

**RECORD OF COMMENTS:
 PROPOSED RULE REVISIONS AND CLARIFICATION OF EXPORT AND
 REEXPORT CONTROLS FOR THE PEOPLE'S REPUBLIC OF CHINA (PRC);
 NEW AUTHORIZATION VALIDATED END-USER (RIN0694-AD75)**

Published in the *Federal Register*
[15 CFR 38313, extension 15 CFR 61692](#)
 Due December 4, 2006

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SAAB Aircraft AB: Docket No. FAA-2006-25271; Directorate Identifier 2006-NM-067-AD.

Comments Due Date

(a) The FAA must receive comments on this AD action by August 7, 2006.

Affected ADs

(b) This AD supersedes AD 2005-04-12.

Applicability

(c) This AD applies to Saab Model SAAB-Fairchild SF340A (SAAB/SF340A) airplanes having serial numbers 004 through 159 inclusive, and Model SAAB 340B airplanes having serial numbers 160 through 367 inclusive; certificated in any category; on which Saab Modification 2533 has not been implemented.

Unsafe Condition

(d) This AD results from reports of premature failures of the direct current (DC) starter generator prior to scheduled overhaul. We are issuing this AD to prevent failure of the starter generator, which could cause a low voltage situation in flight and result in increased pilot workload and reduced redundancy of the electrical powered systems.

Compliance

(e) You are responsible for having the actions required by this AD performed within the compliance times specified, unless the actions have already been done.

Restatement of the Requirements of AD 2005-04-12

Inspections for Wear of the DC Starter Generator Brushes and Leads

(f) For generators overhauled in accordance with Maintenance Review Board (MRB) Task 243104: Before 800 flight hours since last overhaul, or within 100 flight hours after April 1, 2005 (the effective date of AD 2005-04-12), perform a general visual inspection for wear of the DC starter generator brushes and leads, in accordance with Saab Service Bulletin 340-24-035, dated July 5, 2004.

Note 1: For the purposes of this AD, a general visual inspection is: "A visual examination of an interior or exterior area, installation, or assembly to detect obvious damage, failure, or irregularity. This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to ensure visual access to all surfaces in the inspection area. This level of inspection is made under normally available lighting conditions such as daylight, hangar lighting, flashlight, or droplight and may require removal or opening of access panels or doors. Stands, ladders, or platforms may be required to gain proximity to the area being checked."

Note 2: Saab Service Bulletin 340-24-035, dated July 5, 2004, references Goodrich Service Information Letter 23080-03X-24-01, dated July 1, 2004, as an additional source of service information.

(1) If the tops of the brush sets are above the top of the brush box, repeat the inspection thereafter at intervals not to

exceed 800 flight hours until paragraph (i) of this AD is done.

(2) If the tops of the brush sets are below the top of the brush box, before further flight, measure the brushes and determine the remaining amount of brush life remaining, in accordance with the service bulletin.

(i) If the brush wear is within the limits specified in the service bulletin, repeat the inspection thereafter at intervals not to exceed 800 flight hours until paragraph (i) of this AD is done.

(ii) If the brush wear is outside the limits specified in the service bulletin, before further flight, replace the starter generator with a new or serviceable starter generator, in accordance with the service bulletin.

Inspections for Loose Rivets

(g) For generators overhauled in accordance with MRB Task 243104: Before 800 flight hours since last overhaul, or within 100 flight hours after April 1, 2005, whichever occurs later, perform a general visual inspection of each leading wafer brush for loose rivets, in accordance with Saab Service Bulletin 340-24-035, dated July 5, 2004. Repeat the inspection thereafter at intervals not to exceed 800 flight hours until paragraph (i) of this AD is done. If any rivet is loose, before further flight, replace the DC starter generator with a new or serviceable starter generator, in accordance with the service bulletin.

MRB Task 243103 or 243101

(h) For generators overhauled or with brush replacement accomplished in accordance with MRB Task 243103 or 243101, no action is required by paragraphs (f) and (g) of this AD.

New Requirements of This AD

Installation

(i) For all generators: Within 36 months after the effective date of this AD, install new improved generator control units (GCUs) in accordance with the Accomplishment Instructions of Saab Service Bulletin 340-24-026, Revision 03, dated December 20, 2004. Installing the GCUs terminates the repetitive inspection requirements of paragraphs (f) and (g) of this AD.

Alternative Methods of Compliance (AMOCs)

(j)(1) The Manager, International Branch, ANM-116, Transport Airplane Directorate, FAA, has the authority to approve AMOCs for this AD, if requested in accordance with the procedures found in 14 CFR 39.19.

(2) Before using any AMOC approved in accordance with § 39.19 on any airplane to which the AMOC applies, notify the appropriate principal inspector in the FAA Flight Standards Certificate Holding District Office.

Related Information

(k) Swedish airworthiness directive 1-197, dated November 5, 2004, also addresses the subject of this AD.

Issued in Renton, Washington, on June 28, 2006.

Kalene C. Yanamura,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. E6-10537 Filed 7-5-06; 8:45 am]

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DEPARTMENT OF COMMERCE

Bureau of Industry and Security

15 CFR Parts 740, 742, 744 and 748

[Docket No. 060622180-6180-01]

RIN 0694-AD75

Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC); New Authorization Validated End-User

AGENCY: Bureau of Industry and Security, Commerce.

ACTION: Proposed rule.

SUMMARY: It is the policy of the United States Government to prevent exports that would make a material contribution to the military capability of the People's Republic of China (PRC), while facilitating U.S. exports to legitimate civil end-users in the PRC. Consistent with this policy, the Bureau of Industry and Security (BIS) proposes to amend the Export Administration Regulations (EAR) by revising and clarifying United States licensing requirements and licensing policy on exports and reexports of goods and technology to the PRC.

The proposed amendments include a revision to the licensing review policy for items controlled on the Commerce Control List (CCL) for reasons of national security, including a new control based on knowledge of a military end-use on exports to the PRC of certain CCL items that otherwise do not require a license to the PRC. The items subject to this license requirement will be set forth in a list. This rule further proposes to revise the licensing review policy for items controlled for reasons of chemical and biological proliferation, nuclear nonproliferation, and missile technology for export to the PRC, requiring that applications involving such items be reviewed in conjunction with the revised national security licensing policy.

This rule proposes the creation of a new authorization for validated end-users in certain destinations, including the PRC, to whom certain, specified items may be exported or reexported. Such validated end-users would be placed on a list in the EAR after review

and approval by the United States Government.

Finally, this rule proposes to require exporters to obtain an End-User Certificate, issued by the PRC Ministry of Commerce, for all items that both require a license to the PRC for any reason and exceed a total value of \$5,000. The current PRC End-Use Certificate applies only to items controlled for national security reasons. This rule also proposes to eliminate the current requirement that exporters submit PRC End-User Certificates to BIS with their license applications but provides that they must retain them for five years.

DATES: Comments must be received by November 3, 2006.

ADDRESSES: Written comments on this rule may be sent to the Federal eRulemaking Portal: <http://www.regulations.gov>, or by e-mail to publiccomments@bis.doc.gov. Include RIN 0694-AD75 in the subject line of the message. Comments may be submitted by mail or hand delivery to Sheila Quarterman, Office of Exporter Services, Regulatory Policy Division, Bureau of Industry and Security, Department of Commerce, 14th St. & Pennsylvania Avenue, NW., Room 2705, Washington, D.C. 20230, ATTN: RIN 0694-AD75; or by fax to (202) 482-3355.

Send comments regarding the collection of information to David Rostker, Office of Management and Budget (OMB), by e-mail to David_Rostker@omb.eop.gov, or by fax to (202) 395-7285; and to the Regulatory Policy Division, Bureau of Industry and Security, Department of Commerce, P.O. Box 273, Washington, DC 20044.

FOR FURTHER INFORMATION CONTACT: Bernard Kritzer, Director, Office of National Security and Technology Transfer Controls, Bureau of Industry and Security, Department of Commerce, P.O. Box 273, Washington, DC 20044; telephone: (202) 482-0092, or e-mail: bkritzer@bis.doc.gov.

SUPPLEMENTARY INFORMATION

Background

This rule proposes revisions and clarifications to United States policy on exports to the People's Republic of China (PRC) of goods and technologies controlled for national security and foreign policy reasons. As the PRC has increased its participation in the global economy, bilateral trade between the PRC and the United States has grown rapidly, and the PRC has emerged as a major market for U.S. exports. In addition, as the PRC also increasingly has allowed foreign investment, many

U.S. companies have established significant business operations there. This greatly expanded economic relationship is beneficial for both nations. The United States and China share an interest in expanding free and fair trade, which has increased the prosperity of both the American and Chinese people. At the same time, the United States has a long standing policy of not permitting exports that would make a material contribution to the PRC's military capability. Thus, the United States seeks to facilitate trade for confirmed civil end-uses and end-users in the PRC, while preventing trade that would serve military end-uses.

In 2005, U.S. companies exported approximately \$41 billion worth of items to the PRC. During the same period, approximately \$2.4 billion worth of exports were licensed for export to the PRC, while \$12.5 million worth of exports were denied. In order to strengthen U.S. Government confidence that these U.S. exports conform to U.S. policy and to determine the *bona fides* of potential and actual end-users, the U.S. Government conducts end-use visits, consisting of Pre-License Checks (PLCs) and Post-Shipment Verifications (PSVs). In April 2004, the Vice Minister of Commerce of the PRC and the U.S. Under Secretary of Commerce for Industry and Security exchanged letters transmitting an understanding on strengthened procedures for conducting such end-use visits. This end-use visit understanding has facilitated exports of items on the Commerce Control List (CCL) in Supplement No. 1 to Part 774 of the Export Administration Regulations (EAR) by providing greater assurance that U.S. exports of controlled dual-use items are being used by their intended recipients for their intended purposes.

This rule proposes certain revisions and clarifications to licensing requirements and policies with regard to the PRC to more precisely reflect U.S. export control policy.

Revision of Licensing Review Policy and License Requirements

To strengthen U.S. efforts to prevent U.S. exports to the PRC that would make a material contribution to the PRC's military capabilities, this rule proposes revisions to the licensing review policy for items controlled on the CCL for reasons of national security (i.e., controlled pursuant to the Wassenaar Arrangement), set forth in section 742.4(b)(7) of the EAR. Specifically, this rule amends section 742.4(b)(7) to reaffirm that the overall policy of the United States for exports to the PRC of these items is to approve

exports for civil applications but generally to deny exports that will contribute to the advancement of Chinese military capabilities.

Consistent with this revised policy and U.S. commitments as a Participating State in the Wassenaar Arrangement regarding review of items not on that regime's dual use list that are destined for military end-use in a country subject to an arms embargo, this rule proposes to implement a new control on exports to the PRC of certain CCL items that otherwise do not require a license to the PRC when the exporter has knowledge, as defined in section 772.1 of the EAR, that such items are destined for military end-use in the PRC or is informed that such items are destined for such an end-use. The additional items that would be subject to this military end-use restriction are based on careful interagency review of items listed on the CCL that currently do not require a license for export to the PRC but have the potential to advance the military capabilities of the PRC. For purposes of serving this revised policy and U.S. commitments as a Participating State in the Wassenaar Arrangement, this rule proposes to define "military end-use" as: incorporation into, or use for the production, design, development, maintenance, operation, installation, or deployment, repair, overhaul, or refurbishing of items (1) described on the U.S. Munitions List (USML) (22 CFR Part 121, International Traffic in Arms Regulations); (2) described on the Munitions List (IML) (as set out on the Wassenaar Arrangement Web site at <http://www.wassenaar.org>); or (3) listed under Export Control Classification Numbers (ECCNs) ending in "A018" on the CCL in Supplement No. 1 to Part 774 of the EAR. This new control would be set forth in new section 744.21 of the EAR.

Applications to export, reexport, or transfer items controlled pursuant to proposed section 744.21 would be reviewed on a case-by-case basis to determine whether the export, reexport, or transfer would make a material contribution to the military capabilities of the PRC and would result in advancing the country's military activities contrary to the national security interests of the United States. Other end-use controls in part 744 of the EAR will continue to apply. In addition, BIS proposes to also review license applications for items controlled for chemical and biological proliferation, nuclear nonproliferation and missile technology under sections 742.2, 742.3 and 742.5, respectively, of the EAR, in accordance with the licensing policies in both paragraph (b) of the particular

proliferation section and section 742.4(b)(7) of the EAR when those items are destined to the PRC.

Items primarily affected by the revisions discussed in this section are items controlled for anti-terrorism reasons under the EAR. The specific items that are subject to the military end-use license requirement will be set forth, by ECCN, including specific parameters, in a list in Supplement No. 2 to Part 744 of the EAR.

See sections 744.6 (Restrictions on certain activities of U.S. persons), 744.21 (Restrictions on Certain Military End-uses in the People's Republic of China (PRC)), and Supplement No. 2 to Part 744 (Supplement No. 2 to Part 744—List of Items Subject to the Military End-Use License Requirement of Section 744.21) of the EAR.

Revision of End-User Certificate Requirements

To strengthen implementation of the April 2004 end-use visit understanding between the Vice Minister of Commerce of the PRC and the U.S. Under Secretary of Commerce for Industry and Security, this rule proposes that the requirement for exporters to obtain PRC End-User Certificates from the Ministry of Commerce of the PRC be expanded to apply to all exports of controlled goods and technologies over a specific value threshold (and not merely to those exports controlled for national security reasons, as currently set forth in section 748.10 of the EAR). Specifically, exporters would be required to obtain an End-User Certificate, issued by the PRC Ministry of Commerce, for all items that require a license to the PRC for any reason and exceed a total value of \$5,000 per single ECCN entry. Consistent with the existing Regulations, BIS will continue to require End-User Certificates for all computer exports to the PRC that require license applications, regardless of the dollar value of the export. BIS anticipates that this expansion of the End-Use Certificate requirement will facilitate BIS's ability to conduct end-use checks on exports or reexports of controlled goods and technologies to the PRC, consistent with the existing end-use visit understanding with the Government of the PRC. Facilitation of end-use checks should facilitate increased U.S. exports to the PRC. This revised requirement would be set forth in revised section 748.10 of the EAR.

To minimize the impact that this expanded support documentation requirement will have on exporters, this rule also proposes to eliminate the requirement that exporters submit PRC End-User Certificates to BIS as required

support documentation provided with the license application. Instead, this rule would require exporters to include the serial number of the PRC End-User Certificate in an appropriate field of the license application, and to retain the PRC End-User Certificate in accordance with the recordkeeping provisions of the EAR. See section 762.3 (Records exempt from recordkeeping requirements) of the EAR. These changes would be set forth in sections 748.9 (Support Documents for License Applications), 748.10 (Import and End-User Certificates), and 748.12 (Special Provisions for Support Documents) of the EAR.

New Authorization Validated End-User (VEU)

To facilitate legitimate exports to civilian end-users, BIS proposes to establish a new authorization for validated end-users in section 748.15 of the EAR. This proposed authorization would allow the export, reexport, and transfer of eligible items to specified end-users in an eligible destination, including the PRC. These validated end-users would be those who meet a number of criteria, including a demonstrated record of engaging only in civil end-use activities and not contributing to the proliferation of weapons of mass destruction or otherwise engaged in activity contrary to U.S. national security or foreign policy interests.

In conjunction with other relevant agencies, BIS proposes to evaluate prospective validated end-users on the basis of a range of specific factors, which include the party's record of exclusive engagement in civil end-use activities; the party's compliance with U.S. export controls; the party's capability to comply with the requirements for VEU; the party's agreement to on-site compliance reviews by representatives of the United States Government; and the party's relationships with U.S. and foreign companies. In addition, when evaluating the eligibility of an end-user, agencies would consider the status of export controls in the eligible destination and the support and adherence to multilateral export control regimes of the government of the eligible destination. The proposed rule states that requests to be listed as a validated end-user should be submitted in the form of an advisory opinion request as set forth in new section 748.15(a)(2) (Eligible end-users) of the EAR. In addition, requests would have to include a list of items identified by ECCN that would be exported, reexported or transferred to an eligible end-user. Those items would have to be

specified to the extent of the applicable subparagraph of the ECCN entry. The request also should include a description of how each item would be used by the eligible end-user in an eligible destination. Such requests would be accepted from exporters, reexporters and end-users. A list of validated end-users, respective eligible items, and eligible destinations would appear in proposed Supplement No. 7 to Part 748 (Supplement No. 7 to Part 748—Authorization Validated End-User (VEU): List of Validated End-Users, Respective Eligible Items and Eligible Destinations) of the EAR.

The proposed rule also provides, as set forth in proposed section 748.15(c) (Item restrictions), that some items would not be eligible for export, reexport, or transfer under this authorization. Ineligible items are those restricted by statute.

Finally, under new section 748.15, exporters, reexporters and end-users who use authorization VEU would be required to comply with recordkeeping and reporting requirements, as described in sections 748.15(e) (Certification and recordkeeping) and (f) (Reporting and auditing requirements) of the EAR. As required in proposed section 748.15(e), prior to the initial export or reexport under authorization VEU, exporters or reexporters would be required to receive and retain certifications from eligible end-users that state that they are informed of and will abide by all VEU end-use restrictions; they have procedures in place to ensure compliance with the terms and conditions of VEU; they will not use items obtained under VEU in any of the prohibited activities described in part 744 of the EAR; and they agree to allow on-site visits by U.S. Government officials to verify their compliance with the conditions of VEU. Validated end-users found to be not in compliance with the requirements of VEU as set forth in section 748.15 will be subject to removal from the list of validated end-users and other action, as appropriate.

In addition, as described in proposed section 748.15(f)(1), exporters and reexporters who use authorization VEU would be required to submit annual reports to BIS. These reports must include specific information regarding the export or reexport of eligible items to each validated end-user. Exporters, reexporters, and end-users who avail themselves of VEU also would be audited on a routine basis, as described in proposed section 748.15(f)(2) (Audits). Upon request by BIS, exporters, reexporters, and validated end-users would be required to allow

inspection of records or on-site compliance review. For audit purposes, this rule would require records and information identified in proposed section 748.15 to be retained in accordance with the recordkeeping requirements set forth in part 762 of the EAR.

Although the Export Administration Act expired on August 20, 2001, the President, through Executive Order 13222 of August 17, 2001 (3 CFR, 2001 Comp., p. 783 (2002)), as extended by the Notice of August 2, 2005, 70 FR 45273 (August 5, 2005), has continued the Export Administration Regulations in effect under the International Emergency Economic Powers Act. BIS proposes to amend the EAR in this rule under the provisions of the EAA as continued in effect under IEEPA and Executive Order 13222.

Expansion of Foreign Policy-Based Controls

[The following language will apply at the point the rule passes the proposed stage: This action is taken after consultation with the Secretary of State. This rule imposes new export controls for foreign policy reasons. As required by section 6 of the Export Administration Act of 1979, as amended (the Act), a report on the imposition of these controls was delivered to the Congress on [INSERT DATE OF DELIVERY TO THE CONGRESS.]]. Although the Act expired on August 20, 2001, Executive Order 13222 of August 17, 2001, 3 CFR, 2001 Comp., p. 783 (2002), as extended by the Notice of August 2, 2005, 70 FR 45273 (August 5, 2005), has continued the Export Administration Regulations in effect under the International Emergency Economic Powers Act.]

Rulemaking Requirements

1. This proposed rule has been determined to be not significant for purposes of E.O. 12866.

2. Notwithstanding any other provision of law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*) (PRA), unless that collection of information displays a currently valid Office of Management and Budget (OMB) Control Number. This proposed rule contains collections of information subject to the requirements of the PRA. These collections have been approved by OMB under Control Numbers 0694-0088 (Multi-Purpose Application), which carries a burden hour estimate of 58 minutes to prepare and submit form

BIS-748, and 0694-0093, "Import Certificates and End-User Certificates," which carries a burden of 15 minutes per submission. This proposed rule also contains a proposed revision to the existing collection under Control Number 0694-0088 for recordkeeping, reporting and auditing requirements, which would be submitted in connection with proposed authorization Validated End-User and would carry an estimated burden of 30 minutes per submission. An amendment to the existing collection under Control Number 0694-0088 will be submitted to OMB for approval. Public comment will be sought regarding the burden of the collection of information associated with preparation and submission of these proposed requirements. This proposed rule is not expected to result in a significant increase in license applications or other documentation submitted to BIS. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to David Rostker, Office of Management and Budget (OMB), and to the Regulatory Policy Division, Bureau of Industry and Security, Department of Commerce, as indicated in the **ADDRESSES** section of this rule.

3. This rule does not contain policies with Federalism implications as that term is defined under Executive Order 13132.

4. The provisions of the Administrative Procedure Act (5 U.S.C. 553) requiring notice of proposed rulemaking and the opportunity for public participation are inapplicable because this regulation involves a military or foreign affairs function of the United States (5 U.S.C. 553(a)(1)). Further, no other law requires that a notice of proposed rulemaking and an opportunity for public comment be given for this rule. Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given for this rule by 5 U.S.C. 553, or by any other law, the analytical requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, are not applicable. However, in order to obtain the benefit of a variety of viewpoints before publishing any final rule, BIS is issuing this proposed rule with a request for comments. The period for submission of comments will close on November 3, 2006. In developing a final rule, BIS will consider all comments on all aspects of this proposed rule that are received before the close of the comment period. Comments received after the end of the comment period will be considered if

possible, but their consideration cannot be assured. BIS will not accept public comments accompanied by a request that a part or all of the material be treated confidentially because of its business proprietary nature or for any other reason. BIS will return such comments and materials to the persons submitting the comments and will not consider them in the development of the final rule. All public comments on this proposed rule must be in writing (including fax or e-mail) and will be a matter of public record, available for public inspection and copying at the Federal eRulemaking Portal at <http://www.regulations.gov> and on the BIS Freedom of Information Act (FOIA) web site at <http://www.bis.doc.gov/foia>. BIS does not maintain a separate public inspection facility. If you have technical difficulties accessing this web site, please call BIS's Office of Administration at (202) 482-0500 for assistance.

List of Subjects

15 CFR Parts 740 and 748

Administrative practice and procedure, Exports, Foreign trade, Reporting and recordkeeping requirements.

15 CFR Part 742

Exports, Terrorism.

15 CFR Part 744

Exports, Foreign trade, Reporting and recordkeeping requirements.

Accordingly, parts 740, 742, 744 and 748 of the Export Administration Regulations (15 CFR parts 730-799) are proposed to be amended as follows:

PART 742—[AMENDED]

1. The authority citation for 15 CFR part 742 continues to read as follows:

Authority: 50 U.S.C. app. 2401 *et seq.*; 50 U.S.C. 1701 *et seq.*; 18 U.S.C. 2510 *et seq.*; 22 U.S.C. 3201 *et seq.*; 42 U.S.C. 2139a; Sec. 901-911, Pub. L. 106-387; Sec. 221, Pub. L. 107-56; Sec. 1503, Pub. L. 108-11, 117 Stat. 559; E.O. 12058, 43 FR 20947, 3 CFR, 1978 Comp., p. 179; E.O. 12851, 58 FR 33181, 3 CFR, 1993 Comp., p. 608; E.O. 12938, 59 FR 59099, 3 CFR, 1994 Comp., p. 950; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783; Presidential Determination 2003-23 of May 7, 2003, 68 FR 26459, May 16, 2003; Notice of August 2, 2005, 70 FR 45273 (August 5, 2005); Notice of October 25, 2005, 70 FR 62027 (October 27, 2005).

2. Amend § 742.2 by adding paragraph (b)(4) to read as follows:

§ 742.2 Proliferation of Chemical and Biological Weapons.

* * * * *

(b) * * *

(4) BIS will review license applications for items described in paragraph (a) of this section in accordance with the licensing policies described in paragraph (b) of this section and the licensing policies in both paragraph (b) of this section and § 742.4(b)(7) when those items are destined to the People's Republic of China.

* * * * *

3. Amend § 742.3 by adding paragraph (b)(4) to read as follows:

§ 742.3 Nuclear nonproliferation.

* * * * *

(b) * * *

(4) BIS will also review license applications for items described in paragraph (a) of this section in accordance with the licensing policies described in paragraph (b) of this section and the licensing policies in both paragraph (b) of this section and § 742.4(b)(7) when those items are destined to the People's Republic of China.

* * * * *

4. Amend § 742.4 by revising paragraph (b)(7) to read as follows:

§ 742.4 National Security.

* * * * *

(b) * * *

(7) For the People's Republic of China, there is a general policy of approval for license applications to export, reexport, or transfer items to civil end-uses. There is a presumption of denial for items that would make a material contribution to the military capabilities of the People's Republic of China. Thus, all license applications for exports, reexports, and transfers to the People's Republic of China will be reviewed on a case-by-case basis to determine whether the export, reexport, or transfer would make a material contribution to the military capabilities of the People's Republic of China. In addition, license applications may be reviewed under missile technology, nuclear nonproliferation, or chemical and biological weapons review policies, to determine if the end-user may be involved in proliferation activities.

* * * * *

5. Amend § 742.5 by adding paragraph (b)(4) to read as follows:

§ 742.5 Missile Technology.

* * * * *

(b) * * *

(4) BIS will also review license applications for items described in paragraph (a) of this section in accordance with the licensing policies described in paragraph (b) of this

section and the licensing policies in both paragraph (b) of this section and section 742.4(b)(7) of the EAR when those items are destined to the People's Republic of China.

* * * * *

PART 744—[AMENDED]

6. The authority citation for 15 CFR part 744 is revised to read as follows:

Authority: 50 U.S.C. app. 2401 *et seq.*; 50 U.S.C. 1701 *et seq.*; 22 U.S.C. 3201 *et seq.*; 42 U.S.C. 2139a; Sec. 901–911, Pub. L. 106–387; Sec. 221, Pub. L. 107–56; E.O. 12058, 43 FR 20947, 3 CFR, 1978 Comp., p. 179; E.O. 12851, 58 FR 33181, 3 CFR, 1993 Comp., p. 608; E.O. 12938, 59 FR 59099, 3 CFR, 1994 Comp., p. 950; E.O. 12947, 60 FR 5079, 3 CFR, 1995 Comp., p. 356; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13099, 63 FR 45167, 3 CFR, 1998 Comp., p. 208; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783; E.O. 13224, 66 FR 49079, 3 CFR, 2001 Comp., p. 786; Notice of August 2, 2005, 70 FR 45273 (August 5, 2005); Notice of October 25, 2005, 70 FR 62027 (October 27, 2005).

7. Amend § 744.6 by revising paragraph (a)(1)(ii) to read as follows:

§ 744.6 Restrictions on certain activities of U.S. persons.

(a) * * *

(1) * * *

(ii) No U.S. person, as defined in paragraph (c) of this section, shall, without a license from BIS, knowingly support an export or reexport, or transfer that does not have a license as required by this section or by § 744.21. Support means any action, including financing, transportation, and freight forwarding, by which a person facilitates an export, reexport, or transfer without being the actual exporter or reexporter.

* * * * *

8. Section 744.21 is added to read as follows:

§ 744.21 Restrictions on Certain Military End-uses in the People's Republic of China (PRC).

(a) *General prohibition.* In addition to the license requirements for items specified on the Commerce Control List (CCL), you may not export, reexport, or transfer any item listed in Supplement No. 2 to Part 744 to the PRC without a license or under a license exception described in paragraph (c) of this section if, at the time of the export, reexport, or transfer, you know, meaning either:

(1) You have knowledge that the item is intended, entirely or in part, for a “military end-use,” as defined in paragraph (f) of this section, in the PRC; or

(2) You have been informed by BIS that the item is or may be intended, entirely or in part, for a “military end-use” in the PRC.

(b) *Additional prohibition on those informed by BIS.* BIS may inform you either individually by specific notice, through amendment to the EAR published in the **Federal Register**, or through a separate notice published in the **Federal Register**, that a license is required for specific exports, reexports, or transfers of any item because there is an unacceptable risk of use in or diversion to military end-use activities in the PRC. Specific notice will be given only by, or at the direction of, the Deputy Assistant Secretary for Export Administration. When such notice is provided orally, it will be followed by written notice within two working days signed by the Deputy Assistant Secretary for Export Administration or the Deputy Assistant Secretary's designee. The absence of BIS notification does not excuse the exporter from compliance with the license requirements of paragraph (a) of this section.

(c) *License Exception.* The only License Exception that may apply to the prohibitions described in paragraphs (a) and (b) of this section are the provisions of License Exception GOV set forth in § 740.11(b)(2)(i) or (ii) of the EAR.

(d) *License application procedure.* When submitting a license application pursuant to this section, you must state in the “additional information” section of the BIS–748P “Multipurpose Application” or its electronic equivalent that “this application is submitted because of the license requirement in § 744.21 of the EAR (Restrictions on Certain Military End-uses in the People's Republic of China).” In addition, either in the additional information section of the application or in an attachment to the application, you must include all known information concerning the military end-use of the item(s). If you submit an attachment with your license application, you must reference the attachment in the additional information section.

(e) *License review standards.* (1) Applications to export, reexport, or transfer items described in paragraph (a) of this section will be reviewed on a case-by-case basis to determine whether the export, reexport, or transfer would make a material contribution to the military capabilities of the PRC and would result in advancing the country's military activities contrary to the national security interests of the United States.

(2) Applications may be reviewed under missile technology, nuclear

nonproliferation, or chemical and biological weapons review policies if the end-user may be involved in certain proliferation activities.

(3) Applications for items requiring a license for other reasons that are destined to the PRC for a military end-use also will be subject to the review policy stated in paragraph (e) of this section.

(f) In this section, "military end-use" means: incorporation into, or use for the production, design, development, maintenance, operation, installation, or deployment, repair, overhaul, or refurbishing of items:

(1) Described on the U.S. Munitions List (USML) (22 CFR Part 121, International Traffic in Arms Regulations);

(2) Described on the International Munitions List (IML) (as set out on the Wassenaar Arrangement Web site at <http://www.wassenaar.org>); or

(3) Listed under ECCNs ending in "A018" on the Commerce Control List (CCL) in Supplement No. 1 to Part 774 of the EAR.

Note to paragraph (f) of this section: For purposes of this section: "production" means integration, assembling, inspection, or testing; "development" means design, and includes testing and building of prototypes; "maintenance" means performing work to bring an item to its original or designed capacity and efficiency for its intended purpose, and includes testing, measuring, adjusting, inspecting, replacing parts, restoring, calibrating, overhauling; "operation" means to cause to function as intended; "installation" means to make ready for use, and includes connecting, integrating, incorporating, loading software, and testing; "deployment" means placing in battle formation or appropriate strategic position.

9. Supplement No. 2 to Part 744 is added to read as follows:

Supplement No. 2 to Part 744—List of Items Subject to the Military End-Use License Requirement of § 744.21

The following items are subject to the military end-use license requirement in § 744.21.

(1) Category 1—Materials, Chemicals, Microorganisms, and Toxins

(i) 1A290 Depleted uranium (any uranium containing less than 0.711% of the isotope U-235) in shipments of more than 1,000 kilograms in the form of shielding contained in X-ray units, radiographic exposure or teletherapy devices, radioactive thermoelectric generators, or packaging for the transportation of radioactive materials.

(ii) 1B999 Equipment controlled by 1B999.e specially designed for the production of structural composites, fibers, prepreps and preforms controlled in Category 1, n.e.s.

(iii) 1C990 Fibrous and filamentary materials, not controlled by 1C010 or 1C210,

for use in "composite" structures and with a specific modulus of 3.18×10^6 m or greater and a specific tensile strength of 7.62×10^4 m or greater.

(iv) 1C995 Mixtures not controlled by 1C350, 1C355 or 1C395 that contain chemicals controlled by 1C350 or 1C355 and medical, analytical, diagnostic, and food testing kits not controlled by 1C350 or 1C395 that contain chemicals controlled by 1C350.d, as follows (see List of Items Controlled), except 1C995.c "Medical, analytical, diagnostic, and food testing kits."

(v) 1C996 Hydraulic fluids containing synthetic hydrocarbon oils, having all the following characteristics (see List of Items Controlled).

(vi) 1D999 Specific software controlled by 1D999.b for equipment controlled by 1B999.e specially designed for the production of structural composites, fibers, prepreps and preforms controlled in Category 1, n.e.s.

(vii) 1D993 "Software" specifically designed for the "development", "production", or "use" of equipment or materials controlled by 1C210.b, or 1C990.

(viii) 1E994 "Technology" for the "development", "production", or "use" of fibrous and filamentary materials controlled by 1C990.

(2) Category 2—Materials Processing

(i) 2A991 Bearings and bearing systems not controlled by 2A001.

(ii) 2B991 Limited to machine tools controlled under 2B991 having "positioning accuracies", with all compensations available, better than 0.010 mm along any linear axis; and machine tools having the characteristic of one or more contouring "tilting spindles" controlled by 2B991.d.1.a.

(iii) 2B992 Non-"numerically controlled" machine tools for generating optical quality surfaces, and specially designed components therefor.

(iv) 2B993 Limited to gear making and/or finishing machinery not controlled by 2B003 capable of producing gears to a quality level of better than AGMA 12.

(v) 2B996 Dimensional inspection or measuring systems or equipment not controlled by 2B006.

(3) Category 3—Electronics Design, Development and Production

(i) 3A292 Oscilloscopes and transient recorders other than those controlled by 3A002.a.5, and specially designed components therefor.

(ii) 3A999 Limited to items controlled by 3A999.c.

(iii) 3B991 Equipment not controlled by 3B001 for the manufacture of electronic components and materials, and specially designed components and accessories therefor.

(iv) 3B992 Equipment not controlled by 3B002 for the inspection or testing of electronic components and materials, and specially designed components and accessories therefor.

(v) 3D991 "Software" specially designed for the "development", "production", or "use" of electronic devices or components controlled by 3A991, general purpose electronic equipment controlled by 3A992, or

manufacturing and test equipment controlled by 3B991 and 3B992.

(vi) 3E292 "Technology" according to the General Technology Note for the "development", "production", or "use" of equipment controlled by 3A292.

(vii) 3E991 "Technology" for the "development", "production", or "use" of electronic devices or components controlled by 3A991, general purpose electronic equipment controlled by 3A992, or manufacturing and test equipment controlled by 3B991 or 3B992.

(4) Category 4—Computers

(i) 4A994 Limited to computers not controlled by 4A003, with an Adjusted Peak Performance ("APP") exceeding 0.1 Weighted TeraFLOPS (WT).

(ii) 4D993 "Program" proof and validation "software", "software" allowing the automatic generation of "source codes", and operating system "software" not controlled by 4D003 that are specially designed for real time processing equipment.

(iii) 4D994 "Software" specially designed or modified for the "development", "production" or "use" of equipment controlled by 4A101, 4A994 with an Adjusted Peak Performance ("APP") exceeding 0.1 Weighted TeraFLOPS (WT), 4B994 and materials controlled by 4C994.

(iv) 4E992 "Technology" for the "development", "production", or "use" of equipment controlled by 4A994, as described in this Supplement No. 2 to Part 744, and 4B994, materials controlled by 4C994, or "software" controlled by 4D993 or 4D994.

(5) Category 5—(Part 1) Telecommunications

(i) 5A991 Limited to items controlled by 5A991.a., 5A991.b.5., 5A991.b.7. and 5A991.f.

(ii) 5B991 Telecommunications test equipment, n.e.s.

(iii) 5C991 Preforms of glass or of any other material optimized for the manufacture of optical fibers controlled by 5A991.

(iv) 5D991 "Software" specially designed or modified for the "development", "production", or "use" of equipment controlled by 5A991 and 5B991.

(v) 5E991 "Technology" for the "development", "production" or "use" of equipment controlled by 5A991 or 5B991, or "software" controlled by 5D991, and other "technologies" as follows (see List of Items Controlled).

(6) Category 5—(Part 2) Information Security

(i) 5A992 Equipment not controlled by 5A002, except mass market encryption commodities and software described in §§ 742.15(b)(1)(i) and 742.15(b)(2); certain "short-range wireless" commodities and software described in § 742.15(b)(3)(ii); and commodities and software with limited cryptographic functionality described in § 742.15(b)(3)(iii).

(ii) 5D992 "Information Security" "software" not controlled by 5D002, except mass market encryption commodities and software described in §§ 742.15(b)(1)(i) and 742.15(b)(2); certain "short-range wireless" commodities and software described in § 742.15(b)(3)(ii); and commodities and

software with limited cryptographic functionality described in § 742.15(b)(3)(iii).

(iii) 5E992 "Information Security" "technology", not controlled by 5E002.

(7) *Category 6—Sensors and Lasers*

(i) 6A995 "Lasers", not controlled by 6A005 or 6A205.

(ii) 6C992 Optical sensing fibers not controlled by 6A002.d.3 which are modified structurally to have a "beat length" of less than 500 mm (high birefringence) or optical sensor materials not described in 6C002.b and having a zinc content of equal to or more than 6% by mole fraction.

(8) *Category 7—Navigation and Avionics*

(i) 7A994 Other navigation direction finding equipment, airborne communication equipment, all aircraft inertial navigation systems not controlled under 7A003 or 7A103, and other avionic equipment, including parts and components, n.e.s.

(ii) 7B994 Other equipment for the test, inspection, or "production" of navigation and avionics equipment.

(iii) 7D994 "Software", n.e.s., for the "development", "production", or "use" of navigation, airborne communication and other avionics.

(iv) 7E994 "Technology", n.e.s., for the "development", "production", or "use" of navigation, airborne communication, and other avionics equipment.

(9) *Category 8—Marine*

(i) 8A992 Underwater systems or equipment, not controlled by 8A002, and specially designed parts therefor.

(ii) 8D992 "Software" specially designed or modified for the "development", "production" or "use" of equipment controlled by 8A992.

(iii) 8E992 "Technology" for the "development", "production" or "use" of equipment controlled by 8A992.

(10) *Category 9—Propulsion Systems, Space Vehicles and Related Equipment*

(i) 9A991 "Aircraft", n.e.s., and gas turbine engines not controlled by 9A001 or 9A101 and parts and components, n.e.s.

(ii) 9B990 Vibration test equipment and specially designed parts and components, n.e.s.

(iii) 9D990 "Software", n.e.s., for the "development" or "production" of equipment controlled by 9A990 or 9B990.

(iv) 9D991 "Software", for the "development" or "production" of equipment controlled by 9A991 or 9B991.

(v) 9E990 "Technology", n.e.s., for the "development" or "production" or "use" of equipment controlled by 9A990 or 9B990.

(vi) 9E991 "Technology", for the "development", "production" or "use" of equipment controlled by 9A991 or 9B991.

PART 748—[AMENDED]

10. The authority citation for 15 CFR part 748 continues to read as follows:

Authority: 50 U.S.C. app. 2401 *et seq.*; 50 U.S.C. 1701 *et seq.*; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783; Notice

of August 2, 2005, 70 FR 45273 (August 5, 2005).

11. Section 748.9 is amended:

a. By revising paragraph (b)(1) introductory text;

b. By revising paragraph (b)(2) introductory text before the list of countries;

c. By revising paragraphs (b)(2)(i) and (b)(2)(ii); and

d. By revising paragraph (c)(1).

The revisions read as follows:

§ 748.9 Support Documents for License Applications.

* * * * *

(b) * * *

(1) Does your transaction involve items controlled for national security reasons?

Does your transaction involve items destined for the People's Republic of China (PRC)?

* * * * *

(2) Does your transaction involve items controlled for national security reasons destined for one of the following countries? (This applies only to those overseas destinations specifically listed.) If your item is destined for the PRC, does your transaction involve items that require a license to the PRC for any reason?

* * * * *

(i) If *yes*, your transaction may require an Import or End-User Certificate. If your transaction involves items destined for the PRC that are controlled to the PRC for any reason, your transaction may require a PRC End-User Certificate. Note that if the destination is the PRC, a Statement of Ultimate Consignee and Purchaser may be substituted for a PRC End-User Certificate when the item to be exported (i.e., replacement parts and sub-assemblies) is for servicing previously exported items and is valued at \$75,000 or less.

(ii) If *no*, your transaction may require a Statement by Ultimate Consignee and Purchaser. Read the remainder of this section, then proceed to § 748.11 of the EAR.

(c) License Applications Requiring Support Documents. * * *

(1) License applications supported by an Import or End-User Certificate. You may submit your license application upon receipt of a facsimile or other legible copy of the Import or End-User Certificate, provided that no shipment is made against any license issued based upon the Import or End-User Certificate prior to receipt and retention of the original statement by the applicant.

* * * * *

12. Section 748.10 is amended:

a. By revising the fourth sentence in paragraph (a);

b. By redesignating paragraph (b)(4) as paragraph (b)(5) and by adding a new paragraph (b)(4) and revising newly designated paragraph (b)(5);

c. By revising paragraph (c)(1);

d. By revising paragraph (c) (3) introductory text; and

e. By revising paragraph (g).

The additions and revisions read as follows:

§ 748.10 Import and End-User Certificates.

(a) *Scope.* * * * This section describes exceptions and relationships true for both Import and End-User Certificates, and applies only to transactions involving national security controlled items destined for one of the countries identified in § 748.9(b)(2) of this part, or, in the case of the PRC, for all items that require a license to the PRC for any reason.

(b) * * *

(4) Your transaction involves an export to the People's Republic of China (PRC) of commodities and software classified in a single entry on the CCL, the total value of which exceeds \$5,000. Note that this \$5,000 threshold does not apply to exports to the PRC of computers, which are subject to the provisions of § 748.10(b)(3).

(i) Your license application may list several separate CCL entries. If the total value of entries that require a license to the PRC for any reason on the CCL on a license application exceeds \$5,000, then a PRC End-User Certificate covering all controlled items on your license application must be obtained;

(ii) You may be specifically requested by BIS to obtain an End-User Certificate for a transaction valued under \$5,000 or for a transaction that requires a license to the PRC for reasons in the EAR other than those listed on the CCL.

(5) Your transaction involves a destination other than the PRC and your license application involves the export of commodities and software classified in a single entry on the CCL, the total value of which exceeds \$5,000.

(i) Your license application may list several separate CCL entries. If any entry controlled for national security reasons exceeds \$5,000, then an Import Certificate must be obtained covering all items controlled for national security reasons on your license application;

(ii) If your license application involves a lesser transaction that is part of a larger order for items controlled for national security reasons in a single ECCN exceeding \$5,000, an Import Certificate must be obtained.

(iii) You may be specifically requested by BIS to obtain an Import Certificate for a transaction valued under \$5,000.

(c) *How to obtain an Import or End-User Certificate.* (1) Applicants must

request that the importer (e.g., ultimate consignee or purchaser) obtain the Import or End-User Certificate, and that it be issued covering only those items that are controlled for national security reasons. Note that in the case of the PRC, applicants must request that the importer obtain an End-User Certificate for all items on a license application that are controlled to the PRC for any reason on the CCL. Importers should not be requested, except in the case of the PRC, to obtain an Import or End-User Certificate for items that are controlled for reasons other than national security. Applicants must obtain original Import or End-User Certificates from importers.

* * * * *

(3) If your transaction requires the support of a PRC End-User Certificate,

you must ensure that the following information is included on the PRC End-User Certificate signed by an official of the Department of Scientific and Technological Development and Trade in Technology of the PRC Ministry of Commerce (MOFCOM), with MOFCOM's seal affixed to it:

* * * * *

(g) *Submission of Import and End-User Certificates.* Certificates must be retained on file by the applicant in accordance with the recordkeeping provisions of part 762 of the EAR, and should not be submitted with the license application. For more information on what Import and End-user Certificate information must be included in license applications, refer to § 748.9(c) of the EAR. In addition, as set

forth in § 748.12(e), to assist in license reviews, BIS will require applicants, on a random basis, to submit specific original Import and End-user Certificates.

* * * * *

§ 748.12 [Amended]

13. Section 748.12 is amended by removing and reserving paragraph (a).

14. Supplement No. 4 to Part 748, is amended by revising the entry for "China, People's Republic of", to read as follows:

Supplement No. 4 to Part 748— Authorities Administering Import Certificate/Delivery Verification (IC/DV) and End-Use Certificate Systems in Foreign Countries

Country	IC/DV authorities	System administered
* * * * *	* * * * *	* * * * *
China, People's Republic of	Export Control Division I Department of S&T No. 2 Dong Chang An Street Beijing Phone: 8610-6519-7366 Fax: 8610-6519-7926.	PRC End-User Certificate.
* * * * *	* * * * *	* * * * *

15. Section 748.15 is added to read as follows:

§ 748.15 Authorization Validated End-User (VEU).

Authorization Validated End-User (VEU) permits the export, reexport, and transfer to validated end-users of any eligible items that will be used in an eligible destination. Validated end-users are those who have been approved in advance pursuant to the requirements of this section. To be eligible for authorization VEU, exporters, reexporters, and potential validated end-users must adhere to the conditions and restrictions set forth in paragraphs (a) through (f) of this section.

(a) *Eligible end-users.* The only end-users to whom eligible items may be exported, reexported, or transferred under VEU are those validated end-users identified in Supplement No. 7 to Part 748.

(1) In evaluating an end-user for eligibility under this authorization, BIS, in consultation with the Departments of State, Energy, and Defense and other agencies, as appropriate, will consider a range of information, including such factors as: The party's record of exclusive engagement in civil end-use activities; the party's compliance with U.S. export controls; the party's capability to comply with the requirements of authorization VEU; the party's agreement to on-site compliance

reviews by representatives of the United States Government; and the party's relationships with U.S and foreign companies. In addition, when evaluating the eligibility of an end-user, agencies will consider the status of export controls and the support and adherence to multilateral export control regimes of the government of the eligible destination.

(2) Requests for authorization must be submitted in the form of an advisory opinion request, as described in § 748.3(c), and should include a list of items, identified by Export Control Classification Number (ECCN), that exporters or reexporters intend to export, reexport or transfer to an eligible end-user. In addition to the information described in § 748.3, the items identified by ECCN should be specified to the extent of the applicable subparagraph of the ECCN entry. The request also should include a description of how each item would be used by the eligible end-user in an eligible destination. Requests for authorization will be accepted from exporters, reexporters and end-users. Submit the request to:

The Office of Exporter Services, Bureau of Industry and Security, U.S. Department of Commerce, 14th Street and Pennsylvania Avenue, NW., Room 2075, Washington, DC 20230; or to

The Office of Exporter Services, Bureau of Industry and Security, U.S. Department of Commerce, P.O. Box 273, Washington, DC 20044.

Mark the package sent to either address "Request for Authorization Validated End-User".

(3) Exports, reexports, or transfers made under authorization VEU may only be made to an end-user listed in Supplement No. 7 to Part 748 if the items will be consigned to and for use by the validated end-user.

(b) *Eligible destinations.* Authorization VEU may be used for the following destinations:

- (1) The People's Republic of China.
- (2) [Reserved].

(c) *Item restrictions.* (1) Items controlled under the EAR for missile technology (MT) and crime control (CC) reasons may not be exported or reexported under this authorization.

(d) *End-use restrictions.* Items obtained under authorization VEU may not be used for any activities described in part 744. Eligible end-users who obtain items under VEU may only:

- (1) Use such items at the end-user's own facility located in an eligible destination or at a facility located in an eligible destination over which the end-user demonstrates effective control;
- (2) Consume such items during use; or
- (3) Transfer or reexport such items only as authorized by BIS.

(e) *Certification and recordkeeping.* Prior to the initial export or reexport under authorization VEU, exporters or reexporters must receive and retain end-use certifications from eligible end-users stating that:

(1) They are informed of and will abide by all authorization VEU end-use restrictions;

(2) They have procedures in place to ensure compliance with authorization VEU destination and end-use restrictions;

(3) They will not use items obtained under authorization VEU in any of the prohibited activities described in part 744 of the EAR; and

(4) They agree to allow on-site visits by U.S. Government officials to verify the end-users' compliance with the conditions of authorization VEU.

Note to paragraph (e) of this section: These certifications must be retained by exporters or reexporters in accordance with the recordkeeping requirements set forth in part 762 of the EAR.

(f) *Reporting and auditing requirements—(1)(i) Reports.* Exporters and reexporters who use authorization VEU are required to submit annual reports to BIS. These reports must include, for each validated end-user to whom the exporter or reexporter exported or reexported eligible items:

(A) The name and address of any validated end-users to whom the exporters or reexporters exported or reexported eligible items;

(B) The eligible destination to which the items were exported or reexported;

(C) The quantity of such items;

(D) The value of such items; and

(E) The ECCN(s) of such items.

(ii) Reports are due by February 15 of each year, and must cover the period of January 1 through December 31 of the prior year. Packages containing such reports should be marked

“Authorization Validated End-User Reports.” Reports should be sent to: Office of Export Enforcement, Bureau of Industry and Security, U.S. Department of Commerce, 14th Street and Constitution Avenue, NW., Room H-4520, Washington, DC 20230.

(2) *Audits.* Users of authorization VEU will be audited on a routine basis. Upon request by BIS, exporters, reexporters, and validated end-users must allow inspection of records or on-site compliance reviews. For audit purposes, records, including information identified in paragraphs (e), (f)(1) and the note to paragraph (c) of this section, should be retained in accordance with the recordkeeping requirements set forth in part 762 of the EAR.

12. Supplement No. 7 to Part 748 is added to read as follows:

**Supplement No. 7 to Part 748—
Authorization Validated End-User
(VEU): List of Validated End-Users,
Respective Eligible Items and Eligible
Destinations**

**Validated End-Users, Respective Eligible
Items and Eligible Destinations for Exports
and Reexports Under Authorization VEU:**

*Certified End-User
Eligible Items
Eligible Destination*

Dated: June 29, 2006.

Matthew S. Borman,

*Deputy Assistant Secretary for Export
Administration.*

[FR Doc. E6-10504 Filed 7-5-06; 8:45 am]

BILLING CODE 3510-33-P

DEPARTMENT OF COMMERCE

Bureau of Industry and Security

15 CFR Parts 764 and 766

[Docket No. 060511128-6128-01]

RIN 0694-AD63

Antiboycott Penalty Guidance

AGENCY: Bureau of Industry and Security, Commerce.

ACTION: Proposed rule; correction.

SUMMARY: This notice corrects a transposition error in the Regulatory Identification Number (RIN) in the preamble to a proposed rule that the Bureau of Industry and Security published on June 30, 2006 (71 FR 37571). The correct RIN is 0694-AD63. The RIN was incorrectly listed as 0694-AD36. In addition this notice corrects that same transposition error that appeared in the final sentence of the **ADDRESSES** paragraph of the preamble of that propose rule. As corrected, the final sentence of the **ADDRESSES** paragraph reads:

ADDRESSES: * * * Please refer to RIN 0694-AD63 in all comments.

FOR FURTHER INFORMATION CONTACT: Edward O. Weant III, Acting Director, Office of Antiboycott Compliance, Bureau of Industry and Security, United States Department of Commerce, at (202) 482-2381.

Dated: June 30, 2006.

Eileen Albanese,

Director, Office of Export Services.

[FR Doc. E6-10560 Filed 7-5-06; 8:45 am]

BILLING CODE 3510-33-P

FEDERAL TRADE COMMISSION

16 CFR Part 311

**Test Procedures and Labeling
Standards for Recycled Oil**

AGENCY: Federal Trade Commission.

ACTION: Request for public comments.

SUMMARY: The Federal Trade Commission (“FTC” or “Commission”) requests public comment on the overall costs, benefits, and regulatory and economic impact of its rule specifying Test Procedures and Labeling Standards for Recycled Oil (“Recycled Oil Rule” or “Rule”), as part of the Commission’s systematic review of all current FTC rules and guides.

DATES: Written comments will be accepted until September 5, 2006.

ADDRESSES: Interested parties are invited to submit written comments. Comments should refer to “16 CFR Part 311 Comment—Recycled Oil Rule, Matter No. R511036” to facilitate the organization of comments. A comment filed in paper form should include this reference both in the text and on the envelope, and should be mailed or delivered to the Office of the Secretary, Federal Trade Commission, Room H-135 (Annex P), 600 Pennsylvania Avenue, NW., Washington, DC 20580. Comments containing confidential material, however, must be filed in paper form, must be clearly labeled “Confidential,” and must comply with Commission Rule 4.9(c).¹ The FTC is requesting that any comment filed in paper form be sent by courier or overnight service, if possible, because postal mail in the Washington area and at the Commission is subject to delay due to heightened security precautions. Comments filed in electronic form should be submitted by clicking on the following: <https://secure.commentworks.com/ftc-recycledoil> and following the instructions on the web-based form.

The FTC Act and other laws the Commission administers permit the collection of public comments to consider and use in this proceeding as appropriate. The Commission will consider all timely and responsive public comments that it receives, whether filed in paper or electronic form. Comments received will be

¹ The comment must be accompanied by an explicit request for confidential treatment, including the factual and legal basis for the request, and must identify the specific portions of the comment to be withheld from the public record. The request will be granted or denied by the Commission’s General Counsel, consistent with applicable law and the public interest. See Commission Rule 4.9(c), 16 CFR 4.9(c).

DEPARTMENT OF COMMERCE**Bureau of Industry and Security****15 CFR Parts 740, 742, 744 and 748**

[Docket No. 06022180-6266-02]

RIN 0694-AD75

Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC); New Authorization Validated End-User**AGENCY:** Bureau of Industry and Security, Commerce.**ACTION:** Proposed rulemaking; extension of comment period.

SUMMARY: This notice extends the comment period on a July 6, 2006 proposed rule in which the Bureau of Industry and Security (BIS) proposed amending the Export Administration Regulations (EAR) to revise and clarify the United States' policy for exports and reexports of dual-use items to the People's Republic of China (PRC).

DATES: All comments on the proposed rule must be received by no later than December 4, 2006.

ADDRESSES: Written comments on this rule may be sent to the Federal eRulemaking Portal: <http://www.regulations.gov>, or by e-mail to publiccomments@bis.doc.gov. Include RIN 0694-AD75 in the subject line of the message. Comments may be submitted by mail or hand delivery to Sheila Quarterman, Office of Exporter Services, Regulatory Policy Division, Bureau of Industry and Security, Department of Commerce, 14th St. & Pennsylvania Avenue, NW., Room 2705, Washington, DC 20230, ATTN: RIN 0694-AD75; or by fax to (202) 482-3355.

FOR FURTHER INFORMATION CONTACT: For further information regarding this notice or the proposed rule, contact Sheila Quarterman, Office of Exporter Services, Regulatory Policy Division, by telephone at (202) 482-2440 or by fax at (202) 482-3355.

SUPPLEMENTARY INFORMATION: On July 6, 2006, the Bureau of Industry and Security (BIS) published a proposed rule in the **Federal Register** (71 FR 38313) that proposed amending the Export Administration Regulations (EAR) to revise and clarify the United States' policy for exports and reexports of dual-use items to the People's Republic of China (PRC). Specifically, the proposed rule states that it is the policy of the United States Government to prevent exports that would make a material contribution to the military

capability of the PRC, while facilitating U.S. exports to legitimate civil end-users in the PRC. Consistent with this policy, BIS proposed to amend the EAR by revising and clarifying United States licensing requirements and licensing policy on exports and reexports of goods and technology to the PRC. The main amendments in the proposed rule include restrictions on certain exports and reexports for military end-users in the PRC; a change in scope of end-user certificate requirement for the PRC; and a new Authorization Validated End-User (VEU).

The proposed rule indicated that the deadline for public comments closes on November 3, 2006. BIS is now extending the comment period until December 4, 2006, to allow the public more time to submit comments in light of discussions heard during the public meetings.

Dated: October 13, 2006.

Eileen Albanese,*Director, Office of Exporter Services.*

[FR Doc. E6-17429 Filed 10-18-06; 8:45 am]

BILLING CODE 3510-33-P**DEPARTMENT OF THE TREASURY****Internal Revenue Service****26 CFR Part 1**

[REG-127819-06]

RIN 1545-BF79

TIPRA Amendments to Section 199**AGENCY:** Internal Revenue Service (IRS), Treasury.**ACTION:** Notice of proposed rulemaking by cross-reference to temporary regulations and notice of public hearing.

SUMMARY: In the Rules and Regulations section of this issue of the **Federal Register**, the IRS is issuing temporary regulations concerning the application of section 199 of the Internal Revenue Code, which provides a deduction for income attributable to domestic production activities. The text of those regulations also serves as the text of these proposed regulations. This document also provides notice of a public hearing on these proposed regulations.

DATES: Written or electronic comments must be received by January 17, 2007. Outlines of topics to be discussed at the public hearing scheduled for February 5, 2007, must be received by January 16, 2007.

ADDRESSES: Send submissions to: CC:PA:LPD:PR (REG-127819-06), room 5203, Internal Revenue Service, PO Box

7604, Ben Franklin Station, Washington, DC 20044. Submissions may be hand delivered Monday through Friday between the hours of 8 a.m. and 4 p.m. to CC:PA:LPD:PR (REG-127819-06), Internal Revenue Service, Crystal Mall 4 Building, 1901 S. Bell St., Arlington, VA, or sent electronically, via the IRS Internet site at <http://www.irs.gov/regs> or via the Federal eRulemaking Portal at <http://www.regulations.gov> (IRS-REG-127819-06). The public hearing will be held in the auditorium of the New Carrollton Federal Building, 5000 Ellin Rd., Lanham, Maryland 20706.

FOR FURTHER INFORMATION CONTACT:

Concerning the regulations, Paul Handleman or Lauren Ross Taylor, (202) 622-3040; concerning submission of comments, the hearing, and/or to be placed on the building access list to attend the hearing, Kelly D. Banks, (202) 622-7180 (not toll-free numbers).

SUPPLEMENTARY INFORMATION:**Background**

Temporary regulations in the Rules and Regulations section of this issue of the **Federal Register** amend the Income Tax Regulations (26 CFR part 1) relating to section 199. The temporary regulations provide guidance concerning the amendments made by the Tax Increase Prevention and Reconciliation Act of 2005 to section 199 of the Internal Revenue Code. The text of those regulations also serves as the text of these proposed regulations. The preamble to the temporary regulations explains the amendments.

Special Analyses

It has been determined that this notice of proposed rulemaking is not a significant regulatory action as defined in Executive Order 12866. Therefore, a regulatory assessment is not required. It also has been determined that section 553(b) of the Administrative Procedure Act (5 U.S.C. chapter 5) does not apply to these regulations, and because the regulations do not impose a collection of information on small entities, the Regulatory Flexibility Act (5 U.S.C. chapter 6) does not apply. Pursuant to section 7805(f) of the Internal Revenue Code, this notice of proposed rulemaking will be submitted to the Chief Counsel for Advocacy of the Small Business Administration for comment on their impact on small business.

Comments and Public Hearing

Before these proposed regulations are adopted as final regulations, consideration will be given to any written comments (a signed original and eight (8) copies) or electronic comments that are submitted timely to the IRS.

July 15, 2006

To: publiccomments@bis.doc.gov
From: William A. Root - waroot@aol.com

Subject: China Proposed Rule RIN0694-AD75 (71 FR 38313-38321, July 6, 2006)

It is recommended that, in the subject proposed rule, 744.21(a), the last sentence of 744.21(b), and 744 Supplement 2 be deleted and “paragraphs (a) and (b)” be changed to “paragraph (b)” in 744.21(c).

This recommendation is for consistency with the policy stated in the first sentence of the Federal Register notice, namely:

It is the policy of the United States Government to prevent exports that would make a material contribution to the military capability of the People’s Republic of China (PRC), while facilitating U.S. exports to legitimate civil end-users in the PRC.

License requirements for export or reexport to China were removed from the items listed in proposed 744 Supplement 2 on findings by the U.S. Government, and its allies in COCOM or Wassenaar, that this would be consistent with the agreed criteria of those organizations. Those criteria did not, and do not, differ substantially from the material contribution to military capability policy stated in the proposed rule. The proposed license requirement for such items if the exporter knows of any military end-use would cast a much broader net than the stated policy of preventing a material contribution to China’s military capability. The proposed broad definition of “military end-use” clearly goes far beyond “material contribution to military capability.” It is unlikely that the problem can be solved by revising that definition, because “material contribution to military capability” is a largely subjective judgment best left to military experts in the Government. The issue is, therefore, whether, in order to further the stated policy, export controls must restrict trade which, in the vast majority of cases, would not come close to contravening that policy.

It is possible that a situation might arise in which an export or reexport to China of an item not now requiring a license could make a material contribution to that country’s military capability. For example, about 20 years ago, the U.S. Government obtained intelligence on the basis of which it determined that export of a Consarc furnace to a destination of concern should be stopped. Extraordinary measures were required to accomplish this, because that furnace did not require a license for export to that destination. This experience led to the Enhanced Proliferation Control Initiative (EPCI) in the early 1990s. Since then, under EPCI, a license has been required for unlisted items if the exporter knows, or BIS informs the exporter, that the end-use would be related to a weapon of mass destruction (WMD).

It is now proposed to expand EPCI to cover all military uses, not just relatively narrow WMD uses. Moreover, this expansion is being proposed without informing the public of any evidence that the “exporter knows” portion of the EPCI procedure has been effective in furthering its

goals. The Government is much more likely to become aware than the exporter of a potential export of an unlisted item which should be stopped. That is what happened in the Consarc furnace case. A future such case could be stopped using the “is informed by BIS” procedure, which would remain in the proposed rule under the above recommendation.

From: "Richard Pearce" <azarrays@msn.com>
To: <publiccomments@bis.doc.gov>
Date: Fri, Jul 28, 2006 6:23 PM
Subject: RIN 0694-AD75

I am a small manufacturer of geophysical seismic equipment used in marine geophysics. I am also the inventor of a technology for use in seismic towed arrays that was classified Secret upon approval of my patent in 1992. The secret designation was released in 1994 and my patent was issued. As a result of my invention of the polymer hydrophone in 1992, in 1994 the export regulations were re-written to specifically include my technology and have remained so since. The irony of all this is the fact that the US Navy has never implemented my technology in any system. Over the years the export requirements of 6A001 have been relaxed to allow export of my systems to all the Wassenaar country's with No License Required based on National Security. As most are aware, the People's Republic of China is one of the fastest growing markets in the world especially for systems related to the exploration and production of oil and gas. For those of us in the manufacturing end of the seismic exploration business, the past many years have not been good, with most US firms having been absorbed by foreign companies. Those foreign companies now export to China, perform surveys in China and have formed partnerships with Chinese companies. Secondly, many Chinese companies are manufacturing the constituent parts that we use here in the US to build seismic systems. For instance, the Chinese now manufacture geophones and hydrophones used in towed arrays and land seismic systems. Many US manufacturers use the Chinese manufactured products.

The regulations are very specific regarding the type and performance of hydrophones exported from the US, the regulations prohibit the export of various configurations of hydrophones within a system and place unreasonable limits on those configurations under the assumption that they can be used in military applications. The unreasonable part of this is that the performance specifications relative to sensitivity prohibit and make senseless the restrictions on channel spacing. So, on one hand we know that a certain sensitivity is required to make a system militarily useful, a system constructed that does not incorporate still is restricted in the channel spacing requirement. Virtually all geophysical systems use hydrophones that possess a sensitivity of -194 dB re 1v/uPa. The regulation indicates that any hydrophone with a sensitivity of -180 dB re 1v/uPa is restricted (-180 being more sensitive than -194). There are many reasons for the magic -180 number and are justified. However, a system constructed using the -194 hydrophone can not achieve the performance necessary to make it useful for such things as submarine detection so it is virtually of no use for that purpose. The largest roadblock faced in construction of commercial seismic arrays for export is the limitation imposed by the channel spacing. It is unreasonable considering what is necessary to achieve the performance of any surveillance array now or in the past used by the US Navy. The current regulation indicates a 12.5 meter channel spacing. This is the standard channel spacing for deep seismic operations both 2D and 3D. The manufacturers of deep seismic systems are able to export with little problem. They are large companies like Teledyne. I am a small company making small systems used specifically for high resolution engineering geophysics surveys which are performed prior to placing rigs, building bridges and are necessary to define the faults and subsurface characteristics of the sea-floor. They are shallow surveys and

required denser spatial sampling so naturally, given the methods by which surveys are done, they require shorter spacing between the groups. Conventional seismic arrays are constructed using an oil filled tube into which the acoustic sensors are placed. Modifying the spacing is a simple matter of emptying out the oil, and putting the sensors closer together. It is not rocket science and the Chinese are quite capable of doing this. So it is easy to compromise the spacing on an oil filled array to violate the spacing requirements imposed by the regulations yet we allow these systems to be exported to China. My company constructs solid arrays that by their nature can not be altered in any way and yet I can not export to China unless I maintain the 12.5 meter spacing requirement.

I believe that we should allow export under license of seismic towed arrays to China that have channel spacing as small as 3.125 meters while observing the depth performance limitations as well as the sensitivity limitations imposed by the current regulations. This will prohibit their use in dual purpose applications. After all, the Chinese have the capability and can build arrays in any configuration they please. The restrictions imposed by this notion that we would somehow transfer to the Chinese a technology that has dual purpose is ludicrous. The US has allowed it's dominance in this field to be sold off to the highest non-US bidder over the past several years. We are now at a serious disadvantage in the field of seismic exploration. That I believe is the tragedy and presents a larger threat to our national security than does the channel spacing of an array.

Sincerely,

Richard Pearce
President
Pearce Technologies Inc.



Robert W. Holleyman, II
President and Chief Executive Officer

1150 18th Street, NW
Suite 700
Washington, DC 20036

p. 202/872 5500
f. 202/872 5501

September 6, 2006

The Honorable Mark Foulon
Acting Under Secretary for Industry and Security
Bureau of Industry and Security (BIS)
U.S. Department of Commerce
14th Street and Constitution Avenue, NW
Washington, D.C. 20230

Dear Mr. Foulon:

On behalf of the members of the Business Software Alliance (BSA)*, we appreciate the opportunity to continue this dialogue with you and your office concerning the proposed changes to the U.S. export control regulations applying to U.S.-China trade. BSA and its member companies support an effective export control system that protects U.S. national security, while also maintaining a favorable environment for U.S. businesses. However, we continue to have serious concerns with the proposed rule and the unilateral approach the U.S. appears to be taking in fulfilling the multilateral commitment of the Wassenaar Arrangement.

No other countries appear to be taking similar approaches with regards to their exports to China. It is in our view that this regulation will significantly harm our industry's ability to compete in China with foreign and homegrown competitors. The regulation also places an incremental, higher control over proprietary source code to China: restricting the ability of U.S. companies to export this type of widely available commercial proprietary software will boost the efforts of those in the Chinese government who favor adopting open source software procurement preferences. The U.S. government has long supported a position of technology neutrality toward software platforms.

We outline some of our immediate thoughts below.

Widely available products, such as retail software and those products sold through retail channels should be excluded:

We recommend that retail software, as well as products typically sold through retail channels be excluded from the proposed regulations. Specifically, these would be products classified under ECCN 5D992 and 5D002 eligible for ENC Unrestricted treatment. In the past, these products were exempted from most restrictions and national security controls because they were deemed not useful for military end use purposes. Software products, by nature, are a commodity so widely available to the general public that they cannot be easily controlled.

Rampant software piracy in China is a clear indication of this. Therefore, rolling back export controls on retail software and products typically sold through retail channels in China will not add significant national security value.

End-User Certificate (EUC) requirements will hinder our ability to compete in China:

We believe the EUC requirements are too broad. We recommend that certification apply only to dual-use products and that we try to push for a distribution license exception (1 year vs. individual product). Furthermore, the EUC requires additional operational due diligence, time and support, which imposes significant time lags for U.S. companies and BIS. The resulting additional delays would put U.S. companies at a competitive disadvantage versus companies in other countries that are not held to the same restrictions for conducting business in China. In addition we are skeptical that China's Ministry of Commerce (MOFCOM) has the capacity and staffing required to fulfill their end of the commitment and perform in a timely fashion. It also would not be unreasonable to assume that MOFCOM could discriminate against issuing certificates to US companies in order to favor domestic Chinese producers. For this rule to be properly considered, the U.S. would at least need serious commitments from China to ensure timeliness, appropriate staffing, and non-discriminatory issuance of certificates. It would be helpful if BIS circulate recommendations on a distribution license scheme as well as provide proposed conditions for such a licensing scheme.

Validated End User Authorization (VEU) creates significant burdens that hurt our competitiveness:

The proposed VEU, much like the EUC, creates additional process burdens for both U.S. companies and BIS. It is our understanding that BIS will only list names provided by U.S. companies after they have been vetted. The requirement places a huge burden on U.S. companies without much benefit. In addition, the VEU would be extremely difficult to police and would most probably inundate companies with compliance burdens. It would be much more beneficial to US companies if BIS would provide names of companies they have previously vetted and for whom they have provided individually validated licenses (IVLs). Of course such a list would need disclaimer language so not to have the appearance of a commercial endorsement from BIS.

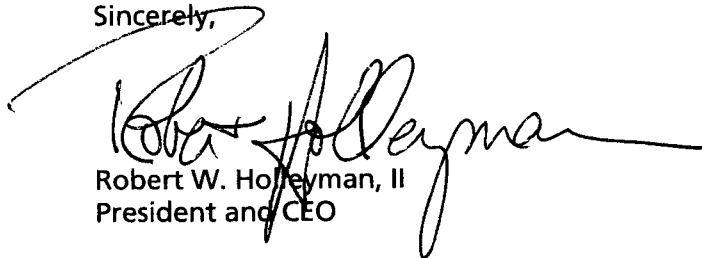
Clear guidance on due diligence for obtaining knowledge of a military end use is needed:

We urge greater clarification on the expectation for due diligence in attaining knowledge of a military end-use. Military end-use can

encompass a breadth of applications if due diligence and knowledge are not applied restrictively. There needs to be clear guidelines on what constitutes acceptable forms of due diligence. Specifically, there needs to be guidance on handling manufacturing relationships for technologies and products that did not previously require licenses, but now do. Additionally BIS should provide guidance about how one should treat entities that appear to be private/commercial in nature but may in fact be controlled by the Chinese military, unbeknownst to the US company.

Beyond these important specific concerns, we urge a fundamental reevaluation of the current unilateral approach to the proposed regulations. We encourage a multilateral approach, one that involves negotiating guidelines with other supplier countries, to adequately address U.S.-China policies and formulate reasonable export control regulations. We look forward to collaborating with you and your office to address our national security priorities, while also maintaining a favorable environment for US businesses.

Sincerely,



Robert W. Hofferlyman, II
President and CEO

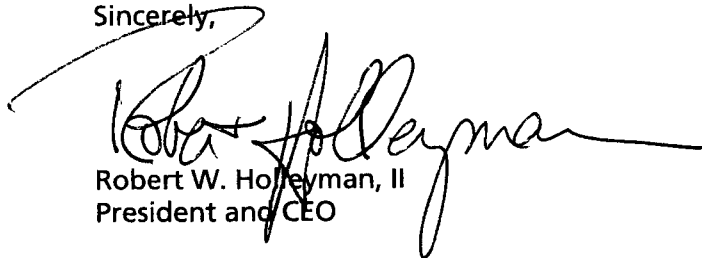
Cc: **Matthew Borman**, Deputy Assistant Secretary for Export Administration
Bernard Kritzer, Director, Office of National Security and Technology Transfer Controls, Bureau of Industry and Security
Catherine Pratt, Director, Office of Information Technology Controls Division, Bureau of Industry and Security

**The Business Software Alliance (www.bsa.org) is the foremost organization dedicated to promoting a safe and legal digital world. BSA is the voice of the world's commercial software industry and its hardware partners before governments and in the international marketplace. Its members represent one of the fastest growing industries in the world. BSA programs foster technology innovation through education and policy initiatives that promote copyright protection, cyber security, trade and e-commerce. BSA members include Adobe, Apple, Autodesk, Avid, Bentley Systems, Borland, Cadence Design Systems, Cisco Systems, CNC Software/Mastercam, Dell, Entrust, HP, IBM, Intel, Internet Security Systems, McAfee, Microsoft, PTC, RSA Security, SAP, SolidWorks, Sybase, Symantec, Synopsys, The MathWorks, and UGS.*

encompass a breadth of applications if due diligence and knowledge are not applied restrictively. There needs to be clear guidelines on what constitutes acceptable forms of due diligence. Specifically, there needs to be guidance on handling manufacturing relationships for technologies and products that did not previously require licenses, but now do. Additionally BIS should provide guidance about how one should treat entities that appear to be private/commercial in nature but may in fact be controlled by the Chinese military, unbeknownst to the US company.

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Sincerely,



Robert W. Hofferlyman, II
President and CEO

Cc: **Matthew Borman**, Deputy Assistant Secretary for Export Administration
Bernard Kritzer, Director, Office of National Security and Technology Transfer Controls, Bureau of Industry and Security
Catherine Pratt, Director, Office of Information Technology Controls Division, Bureau of Industry and Security

**The Business Software Alliance (www.bsa.org) is the foremost organization dedicated to promoting a safe and legal digital world. BSA is the voice of the world's commercial software industry and its hardware partners before governments and in the international marketplace. Its members represent one of the fastest growing industries in the world. BSA programs foster technology innovation through education and policy initiatives that promote copyright protection, cyber security, trade and e-commerce. BSA members include Adobe, Apple, Autodesk, Avid, Bentley Systems, Borland, Cadence Design Systems, Cisco Systems, CNC Software/Mastercam, Dell, Entrust, HP, IBM, Intel, Internet Security Systems, McAfee, Microsoft, PTC, RSA Security, SAP, SolidWorks, Sybase, Symantec, Synopsys, The MathWorks, and UGS.*



**Electronic Design
Automation Consortium**

111 West Saint John St., Suite 220
San Jose, CA 95113-1104
408-287-EDAC (3322)
Fax 408-283-5283
www.edac.org

October 12, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th St. and Constitution Ave. NW
Room 2705
Washington, DC 20230

Attention: Sheila Quarterman

RIN 0694-AD75

RE: Proposed Rulemaking Concerning Revisions and Clarifications of Export and Re-export Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 Fed. Reg. at 38.313, July 6, 2006)

Dear Ms. Quarterman:

On behalf of the members of the EDA Consortium, we appreciate the opportunity to comment on this important proposed rule.

EDA Consortium appreciates the difficulty inherent in developing an export control policy that fosters civilian trade with China while at the same time recognizing that exports to certain end-uses may not further the national security and foreign policy interests of the United States. The evolution of the Proposed Rule for China highlights some of these difficulties. As currently proposed, EDA Consortium member companies feel that this rule has potentially serious impact on both export compliance costs and risk in a critical export market for the United States. As you continue to discuss this matter inter-agency, we hope that you will consider the following points.

EDA software has been specifically excluded from the Wassenaar Dual Use List for fifteen years, as recognized in the Dual Use List Reviews for 2003 and 2005, and should be excluded from MEUR for China

EDA Consortium appreciates all of the efforts put forth by the Bureau of Industry and Security and other interested agencies to ensure that Electronic Design Automation ("EDA") software has been, and remains, excluded from the Wassenaar Dual Use List. The clarification of Item 3.D.3 in the 2003 Dual Use List Review, and the addition of a new Note to Item 5.A.2 in the 2005 Dual Use List Review, have reaffirmed that EDA software is not of significant strategic concern. EDA software is



foreign policy interests of the United States to disadvantage items classified under 3D991 because they do not include cryptography, vis-à-vis items classified under 5D992 because they do include cryptography. Clearly, the preferred outcome would be to exclude EDA software entirely from the scope of MEUR for China.

The China market for EDA software is the fastest growing segment of the world market.

The China market for EDA software is not large compared with markets for aerospace and even for other electronics products. However, China is the fastest growing market segment in the world for EDA software, and has one particular characteristic which could cause a disproportionate impact on EDA Consortium member companies.

Most students of integrated circuit design learn to use EDA software when they are in college or university engineering programs. In order to “seed” the market, EDA Consortium member companies often provide EDA software at a reduced price to college and university engineering programs, with the expectation that graduates will continue to use the programs learned during their academic experience.

If Chinese colleges and universities should conclude that a significant number of their graduates would not be able to use EDA software from U.S. companies in the full scope of their employment, they might prefer to use EDA software from other sources, either indigenous or from third countries. Such a reluctance to use EDA software from U.S. companies could have a dramatic impact on sales to legitimate end-users in China, if the “best and brightest” integrated circuit engineers in China learn their trade using EDA software from indigenous or third country sources.

The proposed License Exception Certified End-User would be most helpful to companies that sell large dollar value products directly to small numbers of customers, but it would not be particularly helpful to companies like EDA member companies that sell small dollar value products indirectly to large numbers of customers

EDA Consortium recognizes that the MEUR for China has evolved to include not only a “stick” in the form of a restriction on sales to military end-uses, but also a “carrot” in the form of the new License Exception Certified End-User. We believe that this is a positive development, and would not like to see the License Exception Certified End-User removed.

Nevertheless, it is important to point out that the License Exception Certified End-User is likely to be useful only to companies that sell large dollar value products directly to a small number of customers. For example, it might be useful to some number of aerospace companies that sell to China’s civil aviation operators. Companies like EDA Consortium members, that sell (relatively) small dollar value

products to large numbers of customers through indirect sales channels are not likely to benefit from the License Exception Certified End-User.

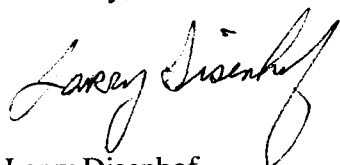
As regulations concerning exports to China become more complex, greater clarity in knowing the end-user can be obtained by providing CEU and Entity Names in Mandarin.

Assuming that a Certified End-User program is adopted, EDA Consortium strongly advocates that BIS help the exporting community by publishing the list of companies on this list in Mandarin Chinese. In addition, and even more important, is to have BIS publish the list of Entity and Unverified Chinese destinations in Mandarin. Today there is unnecessary confusion created when order-takers in China are translating names from English to Chinese. For example, the listed Entity "Beihang University" is known in Chinese as "Bei Hang" – two words. This Entity name may be missed by database checkers who are entering "Bei Hang" instead of "Beihang". We all want to ensure that we are not selling to proscribed entities – BIS could assist the exporting community in a meaningful way by providing the correct Mandarin names.

Conclusion

For these reasons, among others, we respectfully submit that EDA software classified under 3D991 should be removed from the scope of the MEUR for China. We remain optimistic that a reasonable scope of a MEUR for China can be devised that not only protects the national security and foreign policy interests of the United States, but also recognizes that unfettered EDA software can contribute to the continuing market leadership of American companies in the EDA software field in China. We would be pleased to respond to any additional questions and concerns that may not have been addressed in this letter, in a manner and time that would be mutually convenient.

Sincerely,



Larry Disenhof
Export Committee Chair, EDA Consortium
Group Director, Export Compliance and Government Relations, Cadence Design
Systems

Cc: EDA Consortium Export Committee

October 23, 2006,

To: publiccomments@bis.doc.gov
From: William A. Root - waroot@aol.com

Subject: China Proposed Rule RIN0694-AD75 (71 FR 38313-38321, July 6, 2006)

Authority and Justification

The statutory authority and national security justification for the proposed new control on exports to China are questionable.

Section 5(c)(6) of the Export Administration Act restricts authority to impose national security export controls unilaterally. Section 202(b) of IEEPA limits the exercise of authorities under that Act to dealing with an unusual and extraordinary threat with respect to which a national emergency has been declared. No emergency has been declared to authorize imposition of unilateral controls on exports to China of items which the United States has determined over the years would not make a material contribution to a conventional military capability.

The recent North Korean test of a nuclear weapon constitutes the current extraordinary threat in East Asia. Countering that threat is vastly more important than controlling exports to China of items of no demonstrated military significance. China has more influence on North Korea than any other nation. The proposed rule would jeopardize Chinese cooperation with U.S. efforts to rein in North Korean nuclear proliferation.

Regulatory Aspects

The remainder of this message responds to recent BIS stated desires for comment on various regulatory aspects of the proposal. They are not intended to modify the above arguments to withdraw the proposal altogether. Similarly, if the proposal is not withdrawn, they are not intended to supersede my July 15 recommendation to limit the new control to the "is informed" procedure in proposed 744.21(a)(2) and (b). If that recommendation were accepted, the following comments would become moot.

Scenarios

The broad coverage of many of the 47 categories listed in proposed 744 Supplement 2 plus the broad definition of "military end-use" make it a simple matter to describe license requirement scenarios clearly going beyond the stated objective of preventing material contributions to PRC military capabilities. This is particularly true for components and accessories. For example, of the thousands of parts and components covered by 9A991 which might be "incorporated into" an aircraft on the USML, the vast majority are general purpose and have no military significance whatsoever. Indeed, incorporation of some of these components would decrease rather than increase the military capability of such an aircraft. Such scenarios become even more ludicrous if

one considers the broad interpretation of “specially designed” in the FMI court case and the broad coverage of technology and software unless modified by the defined word “required” in the General Technology Note.

Foreign Availability

Most xx99x ECCNs were removed from the COCOM Industrial List or the Wassenaar Dual-Use List following determinations of foreign availability or of such wide general availability as to make effective control impossible. Particularly significant examples include oscilloscopes and semi-conductor manufacturing equipment. The oscilloscope item was subjected to rigorous and numerous foreign availability studies over many years before it was removed from the international list. Unilateral U.S. control of equipment, software, and technology for the manufacture, inspection, or testing of electronic components and materials has gradually expanded over the years as multilateral controls have contracted. The contraction of multilateral controls has been based, for the most part, on foreign availability. It should not be necessary for exporters to repeat such studies in order to justify a removal of items from the list of 47. Indeed, EAA Section 5(c)(6)(A)(i) puts the burden on the Secretary (of Commerce) to determine that there is no foreign availability if unilateral controls are to continue even for 6 months.

Military End-Use vs. Material Contribution to Military Capability

“Military end-use,” no matter how defined, is far broader than material contribution to military capability. It is, therefore, recommended that 744.21(a) be revised to read (~~deleted text~~ new text):
 You have knowledge that the item is intended, entirely or in part, for a “military end-use,” as defined in paragraph (f) of this section, in the PRC which would make a material contribution to the military capability of the PRC.

This would limit the license requirement to the objective as stated in the proposed rule. It would relieve the exporter of the need to review exports for the countless items covered by the listed 47 categories which could not possibly make a material contribution to military capability. If it were possible to define any of the 47 categories with sufficient precision to identify what would clearly make a material contribution to military capability, that definition should be added to the Wassenaar multilateral list. Exporters can be relied upon not to abuse a license-free regime for items with military uses which do not make a material contribution to military capability. That is because they do not wish to violate this stated U.S. policy. License applications would then be limited to the relatively few transactions for which an exporter might be in doubt as to whether a material contribution to a military capability would result.

Texts of the controlled items

For reasons stated above, deletion is the preferred option for each of the 47 items in proposed 744 Supplement 2. The following comments become relevant only if, for whatever reason, that item were not to be deleted from the Supplement. Recommendations below to put “specially designed” in quotation marks assume that “(MTCR context)” is removed from the definition of

that term in 772.1

(1)(ii) ~~1B999.e Equipment controlled by 1B999.e, not controlled by 1B001, specially designed~~ “specially designed” for the production of structural composites, fibers, prepregs and preforms controlled in ~~Category 1, n.e.s. ECCNs 1A002, 1C007, 1C010, or 1C210~~

(1)(iii) 1C990 Fibrous and filamentary materials, not controlled by 1C010 or 1C210, for use in “composite” structures and with a specific modulus of 3.18×10^6 m or greater and a specific tensile strength of 7.62×10^4 m or greater.

(Such materials have predominantly civil uses. An exporter would normally not know whether an importer producing both civil and military end-items planned to use the imported materials for civil or military end-use. The extent of production in China or import from third countries into China is currently being researched.)

(1)(iv) ~~1C995.a,b Mixtures not controlled by 1C350, 1C355 or 1C395 that contain chemicals controlled by 1C350 or 1C355 and medical, analytical, diagnostic, and food testing kits not controlled by 1C350 or 1C395 that contain chemicals controlled by 1C350.d, as follows (see List of Items Controlled), except 1C995.e “Medical, analytical, diagnostic, and food testing kits.”~~ mixtures containing less than 1% by weight or when the controlled chemicals are normal ingredients in consumer goods packaged for retail sale for personal use.

(It is impractical to control trace amounts. 1C395 License Requirements Note 2 states that controlled chemicals which are normal ingredients in consumer goods packaged for retail sale for personal use are classified EAR99.)

(1)(vii) ~~1D993 “Software” specifically designed “required”~~ for the “development”, “production”, or “use” of ~~equipment or~~ fibrous and filamentary materials controlled by 1C210.b, or 1C990

(1)(vi) ~~1D999.b Specific software controlled by 1D999.b for equipment controlled by 1B999.e specially designed for the production of structural composites, fibers, prepregs and preforms controlled in Category 1, n.e.s. “Software” “required” for the “use” of 1B999.e as modified in 744 Supplement 2 (1)(ii).~~

(1)(viii) ~~1E994 “Technology”, according to the General Technology Note, for the “development”, or “production”, or “use”~~ of fibrous and filamentary materials controlled by 1C990.

(2)(i) 2A991 Bearings and bearing systems not controlled by 2A001 (See List of Items Controlled)

(2)(ii) ~~2B991.c Limited to machine tools controlled under 2B991 having “positioning accuracies”, with all compensations available, better than 0,010 mm along any linear axis substituting 0,008mm for 0.020mm in c.2.a, c.2.b, and c.2.c; and machine tools having the characteristics of one or more contouring “tilting spindles” controlled by 2B991.d heading, 2B991.d.1 heading, and 2B991.d.1.a.~~

(2)(iii) 2B992 Non-“numerically controlled” machine tools for generating optical quality surfaces, ~~and~~ but omitting specially designed components therefor (See List of Items Controlled)

(2)(v) 2B996 Dimensional inspection or measuring systems or equipment not controlled by 2B006 (See List of Items Controlled)

(3)(i) 3A292 Oscilloscopes and transient recorders, ~~other than those not~~ not controlled by 3A002.a.5, and but omitting specially designed components therefor (See List of Items Controlled)

(3)(ii) 3A999.c ~~Limited to items controlled by 3A999.e~~ Flash x-ray machines and Marx generators, but omitting other components of pulsed power systems designed thereof, including high power pulse shaping networks, high voltage capacitors, and triggers.

(“Other components” is vague. Pulse shaping, capacitors, and triggers are covered by ECCNs 3A228, 3A229, 3A230, or 3A001.e.2.b.)

(3)(iii) 3B991 Equipment not controlled by 3B001 for the manufacture of electronic components and materials, ~~and~~ but omitting specially designed components and accessories therefor. (See List of Items Controlled, deleting “or 3A991” from 3B991.a)

(3)(iv) 3B992 Equipment not controlled by 3B002 for the inspection or testing of electronic components and materials, ~~and~~ but omitting specially designed components and accessories therefor. (See List of Items Controlled, deleting “or 3A991” from 3B992.a)

(3)(v) 3D991 “Software” ~~specially designed~~ “required” for the “development”, or “production”, ~~or “use” of electronic devices or components controlled by 3A991, general purpose electronic equipment controlled by 3A992 or manufacturing and test equipment controlled by 3B991 and 3B992 as modified in 744 Supplement 2 (3)(iii, iv).~~

(3)(vi) 3E292 “Technology” according to the General Technology Note for the “development”, or “production”, ~~or “use”~~ of equipment controlled by 3A292 as modified in 744 Supplement 2 (3)(i).

(3)(vii) 3E991 “Technology” according to the General Technology Note for the “development”, or “production”, ~~or “use” of electronic devices or components controlled by 3A991, general purpose electronic equipment controlled by 3A992 or manufacturing and test equipment controlled by 3B991 and 3B992 as modified in 744 Supplement 2 (3)(iii,iv).~~

(4)(ii) 4D993 “Program” proof and validation “software”, “software” allowing the automatic generation of “source codes”, and operating system “software” not controlled by 4D003 that are ~~specially designed~~ “required” for real time processing equipment.

(4)(iii) 4D994 “Software” ~~specially designed or modified~~ “required” for the “development”, or “production”, ~~or “use”~~ of equipment controlled by 4A101, 4A994 ~~with an Adjusted Peak Performance (“APP”) exceeding 0.1 Weighted TeraFLOPS (WT),~~ 4B994 and materials

controlled by 4C994.

(Software for computers exceeding 0.04 WT is already covered by 4D001.b.)

(4)(iv) 4E992 “Technology” according to the General Technology Note for the “development”, ~~or~~ “production”, ~~or~~ “use” of equipment controlled by ~~4A994 as described in this Part 744,~~ and 4B994, materials controlled by 4C994, or “software” controlled by 4D993 or 4D994 as modified by 744 Supplement 2 (4)(ii.iii).

(Technology for computers exceeding 0.04 WT is already covered by 4E001.b.)

(5)(ii) 5B991 Telecommunications test equipment, ~~n.e.s.~~ “specially designed” for 5A991 as modified in 744 Supplement No. 2 (5)(i)

(5)(iv) 5D991 “Software” ~~specially designed or modified~~ “required” for the “development”, ~~or~~ “production”, ~~or~~ “use” of equipment controlled by 5A001 ~~and~~ or 5B991 as modified in 744 Supplement No. 2 (5)(i,ii)

(5)(v) 5E991 “Technology”, according to the General Technology Note, for the “development”, “production”, or “use” of equipment controlled by 5A991 or 5B991, or “software” controlled by 5D991 as modified in 744 Supplement 2 (5)(i,ii,iv)

(6)(i) 5A992: revise by describing what it is intended to control and by deleting “and software” three times

(6)(ii) 5D992: revise by describing what it is intended to control; adding to the list of exceptions 5D992.c “Software” designed or modified to protect against malicious computer damage, e.g., viruses; and deleting “commodities and” three times.

6(iii) 5E992 “Technology”, according to the General Technology Note, for the “development”, ~~or~~ “production”, ~~or~~ “use” of equipment controlled by 5A992 or “software” controlled by 5D992 as modified in 744 Supplement No. 2 (6)(i,ii)

(7)(i) 6A995 “Lasers”, not controlled by 6A005 or 6A205 (See List of Items Controlled)
(6A005 is probably overly restrictive, not having been revised for many years. Therefore, there is unlikely to be a need to control anything in 6A995.)

(8)(i) 7A994 ... avionic equipment, including “specially designed” parts and components, n.e.s.

(8)(ii) 7B994 Other equipment “specially designed” for the test, inspection, or “production” of navigation and avionics equipment.

(8)(iii) 7D994 “Software”, n.e.s., “required” for the “development”, ~~or~~ “production”, ~~or~~ “use” of navigation, airborne communication, and other avionics.

(8)(iv) 7E994 “Technology”, n.e.s., according to the General Technology Note, for the “development”, ~~or~~ “production”, ~~or~~ “use” of navigation, airborne communication, and other

avionics equipment.

(9)(i) 8A992.a,b,c Underwater systems or equipment, not controlled by 8A002, and ~~special-~~
~~designed~~ “specially designed” parts therefor.

(9)(ii) 8D992 “Software” ~~special-~~~~designed or modified~~ “required” for the “development”, or
“production”, ~~or “use”~~ of equipment controlled by 8A992.a,b,c

(9)(iii) 8E992 “Technology”, according to the General Technology Note, for the “development”,
or “production”, ~~or “use”~~ of equipment controlled by 8A992.a,b,c

(10)(i) 9A991 “Aircraft”, n.e.s., and gas turbine engines not controlled by 9A001 or 9A101 and
parts and components “specially designed” therefor, n.e.s.

(Aircraft parts and components are probably adequately controlled by USML VIII(h) plus
CCL Categories 7 and 9. Indeed, the DOS CJ determination that even general purpose L-
100 components are ITAR constitutes over-control.)

(10)(ii) 9B990 Vibration test equipment and ~~special-~~~~designed~~ parts and components “specially
designed” therefor, n.e.s.

(10)(iii) 9D990 “Software”, n.e.s., “required” for the “development” or “production” of
equipment controlled by ~~9A990 or~~ 9B990 as modified in 744 Supplement 2 (10)(ii)

(10)(iv) 9D991 “Software” “required” for the “development” or “production” of equipment
controlled by 9A991 as modified in 744 Supplement 2 (10)(i) or 9B991

(10)(v) 9E990 “Technology”, n.e.s., according to the General Technology Note, for the
“development”, or “production”, ~~or “use”~~ of equipment controlled by ~~9A990 or~~ 9B990 as
modified in 744 Supplement 2 (10)(ii)

(10)(vi) 9E991 “Technology”, n.e.s., according to the General Technology Note, for the
“development”, or “production”, ~~or “use”~~ of equipment controlled by 9A991 as modified in 744
Supplement 2 (10)(i) or 9B991

Chinese End-User Certificate

Counter-productive requirement

The requirement to obtain a Chinese End-User Certificate (EUC) to support an application for
exporting one of the 47 items to China for a military end-use should be removed in order not to
undermine the purpose of the control. Many years ago a similar, Fowler-Debre, requirement for a
French Government certification of non-nuclear use of U.S. high performance computers being
considered for export to France was removed for this reason. A request by a U.S. exporter for an
EUC for one of the 47 items would alert the Chinese authorities that the Americans assume a

military end-use which would result in denial if that use were determined to constitute a material contribution to Chinese military capability. This could delay issuance of the EUC while the Chinese tried to figure out how to reduce the risk of denial. Meanwhile the exporter would be unable to submit the license application because of the requirement that it include the EUC number. The exporter may be motivated to apply for a license either to alert U.S. authorities to a potential problem or to seek to persuade U.S. authorities that the license should be approved because the military nature of the end-use was inconsequential. Either way, the Chinese delay would be to the disadvantage of both the U.S. exporter and the U.S. governmental authorities. The latter would be kept in the dark while the Chinese sought to acquire the item from another source less likely to be denied. In other words, the EUC requirement could defeat the purpose of the new control. This would be particularly unfortunate, since the Chinese certificate would be largely, perhaps entirely, irrelevant, being related to the end-user, whereas the U.S. control applies to the end-use and not to the end-user.

Needed clarification of requirement

If this EUC requirement is retained, clarification is needed. Proposed 748.9(b)(2)(i) states that an EUC may be required if there is an affirmative answer to the question “does your transaction involve items that require a license to the PRC for any reason?” An export of one of the 47 items to China would involve an affirmative answer even if the end-use were clearly civil. Proposed 748.10(c) states this even more unequivocally:

Note that in the case of the PRC, applicants must require that the importer obtain an End-User Certificate for all items on a license application that are controlled to the PRC for any reason on the CCL.

In other words, the proposed rule states an unintended requirement to obtain an EUC in order to export one of the 47 items to China whether the end-use is civil or military.

De minimis discrimination against China

There is no apparent reason for China to be treated more restrictively than other destinations with respect to the \$5,000 *de minimis* EUC exception. Proposed 748.10(b)(4)(i) states:

If the total value of entries that require a license to the PRC for any reason on the CCL on a license application exceeds \$5,000, then a PRC End-User Certificate covering all controlled items on your license application must be obtained.

This means that a license application involving 10 different ECCNs, each at \$501, would require a PRC EUC. This contrasts with 748.10(b)(5)(i) which, for a destination other than the PRC, requires an EUC only if a single national security entry on the CCL exceeds \$5,000. One wonders why \$501 non-national security items to China would require an EUC whereas a \$4,999 national security item to another destination would not.

WISCONSIN PROJECT ON NUCLEAR ARMS CONTROL

October 27, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Room 2705
14th Street and Pennsylvania Avenue, NW
Washington, DC 20230

Attention: RIN 0694-AD75

RE: Comments on Proposed Rule - Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC); New Authorization Validated End-User

Dear Sir or Madam,

The Wisconsin Project on Nuclear Arms Control ("Project") submits the following comments in response to the Commerce Department's Bureau of Industry and Security's ("BIS's") July 6, 2006, Proposed Rule (71 Fed. Reg. 38313) setting forth Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC) and a New Authorization Validated End-User. The Project is a non-profit organization conducting outreach and public education to bolster the nonproliferation of mass destruction weapons and their means of delivery. For more than twenty years, the Project has pursued its mission by advocating for strong and effective export controls worldwide. The Project commends the Commerce Department for the step it has taken in the direction of controlling sensitive American exports to China by publishing this proposed rule. It is not in the interest of the United States to allow its products to help China build up its military strength. There are two separate initiatives introduced in the rule; they deserve to be considered individually. Unfortunately, both initiatives have serious problems which are discussed below. We recommend that the proposed rule be withdrawn for further consideration by the Department.

PRC Military End-use License Requirement

The proposal would require a license for the export of certain listed items to China if the exporter "knows" that item is intended for a military use. The new list of items would be set forth in Supplement No. 2 to Part 744. At present, these items can be exported to China without a license.

The new list of items is quite limited, having been reduced from earlier (unpublished) drafts of the rule. It contains only a fraction of the items on the Commerce Control List that are likely to

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contribute to China's military strength. And the Commerce Department has signaled its openness to further diminution of the proposed list by inviting industry proposals for removal of additional items. Commerce should not weaken this new control by eliminating items based on their "availability" in China or elsewhere abroad. The Chinese military seeks to acquire dual-use American goods and technologies so that they can be reverse-engineered and utilized to improve similar but inferior products made in China or imported from elsewhere. The proposed control seeks to inhibit such activity, and should not be undermined by the mere existence of these inferior foreign "equivalents."

To have a greater impact, the scope of the rule should be expanded, by enlarging the list of items subject to the new control, or even by eliminating the list altogether. If an exporter knows that an item subject to the Export Administration Regulations is intended for a military purpose in China, the exporter should be required to apply for a license. Such a general "catch-all" clause would be far more effective than the proposed list of controlled items.

A second weakness in the draft rule is that it does not name Chinese military buyers. The "knowledge" test is extremely weak unless an effort is made to help the exporter acquire the requisite knowledge. If a Chinese buyer is unquestionably doing military work, that should be part of what the exporter "knows" about a sale to such a buyer. As things stand now, the Commerce Department has named only a handful of Chinese military organizations on the present "Entity List." This List concentrates on entities doing nuclear and missile work, and is not directed at military firms generally. Other countries have warning lists that are much broader, and so should the United States.

For the new control to have a meaningful impact on preventing exports that assist China's military capability, exporters should be educated about Chinese military end-users. Industry has reasonably requested that a list of "targeted" end-users be made part of any guidance on complying with the new controls. And it would be a simple matter to list such organizations -- their activities are described in open sources. The publication of such a list will ease the burden on exporters of performing due diligence under the new rule. The appearance of an end-user on the list could serve as a "red flag" requiring further investigation by the exporter. Alternatively, the exporter could be required to apply for a license if the intended recipient was listed. To be effective, a public list of Chinese military end-users would need to include contact information and related entities (subsidiaries, parents, siblings, etc.) The list would also need to be refreshed regularly. If such a list is published, it should be accompanied by clarification that an exporter of a listed item to China who "knows" of an intended military use is required to apply for a license, whether or not the intended recipient is on the list.

Proposed Authorization Validated End-User (VEU)

This proposed authorization is unclear, and may be unnecessary. Certain Chinese companies would for the first time be allowed to receive controlled American products without an export license. The Department of Commerce would create the list of these privileged Chinese companies by determining that the companies were engaged only in civilian activities. A company on the list would be designated a "Validated End-User (VEU)," and would be allowed

to receive American products in specified categories license-free. The proposed authorization should not be adopted, at least not without substantial revisions and clarifications.

The VEU scheme is intended to speed up legitimate exports to civilian end-users, and to offset the compliance burden of the new military catch-all requirement for China. But industry commentators doubt the proposed VEU authorization will have this beneficial effect. To take advantage of VEU, exporters would need to comply with substantial new reporting requirements. And both exporters and end-users would need to consent to audits by the U.S. government. Industry experts suggest that few foreign companies – particularly Chinese companies – would be willing to agree in advance to such audits. Industry advocates also suggest that, rather than comply with the qualification and procedural requirements of VEU, it would be easier for exporters to simply continue applying for individual export licenses. Thus, VEU is unnecessary because it will not be widely utilized to reduce the compliance burden on the Commerce Department and exporters. Indeed, a similar scheme was tried two decades ago, but it was not used by industry and was terminated in short order.

The requirements of the proposed VEU scheme are too burdensome for industry to use it. But these requirements are not sufficient to ensure that the scheme does not undermine national security. And the Commerce Department does not have the resources to ensure that the VEU scheme is implemented efficiently while protecting national security.

Fundamentally, each export of a controlled dual-use item is scrutinized *a priori* if an export license is required (and applied for by the exporter). Under the proposed rule, exports of specified sensitive dual-use items to VEUs would no longer be checked, indefinitely. The rule requires annual reports detailing exports under the scheme, and promises periodic compliance audits. But these measures would all be too late to stop a questionable export that was not examined before it took place.

The rule mandates no procedures to deal with changed circumstances after a VEU is listed. Should a VEU designation not be re-examined in cases of reorganization or change in ownership, to check for new risks of non-civil end-use? And what if an exporter would like to expand the list of items a VEU is allowed to receive without a license? Should not the VEU be re-examined in such a case, to rule out non-civil end-uses for the new items? These are but two situations which would require additional scrutiny by the Commerce Department, but are left unaddressed in the proposed rule.

The rule should also make clear that the "knowledge" standard would continue to apply to an exporter's actions vis-à-vis an entity listed as a VEU. This should be true both for the existing nonproliferation requirements and for the proposed China military control (if it is adopted). For example, if the exporter learns that a buyer already on the VEU list intends to use the product for a military purpose, or to re-transfer the product to a military site, the exporter should be required to apply for a license. The exporter should be entitled to rely on the recipient's VEU designation only to the extent that the exporter is not aware of facts indicating non-civilian end-use. This clarification should be expressly noted in the rule. And the exporter should be required to inform Commerce if he discovers an intended non-civilian end-use in a transaction involving a VEU. Such notice should also trigger reconsideration by the Department of the end-user's VEU status.

The process of properly screening potential VEUs, and sufficiently verifying their civilian status on an ongoing basis, will require a substantial manpower investment by Commerce. Large Chinese conglomerates involved in trade with the United States pose a substantial risk of diversion, because they often have dozens if not hundreds of subsidiaries, many of which do military work. But Commerce managers admit that their current knowledge of Chinese military entities is insufficient. And there are almost no Commerce officials designated to carry out site visits in China. The Department is already understaffed, leading to persistent complaints regarding processing times for license applications and commodity classification requests. To move the VEU scheme along, Commerce will be tempted to rely too much on past license history, "recent" visits and industry suggestions in selecting VEUs, and to skimp on follow-up audits once VEUs are certified. Department officials have already promised swift VEU designations. Such an approach would undermine national security, and must be avoided. It would be better to shelve the scheme, at least until the Department has the resources to implement it efficiently and securely.

Overall, the VEU scheme as proposed is unlikely to be used by industry, and would undermine national security and overburden the Commerce Department. If the scheme is revised and implemented to minimize security risks, it is even less likely to be utilized by exporters. At present, it may be best to simply abandon this approach. Furthermore, it certainly seems premature and unwise to discuss expanding the VEU scheme to include Indian companies by spring 2007.

Revision of End-User Certificate Requirements

The rule also proposes to require a PRC End-User Certificate for all items controlled for export to the PRC that exceed a total value of \$5,000. Such certificates are issued by the Chinese government, contain information about the export, and provide some assurance that the exported item would not be misused in China. The proposed change is a potential security improvement, as such certificates are currently required only for exports controlled for national security reasons.

However, the rule also proposes to eliminate the requirement that exporters submit the certificates with their license applications. This seems counterintuitive, as the certificate should be a key supporting document for evaluating the application. Unless Commerce has an up-to-date, easily searchable database of all such issued certificates, exporters should be required to continue submitting these documents with their license applications. Once the exporter has procured the certificate, sending it to Commerce is a minimal additional burden.

Conclusion

The Project supports the intent of the Commerce Department to control sensitive American exports to the PRC. We hope that the Department will find our comments and suggestions to be

contribute to China's military strength. And the Commerce Department has signaled its openness to further diminution of the proposed list by inviting industry proposals for removal of additional items. Commerce should not weaken this new control by eliminating items based on their "availability" in China or elsewhere abroad. The Chinese military seeks to acquire dual-use American goods and technologies so that they can be reverse-engineered and utilized to improve similar but inferior products made in China or imported from elsewhere. The proposed control seeks to inhibit such activity, and should not be undermined by the mere existence of these inferior foreign "equivalents."

To have a greater impact, the scope of the rule should be expanded, by enlarging the list of items subject to the new control, or even by eliminating the list altogether. If an exporter knows that an item subject to the Export Administration Regulations is intended for a military purpose in China, the exporter should be required to apply for a license. Such a general "catch-all" clause would be far more effective than the proposed list of controlled items.

A second weakness in the draft rule is that it does not name Chinese military buyers. The "knowledge" test is extremely weak unless an effort is made to help the exporter acquire the requisite knowledge. If a Chinese buyer is unquestionably doing military work, that should be part of what the exporter "knows" about a sale to such a buyer. As things stand now, the Commerce Department has named only a handful of Chinese military organizations on the present "Entity List." This List concentrates on entities doing nuclear and missile work, and is not directed at military firms generally. Other countries have warning lists that are much broader, and so should the United States.

For the new control to have a meaningful impact on preventing exports that assist China's military capability, exporters should be educated about Chinese military end-users. Industry has reasonably requested that a list of "targeted" end-users be made part of any guidance on complying with the new controls. And it would be a simple matter to list such organizations -- their activities are described in open sources. The publication of such a list will ease the burden on exporters of performing due diligence under the new rule. The appearance of an end-user on the list could serve as a "red flag" requiring further investigation by the exporter. Alternatively, the exporter could be required to apply for a license if the intended recipient was listed. To be effective, a public list of Chinese military end-users would need to include contact information and related entities (subsidiaries, parents, siblings, etc.) The list would also need to be refreshed regularly. If such a list is published, it should be accompanied by clarification that an exporter of a listed item to China who "knows" of an intended military use is required to apply for a license, whether or not the intended recipient is on the list.

Proposed Authorization Validated End-User (VEU)

This proposed authorization is unclear, and may be unnecessary. Certain Chinese companies would for the first time be allowed to receive controlled American products without an export license. The Department of Commerce would create the list of these privileged Chinese companies by determining that the companies were engaged only in civilian activities. A company on the list would be designated a "Validated End-User (VEU)," and would be allowed

to receive American products in specified categories license-free. The proposed authorization should not be adopted, at least not without substantial revisions and clarifications.

The VEU scheme is intended to speed up legitimate exports to civilian end-users, and to offset the compliance burden of the new military catch-all requirement for China. But industry commentators doubt the proposed VEU authorization will have this beneficial effect. To take advantage of VEU, exporters would need to comply with substantial new reporting requirements. And both exporters and end-users would need to consent to audits by the U.S. government. Industry experts suggest that few foreign companies – particularly Chinese companies – would be willing to agree in advance to such audits. Industry advocates also suggest that, rather than comply with the qualification and procedural requirements of VEU, it would be easier for exporters to simply continue applying for individual export licenses. Thus, VEU is unnecessary because it will not be widely utilized to reduce the compliance burden on the Commerce Department and exporters. Indeed, a similar scheme was tried two decades ago, but it was not used by industry and was terminated in short order.

The requirements of the proposed VEU scheme are too burdensome for industry to use it. But these requirements are not sufficient to ensure that the scheme does not undermine national security. And the Commerce Department does not have the resources to ensure that the VEU scheme is implemented efficiently while protecting national security.

Fundamentally, each export of a controlled dual-use item is scrutinized *a priori* if an export license is required (and applied for by the exporter). Under the proposed rule, exports of specified sensitive dual-use items to VEUs would no longer be checked, indefinitely. The rule requires annual reports detailing exports under the scheme, and promises periodic compliance audits. But these measures would all be too late to stop a questionable export that was not examined before it took place.

The rule mandates no procedures to deal with changed circumstances after a VEU is listed. Should a VEU designation not be re-examined in cases of reorganization or change in ownership, to check for new risks of non-civil end-use? And what if an exporter would like to expand the list of items a VEU is allowed to receive without a license? Should not the VEU be re-examined in such a case, to rule out non-civil end-uses for the new items? These are but two situations which would require additional scrutiny by the Commerce Department, but are left unaddressed in the proposed rule.

The rule should also make clear that the "knowledge" standard would continue to apply to an exporter's actions vis-à-vis an entity listed as a VEU. This should be true both for the existing nonproliferation requirements and for the proposed China military control (if it is adopted). For example, if the exporter learns that a buyer already on the VEU list intends to use the product for a military purpose, or to re-transfer the product to a military site, the exporter should be required to apply for a license. The exporter should be entitled to rely on the recipient's VEU designation only to the extent that the exporter is not aware of facts indicating non-civilian end-use. This clarification should be expressly noted in the rule. And the exporter should be required to inform Commerce if he discovers an intended non-civilian end-use in a transaction involving a VEU. Such notice should also trigger reconsideration by the Department of the end-user's VEU status.

The process of properly screening potential VEUs, and sufficiently verifying their civilian status on an ongoing basis, will require a substantial manpower investment by Commerce. Large Chinese conglomerates involved in trade with the United States pose a substantial risk of diversion, because they often have dozens if not hundreds of subsidiaries, many of which do military work. But Commerce managers admit that their current knowledge of Chinese military entities is insufficient. And there are almost no Commerce officials designated to carry out site visits in China. The Department is already understaffed, leading to persistent complaints regarding processing times for license applications and commodity classification requests. To move the VEU scheme along, Commerce will be tempted to rely too much on past license history, "recent" visits and industry suggestions in selecting VEUs, and to skimp on follow-up audits once VEUs are certified. Department officials have already promised swift VEU designations. Such an approach would undermine national security, and must be avoided. It would be better to shelve the scheme, at least until the Department has the resources to implement it efficiently and securely.

Overall, the VEU scheme as proposed is unlikely to be used by industry, and would undermine national security and overburden the Commerce Department. If the scheme is revised and implemented to minimize security risks, it is even less likely to be utilized by exporters. At present, it may be best to simply abandon this approach. Furthermore, it certainly seems premature and unwise to discuss expanding the VEU scheme to include Indian companies by spring 2007.

Revision of End-User Certificate Requirements

The rule also proposes to require a PRC End-User Certificate for all items controlled for export to the PRC that exceed a total value of \$5,000. Such certificates are issued by the Chinese government, contain information about the export, and provide some assurance that the exported item would not be misused in China. The proposed change is a potential security improvement, as such certificates are currently required only for exports controlled for national security reasons.

However, the rule also proposes to eliminate the requirement that exporters submit the certificates with their license applications. This seems counterintuitive, as the certificate should be a key supporting document for evaluating the application. Unless Commerce has an up-to-date, easily searchable database of all such issued certificates, exporters should be required to continue submitting these documents with their license applications. Once the exporter has procured the certificate, sending it to Commerce is a minimal additional burden.

Conclusion

The Project supports the intent of the Commerce Department to control sensitive American exports to the PRC. We hope that the Department will find our comments and suggestions to be

of value. We are grateful for the opportunity to present our views, and look forward to doing so again in the future.

Respectfully submitted,

Arthur Shulman
Senior Research Associate
Wisconsin Project on Nuclear Arms Control

From: "Paul Warndorf" <PWarndorf@amtonline.org>
To: <publiccomments@bis.doc.gov>
Date: Tue, Nov 14, 2006 2:35 PM
Subject: Response to RIN 0694-AD75

This email contained an attached file "China Reg ResponseFin.doc" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?8D5AFF7D4354C6EFEEEDCC8AD9358975C455A1A860006F89F> Per BIS policy, the file(s) attached to this message have been held in quarantine. If you are certain the file is a legitimate business document, forward this message to the BIS Help Desk (ITHELP) and ask to have the attachment(s) released.

Sheila Quarterman

Here is a response to RIN 0694-AD75 "Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC); New Authorization Validated End-User" proposed rule. This response is being submitted by the Department of Commerce Materials Processing Equipment Technical Advisory Committee (MPETAC).

Submitted by Paul Warndorf, Chair of the MPETAC.

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CC: "Sheila Kapian" <skapian@amtonline.org>

November 10, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th St. and Constitution Avenue, NW
Room 2705
Washington, DC 20230

Attention: Sheila Quarterman

Subject: RIN 0694-AD75

RE: Revisions and Clarification of Export and Re-export Controls for the People's Republic of China (PRC); New Authorization Validated End-User (71 Fed. Reg. at 38,313, July 6, 2006)

Dear Ms. Quarterman:

I appreciate the opportunity, as Chairman of the U.S. Department of Commerce Materials Processing Equipment Technical Advisory Committee (MPETAC), to submit the following recommendations and comments on behalf of the Committee.

Recommendation: Delete item (2)(ii) - 2B991 from the proposed China regulation.

Justification: This recommendation is based upon a significant review of the capability of China to either obtain or produce equipment with positioning accuracies of machine tools that fall between the existing 2B001 and the proposed (2)(ii) in RIN 0694-AD75. This recommendation is also based on the fact, that even if the regulation were enacted, it would have no effect on China's ability to make or purchase machines of the accuracies desired for military end use being considered for control. The results, therefore, would only affect U.S. Machine Tool export business that in 2005 represented only 3.8 percent of CNC turning, milling, and grinding equipment imports to China by all nations.

Most importantly, as noted in the data provided below, it is evident that China has the capability to manufacture machine tools of the range of positioning accuracy being proposed for control. It also has the ability to acquire these type machines from Taiwan or obtain them from Taiwanese factories located within China.

It should also be understood that if Wassenaar countries do not adopt equivalent requirements, especially Japan and Germany, China will continue to be able to supply their domestic and military needs related to (2)(ii) in RIN 0694-AD75 with no impact due to the U.S. restriction. Again, since the United States is an insignificant supplier to China of CNC machine tools, this restriction offers relatively little or no control to these items.

As a result, (2)(ii) in RIN 0694-AD75 is an uncontrollable restriction that will have no effect on military end use beyond the current export control regulations, and will only affect U.S.

companies' ability to maintain the meager market share they have in China.

Discussion: Even though the MPETAC is a technical advisor to the U.S. Department of Commerce, the information provided in this response will begin first with background information and a brief economic overview of machine tool manufacturing and sales in China.

As the data on the following charts and graphs will demonstrate, China has built up its indigenous machine tool industry significantly. The United States currently has approximately 350 machine tool and component manufacturers, of which some 175 produce metal-cutting machinery. By contrast, according to China Machine Tool & Tool Builders' Association (CMTBA), China has nearly five times that number, with more than 1,650 manufacturers, of which 415 are metal-cutting machine tool builders.

In support of China's machine tool industry, the Chinese Government has been providing subsidies and grants to various manufacturers in order to enable them to catch up with the West in terms of technological sophistication and to meet a desired objective of being totally independent of foreign machine tool needs by 2010.

The Chinese machine tool market has had tremendous growth since 2000. Consider the following relationship between Chinese consumption (total purchase from all sources) of machine tools and that of the United States. In 2000, China consumed half as many machine tools as the United States. By 2002, China had drawn even. By 2004, China had doubled U.S. consumption. This year, it is likely that China's consumption of machine tools will be triple that of the United States.

That being said, however, the United States machine tool industry has lost 38.8 percent of market share in China over the past decade. That loss has occurred during a period in which China has become the largest machine tool market in the world. Other nations have lost market share in China as well, but Japan has seen a market share gain of 35 percent, Taiwan 13.4 percent, and South Korea 124.4 percent. In fact, as previously noted, the U.S. share of Chinese imports of CNC milling, turning, and grinding machine tools was only 3.8 percent in 2005.

During a fact-finding trip to China in June 2006 (sponsored by AMT-The Association For Manufacturing Technology), former Under Secretary of Commerce for Export Administration, Dr. Paul Freedenberg, and the current machine tool technical advisor to the U.S. Wassenaar Arrangement, Paul Warndorf, found that there were over 15 indigenous Chinese manufacturers of CNC controls, with more than five manufacturers of units for 5-axis machine tools. As recently as four years ago, Dr. Freedenberg stated that he had not found a single operational Chinese manufacturer of this technology.

The two manufacturers with the widest range of customers, Beijing Aerospace Numerical Control Systems and Wuhan Huazhong Numerical Control Company, had developed their technology with the financial support of the Ministry of Defense and the Ministry of Education respectively. To demonstrate the quality and reliability of these control builders, Chinese manufacturers were comfortable enough with these CNC controllers to put them on their best machines going into aerospace factories and other sophisticated applications.

Gathering the bulk of our information in Beijing at the June 12 to 16, 2006 China International Machinery and Equipment Show, there were some 70 Chinese builders reviewed, of which more

than 12 produced 5-axis machine tools (in addition to the aforementioned CNC control manufacturers). Also, there were 35 Taiwanese builders, of which five produced 5-axis machine tools, and one additional Taiwanese CNC control manufacturer. While the Taiwanese bring virtually no new technology to Chinese manufacturers, they do bring very high quality machines with extremely good accuracies as well as established manufacturing facilities in China.

World Market

As reported by AMT – The Association For Manufacturing Technology and Gardner Publication, Inc., the United States ranked sixth in the world in the total production of machine tool products in 2005. This is down 29% in production from its ranking as third in the world in 1995 due to the increased production of equipment in China PRC and Taiwan. Therefore, both countries have moved up to third and fifth respectively in ranking. Also noted is the loss of U.S. sales as compared to Italy who continues to be fourth in the world.

Production of Top Ten Countries Manufacturing Machine Tool Products

	2005 Ranking	2005	2004	Increase 2005 over 2004	1995 Ranking	1995	Increase 2005 over 1995
Country		\$'s Millions Total	\$'s Millions Total			\$'s Millions Total	
Japan	1	13259	10573	20%	1	9002	47%
Germany	2	9509	8959	6%	2	7290	30%
China, Peoples Rep.	3	5000	4080	18%	7	1857	169%
Italy	4	4879	4639	5%	4	3324	47%
Taiwan	5	3295	2884	12%	8	1627	103%
United States	6	3169	3132	1%	3	4468	-29%
Korea, Rep. of	7	2816	2362	16%	6	1898	48%
Switzerland	8	2635	2333	11%	5	2141	23%
Spain	9	1141	1021	11%	12	662	72%
Canada	10	949	814	14%	13	397	139%

CHINA

Machine Tool Industry

The following section takes a closer look at the production of CNC milling, turning, and grinding machine tool products in China.

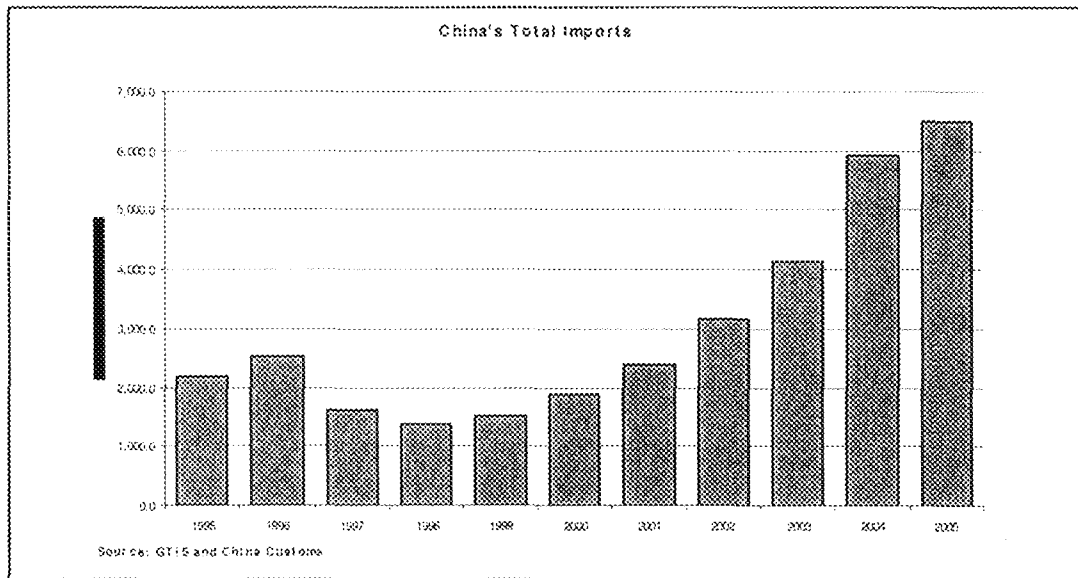
Market

Production

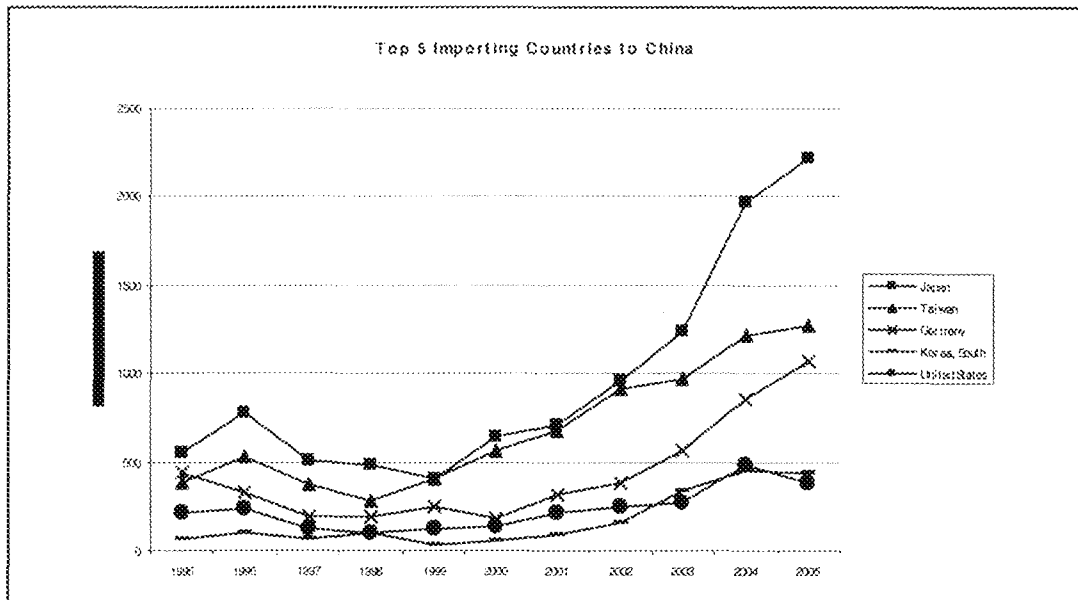
Shown in the world market chart above, China produced \$5 billion in machine tool products in 2005.

Imports

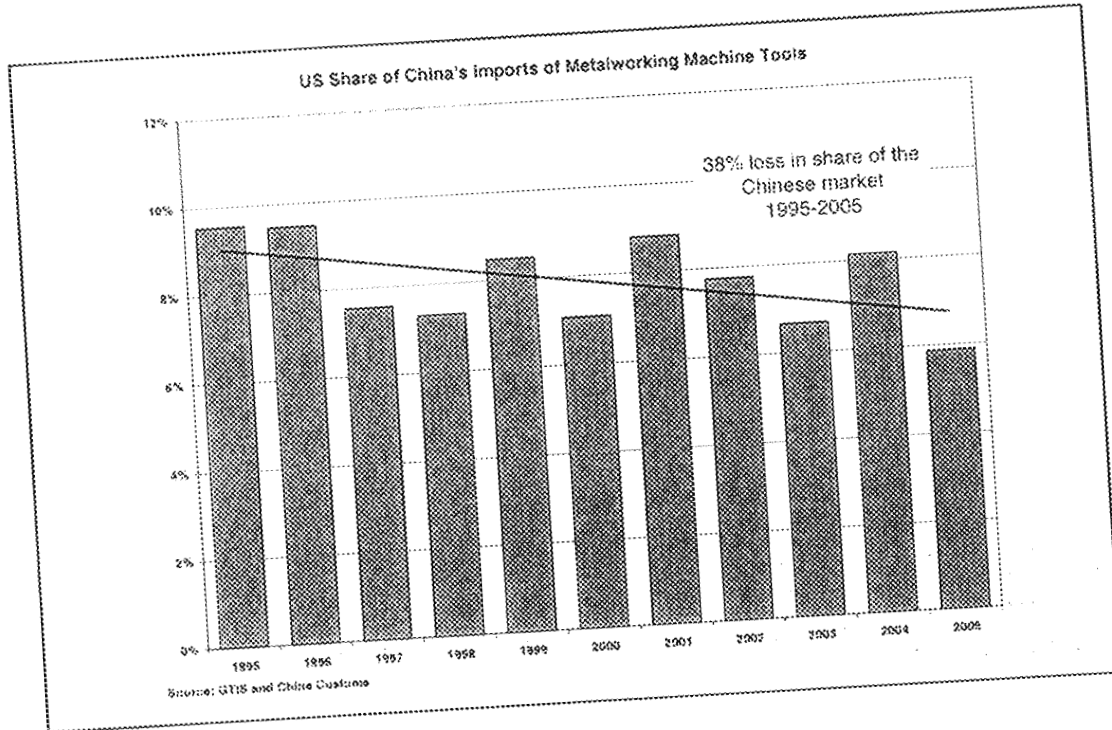
For the past five years, China has been increasing its import demand for machine tools to a reported level in 2005 of approximately \$6.5 billion.



With this increased demand, as illustrated in the following graph, Japan, Taiwan, and Germany have been able to improve their sales penetration into China, while the United States has actually realized a decrease in sales from 2004 to 2005.



Not only has a loss occurred from 2004 to 2005, there has also been an overall decrease in percentage of sales to China since 1995. The United States has actually shown a 38% loss in share of the total import sales to China in the past ten years as represented in the chart below.



In the next chart, it can be seen that of the approximately \$6.5 billion machine tools imported to China, \$2.5 billion were CNC milling, turning, and grinding products. Also, of the \$6.5 billion machine tools sold to China, the United States represented only \$382 million in sales, or 5.9% of total imports. Of that \$382 million, only \$96 million represented CNC milling, turning, and grinding products. For 2005, therefore, only 3.8% of the total CNC equipment covered in the proposed regulation was sold by the United States. This was far below, for example, that of Taiwan at 19.9%.

CNC Equipment Imports to China in 2005
(\$ million)

Country	Total Imports	Share of Total Imports to China by Country	Total CNC Equipment Imports to China	Share of CNC Sales to China by Country
World	6,497		2,508	
Japan	2,220	34.2%	958	38.2%
Taiwan	1,269	19.5%	498	19.9%
Germany	1,071	16.5%	459	18.3%
Korea, South	434	6.7%	170	6.8%
United States	382	5.9%	96	3.8%
Switzerland	264	4.1%	94	3.7%

Source: China Customs Data

Products

It is clear that through assistance from foreign manufactures, China has established, and is enhancing, its ability to manufacture state-of-the-market machine tools. This can be seen by the increasing number of suppliers of sophisticated CNC controls, 5-axis machine tools, and products having competitively stated machine positioning accuracies.

CNC Controls

One of the most important aspects of being able to manufacture equipment lies in the availability of CNC controls that can provide this capability. In China, there are a growing number of CNC providers, some of which offer 5-axis simultaneous control capability.

The chart below lists some of the major suppliers of CNC controls in China. This is not a complete list because some controls are built for the specific use of a company. For example, Shenyang Liming Aero-Engine has built their own control and has applied it to equipment for their own internal use. This is also true for Dalian and Beijing Jingdiao Co. that have designed CNC controls for application on their machine tools.

China CNC Control Manufacturers and Representative Controls:

Company	CNC Control	Maximum Number of controlled axis	Maximum Number of Simultaneously Controlled Axis	Source
Beijing Aerospace Numerical Control System www.casnuc.com.cn	CASNUC	8	6	(CIMES & CMTF) 2006*
Beijing Catch CNC Equipment Co., Ltd www.catchcnc.com	NC-110	16	6	Brochure (CIMES & CMTF) 2006
Chengdu Great Industrial Co., Ltd www.great-cnc.com	Great-160iM Great-180M	5 9	5 9	Brochure IMTS 2006**
LT-CNC http://lt-cnc.sicelac.cn/en_contact.asp	NC110	16	8	Website 2006
Wuhan Huazhong Numerical Control Co. (HNC) www.huazhongcnc.com	HNC2000 HNC-21M6	16 6	5 6	Brochure (CIMES & CMTF) 2006

* CIMES & CMTF represents the China International Machinery & Equipment Show that occurred in June 2006

** IMTS represents the International Manufacturing Technology Show that occurred in September 2006 in Chicago, IL.

In discussions with manufacturers, Wuhan Huazhong Numerical Control Co. appears to be the current leader in this area. The JNC2000 has been applied to many machine tools in China and, for example, has become the standard control for Guilin Machine Tool Co.'s 5-axis Bridge Type Gantry machines. In fact, the China Ministry of Education has provided large grants to Wuhan to manufacture educational units for teaching individuals how to operate multi-axis machines.

When discussing the capability of the Wuhan control with Guilin personnel, they commented that their customer base has indicated that parts produced using the Wuhan control are equivalent to those produced using a 5-axis Fidia (Italy) CNC control.

It should be noted, however, that Beijing Aerospace Numerical Control System, which is supported by the China Ministry of Defense, stated that they have developed the above mentioned controller, however, it is new to the market.

Position Accuracy

Before a realistic assessment of the positioning accuracies of machine tools manufactured in China, or elsewhere in the world, can be assessed, a sound understanding of the relationship of quoted accuracies, measured by different standards, should be realized (Refer to Appendix A). Without this, the accuracy of a machine tool often remains a relatively subjective statement.

Even though this may be understood, there still remains the fact that China has a growing number of equipment suppliers offering products with accuracies better than 0.010 mm in China. To illustrate this fact, a series of tables are provided indicating the positioning accuracy of some products in China.

The first set of tables shows Chinese companies that have advertised information, not only on the position accuracies of their machines, but on the standard used to obtain the accuracy data. The second set of tables indicates stated accuracies of equipment, however, there is no indication of the standard used in making the accuracy claim.

Note 1: Only one machine model is listed for each mentioned company. Even though other models or products manufactured by the company meet similar accuracy claims, it is believed to be more significant to understand which, and the number of, companies that have the capability to manufacture accurate machine tool products.

Note 2: Information provided in the following tables may not be available on company websites. Some data was obtained through brochure information.

Note 3: Stated positioning accuracies are in mm.

Chinese Companies - Stating Positioning Accuracies with Identified Standards

Milling:

Company	Machine	Position Accuracy	Source
BMTI Precision Mechatronics Co. http://www.jcsjm.com	u2000/5-630H 5-axis	0.008 to GB/T 17421.2 (2000) (optional package)	Website - 2006
Guilin Machine Tool Co., Ltd. www.glmte.com.cn	Vertical Machining Center XK716/2-5X 5-axis	0.010 to GB/T 17421.2 (2000)	Brochure 2006 CIMES & CMTF Show
Qinghai No.1 CNC Machine Tool Co. LTD www.qh-machine.com.cn	Vertical Machining Center VMC750	0.010 to VDI 3441	Brochure 2006 CIMES & CMTF Show
SDL - Jiangsu Duoleng CNC Machine Tool Co. www.czntw.com	Vertical Machining Center XH716/5x 5-axis	0.010 to JB/T8771.4- (1998)	Brochure - 2005
Shinri Machinery Co. www.shinri.cn	Vertical Machining Center VM55	0.008 to ISO	Website - 2006
T LUNAN - Shandong Lunan Machine Tool Co. www.lunanmachine.com	Vertical Machining Center XHS716 5-axis	+/- 0.005 to GB16462	Brochure 2006 CIMES & CMTF Show
Tonmac International Co. www.tonmac.com.cn	Vertical Machining Center VMC600	0.005 to JIS	Brochure 2006 CIMES & CMTF Show

Turning:

Company	Machine	Position Accuracy	Source
BMTI Precision Mechatronics Co. www.jcsjm.com	CNC Lathe CKG 250	+/- 0.002 to JIS	Brochure - 2006 CIMES & CMTF Show
DMTG - Dalian Machine Tool Group Corp. www.dmtg.com	CNC Turning Center DL-20MH	0.010 to ISO 230-2 (1997)	Brochure - 2006 CIMES & CMTF Show
FED - ChongQing Kefei Precision Machinery Co. www.fred.com.cn	CNC Lathe CNCP5	0.007 to VDI	Brochure - 2006 CIMES & CMTF Show
Ningjiang Machine Tool Group Co. www.ningjiang.com	CNC Lathe CKN6140	0.006 to GB China std.	
TianBei Machine Tool www.tjbmachine.com	CNC Lathe CK6125B	0.006 to GB16462	Brochure - 2006 CIMES & CMTF Show
Index-Dalian Machine Tool www.dmtg.com	CNC Turning Center TNA 400 (only available for China mainland)	0.008 to VDI 3441	Website - 2006
JFMT - Jinan First Machine Tool Group Co. www.jfmt.com.cn	CNC Turning Center MJ-18	0.005 to GB16462 (with glass scale option)	Brochure - 2006 CIMES & CMTF Show

Grinding:

Company	Machine	Position Accuracy	Source
Ningjiang Machine Tool Group Co. www.ningjiang.com	Jig Grinder MK2945C	0.007 to VDI	Website - 2006

Chinese Companies - Stating Positioning Accuracies with "NO" Identified Standard

The following are tables of Chinese companies claiming high accuracy machines, however, no standards information was provided.

Milling:

Company	Machine	Position Accuracy	Source
BYIC – Beijing No.1 Machine Tool Plant http://www.byic.com.cn/bycpm3.htm	Vertical Machining Center MAR-560V	+/- 0.004	Website - 2006
Dabe CNC Machine Co. www.nxdahe.com.cn	Vertical Machining Center V600C	+/- 0.005	Brochure 2006 CIMES & CMTF Show
DMTG - Dalian Machine Tool Group Corp. www.dmtg.com	Vertical Machining Center VDL 500	+/- 0.005	Website - 2006
HDCNC - Weihai Huadong Automation Co.	HC-6350(B)	0.008/300	
Jinan Third Machine Tool Ltd. Co. www.sdjichuang.com	Vertical Machining Center JTVM650	0.010	Brochure 2006 CIMES & CMTF Show
Ningjiang Machine Tool Group Co. www.ningjiang.com	Horizontal Machining Center THM 6363	0.008	Website -- 2006
Shanghai No.4 Machine Tool Works www.h3mt.chinasec.com	XH766A	+/- 0.005	Website -- 2006
Shenzhen First CNC Machine Tool Co., LTD	FSTM-650	0.008	
YMTW – Yunnan Machine Tool Group of SMTCL www.smtcl.com	Vertical Machining Center VM650	+/- 0.005	Brochure 2006 IMTS

Turning:

Company	Machine	Position Accuracy	Source
Beijing Jingyi Century Automatic Equipment Co. www.chinabyi.com	CNC Lathe CK6110A	0.006	Brochure 2006 CIMES & CMTF Show
Ningjiang Machine Tool Group Co. www.ningjiang.com	CNC Lathe NJ-KM011	0.003	Website - 2006
Dezhou Delong (Group) Machine Tool Co. www.dzjc.com	CNC Turning/Milling Center CH6171-4	0.004	Brochure 2006 CIMES & CMTF Show
Shenzhen Poly Top Industry Development Co. www.sz-polytop.com	CNC Turning Center PTCL-15	0.010	Website - 2006
SMTCL - Shenyang Machine Tool Group Co., Ltd. www.smtcl.com	CNC Turning/Milling Center SSCKZ80A-5 5-axis	0.008	Website - 2006

Grinding:

Company	Machine	Position Accuracy	Source
Shanghai Rabbit Machinery Development Co. www.rabbit-m.com	Leading supplier of grinders for bearing industry	No data	Website - 2006
Wuxi Kuaiyuan Machine Tool Co. www.xiji.com.cn	Internal & External Grinder MK2710	Part Accuracy 0.002 Roundness 0.4 Ra Roughness	Website - 2006

Tilting Spindles

Relative to the second half of the item addressing tilting spindles, China has a number of products that provide this capability or have access to products manufactured in other countries with this capability like Taiwan. Below is a list of these type products.

China product offerings include:

Company	Machine Type	Model
Beijing No.1 Machine Tool Plant	CNC Turning/Milling Center	CXHA6130
	Gantry Planomiller	XKAV2415
BMEI Co., Ltd.	Vertical Machining Center	5C-VMC1250
	Vertical Machining Center	XKH400
Dalian Machine Tool Group Corp	CNC Turning/Milling Center	CHD25
Guilin Machine Tool Co., Ltd.	Bridge Type Gantry Machine	XK2316/4-5X
Hanchuan Machine Tool Group Co	Bridge Type Gantry Machine	XH2308
Jiangsu Duoleng CNC Machine Tool Co.	Bridge Type Gantry Machine	TH42160B/5X
	Gantry Profiler/MC	XH2725/5X-10
	Horizontal Machining Center	TH(TK)68125A
	Vertical Machining Center	XH716/5x
Ningjiang Machine Tool Group Co., Ltd.	Horizontal Machining Center	NI-5HMC40
Shenyang Machine Tool Group Co.	CNC Turning/Milling Center	SSCKZ80A-5
	Gantry Profiler/MC	MB200x40/5x

Manufacturing

Joint Ventures in China

Okuma – Beijing No. 1 Machine Tool Plant (BYJC-OKUMA)

This joint venture started in early 2000. It currently resides in a newly constructed building on the outskirts of Beijing. Current production in the facility is reported at 400 machining centers a year. The facility manufactures (machines) the large cast iron components (i.e. columns, bases, etc.) for the machines on highly sophisticated systems. They operate in a flexible manner having two manned shifts and one lights-out unmanned shift. The assembly area operates under “lean” manufacturing principles.

INDEX-DALIAN

INDEX-DALIAN, a joint venture of INDEX and the DALIAN MACHINE TOOL GROUP, was established in the city of Dalian, China in 2001. INDEX-DALIAN manufactures selected turning machines of the INDEX Group for the Chinese market.

Dalian Yida Nippei Machine Tool Co., Ltd.

Dalian Yida Nippei Machine Tool Co., Ltd. (YNC) joint venture founded by Dalian Yida Group Co., Ltd. and Nippei Toyama Corp. Japan Co. Ltd. (NTC). The main products of YNC are CNC vertical machining centers and transfer line equipment.

Dalian Dali CNC Machine Tool Co., Ltd.

Dalian Dali CNC Machine Tool Co., Ltd., was established in 1993 as a joint venture between the Hongkong Join Channel Investment Limited and Dalian Machine Tool Group Corp. The company manufactures CNC turning products.

Companies owned by China firms

Zimmerman GmbH

Dalian Machine Tool Group in 2004 became the main shareholder of the German firm manufacturing large gantry machines.

Ingersoll Production Systems

In 2002 the Dalian Machine Tool Group purchased the United States Company, Ingersoll Production Systems.

Waldrich Coburg GmbH

Beijing No. 1 Machine Tool Plant purchased this German firm, a manufacturer of large gantry type machine tools.

Schiess AG

Shenyang Machine Tool Group purchased Schiess AG in 2004. This German firm is a manufacturer of large gantry type machine tools.

Wohlenberg Werkzeugmaschinen GmbH

Shanghai Electric Corporation purchased Wohlenberg in 2005 which is a manufacturer of turning centers and machining centers.

Companies with facilities in China

EUMA-Spinner Corp.

EUMA-Spinner Corp. is headquartered in Taiwan. During the 2006 China International Machinery and Equipment Show, the President of EUMA-Spinner Corp. noted that his company not only produced products in Taiwan, but had operations in China that manufactured virtually all of the products. As noted in the Taiwan section below, these are high accuracy milling and turning pieces of equipment.

Quality

An important aspect of any machine tool is its build quality. As for almost any machine tool built in the world today, Chinese manufacturers also use components manufactured in countries throughout the world. In literature, many companies state components used on their equipment that are manufactured by companies outside of China, mostly Wassenaar member companies. They also note relationships with companies that have enabled them to produce higher quality machines than they had in the past. In short, China builders use the same high quality products (i.e. feedback systems, linear ways, etc.) as any company would use in the world and are instructed upon their application.

TAIWAN

Machine Tool Industry

What may be of equal importance is the improved accuracy of products produced in Taiwan that are available to the China market, and in some cases manufactured in China. The Taiwan Association of Machinery Industry (TAMI) reports that they have a membership of more than 2,376 machine tool and component manufacturers. Unfortunately the number of manufacturers classified as metal-cutting machinery manufacturers is not reported.

Position Accuracy

As noted above, before a realistic assessment of the positioning accuracies of machine tools manufactured in Taiwan, or elsewhere in the world, can be assessed, a sound understanding of the relationship of quoted accuracies, measured by different standards, should be realized (Refer to Appendix A). Without this, the accuracy of a machine tool often remains a relatively subjective statement.

From the tables below, however, it can be seen that Taiwan has matured into a notable machine tool manufacturer producing machines of relatively high accuracy.

It should be noted that the chart below represents a small number of manufacturers.

Taiwan Manufacturers

Company	Machine	Position Accuracy	Source
Turning			
Campro Precision Machinery Co. www.campro.com.tw	CPL-20	0.004 to VDI 3441	Brochure 2006 CIMES & CMTF Show
EUMA-Spinner Corp. euma.machine-tools.com.tw	EL-52	0.002 to VDI 3441	Brochure 2006 CIMES & CMTF Show
Leadwell CNC Machines Mfg. Corp. www.leadwell.com.tw	T-8S	0.005 to VDI 3441	Brochure 2006 CIMES & CMTF Show
OR www.or.com.tw	VTplus-15	0.004 to JIS	Brochure 2006 CIMES & CMTF Show

Vertical Machining Centers			
EUMA-Spinner Corp. euma.machine-tools.com.tw	ME-810S 5-axis	0.005 to VDI 3441	Brochure 2006 CIMES & CMTF Show
Fulland Machinery Co. www.fullandtech.com	DMC880-5X 5-axis	0.004/300 mm to VDI 3441	Website 2006
Leadwell CNC Machines Mfg. Corp. www.leadwell.com.tw	V-20 5-axes	0.005 to VDI	Brochure 2006 CIMES & CMTF Show
Quaser Machine Tools Inc. www.quaser.com	MK603U 5-axis	0.008 to ISO 230-2	Website 2006
Horizontal Machining Centers			
DAHLIH - Dah Lih Machinery Industry Co. http://www.dalicnc.com	MCQH-400 5-axis	0.005/300 mm standard not specified	Brochure IMTS 2006
Quaser Machine Tools Inc. www.quaser.com	HX805B 5-axis	0.004 to JIS	Website 2006
Bridge Type Gantry			
EUMA-Spinner Corp. euma.machine-tools.com.tw	DMH-1208i 5-axis	+/- 0.004/300 mm to JIS B 6336	Brochure 2006 CIMES & CMTF Show
FIRST – Long Chang Machinery Co. www.first.com.tw	MCV2000 5-axis (option)	Not specified	Website 2006
Hartford – She Hong Industrial Co. www.hartford.com.tw	HB-3210BC 5-axis	Not specified	Website 2006
Johnford www.johnford.com.tw	DMC-4000 GSA 5-Axis	Not specified	Website 2006
Gantry Profiler/MC			
AWEA Mechnantronic Co. www.awea.com	LG5025 5-axis	0.045 to VDI	Website 2006

Tilting Spindles

For many years, Taiwan concentrated on the manufacturing of up to 4-axis machine tools. In recent years, however, it has begun to focus on 5-axis machine tool products.

Machine Tools with Tilting Spindle Capability

Taiwan product offerings include:

Company	Machine Type	Model
EUMA-Spinner Corp.	Bridge Type Gantry	DM-2020
Johnford	Bridge Type Gantry	DMC-4000 GSA
OR	Vertical Machining Center	Vcenter-110
Quaser Machine Tool Inc.	Vertical Machining Center	MK603U
	Horizontal Machining Center	HX805B
Sheng Fang Yuan Technology Co.	Bridge Type Gantry	5AX-1000
	Horizontal Machining Center	HA-5AX6

Sincerely,

Paul R. Warndorf
Chairman, Materials Processing Equipment Technical Advisory Committee of the U.S.
Department of Commerce
Vice President – Technology
AMT – The Association For Manufacturing Technology
Phone: 703-827-5291
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Standards for Measuring Accuracies of Machine Tools

(This table is for reference information and is in the process of review)

China

- **GB/T 16462 (1996)**
Numerically controlled turning machines--Testing of the accuracy.
- **GB/T 17421.2 (2000)**
Test code for machine tools--Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes.
Equivalent to: ISO 230-2 (1997), Test code for machine tools -- Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes
- **JB/TB 8771.4 (1998)**
Industry standard
Similar to: ISO 10791-4, Test conditions for machining centres - Part 4: Accuracy and repeatability of positioning of linear and rotary axes

Germany

- **VDI 3441 (1982)**
Statistical testing of the operational and positional accuracy of machine tools

International

- **ISO 10791-4 (1998)**
Test conditions for machining centres - Part 4: Accuracy and repeatability of positioning of linear and rotary axes
- **ISO 230-2 (1988)**
Test code for machine tools -- Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes
- **ISO 230-2 (1997)**
Test code for machine tools -- Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes
- **ISO 230-2 (2006)**
Test code for machine tools -- Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes
Equivalent to: ISO 230-2 (1997), Test code for machine tools -- Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes

Japan

- **JIS B 6192 (1999)**
Test code for machine tools -- Determination of accuracy and repeatability of positioning numerically controlled axes
Modified: ISO 230-2 (1997), Test code for machine tools -- Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes
- **JIS B 6228 (2003)**
Bridge type plano-milling machines -- Testing of the accuracy
Modified: ISO 8636-1 (2000), Machine tools -- Test conditions for bridge-type milling machines -- Testing of the accuracy -- Part 1: Fixed bridge (portal-type) machines
- **JIS B 6331 (1986)**
Test code for performance and accuracy of numerically controlled lathes
- **JIS B 6336 (1986) Withdrawn**
Test code for performance and accuracy of machining centres
- **JIS B 6336-1 (2000)**
Test conditions for machining centers -- Part 1: Geometric tests for machines with horizontal spindle and with accessory heads (horizontal Z-axis)
Equivalent to: ISO 10791-1 (1998), Test conditions for machining centres - Part 1: Geometric tests for machines with horizontal spindle and with accessory heads (horizontal Z-axis)
- **JIS B 6336-2 (2002)**
Test conditions for machining centres -- Part 2: Geometric tests for machines with vertical spindle or universal heads with vertical primary rotary axis (vertical Z-axis)
Modified: ISO 10791-2 (2001), Test conditions for machining centres -- Part 2: Geometric tests for machines with vertical spindle or universal heads with vertical primary rotary axis (vertical Z-axis)
- **JIS B 6336-3 (2000)**
Test conditions for machining centers -- Part 3: Geometric tests for machines with integral indexable or continuous universal heads (vertical Z-axis)
Equivalent to: ISO 10791-3 (1998), Test conditions for machining centres - Part 3: Geometric tests for machines with integral indexable or continuous universal heads (vertical Z-axis)
- **JIS B 6336-4 (2000)**
Test conditions for machining centers -- Part 4: Accuracy and repeatability of positioning of linear and rotary axes
Equivalent to: ISO 10791-4 (1998), Test conditions for machining centres - Part 4: Accuracy and repeatability of positioning of linear and rotary axes

- **JIS B 6338 (1985) Withdrawn**

Test code for performance and accuracy of machining centers (vertical type)

Replaced by: JIS B 6336 (2000) which is identical to ISO 10791 (1998)

- **JIS B 6338-3 Withdrawn**

Test conditions for machining centres - Part 2: Geometric tests for machines with vertical spindles or universal heads with vertical primary rotary axis (vertical Z-axis)

Replaced by: JIS B 6336-2:2000, Test conditions for machining centres -- Part 2: Geometric tests for machines with vertical spindle or universal heads with vertical primary rotary axis (vertical Z-axis)

United States

- **ANSI B5.54 (2005)**

Methods for performance evaluation of computer numerically controlled machining centers

- **ASME B5.57 (1998)**

Methods for performance evaluation of computer numerically control lathes and turning centers



Reliable Electronic Solutions

Gerald T. Young
Assistant Secretary

November 15, 2006

VIA FACSIMILE - (202) 482-3355

Ms. Sheila Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry & Security
Department of Commerce
14 Street & Pennsylvania Avenue NW, Room 2705
Washington, DC 20230
Attn: RIN 0694-AD75

Re: Comments on Revisions and Clarification of Export and Re-export Controls for the People's Republic of China (PRC): New Authorization Validated End-User

Dear Ms. Quarterman:

Bourns, Inc. ("Bourns") would like to express our appreciation for the opportunity to comment on the proposed regulation for export, re-export, and in-country transfer controls to the People's Republic of China ("PRC") and the new authorization for Validated End User ("VEU").

Bourns, Inc. is a California Corporation with locations worldwide, including several locations in Asia and China. Bourns manufactures and sells electronic components to customers located in all geospheres. Some of Bourns® Products are manufactured for it on a private label basis and some of the manufacturers of those privately labeled products are located in the PRC.

Bourns is sincerely committed to strict compliance with U.S. export control laws and to protecting U.S. national security. We have a strong record of compliance with BIS and ITAR regulations and cooperation with federal authorities, and we want to maintain that record. While we understand that the PRC poses special challenges with respect to export controls, we believe compliance cannot be effective unless regulations are clear, enforcement policies are consistent, and the compliance burden is not so heavy as to put U.S. companies in a competitive disadvantage vis-à-vis our non-U.S. counterparts.

The proposed regulation creates serious concerns within our company, as well as the companies and trade associations in our industry. We believe the proposed regulation would not enhance U.S. national security, but would impose an onerous compliance burden on companies such as Bourns. In the interest of making the proposed rule clearer and limiting the burden of compliance, we would like to outline some of the detrimental affects of the proposed rule both in terms of complicating trade between the U.S. and the PRC while at the same time creating trade barriers for U.S. companies in the global market.

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1. Many Affected Products Are Readily Available in PRC and Elsewhere

The proposed rule casts a wide net over the 47 Export Control Classification Numbers ("ECCN's") that would be affected. However, it fails to take into consideration the fact that many products in these categories (i.e., 3A292, 3B991, 4A994, 4D994, 5A991, 5A992 and 5D992) are readily available in PRC, other parts of Asia, as well as Europe from sources other than United States companies. These products manufactured by non-U.S. companies, therefore, will escape the strict controls contemplated by the proposed rule. The result will be a significant increase in purchases of these non-controlled products, to the detriment of U.S. companies, such as Bourns, that operate within stringent U.S. export controls. More importantly, there will be minimal, if any, counterbalancing advancement of U.S. national security interest.

2. Excessive Due Diligence Burden

The proposed regulation would significantly increase the risks and costs of compliance for Bourns due to the global nature of our business. The expansive scope of the proposed rule, added to unclear terms and the lack of due diligence guidance, will significantly increase the compliance cost and potential liability for Bourns and other American companies while drastically reducing any competitive advantage that we may have against foreign competitors. We urge BIS to consider the following concerns:

- The proposed rule would impose an undue burden on Bourns to conduct due diligence that ultimately may prove to be meaningless. Bourns has many customers worldwide. Under the proposed rule, Bourns will be required to inquire and investigate ultimate end-user and end-use information for each transaction involving a product that falls under the listed ECCN's. As the proposed rule provides no guidance on the scope of due diligence required, Bourns may have to drill down to many levels beyond the first level customer to ascertain the ultimate end-user and end-use. Since Bourns' customers tend to be distributors, resellers, original equipment manufacturers or contract manufacturers, Bourns will have difficulty gaining visibility beyond the first level customer.

Furthermore, this lengthy due diligence exercise could prove to be pointless. Bourns' investigation will involve, for the most part, asking the customers about the intended end-user and end-use for the products. Frequently, the customers would provide non-specific answers, either because they do not want to disclose their customers to Bourns for fear of direct competition from Bourns or because they intend to incorporate Bourns' parts into their own products to be sold to a variety of customers and thus cannot provide specific end user or end use information. When confronted with burdensome requirements from Bourns, these customers will likely turn to our non-U.S.-based competitors who will be more than happy to sell them these products without asking bothersome questions.

- The expansion of the PRC end user certificate requirement will cause lengthy delays. In the event that the Chinese Government decides to cooperate with end user certificates, they do not have sufficient resources to issue certificates efficiently.
- The definitions of "military end use" and "support" are overly broad. They expose U.S. companies like Bourns to considerable liability and raise numerous questions. For example, if an exporter has information that a product could be used for the design of both military and civilian products, would the "military end use" definition apply? What if an exporter knew that at the present time the item would be used for the production of civilian items, but that they might be used in the future to produce a military product? Does the definition of "deployment" include simple transportation of military items (or the possibility of transportation of such items)? Does BIS expect exporters to interpret the USML the same way Department of State does currently, in that items not specifically

described but that are specially designed, modified, adapted or configured for military use could be subject to their jurisdiction? If read broadly, these definitions could, for example, affect sales of components that are used in the production of items that are intended for sale to military and commercial customers even though such items have no real military value or function. These definitions raise many questions. BIS must provide specific examples to the exporting public to explain how it would apply these terms in different contexts.

- The proposed new control based on BIS notification that an item is or may be intended for military end-use in the PRC does not specify how much notice BIS would give before such notices become effective and so exporters may find themselves required to act quickly to halt exports on short notice. Additional guidance from BIS is necessary.

3. The Proposed Regulation Will Be Unilateral

We understand that currently, the U.S. is the only party to the Wassenaar Arrangement intending to implement a conventional arms embargo with respect to PRC. Some European members have already made clear that implementation of the Statement of Understanding on Control of Non-Listed Dual-Use Items will not apply to PRC. Without participation by other Wassenaar members, the proposed rule is virtually guaranteed to be ineffective in denying these controlled items to PRC. In fact, it will encourage other countries to design U.S. technology out of their products.

4. No Gain for National Security

In light of the ready availability in the PRC and elsewhere of products subject to the proposed controls and the lack of commitment from other Wassenaar members to endorse the proposal, it is extremely unlikely that the proposed regulation will have any impact on the military capability of the PRC. Under the circumstances, we have difficulty understanding how this proposed regulation could advance U.S. national security. In contrast, it is abundantly clear that its broad scope will add significant compliance burden to already burdened U.S. companies and will, over time, reduce our ability to compete in the global market and detrimentally impact the U.S. labor market.

5. Validated End User Rule Is Unclear and Offers Little Benefit to Bourns

We commend BIS' attempt to ease restrictions on exports to civilian end-users in the PRC; however, in its current form, the Validated End User ("VEU") program is ill-defined and would be of little benefit to Bourns. The following illustrates the concerns raised by the VEU program:

- While the VEU program may benefit companies that have a small customer base, it would not benefit a company like Bourns that sells to customers in the PRC that in turn resell to Chinese end-users. Bourns would have to get all of those customers approved through the VEU process. The additional administrative burden for managing the VEU certification, recordkeeping and reporting requirements can be likened to an application for a Special Comprehensive License and follow up management of the license to fulfillment. Systems would need to be updated to flag, monitor and report the quoting, sale and shipping of the 47 ECCN's as well as the VEU status of the PRC customer. Bourns would have to train employees on the processes, including but not limited to employees in sales, marketing, contracts, purchasing, credit management, transportation, export administration and warehouse operations. We would have to incur start up costs to put such a program in place. Given the number of customers that we have, the VEU program would be cost prohibitive and, therefore, of little benefit to Bourns.
- BIS has not provided a meaningful incentive for U.S. exporters to apply for VEU status. Companies are asking, "Why would a U.S. company "A" want to go through the administratively burdensome and costly process of preparing and submitting a VEU application for PRC customer "B," only to have B listed on the BIS website, which then would allow all competitors shipping goods subject to the EAR to "piggy back" on company A's efforts? Under this scenario, company A would definitely

lose a competitive advantage under this process, while applying for an export license, which is a similar and perhaps less cumbersome and costly process, would protect A's competitive advantage.

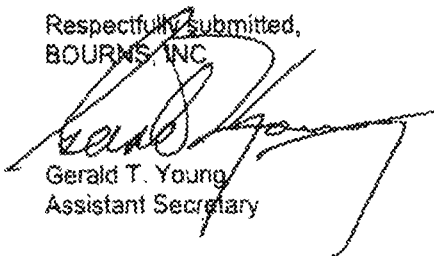
While BIS may believe that PRC companies will come forward to apply for VEU status, our experience indicates that in the PRC market, few customers would willingly come forward with information about their business or willingly sign any documents required by the U.S. companies to meet due diligence standards.

Conclusion

In summary, this proposed regulation will impose significant costs and diminish the competitiveness of U.S. companies, as well as interferes with important U.S. policy goals towards the PRC, without offering any tangible enhancement to U.S. national security. Bourns urges BIS to withdraw this proposed rule.

We appreciate the opportunity to submit these comments to BIS and hope that they are helpful to the rulemaking process.

Respectfully submitted,
BOURNS, INC



Gerald T. Young
Assistant Secretary



November 20, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th St. and Constitution Ave. NW
Room 2705
Washington, DC 20230

Attention: Sheila Quarterman

RIN 0694-AD75

RE: Proposed Rulemaking Concerning Revisions and Clarifications of Export and Reexport Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 Fed. Reg. at 38.313, July 6, 2006)

Dear Ms. Quarterman:

We appreciate the tension inherent in developing an export control policy that fosters civilian trade with China while concurrently protecting the national security and foreign policy interests of the United States. Certainly this tension is evident in the creation and evolution of this Proposed Rule. However we feel that this rule as proposed has potentially serious adverse impact on both export compliance costs and risk in a critical export market for Cadence without delivering clear national security benefits; thus we appreciate the opportunity afforded by BIS under this comment period to address our concerns.

Classification of Cadence products

Cadence produces and provides Electronic Design Automation (EDA) software worldwide. The draft of the Proposed Rule for Military End Use Restrictions (MEUR) for China includes within its scope EDA software that is classified under Export Control Classification Number ("ECCN") 3D991 of the Commerce Control List ("CCL") of the Export Administration Regulations ("EAR", 15 CFR Part 730 *et seq.*)



ECCN 3D991 is defined as “Software” specially designed for the “development”, “production”, or “use” of electronic devices or components controlled by 3A991, general purpose electronic equipment controlled by 3A992, or manufacturing and test equipment controlled by 3B991 and 3B992. Similarly, ECCN 3E991 is defined as “Technology” referencing the same hardware classifications. The MEUR list of controlled ECCNs does include ECCNs 3B991 and 3B992; but importantly, not 3A991. Thus, due to the all-encompassing language in ECCNs 3D991 and 3E991, a broader restriction is placed on software and technology in Category 3 than on their related hardware - much more in these ECCNs is captured by the MEUR than just the software and technology directly linked to hardware specified in 3B991 and 3B992.

The clarification of Item 3.D.3 in the 2003 Wassenaar Dual Use List Review, and the addition of a new Note to Item 5.A.2 in the 2005 Dual Use List Review, have reaffirmed that EDA software is not of significant strategic concern. EDA software is like a word processor for the design of integrated circuits, and has no inherent military value. There may be some intellectual property that designers of integrated circuits may use with EDA software that might reasonably be subject to MEUR for China, but basic EDA software classified under 3D991 should be exempt. At minimum, the scope of the MEUR on 3D991 and 3E991 should be limited to software and technology specifically tied to the items mentioned in 3B991 and 3B992, releasing the balance of software and technology covered in these classifications (including EDA) from the proposed rule.

Foreign Sources of EDA

The European Union apparently has decided that it will not implement MEUR for China, thus numerous European competitors are not subject to restrictions similar to MEUR for China. The net effect is that our European competitors will not face the same fear, uncertainty and doubt with respect to sales in China that we will face. This may result in causing Chinese customers to avoid U.S. suppliers such as Cadence because of this uncertainty, which could then lead to a shift of technological leadership out of the U.S. These competitors include MunEDA, Chip Vision and Concept Engineering, TransEDA, Spiritech Pulsec and Kimotion. Further to this, large consumers of EDA in Europe, such as Infineon, STMicroelectronics and Philips actively collaborate on EDA R&D, and large research institutes like Leti in France or IMEC in Belgium also have active EDA programs, with the intent of shifting this technology from its core US roots to the EU. If a rule such as MEUR for China is to be effective, then it must be multilateral in order to avoid disadvantaging American companies vis-à-vis our European competitors.



The EDA Market in China

The China market for EDA software is not large, compared with markets for aerospace and even for other electronics products. However, China is the fastest growing market segment in the world for EDA software, and has one particular characteristic which could cause a disproportionate impact on Cadence.

Most students of integrated circuit design learn to use EDA software when they are in college or university engineering programs. In order to "seed" the market, Cadence often provides EDA software at a reduced price to college and university engineering programs, with the expectation that graduates will continue to use the programs learned during their academic experience.

If Chinese colleges and universities should conclude that a significant number of their graduates would not be able to use EDA software from Cadence in the full scope of their employment, they might prefer to use EDA software from other sources, either indigenous or from third countries. Such a reluctance to use EDA software from Cadence and other U.S. companies could have a dramatic impact on sales to legitimate end-users in China, if the "best and brightest" integrated circuit engineers in China learn their trade using EDA software from indigenous or third country sources.

Due Diligence and Responsibilities

The Chinese military uses electronics. Though much of which falls into the ECCN 3A991 classification that is not covered under the proposed MEUR, there will be other electronics components that fall into more strict categories. While Cadence has no intention of assisting the military, at some point electronics designed with the assistance of EDA tools will reach the military.

As with compliance to all export regulations, Cadence plans to make reasonable efforts to ensure compliance with MEUR, however we need to know what the minimal and optimal due-diligence steps should be. Is there a threshold level of acceptance for end-user companies or universities who research and design commercial products, but might upon occasion provide work for the military? Further, the military may acquire commercial-grade electronics for their programs. What is our liability when selling to a commercial design company beyond understanding that they're designing commercial products?

Considering our sales into universities - assuming that many universities educate students who, post-graduation, may eventually provide designs for military products (directly or indirectly), what is our liability?



VEU Program

Cadence recognizes that the MEUR for China has evolved to include not only a "stick" in the form of a restriction on sales to military end-uses, but also a "carrot" in the form of the new License Exception Validated End-User ("VEU"). We believe that this is a positive development, and would not like to see the License Exception VEU removed.

Although our products do not ordinarily require an Export License to China, our intent would be to reference this list in our due-diligence of new customers. If the customer is on this list, this provides additional assurance that the customer will be using our products for non-restricted purposes. Beyond this however, the list provides limited value as we suspect there will be a limited number of end-users on this list, mostly large enterprises, not the small design companies to which we sell.

Assuming that a VEU program is adopted, Cadence strongly advocates that BIS help the exporting community by publishing the list of companies on this list in Mandarin Chinese. In addition, and even more important is to have BIS publish the list of Entity and Unverified Chinese destinations in Mandarin. Today there is unnecessary confusion created when order-takers in China are translating names from English to Chinese. We want to ensure that we are not selling to proscribed entities -- BIS could assist the entire exporting community in a meaningful way by providing the correct Mandarin names.

Conclusion

For these reasons, among others, we respectfully submit that EDA software and related technology classified under ECCNs 3D991 and 3E991 should be removed from the scope of the MEUR for China. We remain optimistic that a reasonable scope of a MEUR for China can be devised that not only protects the national security and foreign policy interests of the United States, but also recognizes that unfettered EDA software can contribute to the continuing market leadership of American companies in the EDA software field in China. We would be pleased to respond to any additional questions and concerns that may not have been addressed in this letter, in a manner and time that would be mutually convenient.

Sincerely,

A handwritten signature in black ink, appearing to read "Larry Disenhof".

Larry Disenhof
Group Director, Export Compliance and Government Relations
Cadence Design System



Greg Spierkel
Chief Executive Officer

November 21, 2006

Sheila Quarterman
Bureau of Industry and Security
United States Department of Commerce
14th Street and Constitution Avenue N.W.
Washington, D.C. 20230

Re: Proposed Rulemaking Concerning Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 FR 38313 of July 6, 2006)

Dear Ms. Quarterman:

Ingram Micro Inc. ("Ingram Micro") appreciates this opportunity to comment on the Proposed Rulemaking Concerning Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 FR 38313 of July 6, 2006).

Ingram Micro is the world's largest distributor of technology such as computers, peripherals and software, with \$28.8B in sales in 2005. As a distributor, Ingram Micro distributes products made by others. That is, it buys products from manufacturers (called "vendors") and resells them to customers ranging from (1) retail outlets such as Best Buy and CMD to (2) Value-Added Resellers to (3) systems integrators to (4) sub-distributors, who resell again to other sub-distributors or resellers.

As a distributor, Ingram Micro generally operates on a high-volume, commodity basis. Typical products distributed include laptops, printers, computer monitors and the like. It has more than 160,000 customers worldwide, with whom it does thousands of transactions per day.

In China, Ingram Micro operates on the same distribution model, namely, high volume sales of commodity products bought from vendors and resold to countless retailers, value-added resellers and sub-distributors. Its subsidiary, Ingram Micro China, does not sell to the ultimate end-user and will generally not know the identity of the eventual end-user, whether the end-user is a Chinese family buying a printer or a Chinese business installing an integrated network of laptops and servers.

Ingram Micro China distributes technology products both of US vendors such as HP and Logitech as well as products of non-US vendors such as Acer, a Taiwanese company, and Lenovo, a Chinese company, whose product line may not be covered by the EAR. To take but one example, Ingram Micro China sells the HP laptop Model PX851AV, a product covered by the EAR, but this competes with Acer laptop Model 00LX.TB105.015, a foreign-produced product not covered by the EAR that could be caught under CCL Category 4, ECCN 4A994.

Ingram Micro China obtains 85% of its inventory by direct purchases within China and the rest by importing through Ingram Micro's Hong Kong operations. As a distributor operating in China, Ingram Micro China competes primarily with locally based, Chinese-owned distributors, such as Digital China, as opposed to other American companies (or even other Western companies).

Ingram Micro is fully committed to doing its part in supporting the national security of the United States, including compliance with BIS regulations and cooperating with federal authorities. As explained below, however, the proposed regulation with respect to Military End-Use Requirements ("MEUR"), as applied to Ingram Micro's distribution business in China, will do nothing to advance national security but will rather just produce paperwork and extra cost with no return on export controls aims.

1. Many Affected Products Are Commodity Products Readily Available in China

The scope of Export Control Classification Numbers ("ECCNs") that would be affected by the proposed rule, including 4A994, 4D994, 5A002, 5D002, 5A992 and 5D992, is overbroad. Many products in these categories are commodity-type computers, networking equipment, and software, which are distributed by Ingram Micro China. As explained above, these are commodity products readily available from non-US vendors such as Acer, Lenovo, Huawei, and a host of other companies that produce for their own distribution or source from other non-US companies. Thus, imposing paperwork restrictions on the sale of these controlled products will simply result in more purchases of alternative, non-US (and non-controlled) products, without advancing any national security interest.

2. The Affected Products Are Readily Obtainable from Non-US Distributors in China

As explained above, Ingram Micro China competes against local Chinese distributors and any of the commodity products described above are readily obtainable from these local distributors. Thus, Chinese customers can avoid any other paperwork and other obstacles posed by the MEUR by simply turning to one of these competing distributors for their purchases.

3. The Regulation Poses a Meaningless Due Diligence Burden on Ingram Micro

Under the proposed MEUR, Ingram Micro China is obligated to engage in due diligence in all its transactions concerning affected products to determine if the product is intended for military end-use. As explained above, Ingram Micro China has several thousand customers, some who sell at retail and some who re-sell to other sub-distributors (with the products changing hands many times before its reaches the end-user). In short, Ingram Micro China's due diligence, as it tries to ascertain the ultimate end-use of its products, will be lengthy and expensive and in the end often inconclusive.

Moreover, as the due diligence will comprise steps such as asking its own customers about the possible end-use of the product, it will be ineffective, as the customer may simply respond in an innocuous fashion that there is no military end-use, without Ingram Micro China having the

opportunity to verify the accuracy of the representation. Also, in the distribution business in the United States and elsewhere, customers jealously guard information about their own customers and those customers not wishing to divulge such information will simply turn to competing local distributors not burdened by the MEUR to avoid the prying questions and any associated paperwork.

4. The Proposed Regulation Would be Unilateral

As Ingram Micro understands it, participating member states of the Wassenaar Arrangement agreed to implement military end-use restrictions on countries subject to conventional arms embargoes. However, as far as we can determine, only the United States has implemented a conventional arms embargo with respect to China. The net effect is that American companies will be subject to more stringent regulations than their foreign competitors, undermining the effectiveness of the MEUR and negatively impacting American companies in their efforts to compete on a level playing field.


5. Validated End User Rule Would Have Limited Utility for Ingram Micro

The Validated End User Rule would have limited utility for the activities of Ingram Micro China. The Rule may have some utility for companies that sell relatively high dollar value, non-commodity products directly to a small set of customers. By comparison, as shown above, Ingram Micro China sells on a high-volume, commodity basis to the technology distribution channel involving thousands of customers and many more thousands (if not millions) of Chinese end-users. Thus, the Validated End User Rule will have no benefit to Ingram Micro.

Conclusion

In short, the MEUR proposed rule significantly adds costs to Ingram Micro and reduces its competitiveness in China without offering any tangible benefit to United States security. Accordingly, Ingram Micro respectfully recommends that BIS reassess the MEUR proposed rule.

Sincerely,



Gregory M. Spierkel

Customs and International Trade Bar Association

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November 22, 2006

Ms. Sheila Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry and Security
U.S. Department of Commerce
14th St. & Pennsylvania Ave., N.W., Room 2705
Washington D.C. 20230

Attention: RIN 0694-AD75

***Re: Proposed Rulemaking Concerning Revisions and
Clarification of Export and Re-export Controls for
the People's Republic of China (PRC),
71 Fed. Reg. 38313 (July 6, 2006);
Comments on Proposed Rule.***

Dear Ms. Quarterman:

On behalf of the Customs and International Trade Bar Association ("CITBA") we are submitting these comments on the proposed revisions to the regulations controlling exports to the People's Republic of China (China) recently published in the *Federal Register* by the Bureau of Industry and Security (BIS) on July 6, 2006. Founded in 1926, CITBA is a national association of attorneys who concentrate in customs law, export controls, international trade regulation, and other related fields of law. CITBA has members throughout the United States as well as foreign affiliate members.

In general, CITBA understands the concerns that prompt BIS's proposals, but we nevertheless have reservations. As BIS has recognized, China has become a major participant in the global economy and as such has emerged as a major market for exports of the United States, particularly high-technology products in which the United States excels. We are concerned that the proposed revisions could threaten this favorable state of affairs by creating excessive burden and expense and chilling effect on

U.S. exporters. We believe that less stringent measures could adequately serve the Government's objectives while minimizing the adverse effects. There is every reason to reduce these effects because the United States must do all it can to increase exports and reduce trade imbalances.

The following are our specific concerns:

Proposed Section 744.21

1. Proposed section 744.21 would prohibit exports, re-exports, or transfers of items when the exporter "know[s]" at the time of exportation that the exports are intended for "military end use." We believe the provision should make clear that it is limited to *actual* knowledge, and that such knowledge should be evident from the circumstances of the transaction or from an express BIS notice pursuant to proposed subsections 744(b) and (c) that particular items present a risk. It should not be that a U.S. exporter could find itself at a subsequent date charged with arguable knowledge of facts when actual knowledge did not exist at the time of exportation.

2. The proposed provision would also require exporters to state on the export application "all known information" concerning military end-use. Broadly construed, this could require extensive inquiry for each and every exportation, and this could be an onerous burden if the exporter were large and complex. Moreover, some products have countless applications, and accounting for all potential uses could require speculation and create a corresponding risk that all uses were not identified. We believe it ought to suffice for the exporter to provide only information that it is reasonably available in a commercial time frame which it has obtained from making a reasonable inquiry of all relevant departments within the company. To require more, in our view, would create a chilling effect on U.S. companies exporting goods. This could result in lost sales that the exporter could otherwise make in good faith.

Proposed Section 748.10

3. Section 748.10 would create exceptions for transactions of less than \$5000. We agree that exceptions are appropriate and should be available when values are *de minimis*. However, inflation changes real values over time, so \$5000 at one point in time might purchase much less at a future point in time. The regulation should therefore provide that the BIS will revise the figure at least once each calendar year by reference to an inflation index, perhaps Federal Reserve Board statistics. Without automatic revisions, the proposed well-justified exception could lose significance over time. Automatic adjustments would be easier than periodically amending the regulation.

Proposed Section 748.15

4. Proposed section 748.15 would provide for a system of "validated end users" (VEUs), *i.e.*, users pre-approved by BIS. We generally support this system but see the potential for costly delay. In acting on a VEU application, BIS would consult with the Departments of State,

Energy, and Defense, as well as "other agencies, as appropriate," and consider a wide range of information. *See* section 748.15(a)(1). We believe the final regulation should establish firm deadlines for the inter-agency review, possible subject to specific exceptions when particular circumstances warrant. Being able to establish quickly VEU status for particular end-users would minimize the disadvantages that U.S. exporters would inevitably face in competing for sales in the international market as a result of extensive review. Excessive time to process applications can result in lost sales, particularly when other international suppliers are able to supply the same products without elaborate governmental approvals. As stated, exporting American goods to China is in the interests of the United States. It undermines this important goal when lost sales result from delay.

Further Comment Regarding "Deemed Exports"

The impact of the proposed regulations on "deemed exports" seems problematic, particularly in the case of Chinese subsidiaries of U.S. parent corporations. Technical knowledge lies at the heart of many business operations and inhibiting the flow of technical information within affiliated organizations, beyond the already existing restraints, could seriously disrupt commercial operations and adversely affect American businesses. As the *Federal Register* notice observes, "many U.S. companies have established significant business operations" in China. 71 Fed. Reg. at 38314. We believe the new regulations should not apply to technical information that flows between affiliated entities. Existing controls ought to suffice to protect the national security concerns.

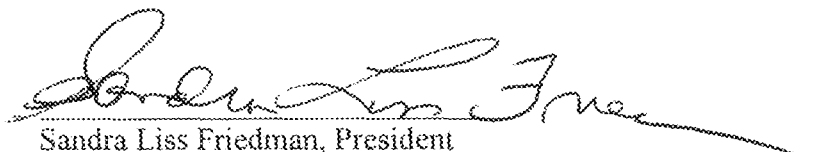
Conclusion

CITBA appreciates this opportunity to comment. As stated at the outset, the organization supports BIS's goals and only hopes the goal can be furthered without unnecessary obstacles to trade.

Respectfully submitted,

Customs and International Trade Bar Association

Wesley K. Caine, Chair
International Trade Committee


Sandra Liss Friedman, President

WKC/SLF/ep



November 27, 2006

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Attention: Ms. Sheila Quarterman

RIN 0694-AD75

RE: Proposed Rulemaking Concerning Revisions and Clarification of Export and Re-export Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 Fed. Reg. at 38,313, July 6, 2006)

Dear Ms. Quarterman:

I appreciate the opportunity to submit the following comments on behalf of the 350 member companies of AMT-The Association for Manufacturing Technology. Our members manufacture the machine tools and productivity technology and equipment that enable our country to stay in the forefront of manufacturing, and we are a critical part of the defense manufacturing base.

While AMT understands the purpose of the proposed "China Military Catch-All" regulations is intended to prevent the Chinese military from obtaining dual-use items and technology that would be useful in advancing military ends, we believe that there are several reasons why the proposed regulations will not only fail to achieve their stated purpose but also be costly and deleterious to the United States machine tool industry. In the following paragraphs we will lay out first our general concerns about the regulations and then we will go into detail on the specific problems we see for the United States machine tool industry.

Although you will see that we have a number of concerns, it is important to note that this version of the "China Catch-All" regulations is a substantial improvement over the earlier version, which you issued in March. We would note the following improvements:

1) The emphasis in the latest version is placed on "end-use" not "end-user." Under the new proposed regulations, the export would have to make a "material contribution to the PRC's military capability," not simply be useful to the Chinese military. This should help companies avoid technical violations, particularly because it is so difficult to identify Chinese military entities which have made efforts to conceal their identities.

- 2) Military end-use is further defined to include only those items found on either the State Department's U.S. Munitions List or the Wassenaar International Munitions List, such as tanks and military aircraft, rather than leaving it to the exporter's imagination to define what is a military end-use. This too is a very helpful addition and should provide significant clarity for exporters attempting to comply.
- 3) The new regulations also create a new category of "validated end-users," which would consist of pre-certified companies, who would not need approval for each and every license. AMT appreciates the good intentions of this new provision, and we intend to distribute information about this new provision to our members. But we are concerned that the certification process will be long and cumbersome. If that is the case, few, if any, AMT members will be able to take advantage of this new "white list."
- 4) For those who need a license, you have created a threshold value of \$5000 before an exporter would need an end-user certificate issued by MOFCOM in China. This could be useful for spare parts, but no machine tool sells for less than \$5000. Consequently, AMT is concerned that this new requirement could create a bottleneck. The Chinese Government's export control agency, within the larger ministry known as MOFCOM, is already significantly under-staffed, with perhaps a dozen officials processing end-user certificates. AMT is concerned that these individuals will be likely not be able to process efficiently the new volume of applications for end-user certificates caused by the regulation.

AMT would also like to emphasize that when drafting the final version of the regulations, we believe that it would be extremely important to provide for "grandfathering" of open, unshipped orders or contracts. Capital goods, particularly machine tools, have long lead times and build cycles, extending out many months, even as long as more than a year (especially when engineering is involved). The regulations must take into consideration these characteristics of our industry and contain a deferral provision that would authorize the completion of any such orders based on binding contracts at the time that the final rule is published.

Within this same context, companies should be allowed to continue to satisfy all customary warranty obligations for spare parts, service, and maintenance, as well as well as non-warranty obligations for machines that are already installed. AMT would like to remind you that the useful lives of machine tools usually extend out past ten years, and customers expect that the manufacturer will supply critical spare parts and maintenance for the live of the machine. Indeed, many contracts have clauses stating just that. Not to offer such service would put U.S. companies at a significant disadvantage in the Chinese market.

On the policy level, what AMT finds troubling about the new regulations is that they indicate that the United States Government intends to send a strong signal to the Chinese that there will be new export control restrictions on China trade. Since export control cooperation with the Chinese Government has been steadily improving over the past few years, it will be difficult for the Chinese to understand what provoked this new round of restrictions. It is particularly unfortunate to the U.S. high technology industrial sector, because it comes at a time when the Chinese already perceive the United States to be the most restrictive and least reliable trading partner among all the major industrial countries as a consequence of the application of the U.S. export control restrictions already in place and the manner in which they have been applied by the U.S. Government.

The likelihood is that few, if any, of the other members of Wassenaar will adopt a similar set of regulations, or indeed even publicly support the correctness of the U.S. position.

The European Union has already made it clear that it does not feel itself bound by the Tiananmen Square sanctions and could even formally end their commitment to enforcing those sanctions within the next year. Thus, the EU could very well be loosening export controls to China at the very time we are tightening them. Certainly, neither Russia nor most of the other non-EU Wassenaar members are likely to publicly endorse this new approach. Thus, there is little hope for wide acceptance of new, more restrictive export controls towards

China. That will make the new U.S. "China Catch-All" regulations even more irritating to the Chinese Government, particularly when these regulations will be introduced after a recent series of Chinese Government commitments to improve their own export control cooperation with the United States, with Wassenaar, and with the Nuclear Suppliers Group.

Thus, while AMT would concede that this latest version of the regulations does constitute a substantial improvement over the earlier versions of the proposed regulations, we would note that BIS has made the assertion (in the preface to the regulations and during interviews on the regulations) that the new regulations do not cut off very much of what currently is being exported to China. This may be true. Nevertheless, that does not mean that the Chinese will interpret the new regulations in a benign way. The Chinese Government has already made public statements that pronounced the regulations as "disappointing." They obviously take the announcement of the new "China Military Catch-All" regulations as a further indication of the unreliability of U.S. vendors and as one more reason that goods and technology purchased from the United States are likely to be delayed or denied. As a consequence, AMT believes that the new regulations are precisely the wrong signal to send to the Chinese Government if the U.S. Government wants continued export control cooperation and increased high technology trade.

The United States machine tool industry has lost 38.8 percent of market share in China over the past decade. That loss has occurred during a period in which China has become the biggest machine tool market in the world. To get an idea of the enormity of the Chinese machine tool market growth, consider the following relationship between Chinese consumption (total purchase from all sources) of machine tools and that of the United States. In 2000, China consumed half as many machine tools as the U.S. By 2002, China had drawn even. By 2004, China had doubled U.S. consumption. This year, it is likely that China's consumption of machine tools will be triple that of the United States.

Other nations have lost market share in China as well. But Japan has seen a market share gain of 35 percent, Taiwan 13.4 percent, and South Korea a whopping 124.4 percent.

Obviously, export controls are not the sole factor in U.S. market share losses. But one could not argue that the U.S. Government's reputation for being the slowest in approving license applications and the most rigorous in its application of export controls to China is a negligible factor in the migration of Chinese manufacturers from U.S. vendors to those who have a reputation for less stringent application of the Wassenaar guidelines regarding technology transfer. Taiwan and South Korea have hardly distinguished themselves as tough enforcers of the rules on technology transfer. Japan, on the other hand, does follow essentially the same guidelines as those imposed by the United States, but export license applications from Japan, while they are likely to be rigorously reviewed, are less likely to be denied or delayed, which can be a crucial factor in the purchasing decisions of factory managers on a tight deadline for contract fulfillment or in urgent need of production increases.

Meanwhile, as the data on the charts and graphs below will demonstrate, China has built up its indigenous machine tool industry significantly. The United States currently has approximately 350 machine tool and component manufacturers, of which 175 produce metal-cutting machinery. By contrast, China has nearly five times that number, with more than 1650 manufacturers, of which there are 415 metal-cutting machine tool builders. Moreover, the Chinese Government has been providing subsidies and grants to various Chinese manufacturers in order to enable them to catch up with the West in terms of technological sophistication.

During a fact-finding trip to China in June 2006, AMT found that there were as many as 18 indigenous Chinese manufacturers of CNC controls, with eight manufacturing units for five-axis machine tools. As recently as four years ago, there had not been a single operational Chinese manufacturer of this technology. The two

manufacturers with the widest range of customers, Beijing Aerospace Numerical Control Systems and Wuhan Huazhong Numerical Control Company, had developed their technology with the financial support of the Ministry of Defense and the Ministry of Education respectively. To demonstrate the quality and reliability of these control builders, Chinese manufacturers were comfortable enough with these CNC controllers to put them on their best machines going into aerospace factories and other sophisticated applications.

Gathering the bulk of the information in Beijing at the June 12 to 16, 2006 China International Machinery and Equipment Show, AMT reviewed 70 Chinese builders, of which 13 produced five-axis machine tools (in addition to the aforementioned CNC control manufacturers). But AMT also found 35 Taiwanese builders, of which five produced five-axis machine tools, and one additional Taiwanese CNC Control manufacturer. This was not an exhaustive study, but the partial facts speak for themselves. For the past four decades, the United States Government policy has been to keep five-axis machine tool technology and (to a large degree) products out of the hands of the Chinese. This data indicates that the effort has been unsuccessful.

As is discussed below, the Chinese now possess ample numbers of five-axis machine tools, most of which have accuracies competitive with Western-produced products. In addition, they also have multiple suppliers of five-axis-enabling CNC controls. Moreover, AMT maintains that the Taiwanese have so integrated their machine tool technology with that of the mainland Chinese companies that it would be difficult to distinguish the two. That brings at least five more five-axis machine tool suppliers and one additional five-axis-capable CNC control manufacturer to the service of the Chinese, with virtually no control over their deployment. While the Taiwanese bring virtually no new technology to Chinese manufacturers, they do bring very high quality machines with extremely good accuracies as well.

What can one conclude from this survey of the data? AMT contends that it makes little sense to include machine tools within the 47 categories of items that would be specifically designated for additional controls within the proposed "China Military Catch-All" regulations.

With that introduction, we would now like to turn to more specific recommendations regarding the machine tool portion of the proposed "China Military Catch-All" regulations. We have listed all the recommendations put forward by the MPTAC, since that group has the technical expertise to opine on the specifics of the proposed regulations:

Recommendation: Delete item (2)(ii) - 2B991 from the proposed China regulation.

Justification: This recommendation is based upon a significant review of the capability of China to either obtain or produce equipment with positioning accuracies of machine tools that fall between the existing 2B001 and the proposed (2)(ii) in RIN 0694-AD75. This recommendation is also based on the fact that even if the regulation were enacted, it would have no effect on China's ability to make or purchase machines of the accuracies desired for military end use being considered for control. The results, therefore, would only affect U.S. Machine Tool export business that in 2005 represented only 3.8 percent of CNC turning, milling, and grinding equipment imports to China by all nations.

Most importantly, as noted in the data provided below, it is evident that China has the capability to manufacture machine tools of the range of positioning accuracy being proposed for control. It also has the ability to acquire these type machines from Taiwan or obtain them from Taiwanese factories located within China.

It should also be understood that if Wassenaar countries do not adopt equivalent requirements, especially Japan and Germany, China will continue to be able to supply their domestic and military needs related to (2)(ii) in RIN

0694-AD75 with no impact due to the U.S. restriction. Again, since the United States is an insignificant supplier to China of CNC machine tools, this restriction offers relatively little or no control to these items.

As a result, (2)(ii) in RIN 0694-AD75 is an uncontrollable restriction that will have no effect on military end use beyond the current export control regulations, and will only affect U.S. companies' ability to maintain the meager market share they have in China.

Discussion: Even though the MPETAC is a technical advisor to the U.S. Department of Commerce, the information provided in this response will begin first with background information and a brief economic overview of machine tool manufacturing and sales in China.

As the data on the following charts and graphs will demonstrate, China has built up its indigenous machine tool industry significantly. The United States currently has approximately 350 machine tool and component manufacturers, of which some 175 produce metal-cutting machinery. By contrast, according to China Machine Tool & Tool Builders' Association (CMTBA), China has nearly five times that number, with more than 1,650 manufacturers, of which 415 are metal-cutting machine tool builders.

In support of China's machine tool industry, the Chinese Government has been providing subsidies and grants to various manufacturers in order to enable them to catch up with the West in terms of technological sophistication and to meet a desired objective of being totally independent of foreign machine tool needs by 2010.

The Chinese machine tool market has had tremendous growth since 2000. Consider the following relationship between Chinese consumption (total purchase from all sources) of machine tools and that of the United States. In 2000, China consumed half as many machine tools as the United States. By 2002, China had drawn even. By 2004, China had doubled U.S. consumption. This year, it is likely that China's consumption of machine tools will be triple that of the United States.

That being said, however, the United States machine tool industry has lost 38.8 percent of market share in China over the past decade. That loss has occurred during a period in which China has become the largest machine tool market in the world. Other nations have lost market share in China as well, but Japan has seen a market share gain of 35 percent, Taiwan 13.4 percent, and South Korea 124.4 percent. In fact, as previously noted, the U.S. share of Chinese imports of CNC milling, turning, and grinding machine tools was only 3.8 percent in 2005.

During a fact-finding trip to China in June 2006, sponsored by AMT, we found that there were over 15 indigenous Chinese manufacturers of CNC controls, with more than five manufacturers of units for 5-axis machine tools. As recently as four years ago, a similar trip found not a single operational Chinese manufacturer of this technology.

The two manufacturers with the widest range of customers, Beijing Aerospace Numerical Control Systems and Wuhan Huazhong Numerical Control Company, had developed their technology with the financial support of the Ministry of Defense and the Ministry of Education respectively. To demonstrate the quality and reliability of these control builders, Chinese manufacturers were comfortable enough with these CNC controllers to put them on their best machines going into aerospace factories and other sophisticated applications.

Gathering the bulk of our information in Beijing at the June 12 to 16, 2006 China International Machinery and Equipment Show, there were some 70 Chinese builders reviewed, of which more than 12 produced 5-axis machine tools (in addition to the aforementioned CNC control manufacturers). Also, there were 35 Taiwanese builders, of which five produced 5-axis machine tools, and one additional Taiwanese CNC control manufacturer.

While the Taiwanese bring virtually no new technology to Chinese manufacturers, they do bring very high quality machines with extremely good accuracies as well as established manufacturing facilities in China.

World Market

As reported by AMT – The Association For Manufacturing Technology and Gardner Publication, Inc., the United States ranked sixth in the world in the total production of machine tool products in 2005. This is down 29% in production from its ranking as third in the world in 1995 due to the increased production of equipment in the PRC and Taiwan. Therefore, both countries have moved up to third and fifth respectively in ranking. Also noted is the loss of U.S. sales as compared to Italy who continues to be fourth in the world.

Production of Top Ten Countries Manufacturing Machine Tool Products

	2005 Ranking	2005	2004	Increase 2005 over 2004	1995 Ranking	1995	Increase 2005 over 1995
Country		\$'s Millions Total	\$'s Millions Total			\$'s Millions Total	
Japan	1	13259	10573	20%	1	9002	47%
Germany	2	9509	8959	6%	2	7290	30%
China, Peoples Rep.	3	5000	4080	18%	7	1857	169%
Italy	4	4879	4639	5%	4	3324	47%
Taiwan	5	3295	2884	12%	8	1627	103%
United States	6	3169	3132	1%	3	4468	-29%
Korea, Rep. of	7	2816	2362	16%	6	1898	48%
Switzerland	8	2635	2333	11%	5	2141	23%
Spain	9	1141	1021	11%	12	662	72%
Canada	10	949	814	14%	13	397	139%

CHINA

Machine Tool Industry

The following section takes a closer look at the production of CNC milling, turning, and grinding machine tool products in China.

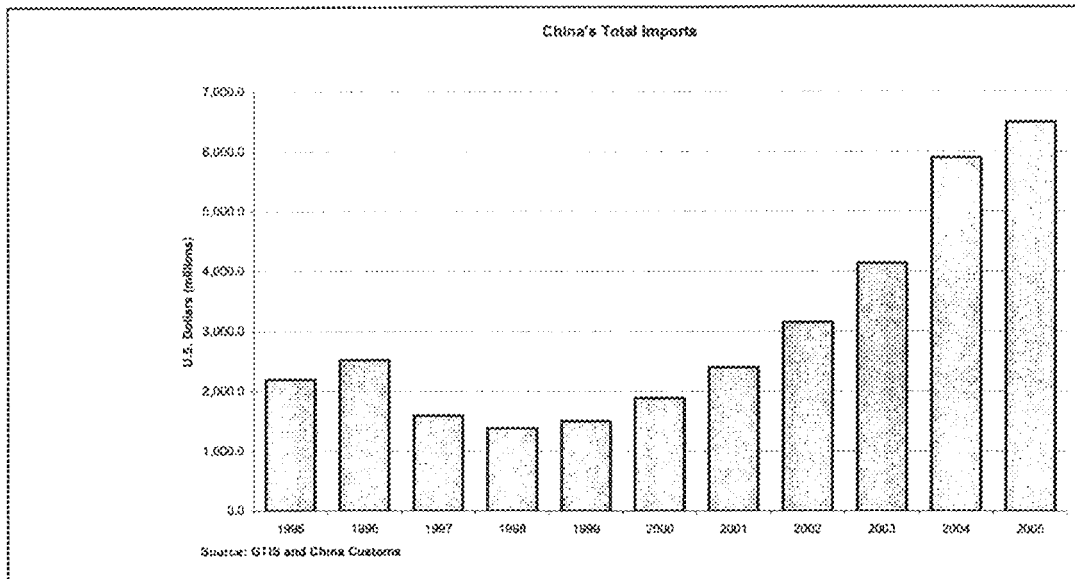
Market

Production

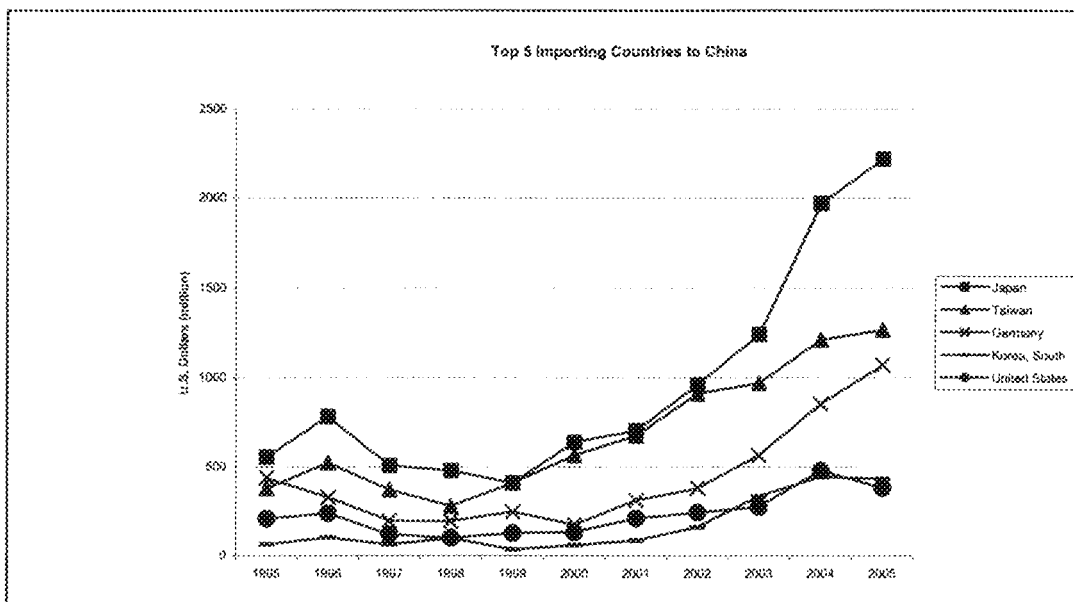
Shown in the world market chart above, China produced \$5 billion in machine tool products in 2005.

Imports

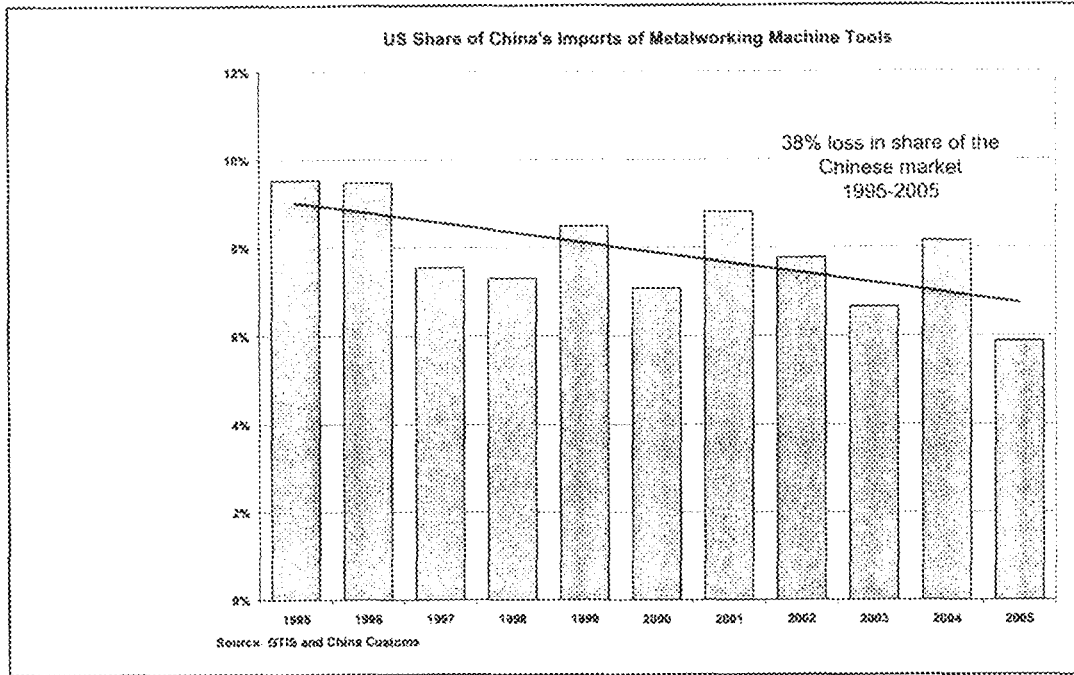
For the past five years, China has been increasing its import demand for machine tools to a reported level in 2005 of approximately \$6.5 billion.



With this increased demand, as illustrated in the following graph, Japan, Taiwan, and Germany have been able to improve their sales penetration into China, while the United States has actually realized a decrease in sales from 2004 to 2005.



Not only has a loss occurred from 2004 to 2005, there has also been an overall decrease in percentage of sales to China since 1995. The United States has actually shown a 38% loss in share of the total import sales to China in the past ten years as represented in the chart below.



In the next chart, it can be seen that of the approximately \$6.5 billion machine tools imported to China, \$2.5 billion were CNC milling, turning, and grinding products. Also, of the \$6.5 billion machine tools sold to China, the United States represented only \$382 million in sales, or 5.9% of total imports. Of that \$382 million, only \$96 million represented CNC milling, turning, and grinding products. For 2005, therefore, only 3.8% of the total CNC equipment covered in the proposed regulation was sold by the United States. This was far below, for example, that of Taiwan at 19.9%.

CNC Equipment Imports to China in 2005
 (\$ million)

Country	Total Imports	Share of Total Imports to China by Country	Total CNC Equipment Imports to China	Share of CNC Sales to China by Country
World	6,497		2,508	
Japan	2,220	34.2%	958	38.2%
Taiwan	1,269	19.5%	498	19.9%
Germany	1,071	16.5%	459	18.3%
Korea, South	434	6.7%	170	6.8%
United States	382	5.9%	96	3.8%
Switzerland	264	4.1%	94	3.7%

Source: China Customs Data

Products

It is clear that through assistance from foreign manufactures, China has established, and is enhancing, its ability to manufacture state-of-the-market machine tools. This can be seen by the increasing number of suppliers of sophisticated CNC controls, 5-axis machine tools, and products having competitively stated machine positioning accuracies.

CNC Controls

One of the most important aspects of being able to manufacture equipment lies in the availability of CNC controls that can provide this capability. In China, there are a growing number of CNC providers, some of which offer 5-axis simultaneous control capability.

The chart below lists some of the major suppliers of CNC controls in China. This is not a complete list because some controls are built for the specific use of a company. For example, Shenyang Liming Aero-Engine has built their own control and has applied it to equipment for their own internal use. This is also true for Dalian and Beijing Jingdiao Co. that have designed CNC controls for application on their machine tools.

China CNC Control Manufacturers and Representative Controls:

Company	CNC Control	Maximum Number of controlled axis	Maximum Number of Simultaneously Controlled Axis	Source
Beijing Aerospace Numerical Control System www.casnuc.com.cn	CASNUC	8	6	(CIMES & CMTF) 2006*
Beijing Catch CNC Equipment Co., Ltd www.catchcnc.com	NC-110	16	6	Brochure (CIMES & CMTF) 2006
Chengdu Great Industrial Co., Ltd www.great-cnc.com	Great-160iM Great-180M	5 9	5 9	Brochure IMTS 2006**
LT-CNC http://lt-cnc.sict.ac.cn/en_contact.asp	NC110	16	8	Website 2006
Wuhan Huazhong Numerical Control Co. (HNC) www.huazhongcnc.com	HNC2000 HNC-21M6	16 6	5 6	Brochure (CIMES & CMTF) 2006

CIMES & CMTF represents the China International Machinery & Equipment Show that occurred in June 2006.

** IMTS represents the International Manufacturing Technology Show that occurred in September 2006 in Chicago, IL.

In discussions with manufacturers, Wuhan Huazhong Numerical Control Co. appears to be the current leader in this area. The HNC2000 has been applied to many machine tools in China and, for example, has become the standard control for Guilin Machine Tool Co.'s 5-axis Bridge Type Gantry machines. In fact, the China Ministry of Education has provided large grants to Wuhan to manufacture educational units for teaching individuals how to operate multi-axis machines.

When discussing the capability of the Wuhan control with Guilin personnel, they commented that their customer base has indicated that parts produced using the Wuhan control are equivalent to those produced using a 5-axis Fidia (Italy) CNC control.

It should be noted that Beijing Aerospace Numerical Control System, which is supported by the China Ministry of Defense, stated that they have developed the above mentioned controller, however it is new to the market.

Position Accuracy

Before a realistic assessment of the positioning accuracies of machine tools manufactured in China, or elsewhere in the world, can be assessed, a sound understanding of the relationship of quoted accuracies, measured by different standards, should be realized (Refer to Appendix A). Without this, the accuracy of a machine tool often remains a relatively subjective statement.

Even though this may be understood, there still remains the fact that China has a growing number of equipment suppliers offering products with accuracies better than 0.010 mm in China. To illustrate this fact, a series of tables are provided indicating the positioning accuracy of some products in China.

The first set of tables shows Chinese companies that have advertised information, not only on the position accuracies of their machines, but on the standard used to obtain the accuracy data. The second set of tables indicates stated accuracies of equipment, however, there is no indication of the standard used in making the accuracy claim.

Note 1: Only one machine model is listed for each mentioned company. Even though other models or products manufactured by the company meet similar accuracy claims, it is believed to be more significant to understand which, and the number of, companies that have the capability to manufacture accurate machine tool products.

Note 2: Information provided in the following tables may not be available on company websites. Some data was obtained through brochure information.

Note 3: Stated positioning accuracies are in mm.

Chinese Companies - Stating Positioning Accuracies with Identified Standards

Milling:

Company	Machine	Position Accuracy	Source
BMTI Precision Mechatronics Co. http://www.jcsjm.com	u2000/5-630H 5-axis	0.008 to GB/T 17421.2 (2000) (optional package)	Website - 2006
Guilin Machine Tool Co., Ltd. www.glmto.com.cn	Vertical Machining Center XK716/2-5X 5-axis	0.010 to GB/T 17421.2 (2000)	Brochure 2006 CIMES & CMTF Show
Qinghai No.1 CNC Machine Tool Co. LTD www.qh-machine.com.cn	Vertical Machining Center VMC750	0.010 to VDI 3441	Brochure 2006 CIMES & CMTF Show
SDL - Jiangsu Duoleng CNC Machine Tool Co. www.czmtw.com	Vertical Machining Center XH716/5x 5-axis	0.010 to JB/T8771.4- (1998)	Brochure - 2005
Shinri Machinery Co. www.shinri.cn	Vertical Machining Center VM55	0.008 to ISO	Website - 2006
T LUNAN - Shandong Lunan Machine Tool Co. www.lunanmachine.com	Vertical Machining Center XHS716 5-axis	+/- 0.005 to GB16462	Brochure 2006 CIMES & CMTF Show
Tonmac International Co. www.tonmac.com.cn	Vertical Machining Center VMC600	0.005 to JIS	Brochure 2006 CIMES & CMTF Show

Turning:

Company	Machine	Position Accuracy	Source
BMTI Precision Mechatronics Co. www.jcsjm.com	CNC Lathe CKG 250	+/- 0.002 to JIS	Brochure - 2006 CIMES & CMTF Show
DMTG - Dalian Machine Tool Group Corp. www.dmtg.com	CNC Turning Center DL-20MH	0.010 to ISO 230-2 (1997)	Brochure - 2006 CIMES & CMTF Show
FED -- ChongQing Kefei Precision Machinery Co. www.fred.com.cn	CNC Lathe CNCP5	0.007 to VDI	Brochure - 2006 CIMES & CMTF Show
Ningjiang Machine Tool Group Co. www.ningjiang.com	CNC Lathe CKN6140	0.006 to GB China std.	
TianBei Machine Tool www.tjtbmachine.com	CNC Lathe CK6125B	0.006 to GB16462	Brochure - 2006 CIMES & CMTF Show
Index-Dalian Machine Tool www.dmtg.com	CNC Turning Center TNA 400 (only available for China mainland)	0.008 to VDI 3441	Website - 2006
JFMT -- Jinan First Machine Tool Group Co. www.jfmt.com.cn	CNC Turning Center MJ-18	0.005 to GB16462 (with glass scale option)	Brochure - 2006 CIMES & CMTF Show

Grinding:

Company	Machine	Position Accuracy	Source
Ningjiang Machine Tool Group Co. www.ningjiang.com	Jig Grinder MK2945C	0.007 to VDI	Website -- 2006

Chinese Companies - Stating Positioning Accuracies with "NO" Identified Standard

The following are tables of Chinese companies claiming high accuracy machines, however, no standards information was provided.

Milling:

Company	Machine	Position Accuracy	Source
BYJC -- Beijing No.1 Machine Tool Plant http://www.byjc.com.cn/bycpr3.htm	Vertical Machining Center MAR-560V	+/- 0.004	Website - 2006
Dahe CNC Machine Co. www.nxdahe.com.cn	Vertical Machining Center V600C	+/- 0.005	Brochure 2006 CIMES & CMTF Show
DMTG - Dalian Machine Tool Group Corp. www.dmtg.com	Vertical Machining Center VDL 500	+/- 0.005	Website - 2006
HDCNC - Weihai Huadong Automation Co.	HC-6350(B)	0.008/300	
Jinan Third Machine Tool Ltd. Co. www.sdjichuang.com	Vertical Machining Center JTVM650	0.010	Brochure 2006 CIMES & CMTF Show
Ningjiang Machine Tool Group Co. www.ningjiang.com	Horizontal Machining Center THM 6363	0.008	Website -- 2006
Shanghai No.4 Machine Tool Works www.h3mt.chinasec.com	XH766A	+/- 0.005	Website -- 2006
Shenzhen First CNC Machine Tool Co., LTD	FSTM-650	0.008	
YMTW -- Yunnan Machine Tool Group of SMTCL www.smtcl.com	Vertical Machining Center VM650	+/- 0.005	Brochure 2006 IMTS

Turning:

Company	Machine	Position Accuracy	Source
Beijing Jingyi Century Automatic Equipment Co. www.chinabyi.com	CNC Lathe CK6110A	0.006	Brochure 2006 CIMES & CMTF Show
Ningjiang Machine Tool Group Co. www.ningjiang.com	CNC Lathe NJ-KM011	0.003	Website - 2006
Dezhou Delong (Group) Machine Tool Co. www.dzjc.com	CNC Turning/Milling Center CH6171-4	0.004	Brochure 2006 CIMES & CMTF Show
Shenzhen Poly Top Industry Development Co. www.sz-polytop.com	CNC Turning Center PTCL-15	0.010	Website - 2006
SMTCL - Shenyang Machine Tool Group Co., Ltd. www.smtcl.com	CNC Turning/Milling Center SSCKZ80A-5 5-axis	0.008	Website - 2006

Grinding:

Company	Machine	Position Accuracy	Source
Shanghai Rabbit Machinery Development Co. www.rabbit-m.com	Leading supplier of grinders for bearing industry	No data	Website - 2006
Wuxi Kuaiyuan Machine Tool Co. www.xiji.com.cn	Internal & External Grinder MK2710	Part Accuracy 0.002 Roundness 0.4 Ra Roughness	Website - 2006

Tilting Spindles

Relative to the second half of the item addressing tilting spindles, China has a number of products that provide this capability or have access to products manufactured in other countries with this capability like Taiwan. Below is a list of these type products.

China product offerings include:

Company	Machine Type	Model
Beijing No.1 Machine Tool Plant	CNC Turning/Milling Center Gantry Planomiller	CXHA6130 XKAV2415
BMEI Co., Ltd.	Vertical Machining Center Vertical Machining Center	5C-VMC1250 XKH400
Dalian Machine Tool Group Corp	CNC Turning/Milling Center	CHD25
Guilin Machine Tool Co., Ltd.	Bridge Type Gantry Machine	XK2316/4-5X
Hanchuan Machine Tool Group Co	Bridge Type Gantry Machine	XH2308
Jiangsu Duoleng CNC Machine Tool Co.	Bridge Type Gantry Machine Gantry Profiler/MC Horizontal Machining Center Vertical Machining Center	TH42160B/5X XH2725/5X-10 TH(TK)68125A XH716/5x
Ningjiang Machine Tool Group Co., Ltd.	Horizontal Machining Center	NJ-5HMC40
Shenyang Machine Tool Group Co.	CNC Turning/Milling Center Gantry Profiler/MC	SSCKZ80A-5 MB200x40/5x

Manufacturing

Joint Ventures in China

Okuma -- Beijing No. 1 Machine Tool Plant (BYJC-OKUMA)

This joint venture started in early 2000. It currently resides in a newly constructed building on the outskirts of Beijing. Current production in the facility is reported at 400 machining centers a year. The facility manufactures (machines) the large cast iron components (i.e. columns, bases, etc.) for the machines on highly sophisticated systems. They operate in a flexible manner having two manned shifts and one lights-out unmanned shift. The assembly area operates under "lean" manufacturing principles.

INDEX-DALIAN

INDEX-DALIAN, a joint venture of INDEX and the DALIAN MACHINE TOOL GROUP, was established in the city of Dalian, China in 2001. INDEX-DALIAN manufactures selected turning machines of the INDEX Group for the Chinese market.

Dalian Yida Nippe Machine Tool Co., Ltd.

Dalian Yida Nippe Machine Tool Co., Ltd. (YNC) joint venture founded by Dalian Yida Group Co., Ltd. and Nippe Toyama Corp. Japan Co. Ltd. (NTC). The main products of YNC are CNC vertical machining centers and transfer line equipment.

Dalian Dali CNC Machine Tool Co., Ltd.

Dalian Dali CNC Machine Tool Co., Ltd., was established in 1993 as a joint venture between the Hongkong Join Channel Investment Limited and Dalian Machine Tool Group Corp. The company manufactures CNC turning products.

Companies owned by Chinese firms

Zimmerman GmbH

Dalian Machine Tool Group in 2004 became the main shareholder of the German firm manufacturing large gantry machines.

Ingersoll Production Systems

In 2002 the Dalian Machine Tool Group purchased the United States Company, Ingersoll Production Systems.

Waldrich Coburg GmbH

Beijing No. 1 Machine Tool Plant purchased this German firm, a manufacturer of large gantry type machine tools.

Schiess AG

Shenyang Machine Tool Group purchased Schiess AG in 2004. This German firm is a manufacturer of large gantry type machine tools.

Wohlenberg Werkzeugmaschinen GmbH

Shanghai Electric Corporation purchased Wohlenberg in 2005 which is a manufacturer of turning centers and machining centers.

Companies with facilities in China

EUMA-Spinner Corp.

EUMA-Spinner Corp. is headquartered in Taiwan. During the 2006 China International Machinery and Equipment Show, the President of EUMA-Spinner Corp. noted that his company not only produced products in Taiwan, but had operations in China that manufactured virtually all of the products. As noted in the Taiwan section below, these are high accuracy milling and turning pieces of equipment.

Quality

An important aspect of any machine tool is its build quality. As for almost any machine tool built in the world today, Chinese manufacturers also use components manufactured in countries throughout the world. In literature, many companies state components used on their equipment that are manufactured by companies outside of China, mostly Wassenaar member companies. They also note relationships with companies that have enabled them to produce higher quality machines than they had in the past. In short, China builders use the same high quality products (i.e. feedback systems, linear ways, etc.) as any company would use in the world and are instructed upon their application.

TAIWAN

Machine Tool Industry

What may be of equal importance is the improved accuracy of products produced in Taiwan that are available to the China market, and in some cases manufactured in China. The Taiwan Association of Machinery Industry (TAMI) reports that they have a membership of more than 2,376 machine tool and component manufacturers. Unfortunately the number of manufacturers classified as metal-cutting machinery manufacturers is not reported.

Position Accuracy

As noted above, before a realistic assessment of the positioning accuracies of machine tools manufactured in Taiwan, or elsewhere in the world, can be assessed, a sound understanding of the relationship of quoted accuracies, measured by different standards, should be realized (Refer to Appendix A). Without this, the accuracy of a machine tool often remains a relatively subjective statement.

From the tables below, however, it can be seen that Taiwan has matured into a notable machine tool manufacturer producing machines of relatively high accuracy.

It should be noted that the chart below represents a small number of manufacturers.

Taiwan Manufacturers

Company	Machine	Position Accuracy	Source
Turning			
Campro Precision Machinery Co. www.campro.com.tw	CPL-20	0.004 to VDI 3441	Brochure 2006 CIMES & CMTF Show
EUMA-Spinner Corp. euma.machine-tools.com.tw	EL-52	0.002 to VDI 3441	Brochure 2006 CIMES & CMTF Show
Leadwell CNC Machines Mfg. Corp. www.leadwell.com.tw	T-8S	0.005 to VDI 3441	Brochure 2006 CIMES & CMTF Show
OR www.or.com.tw	VTplus-15	0.004 to JIS	Brochure 2006 CIMES & CMTF Show
Vertical Machining Centers			
EUMA-Spinner Corp. euma.machine-tools.com.tw	ME-810S 5-axis	0.005 to VDI 3441	Brochure 2006 CIMES & CMTF Show
Fulland Machinery Co. www.fullandtech.com	DMC880-5X 5-axis	0.004/300 mm to VDI 3441	Website 2006
Leadwell CNC Machines Mfg. Corp. www.leadwell.com.tw	V-20 5-axes	0.005 to VDI	Brochure 2006 CIMES & CMTF Show
Quaser Machine Tools Inc. www.quaser.com	MK603U 5-axis	0.008 to ISO 230-2	Website 2006
Horizontal Machining Centers			
DAHLIH - Dah Lib Machinery Industry Co. http://www.dalicnc.com	MCQH-400 5-axis	0.005/300 mm standard not specified	Brochure IMTS 2006
Quaser Machine Tools Inc. www.quaser.com	HX805B 5-axis	0.004 to JIS	Website 2006

Bridge Type Gantry			
EUMA-Spinner Corp. euma.machine-tools.com.tw	DMH-1208i 5-axis	+/- 0.004/300 mm to JIS B 6336	Brochure 2006 CIMES & CMTF Show
FIRST -- Long Chang Machinery Co. www.first.com.tw	MCV2000 5-axis (option)	Not specified	Website 2006
Hartford -- She Hong Industrial Co. www.hartford.com.tw	HB-3210BC 5-axis	Not specified	Website 2006
Johnford www.johnford.com.tw	DMC-4000 GSA 5-Axis	Not specified	Website 2006
Gantry Profiler/MC			
AWEA Mechantronic Co. www.awea.com	LG5025 5-axis	0.045 to VDI	Website 2006

Tilting Spindles

For many years, Taiwan concentrated on the manufacturing of up to 4-axis machine tools. In recent years, however, it has begun to focus on 5-axis machine tool products.

Machine Tools with Tilting Spindle Capability

Taiwan product offerings include:

Company	Machine Type	Model
EUMA-Spinner Corp.	Bridge Type Gantry	DM-2020
Johnford	Bridge Type Gantry	DMC-4000 GSA
OR	Vertical Machining Center	Vcenter-110
Quaser Machine Tool Inc.	Vertical Machining Center	MK603U
	Horizontal Machining Center	HX805B
Shenq Fang Yuan Technology Co.	Bridge Type Gantry	5AX-1000
	Horizontal Machining Center	HA-5AX6

Ms. Sheila Quarterman
November 27, 2006
Page 20

The above material was prepared by the following:

Paul R. Warndorf
Chairman, Materials Processing Equipment Technical Advisory Committee
of the U.S. Department of Commerce
Vice President -- Technology
AMT -- The Association For Manufacturing Technology
Phone: 703-827-5291
Fax: 703-893-1151
E-Mail: pwarndorf@amtonline.org

It is my sincere hope that our comments are helpful to you in your preparation of the final regulation. If any of the above material is unclear to you, please do not hesitate to call me at (703)827-5282.

Sincerely,

A handwritten signature in black ink, reading "Paul Freedenberg". The signature is written in a cursive style with a large, sweeping flourish at the end.

Dr. Paul Freedenberg
Vice President for Government Relations

Standards for Measuring Accuracies of Machine Tools

(This table is for reference information and is in the process of review)

China

- **GB/T 16462 (1996)**
Numerically controlled turning machines--Testing of the accuracy.
- **GB/T 17421.2 (2000)**
Test code for machine tools--Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes.
Equivalent to: ISO 230-2 (1997), Test code for machine tools -- Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes
- **JB/TB 8771.4 (1998)**
Industry standard
Similar to: ISO 10791-4, Test conditions for machining centres - Part 4: Accuracy and repeatability of positioning of linear and rotary axes

Germany

- **VDI 3441 (1982)**
Statistical testing of the operational and positional accuracy of machine tools

International

- **ISO 10791-4 (1998)**
Test conditions for machining centres - Part 4: Accuracy and repeatability of positioning of linear and rotary axes
- **ISO 230-2 (1988)**
Test code for machine tools -- Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes
- **ISO 230-2 (1997)**
Test code for machine tools -- Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes
- **ISO 230-2 (2006)**
Test code for machine tools -- Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes
Equivalent to: ISO 230-2 (1997), Test code for machine tools -- Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes

Japan**- JIS B 6192 (1999)**

Test code for machine tools -- Determination of accuracy and repeatability of positioning numerically controlled axes

Modified: ISO 230-2 (1997), Test code for machine tools -- Part 2:
Determination of accuracy and repeatability of positioning
numerically controlled axes

- JIS B 6228 (2003)

Bridge type plano-milling machines -- Testing of the accuracy

Modified: ISO 8636-1 (2000), Machine tools -- Test conditions for bridge-type
milling machines -- Testing of the accuracy -- Part 1: Fixed bridge
(portal-type) machines

- JIS B 6331 (1986)

Test code for performance and accuracy of numerically controlled lathes

- JIS B 6336 (1986) Withdrawn

Test code for performance and accuracy of machining centres

- JIS B 6336-1 (2000)

Test conditions for machining centers -- Part 1: Geometric tests for machines with horizontal spindle and with accessory heads (horizontal Z-axis)

Equivalent to: ISO 10791-1 (1998), Test conditions for machining centres - Part 1:
Geometric tests for machines with horizontal spindle and with
accessory heads (horizontal Z-axis)

- JIS B 6336-2 (2002)

Test conditions for machining centres -- Part 2: Geometric tests for machines with vertical spindle or universal heads with vertical primary rotary axis (vertical Z-axis)

Modified: ISO 10791-2 (2001), Test conditions for machining centres -- Part 2:
Geometric tests for machines with vertical spindle or universal heads
with vertical primary rotary axis (vertical Z-axis)

- JIS B 6336-3 (2000)

Test conditions for machining centers -- Part 3: Geometric tests for machines with integral indexable or continuous universal heads (vertical Z-axis)

Equivalent to: ISO 10791-3 (1998), Test conditions for machining centres - Part 3:
Geometric tests for machines with integral indexable or continuous
universal heads (vertical Z-axis)

- JIS B 6336-4 (2000)

Test conditions for machining centers -- Part 4: Accuracy and repeatability of positioning of linear and rotary axes

Equivalent to: ISO 10791-4 (1998), Test conditions for machining centres - Part 4:
Accuracy and repeatability of positioning of linear and rotary axes

- JIS B 6338 (1985) Withdrawn

Test code for performance and accuracy of machining centers (vertical type)

Replaced by: JIS B 6336 (2000) which is identical to ISO 10791 (1998)

- **JIS B 6338-3 Withdrawn**

Test conditions for machining centres - Part 2: Geometric tests for machines with vertical spindles or universal heads with vertical primary rotary axis (vertical Z-axis)

Replaced by: JIS B 6336-2:2000, Test conditions for machining centres -- Part 2:
Geometric tests for machines with vertical spindle or universal heads
with vertical primary rotary axis (vertical Z-axis)

United States

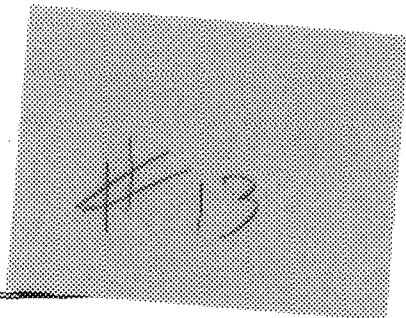
- **ANSI B5.54 (2005)**

Methods for performance evaluation of computer numerically controlled machining centers

- **ASME B5.57 (1998)**

Methods for performance evaluation of computer numerically control lathes and turning centers

NOVELL, INC.
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FACSIMILE TRANSMITTAL SHEET

TO:	FROM:
<i>Sheila Quarterman</i>	<i>Angela Steen</i>
COMPANY:	DATE:
<i>BIS / office of report serv</i>	<i>11/28/06</i>
FAX NUMBER:	TOTAL NO. OF PAGES INCLUDING COVER:
<i>202-482-3355</i>	<i>2</i>
PHONE NUMBER:	SENDER'S REFERENCE NUMBER:
RE:	YOUR REFERENCE NUMBER:
<i>RIN 0694-AD75 Proposed Rule</i>	

URGENT FOR REVIEW PLEASE COMMENT PLEASE REPLY PLEASE RECYCLE

NOTES/COMMENTS

NOVELL, INC.
1735 TECHNOLOGY DRIVE
SUITE 790
SAN JOSE, CA 95110

Novell.

November 27, 2006

Ms. Sheila Quarterman
Bureau of Industry and Security
United States Department of Commerce
14th Street and Constitution Avenue N.W
Washington, D.C. 20230

Re: RIN 0694-AD75
Proposed Rule: Revisions and Clarification of Export and Re-export
Controls for the PRC and New Authorization Validated End-User
71 FR 38313, July 6, 2006

Dear Ms. Quarterman:

Novell, Inc., appreciates this opportunity to comment on the Proposed Rulemaking Concerning Revisions and Clarification of Export and Re-export Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 FR 38313 of July 6, 2006). While Novell is avid in its participation in programs for the protection of national security, we have concerns with respect to the proposed rule. Our concerns are summarized below.

1. Unilateral nature of the Military End Use Requirements ("MEUR")

The U.S. should not be alone in its implementation of MEUR and should wait until the members of the Wassenaar Arrangement implement controls similar to MEUR. A unilateral control would virtually hobble U.S. manufacturers. The knowledge standard of MEUR is so broad as to require companies to confirm the end use even for products that would normally have no military end use, such as general use operating systems.

2. The scope of items subject to MEUR is very broad

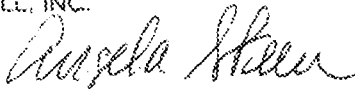
We believe that items classified under Export Control Classification Numbers SA/B/D/E991 and SA/B/D/E992 should be exempted from MEUR, to maintain parity with items controlled for national security reasons and which do not require licenses for export to government end-users.

3. The requirements of MEUR will have a negative effect on sales of American companies that compete with domestic Chinese and other foreign competitors.

If the MEUR is imposed on networking equipment, software, and technology, many American companies face Chinese and foreign competition that will be detrimental to American companies. Because competitive products could be obtained from Chinese and other foreign manufacturers, there would not be any recognizable benefit to the national security interests of the United States.

Respectfully submitted,

NOVELL, INC.



By: Angela Steen, Director
International Trade Services



中國美國商會
**The American Chamber of Commerce
People's Republic of China**

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November 29, 2006

Sheila Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry and Security
Department of Commerce
14th St. & Pennsylvania Avenue, N.W.
Room 2705
Washington, D.C. 20230

ATTN: RIN 0694-AD75

Dear Ms. Quarterman:

It gives us great pleasure to submit the following report in response to the Proposed Rule the Bureau of Industry and Security published for comment on July 6, 2006. The Export Compliance Working Group (ECWG) of the American Chamber of Commerce - PRC (AmCham) prepared the report. Attached you will find a cover letter summarizing the report's contents. The report was sent out this morning, Wednesday, November 29, 2006 and is expected to arrive at your office on Friday, December 1, 2006. Please be advised that the DHL tracking number is as follows: DHL EXPRESS 273 2994 891.

Respectfully,

Michael Barbalas
President of the American Chamber Commerce-PRC
11/29/06

Cc: Mr. Jim Gradoville, Co-Chair AmCham Export Compliance Working Group, Mr. David Wang,
Co-Chair AmCham Export Compliance Working Group



中國美國商會

**The American Chamber of Commerce
People's Republic of China**

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Washington, D.C. 20230

ATTN: RIN 0694-AD75

Dear Ms. Quarterman:

The Export Compliance Working Group ("ECWG") under the American Chamber of Commerce in the People's Republic of China ("Amcham") submits the following report in response to the Proposed Rule the Bureau of Industry and Security published for comment on July 6, 2006, 71 Fed. Reg. 38313. The report provides a market analysis on the current level of Chinese capabilities in numerous industry sectors the Proposed Rule could impact.

The ECWG believes the data collected will be useful to the United States Government in assessing the impact of the new control levels on Chinese military capabilities and the facilitation of legitimate exports to Chinese civil end-users. The ECWG respectfully submits that the items discussed in this report are below if not well below the current technical levels of the Chinese military and, therefore, could not make a material contribution to the Chinese military capabilities.

The report covers the following industry sectors and the corresponding ECCNs as listed in the Proposed Rule:

- A. Chapter I - Composites Materials
- B. Chapter II - Machine Tools
- C. Chapter III - Information Security and Telecommunications (I): Servers, Integrated Circuits and Encryption
- D. Chapter IV - Information Security and Telecommunications (II): Telecom Equipment, Test Equipment and Software
- E. Chapter V - Navigation and Avionics
- F. Chapter VI - Diesel and Marine Engines
- G. Chapter VII - Helicopters

Each industry chapter contains data focusing on three distinct areas: 1) the technical levels available domestically in China; 2) the technical level being supplied to China from foreign sources, non-U.S.; and 3) the distinction between commercial and military levels and demands in each industry. This data is divided in each chapter is divided as follows:

Chinese Domestic Capabilities

Chinese Domestic Companies

In each chapter, the report identifies Chinese state-owned and private sector companies producing items at levels above the control levels in the Proposed Rule. The report provides background information on these entities and details their capabilities.

Joint Ventures in China

Joint ventures between Chinese entities, both state-owned and private sector, and foreign partners, non-U.S., exist in every industry sector. These joint venture companies design, develop and produce items above the control levels in the Proposed Rule. In almost all instances the joint ventures have been provided with technology through licensing or joint development agreements.

Wholly Owned Foreign Enterprises in China

Foreign companies, non-U.S., have also established enterprises in China in many of the industry sectors. These enterprises design, develop and produce items above the control levels in the Proposed Rule.

Note: All of the above business' types are incorporated in China according to Chinese laws and regulations. Their capabilities are available in China and should, therefore, be treated as domestic Chinese capabilities.

Foreign Imports -- non U.S.

Non U.S. foreign companies freely export products, software and technology not only at levels well above those in the Proposed Rule but above the current control levels set under the Wassenaar Arrangement. The ECWG learned that these exports are to civil end-uses, dual civil and military end-uses, and solely military end-use. The research as detailed in the report clearly demonstrates that non U.S. foreign entities are directly contributing to the military capabilities of the PRC through direct product sale of dual-use and military items, joint research and development of dual-use and military items, and joint production of dual-use and military items, where the end-use is known to be the Chinese military. The levels of these items are technical generations above the control levels in the Proposed Rule.

Commercial vs. Military Sectors in China

Commercial Sector

Commercial demand across the various industry sectors in China is growing. Additionally, Chinese companies are aggressively seeking to become globally competitive in medium to high technology products. Because of this, Chinese companies are seeking to raise the quality of their products to meet the standards requirements of the foreign countries to which they export. Meeting these standards requires that equipment, software, manufacturing processes, material specifications, safety codes, and quality, among others, be certified, which is a timely and expensive process. It is much more cost effective and a better business model to partner with foreign companies and/or procure materials, equipment, software and technology that has already been certified, than go through the arduous process of developing these items indigenously and receiving certification. Based on the research, the ECWG has found that this is what is driving Chinese companies to purchase foreign items, not an inability to develop, design and produce these items on their own.

Military Sector

Chinese military demand is primarily met by domestic state-owned enterprises. This is in line with both the policy and legal guidelines for Chinese military procurement, which prevents the involvement of foreigners in the military procurement process.


When the Chinese military does procure items from foreign sources, it finds them readily available from primarily Russia and Europe. European and Russian companies have provided direct military sales and joint development assistance to China's PLA, Navy, and Air force programs.

The ECWG strongly believes in working as a cooperative partner with the U.S. Government on export controls. The intent of this report is to provide the U.S. Government with detailed information on the Chinese market, so U.S. export controls are set at a level that truly increases U.S. national security through preventing the export of items that can make a material contribution to the military capabilities of the PRC.

The data, however, related to the items in this report, plainly demonstrates that the Chinese military has inherently or has direct access to the items at levels well above those in the Proposed Rule. The ECWG respectfully, therefore, submits that controlling the items listed in this report at the levels in the Proposed Rule will have no impact on Chinese military capabilities but will only serve to inhibit legitimate commercial trade for U.S. companies.

The ECWG requests that the U.S. Government review the items in Supplement 2 to Part 744 addressed in this report and remove or limit the scope of those items it deems would not make a material contribution to Chinese military capabilities.

Respectfully,



Michael Barbala
President of the American Chamber Commerce-PRC
11/29/06

cc: Mr. Jim Gradoville, Co-Chair AmCham Export Compliance Working Group, Mr. David Wang,
Co-Chair AmCham Export Compliance Working Group

Cross Sector Report

Export Compliance Working Group

American Chamber of Commerce
People's Republic of China

December 4, 2006

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Executive Summary

I. Introduction

The Export Compliance Working Group ("ECWG") under the American Chamber of Commerce in the People's Republic of China ("Amcham") submits the following report in response to the Proposed Rule the Bureau of Industry and Security published for comment on July 6, 2006, 71 Fed. Reg. 38313. The report provides a market analysis on the current level of Chinese capabilities in numerous industry sectors the Proposed Rule could impact. Each industry chapter contains data focusing on three distinct areas: 1) the technical level of the Chinese domestic industry; 2) the technical level being supplied to China from foreign sources, non-U.S.; and 3) the distinction between commercial and military levels and demands in each industry.

II. Objective

The objective of this report is to provide tangible data to the United States Government on items covered under the Proposed Rule. The ECWG believes the data collected will be useful to the United States Government in assessing the impact of the new control levels on the Chinese military capabilities and the facilitation of legitimate exports to Chinese civil end-users. The ECWG respectfully submits that the items discussed in this report are below if not well below the current technical levels of the Chinese military and, therefore, could not make a material contribution to the Chinese military capabilities. If these items, as this report demonstrates, cannot make a material contribution to the Chinese military capabilities, including them in the Proposed Rule does not enhance the stated U.S. Government policy "to prevent exports that would make a material contribution to the military capability of the People's Republic of China ("PRC"), while facilitating U.S. exports to legitimate Chinese civil end-users.

The ECWG believes this report provides valuable information that will benefit the U.S. Government and industry by allowing the U.S. Government to accurately target export controls to fulfill the stated policy goals of increasing exports to legitimate commercial end-users while preventing exports that make a material contribution to the Chinese military capabilities.

III. Scope

This report covers 32 out of the 47 items listed in Supplement 2 to Part 744 of the Proposed Rule. (Note: The report only addresses these 32 items because these are the items ECWG member companies chose to address.) The report is divided into chapters based on industry sectors, as this provided the best format for presenting a clear picture of the technical capabilities, both domestic and foreign, currently available in China. The ECCNs for each item falling under each industry sector are listed at the beginning of each chapter.

The report contains the following industry sectors and the corresponding ECCNs:

A. Chapter I - Composite Material

1. 1B999
2. 1C990
3. 1D999
4. 1D993
5. 1E994

B. Chapter II – Machine Tools

1. 2B991
2. 2B993
3. 2B996

C. Chapter III – Information Security and Telecommunications (I): Servers, Integrated Circuits, and Encryption

1. 4A994
2. 4D994
3. 4E992
4. 3D991
5. 3E991
6. 5A992
7. 5D992
8. 5E992

D. Chapter IV – Information Security and Telecommunications (II): Telecom Equipment, Test Equipment, and Software

1. 5A991
2. 5B991
3. 5D991
4. 5E991

E. Chapter V – Navigation and Avionics

1. 7A994
2. 7B994
3. 7D994
4. 7E994

F. Chapter VI – Diesel Engines and Marine Engines

1. 9D990
2. 9E990
3. 8A992
4. 8D992
5. 8E992

G. Chapter VII – Helicopters

1. 9A991
2. 9D991
3. 9E991

IV. Summary Points

An analysis of the research conducted across the various industry sectors revealed a number of patterns relating to the Chinese domestic capabilities, foreign supply from non-U.S. companies to China, and the distinction between the commercial and military sectors.

A. Chinese Domestic Capabilities

1. *Chinese Domestic Companies*

In each chapter, the report identifies Chinese state-owned and private sector companies producing items at levels above the control levels in the Proposed Rule. The report provides background information on these entities and details their capabilities.

2. *Joint Ventures in China*

Joint ventures between Chinese entities, both state-owned and private sector, and foreign partners, non-U.S., exist in every industry sector. These joint venture companies design, develop and produce items above the control levels in the Proposed Rule. In almost all instances the joint ventures have been provided with technology through licensing or joint development agreements.

3. *Wholly Owned Foreign Enterprises in China*

Foreign companies, non-U.S., have also established enterprises in China in many of the industry sectors. These enterprises design, develop and produce items above the control levels in the Proposed Rule.

Note: All of the above business' types are incorporated in China according to Chinese laws and regulations. Their capabilities should, therefore, be treated as domestic Chinese capabilities.

B. Foreign Imports -- non U.S.

Non U.S. foreign companies freely export products, software and technology not only at levels well above those in the Proposed Rule but above the current control levels set under the Wassenaar Arrangement. **The ECWG learned that these exports are to civil end-uses, dual civil and military end-uses, and solely military end-use. The research as detailed in the report clearly demonstrates that non U.S. foreign entities are directly contributing to the military capabilities of the PRC through direct product sale of dual-use and military items, joint research and development of dual-use and military items, and joint production of dual-use and military items, where the end-use is known**

to be the Chinese military. The levels of these items are technical generations above the control levels in the Proposed Rule.

C. Commercial vs. Military Sectors in China

1. Commercial Sector

Commercial demand across the various industry sectors in China is growing. Additionally, Chinese companies are aggressively seeking to become globally competitive in medium to high technology products. Because of this, Chinese companies are seeking to raise the quality of their products to meet the standards requirements of the foreign countries to which they export. Meeting these standards requires that equipment, software, manufacturing processes, material specifications, safety codes, and quality, among others, be certified, which is a timely and expensive process. It is much more cost effective and a better business model to partner with foreign companies and/or procure materials, equipment, software and technology that has already been certified, than go through the arduous process of developing these items indigenously and receiving certification. Based on the research, the EC WG has found that this is what is driving Chinese companies to purchase foreign items, not an inability to develop, design and produce these items on their own.

2. Military Sector

Chinese military demand is primarily met by domestic state-owned enterprises. This is in line with both the policy and legal guidelines for Chinese military procurement, which prevents the involvement of foreigners in the military procurement process.

When the Chinese military does procure items from foreign sources, it finds them readily available from primarily Russia and Europe. European and Russian companies have provided direct military sales and joint development assistance to China's PLA, Navy, and Air force programs. As recently reported in the Associated Press, China accounted for 45 percent of Moscow's \$6 billion in arms exports last year as Beijing upgraded its arsenal with Russian fighter jets, submarines and other high-tech weaponry.¹ Eurocopter of France is currently engaging Chinese helicopter manufacturers to jointly develop the state-of-the-art Z-15 intermediate helicopter, which will include army and naval support variants, and is also providing assistance that will go into the Chinese development of the WZ-10 third generation attack helicopter. The Type 99 Main Battle Tank is powered by a liquid cooled, turbocharged 1,500hp diesel derived from the German MB871ka501 diesel technology.

¹ Joe McDonald, "Russia Out in Force at China Air Show," Associated Press, 30 Oct 2006.

As is detailed in the report, there are countless examples of military joint development projects with European countries and Russia and direct sales of dual-use and military items to the Chinese military establishment.

V. Conclusion

The ECWG strongly believes in working as a cooperative partner with the U.S. Government on export controls. The intent of this report is to provide the U.S. Government with detailed information on the Chinese market, so U.S. export controls are set at a level that truly increases U.S. national security through preventing the export of items that can make a material contribution to the military capabilities of the PRC. The data, however, related to the items in this report, plainly demonstrates that the Chinese military has inherently or has direct access to the items at levels well above those in the Proposed Rule. The ECWG respectfully, therefore, submits that controlling the items listed in this report at the levels in the Proposed Rule will have no impact on Chinese military capabilities but will only serve to inhibit legitimate commercial trade.

Note: This report was written based on extensive market research conducted on the ground in China. Due to a desire to limit the size, the scope of industry sectors covered and time limitations, the report only details the best examples pertaining to each industry sector. The ECWG stands ready to provide additional information if the U.S. Government deems necessary.

VI. Recommendation

The ECWG requests that the U.S. Government review the items in Supplement 2 to Part 744 addressed in this report and remove or limit the scope of those items it deems would not make a material contribution to Chinese military capabilities.

CHAPTER I Composite Materials

I. List of ECCNs:

1B999: Equipment controlled by 1B999.e specially designed for the production of structural composites, fibers, prepregs and preforms controlled in Category 1, n.e.s.

1C990: Fibrous and filamentary materials, not controlled by 1C010 or 1C210, for use in "composite" structures and with a specific modulus of 3.18×10^6 m or greater and a specific tensile strength of 7.62×10^4 m or greater.

1D999: Specific software controlled by 1D999.b for equipment controlled by 1B999.e specially designed for the production of structural composites, fibers, prepregs and preforms controlled in Category 1, n.e.s.

1D993: "Software" specifically designed for the "development", "production", or "use" of equipment or materials controlled by 1C210.b. or 1C990.

1E994: "Technology" for the "development", "production", or "use" of fibrous and filamentary materials controlled by 1C990.

Under existing U.S. export control regulations, composite materials and tooling, along with related software and technology, falling under ECCNs 1A002, 1A202, 1B001, 1B101, 1B201, 1C010, 1C210, 1D002, 1D101, 1D201, 1E001, 1E102 and 1E202 require a license to China. The Proposed Rule would add controls to items falling under 1B999, 1C990, 1D999, 1D993 and 1E994.

In May of 2006, the ECWG provided the Bureau of Industry and Security with a full market analysis of the composite material and tooling sector in China. That report demonstrated that composite materials and tooling, along with related software and technology, were available in China above the current control levels. The ECWG submits the report in its entirety as Attachment A as comment on the Proposed Rule as it relates to the ECCNs listed above.

II. Summary

The U.S. Government provided positive feedback on this report when it was submitted in May. The U.S. Government also followed up on the report by sending a delegation to China that visited a number of the companies detailed in the report. The ECWG believes the report along with the first hand knowledge of this sector the U.S. Government delegation gained during its trip provide irrefutable evidence that the Chinese:

- A. Have ample access to composite materials from a variety of internal and external sources. Numerous companies in the U.S., Japan and Europe supply aerospace grade composite materials (prepregs) to China.
- B. China produces its own materials (prepregs) for use in the military sector. These materials are at a higher level than what foreign suppliers are providing for commercial end-use in China but well below the level of composite materials being produced for U.S. military aircraft such as the F-22 and Joint Strike Fighter (JSF).
- C. One Chinese company is designing, developing and manufacturing composite parts for commercial aircraft completely on its own from start to finish. For example, they have solely designed, developed and currently produce an aircraft frame out of carbon composite materials. This is well above the build to print level, which is the level most foreign companies and joint ventures are currently providing to the commercial aircraft sector in China.
- D. European companies have announced plans to increase cooperation with China on the design and development of composite parts for commercial aircraft. Airbus recently announced it will partner with Chinese companies on the design and development of composite parts for the A350. Airbus stated that this would be at the build to spec level. Published reports state that at least 50 Chinese engineers are currently in Europe receiving training from Airbus on the A350 project.
- E. The Chinese military is already producing composite parts at the build to spec level. The demands on the military side also do not coincide with the commercial aircraft specification requirements. The glass transition temperature required for military aircraft is necessarily higher than that for commercial aircraft.
- F. On composite tooling, it is available in China from foreign sources, but the work is predominantly being carried out by hand. The growing demand to produce composite parts for the commercial aircraft sector, however, is requiring an increase in Chinese production efficiency and quality. This will necessitate the purchase of composite tooling from foreign sources.

Since the submission of the Composite Materials Report in July 2006, the ECWG has collected new information about Chinese composite tooling capabilities based upon a site visit to Changhe Aircraft Industry Corporation. The Composite Workshop at Changhe occupies a total floor area of 8000m², including a clean room that occupies 1200 m². 96 Skilled workers and 13 Engineers are employed at the composite workshop where 20 items of fabrication equipment are used. Changhe plans to build a large new composite facility, which it will fill with brand new top level composite

tooling equipment as it has done with the new Changhe machining line. For details about this, please refer to Chapter II on Machine tools and Chapter 7 on Helicopters.

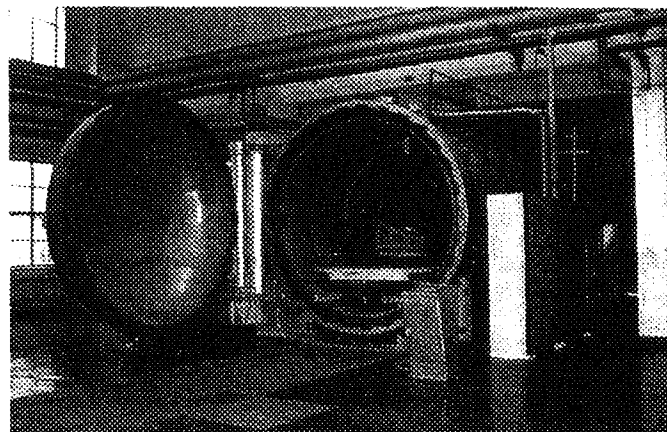
Below is a list of the current composite tooling equipment used by Changhe Aircraft.

Note: Although some of these tools may not be controlled under current or proposed export control regulations, they are included below to provide a clearer picture of the overall composites capabilities in China.

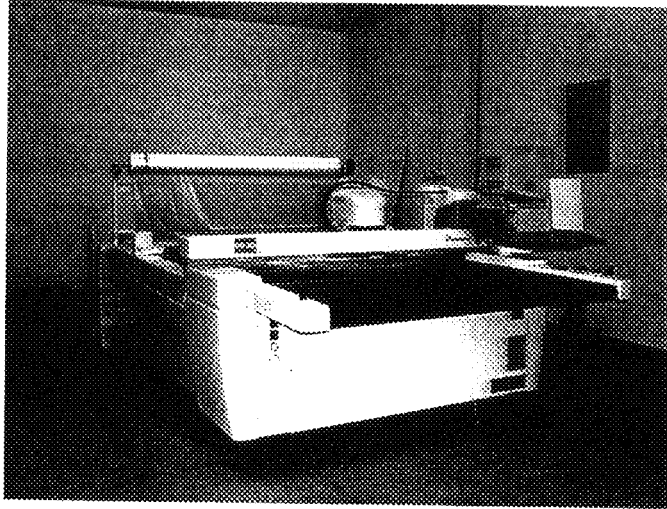
1. Imported Scholz Autoclave: $10\text{m} \times \phi 4.5\text{m}$



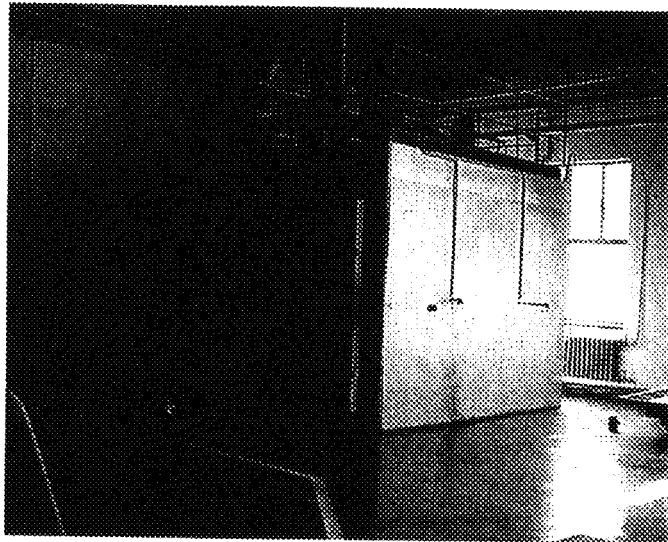
2. Domestic Autoclave: $7\text{m} \times \phi 2.5\text{m}$



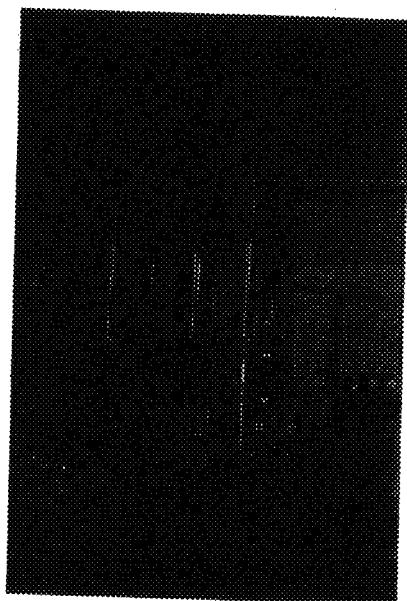
3. Composite material roofer



4. Oven: 2m×2.5m×2m



5. 500T hot press



6. 50T hot press



- G. If U.S. industry is prevented from providing composite tooling to China, this market demand will be met by European companies. The current composite tooling equipment in China is from Germany and Switzerland and includes autoclaves, tape winding machines, hot meld machines and UD dip machines.
- H. The Chinese will also fund its internal industry to develop composite tooling as it did in the machine tool sector. In the machine tool sector this funding led to an increase in the number of Chinese machine tool companies from one or two in 2002 to the current level of eight. These Chinese machine tool companies now compete directly with the U.S. companies at a high level.

III. Conclusion

China's capabilities in composite materials and tooling, along with related software and technology, are far above the control levels in the Proposed Rule. The ECWG hopes that the U.S. Government would take into account the attached report, combined with related information from the chapters on Machine Tools, Navigation and Avionics and Helicopters in reviewing whether the control levels in Proposed Rule would serve any benefit in preventing material contributions to Chinese military capabilities. The ECWG respectfully submits that they do not.

CHAPTER II Machine Tools

I. List of ECCNs:

2B991: Limited to machine tools controlled under 2B991 having “positioning accuracies”, with all compensations available, better than 0.010 mm along any linear axis; and machine tools having the characteristic of one or more contouring “tilting spindles” controlled by 2B991.d.1.a.

2B993: Limited to gear making and/or finishing machinery not controlled by 2B003 capable of producing gears to a quality level of better than AGMA 12.

2B996: Dimensional inspection or measuring systems or equipment not controlled by 2B006.

Currently, machine tools falling under ECCN 2B001 on the CCL require a license to China. The 2B991 category in the Proposed Rule has been trimmed down to include limited sub-categories, and the 2B993 category has been limited to controlling a quality level better than AGMA 12 rather than AGMA 11.

Data collected from the Chinese market shows that a select number of Chinese machine tool companies have reached the technological level described by the proposed controls above. These Chinese companies are currently developing and producing several lines of high level machine tools, as detailed in this chapter. Although this is not the standard for all Chinese machine tool companies, these companies are taking on large scale improvement and innovation programs to build up a strong base of high level machine tool equipment. Some of these Chinese companies are gaining the ability to produce aerospace quality machine tools. Shenyang Machine Tool Group Company has sold 5-axis tools to Hongdu Aviation and Guilin Machine Tool Company has provided high level milling and machining centers to the Chinese aviation industry. BMEI had its breakthrough this year into the aerospace machine tools industry with the sale of three 5-axis simultaneously controlled machining centers to China’s aviation and aeronautical industry for making large size vane parts.²

This market data shows that Chinese entities, through a combination of Chinese SOEs, wholly foreign-invested enterprises, and joint ventures, have developed the capability to produce machine tools better than the levels specified in the Proposed Rule. Chinese entities have achieved these capabilities through indigenous development as well as investment and assistance from German, Japanese and other foreign machine tool conglomerates.

²严曼青, “从科技精英到‘小巨人’,” 机电商报 (Machinery & Electronics Business), 13 Nov 2006.

In addition to the growing and maturing domestic availability, high technology foreign machine tools are widely available to Chinese end-users. Where Chinese machine tool companies are unable to satisfy the domestic demand in high technology machine tools, Chinese end-users are purchasing state-of-the-art equipment from Japanese, German, Italian, British, Korean, Taiwanese and other foreign companies. Foreign companies are directly supplying these high level tools to China through local offices, assembly plants, and local production facilities.

Given the rapidly growing market for machine tools, many foreign European and Asian companies have seized the opportunity to partner with the Chinese to produce and provide the most advanced machine tools and gain greater market share. These joint venture and foreign enterprises have entered the Chinese market, contributing to both civil and military capabilities. Joint ventures and wholly owned foreign enterprises, which import key foreign technologies and rely upon the local Chinese workforce, are quickly and efficiently feeding the Chinese domestic capability by providing technology for assembly and production of high level machine tools. This is reflected, for example, by the joint venture between Okuma of Japan and Beijing No.1 Machine Tool. Joint partnerships and domestic development in machine tools have taken place independent of U.S. participation in the market.

U.S. machine tool sales to China are already restricted under licensing requirements for items falling under current ECCN 2B001. Given the existing domestic and joint venture development, and the foreign availability of high level machine tools, U.S. companies could not make a material contribution to China's military development. China's military demands are already satisfied by domestic and foreign supply, which is far above the level of control in the Proposed Rule. Imposing further restrictions on the U.S. machine tool company sales to China will have no effect in hindering China's machine tool industry, but it will further damage the U.S. machine tool industry by cutting U.S. companies out of the Chinese market.

The sections below include details about this Chinese domestic capability as well as the foreign availability in machine tools in China.

II. Overall China Market

China is today's largest consumer and importer of machine tools. Imported machine tools in China reached a total value of \$5.9 billion in 2004, with approximately 8% of these imports from U.S. sources. Japan held 33% of imports, Taiwan 21% and Germany 15% of machine tool imports in 2004.³ In 2005, China imported \$6.7 billion worth of machine tools, which made up 61% of China's total machine tools consumption for the year.⁴

³ U.S. Commercial Service in China. Market Research Report, "2005 Machine Tool Exporters Guide to China." < http://www.buyusainfo.net/docs/x_4756327.pdf> Oct 2006.

⁴ Gardener Publications Inc., "Machinery & Electric Products Export Guidance" as found in Machine Info 2005, < <http://mep128.mofcom.gov.cn/jchnew/hypl/39665.asp>> Oct 2006.

China's rapidly growing demand for machine tools is prompted by the establishment of individual large-scale national and international projects as well as general development in certain key industries. Some examples of projects fueling the domestic demand for machine tools include: the three gorges dam project, the many building projects leading to the 2008 Olympics, the booming local car industry, the industrialization of the farming industry, the privatization and upgrade of formerly state-owned manufacturing plants, and the push for improvement in the Chinese aerospace industry.

A large portion of China's machine tool output is constituted by low level and common machine tools, with over half of China's current machine tool demand for high and middle level machine tools met by foreign imports.

Chinese domestic capability in high level machine tools is growing rapidly. In 2005, approximately 59,600 units of CNC machine tools were produced in China, among which the proportion of high-grade products had significantly increased from previous years. Domestically produced CNC machine tools have quickly gained market share in China's market, rising by nearly 3% in 2005. Meanwhile, Japan, Taiwan, Germany and Korea are increasing investment and participation in the Chinese machine tool industry, gaining greater market share and equipping China with the technology to power domestic production.

III. Chinese National Machine Tool Strategy

Chinese companies are following an overall strategy in growing their domestic high technology machine tool capabilities. The goals are set forth in government directives to provide strong support in the machine tool industry. Meanwhile, Chinese companies follow a pattern of development and technology acquisition that includes indigenous development and research, foreign investment, joint partnerships in R&D and manufacturing, and Chinese acquisitions of foreign companies.

A. Five Year Plan Targets Machine Tools for Investment

According to China's Eleventh Five-Year Plan of the Machinery Industry and its Development, China plans to focus on the machinery industry as a foundational area for accelerated development, because this industry will affect many other industries that China also hopes to grow. To the end of cultivating an internationally competitive high quality machinery industry by 2010, China will exploit all available new technologies and information techniques. The government has indicated that it will provide support to the large Chinese enterprises to help them accelerate their product development and apply new techniques, which will advance and upgrade the whole sector. The national plan focuses on restructuring in four areas, one of which is numerical controlled machine tools.

By the end of the Eleventh Five Year Plan in 2010, China estimates that the Chinese market share of numerically controlled machine tools held by domestic companies will account for 50 percent of the value and 65 percent of the output volume. China hopes to narrow the gap between the production of the basic mechanical parts and the complete system large scale equipment.⁵

B. Joint Partnerships with Foreign Firms

Foreign-invested enterprises are estimated to account for nearly 14% of China's machine tool manufacturers. These enterprises take the form of both wholly owned foreign enterprises and joint ventures. Both types of foreign invested enterprises involve transfers of component parts, technology, and internationally proven manufacturing processes and management techniques from the foreign partners to the Chinese partners. Below is a non comprehensive list of wholly owned foreign enterprises (WOFEs) and joint ventures in machine tools in China.

1. Wholly Owned Foreign Enterprises (WOFEs):⁶

- DMG Gildermeister factory in Shanghai, est. 2003
- Riello (Italy) metal-cutting tools facility in Shanghai, est. 2003
- TGI (South Korea) factory in Xingdao Bonded Zone: drills and milling tools
- Danielli plant in Beijing Development Area
- Little Giant in Ningxia Hui Autonomous Region (Japan)
- NOEMA-Spinner in Nanjing (Taiwan and Germany)

2. Joint Ventures:

- Beijing First Machine Tools Plant and Okuma (Japan)
- Yawei Machine Tool Company, SMS (Switzerland) and Selema (Italy)
- Shanghai Mechanical Press Plant and Acupress (Canada) to produce numerical controlled shearing and bending machines

C. Acquisitions of Foreign Firms

Several Chinese machine tool companies, which have reached a level of economic stability and technological achievement, have begun purchasing branches of foreign companies and establishing their own foreign branches for research and development, manufacturing and international sales. Through the acquisition of foreign branches, Chinese companies are acquiring new

⁵ China Daily, BizChina Machinery, "10th Five Year Plan," 18 Apr 2006, <http://www.chinadaily.com.cn/bizchina/2006-04/18/content_570635.htm> Oct 2006. [Note: This article mistakenly cites this as the Tenth Five Year Plan, but this is simply a translation error.]

⁶ Price Waterhouse Coopers, "Machinery and Equipment Market in China: China Risks and Rewards," Sept 2005.

technologies and new equipment that is boosting their own development and production capabilities. A list of the most prominent Chinese acquisitions is included below:

- Wuxi Kaiyuan Machine Tool Group: set up a UK operation with British investors to produce grinders
- Qinchuan Machine Tool Group: acquired 60% shares in UAI (US)
- Shanghai Mingjing Machine Tool Company: acquired majority stakes in Wohlenberg (Germany) and Ikegai Corporation (Japan) in 2001
- Dalian Machine Tool Group (DMTG): purchased Ingersoll CM Systems and Ingersoll Production Systems (U.S.), and the F. Zimmermann GmbH (Germany) in 2003
- Beijing No. 1 Machine Tool Works: purchased Werkzeugmaschinenfabrik Adolf Waldrich Coburg GmbH & Co.KG (Germany) from HerkulesGroup in October 2005

IV. Chinese Domestic Availability

Market data about the Chinese machine tool market demonstrates that a select number of Chinese domestic companies are able to produce machine tools better than the proposed U.S. controls on machine tool exports to China.

While several Chinese domestic companies are capable of producing high-level machine tools, we have selected three of the top Chinese companies for the analysis below. These companies are: Shenyang Machine Tool (Group) Co., Ltd., Dalian Machine Tool Group Corp., and Guilin Machine Tool Co., Ltd.

1. Shenyang Machine Tool (Group) Co., Ltd. (SMTCL)

The Shenyang Machine Tool (Group) Co., Ltd. (SMTCL) is one of China's largest machine tool companies. SMTCL was founded in December 1995 with funding from the Shenyang City State-owned Asset Management Administration Bureau. Today, SMTCL contains a number of subsidiaries, some of which are branches from the original Shenyang Machine Tool Company and others which were acquired when SMTCL purchased other machine tool companies. The SMTCL conglomerate includes: Shenyang Machine Tool Co., Shenyang Machine Tool Foundry Co., Shenyang Machine Tool No.3 Mechanical Works; Yunnan CY Group Co., Kunming Machine Tool Co., and Schiess GmbH located in Germany.

SMTCL manufactures mechanical-electrical integration equipment and instruments, such as CNC machining centers, large bridge type gantry machines, grinders, CNC boring-milling machines, worm wheel gear grinding machines, CNC bending machines, CNC punching machines, coordinate measuring machines and other advanced equipment. In 2005,

SMTCL produced approximately 60,000 units of metal-cutting machine tools, including about 10,000 units of CNC machine tools.

SMTCL produces most of the machine tool components in-house, while others are sourced from other provinces in China, including: Liaoning, Tianjin, and Shandong. SMTCL customers come from across China, and some products are exported globally.

Shenyang began construction on a CNC machine tool industrial park in July 2004. To date phase I of the project is complete and employees have been assigned to this location. The final phase of the project is still under construction, but completion of the park is estimated in March or April 2007.

According to published SMTCL information from the company website and promotional sales materials, SMTCL and subsidiaries produce high level CNC and 5-axis machine tools. China Czechoslovakia Machine Co., Ltd., which is a subsidiary of SMTCL, sold such 5-axis machines to Hongdu Aviation Industry Group Ltd., an AVIC II company.⁷

Note: Hongdu Aviation also uses the following tools: (1) 5-axis numerical control gantry milling machines produced by China Aviation Processes Research Institute in cooperation with France, delivered in 1997; (2) 5-axis horizontal numerical control fabrication center by Mandelli Co. of Italy, delivered in 2000; (3) Numerical knife grinding machine produced by Schneeburger of Switzerland, delivered in 1999; (4) 3-axis numerical metering machine produced by Qingdao Qianshao Machine Tools Factory, delivered in 2001.⁸

The following is a non comprehensive sample of the high-end tools that SMTCL and subsidiaries produce:

- **SSCKZ80A:** Shenyang Machine Tool Group Co. produces a 5-axis CNC turning/milling center with tilting spindles called the SSCKZ80A-5 5-axis with a stated positioning accuracy of 0.008.
- **VMC630:** China Czechoslovakia Radial Drilling Machine Tool Works produces a vertical machining center, the VMC630, with a stated positioning accuracy of +/-0.005/300.
- **VM650:** Yunnan Machine Tool Group's VM650 vertical machining center has a stated positioning accuracy of +/-0.005.

⁷ Verified through phone interviews with SMTCL, China Czechoslovakia Machine Co., Ltd. and Hongdu Aviation Industry Group, Ltd.

⁸ Hongdu Aviation, "Brief to Numerical Control Machining Factory," <<http://www.hongdu-aviation.com/english/html/about5-3.htm>> Nov 2006.

- **MB200x40/5x:** Shenyang Machine Tool Group Co. makes a 5-axis gantry profiler/machining center with tilting spindles, the MB200x40/5x, with a stated positioning accuracy of 0.010.

2. *Dalian Machine Tool Group Corp. (DMTG)*

The core company of Dalian Machine Tool Group Corporation (DMTG), the Dalian Machine Tool Plant, was founded in 1948. The establishment of DMTG in 1995 was a merging other state-owned companies in the Dalian area into one consolidated machine tool industry DMTG. In 2000, the former state-owned Dalian Special Purpose Machine Research Institute was also merged with DMTG, further increasing its technical force and scale in its manufacturing systems. DMTG now employs 6,229 workers, of which 815 are technicians.

Today, DMTG has 22 subsidiaries, joint ventures and cooperation agreements with international partners from the U.S., Germany, Japan, Korea, Switzerland and Israel. Five of these are joint ventures established with German, Japanese, Korean and Taiwanese companies, and two are wholly-owned subsidiaries of the U.S. In 2002 and 2003 respectively, DMTG acquired Ingersoll Production Systems and Ingersoll CM Systems. One year later, DMTG became the main shareholder of F. Zimmermann GmbH, Germany. These acquisitions brought DMTG a higher level of technology as well as offices and plants abroad. Details about the DMTG joint venture with the German Index machine tool company, Index Dalian Machine Tool Ltd., are included in the joint-venture section below.

From 2000 to 2004, DMTG boasted the largest sales revenue of machine tool companies in China.

DMTG has five manufacturing product lines with 300 individual products. These five product lines are: (1) Special purpose machines with flexible manufacturing systems; (2) vertical and horizontal machining centers; (3) CNC lathes including turning and milling centers; (4) high speed precision lathes and machine tool accessories; (5) auto power assembly and power transmission components.

Dalian Machine Tool Group can produce machine tools better than the proposed control level in the Proposed Rule. The following is a sample of some DMTG products:

- **CHD25:** 5-axis CNC turning/milling center machine with tilting spindles [Note: 9-axis with 5-axis simultaneous].
- **VDL500:** Vertical machining center with a stated positioning accuracy of +/- 0.005.

3. Guilin Machine Tool Co., Ltd. (GMTC)

The Guilin Machine Tool Co., Ltd. (GMTC) was established in July 1993 as the successor to the original Guilin Machine Tool Factory, which was constructed in 1951. GMTC has received many awards for its high quality machine tool products from the Chinese government.

In order to maintain its competitiveness in the rapidly developing machine tool market, GMTC has engaged in research and development cooperation with universities and research institutes throughout China such as: Beijing University of Aeronautics and Astronautics (Beihang University), Huazhong University of Science and Technology, and other research institutes. Together, these universities, institutes and GMTC have cooperated to raise the company's overall technical level and the technical innovation ability.

To date, GMTC produces 28 machine tool types, with nearly 400 models. 18 of these are high-technology CNC machine tools, with 180 different specification variations of these CNC machines. GMTC has placed a high priority on machine tool innovation.

GMTC produced and developed several models, which GMTC has sold to aerospace, national defense, automobile and other key industries, including: XK2316/3-5X, XHZ77125A/3, XKZ2330/12, XHZ2925/16, XHZ2330/6, XHZ2320/83, XK716/3-5X. GMTC has also provided 5 axis simultaneously controlled Plano-type milling machines and machining centers to China's aviation and aeronautical industry.⁹ Although not all of these models are caught by the Proposed Rule, this provides a clearer picture of the level at which Chinese machine tool companies satisfy domestic military demand.

Below is an example of a GMTC machine tool that reaches the level of proposed control:

- **XK2316/4-5X:** Bridge Type Gantry Machine, model XK2316/4-5X, a 5-axis simultaneous tool with tilting spindles

V. Chinese Joint Ventures and Wholly Owned Foreign Enterprises in China

In addition to developing top level machine tools in their existing China-based factories, Chinese companies are purchasing foreign companies and establishing joint ventures with foreign partners. These measures provide the Chinese companies with technology and manufacturing branches outside of China.

⁹ China Industry News, "桂林机床新品开发投入大," 14 Sept 2006, <<http://www.cinn.cn/show.asp?classid=15&id=29538>> Nov 2006.

Several Chinese machine tool companies have established joint ventures with foreign machine tool companies. These joint venture companies have been established for the production and assembly of high level machine tools. Japanese and German companies have been among the most prominent partners and investors in the Chinese machine tool industry.

1. OKUMA-BYJC (Beijing) Machine Tool Co., Ltd.

Okuma-BYJC (Beijing) Machine Tool Company, established in December 2003 as a joint venture between Beijing No.1 Machine Tool (BYJC) and Okuma of Japan, is located in the Shunyi Linhe Industrial Development Zone of Beijing. The Okuma-BYJC facility was planned as China's largest manufacturing base for numerical control machine tools.¹⁰ BYJC is one of the largest and most advanced machine tool companies in China. As the foreign partner, Okuma contributed by transferring its advanced flexible manufacturing systems (FMS) production lines and intellectual property management system to the joint venture to improve its products, manufacturing and logistics.¹¹

The company's business scope includes the design and production of numerically controlled machine tools, product installation, and after-sales service. Okuma-BYJC facilities are temperature controlled for a top-of-the-line manufacturing line. The grounds cover 30,000 m², with an indoor production facility occupying 20,000 m². Okuma-BYJC has a precision installation room and precision measurement center, which ensure the quality of processing and fitting these parts. The company also uses an environmental management information system (EMIS).

Okuma-BYJC produces and sells machine tools using technology provided by Okuma. The primary products include: MAR-560V numerically controlled vertical machining center and MAR-500H horizontal machining center. They estimate this year's production to be 700 machine tools and the output value to reach 500 million RMB. Within the next three years, Okuma-BYJC expects to reach a yearly output of 1200 machines and an output value of 900 million RMB. The quality of the machine tools manufactured by BYJC-OKUMA (Beijing) Machine Tool Co., Ltd. has reached the level of Japan OKUMA.¹²

¹⁰ Asian TOP Panel, "China to Build Largest Numerical Control Machine Tools Plant," The Japan Society of Mechanical Engineers JSME, Engineering in Brief E-mail Newsletter No.7, July 2002. <<http://www.jsme.or.jp/English/emnews07.htm>> Nov 2006

¹¹ China Daily, "SOEs Gain Foreign Input," 19 Oct 2002, <http://www.chinadaily.com.cn/en/doc/2002-10/19/content_140255.htm> Nov 2006.

¹² Fayin Digital-control, "China Machine Tool Industry Faced New Opportunity," 7 July 2005. <<http://www.fimom.com/english/newslst.asp?id=124>> Nov 2006.

- **MAR-560V:** This numerically controlled vertical machining center has a stated positioning accuracy of $\pm 0.004\text{mm}$
- **MAR-500H:** This numerically controlled horizontal machining center also has a positioning accuracy of $\pm 0.004\text{mm}$.
- **CXBA6130 5-axis:** This CNC Turning/Milling Center is a BYJC 5-axis simultaneous controlled machine with tilting spindles and no stated positioning accuracy
- **XNAV2415 5-axis:** This Gantry Planomiller is a BYJC 5-axis simultaneously controlled with tilting spindles and no stated positioning accuracy.

2. Index Dalian Machine Tool Ltd.

Index Dalian Machine Tool Ltd. was established in January 2001 as a joint venture between German Index and Dalian Machine Tool Group Corp., with Index as the greater shareholder. The company was established to assemble and sell the TNA300/TNA400 turning center in the Chinese market. Index Dalian has one production center and two assembly workshops, the newest of which is currently in the final stages of completion and will begin operations by the end of 2006.

To date the Index Dalian branch only produces the TNA300/TNA400 model turning center for the Chinese domestic market and non-domestic customers that have been pre-approved by German Index. The production and technical service departments employ primarily Chinese citizens, but both are headed by a German technician.

Index Dalian was the successful trial facility in which German Index planned to replace its own production of these turning center models with the Index Dalian production. By the end of 2006, German Index will turn over all of its international sales and orders for the TNA300/TNA 400 over to the Index Dalian facility. With this increase in orders, Index Dalian plans to significantly increase its production capacity.

Some of the machine components for the TNA300/TNA400 are purchased locally in China, but most of the core parts are provided by German Index. Currently, Index Dalian has no local R&D facilities because all of its technology comes from the parent company, German Index.

The main clientele in China includes military enterprises such as Xi'an Aero-Engine (Group) Ltd. and Xi'an Xibei Optoelectronic Instrument Factory, and the commercial auto and engine industries.

- **TNA 400:** The TNA400 model CNC turning center has a stated positioning accuracy of 0.008.

3. *NOEMA-Spinner (Nanjing) Co., Ltd.*

In October 1996, NOEMA-Spinner was established as a wholly-owned foreign enterprise of EUMA-Spinner in Nanjing.

EUMA-Spinner Corporation was established in January 1995 as a joint venture between Germany and Taiwan. Technology from Spinner of Germany was introduced to manufacture a range of CNC machine tools such as the column traverse type vertical machining center (ME series), EH horizontal machining center, and EV MVC vertical machining center. Since the partnership, EUMA has established a European Headquarters in Munich and has cultivated a vast sales network in Europe in addition to developing and implementing plans for new factories and sales centers in Mainland China. EUMA hopes to promote its machines in over twenty cities, including: Beijing, Shanghai, Nanjing, Shenyang, Xinan, Wuhan, Chongqing Guangzhou, and others.

NOEMA-Spinner was established to market EUMA-Spinner CNC Machine tools and CAD/CAM/CAE professional computer auxiliary designing software. The NOEMA-Spinner Nanjing facility, which also includes a special show ground for EUMA-Spinner machines and complete training and service facilities, assembles and sells the EV810 and EV1020 3-axis Vertical Machining Centers for the domestic Chinese market. According to a phone interview with NOEMA-Spinner's Nanjing sales representatives, all of the EUMA-Spinner machine tools listed on the EUMA-Spinner website, which includes high level 5-axis tools, are produced in the Nanjing facility.¹³ The two machining centers listed below have been confirmed by Spinner as the main products manufactured at the Nanjing facility:

- **EV810 Vertical Machining Center:** This 3-axis high speed machining center has a stated positioning accuracy (JIS) of $\pm 0.004\text{mm}/300$.
- **EV1020 Vertical Machining Center:** This machine also has a stated positioning accuracy (JIS) of $\pm 0.004\text{mm}/300$.

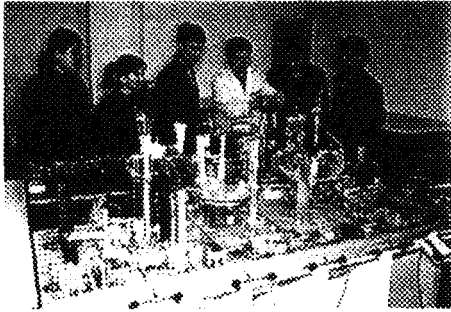
VI. Vocational Training Institutes: Sino-Foreign Cooperation

One of the greatest challenges for Chinese manufacturing and machining, as is in the case in almost all industries in China, is quality and efficiency in production and machining lines. The following section includes details about two vocational training institutes located in Tianjin for training in electrical engineering, metal processing and machine tooling. Although these training centers may not invest great resources in engineering research and development, they do demonstrate the depth of cooperation between Europe and China in the area of strategic manufacturing. In the overall economic development

¹³ LTI Associates, Telephone interview with NOEMA-Spinner sales representative in Nanjing, 23 Nov 2006.

of China, such training and cultivating of a skilled labor force may prove to be more valuable for China's economic and military development than the transfer of technology.

1. Tianjin Sino-German Vocational Training Center (AFZ)

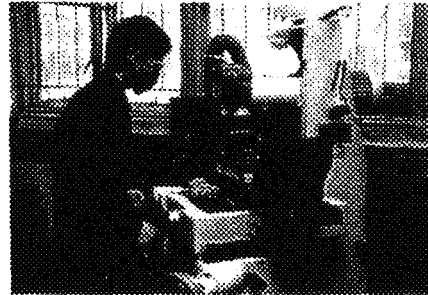


The Tianjin Sino-German Vocational Training Center (AFZ) was established in July 1985 with the support of the Tianjin City Government and the Ministry of Education in Beijing. AFZ Tianjin is a vocational school, which trains students in the fields of electrical engineering and metal engineering. Primary activities consist of advanced technical training courses for qualified employees and skilled workers in these areas, but the center also offers English and German language

courses. The goal of AFZ is to train qualified, motivated and responsible employees that are able to contribute to the development and improvement of economically efficient practices and high quality standards. To reach this goal, AFZ emphasises education as an interplay between practice and theory.

Further education of instructors is also a key goal of AFZ. On behalf of the Ministry of Education in Beijing, AFZ plans to establish a new system of cooperative education, based upon the German concept, *Berufsakademie*, and to extend AFZ courses to new sectors such as automobile mechanics.

The teaching staff at AFZ includes German and Spanish experts and more than 200 qualified Chinese teachers of which over 60 percent have attended training programs abroad. Over 90 percent of the modern equipment employed at AFZ is imported from abroad, and the value of this equipment is greater than 200 Million RMB. The AFZ currently holds courses for more than 4500 students.



Majors and courses include the following areas:

- Processing Technology of Numerically Controlled Machine Tool
- Maintenance Technology of Numerically Controlled Machine Tool
- Mould Design and Manufacturing
- Mechanical and Electrical Integration
- Electric Automation
- Computer Controlling Technology

- Information Security Technology
- Computer Network Technology
- German and English Language

2. *Tianjin Sino-Spanish Machine Tool Vocational Training Center (CSMC)*

The Tianjin Sino-Spanish Machine Tool Vocational Training Center (CSMC) was built in December 2003. CSMC is a vocational training center established as a result of the collaboration between the Spanish and Chinese governments and the cooperation between the Tianjin Technology Institute and the Machine Tool Spanish Promotional Group lead by Proschools. The Spanish government provided \$9.76 million USD to purchase equipment for the CSMC workshops.

Located in Tianjin, CSMC has defined one of its main objectives as helping and servicing Spanish Machine Tool manufacturers. In August 2005, Lantek and CSMC signed a collaboration agreement in which Tianjin CSMC agreed to provide Lantek with logistic and human support for their installations and customer support in China. Lantek is a Spanish company that develops and sells CAD/CAM software for the sheet metal industry. According to Alberto Martínez, Lantek's CAD/CAM division Managing Director, "Lantek's presence in China has significantly increased during the last two years thanks to several agreements with leading Chinese sheet metal manufacturers to provide Lantek's software with their machines. In Lantek, we think that this is the perfect moment to establish our own branch office in a country where the growth expectations are spectacular. Thanks to this collaboration agreement we can provide a qualified support service to our current and future customers in one of the most industrialized areas in China."

According to Jose Ignacio Artamendi, Tianjin CSMC Director, "This collaboration agreement shows that the expectations generated by the CSMC in order to enforce the service that the Spanish companies offer their customers in the great Chinese market are being met. Furthermore, CSMC is playing a significant role in enforcing the image of the Spanish machine tool technology in general and the Basque Country in particular. One of the main objectives of the center is to serve as a reference and a facility to be used by those companies interested in establishing or doing business in China by helping them with machine tool demonstrations, educational actions or marketing tasks."¹⁴

¹⁴ TenLinks, Inc. "Lantek Signs Collaboration Agreement with Tianjin CSMC." 25 Aug 2005. <http://www.tenlinks.com/NEWS/PR/Lantek/082505_tinajin.htm> Nov 2006.

Training courses at the CSMC include:

- Distance Diagnosis Technology
- Maintenance Technology of Numerically Controlled Machine Tool
- Digital Tridimensional Measuring Technology
- Operation of Numerically Controlled Processing Center
- Numerically Controlled Grinder Operation
- Numerically Controlled Machine Tool Operation
- Electro-processing Machine Tool Operation
- Electronics
- Pneumatic Hydraulics
- Principle of Electric Drive Numerical Control
- Typical Numerical Control System
- Installation, Testing and Maintenance for Numerically Controlled Machine Tool

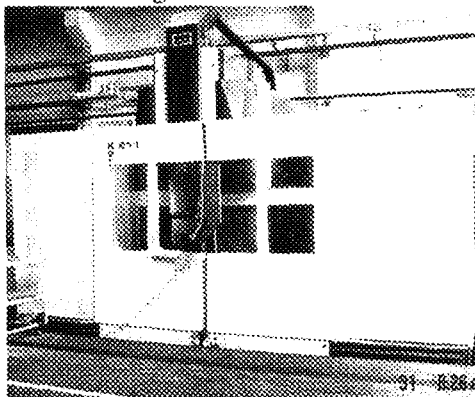
VII. Foreign Imports

The best way to fully understand the level of engagement from non-U.S. foreign companies in the Chinese market is to review the tooling in one of the Chinese aircraft manufacturing plants. Chang He Aircraft Industry Corporation ("Chang He"), which is a manufacturer of small fixed wing and rotary wing aircraft, completed construction this year on a machine shop that is two blocks long in size. [Note: A full description of Chang He and its programs is provided in the Helicopter Chapter.] This new structure is now being filled with state-of-the-art machining equipment, most of which has already been purchased from European and Japanese machine tool companies. This building is temperature controlled and equipped with good lighting. They estimate that the machining line will be up and running in approximately 6 months.

The following equipment has already been installed at Chang He in either the old machine shop or the new machine shop described above:

1. Fidia

Chang He has purchased a total of four machine tools from Fidia of Italy. Following are the specifications and pictures of two of the Fidia machines at Chang He:



Fidia High speed vertical 5-axis N/C machining center

Specifications:

Made in Italy
Manufacturer: FIDIA
Model Number: K211
X : 2700; Y : 1100; Z : 1000
A : -110 ~ 40°
C : ±180°
S : 24000
F : 24000

**Fidia High speed
vertical twin-head 5-
axis N/C machining
center**

Specifications:

Made in Italy
Manufacturer: FIDIA
Model Number: 2K411
X : 3000; Y : 2000;
Z : 1000
A : -110---40°
C : ±180°
S : 24000
F : 24000

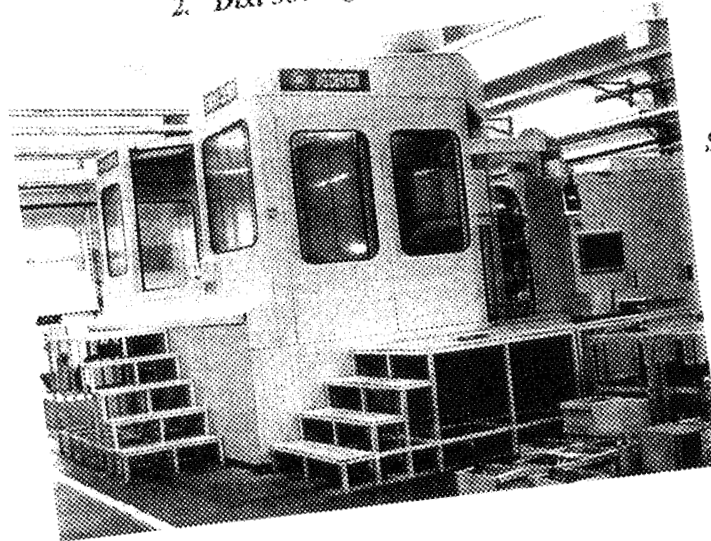


2. Dixi 350 Jig Center

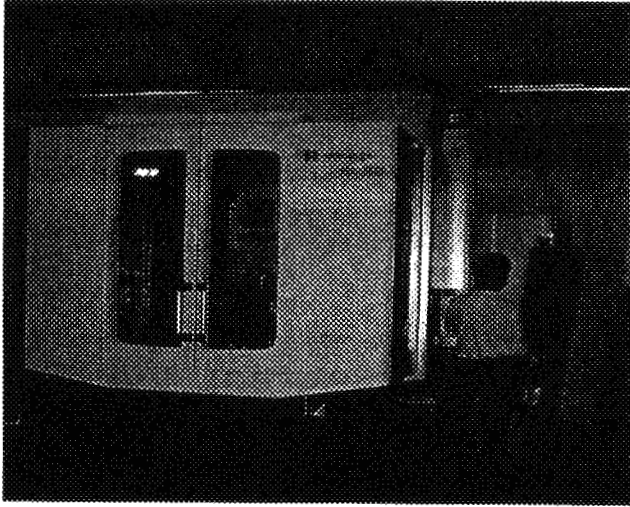
**4-axis precision N/C
boring lathe**

Specifications:

Made in Switzerland
Manufacturer: DIXI
Model Number: DIXI350
X : 1000; Y : 1000; Z : 1000
A :
B :
S : 5000
F : 10000



3. *Hardinge Hansero 555Deckel Matto DMU 125P:*



N/C grinding machine

Specifications:

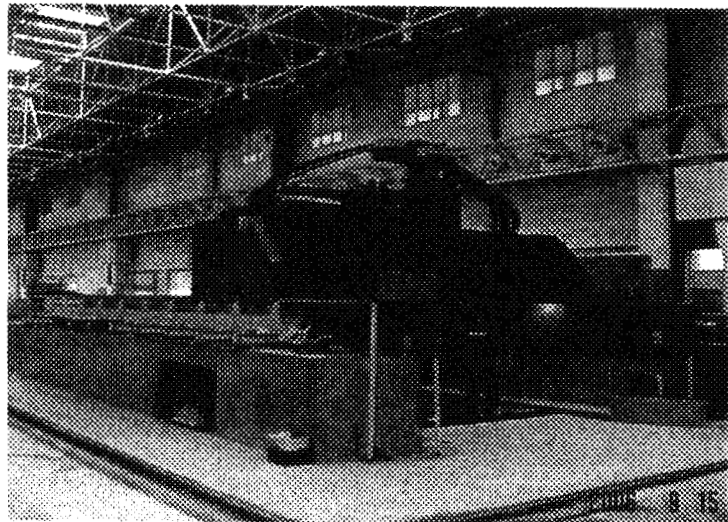
Made in the USA
Manufacturer: Hardinge
Model Number 555
φ : 2700
S : 15000
F : 10000

4. *VStar Forest-Liné:*

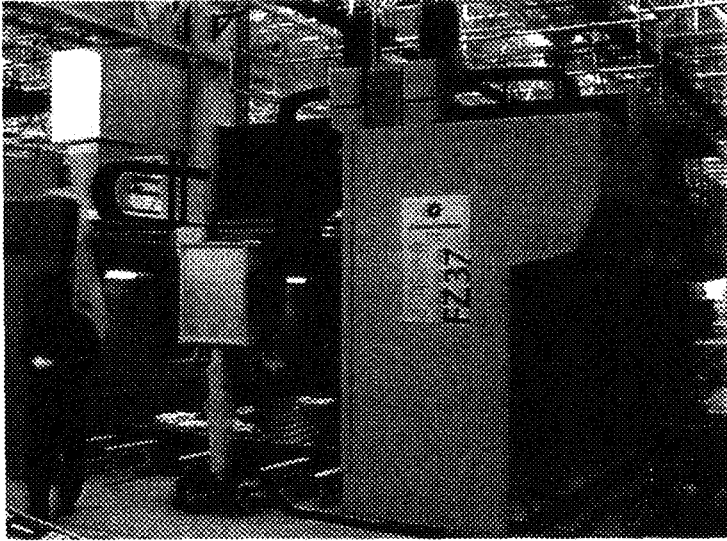
High speed 5-axis N/C
gantry machining
center

Specifications:

Made in France
Manufacturer: Forest Lin
Model Number: VSTAR
X : 6700; Y : 3500;
Z : 1000
A : -110~40°
C : ±410°
S : 24000
F : 40000



5. *Zimmerman Boko FZ37:*



**High speed vertical
5-axis N/C
machining center**

Specifications:

Made in Germany
Manufacturer:
ZIMMERMANN
Model Number: FZ3
X : 6000; Y : 3000;
Z : 1000
A : -110 ~40°
C : ±180°
S : 24000
F : 24000

Note: Chang He has two of these machines.

6. *Chang He also has the following:*

1. Hexagon Metrology Global Advantage 153010
2. FPT Sino Dynamic Precision
3. Three of the Cincinnati Machines AV0054
4. Rambdaudi H45L 5 axis tool, purchased 2 years ago
5. Mazak Megaturn

VIII. Summary

China's machine tool demand is being met by a rapidly growing domestic machine tool industry and top of the line non-U.S. foreign machine tools. The top Chinese domestic companies are producing four and five axis machine tools at levels better than those in the Proposed Rule. The non-U.S. foreign machine tools, which still dominate the high end Chinese market, are readily available. Additionally, these non-U.S. foreign companies are more aggressively investing technology and money into joint ventures and wholly owned foreign enterprises in China. The data above clearly shows that export controls, even at the current levels, have not prevented China from obtaining the state of the art machine tools it needs for military modernization. On the contrary, China has been able to purchase all of the machine tools it needs for both commercial and military purposes. The only tangible result of the current controls has been the rapid decline in U.S. market share, which today is below 8% and declining. Further lowering these controls would appear to be futile and would clearly not hamper China's military capabilities in any capacity.

Chapter III

Information Security and Telecommunications (I): Servers, Integrated Circuits, and Encryption

Part I: Servers

I. List of ECCNs:

4A994: Limited to computers not controlled by 4A003, with an Adjusted Peak Performance ("APP") exceeding 0.1 Weighted TeraFLOPS (WT).

4D994: "Software" specially designed or modified for the "development", "production" or "use" of equipment controlled by 4A101, 4A994 with an Adjusted Peak Performance ("APP") exceeding 0.1 Weighted TeraFLOPS (WT), 4B994 and materials controlled by 4C994.

4E992: "Technology" for the "development", "production", or "use" of equipment controlled by 4A994, as described in this Supplement No. 2 to Part 744, and 4B994, materials controlled by 4C994, or "software" controlled by 4D993 or 4D994.

Computers with an Adjusted Peak Performance ("APP") exceeding 0.75 Teraflops (WT) currently require an export license to China (see ECCN 4A003). Under the proposed new China policy computers and related software and technology with an APP exceeding 0.1 WT would require an export license to China if going to a military end-use as defined in the draft proposal.

The ECWG has conducted an analysis of the high end computer market in China to determine the level and number of computers exceeding the 0.1 WT level and the ability of Chinese companies to produce computers above this level. The following chapter details our findings.

II. Overall China Market

By the end of 2006, China's total GDP is projected to reach US\$2.429 trillion, more than doubling in just six years time. With a strong growing economy, China plans to invest a vast amount of money on data informatization, creating a huge market for computer-related equipment. Servers and information storage systems are especially needed to store, manage, process, and retrieve the rapidly increasing volume of data.

Chinese telecommunication operators, the biggest consumers of high-end servers and storage systems, will need new equipment to support next generation 3G networks. Numerous government agencies have plans to modernize their computer systems, intending to spend hundreds of millions of dollars in the next decade.

In 2005, China imported more than 484,000 servers, which generated revenues of US\$2.25 billion. In the first quarter of 2006, 134,000 servers were shipped to China, an increase of 26% over the same period a year ago. CCW Research expects blade servers, with sales of US\$66.08 million in 2005, to experience the greatest growth. The blade server market in China is forecasted to reach 759.49 million, with compounded annual growth rates of 59.4% by 2010.

According to the China Storage System Market Quarterly Tracker Q4 2005 report released by Analysis International, the market value of storage systems reached US\$251.90 million at the end of 2005. During the fourth quarter of 2005, 14,000 storage systems were imported to China, an increase of 16.4 percent over the previous year. While the telecommunication industry is the biggest purchaser of storage products in China, the financial industry has also been a force driving the rapid growth of the information storage systems market in China.

American companies such as Hewlett-Packard (HP), IBM, Sun Microsystems, Dell, and EMC have traditionally dominated the Chinese server and storage system market. In 2005, HP, IBM, and Dell were the three biggest importers of servers in China, combining to seize 63.9% market share. In terms of revenue for overall server sales, IBM dominated China's market share with 40.4 percent, followed by HP and Sun with 21.5 percent and 10.1 percent respectively.

The competition in the storage systems market is even more intense with market share and revenues more evenly distributed. In terms of server imports to China, HP, EMC and IBM were in the lead, with market share of 25%, 23.9% and 22.7% respectively. However, in terms of market value, IBM accounted for 24.4 percent of the total revenues. HP was a close second with 23.9 percent and EMC came in third with 17.2 percent. IBM's market value increased slightly, while HP and EMC remained stable compared with the first quarter of 2006.

III. Servers in China

Despite the dominance of U.S. companies in the Chinese server market, there is evidence of domestic Chinese capabilities in this area. A review of the top 500 high performance computers in the world showed that 16 of top 402 high performance computers in the world are located in China.¹⁵ The following lists details these computers and includes the ranking, location, manufacturer and performance level of each:

¹⁵ Top500.org Supercomputer Sites. "November 2006 Top500 List." Nov 2006. <<http://www.top500.org/lists/2006/11>> Nov 2006.

No. 57	
Location:	China Meteorological Administration
Manufacturer:	IBM
Computer:	eServer pSeries 655 (1.7 GHz Power4+)
Processors:	3200
Rmax (Gflops):	10310
Rpeak (Gflops):	21760
Nmax:	
Nhalf:	
No. 82	
Location:	Shanghai Supercomputer Center
Manufacturer:	Dawning
Computer:	Dawning 4000A, Opteron 2.2 GHz, Myrinet
Processors:	3200
Rmax (Gflops):	10310
Rpeak (Gflops):	21760
Nmax:	
Nhalf:	
No. 192	
Location:	Chinese Academy of Sciences
Manufacturer:	Lenovo
Computer:	Deepcom 6800 Itanium 2, 1.3 GHz, OsNet
Processors:	1024
Rmax (Gflops):	4193
Rpeak (Gflops):	5324.8
Nmax:	491488
Nhalf:	0
No. 220	
Location:	Classified
Manufacturer:	Hewlett Packard
Computer:	Cluster Platform 4000 DL 145 Cluster
Processors:	1044
Rmax (Gflops):	3958.8
Rpeak (Gflops):	5011.2
Nmax:	0
Nhalf:	0
No. 254	
Location:	Xinjiang Oil
Manufacturer:	IBM
Computer:	Blade Center HS20 Cluster, Xeon EM64T 3.4 GHz, Gig Ethernet
Processors:	1064
Rmax (Gflops):	3755
Rpeak (Gflops):	7235.2
Nmax:	0
Nhalf:	0
No. 269	
Location:	Petroleum Company H
Manufacturer:	IBM
Computer:	Blade Center HS20 Cluster, Xeon EM64T 3.4 GHz, Gig Ethernet
Processors:	1064

Rmax (Gflops):	3755
Rpeak (Gflops):	6553.6
Nmax:	0
Nhalf:	0
No. 301	
Location:	Geoscience J
Manufacturer:	IBM
Computer:	Blade Center HS20 Cluster, Xeon EM64T 3.4 GHz, Gig Ethernet
Processors:	980
Rmax (Gflops):	3593.65
Rpeak (Gflops):	6664
Nmax:	0
Nhalf:	0
No. 311	
Location:	Geoscience I
Manufacturer:	IBM
Computer:	Blade Center HS20 Cluster, Xeon EM64T 3.4 GHz, Gig Ethernet
Processors:	960
Rmax (Gflops):	3520.31
Rpeak (Gflops):	6528
Nmax:	0
Nhalf:	0
No. 339	
Location:	Galactic Computing (Shenzhen) Ltd.
Manufacturer:	Galactic Computing
Computer:	Supercomputing Blade System GT4000
Processors:	562
Rmax (Gflops):	3413
Rpeak (Gflops):	4046
Nmax:	0
Nhalf:	0
No. 348	
Location:	Institute of Scientific Computing / Nankai University
Manufacturer:	IBM
Computer:	Nankai Stars xSeries Xeon 3.06 GHz, Myrinet
Processors:	768
Rmax (Gflops):	3328
Rpeak (Gflops):	4700
Nmax:	0
Nhalf:	0
No. 397 to 402	
Location:	Gaming Company (B)
Manufacturer:	Hewlett Packard
Computer:	6 Blade Clusters BL-20P, Pentium4 Xeon 3.2 GHz*
Processors:	860
Rmax (Gflops):	3076.7
Rpeak (Gflops):	5504
Nmax:	0
Nhalf:	0

*Note: Gaming Company (B) has a total 6 of these Blade Cluster at the exact same specs

It is of interest to juxtapose the Dawning 4000A, Opteron 2.2 GHz, Myrinet, which is rated at number 82, with the computers of similar level. The chart below shows computers rated from numbers 81 through 90. As the chart shows, a number of the computers of similar ability are supplied to U.S. defense related end-users, such as the Pacific Northwest National Laboratory, Los Alamos National Laboratory and Wright Patterson Air Force Base. Since computers at this level are custom designed, this demonstrates that China has the ability to supply equivalent level computers to its government and military as U.S. companies are supplying to the U.S. government and military.

No.	Purchaser	Computer/OEM	Processors	Year	Rmax	RPeak
81	Lawrence Livermore National Laboratory United States	Zeus - Appro Xtreme Server - Quad Opteron Dual Core 2.4GHz Infiniband Appro International	2304	2006	8181	11059.2
82	Shanghai Supercomputer Center China	Dawning 4000A, Opteron 2.2 GHz, Myrinet Dawning	2560	2004	8061	11264
83	Los Alamos National Laboratory United States	Lightning - Opteron 2 GHz, Myrinet Linux Networkx	2816	2003	8051	11264
84	SCS S.r.l. Italy	ProLiant BL460c EM64T Xeon 51xx 3GHz Hewlett-Packard	1024	2006	7987.2	12288
85	Pittsburgh Supercomputing Center United States	Cray XT3, 2.4 GHz Cray Inc.	2060	2005	7935.82	9888
86	Wright-Patterson Air Force Base/DoD ASC United States	Cluster Platform 4000 DL145 Opteron 2.8 GHz Infiniband Hewlett-Packard	2048	2006	7925	11469
87	University at Buffalo, SUNY, Center for Computational Res. United States	U2 - PowerEdge SC1425 3.2 GHz, Myrinet Dell	1536	2006	7737	9830.4
88	Lawrence Livermore National Laboratory United States	MCR Linux Cluster Xeon 2.4 GHz - Quadrics Linux Networkx	2304	2002	7634	11060
89	Statoil Norway	Cluster Platform 3000 DL380 Xeon 51xx 3.0 Ghz, Infiniband Hewlett-Packard	1024	2006	7495.7	12288
90	Lawrence Livermore National Laboratory United States	ASCI White, SP Power3 375 MHz IBM	8192	2000	7304	12288

IV. Chinese Domestic Capability

China's first server was manufactured in 1993, breaking the foreign monopoly on this product, but domestic companies remained a very small player in this market segment. It wasn't until the early 2000s when Chinese companies made large investments in technological research and development that they started capturing a portion of the market share. The Langchao Group, a Chinese information technology firm, invested

US\$253 million to increase production of Internet servers to compete directly with HP and IBM. Other domestic companies that are becoming more competitive include Langchao, Lenovo, Dawning Information Industry, Legend Holdings, Founder Group, and PowerLeader. Competition amongst server and information storage system suppliers will intensify as foreign companies aim to provide servers to lower-end markets with low-price strategies, while Chinese firms try to break into the middle and high-end market.

1. Dawning Information Industry (Beijing) Co. Ltd. ("Dawning")

Dawning was founded in June 1995. Dawning is primarily engaged in R&D and manufacturing of servers for the IT industry. It is headquartered in Shenzhen and is ranked among the top three sever providers in China.

Dawning's top of the line server is the Tianchao series, which includes the TC4000L, TC3000, TC1700 and industrial specific cluster systems. The TC4000L is a network technology oriented commercial cluster system developed and introduced by Dawning in 2003. It is now in use at BGP Geophysical and a number of other companies. The TC3000 is the most mature super UNIX server in the country. It has been deployed to Beijing Genomic Institute and Western High-performance Network Computing Center and many other organizations. The TC1700 is a mature IA-architecture cluster product introduced by Dawning in 2001. It is widely used in areas including oil, meteorology, military and environmental protection. In 2003, Dawning delivered its 1000th server of this level.

2. Beijing High Performance Computer Users Center (BHPCC)

BHPCC was established on July 25, 2000 and is supported by the China Meteorological Administration. BHPCC's main computers are Sunway supercomputers, which are produced by the National Research Center of Parallel Computer Engineering & Technology. In addition to the Sunway systems, BHPCC also owns the YINHE III (produced in 1997), Dawning, IBM SP, and Cray supercomputers. BHPCC's computers are used for China's weather information net and the connection between China telecom and the internet of Computer Network Information Center, Chinese Academy of Sciences (CNIC, CAS).

BHPCC has two computers at the Shanghai Supercomputer Center whose specifications are as follows:

SW-64P

Peak Performance	302.4Gflops
Computing Nodes	32 Dual-processor nodes
Service Nodes	1 Dual-processor nodes
CPU	Intel P4 Xeon, 2.4 GHz,66 CPU totally
System Memory	66GB

System Storage	2.7TB
Architecture	Cluster, Gig-Ethernet
Operating System	Redhat Linux 7.3
SW-I	
Peak Performance	384GFLOPS
Computing Nodes	96 computing nodes each node composed of 4CPUs and 1 message-processing CPU
CPU	Alpha, 500MHZ, 480 CPUs totally
Front End Computer	6 Alpha servers
System Memory	48GB
System Storage	1.28TB
I/O Nodes	16 nodes
Architecture	MPP
Operating System	64bits UNIX

3. National Research Center of Parallel Computer Engineering & Technology

The State Scientific and Technological Committee founded the National Research Center of Parallel Computer Engineering & Technology (NRPCET) in 1992, and it opened in 1996. The NRPCET headquarters is located in the new Beijing high technology development zone, and the director, Professor Jin Yilian, is a well-known computer expert from the Chinese Academy of Engineering. NRPCET's mission is to develop commercialized parallel computer systems and to gradually form an s Chinese High Performance Computer (HPC) manufacturing industry for both the domestic and overseas markets.

NRPCET is supported by the Computing Technology Institute of the Chinese Science Academy and Jiangnan Institute of Computing Technology. NRPCET applies the technology from these two entities into commercialized products. These technology resources combined with NRPCET's application R&D make them the leading Chinese supercomputer manufacturers in China.

4. Lenovo

Lenovo is the largest computer manufacturer in China. This is the Chinese company in this sector with the greatest amount of foreign cooperation.

V. Major Achievements in the Chinese Supercomputing Industry

- In October 1999, the first SunWay-I supercomputer was installed in the State Meteorological Agency to serve in weather forecasting. The Beijing HPC Application Center was founded based on this system.
- In January 2001, the Shanghai Supercomputing Center was founded. The second Sunway-I parallel supercomputer is the main computer system at the center. This Supercomputing Center will extend the wide range of HPC applications to various fields in the eastern China.
- The Sunway supercomputer is a large-scale scalable parallel computer system, with a peak speed of 384GFLOPS. The system's principal technical indexes come up to advanced world standards. The successful development of Sunway supercomputers enables China to register as the third country with the ability to develop large-scale HPC systems after the U.S. and Japan.
- The development of application systems has also advanced. Since the founding of the Beijing HPC Application Center, nearly 100 items of large-scale and medium-scale application software has been developed for dozens of entities in the petroleum industry, meteorology, aviation, life science, science research and national defense.
- Serialized production lines have been formed in the aspects of peripheral devices and information security, such as disk arrays, security routers, encryption equipment and firewalls. Those products have been applied to various fields and they are now taking more important roles in their own application.

VI. Chinese and Foreign Cooperation

In October 2004 Lenovo and Bull (France) announced the launching of a five-year co-operation in which Bull will provide Lenovo with NovaScale 5000 and 6000 server series based on Intel Itanium 2 processors and its FAME (Flexible Architecture for Multiple Environments) technology. Lenovo will market these servers throughout China, for Enterprise Database and Business Intelligence applications, Enterprise Resource Planning (ERP), Internet-based application servers and HPC.

In an extension of the co-operation agreement signed in Paris on January 28th, 2004 during the State visit of Chinese President Hu Jintao, the French CEA and the Chinese Ministry of Science and Technology (MOST) announced a co-operation agreement in association with Bull and ST Microelectronics around the development of an open computing platform. Taking into account the importance of information technologies in the social and economic development of China, MOST has chosen to develop an open IT platform with 3 major European players.

Based on Linux and an open distributed system, the platform is planned to run in multiple environments, including PCs, servers and mobile devices such as PDAs (personal digital assistants), in order to promote interoperability and the deployment of new on-line services and communications applications.

Bull has also announced the creation of a program within the "New Information Technologies" of the ENST (Higher National School of Telecommunications) and the University of Tongji within the framework of its partnership with Paris Tech. For 5 years, Paris Tech, which groups together 11 large engineering schools in Paris, has been developing in China an important engineer training program in partnership with nine of the main Chinese universities. In joining Paris Tech, Bull demonstrates its contributions to the Chinese higher-level training and the dissemination of French scientific and technical culture to Chinese universities. Within this framework, Bull aims to promote cooperation between the French and Chinese scientific and manufacturing communities.

VII. Summary

Chinese companies clearly already have in place and have access to HPCs above the proposed control level in the new China Policy. Their domestic companies and institutes are providing HPCs at high levels to the Chinese Government and Military. Additionally, Chinese companies are producing proprietary CPUs in China. They have not shown up on the commercial market to date, but this expected to change in the near future.

Part 2: Integrated Circuits

I. List of ECCNs:

3D991: "Software" specially designed for the "development", "production", or "use" of electronic devices or components controlled by 3A991, general purpose electronic equipment controlled by 3A992, or manufacturing and test equipment controlled by 3B991 and 3B992.

3E991: "Technology" for the "development", "production", or "use" of electronic devices or components controlled by 3A991, general purpose electronic equipment controlled by 3A992, or manufacturing and test equipment controlled by 3B991 or 3B992.

Integrated Circuits currently require an export license to China as defined in ECCN 3A001 and the software and technology related to 3A001 is controlled under ECCNs 3D001 and 3E001. Under the proposed new China policy license requirements would be expanded to the software and technology in the ECCNs listed above to produce

integrated circuits controlled under 3A991 for items going to a military end-use as defined in the draft proposal.

II. Overall Chinese Market

According to the U.S. Semiconductor Industry Association (SIA), China is now the third largest market in the world for semiconductors (after Japan and the US), and boasts the world's highest growth rate. China's official statistics show that in 2004, the semiconductor market size was \$35.1 billion, which accounted for about 16.5% of the \$213 billion global total. According to CCID, in 2005, China's IC market reached \$47.3 billion. The strong growth for semiconductors is driven by a large and fast growing domestic manufacturing industry of IT products and equipment. China now boasts the world's second largest electronics manufacturing industry, with total sales revenues of \$329.4 billion in 2004 and \$255.97 billion from January – September 2005.

According to the China Semiconductor Industry Association, by the end of 2004, China had about 50 foundries, 102 testing and packing factories, and 457 design firms. Although some industry insiders believe that there is already an investment bubble in China's semiconductor sector, investment continues to pour into the semiconductor sector due to strong sustained demand, preferential policies in form of tax breaks, government co-investments, and free or cheap land use. In the long run, it is evident that China's reliance on imported chips will decrease with the growth of the local manufacturing industry.

Due to large-scale investment and favorable government policies, Chinese domestic product has grown rapidly since 2000. Most locally-produced products, are low- to-medium end, and cannot effectively compete against imported products. Of domestically produced chips, about 50% are exported to meet overseas demand for low-end products. Local OEM vendors are moving into the semiconductor sector. In 2005, Huawei, ZTE Telecom and Hisense all set up independent subsidiaries focusing on semiconductor product development. According to CCID, Lenovo, China's largest computer manufacturer also released its computer security chip, becoming the fifth manufacturer with proprietary security chips after Atmel, National Semiconductor, Infineon and ST Microelectronics.

A number of new start-ups in chip design are worth noting. Actions Semiconductor, a designer of SoC for MP3 players, reached \$5 million in sales in 2003, increased sales to \$100 million in 2005, and is now listed on NASDAQ. Vimicro Corporation, a design firm specializing in multi-media processing chips, also reached sales of \$100 million in 2005, up from approximately \$12.2 million in 2003.

Despite this growth, China relies on imports to satisfy more than 85% of its current demand for chips, and the major foreign suppliers are already in the market. Among China's top ten suppliers, four are U.S.-based, three are from Europe, two are from South Korea and one is from Japan. The following are the top 10 players in the market, listed in order of market share:

1. Intel
2. Texas Instruments
3. Philip Semiconductor
4. ST Microelectronics
5. Samsung Electronics
6. Hyundai Semiconductor
7. Toshiba
8. Infineon
9. Freescale
10. Micron

III. Chinese Domestic Capabilities

Since the U.S. Government is aware of much of this growth of semiconductor foundries in China, the ECWG lists only the following example:

1. Semiconductor Manufacturing International Corporation (SMIC)

According to SMIC's website and publicly available articles, SMIC is a pure-play IC foundry that offers 0.35 μ m to 90nm IC manufacturing services. Established in 2000, SMIC is headquartered in Shanghai and has three 8-inch fabs including a dedicated copper backend line. SMIC acquired its fourth 8-inch fab facility, Fab 7, located in Tianjin. In Beijing, the foundry also has a 12-inch wafer facility that has been in production since July 2004. In May 2003, Fab 1 was one of the two recipients of the "Top Fab of the Year for 2003" by Semiconductor International. SMIC's joint ventures, a testing and assembly facility in Chengdu with UTAC and the manufacturing of on-chip color filters and micro lenses in Shanghai with Toppan, are also in production.

SMIC's technology capabilities include logic, mixed signal/RF, high-voltage circuits, system-on-chip, embedded and other memories, LCoS, and CIS among others. Key to SMIC's rapid technology development and excellent fab management are a strong R&D team made up of experienced engineers from North America, Europe and Asia, and a network of leading international technology and manufacturing partners.

SMIC provides a full suite of value-added services that include design services, mask making, IC manufacturing, and testing. Packaging and final testing are offered through SMIC's assembly and packaging facility in Chengdu or third-party vendors. With strong internal offerings and collaboration with a global network of design service, IP, Library and EDA providers, SMIC offers its customers wide-ranging and flexible design support. SMIC's mask operation is one of China's most advanced; with 0.5 μ m to 90nm capabilities and a testing facility for logic, mixed

signal and memory devices.

SMIC offers ASIC design services from taking in design specifications, RTL or gate-level netlist, to GDSII file generation. They have taped out numerous multimillion gates chips with first silicon success. Their backend design team can now take customer's RTL to GDS and tackle the timing closure, signal integrity, power integrity, design for manufacturability issues with proven flow and methodologies.

SMIC ASIC service also provides turnkey service which includes front end design, back end design, mask tooling, wafer manufacturing, circuit probing, packaging, final testing, and logistics to deliver the parts.

SMIC can also tap into a global network of more than 20 Design Services Partner Alliance (DSPA) partners for design implementation services. Their DSPA partners are located in the United States, Taiwan, China, Japan, Korea and Europe.

SMIC currently offers design implementation services for logic, mixed-signal and embedded non-volatile memory technologies at the 0.35µm to 0.13µm nodes, to include:

- Logic-level implementation
- Circuit audits and simulations
- Synthesis
- SCAN insertion and ATPG
- Place-and-Route
- RC extraction
- Delay calculation
- Static timing analysis
- Formal verification
- Physical Verification

SMIC technology file support for customers is as follows:

Category	File Type	90µm	0.13µm	0.15µm	0.18µm	0.25µm	0.35µm
DRC/LVS	Calibre (Mentor Graphics)	✓	✓	✓	✓	✓	✓
	Dracula (Cadence)		✓	✓	✓	✓	✓
	Hercules (Synopsys)	✓	✓	✓	✓	✓	✓
RC Extraction	Assura (Cadence)	✓	✓	✓	✓	✓	✓
	StarRCXT (Synopsys)	✓	✓	✓	✓	✓	✓
	HyperExtract (Cadence)		✓	✓	✓	✓	✓
	Fire & Ice (Cadence)		✓	✓	✓	✓	✓
	Dracula LPE (Cadence)		✓	✓	✓	✓	✓
	Assura RCX (Cadence)	✓	✓	✓	✓	✓	✓

	«Calibre (Mentor Graphics)	✓	✓	✓	✓	✓	✓
	Astro (Synopsys)	✓	✓	✓	✓	✓	✓
APR	SE (Cadence)	✓	✓	✓	✓	✓	✓
	First En (Cadence)	✓	✓	✓	✓	✓	✓
	Magma (Magma)		✓	✓	✓		
	Virtuoso (Cadence)	✓	✓	✓	✓	✓	✓
Layout	Laker (Silicon Canvas)	✓	✓	✓	✓	✓	✓
	IC Station (Mentor Graphics)	✓	✓	✓	✓	✓	✓
	✓Available						

Note: Numerous site visits have been conducted at SMIC, and information from those visits supports the information provided above, in that SMIC either is producing or clearly has the capability to produce at the levels described above.

IV. Summary

SMIC is at the high end in capabilities to carry out ASIC design and production in China, but there are a number of foundries in China above the control levels proposed in the draft new China Policy. These foundries were the subject of extensive U.S. Government reviews in the past five years. Controlling levels of ASIC design, production and use software and technology at levels far below the Chinese domestic capabilities would not serve to inhibit Chinese military development.

Part 3: Encryption

I. List of ECCNs:

5A992: Equipment not controlled by 5A002, except mass market encryption commodities and software described in §§ 742.15(b)(1)(i) and 742.15(b)(2); certain “short-range wireless” commodities and software described in § 742.15(b)(3)(ii); and commodities and software with limited cryptographic functionality described in § 742.15(b)(3)(iii).

5D992: “Information Security” “software” not controlled by 5D002, except mass market encryption commodities and software described in §§ 742.15(b)(1)(i) and 742.15(b)(2); certain “short-range wireless” commodities and software described in § 742.15(b)(3)(ii); and commodities and software with limited cryptographic functionality described in § 742.15(b)(3)(iii).

5E992: "Information Security" "technology", not controlled by 5E002.

Under the proposed new China Policy encryption items currently controlled under ECCNs 5A992, 5D992 and 5E992 only for AT reasons would require a license if going to military end-use as defined in the new China Policy.

II. Chinese Domestic Market and Capabilities

As the U.S. Government is very aware, China has been very active in the development and production of encryption software and technology. The best example of this is through a review of the highly publicized and controversial Chinese Wireless LAN Authentication and Privacy Infrastructure (WAPI) encryption standard. In late 2003, China announced it would implement the WAPI encryption standard for wireless communications. This standard required that only the Chinese developed WAPI compliant encryption would be allowed in wireless devices in China. The WAPI encryption, which was developed wholly in China, was supplied to the following Chinese companies:

- Shenzhen Mingwah Aohan Technology (M&W)
Contact Han Yejin, 13901939911 or hyq@mwcad.com
- Wuxi Jiangnan Computer Technology Research Institute
Chai Yali, 13906195091
- Legend Holdings
Sun Guobin, 13501358051 sungb@lenovo.com
- Shanghai Koal Software
Hu Shihui, 13910396333
- Shenzhen Neusoft
Cao Bin, 13609822978, caob@neusoft.com
- Xingtang International
Huang Degen, 13901325955
- Huawei Technologies
Yao Zhenghui 13823539749 or Lan Wenguang 13560786516
- Chengdu Westone Information Industry Inc.
Lei Limin, 13911083956 lei@westone.com
- Xi'an IWNCOMM Co. Ltd.
Yang Yu 6873-1184 ext. 305
- Shenzhen ZTE
Sun Yingtong 13302478960 (Shenzhen), 13901388960 (Beijing) ytsun@sdic.com.cn
- Beijing Watch Data
Li Yong 13311121068 li-yong@watchdata.com.cn
- Beijing Newsy Technology Group

Zhu Wei 13911775962, zhuwei@newsy.com.cn

- Beijing Skynet
Zhang Feng 13801281673, 010-82357210, fengzhang@skynet.net.cn
- Tianjin Guorui Digital Security System
Li Zhongxian 13501262861(Tianjin), lzx@ncs-cyber.com.cn
- Shanghai Weihao Information Security
Zhu Qi & Chen Yuying, 13301616158(Shanghai), 021-5808-4811
- Langchao Electronics Information Technology Company
Kang Yulu 13606405089, ylkang@langchao.com.cn
- Wuhan Tianyu
Wang Tongyang 13329735912 (Wuhan) wty@whty.com.cn
- Sichuan SCU-NESEC Infosec Co., Ltd
Gong Haipeng 13808019944 (Sichuan) yygong@vip.sina.com.cn
- Beijing Topsec
He Weidong 13901034553, 010-82611122x6818, hwd@topsec.com.cn
- Jilin Information Technologies
Gong Jianping 13911586168(Jilin), jianping_gong@jlt.com.cn
- Yiyang Xintong
Yu Yang 13701138718 010 88129999x8276, Jennifer@boco.com.cn
- Jinan De An Computer Technology
Xue Fengying 13065082718 (Jinan) 0531-8037711
- Hubei Saint
Jin Yunqing 13971656505(Hubei) 027-87528082, jinyq@263.net
- Wuhan Andin
Yu Xianxuan 13707171398 (Wuhan) xxyu@andin.net

Foreign companies would have had to partner with one of the above listed companies in order to have the WAPI encryption placed in their products. In 2004 it became clear that China was not completely ready to implement this standard, so implementation was delayed until June 1, 2004. In a meeting with the Xi'an-based China Broadband Wireless IP Standard Group, which developed the new standard, foreign industry associations and companies learned that WAPI contained a number of problems. The Chinese claimed that WAPI has been remedied security holes in the Wireless Equivalent Privacy (WEP) protocol, which is part of the 802.11 wireless LAN standard. The international community, however, believes WAPI replicates many of the problems already solved for WEP. Multinational companies believe that WAPI would actually be insecure and only create a burden for manufacturers, who will have to meet one standard for China and another for the rest of the world.

III. WAPI

The WAPI situation, even with its implementation problems, demonstrates that China has an active encryption industry that is producing encryption products at an international level.

The list of companies the Chinese certified to implement WAPI encryption provides a view of the extent of Chinese encryption capabilities. As an example, details on one of these companies are provided below:

1. Beijing TOPSEC

Beijing TOPSEC ("TOPSEC") is a leader in the Chinese Network Security Industry. It is the largest domestic integrated provider of information security products and services. Founded in 1995 and headquartered in Beijing, TOPSEC has established three Research and Development centers that are located in Beijing, Wuhan and Chengdu. It also has branches in 32 cities and has over 1000 staff on information security, including R&D professionals, consultants and service staff.

In 1996, TOPSEC launched its firewall product, which was the first set of firewall products with independent copyright in China. After this, TOPSEC introduced security products such as VPN, IDS, filtering gateways, and security auditing and management. In 2001, TOPSEC organized and set up the TOPSEC security standard of interaction protocols, and put forward complete, collaborative, efficient and easy to manage security solutions that feature centralized management and auditing. At the end of 2004, TOPSEC took the lead in bringing forward the concept of Trusted Network Architecture (TNA) in the industry, emphasizing that the trusted security management should be the core of security construction, which included overall security management through multi-layered active recovery and colligated defense.

From 2000 to 2004, TOPSEC was the top Chinese domestic security company by market share. TOPSEC's annual market share of firewall in 2004 exceeded 16%, ranking it first among the domestic and international security companies. Up to now, TOPSEC has over 10,000 customers across the country, covering government, telecommunication, finance, military, energy, traffic, education, logistics, postal service and manufacturing.

As an example of TOPSEC's ability, the following details one their firewall products:

- **NGFW4000-UF (high Firewall):** The NetGuard Firewall 4000-UF is a new generation of firewall products by TOPSEC. The NGFW 4000-UF constructs a secure, efficient, reliable, widely applied, convenient and flexible firewall

system that is especially suitable for Gigabit networks serving as backbones for large or medium size enterprises having complicated structures, rich applications, broad bandwidth and heavy traffic.

Main Characteristics

- Based on an exclusive hardware platform and operating system.
- Implements the session inspection function and performs the access control to the application layer in OS kernel.
- Has at least 7 LAN interfaces, and this number can be extended by a plug-and-play module
- Can work in multiple work modes, including route mode, transparent mode, and route/transparent mode.
- Supports the Net Address Translation (NAT), including dynamic, static, two-way, and reserved mode.
- The route can be configured based on the source and destination addresses. Thus, the firewall can choose a different egress for different internal hosts.
- The source and the action can be bound together to define an access policy in which there are many different sources for the same destination.
- Similar to the central management IP interface of a switch, administrators can manage the firewall via any interface. Meanwhile, all the interfaces in the firewall can be used to route traffic.
- Supports URL filtering, content filtering, and keyword filtering.
- The firewall can be prevented from Ping of Death, TCP SYN floods, TCP/UDP port scan, IP spoof (ARP spoof), route attack (based on ICMP, RIP, or source), DNS spoof, and TCP connection spoof. Real-time monitor and alarm are also available.
- The firewall can be managed via serial port, GUI, and Telnet. All the communication between the manager and the firewall are encrypted by the SSL or SSH mechanism to enhance the security. It supports multiple management modes, including local, remote, and central management.
- Supports the most common used route protocols, such as OSPF, RIP, and RIPII.
- Supports IPX, NETBEUI, VOD, H.323v1/v2, and SSH.
- Supports DHCP and VLAN and can route the traffic between VLANs.
- Supports SNMP to be managed by the third party network management software.
- Can work in hot-redundancy and support STP.
- Supports the OTP Radius, Tacacs, and web-based certification.

Technical Index

Produce Name	Product Type	Throughput	Interface Description
Net Guard Firewall	NGFW4000-UF	1000M	One 10/100/1000BASE-T port, Six GBIC Model, Support Interface Type [SX/LX/ZX/T/AUTO]
	NGFW 4000-UF-VPN(S)	1000M	One 10/100/1000BASE-T port, Six GBIC Model, Support Interface Type [SX/LX/ZX/T/AUTO]
	NGFW 4000-UF-VPN(E)	1000M	One 10/100/1000BASE-T port, Six GBIC Model, Support Interface Type [SX/LX/ZX/T/AUTO]

System Components

- NG FW4000 (UF) (hardware): a high-class communication protection and control system based on secured operation system platform with independent copyright.
- Log Manager (software): a management software operating under systems of Windows 98 and Windows 2000 and being used to perform the visual auditing of visit log information provided by NG FW4000 (UF).

- FW Manager (software): a management software operating under systems of Windows 98 and Windows 2000 and being used to perform central management configuration of a number of NG FW4000 (UF) firewalls distributed in different networks

Hardware Configuration

Electrical Specifications

- a. Power supply: AC 110/220V 50/60HZ, 3.0A (max), 260W (max)
- b. Environment Regulations:

Operating Temperature: 0 - 45 Degrees Centigrade
 Non-operating Temperature: -20 - 65 Degrees Centigrade
 Relative humidity: 10 - 90%@40 Degrees Centigrade, non-condensation

National Standards:

GB/T18336-2001
 GB/T18019-1999
 GB/T18020-1999

Referenced Safety Regulations and Standards:

UL 1950
 EN 41003
 AS/NZS 3260
 AS/NZS 3548 Class A
 CSA Class A
 FCC Class A
 EN 60555-2
 VCCI (ClassB)
 Ability of anti-interference
 IEC 1000 4 2 (ESD)
 IEC 1000 4 3 (Radiation sensitiveness)
 IEC 1000 4 4 (Electric transient)
 IEC 1000 4 5 (Power supply)
 IEC 1000 3 2 (Harmonic)
 IEC 1000 4 5 (Power)

Certificates

- Sales License for Computer Information System Security Products by Ministry of National Security, License Number: XKC33181
- Sales License for Computer Information System Security Products by Ministry of National Security, License Number: XKC33181, number: CNISTEC2002TY1P
- Certificate for Military Information Security Products (0081)

IV. Summary

The WAPI standard and the example of TOPSEC provide an overview of Chinese encryption capabilities. It also demonstrates that China does not seek foreign encryption for its products going to government and military end-users. China repeatedly during the

WAPI discussions expressed its desire to have Chinese produced encryption in all products in China. As can be seen from TOPSEC's certification, it and other Chinese companies are certified to supply encryption products to the Chinese military and security apparatus. The ECWG does not know of any foreign companies certified to supply encryption to government and military organizations in China. The ECWG, therefore, respectfully submits that current licensing requirements and license exceptions already fulfill U.S. policy requirements for preventing material contributions to Chinese military capabilities.

CHAPTER IV

Information Security and Telecommunications (II): Telecom Equipment, Test Equipment, and Software

I. List of ECCNs:

5A991: Limited to items controlled by 5A991.a., 5A991.b.5., 5A991.b.7. and 5A991.f.

5B991: Telecommunications test equipment, n.e.s.

5D991: "Software" specially designed or modified for the "development", "production", or "use" of equipment controlled by 5A991 and 5B991.

5E991: "Technology" for the "development", "production" or "use" of equipment controlled by 5A991 or 5B991, or "software" controlled by 5D991, and other "technologies" as follows (see List of Items Controlled).

Telecommunication systems, equipment and components currently require an export license to China as defined in ECCN 5A001, and the software and technology related to 5A001 is controlled under ECCNs 5D001 and 5E001. Under the Proposed Rule license requirements would be expanded to 5A991, 5D991 and 5E991 for items going to a military end-use as defined in the draft proposal.

The Proposed Rule also adds controls to items falling under ECCN 5B991, which includes *all* telecommunications equipment without any listed exceptions. The inclusion of all "telecommunications test equipment, n.e.s." under ECCN 5B991 is very broad in its coverage. As it stands, this section does not distinguish between the layers and technical levels within the telecommunications and information network testing equipment.

II. Overall China Market

As China's economy continues to grow, the domestic commercial demand for electronic network and telecommunications measurement and testing instruments is on the rise. In particular, development and growth of the mobile phone and telecom network providers, emergency response infrastructure, wireless LAN networks, and digital TV and communications markets is opening opportunities for both foreign and domestic Chinese companies in the Chinese non-destructive test equipment industry.

In 2005, China's Ministry of Information Industry (MII), the Chinese government regulator for the telecommunications industry, projected that Chinese telecom carriers will invest \$25 billion to recruit 45 million fixed line telephone subscribers and 58 million cellular phone users.¹⁶

China's two mobile operators, China Mobile and China Unicom, will continue to expand their mobile networks in 2005. This expansion will increase their demand for base stations, switches and network optimization solutions. Chinese fixed line telecom operators, China Telecom, China Netcom and China Tie Tong, also plan to expand their wireless LAN networks, ADSL and other broadband access technologies in China.

Chinese telecom equipment manufacturers such as Huawei Technologies and ZTE are rapidly growing their market share in China and turning to South American, Southeast Asian and African countries for international business opportunities. These Chinese companies are increasing their business in the telecommunications equipment business, which was previously dominated by foreign companies. For more information on these telecom equipment companies, refer to Chapter III of this report.

With increasing awareness of the importance of government's ability to manage critical situations, there is a growing demand for emergency response systems in China. China has not yet developed a national technical standard for its emergency response system, but large Chinese cities such as Beijing, Tianjin, Nanning and Chengdu have started building public safety networks by introducing TETRA-based digital trunking systems that integrate with their existing analogue systems. More Chinese cities will follow in 2005.¹⁷

With the expansion of Chinese telecom equipment manufacturers, telecom carriers, and emergency response systems, Chinese companies will require more and more testing equipment to ensure maximum efficiency in these networks. Continued growth in this industry sector will fuel greater demand for telecommunication and network testing equipment.

III. Chinese Domestic Availability

The market data in China demonstrates that a large number of Chinese companies have achieved development and production capability in telecommunications equipment, testing equipment across technology layers, and software and related technology.

¹⁶ U.S. Commercial Service, "Computers and Telecommunications: Industry Overview Telecommunications," <<http://www.buyusa.gov/china/en/computers.html>> Oct 2006.

¹⁷ Ibid and Nokia Press Release, "Nokia and Beijing Just Top to build Beijing's government shared TETRA network for use during the 2008 Olympics." April 2003. <http://press.nokia.com/PR/200304/897510_5.html> Nov 2006.

A. Telecommunications Systems and Equipment

Chinese companies indigenously develop and produce equipment in the application, datalink and physical layers of technology. Huawei and ZTE are two examples of domestic Chinese companies that produce telecommunications systems and equipment, but these two companies also produce some testing equipment.

1. Huawei Technologies (Huawei)

Huawei Technologies (Huawei) is a leader in providing next generation telecommunications networks. The company provides innovative and customized products, services and solutions to create long-term value and potential growth for its customers. They have numerous products that compete at or near cutting edge western technology levels. Following is a sampling of some these top end products. A detailed specification sheet for each product is attached in Attachment B.

- Quidway S8500 Series 10G Multi-Service Core Routing Switch
- Quidway NetEngine 5000E Core Router
- Viewpoint 8210
- SmartAX MA5200F-2000 Broadband IP Access Equipment
- OptiX Metro 5000 Optical Transmission Equipment
- Eudemon 1000/500/200/100

In the Telecom Attachment there are detailed specifications of this equipment.

Additionally, Huawei has partnered with numerous foreign companies as customers and as strategic partners. A partial list of these partners includes:

- IBM
- Hay Group
- Price Waterhouse Coopers
- FhG
- Mercer
- Agere Systems
- Intel
- Motorola
- Sun Microsystems
- Qualcomm
- Microsoft
- Infineon
- Siemens
- 3Com
- OSS Partners
- BMC
- Cramer
- HP
- Inspur
- Metasolv
- Micromuse
- Vallent

2. ZTE

ZTE was founded in 1985, with global headquarters in Shenzhen China, and has operations in more than 100 countries. ZTE has a complete telecommunications product line, covering every vertical sector of the wireline, wireless and terminal markets. It has an independent R&D capability and is capable of developing and producing market-leading, first-class technologies in wireless, switching, access, optical transmission, data, handsets and telecommunications software.

ZTE commits around 10% of its annual revenue to research and development and takes a leading role in a wide range of international bodies developing emerging telecoms standards. ZTE is the fastest growing telecom equipment supplier in the world, and China's only listed telecom manufacturer, with shares publicly traded on both the Hong Kong and Shenzhen Stock Exchange. In 2005, ZTE had sales revenue of RMB 21.5 billion and 27,000 employees worldwide.

ZTE was ranked as one of the 'Top 100 Information Technology Companies' by *Business Week* in 2005 and has teamed up with numerous global telecom companies, such as Alcatel, Ericsson, France Telecom and Portugal Telecom. It is China's largest wireless equipment provider with a global wireless capacity exceeding 100 million lines and has become one of the three largest DSLAM suppliers worldwide (*Source: Gartner*)

A sampling of their top of the line products includes:

- ZXJ10 Series Switches
- ZXR10 W800A Wireless Access
- ZXR10 T1200 Carrier Class Router

The Telecom Attachment contains the technical specifications for these products.

B. Telecommunications Testing Equipment

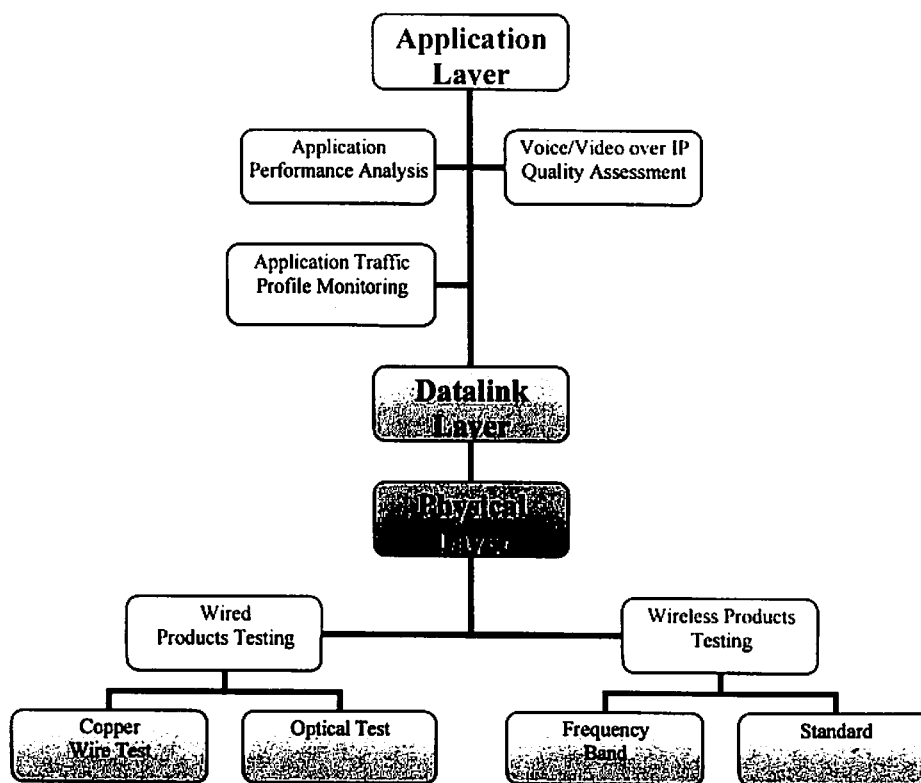
One testing device is difficult to compare against another device because each instrument may provide a single function in one device or a system of testing functions packaged in one device. Different companies package their technology in different systems and in various combinations. Each instrument may contain a number of different combinations of these functions. Furthermore, the technical level of each component may vary from one instrument to another.

Recognizing the difficulties in comparing non-destructive testing equipment, this chapter instead addresses the technology for the various equipment types

based on the breadth of functionality. In this way the report identifies the capabilities inherently available in China based on technical ability as opposed to based on configuration.

Telecommunications and Information Network Testing Equipment can be divided into three levels: the application layer, the datalink layer and the physical layer. The physical layer describes the medium through which communication signals are carried from the source to the destination (i.e. cable, airwave, etc.). The datalink layer describes the way that the communication signal is placed on the physical layer (i.e. GSM, 3G, FrameRelay, Ethernet, etc.), and the application layer describes the actual data exchange between various components of the communication system (i.e. VoIP, Video, ERP data, etc.). China has developed the technology to perform testing functions at all three of these levels. The chart below maps out these layers and their sub-categories in a simplified manner:

Figure 1: Telecommunications and Information Network Testing Technology Layers



The market data shows that a number of Chinese companies have the capability to produce telecommunications test equipment at various layers of the information network and telecommunications system. These Chinese

companies are reaching a technical capability on par with the technology that is commercially available through other foreign sources.

Application layer testing includes three sub-categories: application profile monitoring, application performance analysis, and voice/video over internet protocol (VoIP) quality analysis. Key advanced technology used in the application layer analysis include: NetFlow, response Time measurement, and R-Factor/PSQM measurement for Voice and Video quality assessment. Zhong Chuang, Well Telecom, and the 41st Institute are examples of companies that have the technology to produce testing equipment in these categories of application layer testing.

Zhong Chuang, Well Telecom, the 41st Institute, and Shaanxi Guigu Telecommunications Equipment Co., Ltd. produce equipment at the datalink layer. Finally, Zhong Chuang, the 41st Institute Shaanxi Guigu, Shandong Senter, and Shineway Technologies can all produce equipment at the physical layer.

1. Beijing Zhong Chuang Telecom Test Co., Ltd. (ZCTT)

Beijing Zhong Chuang Telecom Test Co., Ltd. (ZCTT) was established in 1995 and went public in 2003. ZCTT is a high-tech enterprise that specializes in the R&D, production, and marketing of communications testing equipment. ZCTT customizes its products for telecom carriers, distributors, service suppliers and component manufacturers. High investment in technology research and scientific innovation has put ZCTT among the top Chinese manufacturers, with high level testing equipment for both domestic and international markets. At the end of 2005, ZCTT purchased the Chinese company Well Telecom. Information about Well Telecom is included below the description of ZCTT products, but now these products, formerly made by Well Telecom, belong to ZCTT.

- **NetPecker-3G Network Test Instrument:** NetPecker-3G network test instrument, produced by Zhong Chuang Telecom Test Co. Ltd., is designed for monitoring, maintaining and optimizing UMTS network, network equipments and standard network interfaces. Built on highly efficient platform with mature technology, NetPecker-3G supports a wide range of protocols such as UMTS R99, R4, R5, GPRS, GSM, and TD-SCDMA, etc. It can simultaneously monitor all interfaces of lu, lub, and lur. It provides flexible options for users to edit protocol stack and configure interface modules to simultaneously monitor multi-layer protocols on different interfaces. It supports all 3G-protocol analysis, call loss analysis, call trace, multi-interface correlation analysis, standard index statistics, etc.

Detailed technical specifications for this product are included below:

Electric Interface

Interface type	No. of interfaces	Speed	Frame Structure	Encoding	Synchronous Mechanism	Standard
E1 Electric interface (2Mbit/s)	Rx: 8 Tx: 4	2.048MHz \pm 50ppm (TX), 2.048MHz \pm 50ppm (RX)	PCM30, PCM31, PCM31CRC and unframe	HDB3, AMI	Internal clock, circuit resumes, SETS	Comply with ITU-T G.703, G.704, G.706 and G.823 protocols
T1 interface	Rx: 8 Tx: 4	1.544Mbit/s Nx2.048Mbps (N=1-8), n X 64kbps	IMA cell flow	B8ZS, AMI		Comply with ITU-T G.703, G.704, G.706 and G.823 protocols

STM-1/OC3

Optical interface module	Interface rate: 155.520Mbps
	Tx optical power: -5~0dBm
	Rx optical power sensitivity: -37dBm
	Wavelength: 850nm/1310nm/1550nm (changeable)
	Mode: Single mold (SM) / multiple mold (changeable)
	Interface type: (LC)

- NetPecker-NGN Next Generation Network Tester:** NetPecker-NGN network composite tester is developed by ZCTT as the comprehensive simulation, monitoring, network maintenance and network optimization tools designed specifically for various major telecom operators, soft switch network equipment manufacturers, and R & D institutions. This tester provides a full NGN network test implementation solution, which can meet current NGN network maintenance demands and meet demands for the future network development trends.

Detailed specifications for this product are included below:

Specifications

Software technical specification

1. Protocols

MGC Protocol, H.248/MEGACO protocol, SIP protocol, SIP-T/SIP-I protocol, BICC protocol, SIGTRAN protocol, ISUP protocol, SCTP protocol and RTP/RTCP protocols

2. Tester-supported coding modes include:

G.711, G.721, G.722, G.723, G.723.1, G.726, G.728, G.729AB, PCMU, PCMA

Hardware technical specification

1. Network interfaces

- ※ 10/100M Base-T Ethernet interface
 - ※ 75/120 Ohm compatible E1 acquisition interface
 - ※ Analogue line interface
 - ※ Time stamp accuracy: 100ns
- ##### 2. Physical property
- Work power supply: AC simulation 220V \pm 10%, 48Hz-networkHz
 - Work temperature: -10°C ~ +45°C
 - Storage temperature: -20°C ~ +70°C
 - Reliability: MTBF is greater than 30,000 hours
 - Processing capacity: 10M/100M line speed capture

- **NetCompass-SS7 No.7 Signaling Network Centralized Monitoring System:** NetCompass-SS7 is composed of a front-end acquisition computer, remote station, central station and WAN. The system adopts the distributed modular monitoring acquisition, distributed analytical processing and centralized monitoring & maintenance, which guarantees the system's high reliability, expandability, openness and safety, and also ensures the system has no bottleneck when transferring and processing data. The signaling acquisition module, access hardware module and system application software modules of NetCompass-SS7 signaling network centralized monitoring system are developed originally by ZCTT to enable future upgrading and maintenance. The system has won State Science & Technology Progress Second Class Award.

Function and Specification details for this product are included below:

Functions

The main functions of NetCompass-SS7 monitoring system include:

- **Whole network fault alarm monitoring function:** Monitor signaling link network alarm messages and inform maintenance staffs by automatic, accurate and timely alarm information according to the preset alarm thresholds;
- **Network performance analysis:** Statistical analysis of signaling network link and link-set performance indicators such as loading etc;
- **The entire process online real-time tests:** Implement call tracing function, signaling link real-time test function and etc;
- **Call service analysis:** Implement statistical analysis of inter-network and on-net call service completing rate, call duration and call loss etc;
- **Intelligent network analysis:** implement various sorts of analysis based on Intelligent network in order to carry out intelligent network service quality monitoring, and call tracing for intelligent calls and

statistical analysis of intelligent service traffic. It also offers analytical functions for intelligent network voice traffic billing information and master service economic benefit.

- **GSM/CDMA mobile service analysis:** Implement statistical analytical functions for various indicators such as mobile service, SMS service, wireless network optimization etc;
- **The system maintenance and configuration management:**
The system provides perfect self-management, authority hierarchy management and log management functions, record self alarm and fault information and is able to acquire the operation status of various equipments via system monitoring views so as to analyze self-stability. The system's module-level authority hierarchy controlling could limit each operating staff to specific modules. Perfect log management function can record system utilization and operation information.

Technical Indicators

System supports 256 remote stations, 65536 test links and 128 operation & maintenance terminals

Signaling synthesizing call accuracy: 99.99%; Signal element loss rate: $<10^{-7}$

Support GPS and BITS synchronization modes as well as NTP network synchronization mode, synchronization accuracy: Millisecond

System sets subscriber competence and passwords for guaranteeing system safe operation.

2. Well Telecom

Zhong Chuang Telecom Test Co., Ltd. invested 42.5 million RMB to purchase 100% of the stockholders' rights to Well Telecom. After December 31, 2005, Well Telecom became a subsidiary of ZCTT, which greatly reduced ZCTT's domestic competition in the field and increased its market share.¹⁸

Beijing Well Telecom Technology Corporation was a high-tech enterprise focused on the development and production of equipment for telecom network testing and maintenance. At its peak, Well Telecom employed 150 people, including 110 technical specialists in the fields of telecommunications and computers.

Well Telecom independently developed and patented technology in key telecom fields including: access networks, intelligent networks, mobile networks, IP networks and data networks. Well Telecom's products, such as WTF2000 Analyzer and SS7Mon Monitoring System, are widely used by large Chinese telecom carriers.

Two examples of Well Telecom's network testing equipment are included below:

- **WTF4000-VOIP Integration Analyzer:** WTF4000-VoIP Integration Analyzer was designed according to Chinese IP telephone technique and IP telephone gateway interconnecting technique criterion and TCP/IP, ITU-T protocol standard. This analyzer adopts specific packet capture and filter to confirm data security in full load network bandwidth testing. It support IP, H323 series protocol and suitable for operation, O&M, troubleshooting and status analysis of IP network.

Technical parameter

Work power source: Exchanges 220V \pm 10%, 48Hz-66Hz
Operating temperature: -10 °C ~ +45 °C
Memory temperature: -20 °C ~ +70 °C
Reliability: MTBF is bigger than for 20,000 hours
Test connection: 10M/100M Ethernet
Handling ability: 10M/100M line fast capture
When stamp precision: 100ns

Instrument arrangement

Main processor: PIV2.4, the 512M memory, the 80G hard disk
System software: Chinese Windows 2,000
Test module: 10/100M auto-adapted Ethernet card
The E1 data acquisition card (optional)

¹⁸ 中国易富网, "中创信测: 业绩回归 中短线关注" 20 Oct 2006.

<<http://www.eefoo.com/xxzyContent/2006/1020/200610205144.asp>> Nov 2006; and Sohu.com Inc., "中创信测 4250 万元收购沃泰丰," 30 Mar 2006, <<http://business.sohu.com/20060330/n242556251.shtml>> Nov 2006.

The SS7 letter command gathers the card (optional)

- **IP Integrated Digital Network Analyzer:** This integrated network analyzer uses advanced industry standard module designs, and operates on a Windows 2000-based platform. The analyzer monitors various characteristics of the network in real time including: network security, current capacity, performance, etc. It is suitable for large and medium enterprise network tests.

Technical parameter

Work power source: Exchanges 220V ± 10%, 48Hz-66Hz

Operating temperature: -10 °C ~ + 45 °C

Memory temperature: -20 °C ~ + 70 °C

Reliability: MTBF is bigger than for 20,000 hours

Test connection: 10M/100M Ethernet

Handling ability: 10M/100M line fast capture

When stamp precision: 100ns

Instrument arrangement

Main processor: PIV 2.4, the 512M memory, the 80G hard disk

System software: Chinese Windows 2.000

Test module: 10/100M auto-adapted Ethernet card

The E1 data acquisition card (optional)

The SS7 letter command gathers the card (optional)

3. The 41st Institute of China Electronic Technology Group Corporation (41st Institute)

The 41st Institute of China Electronic Technology Group Corporation (41st Institute) was formerly a professional electronic measurement instrument institute under the Ministry of Information Industry (MII) in the national defense industry. The 41st Institute describes its business scope as the research, advanced design, testing, and production of electronic measurement instruments, automatic measuring systems and various applied electronic products.

Products developed and manufactured by the 41st Institute are rated at a high technology level for both military and commercial end-users. According to an interview with the institute, products are indigenously researched and developed in-house. The institute has received numerous patents and national awards for its products.

Of the more than 300 items that the 41st Institute researched and developed during the Eighth and Ninth Five-Year Plans, about 100 were military products and about 200 were civilian products. Four items won national awards and about 60 items won ministerial and provincial science and technology progress awards. Some products have been put into mass production and widely applied to such top-end fields as microwave, millimeter wave, optical fiber, digital communications and radar, satellite and electronic warfare in national defense, research, communications and educational industries. The 41st Institute has reached the international

advanced level in many of these products and has won a number of international bids for testing instruments of optical fiber communication trunk.

While the institute has engaged in many Chinese government and military projects, it has also achieved success in the development of civilian products. It has developed such pillar products as electronic testing instrument, incubation equipment, communications equipment, car washing equipment, fire alarm system and cigarette control system, and undertaken various electronic system projects in industrial automation control and electronic technical application, combining military products with civilian products and achieving notable results.

Several examples of the commercial 41st Institute products are included below:

- **AV5211 Ethernet Analyzer:** The AV5211 Ethernet analyzer is a basic network analyzing system to test local area networks. It is used in network and network equipment R&D, production, approval, and service. The AV5211 analyzes performance, current capacity, protocol and compatibility.
- **AV5271 ATM Analyzer:** Portable and modular-structured, AV5271 ATM analyzer has physical interfaces including dual-path E1, E3, STM-1 electrical or STM-1 optical. The analyzer is capable of ATM service simulation, network damage simulation, GCRA service restoration and test, O.191 QoS test, cell filter and acquisition, UNI/NNI protocol decode and comprehensive physical layer error code and alarm test. It can be applied in R&D of ATM equipment, building, operation and maintenance of ATM network.
- **AV5237 Telecom / Datacom Analyzer:** The AV5237 Telecom/Datacom Analyzer combines a telecom analyzer and a datacom analyzer for use in telecom and datacom test at rates from 50b/s to 2Mb/s. It has multi-interface capability, can be configured as a DCE or a DTE and has a wide range of rates, carrying out transmission capability test, function test, electrical parameter test and CAS monitor. Measurement parameter: Error, Error Performance Analysis, slips, alarms, interval monitoring, 64kb/s Channel frequency and level, circular delay, duplication, duplication release and signal command. The AV5237 can carry out PCM transmission testing at sub-64kb/s, 64kb/s, N*64kb/s, 2.048Mb/s. It also provides datacom testing at rates from 50b/s up to 2Mb/s. The test set is used in development and production of communication, installation, authentication, operation and maintenance of telecommunication network.
- **AV5232E Bit Error Ratio Tester:** The AV5232E Bit Error Ratio Tester is used in the error measurement and error performance analysis for 50b/s ~ 2Mb/s data communication and 2Mb/s, 8Mb/s telecommunication systems. The measurement and analysis conforms to ITU-T G.703, G.151, G.821 recommendation. It is used in the digital/data communication networks and the development, production, construction, maintenance of the communication equipment.

4. Shaanxi Guigu Telecommunications Equipment Co., Ltd.

The Shaanxi Guigu Telecommunications Equipment Co., Ltd., established in Xi'an city in 1993, is a high-technology enterprise focused on the scientific research, production, and sale of network maintenance and test equipment. Shaanxi Guigu has engaged in technical cooperation with Chinese universities and scientific research institutes, such as the Quantitative Measurement Center of the Ministry of Information Industry, Xi'an Jiaotong University, Xidian University (XDU), Northwestern Polytechnic University, Xi'an Institute of Posts & Telecoms, Datang Telecom, and Photomechanical Institute. This cooperation has increase the quality and innovation of Guigu's product R&D.

- **SGT-8B Telecommunication Cable Fault Tester:** Adopted with the advanced international electron measuring technique, and the integration of pulse-reflection principle, intellectual electric-bridge testing principle and advanced single chip technique. SGT-8B tester is applicable to the pinpointing position of line disconnection, mingled-crossed line, the faults of electric, defective insulation and other faults of all the city cables, HF cables and coaxial cables. It plays a very important role in line maintenance and construction carried out by telecom departments.

Technical Specifications

Pulse-reflection testing method:

- * Fully-automatic measuring range: 0~8km
- * Measurement accuracy:
1m when measuring range is less than 2km
8m when measuring range is more than 2km
- * Blind zone test: 0m
- * Pulse width: 60ns-10 μ s self-adjustment

Electric bridge testing method:

- * Test defective-insulation resistance, range of 0~30M Ω
- * Testing length: 9999m (non-segmented); 9999m \times 3 segment, segmented
- * Testing error: 1% \times whole-line length
- * Possess the functions of megohm meter and ohmic meter
- * Power consumption: 2.5W
- * Volume: 240 \times 160 \times 160mm
- * Weight: 2Kg
- * Operation Ambient temperature: -15 $^{\circ}$ C~-50 $^{\circ}$ C

- **SGT-4C Optical Power Meter:** SGT-4C Optical Power Meter, primarily used for measurement the power of continuous light signal, is controlled by the SCM microprocessor. It is applicable extensively to the construction and maintenance of the optic cable, fiber optic correspondence, fiber optic transducer and the field of fiber-optic CATV etc. SGT-4C optical power meter adopt advanced cooled mold craft mold, beautiful and durable.

Parameter	Unit	Technique index			
Type		SGT-4C01	SGT-4C02	SGT-4C03	SGT-4C04
Detector type		InGaAs			

Wavelength range	nm	1600~1700			800~1700
Work wavelength	nm	1300, 1310, 1480, 1550			850, 1300, 1310, 1480, 1550
Measure range	dBm	-70~-10	-50~-20	-50~-30	-70~-10
	W	0.1nW~10mW	10nW~100mW	10nW~1W	0.1nW~10mW
Measure accuracy		±5%			
Optic interface		FC, ST, SC adapter			
Resolution		dBm:0.01dBm W:(0.1~1)%			
Power supply		9V × 1 the charged battery, extra power supply			
Power	mW	30 mW			
Operating temperature	℃	0~+40			
Storage temperature	℃	-40~+70			
Size (L×W×H)	mm	30×80×170			
Weight	Kg	0.25			

- MPT2000E CDMA Protocol Analyzer:** MPT-2000E is a high-performance signaling analyzer which is specially used in installation, maintenance, fault diagnosis for telecommunication signaling network and equipments; it can provide a comprehensive inspection function for SS7, ISDN, V5.x, X.25 in wire & wireless signaling network; and it can also be used to check fixed network, cut-in network, GSM network of signaling and verification of new business opening (such as AIN) and other fields. MPT-2000E is designed to be a signaling analyzer system of multi-homing (32 signaling link), multi-protocol (can analyze several protocols at one time). The inspected links support various speed links on E1 interface, which includes 2M high speed signaling link, 64K signaling link, 32K signaling link, 16K signaling link, 8K signaling link and others. The second layer protocol supports MTP and LAPD signal; while the specific high layer application protocol consists of SS7, and especially protocols of IN, GSM, CDMA, GPRS and AN network.

5. Senter Electronic Co., Ltd.

The Senter Electronic Co., Ltd. develops, manufactures and distributes communication maintenance and testing instruments and systems. The company is located in the Zibo New High-Technology Area of Shandong Province. Senter was established in 1996 and approved as a High-Tech enterprise in 1999.

In 2002, Senter built a postdoctoral scientific research workstation for more advanced technology projects. In the domestic market, Senter's main customers are China Telecom, China Mobile and China Union, while in the international market Senter provides test equipment for telecom companies in the UK, India, Thailand, Malaysia and other South Asian countries. Below is a non-comprehensive list of Senter telecom testing equipment:

- **ST330 xDSL Tester:** This ST330 xDSL Tester can perform xDSL, LAN, and DMM Test, as well as Modem Emulation and File Management. xDSL tests include physical layer test, Modem parameter setting, PPPoE attribute, PPPoE dial, network layer test (Ping, Ipconfig, Route, Tracert), loopback test, webpage browsing function. LAN Test: Test Ethernet including netcard attribute, PPPoE attribute, PPPoE dial, network layer test (Ping, Ipconfig, Route, Tracert), webpage browsing, fixative IP scanning, Ftp Client and webpage speed test. DMM Test: Test xDSL line physical layer parameters including loop resistance, capacitance, insulation resistance and voltage. Modem Emulation: Emulate users Modem. File management includes saving records, browsing records, memory key storage and file transmission.

Functions & Specifications

- * Test ASL2+ Transmit parameters, also supporting ADSL, ADSL2 and READSL.
- * DSL line self-identification connection
- * Link and browse webpage to validate network connection.
- * TFT true color LCD with touch screen & Windows interface.
- * Support memory key, mouse and keyboard through USB port.
- * Can be used as ADSL2+ Modem.
- * Windows network test function (Tracert, Ipconfig, and etc)
- * 20 memory capacity to save records & exchange data through Memory key and LAN.
- * Maximal att. distance: 6.5 Km
- * Emulate PC to make dialing test
- * Emulate PC to ping IP address or make domain test
- * Emulate PC to browse webpage
- * Emulate FTP client
- * Test webpage speed by emulating user's PC
- * Track connection path from tester to remote computer or IP address(Tracert)
- * Display IP route list(Route)
- * Display current TCP/IP configuration and refresh DHCP & DNS(Ipconfig)
- * Software upgrading through Memory key or LAN
- * Test physical layer parameters (DMM)
 - AC & DC voltage: 0~400V
 - Loop resistance: 0~20000Ω
 - Capacitance: 0~1000nF
 - Insulation resistance: 0~50MΩ
- * Test ADSL2+ transmission parameters
 - ADSL2+ attenuation: 0~63.5dB
 - ADSL2+ noise margin: 0~32dB
 - ADSL2+ Upstream channel rate: 0~1.2Mbps
 - ADSL2+ Downstream channel rate: 0~24Mbps
 - DMT sub channel bit number: 0~15 (frequency points on different sub channel)
 - ADSL2+ Error number(CRC, HEC, FEC, NCD, OCD)
 - ADSL2+ local output power
 - ADSL2+ status: Signal loss, connection close.
- * Dimension: 166mm×126mm×50mm
- * Battery: Chargeable 2100mAH Li- battery
- * ADSL2+ standards: ITU G.994.1 (G.hs) , ITU G. 992.5, ITU G.992.5 Annex L, Compatible with ADSL, ADSL and READSL.

• **ST321 Network Tester:**

Functions

Wiring Diagram Test to Validate Cable Link Consequence,
 Network Layer Test,
 Cable Length Test, Maximal Distance 150m
 PPPoE Dialing
 DMM Test
 Touching Screen
 System Software Upgrade

Parameters

Test ports	Network layer test RJ45 Physical layer test RJ45
Test cable type	4 pairs non-shield cables & 4 pairs shield cables. (Includes CAT5, CAT5E, CAT6)
The max test distance	150m
DMM Test	
AC & DC voltage (V)	0~400
Loop resistance(Ω)	0~20000
Capacitance (nF)	0~1000
Insulation resistance (M Ω)	0~50
OTHER PARAMETERS	
Memory capacity	20 M
Display	240*320 LCT, touch screen, Windows interface
Power Supply	External: From adapter, 9.6V DC Internal: Rechargeable 2100mAh Li-ion battery
Battery Duration	2h (except Modem status)
Dimension/Weight	166mm*126mm*50mm/0.7kg (With battery)

• **ST230 Line Tester:**

Functions & Features

FSK/DTMF compatibility
 DTMF meets GB/T15279-94
 Dialing number display, caller ID display
 Checking wire pairs function
 Low voltage warning, auto power off and energy-save design
 Compact & simple

Specifications

- * DC voltage: range: 0~260V, error: $\pm 5\%$.
- * Insulation test range: 0~40M Ω display in two levels
- * Ring up user distance: ≤ 2 Km
- * Line break test distance: ≤ 2 Km
- * Monitor resistance: ≥ 1 M Ω
- * Incoming telephone number display is compatible with FSK/DTMF
- * Dialing index meets GB/T15279-94 standard
- * Battery: Chargeable 9V Ni-Mh battery
- * Dimension (mm) : 232*73*95
- * Weight: 0.5Kg

- **ST820 Fiber ID:** With safe and credible Great curve tech ST820 Optical Fiber Identifier could identify transmission directions without interrupting service and cutting fiber. The measure signal will not affect the normal signal because of low loss. And it can also test the speed with help of comparison light. There are

5 grades indication for identified signal and comparison light signal. It is very useful for proper core line choosing in field cutover and construction.

Specifications

- * Available wavelength range: 800 ~ 1700nm
 - * Available signal type: CW, 270Hz±5%, 1KHz±5%, 2KHz±5%
 - * Detector: InGaAs (photosensitive interface: 1mm, 2pcs)
 - * Sensitivity: -38dBm (@1550nm, bare fiber)
 - * Insert loss (1550nm): Φ250μm: 1.0dB; Φ900μm: 0.5dB; Φ3mm: 0.5dB;
 - * Adapter: Φ250μm for bare fiber; Φ900μm for tight tube fiber; Φ3mm for tail fiber
 - * Communication signal indications: Direction + discontinuous buzzer + intensity indicator light
 - * Comparison light indication: Direction + Frequency + Discontinuous buzzer + Intensity indicator light
 - * Signal Intensity indication: 5 grades LED indication
 - * Continuous working time: > 4 hours
 - * Working temperature: 0 ~ 40 °C
 - * Storage temperature: -20 ~ 60 °C
 - * Relative humidity: 0 ~ 95%
 - * Dimension: 160mm×35mm×30mm
 - * Weight: 200g
- **ST801 Optical Power Multimeter:** ST801 Optical Power Multi Meter combines the functions of a laser source and an optical power meter. The inner dual working wavelength of 1310nm and 1550nm wavelength assures the functions of stable laser source and optical power meter. It can realize the absolute & relative power test and optical loss test. It can be used for tasks in optical telecommunication, CATV, lab project development, etc.

Optical power meter module parameters

- * Wavelength range: 800 ~ 1600 nm
- * Detector type: InGaAs
- * Optical power test range: -45 ~ +25dBm, optional -70 ~ +3dBm
- * Uncertainty: ±5%
- * Resolution: linearity display 0.1%, logarithm display 0.01dBm

Laser source module parameters

- * Emitter type: Fabry_Perot LD
- * Dual wavelength switch: 1310±20nm, 1550±20nm
- * Spectral line width: ≤5nm
- * Output optical power: ≥-7 dBm
- * Output power stability degree: short time: ≤±0.05dB/15min, long time: ≤±0.1dB/8h

Other parameters

- * Low voltage indication: Voltage is lower than 7.2V
- * Auto shut off time: 6min
- * Battery working duration: 2h (laser source and power meter are both on); 8h (Only optical power meter on)
- * Battery: 9V/160mAh
- * Working temperature: 0 °C ~ 40 °C
- * Storage temperature: -10 °C ~ +60 °C

- * Weight: 0.2Kg
- * Dimension: 160mm×76 mm×28 mm

6. *Shineway Technologies, Inc.*

Shineway Technologies, Inc. was established 2000 to develop and manufacture advanced products and solutions in optical communications network testing and maintenance. Shineway also creates custom-built equipment for customers with specific requirements. Shineway's primary customers are telecommunication and network carriers around the world.

Below is one example of a Shineway product:

- **OPT-x/1x/2x:** The Shineway Tech OPM-X/1x/2x optical power meters are compact, lightweight and easy-to-use testing instruments for optical fiber network, with unique characteristics of quick testing. The pocket-size OPM series can support accurate testing of single mode and multimode optical fiber systems, with features of large LCD display, damp and shock proof design and dual-way powering system. The internal microprocessor and linear amplifier technology ensure the long-time accuracy. The wavelength range of OPM series covers from 633nm to 1625. And the measurement power range is from +27dBm to -70dBm. OPM-21/25 has a large memory capacity of 3200 records and can transfer the measurement data to a PC for editing and printing.

C. Software Telecommunications and Telecom Test Equipment

Beta Networks and Uniware are examples of Chinese software companies that offer Network Monitoring Solutions, which provide systems to cover the monitoring of application performance as well as communication network system performance. These companies provide products that retrieve information from the network/telecom equipment database and also, through its software agents, stores the data on servers, PCs and other network equipment that provide the measurement, making this equipment a cross between telecom equipment, software and testing equipment.

1. *Beta Networks*

Beta Networks is a high technology enterprise dedicated to the field of computer network monitoring, network analysis and management, and product R&D. These products are used by a broad spectrum of enterprises, universities and bureaus in industries including: electric power, finance, politics, public security, and others. Beta Networks provides high level IT products based on indigenous research and development. These products can be customized according to the requirements of the consumer.

Beta Networks offers network analysis and management systems within the following three product families:

- **Before Trouble Network Manager (BT NM):** The BT NM is an indigenously developed network management system from Beta Network. This Chinese network management system uses the most advanced network management technology to manage and maintain the servers, routers, telecom equipment, and computers on a day to day basis.
- **Beta SFlow:** BT SFlow Analysis is a data analysis and early warning software system that is based on the RFC-3176 international standard. This product is designed to integrate with equipment from the U.S. Foundry company, which is based upon the same standard. It can provide real-time analysis and the early warning about detected problems in the network data stream.
- **Beta NetFlow:** BT Netflow Analysis is the Netflow data stream network real-time data analysis and early warning software. This system is integrated with a Cisco Corporation router or high end layer 3 routing switches. Using this technology, network users can obtain real-time analysis data on the second to the forth network, and at the same time ensure network security.

2. Uniware Co., Ltd.

Uniware is China's leading provider of Infrastructure network operation management and value-added software. Established in July 1999, Uniware provides specialty software systems and total software solutions as well as relevant technical support and services to expand the operations, maintenance and value-added business of telecommunications and Internet operators. Uniware products are designed to meet the needs of these operators and the users of these networks in basic communications networks and data networks.

Uniware was built upon the research base of the Beijing University of Aeronautics and Astronautics (Beihang University). The company's R&D center receives support from this National University and the National Laboratory of Software Development. This R&D center is dedicated to the research and development of high computer technology, specifically basic and application software for advanced network environments.

Uniware has the only Chinese domestic software production platform, which is oriented towards specialty fields. This platform can ensure the quality and efficiency of software production and is able to mass-produce network operation management software. One of Uniware's software products, produced under the subdivision name "eUniVision," is detailed below:

- **eUniVision Network Management System Software:** eUniVision is software product line for network management systems. This new generation of products aimed at computer network enterprises takes the eUniVision telecommunication level network management system innovation and applies it to the network management system and platform, which is based on SNMP protocol. It can manage any SNMP-based network equipment. This product supports automatic network analysis of performance and safety, and monitors common network

service and status of the application system. Customers for this line of products includes: large scale enterprises, governmental bodies, schools and universities, telecommunications companies, and any other organizations that employ a network facility. Each customer can select different functions for the system to customize and optimize the products for the customer's requirements.

Comparison of Network Management Software Capabilities:¹⁹

Enterprise Management Software (EMS)		Independent Network Management Software Products (NMS)				
Company	Cisco	3Com	HP	IBM	CA	Univere
Product Name	Cisco Works	Supervisor	OpenView	Tivoli	UniCenter	ELin:Vision
Product Type	Specific equipment management system management system	Specific equipment management system management system	Comprehensive network management system	Comprehensive network management system	The enterprise synthesizes the network management system	The enterprise synthesizes the network management system
Functionality	Campus Manager Cluster Manager	-	NFM (node management) FTO (system operation management) ISM (Internet management)	NetView (network view management) Storage Manager (memory management) Monitoring (application management)	TNG (network management frame) Software Delivery (software distribution) Asset Management (property management) AutoSys (maintenance management)	Framework (system frame) Extension (may choose function module)
Overall characteristic	Cisco equipment best management software	3Com equipment management software	Specialized, is fine, specially suits the network management expert to use	Reported receives the IBM style, pays attention to the high-end user, specially IBM reorganization solution user	The function rich, the contact surface friendlier, the function quite is thin	In view of the domestic user design development, the function practical, the structure is compact
Movement platform	Any supports Java system	Microsoft Windows	HP-UX, Sun Solaris, Microsoft Windows	FreeBSD, Sun Solaris, Microsoft Windows, Linux, IBM AIX	Microsoft Windows	Backstage server: Linux, Sun Solaris Front end customer end: Microsoft Windows
Interface Language	English/Chinese binary select	English	English	English	English (partial Chinese)	Chinese
Management object	Cisco equipment and its constitution network	3Com network equipment	IT environment equipment, system and application software	IT environment equipment, system and application software	IT environment equipment, the system and the application software, maintain moves the record	IT environment equipment, system and application software, user activity
Systems supported	-	-	HP-UX, Sun Solaris, Microsoft Windows, Linux, IBM AIX and Compaq Tru64	FreeBSD, Sun Solaris, Microsoft Windows, Linux, IBM AIX/AS400	UNIX, Sun Solaris, Microsoft Windows	UNIX, Sun Solaris, Linux, Microsoft Windows
Network management characteristic	Visible equipment kneading board. Under Cisco private agreement support long-distance dynamic	-	Supports the IPX network the discovery Automatic disposition simple contact mission	Limits is assigning the pitch point movement examination advancement	The three dimensional engine room unfolds Support wireless network management	2 the level network discovered that, precisely discovers the analysis situs The highly effective SNMP gathering engine, reduces the network management initiation current capacity

¹⁹ This table was translated from eLin:Vision website: <http://www.eunivision.com/nms_dif.asp> Nov 2006.

	disposition					
System administration characteristic	Does not support	Does not support	Many Unix server operation management	Self-control	Provides the many kinds of system administration proxy The product intrinsic integration rate is high	Simultaneously supports the proxy type and the non-agent's -like system surveillance Provides to the CPU/memory/hard disk surveillance early warning
Using management characteristic	Does not support	Does not support	Monitors the Internet application the movement situation Provides the SLA management	In view of many kinds of large-scale applications development surveillance proxy	In view of many kinds of large-scale applications development surveillance proxy	Surveillance application advancement running status (www/email/ ftp/dns database) carries on the user experience survey to the standard service Oracle activity monitoring device
IP address management	Supports the Mac track	Does not support	The simple IP address tabulates	Does not support	Does not support	Supports uses the IP address situation to the user the track and the localization, through ties up with the MAC address decides, discovers the illegal IP user
IT property management	Does not support	Does not support	Does not support	Automatic collection and information management	Rich IT property collection and management function	Supports to the IT property information collection, the management and the statistics
Report form tool	Does not support	Does not support	Only supports the real-time data graphical display, has report form tool which the third party provides	Supports the real-time data graphical display	Provides the basic report form demonstration	The nimble convenience graph, the form report form production, redeposit
Data management	Does not support	Does not support	Collection to document data storage	Collection to document data storage.DB2	Based on MS SQL Server memory	Supports My SQL and Oracle
System parameter disposition	-	-	Needs the network management expert to dispose	-	The disposition quite is simple	The guide type contact surface, does not need the too many specialized knowledge, is easy to grasp
Modular design	-	-	The modular design, the product does not support a minute module to pack	The modular design, the product does not support a minute module to pack	The modular design, the product does not support a minute module to pack	The modular design, packs according to a user request minute module
System openness	Loop system	Loop system	Provides massive API, the user may two developments, but the difficulty is bigger	Loop system	Loop system	The support user has custom-made
Hardware request	High carries PC		The recommendation uses the IIP small machine	The advancement uses the IBM server	High end server system	The scale young user may choose PC.
Fixed price strategy	Unification fixed price	Unification fixed price	Pitch point scale fixed price (250)	Server CPU number	-	Regards the pitch point scale and selects and purchases the module the difference
Post-sale service	-	-	Small chronometer price	Small chronometer price	-	The free installment and training, each month pays a return visit, visits the service only to charge the travel expense (the Beijing area free)
Is suitable the user	Mainly by the Cisco equipment primarily network, only	Mainly by the 3Com equipment primarily network.	The network management aspect has the large-scale investment, has the network management	The network management aspect has the large-scale investment, has the network management	The network management aspect has the large-scale investment, the IT management	The network scale is bigger, the attention system usability and the usability, needs to have custom-made the

pays attention to the user which the equipment manages	only pays attention to the user which the equipment manages	expert, moreover HP-UX equipment more users	expert, moreover IBM equipment more users	structure is perfect, an attendant level higher user	development and local serves the support user
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IV. Foreign Availability

The details provided in the previous section indicate the prevalence of Chinese domestically produced telecommunications and information systems testing equipment across all three layers of technology. In addition to these domestically produced products, which are sold on the Chinese commercial market at varying levels of technical capabilities, foreign companies also sell related non-destructive testing equipment on the Chinese commercial market. This section provides some examples of the most prominent non-U.S. foreign companies that participate in this market a high technical level.

1. Exfo (Canada)

Exfo was founded in 1985 in Quebec City, Canada. The Telecom Division of Exfo represents the company's main business activity with a full suite of test solutions and monitoring systems for network service providers, cable TV operators, telecom system vendors and component manufacturers in approximately 70 countries. In the past few years, Exfo has acquired numerous companies around the world, which has helped Exfo to build its business and knowledge base.

The company's original products were focused on the needs of installers and operators of fiber-optic networks. Customers use these field-portable testing products for the installation, maintenance, monitoring and troubleshooting of optical networks. In 1996, Exfo supplemented its product portfolio with an extensive line of high-end products that are mainly dedicated to research and development as well as manufacturing activities of optical component manufacturers and system vendors.

Exfo has been especially successful in the global market for its portable optical test solutions, and protocol and access test solutions that enable triple-play deployments and converged IP networking. Exfo's PC/Windows-based modular FTB-200, FTB-400 and IQS-500 test platforms host a wide range of modular test solutions across optical, physical, data and network layers, while maximizing technology reuse across several market segments.

Exfo has a wide range of testing equipment available for sale in China, but two sample products are listed below to demonstrate the technology level that the company provides to the Chinese market:

2. Anritsu (Japan)

Anritsu Group, formerly known as Anritsu Electronic Co. Ltd, is headquartered in Japan, and its major business includes: test & measurement instruments, information and communications, industrial automation, and electronic devices. Test and measurement equipment accounts for more than 50% of Anritsu's annual volume.

Since it purchased WILTRON in 1990, Anritsu has successfully achieved the multi-field development from low frequency and radio frequency to microwave and from optical fiber communication to mobile communication. Meanwhile, Anritsu has expanded its market around the globe. Anritsu has launched Ethernet solutions and mobile test solutions, including 3G testing solutions. Anritsu launched the all-purpose solutions of POS test, which is from 10M/100M to 10GE and from STM-1 to STM-64 for IP testing.

Anritsu started its research and investment in 3G testing in the late 1990s and most of its investments has been used in WCDMA system. Anritsu has already developed a set of solutions including signaling test, radio frequency test and function test. In Japan and other countries where 3G has been commercialized, Anritsu has gained a large market share in the area of WCDMA protocol, which has been certified as the standard for WCDMA mobile phone development.

Anritsu started cooperating and communicating with Chinese TD-SCDMA research institutions 2 or 3 years ago. Anritsu has added corresponding test function to some universal test instruments and will produce a series of products including signal source and signaling analyzer that support TD-SCDMA soon.

In 2004, the China Academy of Telecommunications Research of MII (CATR), which is responsible for managing communication policies, R&D, and equipment certification in China, ordered an Anritsu ME7873A WCDMA TRX Performance Test System for conformance testing of WCDMA 3G mobile phones. CATR plays a particularly vital role in introducing 3G services, and its purchase of the Anritsu system has opened the market for Anritsu to expand its presence in one of the world's fastest-growing markets.²⁰ Below are some details about the ME7873A Test System:

²⁰ Anritsu Press Release. "China Academy of Telecommunications Research of M.I.I. To Use Anritsu ME7873A W-CDMA TRX Performance Test System: Accelerating W-CDMA 3G Mobile Telephony in China," 23 Apr 2004, <http://www.anritsu.co.jp/e/news_events/040423e.asp> Oct 2006

- **ME7873A WCDMA TRX Performance Test System:** It is an RF Conformance test system for evaluating the Tx/Rx performance characteristics of WCDMA mobile terminals during R&D and verification, and for conformance testing to 3GPP standards. Specifications are listed below:

	Max. input level	+34 dBm (2.5 W)
General	Type	Type N, 50 Ω
	Input/Output connector	VSWR ≤1.2 (0 MHz to 2.4 GHz, for measuring Maximum Output Power) VSWR ≤1.5 (3.1 to 3150 MHz, for measuring Blocking characteristics, Frequency range 3) VSWR ≤1.7 (0 to 13 GHz, for measuring Blocking characteristics, Frequency range 3)
	Reference oscillator	Uses the MS16016A (Option 01 High stable reference recommendation oscillator provided; External reference input enabled (frequency: 10/13 MHz selectable, BNC connector)
Power supply		AC 100 to 120 or 200 to 240 Vac, 50/60 Hz, ±2710 VA, 1400 VA (typ.)
Dimensions and mass		1897 (H) x 1710 (W) x 757 (D) mm (excluding projections), 3560 kg
Operating temperature		+15° to +35°C (operation), 0° to +30°C (storage)
EMC		EN61326, 1997/A2, 2001 (Class A) EN61010-1, 2000 (Class A) EN61326, 1997/A2, 2001 (Annex A)
LVD		EN61010-1, 2001 (Pollution Degree 2)

*1: The general specifications are applied to use of the ME7417B RF Interface Unit (with 1 dB Attenuator connector).

3. AOIP SAS (France)

AOIP SAS is a subsidiary of the ASGARD group, which is based in Honfleur-Normandie, France and specializes in the manufacturing of high value added products and industrial subcontracting. AOIP's headquarters is located in Ris Orangis, France, where product R&D, product marketing and sales are conducted in the field of precision instruments and automation systems. AOIP products are manufactured by ALLIANSYS, also a subsidiary of the ASGARD group. AOIP has an approved distributor located in Shanghai, Pic Shanghai, which deals with the bulk of its China sales.

In the communication test field, AOIP offers LAN and telecom cable testers, including: LAN testers, Automatic fault locators and Megohmmeters / Ohmmeters. Some details about these products are listed below:

- **EasyLAN 300 MHz LAN cable tester:** The EasyLAN cable tester can perform the certification of LAN copper and fiber cables. This device, marketed as the first European tester, is composed of two units: one has a display and the other a sensor. Both are equipped with an intercom, so it is unnecessary to switch or change out the units. This tester offers a complete installation test and certification record using the Easysoft software program. The unit can also be used as a measurement instrument, in which case the PC is unnecessary. EasyLAN tests copper and optical cables up to category 6 and can perform required tests up to a bandwidth of 300 MHz and accuracy to TIA/EIA 568 Level III. It tests and certifies LANs including: Ethernet, ATM, Token-ring and Gigabit-Ethernet.

Technical specifications

Frequency	
1 to 300 MHz	
TIA/EIA 56B Level III accuracy	
Physical features	
Wire map	: Identify miswires
Length	: Accuracy ± 0.3 m
Propagation delay	: Accuracy ± 10 ns
Delay skew	
DC loop resistance	Accuracy $\pm 0.5 \Omega$
NEXT, PSNEXT, ELFEXT, PSELFEXT, ACR, PSACR	
Return loss	
Attenuation	: According to the selected standard
TDR function	
Spurious voltage	: $U < 2$ V
Standards	
USA standard	: TIA/EIA 56B category 3, 5, 5E and 6
International standard	: ISO/IEC 11801 Class C, D, E IEEE 802.3-5
European standard	: EN 50173 Class C, D, E
Other	: AZ/NZS 3095
Connectivity options	
Copper cabling: Coaxial UTP FTP STP 5CTR SF/TP and 5STP	
Fiber's LAN: multimode and singlemode	
Compatibility	
EasyLink certifies following networks:	
10BASE-2, 10BASE-5, 10BASE-T, 100BASE-TX, 1000BASE-T Ethernet, 4MB, 16MB TOKEN-RING, ATM155/31.	

General characteristics

Display	
LCD graphical display 192x128 pixels	
Back light function.	
Menu in 5 languages: English, French, German, Italian and Spanish.	
Ports	
RS232 serial port SUBD 9	
Talk set interface with stereo jack.	
Battery	
Removable, rechargeable NiMH battery pack.	
Charging time: 3 hours.	
Battery life: 10 hours operation	
Dimensions	
Dimensions: 260x165x60 mm (tester - remote unit).	
Weight: 1.1 kg/4.6 kg (complete set).	
ABS casing with protection sheath.	
Operating conditions	
0°C to 50°C and 20 to 90% RH without condensation.	

Other features

Memory capacity 1700 autotests.
Simultaneous management of 10 sites.
Built-in intercom.

- ISOPALM+ Cable Fault Locator:** This instrument is designed to identify and locate with high precision faults as insulation faults and break on the wires. The ISOPALM+ can conduct tests on loop resistance, megohmmeter, voltmeter and capacitance meter. ISOPALM+ stores into its memory a database of 4 cable parts allowing measurement onto heterogeneous cable and homogeneous cables.

functions

Insulation fault location Types of faults: - Fault between 2 wires on a same pair, - Fault on 2 wires on different pairs, - Fault between 1 wire and the ground. Methods used: Murray and Fabe (Kupfmuller); possibility to measure with one healthy wire or 2 healthy wires (one called "auxiliary"). Accuracy: 0.2% of the faulty wire resistance + 0.002 Ω in the reference conditions.	- 1 broken pair Using Sauty method (capacitance ratio or capacitance measurement). Insulation measurement Range from 0 to 1000 M Ω . Resolution variable from 0.1 M Ω . Test voltage: 150 V with current limitation for safety reasons. Accuracy: 4% rdg up to 50 M Ω .	Loop resistance measurement Range: 0 to 10,000 M Ω Accuracy: 0.5% rdg + 0.2 Ω .
Location of break on the wires Type of faults: - 1 broken wire	Capacitance measurement Range: 0.1 up to 2 μ F. Accuracy: 1% rdg.	DC/AC voltage measurements - Ranges DC voltage: 0 to 100 V 0 to 300 V AC voltage: 0 to 100 V RMS 0 to 300 V RMS - Resolutions: 0.1 V up to 100 V 1 V outside this value. - Accuracy: 1% rdg + 0.5 V

- RL 2200 Megohmmeter – Ohmmeter:** The RL2200 is particularly suited to maintenance, verification and reception of telephone lines, and more generally of all low voltage cables. Its unique dual display offers both digital readings, for high accuracy measurements, and analogue readings to «feel» measurements tendency and monitor threshold limits. The RL2200 measures loop resistance, insulation resistance, AC and DC voltages. Threshold limits can be set on resistance and insulation measurements.

Insulation resistance measurements

Ranges and measurement voltages:
- from 0.01 MΩ to 1 000 MΩ under 50 V

- from 0.1 MΩ to 10 000 MΩ under 500 V (500 V constant voltage for insulation > 5 MΩ).
- measuring current: < 1 mA.
Insulation threshold indication (beep) above adjustable limit.

Resistance range under 50 V.....

Analogue range	Range	Measured resistance	Digital range Resolution	Accuracy	
				Analogue	Digital (1)
0.03 MΩ to 3 000 MΩ	0.00 MΩ	0.00 to 10.00 MΩ	0.01 MΩ	± 1 segment	5% + 0.01 MΩ
	10.00 MΩ	10.00 to 30.00 MΩ	0.05 MΩ		
	30.00 MΩ	30.00 to 50.00 MΩ	0.10 MΩ		
	50.00 MΩ	50.00 to 99.50 MΩ	0.50 MΩ		
	100.0 MΩ	100.0 to 200.0 MΩ	1.0 MΩ		
	200.0 MΩ	200.0 to 400.0 MΩ	5.0 MΩ		
400.0 MΩ	400.0 to 700.0 MΩ	10.0 MΩ	10%		
700.0 MΩ	700.0 to 1 000.0 MΩ	20.0 MΩ			

(1) Accuracy is given 1 year in ±(% of reading + nΩ) at 23±1°C

Resistance range under 500 V.....

Analogue range	Range	Measured resistance	Digital range Resolution	Accuracy	
				Analogue	Digital (1)
0.3 MΩ to 30 000 MΩ	0.0 MΩ	0.0 to 100.0 MΩ	0.1 MΩ	± 1 segment	5% + 0.1 MΩ
	100.0 MΩ	100.0 to 300.0 MΩ	0.5 MΩ		
	300.0 MΩ	300.0 to 500.0 MΩ	1.0 MΩ		
	500.0 MΩ	500.0 to 995.0 MΩ	5.0 MΩ		
	1 000 MΩ	1 000 to 2 000 MΩ	10 MΩ		
	2 000 MΩ	2 000 to 4 000 MΩ	50 MΩ		10%
4 000 MΩ	4 000 to 7 000 MΩ	100 MΩ			
7 000 MΩ	7 000 to 10 000 MΩ	200 MΩ			

(1) Over 1 year in ±(% of reading + nΩ) at 23±1°C

AC voltage measurements

Range 0 to 100 V AC, resolution 0.1 V, accuracy ±(1%rdgs. + 0.5 V).
Range 100 to 400 V AC, resolution 1 V, accuracy ±(1%rdgs. + 1 V).
Input impedance: 200 KΩ.
Average value translated to RMS without DC component.
Band width: 40 to 400 Hz (higher frequencies can be measured with lower accuracy).

DC voltage measurements

3 digits digital display.
Range 0 to 100 V DC, resolution 0.1 V, accuracy ±(1%rdgs. + 0.5 V).
Range 100 to 500 V DC, resolution 1 V, accuracy ±(1%rdgs. + 1 V).
Input impedance: 200 KΩ.

Resistance measurements

- Range : from 0 to 10 000 Ω
- Measuring current: < 1mA.

Continuity threshold indication (beep)
below adjustable limit.

Analogue range	Digital range		Accuracy (1)		
	Range	Measured resistance	Resolution	Analogue Digital	
0.3 Ω to 30 000 Ω	0.0 Ω to 999.5 Ω	0.0 to 100.0 Ω 100.0 to 500.0 Ω 500.0 to 999.5 Ω	0.1 Ω 0.2 Ω 0.5 Ω	± 1 segment	0.5% + 0.2 Ω
	1 000 Ω to 10 000 Ω	1 000 to 2 000 Ω 2 000 to 3 000 Ω 3 000 to 5 000 Ω 5 000 to 10 000 Ω	1 Ω 2 Ω 5 Ω 10 Ω		

(1) At 23 \pm 1 $^{\circ}$ C over one year and in \pm (% of reading + n Ω) on digital display.

V. Chinese Military Non Destructive Test Equipment

Telecom and test equipment used for military applications is procured from the same Chinese sources as listed in the sections above. The Chinese government and military entities procure their testing equipment primarily from the Chinese research institutes. The primary testing equipment supplier to the Chinese military is the 41st Institute. The 41st Institutes has won numerous awards for its contributions to military technology, including an award for being among “The Advanced Units in Research and Production of Military Basic Electronic Products” and the “Top 10 Institutes for Military Electronic Components.” The 41st Institute also successfully provided instruments for Chinese satellite and spaceship projects, including the Shenzhou 5 Spaceship. The Chinese military acquires its testing equipment almost entirely from domestic sources.

Some public reports have indicated that Chinese governmental entities have also purchased top line telecom testing equipment from Japanese sources, as in the case of the China Academy of Telecommunications Research of MII purchase of the Anritsu WCDMA TRX Performance Test System.

VI. Summary

The Chinese telecom equipment industry, led by Huawei and ZTE, produces equivalent level products to the worldwide telecom companies from the United States and Europe. They supply telecom equipment to both the domestic and international telecom market and have the ability to supply the Chinese Government and Military at levels above those proposed in the Proposed Rule. The data provided in this chapter clearly demonstrates that numerous Chinese companies have also indigenously developed the ability to research and produce internationally competitive telecommunications testing equipment and relevant software and technology. In addition to the Chinese domestically produced items, Canadian and Japanese companies also offer a wide range of top level equipment

to Chinese consumers. Given that this equipment and software is available through both domestic and foreign sources in China, the ECWG requests that the scope of controls on these items be narrowed or removed from the list of items in the Proposed Rule.

CHAPTER V

Navigation and Avionics

I. List of ECCNs:

7A994: Other navigation direction finding equipment, airborne communication equipment, all aircraft inertial navigation systems not controlled under 7A003 or 7A103, and other avionic equipment, including parts and components, n.e.s.

7D994: "Software", n.e.s., for the "development", "production", or "use" of navigation, airborne communication and other avionics.

7E994: "Technology", n.e.s., for the "development", "production", or "use" of navigation, airborne communication, and other avionics equipment.

Under existing U.S. export control regulations, navigation and avionics equipment falling under the ECCNs 7A003 and 7A103 require a license to China. The Proposed Rule would add controls to items falling under 7A994 as well as the related testing equipment, software and technology falling under ECCNs 7D994, and 7E994.

The Proposed Rule would control all navigation and avionics related equipment, software, and technology without drawing a bottom line for these controls. The market data included in this chapter demonstrates that navigation and avionics related items are readily available in China at and above the proposed level of control. Chinese companies are producing this navigation and avionics equipment at technological levels equivalent to products supplied by foreign companies in China. Chinese companies have also developed the technology to produce relevant software, but they have chosen not to invest the money in manufacturing these items while they are readily available from European and Canadian sources at an acceptable market price.

Furthermore, this equipment has already been supplied by foreign sources for domestic Chinese commercial jet programs such as the ARJ21 and the MA60. The ECWG, therefore, believes equipment and technology that U.S. companies would provide at the levels delineated by the ECCNs listed in this chapter could not make a material contribution to the Chinese military capabilities. China has already acquired navigation and avionics products at and above these levels through both domestic and foreign sources.

II. Overall China Market

The navigation and avionics market in China has great potential in the coming years with the booming aviation industry and broad commercial aviation applications. Current growth predictions for China's commercial aviation industry indicate that China will

become the second largest aviation market in the world within the next twenty years. This growth will result in large purchases of aircraft and drastic expansion of the commercial aviation infrastructure. Recognizing the need for investment in this expanding industry, the Chinese government has developed plans to build new airports, update its air traffic control system, and develop the aircraft and aircraft part production industry in China.

Zeng Qinghong, Vice President of the PRC, addressed that in the Fifth Plenary Session of the 16th Central Committee of the CPC in 2005 and emphasized the need for development of China's high-tech industries including aviation and aerospace.

Yaliang National Aviation High-Tech Industrial Base, a designated aviation development zone located in Xi'an, was approved by the National Development and Reform Commission in 2004. This state-level high-tech industrial base integrates aviation industrial research and development, aviation-related equipment production, aircraft manufacturing, part and component machining, and aviation service facilities into one central location. Zeng Qinghong announced that Yaliang Aviation Base should serve as a model for integrating China's aviation industry and cultivating innovation and collaboration with foreign and domestic partners.²¹ Plans for a similar aviation development zone in Shanghai are under discussion.

China's Industrial Base of Civil Aviation (IBCA) is based in the Tianjin Binhai New Area. The IBCA was established jointly by CAAC and the Tianjin Municipal Government when an agreement was signed on October 16, 2005 to build up equipment manufacturing, R&D and technical services for the Chinese civil aviation industry. This base is located approximately 110km (30 minutes) from Beijing. The Binhai New Area, which covers an area of 2270 km², contains 7 industrial areas: Seaport Logistics, Seaside Leisure and Tourism, Chemical Industry, Advanced Manufacturing, Central Business District, High-tech Industry, and Aviation Industry. Within the IBCA, development is focused on cultivating the following industries: ATC equipment manufacturing, Special Equipment manufacturing, Aircraft parts & airborne equipment processing, Aircraft maintenance, and Aircraft parts and components maintenance. In addition, the new aviation base will contain the infrastructure for R&D in civil aviation as well as certification and test centers.²² Tianjin will also benefit from its proximity to top universities and training and research institutes in the aerospace and aviation fields, such as:

- Beijing University of Aeronautics and Astronautics
- Civil Aviation University of China (Tianjin)
- Tianjin Sino-Germany Vocational Technology Institute
- Tianjin Sino-Spanish Machine Tool Technology Training Center

²¹ Xi'an Yanguang National Aviation High-Tech Industrial Base Website. "Zeng Qinghong, vice president of PRC, visited Xi'an Yaliang China Aviation High-tech Industrial Base," 9 Nov 2005, <<http://en.caib.gov.cn/defaultroot/front/news/NewsEv.go?event=11&id=486>> Nov 2006.

²² Zhang Jialu ed., Tianjin ENORTH NETNEWS Co., "Unique Advantage Helps Civil Aviation Take-off," 22 Aug 2006, <<http://english.enorth.com.cn/system/2006/08/22/001391136.shtml>> Nov 2006.

- Beijing Precision Engineering Institute for Aircraft Industry
- Beijing Aeronautical Manufacturing Technology Research Institute
- China Aeronautical Project & Design Institute
- Beijing Institute of Aeronautical Materials
- China Aero-Polytechnic Establishment
- Aviation Industry Development Research Center of China
- Beijing Great Wall Metrology & Measurement Research Institute of AVIC I.

To date, the Tianjin IBCA has formed an integrated organization, developed a detailed land development plan, engaged in investment negotiations, finalized industry policies, and organized major key projects including the Airbus A320 single-aisle airplane plant. The A320 plant, which is a joint venture between Airbus and Zhongtian Aviation Industry Investment Company located in the Binhai New Area, will assemble the aircraft. The assembly line will include assembly workshops, paint shops, testing areas and a flight-test facility. Currently, preparatory work for the assembly line project has begun, including infrastructure planning, recruitment and equipment procurement.²³

Airbus reportedly has committed to increase yearly procurement in China to \$60 million (USD) by 2007, and \$120 million by 2010. Airbus also formally inaugurated its Airbus Engineering Centre in Beijing, in July 2005, which will conduct research and development. Airbus says it has already hired 54 Chinese engineers and will increase that number to 200 by 2008. Airbus also offered Chinese aviation firms what could amount to as much as 5 percent participation in the airframe of its upcoming A350 twin-aisle aircraft, to include both part design and production. The design will be performed by Centre engineers, while manufacture of the corresponding parts will be given to the Chinese aviation industry.²⁴

Note: For more information about the A350 in design and production in China, please refer to Chapter 1 - Composite Materials.

Chinese commercial regional jet programs such as the MA60 and the ARJ21 offer new opportunities for companies to supply aircraft components to Chinese commercial aircraft:

- The MA60 is an advanced regional turboprop aircraft developed by Xi'an Aircraft Company of AVIC I. Modern design concepts, new technological innovations, and state-of-the-art equipment were introduced in the MA60. The aircraft meets the regulations of CCAR Part 25 and FAR Part 25, and was certified by CAAC. The MA60 will take over short and medium-haul commuter operations. CATIC, which has taken over the marketing activities

²³ Chinese Ministry of Commerce Website, "Chinese companies to help assemble A320 jumbo jets." 22 Nov 2006.

<<http://english.mofcom.gov.cn/article/newsrelease/commonnews/200611/20061103815493.html>> Nov 2006.

²⁴ CompositesWorld.com, "Airbus Extends Partnerships in China, Australia." Jan 2006.

<<http://www.compositesworld.com/hpc/issues/2006/January/1140/1>> Nov 2006.

of the MA60 in recent years, has recently signed sales contracts for the MA60 with Indonesia, Zimbabwe, Zambia, Congo, Laos, and Vanuatu.²⁵

- The ARJ21 is also an AVIC I project, which involves cooperation among four AVIC I companies for the base aircraft: Shanghai Aircraft, Xi'an Aircraft, Shenyang Aircraft, and Chengdu Aircraft. Each of these companies contributes to various aspects of the aircraft design and manufacturing. This project is still in the development phase, but it is currently slated for flight in 2009.

Both of these commercial regional jet programs have benefited from cooperation among a wide range of companies, both Chinese and domestic, which have supplied various parts and components. These projects serve as examples of the increasing commercial aircraft opportunities that are opening up in China. The MA60 and the ARJ21 lay the groundwork for international commercial competition in basic aircraft components, including avionics and navigation equipment. With the success of these Chinese commercial programs and the rising demand in the Chinese aviation industry, more such opportunities will arise.

III. Chinese Domestic Availability²⁶

Chinese companies have the technical capability to indigenously produce navigation and avionics equipment at levels that satisfy the domestic military demand. Chinese companies and research institutes do not domestically manufacture the related integration software for commercial application because they are available in China through non-U.S. foreign suppliers at the required technological levels.

A. Avionics and Navigation Equipment

China can domestically produce avionics and airborne navigation equipment above the level of proposed control. In select cases, China's domestic production of these products is at a higher technical level than that of the products supplied by foreign companies. This high level technology is developed and produced by Chinese research institutes for government and military end-use, with some of the equipment available on the domestic commercial market.

²⁵ ShowNews Airshow China 2006, International Aviation, "MA60 Regional Airliner Gains Momentum in Export Markets," 31 Oct 2006 <<http://www.AviationNow.com.cn>> Nov 2006.

²⁶ Look at China National Aeronautical Radio Electronics Research Institute: 中国航空无线电电子研究所 (AVIC I); Shanghai Software Test & Evaluation Centre, some cooperation with Rockwell Collins Avionics and Communications (Careri); Lanzhou Aviation Electromechanic Inc. 兰州航空机电有限责任公司 (AVIC II) makes Airborne computers MSIC/LSIC types digital, navigators, navigation bombing system, air firing computer, etc.

1. Beijing Keeven Aviation Instrument Co., Ltd.

Beijing Keeven Aviation Instrument Co., Ltd., a national aerospace industry enterprise under AVIC I, was founded in 1958 and is located in the center of Beijing's Zhongguancun Science and Technology Zone. Keeven specializes in the development and production of automatic flight control systems, aviation gyro instruments, radio altimeters, and other avionics equipment.

Keeven has received nearly 40 awards from the Chinese central government and Chinese ministries. Keeven develops and produces a wide range of products, both for the commercial and military markets. At present, the project "Zhongguancun airspace technology zone" initiated by Keeven has been put into practice to establish an international high technology center for the transfer and innovation of state-of-the-art aerospace equipment.

On the commercial market, Keeven sells basic avionic equipment, including items such as the radio altimeter, automatic flight controls, gyroscopes, accelerometers, and control and display systems. Some of this equipment, such as the radio altimeter, was developed nearly 20 years ago with the assistance of the French.

2. AVIC I: Suzhou

[Note: Formerly known as "Suzhou Changfeng Co., Ltd."]

Suzhou Changfeng Co., Ltd. is now a subsidiary of the China Aviation Industry Corporation (AVIC I). This Chinese state-owned company, which specializes in avionics, mechanical equipment, and precision spare parts, develops and produces equipment for both military and commercial uses. Suzhou's products include temperature sensors and controllers, switch generators and assemblies, electronic display systems, engine control systems, inlet automatic adjustment systems, instruments and indicators, and sensors.

Suzhou produces the highest level Multifunction Display in China, and Keeven produces the second-best variant of this product. Both Chinese companies have developed the indigenous ability to manufacture this integrated avionics display system at the most advanced international level.

3. *Sichuan Institute of Piezoelectric and Acousto-optic Technology (SIPAT)*

[Note: Formerly known as the China Electronics Technology Group Corporation No 26 Research Division]

Sichuan Institute of Piezoelectric and Acousto-optic Technology (SIPAT), which was originally the No.26 institute of the Ministry of Electronic Industry, is the foremost Chinese institute specializing in research on piezoelectric and acousto-optic technology. Founded in 1970, and moved to the economic development zone of Chongqing in 1993, SIPAT employs approximately 900 people, of whom 100 are senior researches and nearly 200 are engineers. SIPAT's research areas cover surface acoustic wave (SAW) technology, piezoelectric and acousto-optic crystal materials, bulk acoustic wave (BAW) microwave delay lines, piezoelectric or ferroelectric ceramic materials and devices. This technology is applicable to a wide range of sectors, including: national defense, aviation, communications, and electronics. SIPAT produces and provides a range of military electronic systems.

SIPAT has been especially successful in its development of SAW technology and vibrating inertial technology, packaged in compact multi-function systems. Below are details for the SIPAT SAW filters and Piezoelectric Vibrating Gyro:

- **Surface Acoustic Wave filters:** SAW filters are electromechanical devices commonly used in radio frequency devices. Electrical signals are converted to a mechanical wave in a piezoelectric crystal; this wave is delayed as it propagates across the crystal, before being converted back to an electrical signal by further electrodes. The delayed outputs are recombined to produce a direct analog implementation of a finite impulse response filter. This hybrid filtering technique is also found in an analog sampled filter. SAW filters are limited to frequencies up to 3GHz. SIPAT makes a wide range of IF SAW Filters, with the highest frequency at 160MHz, and a number of RF SAW Filters at center frequencies between 250MHz and 1GHz. SIPAT makes a stabilizing monitor platform system for airplanes.
- **Piezoelectric Vibrating Gyro:** This gyro, which uses MEMs technology, is an angular velocity sensor that can be used for the stabilizing and monitoring systems of weapons systems, aircraft, medical apparatus and instruments, and geological prospecting. As compared with traditional gyros, the piezoelectric vibrating gyro uses a vibrating element instead of the rotor of traditional gyro which rotates at high speed and does not cause friction or wear, increasing its lifespan. It has a wide dynamic range and small nonlinear error therefore most suitable for uses in strap-down inertial system. It has low power consumption and can withstand nuclear radiation.

4. NAV Technology Co., Ltd.

Registered in the Zhongguancun Science Park, Beijing, NAV Technology Co., Ltd. is a high-tech enterprise, which was recently established as a sister company to YH Technology. Previously, YH developed and manufactured products and systems in the field of communication, navigation and modern signal processing, which included GPS navigation and inertial system. NAV Technology was recently established as to produce the inertial systems technology, while YH narrowed its scope to the GPS systems. NAV is moving to expand operations and hoping to gain greater international market share with its relatively inexpensive domestically integrated products.

NAV inherited technology from YH and now developed and produces product lines including: Accelerometers, Gyroscopes, Tilt Sensors, Magnetic Compasses, Inertial Measurement Units (IMU), Vertical Gyroscopes, Attitude & Heading Reference Systems, GPS/INS, and more. Products are targeted for land vehicle, airspace, ship, and tracking applications. The IMU and Magnetic Compass listed below are two examples of NAV products:

- **NV-IMU200 Inertial Measurement Unit:** This inertial measurement unit uses high reliable and quality MEMS accelerometers and Fiber Optical Gyros. This IMU has been full temperature compensated via testing data from -25°C ~ +70°C for zero point, SF, and misalignment. It has 20 bits AD conversion with resolutions less than 0.02 mg and 0.0006 °/s in a rugged design to protect the equipment against harsh environments. The IMU is vibration and EMI resistance.
- **MC301 Magnetic Compass:** This magnetic compass, for use in navigation and guidance systems, can be easily integrated into systems using a UART or SPI interface in ASCII format. The MC301 is a three-axis, tilt compensated compass that uses a two-axis accelerometer for enhanced performance up to a $\pm 60^\circ$ tilt range. With a 1° Heading Accuracy, 0.1° Resolution, 0.5° Repeatability, $\pm 60^\circ$ Tilt Range (Pitch and Roll) for 3200, this compass is compacted into a small, lightweight case. It has a 15 Hz Response Time, and a 40° to 85°C Operating Temperature Range.

B. Software and Integration Systems

The gap in Chinese production of avionics and navigation equipment lies in the software for integration of the airborne avionics equipment. China has conducted research on this integration software and claims the technical capability to produce this software. Chinese companies have made a business decision not to produce this software, because with the high cost of production and low demand for the software, companies could not justify local production.

This software produced by Canadian and French companies is widely available in the Chinese market at reasonable prices. For details about the software systems offered by these foreign companies, see the section below on Foreign Availability.

IV. Joint Venture Availability

1. *Xi'an Chinastar M&C Ltd.*

Xi'an Chinastar M&C Ltd. was founded in 1996 and later became a joint-venture with Panweld Holding Limited Singapore in Aug 2004. Chinastar specializes in the R&D, production and sale of sensors, specifically inertial sensors and automotive electronic sensors. In addition to its own development and production, Chinastar also acts as a distributor for other types of sensors through its commercial networks and permanent branches in Beijing, Shanghai and Qingdao.

Chinastar has received patents for several of its indigenously developed technologies and products. Chinastar also collaborates with scientific institutes in Shaanxi province for the research and development of products.

Although Chinastar sells a wide variety of both its own products and products from other domestic and foreign companies, the three products listed below are samples of Chinastar technology:

- **CS-3ARS Series Gyroscope:** Measures angular rate in three orthogonal axes. The 3-axis angular rate sensors use MEMS "solid-state" chips on each axis. This gyroscope, which has a self-test function, can be used in automotive electronics, guidance and control of aircraft, and other systems.
- **CS-3LAS Accelerometer:** Measures acceleration in three axes. This accelerometer uses MEMS "solid-state" chips on each axis and has a Self-Test function available. It can be applied to measure the acceleration, velocity, position and tilt in automotive-controls, inertial navigation, earthquake monitoring, and other systems.
- **CS-IMU Inertial Measurement Unit:** This unit, which contains accelerometers, pressure sensors and angular rate sensors, is a "solid-state" six degree of freedom inertial sensing system based on MEMS technology. With high accuracy, it can measure angular rate and linear acceleration in three axes of an inertial coordinates system. High precision temperature sensors are built in with an indicator that displays the voltage corresponding with the temperature change. The IMU also has a self-test function available for each of the six degree of freedom.

V. Foreign Availability

While Chinese capabilities in avionics and navigation equipment continue to increase through domestic R&D, European companies continue to supply high level equipment in the Chinese market. The section below contains details about a select number of these European companies:

1. *Thales Avionics*

Thales' Aerospace Division was established in July 2004, combining operations and teams from Thales Airborne Systems, Thales Avionics, Thales Computers, Thales Microelectronics and Thales MESL. As prime contractor, systems integrator or equipment supplier, Thales Aerospace provides high level intelligent onboard equipment, sub-systems, systems, and services for both the commercial and military markets. Thales is heavily involved in the top line aviation programs, both commercial and military, around the world.

Thales offers a comprehensive range of products including custom-tailored solutions for all types of commercial and military aircraft. Thales promotes its expertise in dual (civil/military) technologies at the competitive edge. With a Thales Avionics repair and support center located in Beijing, joint operated with Airbus China, and a Thales Avionics Hub in Singapore, Chinese customers can purchase state-of-the-art Thales avionics equipment directly from Thales. Thales product lines include integrated modular avionics (IMA) suites, cockpit display systems, flight management systems, flight control systems, communications, and navigation and surveillance systems.

Thales has designed a complete family of integrated modular avionics suites for both civil and military aircraft called TopDeck:

- **TopDeck:** This is a family of high-performance integrated modular avionics suites featuring latest-generation glass cockpit technology and ergonomics. It handles all primary functions, from flight control to centralized maintenance management, along with human-machine interface, navigation, communications, and surveillance.

2. *Rohde & Schwarz (R&S)*

Rohde & Schwarz (R&S) is a group of companies specializing in electronics, test and measurement, broadcasting, and radio communications. With company headquarters in Germany, R&S carries out global operations in more than 70 countries. Rohde & Schwarz supplies professional HF, VHF and UHF radio communications systems for stationary and mobile ground stations, on ships and on aircraft. Rohde & Schwarz provides voice and data transmission technology for

government authorities and armed forces around the world.

Since 1968, when development of the R&S XT 3000 V/UHF radio and the R&S XK 401 HF-SSB radio for the Tornado aircraft began, Rohde & Schwarz has expanded its business to provide military avionics equipment internationally for a wide variety of airborne platforms.

Several years ago, Rohde & Schwarz entered the commercial avionics market by introducing a civil airborne HF transceiver for data link operations in all versions of civil air-frames. In conducting the research for this report, the R&S Beijing Representative Office told the researchers that Rohde & Schwarz does not sell any commercial avionics in China, but that R&S only sells military avionics in China. Because the PRC military is the sole R&S avionics customer in China, they were unable to provide details about the avionics products R&S sells in China. The R&S website, however, provides detailed specification information for their line of military avionics VHF/UHF Airborne Transceivers. Below is one example:

- **VHF/UHF Airborne Transceiver MR6000R:** The R&S MR6000R transceiver of the R&S M3AR family is software re-programmable and is one of the world's smallest and most lightweight VHF/UHF airborne transceivers. It is possible to download several EPM (ECCM) waveforms for both NATO and non-NATO countries and use them alternately. The MR6000R is designed for installation in the avionics bay, and its architecture ensures form, fit and function replacement for existing AN/ARC-164 radio systems. The transceiver can be controlled by the Remote Control Unit GB6500 or a MIL-BUS according to MIL-STD-1553B. MR6000R has the following characteristics: 30 MHz to 400 MHz extended frequency range, channel spacing of 25 kHz and 8.33 kHz, Modular design, SMD technology, weight less than 3.5 kg, and VHF FM immunity.

3. *Dy4 Systems*

Dy 4 Systems is the world's leading provider of harsh environment, high-performance processing solutions for real-time, embedded Defense and Aerospace applications. Dy 4 describes these systems as commercial off-the-shelf modules, system-level products and services that are used in industrial and harsh environments, including mission-critical aerospace, industrial control, semiconductor manufacturing and defense platforms.²⁷ Dy 4 specializes in the design and manufacture of high-end VME open architecture systems, which are used worldwide in military and aerospace applications requiring high reliability when operating in rugged or harsh environments.

²⁷ LWN.net, "Metro Link and DY 4 Systems to Offer 3D Graphic Solutions for Military/Aerospace Market," 13 March 2001, <<http://lwn.tucows.com/2001/0315/pr/pr288.php>> Nov 2006.

Headquartered in Ottawa, Canada, with additional facilities in Leesburg, Virginia and Cardiff and Milton Keynes, United Kingdom, Dy 4 has annual sales of approximately \$70 million and serves nearly 300 customers in 26 countries. Dy 4 specializes in using leading commercial technologies to create products that work reliably in harsh environments. Key customers include BAE Systems, DRS Technologies, General Dynamics, Northrop Grumman, Lockheed Martin and Raytheon.²⁸ Dy 4 Systems has sold integrated hardware and software products through a direct sales force in the US, UK and Australia, and elsewhere through a global network of distributors.

Dy 4 has targeted aerospace and defense markets.²⁹ Sources have indicated the Dy 4 Systems has provided key technology to Chinese military-related research institutes and state-owned enterprises for aerospace and aviation equipment. This technology was supplied to fill the capability gaps at these institutes and enterprises. The research was unable to determine the details about the specific products that were supplied, at what time they were supplied, and whether or not Dy4 continues to supply to Chinese entities today. According to a Ploughshares Monitor article from 1996, Dy 4 is among the Canadian companies that have engaged in military sales in Asia by supplying tank and military vehicle computer components. The source does not supply any details about Dy 4 sales specifically to China.³⁰

In 2000, Dy 4 Systems became a wholly owned subsidiary of C-MAC Industries.³¹ C-MAC Industries is a Montreal-based designer and manufacturer of integrated electronic manufacturing solutions, primarily serving the communications, automotive, instrumentation, defense and aerospace equipment markets worldwide. C-MAC merged with Solectron, the parent company to Force Computers, in December 2001, and early 2002 Force Computers announced that Dy 4 would become one of its business units.³² In 2004 Solectron sold Force Computers and Dy 4 Systems to Curtiss Wright Controls based in North Carolina.³³

²⁸ Curtiss-Wright Controls Inc. Press Release, "Curtiss-Wright Controls Completes Acquisition of Dy 4 Systems, Inc.," 2 Feb 2004, <<http://www.cwcembedded.com/downloads/02-02-04%20press%20release.pdf>> Nov 2006.

²⁹ Embedded Star, "Tilcon Software and Dy 4 Systems Aim for Aerospace and Defense Markets," 7 Apr 2004, <<http://www.embeddedstar.com/press/content/2004/4/embedded13976.html>> Nov 2006.

³⁰ Ken Epps, *The Ploughshares Monitor*, vol 17, no.2, "The push for Canadian military sales to Asia: Feeding the tigers," June 1996, <<http://www.ploughshares.ca/libraries/monitor/monj96b.html>> Nov 2006.

³¹ CBC News, "C-MAC to take over DY 4 Systems, 6 Oct 2000, <http://www.cbc.ca/money/story/2000/10/05/cmac_dy4001005.html> Nov 2006.

³² Electronicstalk, "Dy 4 Systems join the Force family," 22 Jan 2002, <<http://www.electronicstalk.com/news/for/for104.html>> Nov 2006.

³³ In February 2004 Curtiss-Wright Controls purchased Dy 4 Systems from Solectron and incorporated Dy 4 as a business unit under the Embedded Computing organization of Curtiss-Wright Controls. Source: Embedded Star, "Curtiss-Wright Targets Rugged Embedded Computing by Acquiring Dy 4," 4 Feb 2004, <<http://www.embeddedstar.com/press/content/2004/2/embedded12685.html>> Nov 2006.

4. Vertex Inertial Technology Engineering (VIT)

Vertex Inertial Technology Engineering (VIT) was founded in 2004 and headquartered in Vienna, Austria with the purpose of commercializing analytic sensor fusion algorithms technology that was developed and tested by the founding scientists and engineers. VIT specializes in navigation, inertial reference and air data sensor integration technology, engaging in development, design, manufacturing, marketing, sales and support of compact low-cost inertial navigation systems (INS) integrated with Global Positioning System (GPS) for aviation, land and industrial applications.

VIT's flagship product is the VIT1000 portable glass cockpit system with perspective flight guidance, based on the VIT aviation INS/GPS system, VITANS, and its in-house-developed "Pictorial Indication" software. Other products include: unmanned air vehicle (UAV) Flight Control System, flight data recorder, land-based navigation and motion sensing system and personal navigator.

- **CompaNav-2:** This is an inertial-GPS integrated system intended for navigation and attitude determination of aircraft. Combining GPS data with MEMS inertial sensors measurements, CompaNav-2 precisely outputs the complete set of navigation and motion parameters of the aircraft, including: coordinates, height, pitch, roll, heading, speed, accelerations, and angular velocities.
- **TekFCS:** The TekFCS is a unique software and hardware complex designed as total solution for guidance and navigation of commercial and civil Unmanned Aerial Vehicles (UAV).

5. IXSEA

IXSEA is a company based in France, which specializes in high technology navigation, positioning, imaging, and surveying equipment. IXSEA products are aimed at scientific, offshore, defense and space customers with a range of systems and solutions for navigation, positioning, imagery, moorings and survey applications. IXSEA also develops and produces equipment for use on aircraft and airborne systems.

Among the IXSEA products available for the China market is the AIRINS position and orientation system:

- **AIRINS:** This product has been designed for high accuracy position and orientation for the new generation of airborne mapping sensors. AIRINS provides high accuracy position and orientation data in real-time, even in tough conditions. This product features high performance FOG, high accuracy position, GPS hybridization algorithms, compatibility with most GPS receivers, and vibration / shock resistance in a small single integrated system.

VI. Chinese Military Avionics and Navigation Capability

The avionics and airborne navigation equipment for the Chinese military is provided by Chinese state-owned enterprises and institutes as well as non-U.S. foreign companies.

Beijing Keeven and AVIC I: Suzhou Changfeng are two examples of state-owned companies that conduct R&D activities in the area of avionics and navigation equipment, relevant software, and testing equipment for the Chinese government and military. These companies also sell some products on the commercial market, but the bulk of their business is on the military and government side.

R&S of Germany is an example of one of the foreign companies that supplies avionics equipment directly to the Chinese military. Public reports indicate that China may also be seeking potential partners in Europe, Russia, and Israel to co-develop avionics and weapon suites for its 4th-generation fighter aircraft. These avionics that China is seeking from European companies would be far above the level of anything that U.S. companies could contribute under the parameters of the navigation and avionics equipment covered by ECCN 7A994.

As noted in the sections above, both Chinese and foreign companies supply avionics and navigation equipment directly for Chinese military use. In the areas of relevant software, these SOEs have conducted R&D but have not begun domestic production of this equipment due to the small commercial market and high investment required. These items are widely available from other European and Canadian companies. Thus, to date China has no need to produce these products.

VII. Future Development Requirements for Chinese Military Avionics and Navigation

As the purpose of the Proposed Rule is to prevent material contributions to Chinese military capabilities, it is important to look at next steps in Chinese aviation development plans. According to numerous open sources, China is currently working on an advanced 4th generation fighter design that is predicted to enter service as early as 2015. The Shenyang Aircraft Industry Co. (SAC)/601 Institute and Chengdu Aircraft Industry Co. (CAC)/611 Institute are both working on their own designs for a twin-engine multi-role fighter with enhanced stealth capability and maneuverability comparable to the U.S. F/A-22. The SAC/601 Institute program is known as J-12, and the CAC/611 Institute program, which may be designated as the J-13, is an enlarged twin-engine stealth version of its J-10 fighter.

All designs are expected to feature an internal weapons bay to reduce RCS. Both designs will incorporate an advanced FBW system based upon the Active Control Technology developed by 601 Institute and tested on its J-8IIACT technology demonstrator. Its fire-control radar could feature an active phased array (possibly Type 1475/KLJ5). These projects are believed to have benefited from Russian aviation and weapon technologies.

and it is anticipated that Russia will provide assistance in terms of software support for calculating the RCS of various designs.

Details on the two programs are as follows:

A. Shenyang J-12 Program

In 1998 the U.S. Office of Naval Intelligence (ONI) reported that an advanced F/A-22-class twin-engine stealth fighter known as J-12 was under development at SAC. An F-22 style wind tunnel model of aircraft was shown briefly in an AVIC I promotional video at the 2002 Zhuhai Air Show. Later in 2003 an Internet source photo revealed a fighter mockup for wind tunnel test which may be linked to the J-12 project. As more details of the fighter began to emerge, it was understood that the fighter will also be fitted with an internal weapon bay and possibly active phased array radar.

For the Chinese military, the J-12 project will require technology advancement in a number of fields including: materials, high-performance aviation engine, electronics, flight control software, and stealth technologies. A project of this scale will also require a huge amount of investment and considerable knowledge of complex project and manufacturing management. While China may be able to benefit from some "off-the-shelf" dual-use technologies available in the commercial market, it will almost definitely seek assistance from its traditional military technology suppliers such as Russia and Israel. However, none of these two countries possess the experience of developing an advance fighter of this class.

Russian Sukhoi Company (JSC), which has developed close ties with SAC over the licensed co-production of its Su-27SK fighter as J-11, has been reportedly working with SAC in developing this next-generation fighter technology and sub-systems. Although Russia has not yet been able to develop an operational stealth fighter, the J-12 project may benefit from its technologies in two particular areas: thrust vectoring engine and stealth design. China may also seek potential partners from Russia, Israel and Europe to co-develop avionics and weapon suites for its 4th-generation fighter aircraft.

B. Chengdu J-13 Project

CAC and its subordinate, the 611 Aircraft Design Institute, are working on an enlarged twin-engine version of the J-10. The new fighter, which was reportedly designated J-13, inherited the J-10's canard delta design and resembles the Russian Mikoyan MiG MFI (Project 1.44) fifth-generation fighter demonstrator in many aspects. The J-13 design is less radical in terms of design and technology compared to the Shenyang J-12, and therefore may stand a better chance of becoming successful.

It was reported that Russian MAPO-MIG has been working with Chengdu since the late 1990s to develop a new generation fighter based on the J-10 design. The J-13 may be powered by two improved AL-41 turbofan engines with thrust-vectoring nozzles and possibly supersonic cruise capability too, giving a maximum take-off weight of 20t. The overall performance is anticipated to be superior to the EF-2000 and French Rafale (in stealth & agility) but still inferior to F/A-22 (in electronics & super cruise).

Considering this information and the activities of European and Russian entities detailed earlier in the report, a logical assumption is that China would be looking to partner with European companies to fill in the gaps in aviation technology it can not gain from Russia. This is especially significant in light of the current dynamics in worldwide military aircraft development and supply. For example, Eurofighter produces the EF 2000 Typhoon mentioned above, and the partners in the consortium are England, Germany, Italy and Spain. As this chapter and others fully demonstrate, German and Italian defense companies are aggressively working with the Chinese military on developing next generation military platforms. If this trend is applied to the technology gained from the EF 2000, this would fill the void in technology the Russians cannot supply.³⁴

VIII. Summary

Taking into account the Chinese aviation industries capabilities, the number of aviation related joint ventures and foreign companies in China, and the support being supplied to China from Russia and Europe on cutting edge military aviation projects, the ECWG does not believe the control levels for the commercial navigation and avionics equipment, software and technology in the Proposed Rule could possibly have any impact on Chinese military aerospace capabilities.

³⁴ Sources for this section include. 1) SinoDefense, "J-XX 4th Generation Fighter Aircraft," 2 June 2006. <<http://www.sinodefence.com/airforce/fighter/jxx.asp>> Nov 2006.; 2) 超级大本营军事论坛 <<http://bbs.cjdtb.net/>> Nov 2006.; 3) Turkish Daily News, "EU Plans to Sell Eurofighter (typhoon) To Pakistan Through Turkey," 29 May 2006. Found in: <<http://www.pakistaniddefenceforum.com/lofiversion/index.php/t57817.htm>> Nov 2006.; 4) Chinese Military Aviation, "Fighters," Nov 2006. <http://mil.jchina.com.cn/huitong/j-10_j-11_FC-1.htm> Nov 2006.

CHAPTER VI

Diesel and Marine Engines

I. List of ECCNs:

8A992: Underwater systems or equipment, not controlled by 8A002, and specially designed parts therefor.

8D992: "Software" specially designed or modified for the "development", "production" or "use" of equipment controlled by 8A992.

8E992: "Technology" for the "development", "production" or "use" of equipment controlled by 8A992.

9D990: "Software", n.e.s., for the "development" or "production" of equipment controlled by 9A990 or 9B990.

9E990: "Technology", n.e.s., for the "development" or "production" or "use" of equipment controlled by 9A990 or 9B990.

Under existing U.S. export control regulations, the equipment controlled under 8A992, the software and technology related to 8A992, and the software and technology related to 9A990 does not require a license to China. The New China Rule proposes to add controls to items falling under ECCNs 8A992, 8D992, 8E992, 9D990 and 9E990.

II. China Market and Domestic Companies

China produces about 10 million of the 28 million engines manufactured globally each year. Approximately 8 million diesel engines produced in China are for the agriculture market and the remaining 2 million engines for the non-agriculture market.

Chinese domestic companies have been growing rapidly over the past five years and expanding their market share both in China and internationally. Two such companies, Weichai Power Co. Ltd. and the Yuchai Group, are detailed below:

1. *Weichai Power Co. Ltd.*

Weichai Power Co., Ltd. ("Weichai Power") was founded by Weifang Diesel Engine Factory together with domestic and foreign investors. Weichai Power specializes in the research and development, manufacturing and sales of diesel engines. The products are widely applicable to different markets, including heavy-duty vehicles, coaches, construction machines, vessels and power generators.

The majority of Weichai Power's business is in the manufacture of high-speed heavy-duty diesel engines. The two main products of the company are the WD615 and WD618 diesel engines, which have a horsepower rating range of 158HP to 433HP and are widely used in heavy-duty vehicles and coaches, construction machine engines, vessel engines and power generator engines. Currently, the revenue from WD615 Euro I Engines constitutes the majority of Weichai Power's sales.

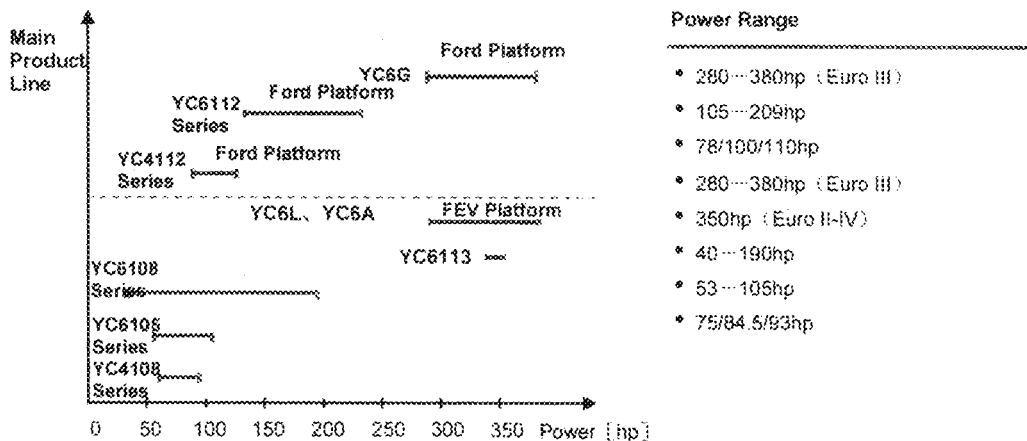
In 2005, Weichai Power, however, announced production of its WP12 series diesel engines. The Weichai Power Landking WP12 series Euro III diesel engine was co-developed by Weichai Power and AVL Company, Austria. It is a totally new design and meets the requirements of Euro III and has the potential to meet the Euro IV standard. The engine can be widely used in heavy-duty vehicles, coaches, construction machines, vessels and power generators. The anticipated production rate is expected to be 50,000 units per year. Weichai Power invented this new product line, so Chinese companies would have time to meet the Euro III emissions standards China is requiring in 2008.

2. Yuchai Group

Established in 1951, Yuchai Machinery Guangxi ("Yuchai Group") is the largest manufacturer of internal combustion engines and the largest manufacturer and exporter of medium and small engineering machinery in China. Yuchai Group was formed by a combination of Yuchai Machinery Group Co., Ltd. and Yuchai Machinery Co., Ltd. which includes twenty five holding and joint venture subsidiaries. In 2005, Yuchai Group's sales revenue were \$725 million, which equated to 230,228 units sold, a net income of \$61 million and a net income margin of 8%.

Yuchai Group's diesel engines come in five categories with ten series. Together they total over 1200 models used in light, medium and heavy-duty trucks, travel coaches, forestry/farm machinery, small to medium watercraft and power generators. These diesel engines start at 65 horsepower and range up to 380 horsepower.

The following chart shows the power range for a number of the Yuchai engines and the corresponding platform:



Their new product development, which will be accomplished in cooperation with global partners, will focus on: higher power range engines; high emission standard engines; and passenger car diesel engines. For example, Yuchai is cooperating with Yamaha in the joint development of a high speed marine engine. Additionally, they are focusing their R&D efforts on electronic control and HPCR and have been developing Euro IV and hybrid fuel technology engines since 2005.

III. Chinese Domestic Military Diesel Engine Manufacturers

The Chinese military engine sector is dominated by a small number of domestic State Owned Enterprises (“SOEs”). For the vehicle engines China cannot produce, it receives significant assistance either in direct engine exports or joint development from Russia and Europe. The specifications for these engines are beyond the control level of the items listed on the CCL and would fall under the scope of the U.S. Munitions List if they were of U.S. origin.

Following is information researchers provided on three of the Chinese SOEs producing diesel engines for the Chinese military.

1. Shan’xi North Power Co., Ltd.

Shan’xi North Power Co., Ltd. (Shan’xi Power”) is a wholly state-funded enterprise that is under the China North Industries Group Corporation (“NORINCO”). Its sole shareholder is the Arms Corporation Shan’xi Arms Industry Management Bureau and its primary business is the production of wind-cooled diesel engines, small-type general oil engines, and the pump filters and spare parts for motorcycles and diesel engines.

One of its primary engine lines is the 413F series of wind-cooled diesel, which was produced based on the German KHD Company’s technology. The current product series B/F8L413F is used in numerous applications, including heavy-duty

trucks, engineering machines and generator units. The specific product parameters for the 413F series are shown in the following chart:

Model	F8L413F	BF8L413F	F12L413F	F6L413F
Cylinder no. / layout	V type 8 cylinders	V type 8 cylinders	V type 12 cylinders	V type 6 cylinders
Bore×stroke (mm)	125*130	125*130	125*130	125*130
displacement (L)	12.763	12.763	19.144	9.572
Compression ratio	15.8	15.8	18	
Rated output/rotating speed (KW/(r/min))	188/2500	235/2500	282/2500	150/2500
Max. torque /rotating speed (Nm / (r/min))	1170/1500		1226/1500	
Min. fuel consumption rate (g/kWh)	212	212	208	205

2. Hebei North China Diesel Engine Co., Ltd.,

Hebei North China Diesel Engine Co., Ltd. ("Hebei Diesel") is solely funded by NORINCO and is a professional manufacturer of diesel engines for both military and civil use. Hebei Diesel is currently licensed by the German DEUTZ company to produce BFM1015 water-cooled diesel engines, which are widely applied to special military vehicles, luxury buses, and heavy-duty buses, specialty cars, engineering machines, oil equipment and power generation.

The specific product parameters are as follows:

Model		BF6M1015	BF6M1015C/ MV	BF6M1015CP/ MV	BF8M1015C/ MV	BF8M1015CP/ MV	
Cylinder number/ layout		V-type 6 cylinders	V-type 6 cylinders	V-type 6 cylinders	V-type 8 cylinders	V-type 8 cylinders	
Bore/stroke	Mm	132/145	132/145	132/145	132/145	132/145	
Displacement	L	11.906	11.906	11.906	15.874	15.874	
Compression ratio		17	17	17	17	17	
Max. rated speed	RPM	2100	2100	2100	2100	2100	
Rated output	Continuous output	kW/RPM	214/2100	261/2100	287/2100	348/2100	383/2100

	intermittent working	kW/RPM	223/2100	273/2100	300/2100	364/2100	400/2100
	Involuntary intermittent working	kW/RPM	231/2100	286/2100	314/2100	381/2100	419/2100
	automotive power	kW/RPM	240/2100	300/2100	330/2100	400/2100	440/2100
Max. torque	Nm		1473	1773	2040	2364	2721
Max torque speed	RPM		1300	1300	1300	1300	1300
Min. idle speed	RPM		550	550	550	550	550
Min. fuel consumption rate	g/kWh		198	188	188	189	189
Weight	Kg		830	830	830	1060	1060
Dimension (L × W × H)	Mm		841 × 932 × 1174	841 × 932 × 1174	841 × 932 × 1174	1010 × 955 × 1174	1010 × 955 × 1174
Emission standard			EUR O I	EUR O II, EUR O III	EUR O II, EUR O III	EUR O II, EUR O III	EUR O II, EUR O III

Note: Its parent, NORINCO, is an investment organization authorized by the State to oversee the performance of state-owned assets. The group has the decision-making power of investment, beneficial interest in assets, authority to examine and approve foreign affairs, import and export permits, and the contract rights in projects and combines product operation with capital operation. NORINCO's primary location is at Sanlihe Road, Xicheng District, Beijing, and its main business activities are the manufacture of weapons and relevant furnishings.

3. FAW Jiefang Automotive Company Ltd. Dalian Diesel Engine Company

FAW Jiefang Automotive Company Ltd. is a heavy duty truck manufacturer with technology support from the FAW Group Corporation R&D Center. It was wholly funded by FAW group and was established based on the original First Automobile Works. The main business activity is the manufacture of heavy duty trucks under the Jiefang brand name. The company was founded in 1951 and was one of the earliest enterprises in the trial-manufacturing of diesel engines for vehicles in China. It has now become a professional diesel engines production base and also provides engines for military use. In 2003, FAW Group began negotiations with the German DEUTZ company about producing DEUTZ diesel engines. The company now has the DEUTZ workshop where it produces DEUTZ diesel engines. The specific product parameters are as follows:

Model	BF6M1013-24	BF6M1013-26	BF6M1013-28	BF6M2012-20	BF6M2012-22
Cylinder number	6	6	6	6	6
Bore*stroke (mm)	108X130	108X130	108X130	101X126	101X126
Displacement(L)/displacement per cylinder	7.2/1.2	7.2/1.2	7.2/1.2	6.06/1.01	6.06/1.02

Type	straight---line Water-cooled	straight---line Water-cooled	straight---line Water-cooled	straight---line Water-cooled	straight---line Water-cooled
Air intake method	turbocharged, inter-cooled	turbocharged, inter-cooled	turbocharged, inter-cooled	turbocharged, inter-cooled	turbocharged, inter-cooled
Rated output/ rotating speed (kW/PS/r/min)	175/240/2300	195/265/2300	206/280/2300	147/200/2300	162/220/2500
Max. torque/ rotating speed (Nm/r/min)	854/1400	954/1400	1050/1400	735/1500	770/1500
Fuel consumption rate(g/kW.h)	200	200	200	200	200
Valve number per cylinder	2	2	2	2	4
Compression ratio	18.1	18.1	18.1	18	
Fuel-supplying mode	mechanical/electronic	mechanical/electronic	electronic	mechanical/electronic	Electronic
Injection pump	unit pump	unit pump	unit pump	unit pump	unit pump
Emission	EURO II/III	EURO II/III	EURO II/III	EURO II/III	EURO II/III
Injection pressure (bar)	1100-1600	1100-1600	1600	1600	1600-1800
Weight (kg)	650	650	650	550	550

IV. Foreign Company Sales/Transfers to China's Military

Following are two examples of foreign cooperation in the supply either through direct engine sales or technology transfers to China's military vehicles and vessels:

A. The Type 99 Main Battle Tank (MBT)

The Type 99 MBT is the PLA's third generation indigenous MBT. The main contractors are Beijing-based China North Vehicle Research Institute (NEVORI, also known as 201 Institute) and Inner-Mongolia First Machinery Group Co., Ltd (FIRMACO) of Baotou, Inner Mongolia. The 201 Institute of Beijing and 617 Factory (now also a part of FIRMACO) of Baotou, Inner Mongolia originally proposed a third-generation MBT design based on the German Leopard 2 MBT, featuring a German-made 1,200hp diesel engine. However, the PLA was reluctant to fund the program because it was in favor of purchasing or locally producing the Leopard 2. Negotiations with West Germany lasted for a few years before the acquisition plan was finally cancelled due to financial difficulties. The program then went back to the indigenous development, with three experimental prototypes (1224, 1226, 1226F2) introduced in the early 1980s.

The program entered full scale development in the mid-1980s when China North Industries Corporation (NORINCO), the parent company of 201 Institute and 617 Factory, was officially awarded the development and manufacturing contract for the third-generation MBT program in the spring of 1989. The first prototype known as the Type 90-II was built and tested in early 1990.

Propulsion: The Type 99 is powered by a liquid cooled, turbocharged 1,500hp diesel derived from German MB871ka501 diesel technology. At its current battle weight of 54t, this gives a power-to-weight ratio of about 27.78. The maximum speed by road is

80km/h and 60km/h cross country. The acceleration is from 0 to 32km/h in 12 seconds. The transmission provides seven forward and one reverse gear.³⁵

B. Marine Diesel Engines

The Type 054 (NATO codename: Jiangkai Class) is the new generation multirole frigate for the PLA Navy. The first two hulls, Ma'anshan (525) and Wenzhou (526), were delivered to the PLA Navy East Sea Fleet in 2005. Equipped with a mixture of Russian- and Chinese-made systems, the 3,400t frigate design incorporates strong stealth features similar to the French La Fayette class. The subsequent ships designated Type 054A are reportedly equipped with Russian 9M317 (SA-N-12) Shtil air-defense missiles and guidance radar. At least two ships are currently under construction.

The propulsion of the Type 054 is a combined diesel and diesel (CODAD) arrangement. The primary propulsion is reported to be two French-made SEMT Pielstick diesel engines (~21,000hp). The similar diesel engine is used by the French La Fayette class frigate. China reportedly received the first batch of the diesel engines from France in 2003. The power plant is said to be one of the most advanced in Europe. The secondary propulsion is two indigenous Shaanxi diesels (Chinese copy of the MTU 20V 956TB92) rated at 8,840 hp (6.5 MW).

It is believed that SEMT-Pielstick has been licensed by the French government to produce diesel engines for numerous PLA Navy surface ships and submarines.³⁶

V. Joint Ventures

In addition to the above-described Chinese domestic companies, a number of joint ventures between Chinese domestic companies and foreign companies also produce diesel engines that would fall under the scope of the EAR, whether classified as EAR99 or under ECCN 9A990. These companies include Volvo (Sweden), Deutz (Germany), Iveco (Italy) and Mitsubishi (Japan). These companies, which represent Cummins' major international competitors, are continually trying to expand their presence in China through joint ventures, technology licensing, and strategic alliances.

For example, the following chart identifies numerous international engine makers and the JV's and alliances they have formed in China in the heavy truck and marine engine markets:

Chinese Partner	Foreign Partners	Country of Origin
DFM	Renault	France
Shanghai Diesel	Hino	Japan
FAW	Deutz	Germany

³⁵ Sinodefence, "Type 99 Main Battle Tank," March 19, 2006, <<http://www.sinodefence.com/army/tank/type99.asp>>, Nov 2006.

³⁶ Sinodefence, "Type 054 (Jiangkai Class) Multirole Missile Frigate," September 16, 2006, <http://www.sinodefence.com/navy/surface/type054jiangkai.asp>, Nov 2006.

SAIC	IVECO	Italy
Qingling Motors	Isuzu	Japan
China Shipbuilding Industry Co.	Mitsubishi/ Wärtsilä	Japan

Details on a number of these joint ventures are as follows:

1. DFM-Renault

The DFM-Renault Joint Venture produces Renault dci11 engines under a technical license agreement. The engines are assembled in China and the DFM technical center works directly on the engine drawings.

2. Shanghai Diesel-Hino

The Shanghai Diesel - Hino Joint Venture is a 50-50 JV with a total investment of US\$ 29.98. Under the first phase, the JV started producing the Hino P11C engine. In the second phase, they will begin producing the J08 C engines. The plant has an annual capacity of 15,000 and began production in 2004.

3. FAW-Deutz

The FAW -Deutz Joint Venture produces the BFM 2012, 2013 and 1013 series 4 and 6 cylinder engines. Deutz transferred the technology for these engines, and they are now completely produced in China. The JV produces 30 categories for auto diesel engines and 9 for construction ranging in power from 122 HP to 300 HP.

4. SAIC and IVECO

SAIC and IVECO have signed an agreement to establish a 50-50 joint venture that will be called Shangqi IVECO. After the approval of the joint venture, IVECO will acquire a 67% share in Chongqing Hongyan. The two partners then plan to invest .12 billion Euros in a new engine company. IVECO will invest 40 million Euros to produce HDT and construction engines. The capacity for the new company will be 30,000 units per year.

5. Qingling Motors-Isuzu

The Qingling Motors-Isuzu Joint Venture is a 50-50 JV located in Chongqing and has a total investment of US\$ 1.5 billion. It is Isuzu's fifth JV globally. The JV will import the new Isuzu world level 340-380 HP engine and the 130-250 HP CNG engine.

6. *Wärtsilä, China Shipbuilding Industry Corporation (CSIC) and Mitsubishi Heavy Industries (MHI)*

Wärtsilä, China Shipbuilding Industry Corporation (CSIC) and Mitsubishi Heavy Industries (MHI) are establishing a joint venture to manufacture large, low-speed marine engines in China. CSIC will hold 50% of the joint venture, Wärtsilä 27% and Mitsubishi 23%. The investment will total around 75 million euros, spread over several years. Production is scheduled to start during the fourth quarter of 2008.

7. *MTU*

Additionally, MTU has a Wholly Owned Foreign Enterprise (WOFE) located in Suzhou. The WOFE began production in mid 2006 and produces 12, 16 and 18 cylinder engines.

VI. Foreign Technology Suppliers

In addition to the Chinese companies and joint ventures, a number of foreign companies are providing cutting edge technology to China for the development and production of diesel engines. Two of the major foreign technology suppliers are AVL out of Austria and FAV out of Germany. Following are details on technology projects these companies are working on in and with China.

1. *AVL*

AVL-- Austria worked jointly with Weichai Power to produce the Landking WP12 series Euro III diesel engine. This diesel engine adopts a new design concept suited to the requirement of Euro III and has the potential to meet the Euro IV standard. It is environmentally friendly and economical with all the specifications of fuel consumption, emission, noise, and reliability reaching the world advanced level. The Landking series diesel engine is mainly used in heavy-duty trucks, luxury buses, special vehicles as well as engineering machinery, vessels and generating sets. Landking vehicle diesel engine has the largest displacement of its kind in China.

The structure of the WP12 diesel engine is as follows: The whole gear system is designed to lower the noise. Postpositive gear chamber drives the motor, hydraulic pump, injection pump and air compressor (the 1st or 2nd cylinder). It can output the torque of 1000 Nm. The turbocharger is middle-positioned. The electronic heating flange is adopted to replace the flame preheating starting device and solve the problem of the *white smoke* which usually happens when the engine gets started in winter. Multi layered compound material is used to lower the noise and enlarge the storage of the oil pan and prolong the period between oil changes.

The Landking WP10 series Euro III diesel engine was also co-developed by Weichai Power and AVL and is likewise designed to suit the requirements of Euro III with the potential to meet the Euro IV standard. It is environmentally friendly and economical with all the specifications of fuel consumption, emission, noise, reliability reaching the world advanced level. The WP10 has basically the same characteristics and specifications as the WP12.

2. FEV

FEV -- Germany has also worked in China to provide diesel and gasoline engine technology for Chinese automotive companies. Such companies would include Dalian Diesel and Brilliance. On May 11, 2005, FEV China Co., Ltd., opened its new high-tech powertrain development center in Dalian, a harbor city in Liaoning Province about 600 km east of Beijing. This technology development centre provides engine design, electronic calibration development, performance and emissions solutions, and components validation expertise. Technical services include design analysis, engine development, vehicle integration, transmissions design, supplier handling, product reliability planning, manufacturing and quality systems.

Currently, FEV China has 33 employees, a figure that is growing month by month. In addition, six German expatriates are assisting in the set-up of the organization. The first engine was successfully completed in the summer of 2005.

VII. Engine Software Standards and Protocols

Engine manufacturers use commercially available software applications to ensure compliance with environmental regulations. These software applications are used to operate service tools; run engine diagnostics; and operate manufacturing tools for engine calibration.

U.S. Companies, as well as other foreign companies, participate in standards discussions at local and international levels to establish accepted software protocols, ranging from vehicle network communications to diagnostic standards.


China is in the early stages of establishing its engine software standards and protocols. It is U.S. Government policy that industry drives the development of standards. The U.S. Government continually advocates that China be more transparent in its standard setting process and allow U.S. companies to be involved in developing standards in China.

If export controls limit or give the appearance of limiting the ability of U.S. Companies to participate in developing China's standards, U.S. companies will be disadvantaged and forced to re-develop products to meet Chinese market standards. The opportunities naturally associated with standards development will go to non-U.S. multinationals and their Chinese partners. The European and Japanese companies, who will not be under equivalent restrictions, will be involved in China's standards development and thus gain a great advantage over U.S. companies.

VIII. Summary

In the diesel engine sector, China has ample access to components from a variety of internal and external sources. Numerous high technology companies in the U.S., Japan and Europe supply diesel engine technology to China for use in a variety of commercial applications. As detailed above, a combination of Chinese joint ventures and Chinese enterprises are manufacturing commercial diesel engines using foreign and domestically engineered technology. To close the technology gap with international diesel engine makers, the local companies are actively developing larger horsepower engines compliant to more demanding emission standards with the help of international powertrain engineering consultants.

The following chart demonstrates the shared technology and components in the majority of domestic Chinese and internationally produced diesel engines:

Key competitors: 

Summary (predominantly Auto & Bus)

Engine Provider	ECM/ECU	Fuel System/Fuel Pump	Injection	Exhaust	SCR
Isuzu (Bus & L) *	*BOCC R	*Bosch *BOCC R *Lucas (Bus) or Cherehil/S&M	*Bosch *BOCC R	*BOCC R	*Mercedes Benz *Valeo?
Volvo (Bus & L)	*BOCC R	*BOCC R	*BOCC R	*BOCC R	
Changchai (Bus & L)	*Denso?	*Bosch	*Bosch	*BOCC R	
Yuchai (Bus & L)	*Wipac/Bosch	*BOCC R *Denso	*BOCC R *Bosch	*BOCC R *Molins	
Isuzu (Bus & L)	*BOCC R	*BOCC R	*BOCC R	*VogenDenso *Mercedes Benz	
Changchai (Bus & L)	*YIT?	*BOCC R	*BOCC R/Injecon	*Gensco VVO *BOCC R	
Wanzhi (Bus & L)	*YIT?	*BOCC R	*BOCC R	*BOCC R	
C.R.N.T.C. Nanhai (Bus & L)	*Denso?	*Denso (Bus & L) *C.R.N.T.C. Dongying (Bus & L)	*Denso (Bus & L) *C.R.N.T.C. Dongying (Bus & L)		
Isuzu (Bus & L)	*Mitsubishi	*C.B.S.I. (Bosch) BOCC R			
MAN (Bus & L)	*BOCC R	*Bosch (Bus & L)	*BOCC R	*BOCC R	
Nardo	*YIT?	*Bosch			
Termin Perkins	*BOCC R	*BOCC R	*BOCC R	*BOCC R	
Wipac	*BOCC R	*BOCC R (Bus & L)	*BOCC R	*BOCC R	

This chart, along with the previously provided information, demonstrates that China has ample indigenous sources for diesel engines and related software and technology to meet both commercial and military demands. The commercial demand and development is being driven by emission requirements, which is contrary to the military diesel engine requirements. The Chinese military demand is being met through sole and joint development in China, as well as direct exports from non-U.S. foreign companies. The ECWG, respectfully, submits that adding further controls on diesel engine related software and technology, when the Chinese military is clearly well ahead of the levels in the Proposed Rule, would not further U.S. export control policy goals relating to Chinese military capabilities.

CHAPTER VII

Helicopters

I. List of ECCNs:

9A991: "Aircraft", n.e.s., and gas turbine engines not controlled by 9A001 or 9A101 and parts and components, n.e.s.

9D991: "Software", for the "development" or "production" of equipment controlled by 9A991 or 9B991.

9E991: "Technology", for the "development", "production" or "use" of equipment controlled by 9A991 or 9B991.

The Chinese helicopter industry is in a state of transition. While previously China was predominantly focusing on military helicopter development, the opportunities are quickly growing in the area of commercial helicopters. To date U.S. companies have not been heavily involved in China due to U.S. restrictions prohibiting involvement in Chinese military development. This has not, however, prevented the Chinese from advancing in both its military and commercial helicopter sectors. They have found multiple willing partners to assist in the development and production of both military and commercial helicopters.

U.S. companies have not been involved in Chinese military helicopter development, due in large part to U.S. export regulations. The market data shows that current U.S. regulations have been effective in restricting the export of U.S. origin helicopters and related technology and software to the Chinese military. In fact it could be argued that the current regulations have been over-restrictive such that U.S. companies have been almost completely cut out of the Chinese commercial helicopter market.

Now that China's commercial helicopter industry is on the verge of blossoming, U.S. companies have an opportunity to compete with foreign companies from Russia, France, and Italy that currently dominate the Chinese helicopter market.

As detailed later in this chapter, non-U.S. foreign companies have aggressively partnered with the Chinese to provide joint development as well as direct sales across all levels of both the commercial and military helicopter market. Eurocopter, AgustaWestland, Thales and Turbomeca are all participating and supplying technical assistance and components for China's newest military helicopters.³⁷ The Chinese military level, which is being jointly developed and produced in China with the assistance of Russian, French,

³⁷ For information about Thales participation and assistance in the aviation industry, see the Thales Avionics section in Chapter V -- Navigation and Avionics.

and Italian companies is well above the civilian aircraft level U.S. companies would supply. Current U.S. restrictions prevent U.S. companies from participating in these military-related programs, so there is no need to increase restrictions on civil certified aircraft. The Chinese have the ability and the U.S. companies are only seeking to work with China in the commercial helicopter industry.

Placing further restrictions on the military side civil aircraft, parts and components, related technology and software are unnecessary. The Chinese commercial helicopter demand is growing, and U.S. companies should be fully allowed to compete with the Chinese domestic companies and other foreign companies in this commercial market.

II. Overall China Market

In the current Chinese civil helicopter market for the intermediate weight class, which ranges 7,000 to 15,000 lbs, Chinese sources occupy 27.91% of the current civil market, while French sources occupy 23.26% and Italian sources 2.33%. In the medium weight class, which ranges 15,000 to 35,000 lbs, there are currently no Chinese domestic sources in the civil market, but China has invested resources in researching new prototypes for the Medium and Intermediate class helicopters. Meanwhile, Russian helicopters take 54.55% of the civil medium helicopter market share, and French helicopters take 42.42%.

In the past, the Chinese helicopter market has been dominated by the military, with military demand far exceeding demand for commercial aircraft. The remarkably slow growth rate of the Chinese civil helicopter market is primarily due to Government restrictions on air space. 50 years after Hafei made its first helicopter, China's civil helicopter fleet numbers a meager 170 helicopters, whereas the military fleet, initiated at roughly the same time, is at least four times as large. In recent years, a new upward trend has developed in the Chinese commercial aircraft market. Since 2000, the civil helicopter fleet in China has more than doubled, from approximately 70 helicopters in 1999 to 170 today.

With increasing urban wealth and the prospect of China lifting strict airspace controls within the next few years, China expects a significant increase in commercial demand for helicopters. The China National Aero-Technology Import & Export Corporation (CATIC) estimates that China will need more than 10,000 helicopters by 2020, with a market value of \$84 billion, but more conservative estimates anticipate the demand to reach 1,867 civil helicopters by 2013, with a value of \$4.9 billion.³⁸ Civil helicopter applications in China are becoming clearer for a wide range of sectors, from hospitals to search and rescue, off-shore oil support to short-distance airport services, and TV news stations to film crews.

³⁸ John Morris, Aviation Week's Show News Online, "China's Helicopter Market Could Be World's Largest," 2002 <<http://www.aviationweek.com/shownews/02asia1/topsto03.htm>> Nov 2006.

III. Chinese Domestic Availability

China has two major helicopter manufacturing companies, both of which are state-owned: Harbin Aircraft Manufacturing Corporation (Hafei) and Changhe Aircraft Industry Corporation (Changhe). The Chinese Helicopter Research and Development Institute (CHRDI) oversees the early stages of research in indigenous Chinese and jointly-developed helicopter technologies before it passes off the final development and production phase to one of the Chinese helicopter manufacturers. The China National Helicopter Corporation (CNHC) performs engineering management for the helicopter industry in China, is responsible for management of overall concept feasibility studies, research, testing, trial production, mass production and service of all types of helicopters manufactured by Hafei, Changhe and CHRDI. CNHC is also responsible for the development of helicopter markets and organizing international cooperation and technical exchange. CNHC, CHRDI, Changhe and Hafei are all subsidiaries of AVIC II.

The section below first provides details on the commercial helicopter programs at Hafei and Changhe, followed by a section about China's military helicopter capabilities and programs. Helicopter technology can be difficult to separate into commercial and military categories because the base helicopters are in many cases the same. The distinction between commercial and military helicopters frequently lies in the mission-specific equipment added to the helicopter, but in some cases they also differ in the types of materials used. Because military helicopters are made to meet performance requirements, regardless of cost, this sometimes means that military helicopters use a greater percentage of composite materials. The section below, addresses the commercial Chinese helicopter variants that can be expanded for domestic or international commercial sales.

1. Harbin Aircraft Manufacturing Corporation (Hafei)

- **Z-9 Program:** Harbin Aircraft (Hafei) has been deeply involved in joint helicopter development programs with Eurocopter and other foreign companies. In July 1990, Hafei began cooperation with Eurocopter, producing many variants of the AS365N/N1 Dauphin II helicopter (Chinese designator Z-9). Hafei produced the first 50 Z-9 multirole intermediate helicopters under license during the period between 1980 and 1990, during which Eurocopter supplied all components and technologies. The Dauphin II/Z-9 is a intermediate-weight multirole helicopter that is powered by two turbine engines. Capable of carrying 11 passengers and 2 pilots, with a top speed of 305km/h and a range of 1000km, the Z-9 uses composite materials in its main and rear rotor blades, and its tail rotor is built into the vertical fin.³⁹

³⁹ U.S. General Accounting Office. Statement of Harold J. Johnson before the Joint Economic Committee. "U.S. and European Union Arms Sales Since the 1989 Embargoes: China." 28 Apr 1998. <<http://www.gao.gov/archive/1998/ns98171t.pdf>> Nov 2006.

These helicopters were supplied to both the civil and military market in China, with a handful of sales overseas. Since 1990, Hafei has continued production of the Z-9 and variants with a localization rate of more than 90%. Hafei is now upgrading it to the N3 model with assistance from Eurocopter and its engine supplier. In 2001, the earlier civil variant of the Z-9, the H410A, made its debut, but Hafei has developed an improved variant Z-9 for the civil aviation market, the H425. This helicopter features more powerful Turbomeca Arriel 2C engines, more modern avionics, and a wider cabin.

- **HC-120 Program:** The Chinese HC-120 light helicopter program was also developed through assistance from Eurocopter. Eurocopter took the lead in a joint-venture with China and Singapore. CATIC and Hafei took 24% ownership in the JV and was responsible for contributing the fuselage and body of the helicopter to foreign engineers for final assembly. Technologies Aerospace of Singapore took 15% ownership and was charged with developing the tail section of the helicopter. Meanwhile, Eurocopter, which took 61% ownership of the JV, had engineering leadership and overall responsibility. This was the first time that China shared investment and risks with foreign partners in helicopter production. Hafei now boasts an assembly line of HC-120 light helicopter and it is also a supplier of numerous components such as the fuselage for the other assembly line(s) of Eurocopter.⁴⁰ Annual production of the HC-120 has reached more than 100, and to date more than 100 helicopters have been exported to more than 20 countries.

The HC-120 is designed to meet both military and civilian requirements, including search-and-rescue and evacuation operations as well as reconnaissance missions. It has a maximum speed of 232km/h, a range of 748km and seats 5 passengers.

- **Z-15 Program:** AVIC II and Eurocopter announced in late 2005 that the two companies will launch a partnership to develop a new 6-ton helicopter (EC designator EC-175; Chinese designator Z-15). This Z-15 will be a state-of-the-art helicopter.

In November 2006, the European Commission approved French governmental aid of €100 million Euros for Eurocopter to develop the EC-175/Z-15 with China under state aid for research and development. This partnership will last from 2006 until 2011 and the French government's aid to Eurocopter will cover

⁴⁰ John Morris, Aviation Week's Show News Online, "China's Helicopter Market Could Be World's Largest." 2002 <<http://www.aviationweek.com/stownews/02asia1/topsto03.htm>> Nov 2006.

approximately 29% of Eurocopter's research and development spending.⁴¹ Eurocopter will be controlling the design of the dynamic components and rotorhead system.

Hafei was assigned as the primary Chinese partner company in this deal. The goal is to fill the production gap and meet the growing demand for medium class helicopters in China. Several variants for military support have been proposed for this helicopter, but it is currently still in the development phase. The first flight of the Z-15 is expected in 2009.

2. Changhe Aircraft Industry Corporation (Changhe)

Changhe Aircraft Industry Corporation was established in 1969 in the city of Jingdezhen, Jiangxi province. Changhe is the Chinese Aircraft SOE known for both Helicopter and Minibus manufacturing. Since its establishment, Changhe has served as the site of helicopter programs based upon both joint Chinese-foreign and Chinese indigenous development.

In the past couple years Changhe has undergone a large-scale improvement and modernization program. The enterprise has built several large new facilities equipped with top-of-the-line modern machining and testing equipment, and it has plans for further development in the next year. New facilities include a brand new machining center, a modernized sheet metal shop, a revamped testing center, and paint facilities. Changhe is planning to build a large composites facility that will house all composites work and a new flight center that will house the military helicopter programs in an entirely separate and self-sufficient facility 18km away from the main Changhe facilities. All of these recent improvements have greatly facilitated and increased Changhe's production capacity. Through the 1990s, Changhe was producing approximately two or three Z-8 helicopters per year, but today it can produce about one Z-8 per month.⁴²

- **Z-8 Program:** In 1977 and 1978, the PLA Navy purchased the Eurocopter SA 321 Super Prolon. One of these French-made helicopters was disassembled and reverse-engineered at Changhe, reportedly with the agreement of the French, to create the Z-8, a utility transport helicopter. The Z-8 has a maximum speed of 315km/h, a ferry range of 830km, flight endurance of 2.5 hours, and can carry a maximum of 39 passengers.

⁴¹ AFP News, Brussels, "French govt aid for Eurocopter project with China approved by EU," 14 Sept 2006

⁴² John Larkin and Nina Hsu, Site visit to Changhe Aircraft, 9 November 2006.

Since its first successful flight in 1985, localization of the helicopter has reached nearly 100% and Changhe has created new improved variations on the Z-8. Changhe is also considering a new civil variant of the Z-8.⁴³

- **Z-11 Program:** The Z-11 lightweight utility helicopter development program was initiated by Changhe in 1989 and officially approved by the Chinese government in 1991. This helicopter was developed without joint foreign cooperation, but it was a direct copy of the French AS 350B Squirrel helicopter. The Z-11 is a six-seat lightweight helicopter equipped with basic navigation and radio equipment (with the improved upgrade options on the Z-11MB1 variant), a maximum speed of 261km/h, range of 600km, and a flight endurance of more than 3.9hours.

As with the Z-8, localization rate had reached nearly 100% and Changhe has developed a number of variants, including a military training and an armed variant. The Z-11 was revealed in the 1996 Zhuhai Air Show, and the first armed variant Z-11W flew in December 1994. Reports have indicated that Changhe is designing a civil variant of the Z-11, for which it is seeking Western partners.⁴⁴

- **CA-109 Program:** In 1995, Changhe launched an equity Joint-Venture with Agusta of Italy to make various models of Italian helicopters, starting with the A-109 utility helicopter (Chinese designator CA-109) as the launch product.

Changhe is responsible for manufacturing the airframe and tail boom, and Agusta will supply engines and avionics for the helicopter, as well as staff training and other technical assistance. This CA-109 has a maximum speed of 289km/h, a range of 977km, and a maximum take-off weight of 2850kg.

China intends to promote the CA-109 in the domestic and international civil helicopter market, though the helicopter could also be adapted into an armed variant. Changhe Agusta Helicopter has received mass orders for the CA-109 from police forces for security operations during the 2008 Beijing Olympics.⁴⁵

⁴³ Brendan Sobie, "Harbin begins test flying upgraded civil version of license-built Z-9," *Flight International*, 13 Jan 2004.

⁴⁴ Brendan Sobie, "Harbin begins test flying upgraded civil version of license-built Z-9," *Flight International*, 13 Jan 2004.

⁴⁵ Chen Pianpian, "CA109 helicopter to service Beijing Olympic Games," *Zhuhai Special Zone News*, 3 Nov 2006, p.5a.

IV. Foreign Availability

The predominant foreign suppliers to the current Chinese helicopter market, both military and commercial, are Eurocopter (France), AgustaWestland (Italy), and MIL (Russia). Kamov (Russia) has also supplied naval helicopter fleets of significant sizes to China's naval air force. These foreign companies have contributed to Chinese helicopter programs and helicopter fleets on numerous levels. Details on these and other foreign companies involved in Chinese helicopter sales and joint-development are included in the section below.

1. Eurocopter

Eurocopter, a subsidiary of EADS in France, is one of the foremost and significant suppliers to China's military, because it has not only sold fully-assembled helicopters to China, but it has also engaged in various levels of partnerships with Chinese helicopter manufacturers to provide technology and technical assistance. All of the three services under the PLA operate helicopters made by Eurocopter either in Europe or in China through its Joint-Venture. Eurocopter has provided some degree of technical assistance in Chinese programs to build the HC-120 light helicopter, the Z-9 multirole intermediate helicopter, and the Z-15 intermediate utility helicopter (Chinese Medium Helicopter). Reports have indicated that Eurocopter has provided some design assistance and a rotor system to the Chinese for the WZ-10 attack helicopter, and the Z-8 utility helicopter was developed through reverse-engineering of the EC SA 321 Super Frelon sold by Eurocopter to the PLA Navy.

Recently, Eurocopter/Harbin sold 40 EC/HC-120 helicopters to the Chinese PLA Army Aviation Corps.

2. AgustaWestland

Agusta in Italy is perhaps the most aggressive European helicopter manufacturer tackling the Chinese military and para-military market. Agusta has sold A-109, A-119 or A-139 helicopters to many provincial police bureaus at remarkably low prices. Agusta is also courting the Chinese PLA Army Aviation Corps with its A-139 helicopters and is offering its EH-101 helicopters to the Chinese PLA Air Force to carry China's head of state.

In addition, Agusta has provided extensive technical assistance to Changhe Aircraft through the equity Joint-Venture established in November 1995 to make various models of Italian helicopters, starting with the CA-109 utility helicopter as the launch product. The Italian helicopter manufacturer also signed a contract in 1999 with AVIC II and

CATIC to develop gear box and transmission components for WZ-10 attack helicopter, which may also be used on the Z-15.

3. MIL Bureau

Russia's MIL Bureau and its factories in Ulan Ude and Kazan have been supplying MI-8 helicopters and its export derivative MI-17-1 HIP helicopters to the Chinese Military in large quantities. Since early 1990s, total purchases have reportedly exceeded 200 units, in various configurations such as utility, search-and-rescue, and medevac. Sources note that another 24 MI-17-1 are being assembled in Ulan Ude now, waiting to be delivered to the PLA Army this year.

4. Kamov

Russia's Kamov Bureau sold its first 24 Ka-28 Helix-A (Export version of Ka-27) Anti-Submarine helicopters to China's PLA Navy in the late 1990s. Reports indicate that additional such helicopters were sold to PLA Navy in the subsequent years in association with Russia's sale of destroyers to the same customer.

Hong Kong sources reported that China was engaged in negotiations with Russia for the acquisition of 40 Ka-29 Helix-B helicopters in early 2006. The Ka-29 Helix-B is intended to carry paratroopers and conduct electronic warfare. At the same time China sought to buy 20 Kamov Ka-31 Helix-B Radar Early Warning helicopters.

5. Turbomeca

Turbomeca has offered to provide the turbo-shafts for the China Medium Helicopter/Z-10 utility transport and attack helicopter. The French company has already provided turbo-shafts for the Z-11MB1 to provide better performance in high altitude regions.

V. Chinese Military Helicopter Capabilities

Although this chapter of the report focuses on civil aircraft and related parts, software and technology, as covered by ECCNs 9A991, 9D991 and 9E991, the section below gives some background on the Chinese military helicopter capabilities. As noted above, the base aircraft in both the commercial and military sectors typically require equivalent levels of technology. The typical distinction between commercial and military variants of a base helicopter is in the mission equipment added as a modification. For the military, this normally includes items such as weapon mounts, military communication systems, targeting systems including FLIR and laser designators, and defensive survivability equipment such as radar, missile and laser warning systems.

Nearly all of the helicopter programs detailed in the sections above have included modifications of the base aircraft to suit military transport, training, reconnaissance and other military operations. Only one known program, however, has designated its initial prototype as military aircraft: the WZ-10 Attack Helicopter. The WZ-10 program has been under development since the late 1990s under tight security at the Changhe Aircraft facility. Once the Changhe New Flight Center is built, the WZ-10 program and any future military helicopter programs will be moved to this self-sufficient facility, which is located 18km from the main Changhe facilities. Reports indicated that as many as six prototypes have been built since 2004. The WZ-10 is undergoing extensive flight testing before the design will be finalized and production will be approved.

The Z-15 helicopter project that is being jointly-developed with Eurocopter is a commercial project, but once the project is completed, several variants may be available for army support, naval antisubmarine warfare, and search and rescue. As noted in the previous section, this helicopter will be state-of-the-art technology.

The Chinese helicopter manufacturers have met part of the basic demand of its military through domestic supply. For the high end demand, the military continues to depend heavily on imports from Europe or production through their Joint-Ventures with European and other foreign partners.

Note: The ECWG wishes to again emphasize the technology, development and production carried out or license to the JV is owned by the JV and this should be considered as domestic Chinese capabilities.

VI. Summary

The Chinese helicopter industry is concentrating its R&D capabilities and research funding on the development of the high-end, state-of-the-art helicopters such as the Z-10 and Z-15, which it anticipates it will need in large quantities, with technologies and assistance from European companies. Meanwhile, China imports both high-end and low-end helicopters from overseas, to meet the immediate demand of its military. It imports the high-end helicopters, such as the Kamov and Agusta products, because the Chinese industry cannot yet make them or only a small number would be needed for now. It imports the low-end helicopters such as the MI-8 utility transport helicopters because it is easy and more cost-effective to source them overseas than to make them locally.

Recognizing that the base aircraft for both military and civilian helicopters is very similar and that military helicopters are distinguished primarily by the added mission-specific equipment, there remains a clear division between the commercial and military markets for U.S. companies hoping to enter the China market. The Chinese helicopter industry, in the past has been focused on military development. At this point, China has already acquired the technology and ability, through indigenous and joint development with non-U.S. foreign companies, to design and produce state-of-the-art helicopters, which can be altered for both military and commercial applications. Today, the Chinese commercial helicopter market is opening and expanding. Because, U.S. export control regulations

already prohibit U.S. companies from participating in any military or military-related programs, there is no need to restrict U.S. companies from participating in the Chinese commercial helicopter market at a level of and below existing helicopter technology in China.

Chart 1: Harbin Helicopter Projects

Project Name	Nature of Relationship	Foreign Entity	Project Description	Notes
HC-120 (EC-120) Light Helicopter	JV Foreign Partners. CATC and Hafei 24%, Singapore Aerospace 15%, 61% Eurocopter.	Eurocopter (France), Technologies Aerospace (Singapore)	EC-120: Singapore in charge of tail section, France responsible for engine, Hafei contributes body to foreign engineers for final assembly. Eurocopter has engineering leadership and overall responsibility. China built assembly line in Harbin. Designated HC-120 for China market. First time China shared investment and risks with foreign partners in helicopter production.	EC120 helicopter is designed to meet military and civilian requirements, including search-and-rescue and evacuation operations, as well as intelligence uses.
Z-9 Multirole Intermediate Helicopter	Cooperation since 1980	Eurocopter (France)	Since July 1980 made many variants of the AS365N/N1 Dauphin II helicopter (Chinese designator Z-9) under license to supply civil and military market in China. Several sold overseas. Until 1990, EC supplied all components and technologies. Production has continued with now higher than 90% localization of the AS365N/N1. Now upgrading N3 model with assistance from EC and its engine supplier.	The H410A and H425 are variants designed for the civil market. The Army versions are designated Z-9 (unarmed) and WZ-9 (armed), and naval version Z-9C. The helicopter first flew in 1981 and entered PLA service in the mid-1980s.
Z-15 Intermediate Utility Helicopter	Partnership between AVIC II and Eurocopter with Harbin as primary Chinese partner	Eurocopter (France)	December 2005: AVIC II and Eurocopter signed agreement to jointly develop new 6-ton helicopter (EC designator EC-175; Chinese designator Z-15). Aim to fill growing demand for medium class in China. Expected first flight in 2009 and certification in 2012.	Several variants for army support, naval antisubmarine warfare (ASW), and search and rescue (SAR) roles.

Chart 2: Changhe Helicopter Projects

Project Name	Nature of Relationship	Foreign Entity	Project Description	Notes
CA-109 Utility Helicopter	Equity JV	Agusta (Italy)	JV formed to make various models of Italian helicopters with CA-109 (Agusta designator A-109E) as the launch product. JV established Nov 1995. Changhe will serve as the main contractor responsible for the manufacture of the airframe and tail boom.	Will be promoted to domestic and international market. Initially target the civil market, but could also be developed into an armed variant for reconnaissance, surveillance, medical evacuation, and ground attack roles.
Z-8 Utility Helicopter	Reverse-engineering of purchased helicopters	France	Disassembly and reverse-engineering of Eurocopter SA321 Super Prolon purchased for PLA Navy. Z-8 includes WZ-6 (Chinese copy of Turboméca 3C III) turboshafts with similar performance. First Z-8 prototype successfully flew 1985. Localization rate nearly 100%.	Lacks Anti-Submarine Warfare mission equipment that was on the original SA321 Super Prolon, so Z-8 is only capable of transport and logistic roles. Considering developing civil variant.
Z-11 Lightweight Utility Helicopter	Development program initiated by Changhe in 1989 and officially approved by government in 1991.	None: No direct joint cooperation, but was a copy of AS 350B Squirrel.	Direct copy of the French AS 350B Squirrel. Localization rate nearly 100%. Developed a number of variants including the military training variant Z-11J, armed variant Z-11W, French Arriel 2B1A engine-powered Z-11MB1, and Z-11ME1.	Revealed Z-11 utility light helicopter during the 1996 Zhuhai Air Show. Over 40 of the military training variant Z-11J currently flying with PLA Army Aviation Corps Flight School. The armed variant Z-11W first flew in December 2004. Designing a civil variant.
WZ-10 Attack Helicopter	Joint development with CHRDI	None: no outside help with the attack helicopter's mission system, mainly due to security reasons	3 rd generation two-seat design comparable in size and performance to the European Tiger and South African Rooivalk. Under development since late 1990s under tight security. Work with European partners on common helicopter dynamic system, which can be used on both the proposed medium helicopter (CMH - Z-15) and the attack helicopter.	Attack helicopter for the PLA

Chart 3: Foreign-supplied Helicopter Components

Foreign Entity	Supplied Components	Project Name
Eurocopter (France)	Develop appropriate rotor system, including the main and tail rotor hubs and blades	CMH (Z-15) and possibly WZ-10 attack helicopter
	Supplied all components and technologies.	Z-9
Agusta (Italy)	Develop the gear box and transmission components	WZ-10, Z-15
	Providing design expertise, which may include the final choice on the powerplant options.	CMH
	Supply engines, avionics, staff training and other technical assistance	CA-109
Turbomeca (France)	Offered at least one unspecified powerplant, and its new 900kW-class Ardiden turbo-shafts specifically designed for 5/6t class helicopters	CMH; Z-10
	Z-11MB1 is fitted with a French-made 632kW Arriel 2B1A turbo shaft for better performance in high altitude regions.	Z-11MB1
	550kW (739hp) Turbomeca Arriel-JC1 turbo shaft, which is produced by SAEC at Zhuzhou as Wozhou-8A (WZ-8A). Hafei developing H410A/425/450 (variant of Z-9) powered by two improved 635kW (851hp) Arriel-II turbo shaft engines.	Z-9, H410A and H425 (variants)

Chart 4: Foreign Helicopter Sales

Foreign Entity	Helicopter Sales Details	Helicopter Name
Mil Design Bureau (Ulan-Ude Aviation Plant and Kazan Helicopter Plant JSC) (Russia)	Sold Soviet-built Mi-8 transport helicopters (1970s), many no longer used. Sold over 200 Mi-17 (upgraded variant of Mi-8) since 1990. Sold Mi-6 (1970s); reports that PLA may be negotiating to buy successor Mi-26.	Mi-8, Mi-17; Mi-26
Eurocopter (France)	AS 332L Super Puma transport helicopters purchased (1980s).	AS 332L Super Puma
Eurocopter (Formerly Aerospatiale)	Sold 13 examples of the French-made Aerospatiale SA 321Ja Super Frelon helicopter to PLA Navy in the (early 1970s); Sold small number of the French-made, Aerospatiale SA 316 Alouette III utility helicopter (early 1970s).	SA 321 Ja; SA 316

ATTACHMENT A
Composite Materials Report

Composite Materials in the Aerospace Industry in China

AmCham Export Compliance Working Group
May 23, 2006

ATTACHMENT A

Composite Materials Report

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ATTACHMENT A

Composite Materials Report

I. Executive Summary

Introduction

The Export Compliance Working Group (ECWG) under the American Chamber of Commerce -- Beijing (Amcham) has prepared the following report on the Chinese aerospace composite material industry. The report provides a market analysis demonstrating the current level of the Chinese aerospace composite material sector, the current and future demand for composites in the Chinese aerospace industry, and the distinction between the commercial and military sectors in aerospace composite materials.

Objective

The objective of the report is to demonstrate to the U.S. Government the type of data the Amcham ECWG can provide on strategic market sectors. The report supplies information on the current levels of material, technology and equipment available in the Chinese aerospace composite materials sector, with the goal of assisting the U.S. Government in determining the following: 1) setting the level of control on aerospace composite materials, technology and tooling for China, 2) assessing specific end-users in China, and 3) evaluating the end-use for commercial versus military application. The Amcham ECWG believes this report provides valuable information that will benefit the U.S. Government and industry by increasing exports in the aerospace composite material sector to legitimate commercial end-users and end-uses while preventing exports that make a material contribution to the Chinese military capabilities.

Talking Points

Material Level and Availability

1. China's market demand for aerospace grade composite materials for the commercial sector is growing. This growth is due to the globalization of the commercial aircraft manufacturing sector and China's increased role within the worldwide division of labor and production in this sector.
2. The following is a list of current and future projects between Chinese and foreign aircraft manufacturers in the commercial aerospace industry: the ARJ21, Boeing 787 Dreamliner, Retro-fits on the Boeing 737 and 767 aircraft, Airbus A320, A330 A340, and A350, Embraer/Harbin 50 seat commercial aircraft, ZB9 Multi-Role Helicopter, EC120 Helicopter, Z15 Helicopter, and M340 Helicopter.
3. In the aerospace composite material sector, China has ample access to composite materials from a variety of internal and external sources. Numerous companies in the U.S., Japan and Europe supply aerospace composite grade materials (prepregs) to China for use in producing composite parts for commercial aircraft.

ATTACHMENT A

Composite Materials Report

4. China produces its own materials (prepregs) for use in the military sector. These materials are at a higher level than what foreign suppliers are providing for commercial end-use in China but well below the level of composite materials being produced for U.S. military aircraft such as the F-22 and Joint Strike Fighter (JSF).
5. **Conclusion:** This information should assist the U.S. Government in drawing a clear line between the level of materials with legitimate commercial end-uses and those which could make a material contribution to Chinese military capabilities.
6. **Recommendation:** The Amcham ECWG supports drawing this line at a level that would lead to decreasing the number of items requiring a license, decrease licensing time for commercial level items, and prohibiting the export of those items that contribute to China's military capabilities.

Technical Level and Ability

7. A combination of Chinese Joint Ventures and Chinese Enterprises are manufacturing composite parts for commercial aircraft using foreign supplied prepregs. This work is almost exclusively carried out on a build to print basis.
8. One Chinese company, however, is designing, developing and manufacturing composite parts for commercial aircraft completely on its own from start to finish. For example, they have solely designed, developed and currently produce an aircraft frame out of carbon composite materials. This is well above the build to print level foreign companies and joint ventures are currently providing to the commercial aircraft sector in China.
9. Additionally, European companies have announced plans to increase cooperation with China on the design and development of composite parts for commercial aircraft. Airbus recently announced it will partner with Chinese companies on the design and development of composite parts for the A350. Airbus stated that this would be at the build to spec level. Published reports state that at least 50 Chinese engineers are currently in Europe receiving training from Airbus on the A350 project.
10. The Chinese military is already producing composite parts at the build to spec level. The demands on the military side also do not coincide with the commercial aircraft specification requirements. The Glass transition temperature required for military aircraft is necessarily higher than that for commercial aircraft.
11. **Conclusion:** The inherent technical abilities in China combined with the technical levels planned with European aircraft manufacturers demonstrate that China is already fully capable of working at the build to spec level in producing

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composite parts in the commercial sector. This information should assist the U.S. Government in drawing a clear line between the levels of technology the U.S. Government can approve for export to China for legitimate commercial end-uses without making a material contribution to Chinese military capabilities.

- 12. Recommendation:** The Amcham ECWG supports drawing this line at a level that would allow the U.S. Government to approve licenses permitting U.S. companies to work at a technical level equivalent to what is already available inherently in China from its domestic industry or in cooperation with foreign companies.

Manufacturing Level and Ability

- 13.** Some composite tooling is available in China from foreign sources, but the work is predominantly being carried out by hand. The growing demand to produce composite parts for the commercial aircraft sector, however, is requiring an increase in Chinese production efficiency and quality. This will necessitate the purchase of composite tooling from foreign sources.
- 14.** If U.S. industry is prevented from providing composite tooling to China, this market demand will be met by European companies. The current composite tooling equipment in China is from Germany and Switzerland and includes autoclaves, tape winding machines, hot meld machines and UD dip machines.
- 15.** The Chinese will also fund its internal industry to develop composite tooling as it did in the machine tool sector. In the machine tool sector this funding led to an increase in the number of Chinese machine tool companies from one or two in 2002 to the current level of eight. These Chinese machine tool companies now compete directly with the U.S. companies at a high level.
- 16.** Some Chinese companies have expressed their willingness to adopt internal compliance programs, increase transparency and allow follow-up visits to ensure U.S. composite tooling is being used for commercial end-use.
- 17. Conclusion:** Preventing U.S. companies from exporting composite tooling to China will not halt or slow down China's procurement of such tooling. European companies, with little or no review and no follow-up, will provide composite tooling to China. China will also fund its own composite tooling industry, which will in turn speed up China's development in this area.
- 18. Recommendation:** The Amcham ECWG requests that the U.S. Government license tooling at a level equivalent to its competitors, which will in turn strengthen U.S. companies and provide the greatest assurance that the tooling will be for commercial use only.

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Summary Points

19. China has a level of ability and demand on the commercial side well below its military capabilities and demand. China seeks foreign materials, technology and tooling from foreign sources because these foreign materials, designs, processes, and tooling have already gone through long and arduous testing procedures in order to receive commercial certifications. It is not cost effective for either the Chinese companies or their foreign partner to go through new testing and certification when previously certified materials, processes and tooling already exist.
20. China understands the global division of labor and products in aircraft manufacturing and other sectors. Unlike other sectors, aerospace composite materials from foreign sources are more cost effective and higher quality. The decision to procure these items from foreign sources is a practical decision, not one based on lack of capability. The Chinese, however, will expend funds to create its own composite material industry if it has no other alternative.
21. It is in the interest of the U.S. Government and U.S. industry to increase exports in the aerospace composite material sector to legitimate commercial end-users and end-uses in China. These exports would take place under the supervision of the U.S. export licensing and end-use visit system with cooperating U.S. industry partners, which increases transparency and enhances U.S. national security. Increasing legitimate commercial trade strengthens U.S. companies that are vital to the U.S. military industrial base and thus enhances economic security.
22. The alternative is that companies from Europe and elsewhere will supply equivalent or higher technology, materials and tooling to China without the level of supervision the U.S. Government provides. The U.S. government would then be without a means to monitor directly or cooperatively with U.S. industry the item's end use.

Conclusion

Amchem hopes that this report demonstrates the type of U.S. Government and industry cooperation that is possible in order to develop a more effective and efficient U.S. export control system toward China. Amchem sees the report as a positive step in achieving the joint goal of promoting legitimate commercial trade while prohibiting exports that make a material contribution to Chinese military capabilities.

Recommendation

Amchem requests the U.S. Government to provide feedback on this report, suggest other areas where such information would be helpful, and arrange for licensing

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officers to visit China in order to assess China's aerospace composite materials sector first hand.

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Market Analysis

The following report is based on interviews with individuals familiar with the Chinese commercial aerospace composite material sector and in particular the joint commercial projects in place in China. (Appendix D of this report details the companies and interviews conducted in gathering data for this report. Footnotes provide the open source document from which data was collected.)

II. Overview of Domestic Industry

The Chinese aerospace composite material sector includes a combination of domestic state owned enterprises, joint ventures with foreign companies, and foreign sources. In talking with industry experts, the view was expressed as follows:

a. The Chinese Domestic State Owned Enterprises (See Appendix A)

Based on publicly available information, there exist numerous entities in China currently involved in aerospace composite material research and development, production and/or manufacturing. Many of these are or were State Owned Enterprises. An analysis of this market follows:

1. The following companies comprise the major Chinese domestic enterprises involved in aerospace composite materials: AVIC I; Harbin Aircraft Industry Group; Hafei Aviation Industry (under Harbin Aircraft Industry Group); Shenyang Aircraft Industry Group; Xi'An Aircraft Industry Group; Chengdu Aircraft Industry Group; AVIC II; Beijing International Aeronautical Materials Corporation (BIAM), aka Institute 621; Beijing Aeronautical Manufacturing Technology Research Institute (BAMTRI), aka Institute 625; HONGDU Group; and Shanghai Sxcarbon Technology Co., Ltd.
2. The commercial sector in China is well behind the capabilities of the military side. The commercial side at this point is functioning mainly in the build to print level. For example, Chengdu Aircraft Industry Group is utilizing composites on the Boeing 787 program. The technology involved there is epoxy resin technology that was primarily designed in the 1970s and commercialized in the 1980s. While the processing techniques and skill sets are similar across the composite production, the work on the commercial side in China is considered in the industry to be at a low level.
3. The exception on the commercial side is Hafei Aviation Industry (Hafei) under the Harbin Aircraft Industry Group, which has the highest level of capabilities in aerospace composite materials in China. Hafei has the ability to and is developing, designing and producing composite parts for commercial aircraft. This work is being done for production of Chinese commercial aircraft and for parts and assemblies for foreign aircraft. A site visit was

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conducted at Hafei, during which these capabilities were confirmed. The greatest example of Hafei's abilities was the carbon fiber helicopter cockpit frames. Hafei began by developing and producing these carbon fiber frames jointly with Eurocopter, but now performs the complete process independently.

4. The Chinese have the inherent capability to produce composite parts at the current demand levels and higher for commercial use, but it is not cost effective at this point. The primary reason for this is that the customers on the commercial side are foreign companies such as Boeing, Airbus, Embraer, and Eurocopter. The parts being produced for these customers have been approved in their respective countries through a long and expensive certification process. The cost and time involved to test and certify Chinese production processes, materials, tools, molds, etc. would be cost prohibitive to the customers. (Note: China would, however, pursue that path on the commercial side if it is unable to participate in the commercial aircraft manufacturing industry as a global partner. This has in fact happened in the machine tool industry where the Chinese Government has made the development of the domestic machine tool industry a priority. China now has eight machine tool companies that are in direct competition with foreign companies.)
5. Chinese State Owned Enterprises (SOEs) are the major suppliers to the Chinese military. The Chinese, for reasons of supply chain security, choose to supply their military from internal sources. They do not want to be reliant on foreign sources that could be impacted by any number of logistical problems or other issues. These Chinese aerospace composite material producers have the capability to produce bismaleimide (BMI) resins and provide aerospace grade prepregs for primarily military use but can also supply these materials for commercial use. The major distinction between the U.S. and Chinese capabilities in this area are pure repeatability, quality and efficiency.
6. Chengdu Aircraft Industry Group and Xi'An Aircraft Industry Group make prepregs for military use, but it is older technology. The BMI processing they are using for the F7 and F10 are very simple. The BMI processes and procedures for the materials being used on the F-22 and Joint Strike Fighter (JSF) are at a higher level. The Chinese are not at this level of BMI processing, and no U.S. Company is exporting that level of material to China. (Note: The 621 Institute produces BMI resins for the J17 (formerly the F7) radome. The radar for the export model to Pakistan of the J-17 is the Grifo S-7 fire control radar from Italy. The composite material for the Radome pales in importance to the internal radar being supplied by a foreign source.)

b. Joint Ventures

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Joint ventures are providing much of the aerospace composite materials on the commercial side. Two such ventures are BHA Aero Composite Parts Co., Ltd. (BHA) in Tianjin and Smiths Aerospace in Suzhou. It is of note that joint ventures in China should be included in the analysis of the domestic Chinese market. While both domestic and foreign entities invest in a joint venture, the resulting company is a Chinese company.

1. **BHA Aero Composite Parts Co., Ltd.:** BHA is a joint venture between Boeing, Hexcel and AVIC 1 and has a capacity of 500,000 production hours per year. BHA has a total of 524 employees, with four U.S. citizens on the management team, and an employee retention rate of 95%. BHA's customer acceptance rate is 99.1%, compared to a similar plant in Texas with an acceptance rate of 99.999%. This quality standard is much higher than that of the Chinese SOEs. (Note: As stated previously, quality issues often distinguish the difference between foreign and Chinese domestic capabilities.)
2. BHA makes both structural and internal parts and supplies for the export market and the domestic market in China, with a split of 90% to the export market and 10% to the domestic market in China. The customers in the domestic market in China are Xi'an Aircraft Industry Group and the Shanghai Aircraft Industries Corporation for Boeing projects. The resulting assemblies are then exported to the United States. BHA's other clients are Boeing, Hexcel, Goodrich, FACC, BAE Systems, and KAI.
3. BHA is strictly a build to print shop and is certified in numerous Boeing processes. The advantage in this is that Boeing and Boeing subcontractors can utilize these processes without further testing and certification. (Note: New processes developed in China would require a long and expensive testing and certification process. This is why both Chinese and foreign companies choose to use foreign materials and processes.) BHA gets its material from Hexcel, Cytac and Toray. Currently, no domestic companies are supplying composite materials to the joint ventures and SOEs for the commercial aircraft sector.
4. BHA has two autoclaves from Scholz in Germany that are certified to 400 degrees Fahrenheit and 100 PSI, two cure ovens, one Thermowood 3-axis CNC machine, one Thermowood 5-axis CNC machine and one Cincinnati 5-axis CNC machine. As the commercial demand in China grows, BHA will be looking to the U.S. market for equipment. The U.S. companies, however, will receive competition from other foreign companies, especially from Europe. This would include tape winding machines, trimming machines and molds. (Note: As stated previously, the Chinese machine tool industry is also growing and could be a source for machine tools. There are currently eight Chinese machine tool manufacturers.)

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5. **Smiths Aerospace:** According to Smiths Aerospace's website, they have a 134,000 square foot facility in Suzhou, China. This facility has been producing composite material parts for the civilian aerospace market in China since the summer of 2005. The facility also manufactures sheet metal airframe fabrications and precision machine aircraft engine components.¹ (Note: A site visit was not conducted at the Smiths Aerospace facility in Suzhou but should be scheduled as a follow-up to this report.)
6. Smiths Aerospace is a UK listed company with headquarters in London. Its "head office team" has members located in Cheltenham (UK) as well as Grand Rapids, Michigan and Arlington, Virginia in the US. Their US Legal and Compliance Office is in Gemantown, Maryland.²

c. Foreign Suppliers

The following are foreign companies that supply composite materials in China. Some of this material is aerospace composite material, but a vast majority goes to sporting goods, textiles and other industries requiring low level composite materials. China's primary source for aerospace composite materials appears to be Europe and Japan.

1. **Argosy International:** According to the company website, Argosy International is a California company with Trade Representative Offices in Beijing and Shanghai and manufacturing locations in Guangzhou, Shanghai and Zhongshan. They are the exclusive distributors in China for leading manufacturers including HITCO and Cytec.³ HITCO Carbon Composites Inc., is a Delaware Corporation with offices in California.⁴ The majority of Argosy International's exports to China in the composite sector are 250/350 cured epoxy level, which is EAR99, and they are a supplier to BHA in Tianjin. Argosy does not export any BMI resin materials to China. (A visit to Argosy's facility in Shanghai would be arranged as follow-up to this report.)

¹ "Manufacturing commences at Smiths Facility in China," *from Composites Week News Board*, June 13, 2005(May 2, 2006)

<<http://www.e-composites.com/frontend/newspage.aspx?sno=259>>

² *From Smiths Aerospace online*, (May 13, 2006)

<<http://www.smiths-aerospace.com/about/history>>

<<http://www.smiths-aerospace.com/Contact/default.asp>>

³ *From Argosy International online*, (June 12, 2006)

<<http://www.argosychemical.com/CompanyHistory.asp?area=ABOUT>>

⁴ *From Hitco Carbon Composites Inc. online*, (May 5, 2006)

<<http://www.hitco.com/company/profile/index.html>>

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2. **Hexcel:** As stated in a company press release, "Hexcel is the world's leading manufacturer of advanced composite materials... With headquarters in Stamford, Connecticut, Hexcel is a global company, manufacturing in the US, Europe and the Pacific Region." In addition to their joint venture involvement in BHA Aero Composite Parts Co., Ltd., they also have a Composite Sales Office in Shanghai.⁵
3. According to its website, "Hexcel Corporation is a leading advanced structural materials company. It develops, manufactures and markets lightweight, high-performance reinforcement products, composite materials and composite structures for use in commercial aerospace, space and defense, electronics, and industrial applications."⁶
4. "Hexcel is the largest US producer of carbon fiber, the leading weaver of structural fabrics and a major supplier of composite materials. Hexcel fibers, fabrics, resins, prepregs, honeycombs and adhesives are widely used in the aerospace industry. Regional jets, helicopters, aircraft engines and satellites are also major users of Hexcel materials."⁷
5. Hexcel is the major supplier to BHA but very little of this material is at a controlled level.
6. Hexcel provides composite material to the Chinese SOEs primarily out of its European operation.
7. **Toray:** Toray Japan has an extensive network of offices and plants in China. Toray's offices in Shanghai handle its trading activities in China. None of Toray's plants in China produce aerospace composite materials. Its one composite related plant is in the textile industry. Toray Japan provides aerospace composite materials to the Chinese SOEs.
8. Toray USA sells composite materials to China and has an extensive licensing history with the U.S. Government. The Boeing 787 program at Chengdu

⁵ Rachel Atkinson, "About the Company", *Virtual Pressbox Press Center, Materialica*, (May 4, 2006) <<http://www.materialica-pressinfo.de/html/hexcel1.html>>

⁶ Rachel Woolerton, "Hexcel Exhibits at Asian Aerospace 2006," *from Hexcel press releases online*, February 20, 2006 (May 4, 2006)
<<http://www.hexcel.com/News/Press+Releases/Hexcel+exhibits+at+Asian+Aerospace+2006.htm>>

⁷ Woolerton, "Hexcel Exhibits," Background.

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Aircraft Industry Group will create a demand for increased exports of licensable materials to China.

9. **M.C. Gill:** M.C. Gill, headquartered in California, develops and manufactures composite products to serve the aircraft and aerospace industry. According to its website, they are "one of the largest producers of composite sandwich panels used in aircraft flooring and also produce flat panel composites." M.C. Gill has sales offices worldwide, including Beijing.⁸ (Further research would be required as a follow-up to this report.)
10. **ACM:** Asian Composites Manufacturing Sdn Bhd (ACM) -- a strategic alliance between Sime Darby Berhad and Naluri Berhad of Malaysia and Boeing and Hexcel Corporation of the United States -- is a world leader in supplying composite materials to the global aerospace industry.⁹

ACM currently produces advanced composite structures for the wings on all Boeing jetliners in production. The ACM facility located in Bukit Kayu Hitam, commenced production in June 2001 and employs more than 310 skilled Malaysians, along with an all-Malaysian management team.

III. Distinction Between the Commercial and Military Sectors

Research has provided a definite distinction between the military and commercial capabilities in the aerospace composite material sector in China. This distinction is that while China's military capabilities in aerospace composite materials do not reach the levels of the U.S. in this area, they are significantly higher than the commercial level and demand. This distinction is pertinent in that it appears to greatly reduce the likelihood that increased commercial trade in this area would further China's military capabilities.

- a. On the military side, the Chinese SOEs have the ability to design and manufacture parts using BMI resin materials. Preliminary reports indicate that China may soon be producing its own aerospace composite materials. (This information is very recent and would require further research as a follow-up to this report.)
- b. The main reason the Chinese military relies exclusively on its own domestic suppliers is that it wants a secure supply chain. The risk of becoming reliant on a

⁸ *From M.C. Gill online* (May 12, 2006) <<http://www.mcgillcorp.com/about/index.html>> <<http://www.mcgillcorp.com/sales/index.html>>

⁹ "Asian Composites Mfg. To Produce Boeing 737 Aileron Components," *from IHS Aerospace*, April 1, 2005 (May 2, 2006) <<http://aero.ihc.com/news-05Q2/boeing-737-aileron-components.jsp>>

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foreign source, based on historical relations with the U.S. and others, led China to develop its own inherent abilities. The area where China is behind is in the commercial arena.

- c. The commercial sector is growing based on demand to produce parts for foreign aircraft. The globalized nature of the commercial aerospace industry has led to the production of aircraft parts and assemblies worldwide. Companies such as Boeing, Airbus, Embraer, Eurocopter and others have subcontracted work on various parts, sub-assemblies and assemblies throughout the world. When these subcontractors are manufacturing and producing these items they must meet the specifications laid out by their partner. This necessarily leads to countries such as China requiring the materials and tools to meet its customers' demand and quality. As stated previously, producing components based on the customer's previously approved designs and processes is essential to the partnership, as Chinese development of materials and processing would require an extensive testing and certification procedure. China's requirements in the aerospace composite material sector stem from this base opposed to an inability to reach this level independently, since they are already at a higher level.
- d. This is not dissimilar to the situation in the U.S., where the current aerospace composite material sector is also divided. On the military side, the cutting edge is the supply of composite materials to projects such as the F-22 and the JSF. U.S. companies and approved companies from allied nations are performing this work. The commercial sector is moving more towards composite materials to offset rising fuel costs and increase more efficient and durable aircraft. The composites being employed on the commercial aircraft are older technology that was originally developed in the 1970s and put into production in the 1980s and is well below the current U.S. military standard. It is, as stated above, also below the Chinese military standard.
- e. The Amcham ECWG stresses that it completely supports protecting U.S. military items and technology. Those items that would further China's military capabilities are not and should not be exported to China. In this case, the analysis demonstrates that the commercial level is well below this threshold. Chinese domestic capability is at a higher level and additionally is readily available from other countries. Loss of trade in the commercial aerospace composite sector harms U.S. companies, which in turn diminishes U.S. economic security and impacts the U.S. military industrial base. This does not lead to enhanced national security but actually undermines the long term economic and national security of the U.S. It also pushes the Chinese to develop, with the direct assistance of many U.S. allies, its own industry at a faster pace.

IV. Growing Commercial Demand

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In addition to the current status of the aerospace composite material sector in China, the report also looks ahead to future developments. The worldwide commercial aircraft industry is adopting more composites into their designs. This is going to lead a great increase in demand for commercial aerospace composite materials and associated equipment. The following are a few projects:

- a. Airbus has announced that it will build an A320 assembly plant in China. In published reports, Airbus states that several major technology transfer programs are under way, including one that will involve the composite work on the A350 Family to be manufactured in China.¹⁰ Airbus has stated that it will work jointly with China on development and design on a build to spec basis.
- b. The ARJ21 Regional Jet was originally designed with little or no composite components. Recent reports, however, state that the ARJ21 is too heavy and is being retro designed to include about 20% composite materials.¹¹
- c. Chengdu Aircraft Group Industry received the contract for the Boeing 787 rudder. This is the first joint project between a U.S. Company and a Chinese SOE on composite assembly production. The project is at the build to print level. Subsequent to this program, there are strong indications that Boeing will retro fit the 737 and 767 with composite parts. Since Xi'An Aircraft Group Industry, Shanghai Aircraft Industries Corporation, Shenyang Aircraft Group Industry and Chengdu Aircraft Group Industry produce assemblies for these aircraft; composite materials would most likely become a part of this work.

V. The Technology Line

Determining the level of control in a globalized world where the rate of technical advances is staggering is the greatest challenge.

- a. In general terms, military aircraft specifications require higher performance. The speed and maneuverability of military aircraft is much greater than commercial aircraft and thus need composite materials with a greater Glass Transition Temperature.
- b. As stated previously, the Chinese domestic industry has the ability to produce its own prepregs, as well as design, develop and produce parts and assemblies for commercial and military use at a build to spec level. On the commercial side,

¹⁰ Chris Logan, "Airbus China: Lasting Relationship," *The Airbus Way Corporate Brochure*, (Lavaur, France: SIA, November 2005), p.31

¹¹ "Design changes cause fresh delay for China's ARJ21," *Asian Aviation*, Vol. 2 No. 8, November 2005, (May 16, 2006) <www.asianaviation.com>

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they choose to purchase composites from foreign sources and use foreign processes because they are more inexpensive, higher quality and already certified. It is not based on a lack of capability.

- c. Through cooperation between U.S. Government and U.S. industry, a level of control could be set that distinguishes between military spec and commercial spec composite materials. This would seem practical since the commercial requirements are well below military requirements that were in place at least 20 years ago.
- d. Drawing an accurate technology line based on what is available in China should lead to fewer license requirements, decreased licensing review times for commercial level items, and focus U.S. export controls on those items that could make a material contribution to Chinese military capabilities.

VI. The Compliance Side

- a. While conducting research for this report, opportunities arose and will continue to arise where U.S. Companies can work hand in hand with their Chinese partner on the compliance side. Many Chinese Companies are committed to working with their U.S. partners to increase transparency and ensure compliance with U.S. and Chinese export controls.
- b. The benefits of such cooperation include: greater integration for Chinese companies into the global work force in the commercial aircraft industry; increased exports for U.S. companies; and the furtherance of U.S. Government policy towards China in the areas of export compliance and enforcement.

VII. Next Steps

This report is designed to be a starting point for further cooperation between the U.S. Government and the Amcham ECWG. Following is a list of suggested next steps:

- a. Receive feedback from the U.S. Government on the report, to include suggestions on what further types of material would be beneficial.
- b. Arranging a trip to China for U.S. Government representatives for the various agencies involved in export controls to attend one of the seminars listed below and visit joint commercial projects in China related to aerospace composite materials. Possible seminars are:
 - 1. Second China-Japan International Society for the Advancement of Materials and Process Engineering (SAMPE) Symposium, Co-sponsors, SAMPE Japan, SAMPE Shanghai, June 19-21, 2006

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2. International Conference on Aerospace Materials (ICAM), Chinese Materials Research Society (C-MRS), Beijing, June 25-28, 2006
3. China Composites Expo, Shanghai, September 4-6, 2006
4. Fifth Asian-Australasian Conference on Composite Materials (ACCM-5), Hong Kong, November 27-30, 2006

VIII. Future Reports

The Amcham ECWG believes there are a number of sectors which would also benefit from this type of report and cooperation with the U.S. Government. Some of these include:

- a. Nuclear Power Industry: In the nuclear power sector it is easier to obtain a license for nuclear fuels than the dual-use items controlled for nuclear proliferation reasons. Since China is a member of the Nuclear Suppliers Group, this should be an area where cooperation should be increased.
- b. Machine Tools: The machine tools, as well as the high end molds and dies, are sectors that have been drastically impacted by export controls. With the increased commercial demand for these products in China along with the growing Chinese domestic industry abilities, this area requires a thorough analysis.
- c. Semiconductor: Much work has been done in this area, but it has primarily focused on the silicon based industry. The compound semiconductor industry is a growing sector in China, and it could be added along with a new update on the silicon semiconductor industry.
- d. Computers and Software: This would include high performance computers and encryption among other broader computer areas.

Any suggestions on other industry sectors on which to focus from the U.S. Government would also be appreciated.

IX. Responsible Government and Industry Cooperation

Finally, the Export Control Working Group wants to stress the view that only through true U.S. Government and industry cooperation can an effective export control system be put in place. This concept revolves around the concept of promoting responsible government and responsible industry. The following points illustrate this concept:

- a. It is common knowledge in the worldwide export control and business community that the U.S. has the most strenuous export control system. In addition, the U.S. receives greater cooperation from the Chinese Government on export controls

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than any other country. The U.S. is the only country allowed to conduct end-use visits in China and has the most extensive license review process for the export of dual-use items to China. These facts make it less likely that dual-use items from the US compared to those from other countries will be diverted because:

1. The U.S. licensing review process represents the best available process for ensuring that items exported to China are going to legitimate commercial end-uses. U.S. exporters are providing the greatest level of information and the U.S. Government is providing the greatest level of scrutiny. This is in direct contradiction to others that issue licenses with minimal review and processing.
 2. Follow-up is virtually non-existent outside the U.S. system. Only the U.S. Government has the ability to conduct end-use visits in China. Additionally, U.S. companies provide extensive servicing to items supplied to China. The U.S. company employees are the most well informed about export controls and know that continuing to service or supply parts to items, which are being used in violation of the export license, requires that they stop all support for that item.
- b. Lack of cooperation results in an unfocused export control system that wastes limited U.S. Government resources and overburdens industry. The unforeseen consequences of this are:
1. U.S. Government expends valuable resources on items that do not contribute to Chinese military capabilities, while other items more critical do not receive the required attention.
 2. The movement offshore of critical military infrastructure. Industry moves research and development overseas because of fear that the resulting products would be restricted by U.S. export controls.
 3. A weakening of U.S. companies that make them ripe for purchase from foreign companies.
 4. Refusal of U.S. companies to supply military projects due to fear of export controls restricting the commercial sale of similar items.
 5. Loss of revenue to U.S. industry that helps fuel research and development that is critical the U.S. military industrial base.
 6. An increasing unwillingness of Chinese companies to purchase U.S. products, whether an export control issue exists or not, due to their perceived fear that such products in the future could be controlled, barred or restrained for export to China.

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Due to the intricate nature of the relationships between the SOEs, joint ventures and foreign exports, the following charts are provided to illustrate current and/or potential access within the Chinese economy to aerospace composite technologies:

Chart 1. AVIC I COMMERCIAL AIRCRAFT (ACAC)

Project Name	Nature of Relationship	Foreign Entity	Nationality	Project Description
ARJ21	Consortium led by Chinese government controlled ACAC	Multiple (19 as of 5/2006)	US and European Companies	The 90-seat 700 series and 105-seat 900 series jets to be introduced in 2009 will include up to 20% composite materials ¹²
BHA Aero Composite Parts Co., Ltd.	Joint Venture	Boeing and Hexcel	US	Established in January 1998, the company opened its Tianjin factory for business on September 2002. The 1,184,000 sq. ft. site manufactures composite parts for interiors and secondary structures for commercial aircraft. ¹³

Chart 2. HARBIN AIRCRAFT INDUSTRY GROUP (HAIG)

Project Name	Nature of Relationship	Foreign Entity	Nationality	Project Description
Z9B Multi-role Helicopter ¹⁴	With Hafei Aviation Industry Company	None	Chinese	Licensed Chinese copy of the French Eurocopter Dauphin II with modifications including

¹² Polek, Gregory, "Eastern programs find their stride as Western firms ponder next move," *Aviation International News*, May 2006 (May 16, 2006)
<www.ainonline.com/Issues/05_06/05_06_eastern_72.htm>

¹³ "Boeing, Hexcel and AVIC to Collaborate on Joint Venture Composites Facility in China", *from Boeing Press releases online*, January 21, 1998 (May 4, 2006)
<www.boeing.com/news/releases/1998/news_release_980121a.html>

¹⁴ *From HAFEI AVIATION INDUSTRY CO. LTD online* (May 15, 2006)
www.hafei.com/english/index.htm

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	(HAI)			all composite tail blades instead of 13 metal blades ¹⁵
Harbin Embraer Aircraft Industry Co. Ltd. ¹⁶	Joint Venture	Embraer	Brazil	Jointly develop and produce 50-seat pax family aircraft ERJ145 Regional Jet ¹⁷
EC120 Helicopter ¹⁸	Jointly design and develop with (HAI)	Eurocopter, Singapore Technology Aerospace Industry Co. Ltd.(STAIS) ¹⁹	France, Singapore	Serial production of helicopter
Z15 Helicopter ²⁰	50-50 Joint Venture	Eurocopter	France	Six-ton medium sized helicopter to be used in transportation, security, rescue and other civilian uses

HAFEI AVIATION INDUSTRY COMPANY, LTD

Hafei Aviation Industry Company, Ltd was founded under the Harbin Aircraft Industry Group in 1999 as a scientific research and manufacturing base for helicopters, general

¹⁵ "Z-9 Multirole Helicopter", *Chinese Defence Today*, February 20, 2005 (May 15, 2006) <www.sinodefence.com/airforce/helicopter/z9.asp>

¹⁶ *From HAFEI AVIATION INDUSTRY CO. LTD online* (May 15, 2006) <www.hafei.com/english/index.htm>

¹⁷ Fullbrook, David, "Outsourcing Aircraft Parts to China, airliners later," *Asia Times Online*, September 3, 2004 (May 7, 2006)
 "City Firm Launches Small Jets" *from Eastday.com*, March 4, 2003 (May 7, 2006)
 <<http://www.china.org.cn/english/Life/57319.htm>>

¹⁸ Dubois, Thierry "Harbin EC120s to roll off line by year's end," *Aviation International News, Asian Aerospace*, February 2004 (May 18, 2006)
 <http://www.ainonline.com/Publications/asian/asian_04/d1_harbinp51.html>

¹⁹ "HC120 (EC120) Helicopter," *from Global Security.org*, April 27, 2005 (May 18, 2006)
 <<http://www.globalsecurity.org/military/world/china/hc-120.htm>>

²⁰ "China, Europe jointly develop Z15 helicopter," *China View*, March 15, 2006 (May 15, 2006) <www.xinhuanet.com/english/2006-03/15/content_4306823.htm>

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purpose and regional aircrafts in China. Its four major series of products include: Y12 light general purpose aircraft, Z9 series helicopter, EC120 helicopter, and subcontracted aviation products for foreign companies.²¹

Presently, HAI's composite facilities are the largest in China, according to its homepage published in English. Its general production capability is the most advanced in China and has reached an advanced international level on some specific projects.²²

Chart 3. HAFEI AVIATION INDUSTRY COMPANY, LTD (HAI)

Project Name	Nature of Relationship	Foreign Entity	Nationality	Project Description
Z9 Helicopter ²³	With Harbin Aircraft Industry Group (HAIG)	None	Chinese	Licensed Chinese copy of the French Eurocopter Dauphin II with modifications including all composite tail blades instead of 13 metal blades ²⁴
EC120 Helicopter	Joint design and development with HAIG	Eurocopter, STAIS and CATIC (China Aviation Technology Import-Export Corp.)	France, Singapore	Serial production of helicopter
M430 Helicopter ²⁵	"cooperation contract"	Bell Helicopter Textron Canada Limited	Canada	Sole supplier of helicopter body
Wing-to-Body Fairing Panels	Supplier	Boeing ²⁶	US	

²¹ Thirty Thousand Feet Aviation Directory, (May 16, 2006) <www.thirtythousandfeet.com/aircraft.htm>

²² From HAFEI AVIATION INDUSTRY CO. LTD online (May 15, 2006) <www.hafei.com/english/index.htm>

²³ From HAFEI AVIATION INDUSTRY CO. LTD online

²⁴ "Z-9 Multirole Helicopter", *Chinese Defence Today*, 'Programme'

²⁵ From HAFEI AVIATION INDUSTRY CO. LTD online

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Y12 Light None Chinese Fixed wing aircraft
 General
 Purpose
 Aircraft²⁷

SHENYANG AIRCRAFT CORPORATION (SAC)

Shenyang Aircraft Corporation, established in 1953, has been considered China's largest fighter aircraft enterprise. The organization has four divisions: 1) civilian aircraft, 2) ancillary equipment, 3) military aircraft, and 4) civilian products (non-aviation related).²⁸

Chart 4. SHENYANG AIRCRAFT CORPORATION (SAC)

Project Name	Nature of Relationship	Foreign Entity	Nationality	Project Description
Composite and metal panels for the vertical fin leading edge ²⁹	Purchase	Kaman Corp. Plastic Fabricating Company (PlasticFab)	USA (Wichita, KS)	\$20.5 million multi-year contract to purchase composite and metal panels for the vertical fin leading edge which will be part of the Boeing 787 Dreamliner
Vertical Fin Leading Edge Assembly ³⁰	Supplier	Boeing	USA	
FiberSIM ³¹	Purchase	Vistagy	USA (Waltham, MA)	Computer-aided design (CAD) software for the design and manufacture of composite parts for helicopters and commercial airliners

²⁶ "Boeing 787 Suppliers," *Speed News: The Source for Aviation News and Information*, April 24, 2006 (May 16, 2006) <www.speednews.com/lists/787_Suppliers.html>

²⁷ *From HAFEI AVIATION INDUSTRY CO. LTD online*

²⁸ "Shenyang Aircraft Corporation" *China Nuclear Forces*, March 23, 2000 (May 16, 2006) <www.fas.org/nuke/guide/china/contractor/sac.htm>

²⁹ Kaman Corp, "Kaman Reports First Quarter 2006 Results," *PR Newswire-First Call*, May 3, 2006, (May 15, 2006)

³⁰ "Boeing 787 Suppliers"

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Tail Sections and cargo doors ³²	Joint Venture	Boeing	USA	Production joint venture
Manufacturing sub-assembly ³³	Subcontractor	Bombardier	Canada	Supply components for Q100, Q200 and Q300 aircraft
Manufacturing Parts and maintenance tools ³⁴	Supplier	Airbus	EU	

³¹ "Vistagy reports 300% sales growth: Sales of FiberSIM software to aerospace companies across the Asia Pacific region have increased 318% in a single year reports CAD developer Vistagy," news release from Vistagy, edited by Manufacturing Talk, February 9, 2006 (May 15, 2006) <www.manufacturingtalk.com/news/vis/vis117.html>

³² "Boeing 787 Suppliers"

³³ "Bombardier- Our Presence in China," *from Bombardier online*, (May 17, 2006) <www.bombardier.com/en/6_0/6_7_1.html>

³⁴ The Airbus Way, Corporate Brochure 2005

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Chart 5. XI'AN AIRCRAFT INDUSTRY GROUP

Project Name	Nature of Relationship	Foreign Entity	Nationality	Project Description
Components of CL215 and 415 amphibious aircraft ³⁵	Subcontractor	Bombardier	Canada	
Electric Bay Doors/ Fixed trailing edges on wings and brake blades and air ducts ³⁶		Airbus	EU	For the A320,330 and 340/ A320/A330 and 340

Chart 6. CHENGDU AIRCRAFT INDUSTRY CORPORATION

Project Name	Nature of Relationship	Foreign Entity	Nationality	Project Description
787 Composite Rudder ³⁷	Supplier	Boeing	US	
Rear pax door and parts of nose section for the A320 ³⁸		Airbus	EU	

Chart 7. AVIC II COMMERCIAL AIRCRAFT (ACAC)

Project Name	Nature of Relationship	Foreign Entity	Nationality	Project Description
EC175 utility	Joint Venture	EADS Eurocopter	France	Each of the two companies will invest 300

³⁵ "Bombardier- Our Presence in China," *from Bombardier online*

³⁶ The Airbus Way, Corporate Brochure 2005

³⁷ "Boeing 787 Suppliers"

³⁸ The Airbus Way, Corporate Brochure 2005

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helicopter

million euros to develop the new helicopter. Production will be shared on a 50/50 basis and each country will have its own assembly line.³⁹

A very rough estimate of the percentage of composite materials that will be involved is 30 to 40% of the helicopter will be made of composite parts. Currently there are approximately 50 to 60 Chinese design engineers in France working on this project.⁴⁰

³⁹ "Eurocopter creates a new helicopter in cooperative venture with China", *HeliNews: Helicopter and General Aviation News*, December 5, 2005 (May 16, 2006) <www.helinews.com/janindex.shtml>

⁴⁰ From interview by John Larkin

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Appendix B Chinese Institutes and Researchers

In addition to these specific projects, Appendix B lists a number of Chinese research and development institutes and experts. These institutes and experts often work jointly with foreign composite material researchers both within and outside of China. A review of publicly available material shows that China has unlimited access to composite material research and development.

THE HARBIN INSTITUTE OF TECHNOLOGY

The Harbin Institute of Technology (HIT) is a leading institution of research and development. They have consistently undertaken large-scale and highly sophisticated national projects with multi million yuan investments from the government and industry. It is the key university in the Chinese missile and space industry. Within the School of Astronautics, the Department of Astronautic Engineering and Mechanics has a Composite Materials section.

One of HIT's most prolific researchers is Du Shanyi. He is the author of "Research and Development of Advanced Composite Materials for Aerospace Industry in China." He has been a member of the Editorial Board of the Journal of Composite Materials and a frequent contributor to that bimonthly publication. In 2003, Dr. Du served as Co-chair of the EU-China Workshop on Multifunctional Materials in Bologna, Italy, 2003.

Together with his co-authors, Meng Songhe also of Harbin Institute of Technology and Chen Shaojie of the Shenyang Aircraft Design and Research Institute, Dr. Du examined the applications of advanced composite materials in the aerospace industry in China. They also discussed typical work concerning raw materials, manufacturing and processing, design and analysis, testing and NDI in China. The paper was published by the Society of Manufacturing Engineers.

THE CHINA AVIATION INDUSTRY #621 AND #625 INSTITUTES

The China Aviation Industry #621 and #625 Institutes have been cited in primary source interviews as another leading research center on the study and applications of composite materials. However, a review of the publicly available materials on the #621 Institute yielded few mentions.

The #625 Institute also known as the Beijing Aviation Manufacturing Engineering Institute is the only institution in the country specializing in aviation manufacturing technology and the research and development of integrated technical equipment. According to its Deputy Director Liu An Lu, The Institute was established 40 years ago to support the then new aircraft, engine and aviation factories in the country. Today, it

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provides a large quantity of advanced manufacturing technology processes and equipment in digital and soft manufacturing systems, computer software applications, high-energy Shuliu processing and composite materials components manufacture among others⁴¹.

CHINESE ACADEMICS

Below are just a few of the Chinese academics working abroad in areas of composite material research and development:

1. Li Chongjun, University of New South Wales School of Materials Science and Engineering, Australia

Li Chongjun, currently working at the School of Materials Science and Engineering at the University of New South Wales in Australia, specializes in advanced composite materials, high temperature thermal structural composites and nano-composites research. Dr. Li earned his Bachelor's degree in Material Science at Changsha Institute of Technology and his Master of Science degree in Composite Materials from Xi'an Aerospace Composite Materials Institute. Dr. Li completed his doctoral studies in Material Science and Engineering at the Xi'an Jiaotong University in 2001. His major publications include, "The Effects of Carbon Fiber Surface States on Properties of C/C Composites" published in Chinese in the Aerospace Materials & Technology, China, in 2000.⁴²

2. Li Shuguang, University of Manchester School of Mechanical, Aerospace and Civil Engineering

Born in China in 1960, Li Shuguang received his Bachelor's and Master's degrees in Engineering from the Nanjing Aeronautics Institute, now the Nanjing University of Aeronautics and Astronautics (NUAA). Dr. Li received his PhD from the University of Manchester Institute of Science and Technology in the UK where he was a lecturer in the School of Mechanical, Aerospace and Civil Engineering(MACE) from 1995-2002. His research areas include composite materials/structures.⁴³

3. Lin Ye, University of Sydney School of Aerospace, Mechanical and Mechatronic Engineering

⁴¹ From *Beijing Industrial University- Beijing University of Technology* March 29, 2006, (May 15, 2006) <<http://www.bjpu.edu.cn/news/dynamic.\jsp?articleIID=1237>>

⁴² CV of Li, Chongjun, *from the University of South Wales*, updated May 9, 2005 (May 2, 2006) <<http://www.materials.unsw.edu.au/people/dchongli.html>>

⁴³ CV of Li, Shuguang, *from the University of Manchester*, (May 2, 2006) <<http://www.mace.manchester.ac.uk/aboutus/people/academic/readersseniorlecturers/lis/>>

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Professor Lin Ye received his Master of Engineering and PhD from the Beijing Institute of Aeronautics and Astronautics in 1984 and 1987, respectively. He was awarded the Alexander von Humboldt fellowship for conducting advanced composite research at the Institute for Composite Materials at the University of Kaiserslautern from 1990-92. He joined the University of Sydney as a lecturer in 1992 and became a full professor in 20002. He is a member of the Editorial Boards of Composite Science and Technology, Applied Composite Materials and Aircraft Engineering and Aerospace Technology. His major research interests are in the general areas of composite science and technology, smart materials and structures, nano-materials and nano-composites, structural integrity and durability. He has received over A\$6M for research or collaborative projects from various sources.⁴⁴

⁴⁴ CV of Lin, Ye, from *the University of Sydney*, (May 16, 2006)
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NOTE

The information in this report was collected through interviews with industry experts familiar with the aerospace composite material sector in China, site visits to composite material production facilities and aircraft manufacturing facilities, and open source research.

In conducting the research for this report, John Larkin, President of Larkin International Trade Associates, Ltd. (LTI) conducted interviews with the following companies' representatives in China:

Boeing Commercial Aircraft
United Technologies Corporation
Argosy International, Inc.
BHA Aero Composite Parts Co., Ltd.
Hafei Aviation Industry
Association of Manufacturing Technology
MAG Industrial Automation Systems

John Larkin also completed site visits specific to this report at the following locations:

BHA Aero Composite Parts Co., Ltd.
Hafei Aviation Industry

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Additionally, John Larkin utilized his experience in the aerospace sector in China as a basis for this report. This experience includes previous site visits to the following locations:

Shenyang Aircraft Industry Group
Xi'An Aircraft Industry Group
Chengdu Aircraft Industry Group
Shanghai Aircraft Manufacturing Factory
AVIC 1 Aircraft Group ARJ21 Facilities in Shanghai

Finally, a footnote is supplied for each open source document used in preparing this report.

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Telecom Attachment



HUAWEI Quidway® S8500 Series 10G Multi-service Core Routing Switches Product Specification

Quidway® S8500 Series 10G Multi-service Core Routing Switches Product Specification

Quidway® S8500 Main Control Board Details

Feature/SRPU1	SRP1N3	SRP1N2	SRP1N1	SRP1N0
Compatible chassis	S8505/08/12	S8505	S8505	S8512
SDRAM	1G	512M	512M	512M
Stratum 3 Clock	Yes	No	No	No
Position	<ul style="list-style-type: none"> Carrier class network with WAN Interface Module deployment 	<ul style="list-style-type: none"> Enterprise Carrier class network without WAN Interface Module 	<ul style="list-style-type: none"> Enterprise Carrier class network without WAN Interface Module 	<ul style="list-style-type: none"> Enterprise Carrier class network without WAN Interface Module

Quidway® S8500 Series Software and Hardware Details

Attributes	S8505	S8508	S8512
Switching capacity	300Gbps	480Gbps	720Gbps
Backplane capacity	750Gbps	1.2Tbps	1.8Tbps
Packet forwarding speed	175Mpps	285Mpps	428Mpps
Number of slots	7	10	14
Number of slots for interface modules	5	8	12
L2 features	4K VLAN Super VLAN PVLAN 802.1p priority 802.1Q STP/RSTP/MSTP GARP/GVRP IGMP snooping Port mirroring		

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HUAWEI Quidway® S8500 Series 10G Multi-service Core Routing Switches Product Specification

Attributes	S8505	S8508	S8512
	Flow mirroring Link Aggregation (802.3ad) Cross boards link aggregation LACP 802.1x Guest VLAN Dynamic VLAN Broadcast storm suppression MDI/MDI-X auto negotiation HWTACACS Selected QinQ (Class D interface module supported)		
L3 features	RIPv1, RIPv2, OSPF, IS-IS, BGPv4 Equal Cost Multi Path: 8 Policy routing Routing policy uRPF (NAT Service Module Supported) VRRP DHCP-RELAY DHCP-SERVER NAT		
Multicast	IGMP V2 IGMP snooping PIM-DM PIM-SM MSDP/MBGP Any-RP		

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HUAWEI Quidway® S6500 Series 10G Multi-service Core Routing Switches Product Specification

Attributes	S6505	S6508	S6512
MPLS VPN	Label stack levels: 4 LER/LSR MCE Embedded MPLS VPN HoPE Inter-AS MPLS VPN		
VPLS & VLL	VPLS VSI number: 1K Mac table: 128/VSI, 128K(total) VPLS Martini Method H-VPLS VLL VC number: 4K VLL Martini Method VLL Kompella Method		
QoS	DiffServ Each port supporting 6 priority queues Detailed bandwidth management with the granularity of 8k Congestion prevention algorithm: WRED and tail drop Queue scheduling algorithms: SP, WRR and SP+WRR Traffic shaping		
Reliability	MTEF > 200,000 hours MTTR < 0.5 hours Dual main control boards 1+1 power supplies Modules hot-swappable		
System architecture	Integrated chassis that can be installed in a 19-inch rack		
Outline dimensions (mm) (WxDxH)	436 x 450 x 486	436 x 450 x 619	436 x 450 x 753
Weight (in maximum configuration)	65 kg	80 kg	100 kg

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HUAWEI Quidway® S8500 Series 10G Multi-service Core Routing Switches Product Specification

Attributes	S8505	S8508	S8512
Environmental requirements	Working temperature: 0°C ~45°C Relative humidity: 10%~90%, no condensing		

Quidway® S8500 Series Available Power Supply

Attributes	S8505	S8508	S8512
Input voltage (AC)	100~240 VAC auto-ranging (50~60Hz)	2000W AC power supply module: 100~240VAC auto-ranging (50~60Hz) Output 1200W: 100~120VAC; Output 2000W: 200~240VAC;	
Input voltage (DC)	-48 ~ -60 VDC	2000W DC power supply module: -48 ~ -60VDC	
Max power output of single power module	1200W	2000W	
Max power dissipation	<1000W	<1200W	<1800W
Power redundancy	1+1 redundancy; hot swappable		

The Quidway® S8500 Series can provide PoE functions cooperating with the PoE assembly listed below when the customers intend to deploy PoE applications.

Quidway® S8500 Series PoE Assembly Specifications

Attributes	description
PoE power system deployment (redundant configuration)	2+1 redundancy for PoE power supply modules, hot swappable
PoE power module	2500W AC power supply module: 100~240VAC auto-ranging Output 1200W: 100~120VAC Output 2500W: 200~240VAC
PoE power dissipation	Totally 4500W: 200~240V; Support 298 ports at 15.4W

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Guidway® NetEngine 5000E Core Router Product Specification

Guidway® NetEngine 5000E Core Router Product Specification

Attribute	Description
Physical Specification	Integrated chassis, installed in standard 19-inch rack
Input Power	DC: -48V AC: 110V/220V
Max. Power Consumption	5000W
Dimension (W × D × H)	442mm × 668mm × 1600mm (36 U high)
Weight	250 kg (fully configured), 120 kg (empty) 4.8 kg (LPU) 3.8 kg (MPU) 3.0 kg (SFU)
Environment	Long-term working temperature: 0 ~ 45°C Short-term working temperature: -5 ~ 55°C Restriction on temperature variation rate: 30°C/Hour Long-term working humidity: 5%RH ~ 85%RH, non-condensing Short-term working humidity: 0%RH ~ 95%RH, non-condensing Long-term working altitude: < 3000m Storage altitude: < 5000m
Capacity	Switching capacity: 2.56 Tbps Port capacity: 1.28 Tbps Forwarding performance: 1600 Mpps
Slots	16 for LPUs, 2 for MPUs, 4 for SFUs
Interface Types	OC-192c/STM-64c PoS OC-48c/STM-16c PoS OC-12c/STM-4c PoS OC-3c/STM-1 PoS 10GE WAN/LAN GE
IPv4	RIP, OSPF, ISIS, BGPv4

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Attribute	Description
IPv6	IPv4 & IPv6 dual stack Manually configured tunnel, automatic tunnel, 6to4 tunnel IPv6 static route, BGP4+, RIPng, OSPFv3, ISISv6 ICMPv6 MIB, UDPv6 MIB, TCPv6 MIB, IPv6 MIB, etc.
MPLS VPN	MPLS/BGP VPN, Inter-AS VPN, Carrier's Carrier, HoPE, MPLS L2 VPN (Martini/Kompella), PWE3, VPLS/H-VPLS
QoS	CAR, GTS, PQ, LLQ, CBQ, WRED, DS-TE
Multicast	IGMPv1/v2/v3, static multicast routing, PIM-DW/SM/SSM, MSDP, MBGP
Security	ACL based packet filtering, uRPF, ARP attack protection, DOS attack protection, SSH
High Availability	1:1 standby for MPU, 3+1 backup for switching fabric, 1+1 backup for power supply and FAN, IP FRR, LDP FRR, TE FRR, IGP Fast Convergence, VPN FRR, Enhanced VRRP, ETH TRUNK, IP TRUNK, BFD, MPLS OAM, Hot Patching, RPR, Non-stop Forwarding, Graceful Restart

ATTACHMENT B

Telecom Attachment

ViewPoint 8210

Technical Specifications

Standards

Frame: H.323, SIP 2.0
Video: H.261/H.263/H.263+
Audio: G.711, AAC, G.711u/G.729
Network: TCP/IP, UDP, RTP, RTCP, DHCP, Telnet, DNS, PPPoE, IPv6/SIP, FTP

Transmission Rates

IP: 64 kbps ~ 512 kbps

Video Features

Format: QCIF (176x144)/CIF (352x288)
Frame rate: 30fps @ 384kbps
Display: local picture, Remote picture, PIP
Video: brightness, contrast, saturation control

Audio Features

Full-duplex audio
Acoustic Echo Cancellation (AEC)
Automatic Noise Suppression (ANS)
Automatic Gain Control (AGC)
Lip Synchronization Mechanism (LSM)
Adjustable gain and volume

Camera

1/4" sensor CCD
520K pixels for BA1 or 270K pixels for NTSC
180° adjustable vertical angle

LCD Display

3.5" TFT color LCD
Resolution: 960x234
90° adjustable vertical angle
90° adjustable horizontal angle
Adjustable brightness and chroma
Automatic sleep mode

Interfaces

Ethernet: 10/100Base-T, 2xRJ-45
Video output: CVBS/PAL/NTSC, iVRCA
Audio output: Line level, 1xRCA

Call Features

Video IP call
Voice IP call

Conferencing Features

SiteCall (conference conferencing)*
H.323 conference control**

QoS

TOS
IP precedence
Auto downspeeding

Phone Features

Phone book of 200 records
Phone book transferring
Call history
Ring tones selection
Privacy protection
Auto answer mode
Hands free mode
Call forwarding
Power saving mode
Time synchronizing with server
LED indicator

Maintenance

Self test
Status monitoring
Auto upgrading via FTP server
Connectivity testing
Telnet access
SNMP management**

Languages

English and Chinese

Electrical

Operating voltage: 100~240 VAC
Frequency: 47~63 Hz
Power consumption: 12watts(MAX.)

Environmental

Operating temperature: 0°C~40°C
Storage temperature: -40°C~70°C
Relative humidity: 10%~90%
Noise: Less than 48 dBA (3m)
Luminance: 7 lux (minimum), 200 lux or more recommended

Reliability

Standard: ETS 300 386(2009), EN50082-2, EMC class: B

Physical

Dimensions: 270mm (h)x210mm (w)x170mm (d)
Weight: 1.5 kg

Warranty

15 months

* H.323 system only
** SIP system only

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ViewPoint 8220

Technical Specifications

Standards

Frame: H.263, SIP 2.0
Video: H.261/H.263/H.263+
Audio: G.711 A/V5.71 IuQ 723
Network: TCP/IP, UDP, RTP, RTCP, DHCP, Telnet, DNS, PPPoE, 802.1P, RTP

Transmission Rates

IP: 16 kbps ~ 512 kbps

Video Features

Format: CIF (176x144)/QIF (135x108)
Frame rate: 30fps @ 384 kbps
Display: Local picture, Remote picture, PIP
Video brightness, contrast, saturation control

Audio Features

Full duplex audio
Acoustic Echo Cancellation (AEC)
Automatic Noise Suppression (ANS)
Automatic Gain Control (AGC)
Up Synchronization Mechanism (USM)
Adjustable gain and volume

Camera

1/4" sensor CCD
20K pixels
45° adjustable vertical angle

LCD Display

5" TFT color LCD
45° adjustable vertical angle
60° adjustable horizontal angle
Adjustable brightness and chroma
Automatic sleep mode

Interfaces

Ethernet: 10/100Base-T, 1xRJ-45
Video input: CVBS PAL/NTSC, 1xRCA
Video output: CVBS PAL/NTSC, 1xRCA
Audio input: Line level, 1xRCA
Audio output: Line level, 1xRCA

Call Features

Video IP call
Voice IP call

Conferencing Features

SiteCall (conference converging)
H.323 conference control*

QoS

RS
IP precedence
Auto downspeeding

Phone Features

Phone book of 200 records
Phone book transferring
Call history
Ring tones selection
Privacy protection
Auto answer mode
Hands free mode
Call forwarding
Power saving mode
Time synchronization with server
LED indicator

Maintenance

Self test
Status monitoring
Auto upgrading via FTP server
Connectivity testing
Telnet access
SNMP management**

Languages

English, Japanese, Korean, and Chinese (S, T)

Electrical

Operating voltage: 100~240 VAC
Frequency: 47~63 Hz
Power consumption: 15 watts

Environmental

Operating temperature: 0°C~40°C
Storage temperature: -40°C~70°C
Relative humidity: 10%~80%
Noise: Less than 45 dBA 1M
Luminance: 7 lux minimum, 300 lux or more recommended

Reliability

Standard: ETS 300 308/2000, EN50082-2, EMC, class B

Physical

Dimensions: 290mm (W)x233mm (L)x133mm (H)
Weight: 1.5 kg

Warranty

15 months

* H.323 system only

** SIP system only

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SmartAX[®] MA5200F-2000 Broadband IP Access Equipment Product Specification

SmartAX[®] MA5200F-2000 Broadband IP Access Equipment Product Specification

Attribute	MA5200F-2000
Architecture	Box Type
Dimension (WxDxH)	462.6mm × 381mm × 88.9mm 2U
Backplane capacity	≥10Gbps
Switching capacity	Shared cache switching network with the switching capacity of 10Gbps
Forwarding capacity	3Mpps (2GE wire-speed forwarding)
Slot number on the interface board	1 GE slot, 4 FE slot
Interface type	GE interface FE interface OC-3/STM-1 POS interface
Routing protocol	Support such routing protocols as RiP, OSPF and BGP-4 etc.
QoS	Provide complete QoS support based on DiffServ. Support bandwidth control for each subscriber and WRED congestion avoidance algorithm.
Multicast	Support IGMP, static multicast configuration, PIM-DM/SM multicast protocols. Support interoperability of multiple multicast protocols. Support multicast policy processing, including multicast routing protocols and multicast forwarding policies. Support QoS control for multicast.
Reliability	All components support hot swap, and power supply 1+1 redundancy.
Number of concurrent users	2K
Number of VLAN termination	8K
Supported protocols	PPPoE, DHCP/DHCP Relay, DHCP Option 60&82, L2TP LAC, RADIUS and SNMP

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SmartAX[®] MA5200F-2000 Broadband IP Access Equipment Product Specification

Attribute	MA5200F-2000
Security	<p>Provide authentication, resource protection, attack shielding and address anti-counterfeit functions.</p> <p>IP+MAC+VLAN ID binding, protect the customers against IP spoofing attack.</p> <p>Starting from 64K, limit user's bandwidth by CAR with the step of 8K.</p>
NM	<p>Adopt Huawei iManager and Quidview NM platforms as the framework. Support SNMP and the Client/Server architecture. Run independently on UNIX (SUN, HP) or ORACLE/SYBASE, or be nested into the existing NM platform such as HP OpenView.</p> <p>Provide dynamic topology management, fault management, performance management, configuration tools, log management, operation monitoring, security and user management.</p> <p>Provide VPN management, QoS policy management and other service management functions.</p> <p>Provide an optional offline flow engineering tool.</p> <p>Support multiple languages.</p> <p>North-bound interface for 3rd-party APP and Service Provisioning system</p>
Input power supply	DC: -36V to -72V / AC (110V/220V): 90V to 264V
Full-load power consumption	Below 60W
Full-configuration weight	Below 10kg
Mean Time Between Failures (MTBF)	≥15 years
Environmental requirement	<p>Long-term working temperature: 0 to 45°C</p> <p>Short-term working temperature: -5 to 55°C</p> <p>Storage temperature: -30 °C to 60 °C</p> <p>Relative humidity: 10% to 90%</p> <p>Altitude: below 4000m</p>

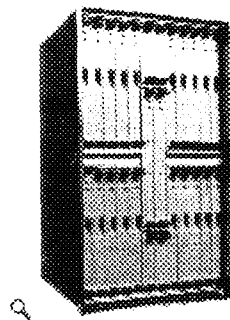
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OptiX Metro5000

Product overview

The OptiX 10G (Metro5000) is the 10G optical transmission equipment. It features such advantages as high capacity, high integration ability, flexible configurations, flexible networking, and large-capacity lower-order convergence and scheduling.



Product characteristics

1. Powerful cross-connection ability

- The cross-connect clock board enables 120G higher-order cross-connection.
- The lower-order cross-connection board enables 10G lower-order cross-connection.
- The mixed cross-connect and clock processing board enables 120G higher-order cross-connection and 5G lower-order cross-connection.
- The enhanced mixed cross-connect and clock processing board enables 120G higher-order cross-connection and 20G lower-order cross-connection.

2. Supporting multiple NE type configurations and MADM

The OptiX 10G (Metro5000) equipment enables flexible configurations. Each NE can be configured as a single REG, TM, ADM or their combination. The equipment can also be configured into the MADM (Multi-ADM) system with STM-1, STM-4, STM-16, STM-64 or combined interfaces. The system enables cross-connection of services among systems.

3. Rich service access types

The OptiX 10G (Metro5000) supports access to the following services.

- SDH signals of STM-64, STM-16, STM-4, STM-1(o), and STM-1(e) rates; OUT-2 signals that are in compliance with the ITU G.709 Recommendation;
- VC-4 services, or VC4-64c/VC4-16c/VC4-8c/VC4-4 concatenation services;

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- GE optical signals, 100M FE optical signals, and 10/100M FE electric signals,
- E1 interface electric signals

4.Hihger board integration

Boards are highly integrated, which results in powerful service access ability of the OptiX 10G (Metro5000) system.

5.Flexible networking ability

The system supports multiple topology modes, including link networking, star networking, two/four-fiber ring networking, ring and link networking, tangent ring, dual ring internetworking, inter-ring service interworking

6.Complete protection mechanism

Protection mechanisms provided by the OptiX 10G (Metro5000) system include equipment-level protection and network-level protection.

- It provides a 1+1 hot backup for cross-connect boards, clock boards and power boards. It also supports the 1+1 protection on two groups of lower-order cross-connect boards (2 groups of 10G, or one group of 20G and one group of 10G, or one group of 10G and one group of 5G); for SLO1, SLH1, SLQ4, SLQ4A, SP16, APQ1, EFS4 and EGS2 boards, it provides board-level power protection;
- For STM-1 or E1 electric signal interface board, it supports two groups of 1:N (Ns5) TPS protection;
- It supports a two-fiber/four-fiber multiplex section ring protection, shared optical fiber virtual path protection, and DNI protection;
- It supports a SNCP protection on higher-order and lower-order services. It supports the mutual switching of SNCP and ordinary services and can dynamically change the SNCP recovery mode;
- It supports 1+1, 1:1 and 1:N linear multiplex section protection as well as the VC-4 multiplex section compression function.

7.Powerful ECC processing ability

The OptiX 10G (Metro5000) equipment enables the 80xECC processing ability. In case the main control board has failed, it can then ensure that the pass-through of ECC information, meeting the requirements for complicated networking.

8.NMS with complete functions

Based on the UNIX and Windows operation system platforms, the network management system (NMS) OptiX iManager can implement centralized operations, maintenance and management (OAM) on complicated networks comprising OptiX 10G(Metro5000) and other OptiX optical transmission systems. It can reasonably configure and schedule bandwidth resources and service resources in the transmission network and ensures safe network operations

9.Power and environment monitoring function

The system adopts the wholly separated power supply mode. Two channels of -48V power are input. It also implements monitoring on power voltage and environment temperature so as to ensure a safer and a more reliable system performance.

Physical characteristics

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Cabinets of the OptiX 10G (Metro5000) optical transmission equipment are made up of three types. They are different in terms of their height, Dimensions and weights. The following are their dimensions

- 2000mm(H)x600mm(W)x600mm(D): 92kg;
- 2200mm (H) x600mm (W) x600mm (D): 101kg;
- 2600mm(H)x600mm(W)x600mm(D): 112.3kg.

The equipment supports the -48V power dual-back working mode. At the same time, it provides 6 external alarm access interfaces and two cabinet alarm output interfaces. Equipment operation management can be conveniently implemented

Dimensions of the OptiX 10G (Metro5000) subrack: 845mm(H)x450mm(W)x490mm(D); weight of each empty subrack: 21kg

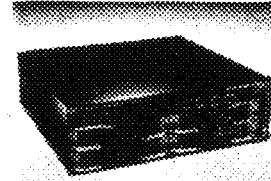
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Eudemon 1000/500/200/100 Series Firewalls

Overview

Quidway Eudemon Series firewall is Huawei's new generation hardware based high speed state firewall, which supports not only state monitor/inspection and NAT but dynamic and static blacklist filtering as well. Besides, Quidway Eudemon has strong anti-attack ability, and can provide rich statistics analysis and detailed classified hierarchical logs. Eudemon supports QOS, VPN and various other features, which are fundamental to a perfect solution to the networking application



Quidway Eudemon consists of 4 models: Eudemon 100, Eudemon 200, Eudemon 500 and Eudemon 1000. All 4 models are based on Huawei's dedicated security hardware platform and VRP routing software platform. All 4 models share a common security feature set, only differs on performance and interface. Networks of any scale can find a security guarantee in Eudemon series.

Features

High-Performance Processing

Eudemon series provides a high-performance security guarantee using NP technology(Eudemon 100 and 200 use software routing technology, not NP). Besides, the Eudemon firewall supports tens of thousands of ACL rules. The Eudemon 500 provides a maximum throughput of 2 Gbit/s and the Eudemon 1000, 3 Gbit/s.

Multiple Security Zones

In addition to the 4 predefined security zones (Local zone, Trust zone, Untrust zone and Demilitarized Zone (DMZ)), Eudemon supports more than 10 user-defined security zones. Besides, the Eudemon can define security zones based on VLANs.

Multiple Functional Modes

Eudemon series provides multiple working modes to facilitate networking application. Routing mode is suitable to initial network construction. Transparent mode meets the general networking requirements, and protects the Eudemon from intrusions. Composite mode combines the benefits of both routing mode and transparent mode. Besides, Eudemon series provides a rich set of routing capabilities

Enhanced Packet Filtering

The black list items of Eudemon can be added manually, automatically by attack defending functions and automatically by ICMP or TCP/UDP filtering

Using application specific packet filter (ASPF) technique, Eudemon series can inspect sessions and states based on TCP/UDP protocol, block Java applets and ActiveX controls, and map port to applications.

Multiple NAT Applications

In addition to One-to-One IP translation, pool based IP translation, policy and IP based translation, PAT, ACL based translation, Eudemon's NAT supports "internal server" services and multiple ALGs like FTP, NBT, ICMP, H.323, SIP, HWCC, DNS, ILS, PPTP, OICQ of tencent and MSN.

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Powerful Attack-Defending Capability

Eudemon series can effectively and efficiently block worm virus and IP spoofing. The DoS attacks that can be blocked by Eudemon include SYN flood, ICMP flood, UDP flood, Land attack, Smurf attack, Fraggle attack, WinNuke attack, ICMP redirection/unreachable, Ping of death, Tear drop, etc. Scanning and snooping attacks can be blocked by Eudemon Series include IP scanning, port scanning, IP source routing option, IP routing record options, network structure snooping via traceroute, etc.

IDS Cooperation

The Eudemon Series can cooperate with Intrusion Detecting Systems. The IDS devices contain complete information about the attacking behaviors and IDS cooperation make it possible to fully unleash the capabilities of both IDS and Eudemon series simultaneously.

Carrier-class Reliability

Eudemon series adopts double power supply modules that support 1+1 backup and hot swap. All the service interface cards and fans of the Eudemon firewall are hot swappable. The Eudemon series supports backup group which can protect communications from the interruptions of firewall failures. Two Eudemon firewalls can work in active/standby or load balancing working modes. The Eudemon series supports Huawei Redundancy Protocol (HRP) which ensures a smooth active/standby switchover when a malfunction occurs.

Traffic Monitoring

Various limitations can be put to connections by Eudemon based on destination/source IP addresses, incoming/outgoing direction of a zone, percentage of various packet types and connection number. The Eudemon series can police traffic through the limitation on committed information rate, committed burst size and excess burst size. The Eudemon series can perform multiple statistics on the input and output IP packets.

Access and Authentication

The authentication schemes provided by Eudemon series include local authentication, standard Remote Access Dial-in User Service (RADIUS) authentication, Huawei RADIUS+ authentication and Huawei Terminal Access Controller Access Control System (HWTACACS). Authentication can be carried out in plain mode or MD5 mode.

The Eudemon series can be used as the PPPoE server. Cooperating with Huawei Portal Server, the Eudemon series can provide secure on-line IP detection and prevent spoof attacks. Cooperating with Huawei Comprehensive Access Management Server (CAMS) accounting system, the Eudemon series can provide various accounting schemes.

Secure VPN Application

The Eudemon series supports IPSec, L2TP, GRE and can provide services of access control, connectionless integrity, data-origin authentication, anti-replay, encryption and data flow classification. Various VPN can be built, such as L2TP VPN, GRE VPN, L2TP over IPSec VPN, GRE over IPSec VPN, IPSec over L2TP and IPSec over GRE. Using the Eudemon firewall, users can build Intranet VPN, Access VPN and Extranet VPN.

QoS Guarantee

QoS functions supported by Eudemon series include Traffic classification, Traffic policing and shaping, Congestion management, and Congestion avoidance. The Eudemon firewall provides special QoS guarantees for the multimedia and Next Generation Network (NGN) services.

Enhanced Log Management

The Eudemon series can provide NAT log, ASPF traffic log, attack-defending log, traffic monitoring log, blacklist log and multiple kinds of statistics. Logs can be output in binary or syslog (text) format. Specially developed log server software can cooperate with Eudemon series to facilitate log browsing, analyzing, querying, exporting, and backing up.

Rich and Flexible Maintenance and Management

The Eudemon firewall supports SNMP (V1/V2c/V3) protocol and can be managed by Network Management

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Station (NMS) The Eudemon firewall provides both command line and (GUI) for configuration and management.

Compliant Test and Verification Standards

The Eudemon 100/200 firewall is designed in compliance with the national standards in China, North America, Europe, Australia and Japan. It meets the requirements of UL, CE, FCC, FCC-part15, Electro Magnetic Compatibility (EMC), VCCI and safety certification and network access requirements.

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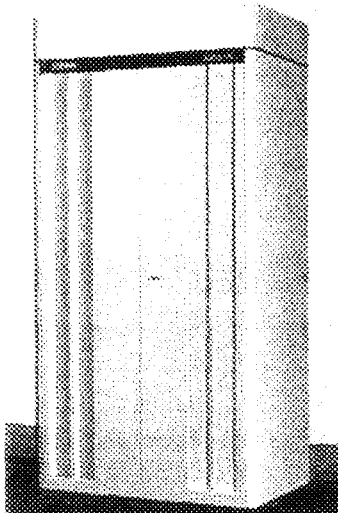
Switching Module (SM)

There are three types of ZXJ10 SMs:

- Standard type: SM8, SM16
- Compact type: SM4C
- Integrated type: SM4I

SM8 and SM16

- **SM8:** The standard switching module SM8 and the small-capacity central module SM8 use the same type of equipment modules that are applied in different occasions.
Application: SM8 is used as a switching module to provide 12,480 lines plus 2,760 trunks or 2,680 trunks. Generally, it is used as the peripheral switching module (PSM) or remote switching module (RSM).
- **SM16:** The standard switching module SM16 and the small-capacity central module SM16 use the same type of equipment modules that are applied in different occasions.
Application: SM16 is used as a switching module to provide 15,360 lines plus 9,600 trunks or 7680 trunks. Generally, it is used as the peripheral switching module (PSM) or remote switching module (RSM).

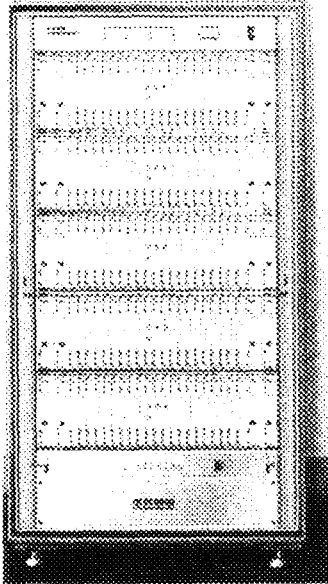


SM8 and SM16

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1.1.1 SM4C



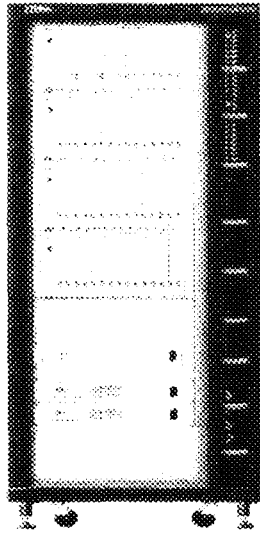
SM4C

- Dimensions: 2000mm×670mm×600mm (H×W×D)
- Weight: 250kg (a single rack with full configuration)
- DC voltage: -48VDC (-40VDC~-57VDC)
- Switching network capacity: Single T 4K/4K
- **Main features:** The transmission, control and switching functions are integrated in the same layer, thus reserving more free space in the rack to connect more subscribers
- **Application:** The typical configuration of SM4C with dual racks has a capacity of 5,280 lines plus 600 trunks. It is generally used as small-capacity end office, remote module (RSM) or Private Automatic Branch eXchange (PABX)

1.1.2 SM4H

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SM41

- Dimensions: 2000mm×870mm×600mm (H×W×D)
- AC voltage: 220VAC±22VAC
- Switching network capacity: Single T 4K/4K
- **Main features:** The primary power supply, storage battery, and MDF (optional) are integrated inside, and the subscriber concentration ratio is 1:1.
- **Application:** The typical configuration of SM41 with a single rack has a capacity of 720 lines plus 720 trunks. Generally, it is used in occasions requiring high concentration ratio, such as toll centers. It can only be used as an independent exchange, and can neither be used as a Peripheral Switching Module (PSM) of other modules, nor be connected with other switching modules. Remote subscriber line modules (RLMs) can be connected to it.

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W800A

The W800A provides IEEE 802.11a/b/g-based, high-speed wireless access with the maximum speed reaching 54Mbps. In combination with a bridge and repeater, it can be used to fulfill high-speed wireless bridging. It can provide one wireless Ethernet interface, one Ethernet interface and one RS232 configuration port. In terms of system software, it is composed of the Support Subsystem, Basic Service Subsystem, Extended Service Subsystem and Configuration Subsystem. The W800A has all functions necessary for building a public, carrier-level WLAN.

(1) Port types

- Wireless interface: IEEE 802.11a/b/g supported
- Uplink network interface: Autosensing 802.3 10/100BASE-T Ethernet interface
- RS-232 interface: The CLI interface for configuration

(2) Performance features

- User roaming
- Power can be adjusted by software within a range of 10~200mW, and power changing modes can be configured.
- Power self-adaptation is supported.
- Automatic scanning of channel
- Multi-SSID supported
- IAPP supported; load balancing based on user quantity and traffic volume
- Layer-2 isolation, avoiding communication between wireless users via AP. This guarantees high security for WLAN access in public places
- MAC address verifying and filtering supported: Up to 100 MAC addresses can be configured.
- Link integrity detection: High dependability of AP.
- Data encryption methods including WEP, TKIP and AES-OCB
- VLAN is provided: Terminals of an AP can form different VLANs by SSID.
- Based on 802.1x authentication (including port control) and advanced 802.1x authentication (including EAP-SIM, EAP-MD5, EAP-TLS)
- RADIUS
- DHCP Server and DHCP relay
- Remote configuration management: Management via Web-based configuration (HTTP), Telnet, SNMP and GUI
- Secure remote configuration management: Supporting SSH
- Local configuration management: Management via RS-232 serial interface

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- Firmware version upgrade: Upgrading via Serial Interface or TFTP
- Configuration upgrade: Upgrading via Serial Interface or TFTP
- Supports QoS and complies with IEEE 802.11e and 802.1p
- SNMPv2-based network management
- Equipment functions like the Restore button, remote reset, and indicators are available by default.

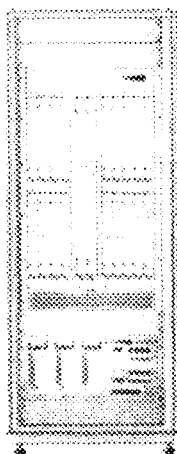
(3) Technical Specifications

Items	Features
Standard	IEEE 802.11a/b/g
Data rate	IEEE 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 & 108Mbps turbo mode; auto sense IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48 & 54Mbps; auto sense IEEE 802.11b: 1, 2, 5.5, 11Mbps; auto sense
Throughput	>=20Mbps
Recommended/Max Number of Subscribers	30/100
Coverage area	Indoor: 30~80 meters; Outdoor: 100~300 meters
Transmitting power	802.11IEEE 802.11b: 100mW 802.11IEEE 802.11g: 100mW 802.11IEEE 802.11a: 40mW
Power supply	48V POE and 12 VDC
Weight	1Kg
Dimension	208mm x 180mm x 47mm (H×W×D)
Temperature	Operating temperature: -5°C ~ 45°C Storage temperature: -40°C ~70°C
Humidity	Operating humidity: 5%~ 95% Storage humidity: 10%~100%

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ZXR10 T1200 Carrier-Class Core Router



1. Overview

The ZXR10 T1200 is a carrier-class, high-end core router developed by ZTE recently to adapt to the rapid growth and expansion of Internet services. With the advanced modular, distributed and expandable design and the large-capacity switching chip & high-performance network processor employed, the ZXR10 T1200 supports up to 16 10G high-speed interfaces and provides hardware-based wire-speed data forwarding and powerful QoS capability. IPv4/IPv6 are supported additionally. The ZXR10 T1200 is the optimal choice for not only carriers and national backbone network nodes of large-scale industry networks, but also provincial backbone nodes and core nodes such as interconnection center between carriers.

2. Product Features

- **Expandable switching capacity and wire-speed forwarding rate**
Leading-industry crossbar switching architecture, centralized control and distributed processing together help guarantee a wire-speed processing capacity for each slot. With a favorable expansibility, the backplane capacity can reach 1.2Tbps. The 640Gbps switching capacity is supported. Advanced network processor technology finally realizes wire-speed IPv4/IPv6 and MPLS data forwarding via high-speed interfaces. The total packet forwarding rate can be as large as 400Mpps.
- **Rich line interface cards with forward compatibility**
Based on the mature ZXR10 T128/T64E series, the ZXR10 T1200 not only provides 10Gbps OC-192c/STM-64c and 10GE WAN/LAN interfaces, but supports line cards of the ZXR10 T128/T64E series as well. Forward compatibility for line interface cards are well guaranteed and customers' early investments are protected.
- **Robust IPv4/v6 routing capability**
IPv4/v6 static routing is supported. ZXR10 T1200 supports diverse dynamic routing protocols such as RIP/RIPng, OSPFv1/v2/v3, IS-ISv4/v6 and BGP4/BGP4+. It can be configurable up to 512K~2M routing entries. Powerful routing capability makes it very suitable for use in Internet backbone networks. In addition, IPv4/IPv6 Dual Stack and fast IPv4/v6 transition mechanism are supported.
- **Strong support various services**
Hardware-based bandwidth restriction is provided, bandwidth control granularity as precise as 1KB. Diversified congestion control and congestion avoidance algorithms such as PQ, CBWFQ, LLQ and WRED are supported so that a perfect QoS mechanism

ATTACHMENT B

Telecom Attachment

is offered for service deployment. MPLS-based traffic engineering, VPN service, hardware-base wire-speed NAT, multicast service, policy routing, load balancing and traffic statistics are support as well.

- **Full support of MPLS**
MPLS technologies are fully supported. MPLS protocols including LDP/RSVP-TE/MP-BGP are supported as well. MPLS-based traffic engineering and DiffServ QoS can be supported. Additionally, good interoperability with MPLS L2/L3 VPN from other mainstream vendors (e.g. Cisco, Juniper and Huawei) is obtained.
- **Carrier-level high reliability**
System's key components including the switching fabric, routing engine, power supply, fan and clock are 1+1 redundant. MPLS Fast Reroute and VRRP are supported. Key components and interface cards support hot swappable, making it very convenient for system maintenance.
- **Superior system management**
Network management protocols of SNMP v2/v3 are supported; both serial interfaces and Ethernet network management interfaces are provided; both in-band and out-band network management are furnished. Each control board has 2 CPUs (route calculation CPU and network management CPU) so that real-time network monitoring is ensured even when there are considerable route interactions. For NMS interface, CLI and GUI are supported; and both Web-based network management and remote network management are available.

3. Technical Specifications

Feature	Description
System Architecture	Crossbar switching fabric+ NP
Input voltage	Double -48 VDC or 220 VAC
Power consumption	1800W(full load)
Dimension (H] W] D)	1111mm] 483mm] 560mm
Weight	<120kg (full load)
Environmental requirement	Long-term operating temperature: 0~40ΣC Operating humidity: 10%~90% (No condensation)
Switching capacity	640Gbps (bi-directional), non-blocking
Forwarding rate	400Mpps
Number of slots	16
Interface type	? 1] OC-192c/STM-64c POS interface ? 4] OC-48c/STM-16c POS interface ? 4] OC-12c/STM-4c POS interface ? 4] OC-3c/STM-1 POS interface

ATTACHMENT B

Telecom Attachment

	<ul style="list-style-type: none"> ○ 2】 channelized OC-3c/STM-1 POS interface ○ 4】 OC-12c/STM-4c ATM interface ○ 16】 100M electronic interface ○ 16】 100M optical interface ○ 4】 GE GBIC interface ○ 10】 GE (SFP) interface ○ 1】 10GE WAN interface ○ 1】 10GE LAN interface
Routing protocols	<ul style="list-style-type: none"> • Routing protocols of RIP, OSPF, IS-IS, BGP-R and static routing are supported; • 2M route entries
IPv6	<ul style="list-style-type: none"> • IPv6 static routing, dynamic routing protocols of RIPvng, OSPFv3, IS-ISv6 and BGP4+ are supported • Basic transition mechanisms: manual tunnel configuration, automatic tunnel configuration, 6to4 tunneling, 6over4, 4in6 hardware-based NAT-PT • ICMPv6 MIB, UDPS MIB, TCP6 MIB, IPv6 MIB are supported
MPLS	<ul style="list-style-type: none"> • LDP, RSVP-TE and MP-BGP • MPLS-based wire-speed data forwarding rate • Can act as P and PE • MPLS FRR(Fast Reroute) • MPLS CoS(E-LSP) • Traffic engineering: RSVP-TE, OSPF-TE, ISIS-TE • MPLS VPN - L2: VVPS, VPLS - L3: BGP/MPLS VPN (RFC2547bis), supports three subcases for inter-AS VPN defined RFC2547bis • Related standards strictly compliant; good interoperability with devices from other mainstream vendors.
QoS	<ul style="list-style-type: none"> • Supports traffic identification and classification according to 5-tuple(source IP address, destination IP address, source port address, destination port address, application protocol number), physical port, logical port, MAC address, ToS, ACL, 802.1p, and MPLS EXP, etc. • Supports PQ, CBWFQ, LLQ queue management • Supports WRED congestion control algorithm • Support DiffServ CoS • Supports RSVP-TE to establish LSP
Multicast	IGMP, MSDP and PIM-SM are supported.
Network Management	<ul style="list-style-type: none"> • Network management interfaces: Console, RJ-45 • Support in-band, out-band network management information channels • Support CLI, GUI and web management interface

ATTACHMENT B

Telecom Attachment

	<ul style="list-style-type: none"> • Support remote network management and software version upgrade
<p>Other</p>	<ul style="list-style-type: none"> • Policy routing; • Security filtering characteristic; • Wire-speed NAT via high-speed interface; • Link bundling; • Load balancing;
<p>Reliability</p>	<ul style="list-style-type: none"> • Main processor and switching modules are 1:1 redundant, power supply modules are 3+2 redundant, fans are 1+1 redundant • Key components and interface cards support hot swappable. • MPLS FRR • VRRP



November 29, 2006

Sheila Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry and Security
Department of Commerce
14th St & Pennsylvania Ave, NW
Room 2705
Washington, DC 20230
Attn: RIN 0694-AD75

Sub: Proposed Rule Revisions for Exports to China

Dear Ms. Quarterman,

I am writing on behalf of Unholtz-Dickie Corp in regard to the "Proposed Rule Revisions and Clarification of Export and Re-export Controls for the People's Republic of China (PRC)". Specifically, please note the newly proposed Supplement No 2 to Part 744 which includes Category 9 (ii) "9B990 Vibration Test Equipment and Specially Designed Parts and Components, n.e.s." and 9 (iii) "9D990 "Software", n.e.s., and 9 (v) 9EE90 "Technology", n.e.s.

This type of vibration test equipment is readily available from multiple sources within the USA and also including major suppliers from England, Germany, Japan, India, and Denmark.

England: LDS (Ling Dynamic Systems)
Gearing & Watson

Germany: TIRA
RMS

Japan: IMV
EMIC
Shinken

India: Saraswati Dynamics

Denmark: B & K

World Headquarters 6 Brookside Drive, Wallingford, Connecticut 06492
West Coast Division 927 Deep Valley Drive, #196, Rolling Hills Est., CA 90274
European Division Karl-Ulrich-Str. 1 D-83059 Kolbemoor Germany
Website: www.udco.com

Tel: (203) 265-3929 Fax: (203) 265-2690
Tel: (310) 265-0927 Fax: (310) 265-0728
T: +49 8031 234-734 F: +49 8031 234-735
e-mail: info@udco.com

USA: Unholtz-Dickie Corp
MB Dynamics
Ling/ACG
Dataphysics
Derritron
Thermotron
And Various "Refurbished" Equipment Dealers

In addition to these sources there are six more major Chinese Shaker manufacturers that produce this type of equipment, as follows:

- 1) Dongling
- 2) Suzhou Test Instruments
- 3) King Design
- 4) CMI
- 5) BISEE
- 6) Northwest Machinery Factory

These companies have been growing quickly especially during the last five years. A major reason for this growth has been due to various export restrictions by the foreign (non-Chinese) suppliers. It is easier and less risky for Chinese customers to purchase from the Chinese Shaker Manufacturers.

Of those listed, Dongling and Suzhou Test Instruments are the most aggressive and offer a full range of vibration shaker equipment from 80 N to 392 kN force.

Please see the attached catalogs from these two companies which clearly indicate the various shaker system models and force capability.

Dongling – Note the shaker system models basic specs on pages 18 and 20 (100 kgf (980N)) to 30,000 kgf (294 kN))

Suzhou Testing Instrument – Note the shaker system models basic specs on pages 9, 11, and 13. (1.9 kN to 392 kN force)

Both these companies offer a broader range of shaker models than other non-Chinese manufacturers. And both are now selling internationally. During the last 3-4 years Dongling has been very aggressively selling to the US marketplace through the USA company, Dynamic Solutions, located in Northridge, California. Dongling/Dynamic Solutions has supplied equipment to numerous US companies including the US government and with no restrictions. A partial list of the Dongling/Dynamic Solutions US customers includes:

US Army – Dugway Proving Grounds, Utah
Holloman Air Force Base, New Mexico
StorageTek/Sun Microsystems
Wyle Test Labs
CascadeTek
Arvin Meritor
Honeywell
Seagate
Advanced Product Testing (APT)

Eagle Picher
EST Testing Solutions
Prestolite
Insight Technology
Synerject
Delserro Engineering Solutions
Hi Shear Technologies
Mark IV Automotive
Entela Labs
Garwood Labs
Environment Associates
Rexnord
TSE Brakes

Dongling has also sold shaker equipment to customers in Canada, France, Spain, India, Korea, Brazil, Israel, Singapore, Germany and others. In fact, these Chinese manufacturers are now a major threat to Unholtz-Dickie's shaker business both within China and internationally.

Of the remaining four Chinese Shaker manufacturers, King Design and CMI are supplying shakers in the range up to 49 kN force (see the King design catalog attached). Both these companies primarily supply equipment to the Chinese domestic marketplace and some other local Asian countries. And King Design now supplies various assemblies to LDS, the UK shaker manufacturer. This provides LDS a low cost supply for better competing in the international marketplace.

BISEE and North West Machinery Factory (the last two of the Chinese shaker supplies listed) also manufacture shaker systems up to the 50 kN force range. However, these two suppliers are much smaller than the other four referenced Chinese supplies.

Due to the broad availability of this type of shaker equipment from at least six Chinese manufacturers, we kindly request that these items (9B990, 9D990, and 9E990) be excluded from the new proposed EAR rules paragraph 744.21 and Supplement No 2 to part 744.

Unholtz-Dickie appreciates the opportunity to provide these "comments" to the proposed rule changes. This provides clear evidence of the Chinese shaker supplier capabilities.

I would be please to review this further with the BIS and to answer any questions about the information contained in this letter. Thank you for your attention.

Very truly yours,

UNHOLTZ-DICKIE CORPORATION



Michael Reen
President
mr@udco.com

Attachments

Dongling Shaker Catalog (and one copy)

Suzhou Testing Instrument Catalog (and one copy)

King Design Catalog (and one copy)



ISO9001

金顿仪器科技(昆山)有限公司

RICH-WELL INTERNATIONAL CO., LTD

■江苏省昆山市周市镇金浦路66号2厂房

台湾总公司:

TEL: (0512) 57868288 FAX: 57868299

金顿科技股份有限公司

E-mail: wtchu@king-design.com.tw

http://www.king-design.com.tw

公司简介

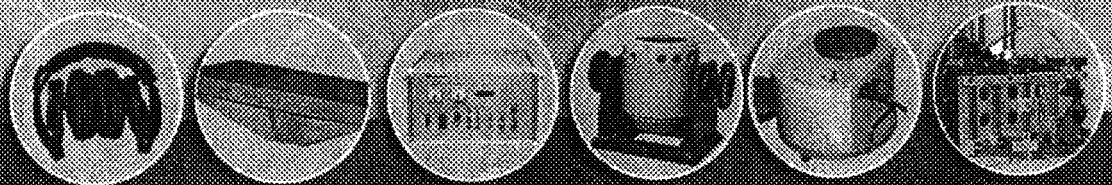
金顿科技专业于振动、冲击、环境试验仪器的公司, 目前已经有二十三年以上的历史, 在制造与应用方面的经验丰富, 并得到许多厂商的信赖与支持。

我们的业务范围与特色如下:

- 一、**仪器销售服务:** 提供 高低温交变箱、高低温冲击箱、步入式温湿度室、振动试验机、冲击试验机、包装跌落试验机、高温烘箱、盐水试验机、耐水、耐光、耐候、耐尘试验机等系列环境测试仪器, 荣获多项专利, 并外销世界多国, 台湾信息大厂皆采用如宏碁、明碁、仁宝、华硕、金宝、友达、英业达、台达、光宝、冠捷、大同公司等, 车厂: 大众(VW)、三阳(本田)、长春汽研、沈阳金杯、宇通客车及配件厂: 大亿车灯、铭洋车灯、美安工业、堤维西TYC、全兴工业、元成工业、健生工业、信通工业、敦扬科技、福州大亿、常州大茂、一汽四环、合力电气、无锡光生、常州大茂、昆山帝宝、著名大专院校: 台大、成大、交大、清大、中兴、元智、屏科大、东北大学、湖南株州工学院、中科院、工研院能资所、化工所、气象局、商检局等, 知名厂商: 飞利浦PHILIPS、摩托罗拉MOTOROLA、康柏COMPAQ、夏普SHARP、日立HITACHI、索尼SONY、戴尔Dell OEM/ODM指定设备、LG金星集团采用。并成功进入大陆军工单位, 如: 华东光电研究所, 中国电子集团20所/55所、西安210所、中科院光学机械所、中国计量院、北方工业旭光厂、北京泰尔实验室、北京邮科院、四川农机质检所等
- 二、唯一民营CNLA实验室(认证编号: 0424/0423)专业在**振动测试、冲击测试、系统校正、振动诊断、加速规校正**领域, 并荣获世界前两大厂美国康柏Compaq计算机公司承认唯一民营检测实验室及美国戴尔Dell计算机实验设备认证, 并获得IBM/PHILIPS/TEAC/SONY/APPLE/HP..公司之能力认证。
- 三、**振动诊断及结构改善**协助厂商的产品在轻、薄、短、小的趋势下, 在旧有的结构上进行抗振动、耐冲击之结构分析及改善, 并配合防治对策(如减振胶的加装)帮助客户解决产品在结构瑕疵上的改良。
- 四、**应力筛选(ESS)**协助厂商于制程品管的步骤上 (In process quality control procedure), 以加速环境应力的方式, 快速有效的达成, 提高产品可靠度Reliability及提升平均失效时间MTBF, 并达到全面品管(TQC)的要求。

综合型录

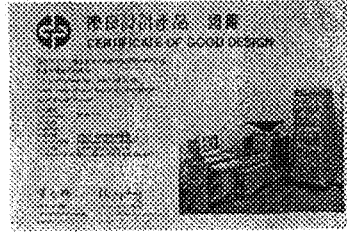
- 振动试验设备 Vibration Testing System
- 冲击试验设备 Shock Tester
- 落下试验设备 Drop Tester
- 弹跳\碰撞试验机 Bumping Tester
- 精密型落球试验机 Precise Ball Dropping Tester
- 可靠度环境试验设备 Reliability Testing System
- 国际认证实验室 TAF Certification Laboratory



电磁式高频振动试验机 VIBRATION TESTING SYSTEM

系统组成

System Installation Composition



最佳设计奖

控制部分		测试平台	
1	振动控制系统 控制柜及软件	8	垂直辅助平台
		9	水平滑床
			附件
	19英寸位器架	10	加速瓶及加速线机台线
2	电源供应器	11	电源线
3	伺服功率放大器	12	信号控制线
4	系统伺服保护器 FT-3	13	信号传输线
5	抗磁悬浮位置控制器		选用配件
		14	夹油具
		15	空压机
		16	闪光灯频闪
		17	消音箱 (与抽风机搭配为静音式抽风机)
	激励系统		
6	电磁式激振器		
7	抽风机及管路		

电磁式激振器

- 音圈结构获得中标局及美国发明专利。
- 振动机机台采气囊避震设计，本体之自然振动频率约3-5Hz间，测试时之传输比TR%<5% ，不影响楼板结构，也不受外在环境之影响。
- 低漏磁设计具音圈上方10cm处漏磁量<10 Gauss
- 振动机采双磁路设计，高导磁合金及H/APTZ等级之线圈制造磁效益最高，本体及音圈之散热系统依据热流冷却风路设计，不发热确保系统稳定。
- 整体系统采重力铸造，造型美观，坚固，侧板及底板采用球状铸钩制造坚固且具低共振之特性。
(本系统执行0.5Hz以上的振动测试)

水平滑床

- 静音式直结帮浦。
- 油压调整器及指示表。
- 压力异常指示及警报器。
- 气囊避震器 6 set /油压缓冲器 6 set
- 系统设计低共振频率3-5Hz，安置在楼层结构上也不会影响建筑物。
- 南非1级花岗岩平台无段式油压帮浦。
- 水平滑板使用高强度镁合金及镁铝合金并采用罕规级之超硬阳极处理。
- 精密线性滚珠导向无侧向偏移。

垂直辅助平台/水平转向机构

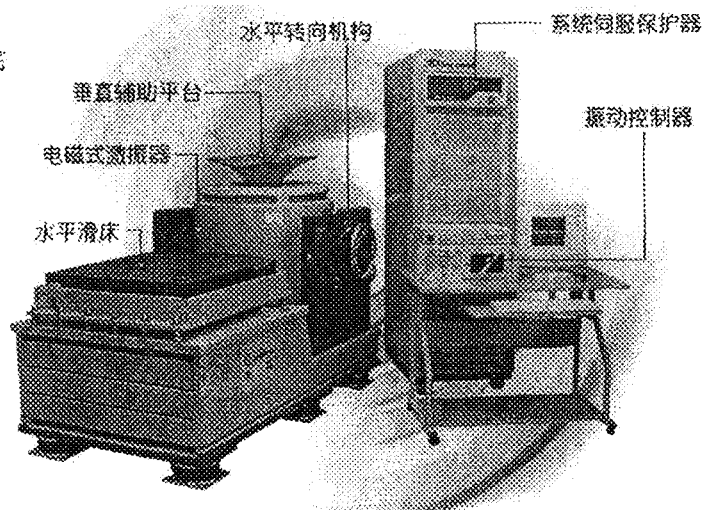
- 镁铝合金/镁合金重力铸造。
- 蜗杆连动齿轮机构，省时、省力，约30sec定位完成。
- 插销自动定位：转盘带刹车装置，无滑动之虞。

直流伺服功率放大器

- 输入阻抗：10K ohm
- 放大器效益：>93%-96%
- 失真率：0.2% at 100v
- 安规符合：European Community directives:
Machinery 89/392/EEC
Low Voltage 73/23/EEC
EMC 89/336/EEC

系统伺服保护器

- 具过位移、过电流、音圈异常温度指示、功率放大器异常温度指示、抽风系统异常指示、及紧急停止保护功能，多项保护功能。
- 输出电压、电流显示。
- 附加四通加速规专用电源组。



振动控制器 (市场占有率85%)

数位伺服控制器--Dactron System
Hardware(Control Card & Signal Box)
Software(Sine & Random & Shock)

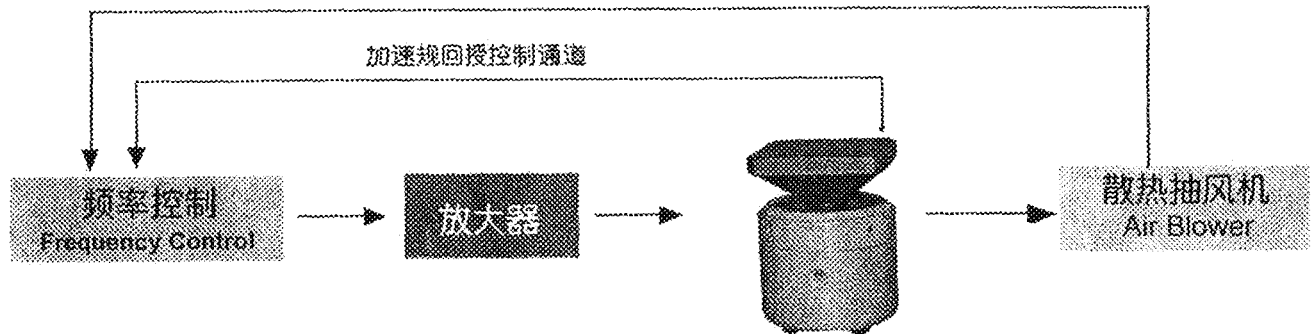
- SINE WAVE
 - 频道数：2-16 channel
 - 频率范围：<12,100 Hz
 - 频率解析度：2,048 Lines(Max)
 - DA交换能力：24bit
 - 动态范围：120dB
 - 扫描能力：0-100 oct/min
- RANDOM WAVE
 - 频率范围：<9,500 Hz
 - 频率解析度：1,600 Lines(Max)
 - DA 交换能力：24bit
 - 动态范围：120db

电磁式高频振动试验机 VIBRATION TESTING SYSTEM

微型振动机 Mini Shaker

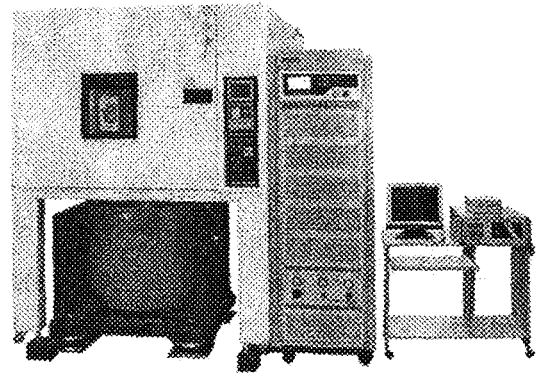
微型振动机是小推力的振动系统，推力从2~50 kgf (19.6~490 N)，有两种系统组合的方式：

- (1) 信号产生器、放大器、激振器；依照推力大小搭配激振器散热抽风机。
- (2) 振动控制器、放大器、激振器。若需进行回授控制，需使用加速规做回授控制通道。



复合式环境试验机 Agree Chamber

- ◆ 航太、军品、车辆、电子高科技产品专用测试适用设备。
- ◆ 可让您的可靠度试验更接近真实环境中的考验。
- ◆ 可模拟产品在实际环境中温度、湿度、振动的试验。
- ◆ 温度、湿度、振动可复合使用或分开使用。
- ◆ 彩色液晶 LCD 中英文显示微电脑控制系统。
- ◆ 磁碟片温度记录器，方便在 PC 上执行曲线分析。
- ◆ 振动试验机控制系统能力：正弦波、随机波、冲击波、正弦+随机、多通道控制。

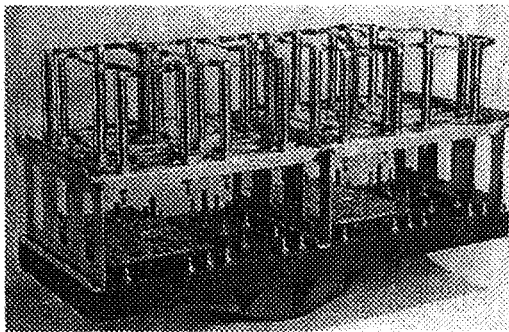


环境应力筛选 E.S.S (Environmental Stress Screening)

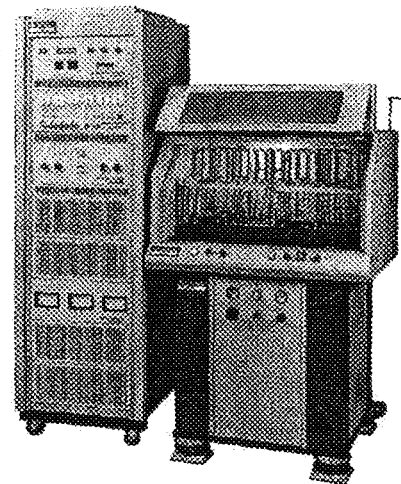
环境应力筛选 (Environmental Stress Screening) 简称为 ESS。它是一种利用环境应力为特徵，材料及零组件之物理特性为依据，进行产品的品质管制程序，其主要目的是将潜在於产品中之瑕疵提早曝露出来，并可有效的消除机件及电路板的残留应力，以提高产品可靠度。

总合上述讨论，ESS 的效益归纳如下：

- ◆ 降低产品使用的失效率，有效缩短制程过程。
- ◆ 提高产品使用时的可靠度值 (MTBF)。
- ◆ 节省产品制造及维修成本 (\$)。
- ◆ 在研发阶段可协助早期发现设计问题，提高工程可靠度，并缩短研发作业时间。

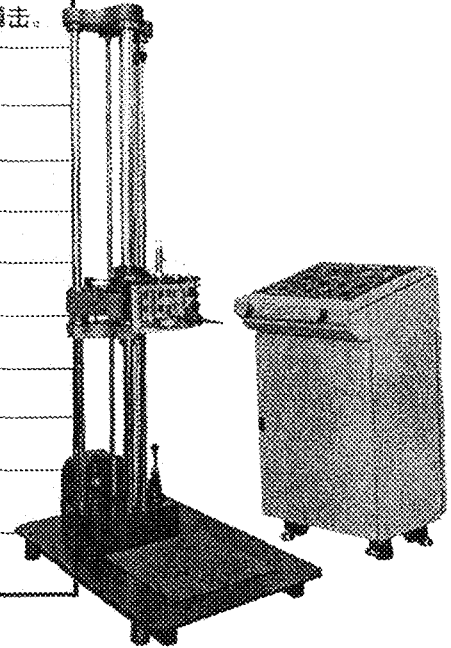


气压式 E.S.S 专用夹治具

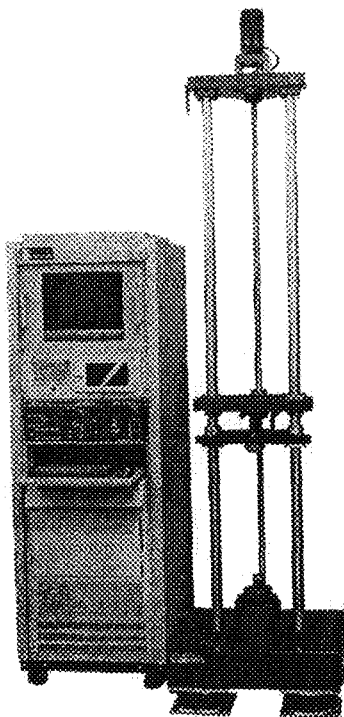


携带式产品落下试验机 PORTABLE DEVICE DROP TESTER

测试产品	手机、电池、PDA、数码相机、墨水夹、...等便携式通讯与资讯产品。 测试尺寸：30mm ~ 220mm 特殊尺寸可依需求制作。 最大测试重量：5kg
作动方式	跌落型：700~2000 mm，试件依测试高度自由落体跌落。 扶落型：350~2000 mm，治具辅助试件自由落体跌落。
机台结构	多支平行结构支柱支撑，精密螺杆带动夹具。
高度调整	数码式高度调整(精度至1 mm)
跌落冲击方式	落地后自由弹跳，直到静足为止。 单次落地方式，只允许落地撞击，并以海绵防护翻转与弹跳之撞击。
底板材质	铜板：可随时加装水泥板、木板、地毯等，以符合不同规范。
跌落角度	可调整测试件测试方向，适用于各方向测试(角、菱、面皆可)
缓冲装置	高吸收油压缓冲器
机台尺寸	850L X 1200D X 2450H mm
机台重量	< 340 kg
控制箱尺寸	600L X 500D X 1060H mm
控制箱重量	< 70 kg
电源需求	220V / 10A 单相
空压需求	6 kg/cm ²
附属件	蓄压瓶



精密型落球试验机 PRECISE BALL DROPPING TESTER



适用产品：缓冲材料吸振特性测试
护具防护能力测试。

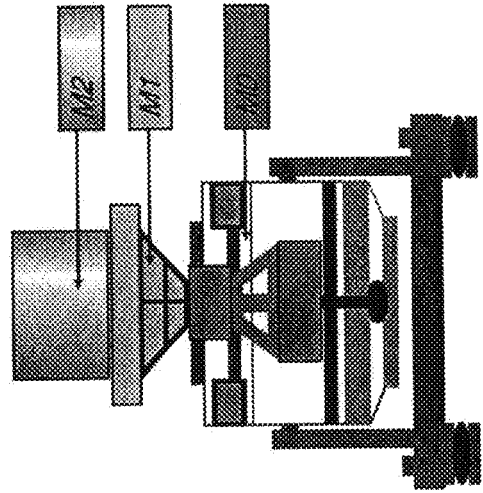
特性

- ◆ 自动举升装置、精密刻度可达0.01mm。
- ◆ 使用气囊装置，隔振效果好，不影响楼面结构。
- ◆ 重测试高、操作简便。
- ◆ 可量测撞击时间、最大冲击力量。
- ◆ 符合CNS、JIS、军规、国标、商规等规范。
- ◆ 可列出报表、存档、记录。
- ◆ 可追加选配功能、量测Joule。
- ◆ 砧座可随时更换，试用多种尺寸。
- ◆ 量测界面中英文文化，简单易懂。
- ◆ 可随时观测能量数值、冲击力量。
- ◆ 下拉式视窗，设定快速，操作简易。

电磁式振动机

型号	推力 (kgf)	频率范围 (Hz)	最高转速 (rpm)	最大位移 (mm)	最大速度 (mm/s)	最大重量 (kg)	负载后的最高加速度					最大偏心距 (kg-cm)	音圈重量 (kg)	激振器规格			电源需求	
							音圈厚度 (mm)							尺寸 (长×宽×高) (mm)	重量 (kg)	电压 (V)		电流 (A)
							5G	10G	20G	30G	40G							
LT-02F4K-02M02	2	2-4000	23	2	45	2	5.0	1.0	1.0	1.0	1.0	35	32	100×100×80	6.5	90-240V / 2A		
LT-20F4K-10M05	20	2-4000	23	10	90	5	3.0	1.0	1.0	1.0	50	40	300×250×280	35	220V / 25A			
LT-50F4K-15N15	50	2-4000	25	15	110	15	6.5	3.5	1.0	1.0	625	80	550×400×450	100	220V / 35A			
EM-100F4K-15N25	100	2-4000	30	15	126	25-50*	16.5	6.5	1.5	1.5	800	140	500×450×600	150	220V / 45A / 3Φ			
EM-200F3K-25N50	200	2-3000	30	25	160	50-120*	33.5	15.5	3.5	3.5	1350	140	560×550×720	350	220V / 50A / 3Φ			
EM-300F3K-30N80	300	2-3000	33	30	180	80-120*	51.0	21.5	6.0	1.0	1350	150	730×560×750	700	220V / 50A / 3Φ			
EM-400F3K-30N60	400	2-3000	44	30	190	80-120*	71.0	31.0	11.0	4.5	1350	150	730×560×750	700	220V / 50A / 3Φ			
EM-500F3K-40N120	500	(DC)2-3000	40	40/50*	230	120-250*	88.0	38.0	13.0	4.5	1640	200	800×800×800	1500	220V / 75A / 3Φ			
EM-600F3K-40N120	600	(DC)2-3000	50	40/50*	230	120-250*	103.0	48.0	15.0	3.0	1640	200	800×800×800	1500	220V / 75A / 3Φ			
EM-800F2K-50N120	800	(DC)2-2500	53	50	230	120-250*	145.0	65.0	25.0	11.7	2000	200	1000×1000×900	1800	220V / 90A / 3Φ			
EM-1000F3K-50N250	1000	(DC)2-2500	66	50	230	250-400*	185.0	85.5	55.5	18.5	2000	200	1000×1000×900	1800	220V / 90A / 3Φ			
EM-1200F3K-50N260	1200	(DC)2-2500	80	50	230	250-400*	221.0	101.0	61.5	21.5	3200	260	1000×1000×900	2000	220V / 90A / 3Φ			
EM-1500F2K-50N250	1500	(DC)2-2500	80	50	230	250-400*	250.0	131.0	56.5	31.5	3200	260	1200×1000×950	2500	220V / 125A / 3Φ			
EM-2000F3K-50N230	2000	(DC)2-2500	100	50	230	250-400*	350.0	180.0	80.0	48.2	4000	280	1500×1300×1100	3500	220V / 185A / 3Φ			
EM-2500F3K-50N230	2500	(DC)2-2500	100	50	230	250-400*	350.0	225.0	100.0	58.3	4000	320	1500×1300×1100	3500	220V / 185A / 3Φ			
EM-3000F2K-50N250	3000	(DC)2-2500	100	50	230	250-450*	250.0	250.0	118.0	68.0	7000	320	1500×1300×1100	3750	220V / 165A / 3Φ			
EM-5000F2K-50N250	5000	(DC)2-2500	100	50	230	250-450*	250.0	250.0	193.0	109.0	7000	430	3000×1500×1200	4000	220V / 400A / 3Φ			

以上规范, 仅供参考, 实际规范, 当依据价单所列规格为主。



公式

1	SINE FORCE (P-P) F = Σ M A = (M0+M1+M2) × a 1.2 M0: 音圈质量 (kg) M1: 测试平台重量 (kg) M2: 测试物件重量 (kg) A: 振动加速度 (g) 1.2: 安全系数
2	RANDOM FORCE (RMS) F-SINE FORCE × √

▲ 推力计算

9363 - EM - 1200F 2K - 50 N 250

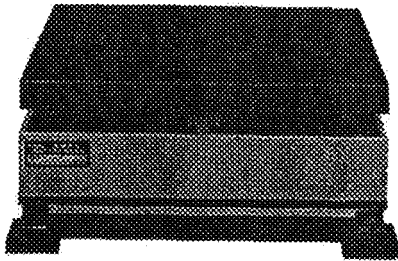
序号	规格
1	LT: 永磁式
2	EM: 电磁式
3	推力大小: 1000kg
4	频率范围: 高於2kHz
5	最大位移: 50mm
6	激振器型式
7	N: 一般型式
8	L: 高加速度
9	H: 高重量
10	S: 特殊设计
11	最大载重: 250kg

运输型低频振动试验机 VIBRATION SIMULATOR

控制器特性 Controller Feature

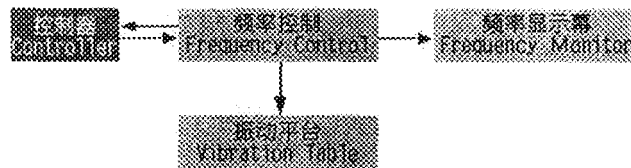
- 机构与控制器分离独立设计，确保控制器精准度及安全性。
- 提供交谈式程式设定方式，操作简单易学；测试结果可储存列印。
- 提供总测试时间999hrs（可自动重复周期）。
- 自动频率扫描控制：提供模拟运输过程（车、船、飞机等运输工具）之振动测试功能。
- 手动频率扫描控制：待测物共振点搜寻（如产品结构分析与改善）振动测试功能。
- 全随机及区域随机频率控制，可提供非连续性振动试验功能，加速产品进行寿命测试。

振动机台特性 Shaker Feature



- 日本 EXEN 原装振动器，振动效率高、安全耐用。
- 振动台面侧边具辅助固定孔，方便固定代测件。
- 振动台面采专制棋盘式设计，镁铝合金铸造及+T6(时效处理)，质轻坚韧。
- 专利特殊胶囊避振装置，吸振效果佳，避免机台之谐振发生。
- 振动机构及本体基座一体成型，结构坚固，避振效果佳。
- 振动机构无任一传动机外露，操作安全。
- 本机无限制使用於特定场合，亦无须地槽特别固定。
- 依国际常用规范设计之可调式振幅大小装置，依规格可自行调变，精确快速。

控制系统方块图 System block of Diagram



规格 Specifications

型号	9363-PCL (电脑型)	9363-SP (标准型)	9363-M (经济型)
外观			
频率范围	5~100 Hz, 1 Hz/step	5~100 Hz, 1 Hz/step	5~60 Hz, 1 Hz/step
测试模式	1. 手动控制模式 2. 自动控制模式 ○ 线性 ○ 对数 ○ 随机	1. 手动控制模式 2. 自动控制模式	手动控制模式
电源需求	AC 220V +/- 10%, single pahse, 50/60 Hz, 5A		

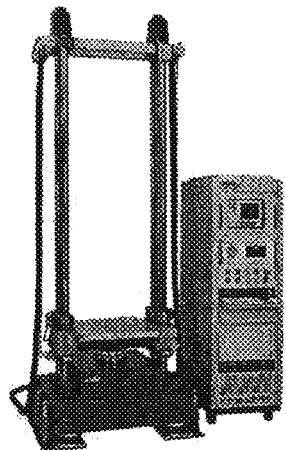
冲击试验机 SHOCK TESTER

冲击试验机 SHOCK TESTER

型式	气举式	重力式	冲击放大器
波形	半正弦波	半正弦波 方波 锯齿波	半正弦波
量测频道	单通道	四通道	
特点	<ul style="list-style-type: none"> ■ 卓越的量测性。 ■ 安全可靠、不占空间。 ■ 人性化的操作介面，操作简单易学，易於上手。 	<ul style="list-style-type: none"> ■ 采古典力学自由落体落下方式，模拟实际使用环境最准确。 ■ 冲击碰撞确实、无二次翻转或偏移之虞。 ■ 全数位控制系统，效率佳。 ■ 速度变化率范围广。 ■ 波形变换调整方式快速。 ■ 符合所有商用、军用测试规范。 	<ul style="list-style-type: none"> ■ 可产生极短波高加速度之冲击脉冲。 ■ 量测性高、稳定性佳，最高测试范围可至20000g。

重力式冲击试验机 Free-Fall Shock Tester

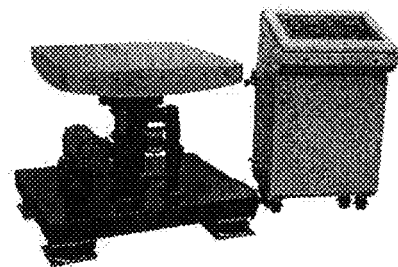
型号	DP-1200-25	DP-1200-45	DP-1200-60	DP-1200-90	DP-1200-100
平台尺寸 (mm ²)	250	450	600	600	1000
平台重量 (kgw)	36	100	200	320	410
平台材质	镁合金				
最大载重 (kgw)	50	70	90	105	200
脉冲最短时间 (mS)	1	2	2	2	2-3
最大加速度 (g)	1,000 (20,000-100,000)		500	500	500
量测频道	四通道				
冲击速率	1-8 (pulse / min)				
举升方式	滚珠导螺杆/伺服控制 servo control				
举升高度 (mm)	Max 1800				
长×宽×高 (cm)	85*80*310	107*75*310	145*90*310	145*110*310	145*180*310
重量 (kgw)	1000	1600	3000	3800	4800
半正弦 (m/s)	6.7				
方波 (m/s)	7.0				
锯齿波 (m/s)	2.7	3.0			
控制器尺寸	标准19"仪器架				
重量 (kgw)	265				
电气需求	110V, 12A/220V, 8A @ 50/60Hz				
电压需求 (kg/cm ²)	6				



弹跳试验机 BUMPING TESTER (专利申请中)

特点 Features

- 本机台符合 IEC-60-2-29 试验规范。
- 安装容易，简易操作，低噪音，免保养，长效性。
- 无共振结构机台，设计精良，气囊防震垫有效隔绝檯板振动。
- 加速规回授量测，可调式半正弦波产生器，数值控制精準。
- 镁铝合金平台，表面阳极处理，伺服马达凸輪传动，可自行调整速率。
- 專利设计可微调式加速度值与衝擊時域 (1mS-13mS)。



落下试验机 Drop Tester

规格 Specifications

型号 Model	气臂式落下	气臂式落下	高荷重栈板落下试验机
机种 Model	KD-128A	KD-128AS	KD-500
底板尺寸 Dropping Platform (mm)	850*1560 1200*1560 1280*1800 1500*1560	1500*1500	1500*1500 (底板厚度 120 mm)
测试高度 Test height (mm)	300~1300 300~1800 300~2000	330~1300 330~1800 330~2000	0~810 (1300mm option)
试件最大重量 Payload Max. (kg)	60	60	300 (7500kg option)
缓冲装置 Buffer type	油压缓冲 Oil pressure absorbability	橡胶缓冲 Rubber Absorbability	油压缓冲
高度控制方式 Height Control	线控 Manual	线控 Manual	PLC控制迴路 高度自动检测/线控
机台尺寸 Dimension (mm)	850*1560*2250 850*1560*2750 850*1560*2950	1500*1500*2250 1500*1500*2750 1500*1500*2950	1930*1500*1600
机台重量 Weight (kg)	350 420 450	400	1400
电气需求 Power Requirement	220V / 2A	220V / 2A	220V / 10A
气压需求 Pneumatic Pressure (kg/cm ²)	6		
参考图片			

2005年07月版

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* 型錄規格更新不另行通知 *

Translation[]

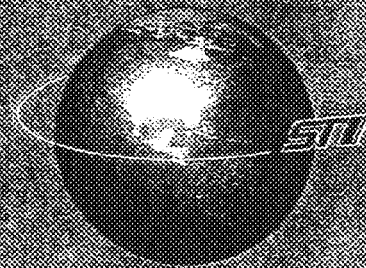
King Design is a shaker and environment test instruments company which has a history of 23 years. Our main business scopes are as follows:

1) Provide Temp. Chamber, temp. shock chamber, walk in chamber, vibration test system, shock machines, drop machines, salt chamber . Our systems are very well sold to many industries and areas around the world. Such as ACER, ASUS, Volkswagon, Honda, Shenyang Toyota Jinbei, Audi, Jiaotong University, Tsinghua University, North East University , China Science Academy, Philips, Motorola, Compaq, Sharp, Hitachi, Sony, Dell, LG, and got success on selling to mainland defense industry.

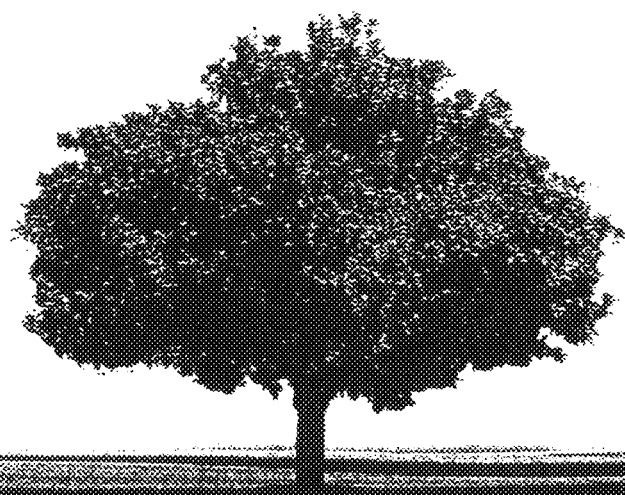
2) In vibration test area, We are the only non-state owned CNLA Lab (License number 0424/0423) And got admitted by Compaq, IBM, Philips, TEAC, APPLE, HP

3) Help customer to modify products structures and increase the capability of anti-shock, vibration and reliability

4) Environment Stress Screen (ESS) to increase products reliability and MTBF, to meet the need of TQC (Total Quality Control)



苏州试验仪器总厂

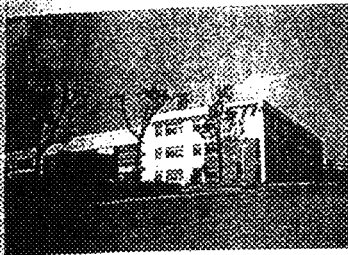


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1956年

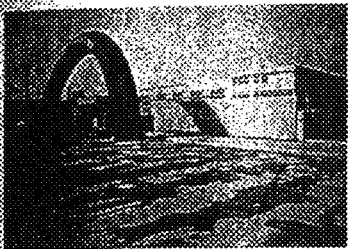
1月18日苏州试验仪器总厂成立。

1962年

制造了中国第一台电动振动台。

1963年

第一机械工业部会同国家计量局等13家单位对该电动振动台进行鉴定，并颁发了技术鉴定合格证书和国家新产品三等奖，至此，苏州试验仪器总厂成为中国第一家振动台专业制造厂商。



1978年

ZS-2000D电动振动台获全国科学大会奖。

1985年

经国家批准引进日本IMV公司电动振动台设计制造技术，振动台产品当年返销日本，成为国内迄今唯一引进国外电动振动台技术的厂家。

1993年

在苏州市首批获得江苏省高新企业称号。

1998年

为适应市场经济发展成为苏州市首批改制企业。

1999年

国内首家推出SA系列开关式功率放大器。

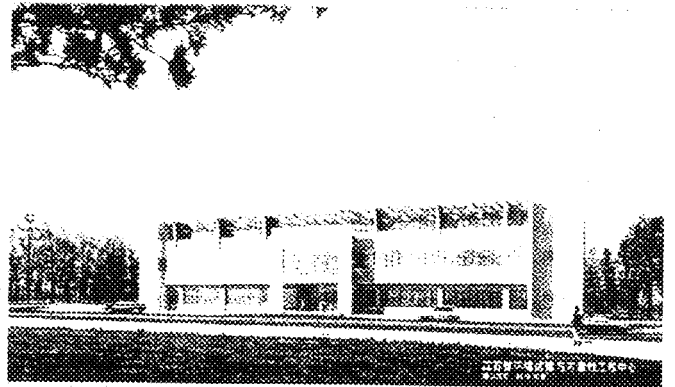
2000年

经市政府批准成立苏州市企业技术中心。

2001年

行业首批通过ISO9001:2000质量体系认证。

获国家科技型中小企业创新基金。



环境与可靠性技术及装备国家工程中心

2002年

完成总装备部下发的DC-5000-50电动振动试验系统项目研制任务，通过鉴定该项目获中国国防科技成果三等奖。

2003年

在苏州高新区兴建新厂区，占地面积3.4万平方米，建筑面积2.72万平方米。

2004年

为贯彻市委、市政府“退城进区”的战略部署，企业完成扩张性搬迁。2月6日苏州市四套班子领导为新厂区开工剪彩。

根据国家下达的大推力水冷电动振动台系列科研项目的要求开发了水冷DC-10000-100电动振动试验系统。通过国家计量部门鉴定和用户验收。从而推出5吨~40吨水冷系列产品。

“苏试”牌振动台、冲击台、碰撞台产品获江苏省名牌产品称号。

2005年

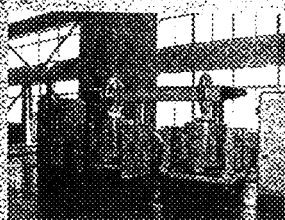
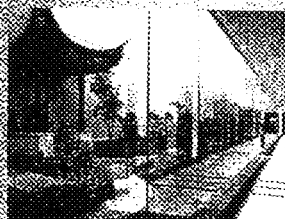
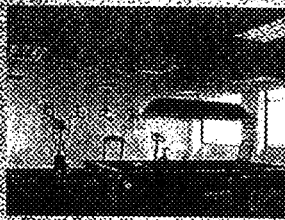
参与中国载人航天工程研制、建设、试验的协作配套工作，获上级有关部门的嘉奖；

环境与可靠性技术及装备国家工程中心开工；

国内首套双台同步振动试验系统交付用户。

2006年

2006年1月18日工厂成立50周年。

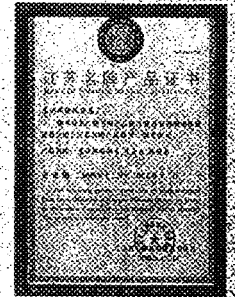




苏州试验仪器总厂是国内最大的环境与可靠性试验装备生产厂家。50年来为我国航空航天、电子、舰船、兵器、核工业、汽车、仪器仪表、家用电器行业 and 大专院校、科研院所、一批国家重点型号任务提供了大量的试验装备。为保障产品可靠性构建了坚实的技术平台。据不完全统计，由我厂提供给不同用户的近200台电动振动台在“神州”1号到“神州”6号的各种关键器件及配套件振动试验中发挥了重要作用，受到上级嘉奖。

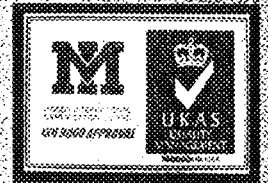
在消化吸收引进国外先进技术的基础上，我们凭借着强大的研发能力，开拓创新，振动台产品形成了具有自主知识产权的苏试品牌系列，并多次获得国家、部、省市科技成果奖。振动台产品还远销欧洲、东南亚、日本、美国、香港等国家和地区。

自1998年工厂改制为股份合作制企业以来，研发的DC-5000-50(5吨推力)、DC-10000-100(10吨推力)型谱系列电动振动试验系统通过了总装备部组织的合同验收和新产品鉴定，这些项目的完成，标志着我厂的大推力风冷、水冷电动振动试验系统达到了国际先进水平，为研发更大推力的振动试验系统和振兴我国装备制造业做出了更大的贡献。



企业宗旨

诚信 创新



10000GN电磁振动试验系统型谱科研项目设计定型鉴定与验收会。



领导、专家、用户代表在本厂考察。

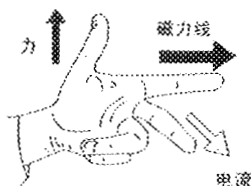


院士、专家在验收会现场。

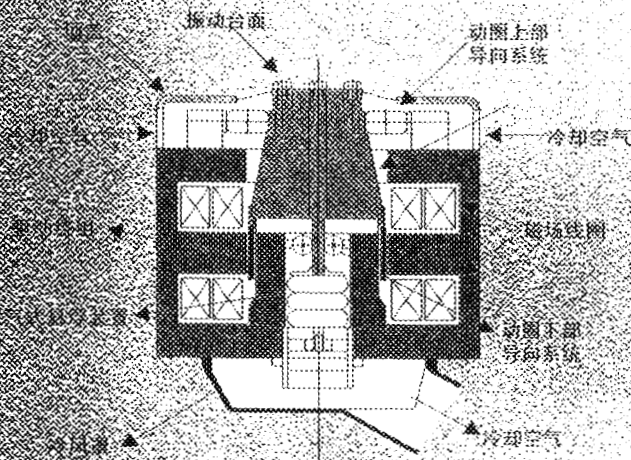
原理

电动振动试验系统的工作原理类似于扬声器。即载流导体在磁场中受电磁力的作用而运动。(见下图)当振动台的动圈通过的电流以交变信号产生激振力时即产生振动运动。

“弗莱明左手法则”



电动振动台结构示意图



名词术语

- **频率范围**: 振动试验系统在额定激振力下, 最大位移和最大加速度规定的频率范围。
- **额定激振力**: 振动试验系统能够产生的力(单位: N), 在正弦振动时该力为峰值; 在随机振动时该力规定为均方根值。(RMS)
- **最大位移**: 振动试验系统能够产生的最大位移值。该值受振动台机械行程限制, 通常用双振幅表示(单位为: mm-p-p)。
- **最大加速度**: 振动试验系统在空载条件下能够产生的最大加速度值(单位: m/s²)。该值可用额定激振力除以运动部件质量表示。
- **最大速度**: 振动试验系统所能产生的最大速度(单位: m/s)。
- **最大载荷**: 振动台面上最大加载重量(单位: kg)。
- **运动部件**: 电动振动台运动部件是由台面、动圈(含骨架)、动圈的悬挂连接件、柔性支承、电气连接件和冷却连接件组成的振动系统。该系统的质量与刚度是频率的函数。
- **容许偏心力矩**: 振动台台面导向系统允许的偏心力矩值。

试验所需的激振力的计算

振动试验所需的激振力可按总的加载质量和最大试验加速度进行计算:

1. 当总质量为 m (单位: kg), 试验加速度 a (单位: m/s²), 正弦振动时所需振动试验系统的激振力为:

$$F=ma \quad (1)$$

2. 运动部件质量

垂直扩展台面或水平滑台台面(含连接头)质量 m_0

振动台和气候试验箱连接轴质量 m_1

夹具质量 m_2

试件质量 m_3

试验加速度为 a

则振动试验所需的激振力可根据(1)式计算如下:

$$F=(m_0+m_1+m_2+m_3+m_4)a \quad (2)$$

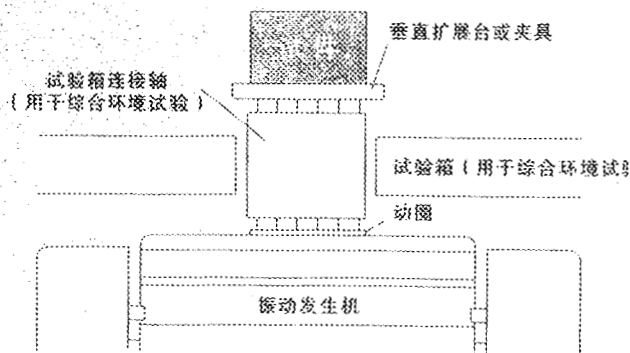
位移、速度和加速度之间的关系

在正弦振动的情况下, 频率 f (Hz)、位移 x (m, 单振幅)、速度 v (m/s) 和加速度 a (m/s²) 之间的关系如下:

$$v = \frac{1}{1000} (2\pi f) x \quad (3)$$

$$a = 2\pi f v = \frac{1}{1000} (2\pi f)^2 x \quad (4)$$

振动台、夹具、试件图



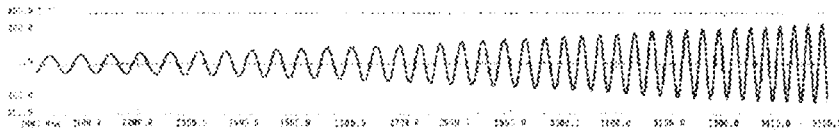
注: 当采用重力单位时, 加速度单位为 g , 激振力单位为 kgf 其中 $1g = 9.8m/s^2$

试验方法

★ 正弦振动试验

正弦振动有两种方法:

一种是扫频试验, 根据试验规定的频率扫描方法不断地改变激励频率; 另一种是定频试验。正弦振动试验的目的是在试验室内模拟电工电子产品在运输、储存、使用过程中所经受的振动及其影响, 并考核其适应性。如按IEC (国际电工委员会标准, 国标GB/T2423) 美国军标MIL-810F (国军标GJB150) 进行的试件共振点试验。这种试验自动跟踪搜索试件频率的变化, 并驻留共振点连续激振。



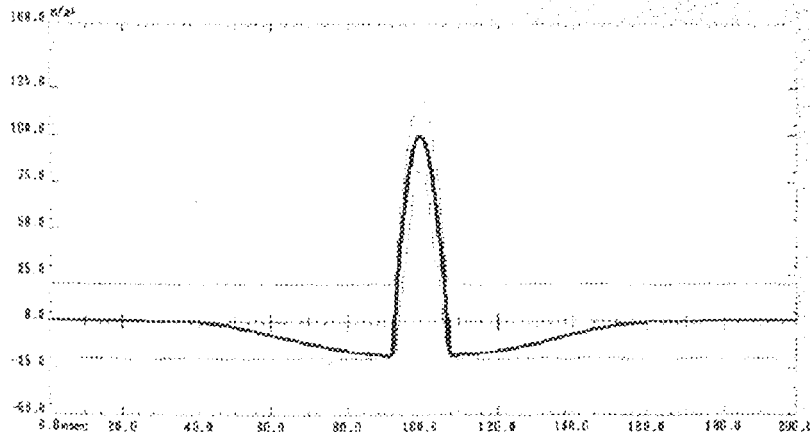
★ 随机振动试验

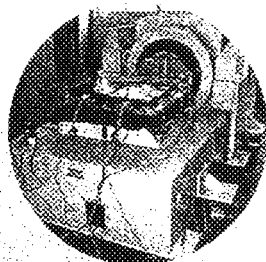
电子电工产品在运输和使用过程中所经受的振动绝大多数是随机性质的振动。随机振动和正弦振动相比, 随机振动的频域宽, 而且是一个连续的频谱, 它能同时在所有的频率上对产品进行振动激励。



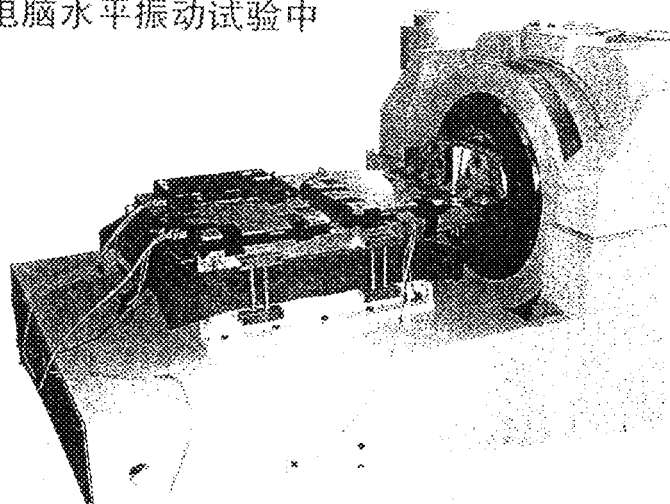
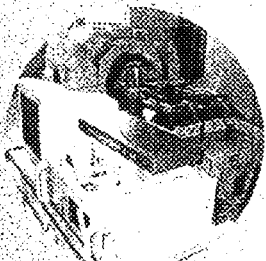
★ 冲击试验和碰撞试验

冲击和碰撞都属冲击范畴, 规定冲击脉冲波形的冲击试验, 主要是用来确定元件、设备和其它产品在使用和运输过程中经受非多次重复 (碰撞则是多次重复) 的机械冲击的适应性, 以及评价结构的完好性。



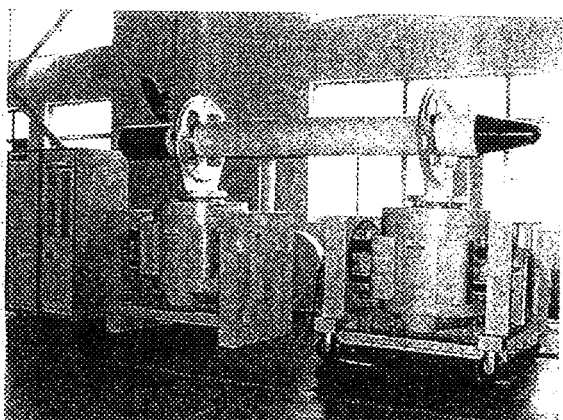


笔记本电脑水平振动试验中



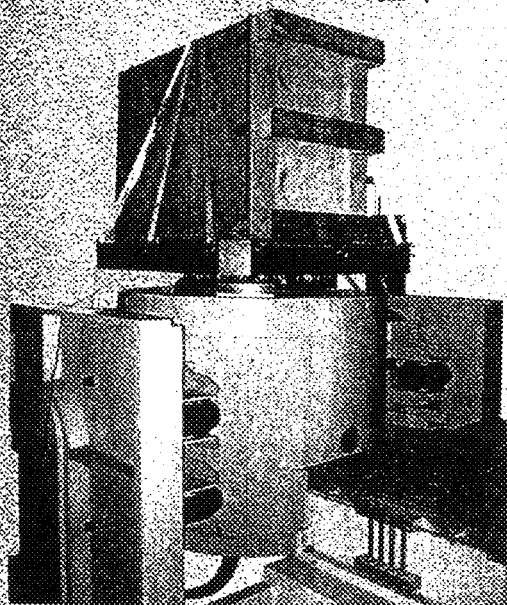
DCS-3200-36-8电动振动试验系统

长形状产品双台同步振动试验中



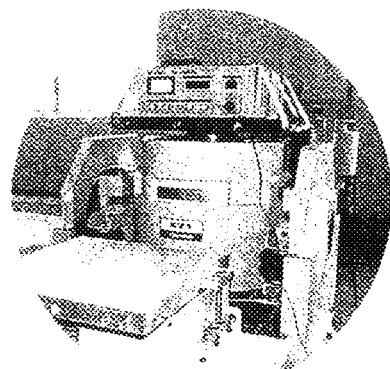
DC-5000-50×2电动振动试验系统

通讯产品在振动试验中



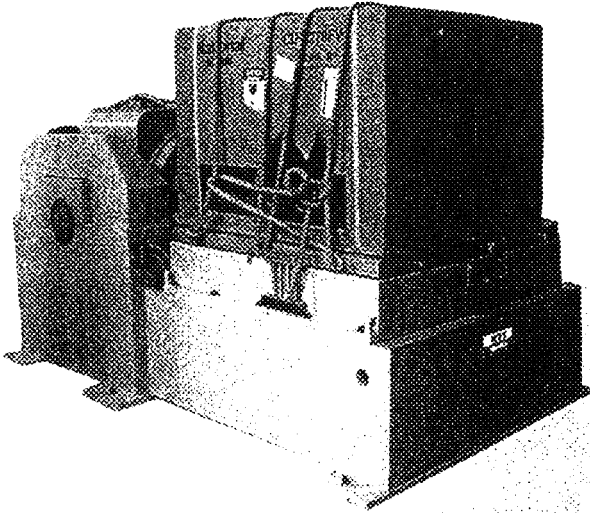
DC-10000-100-10电动振动试验系统

精密仪器在振动试验中



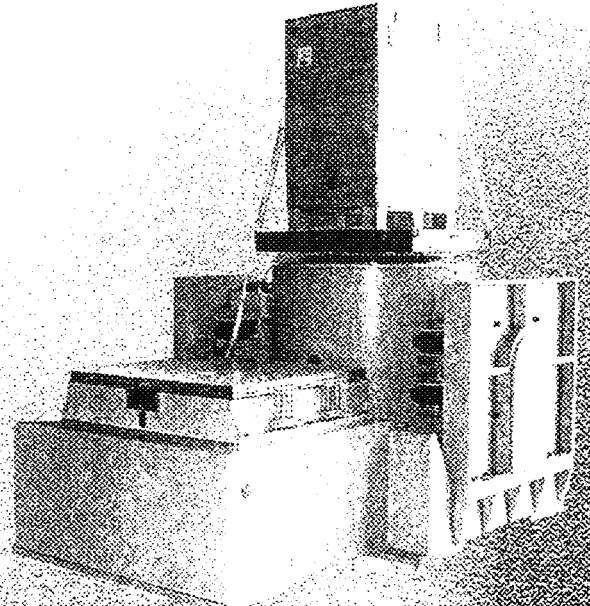
DCS-1000-13-06电动振动试验系统

空调室外机水平振动试验中



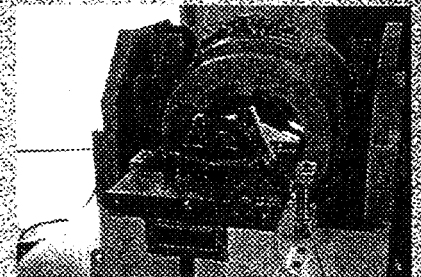
DCS-3000-26-10电动振动试验系统

电气产品在冲击试验中

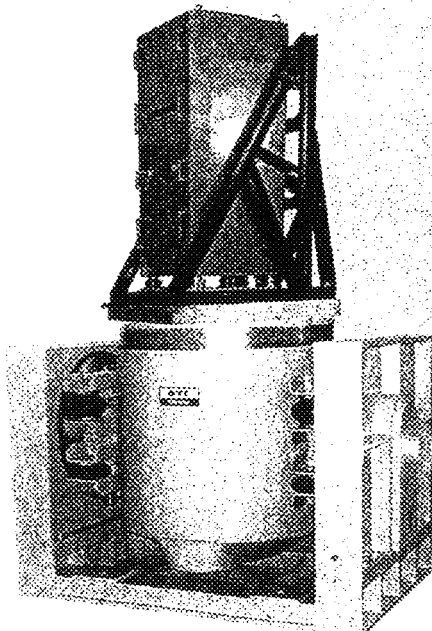


DC-12000-120-10电动振动试验系统

汽车仪表水平振动试验中



DCS-1000-13-05电动振动试验系统

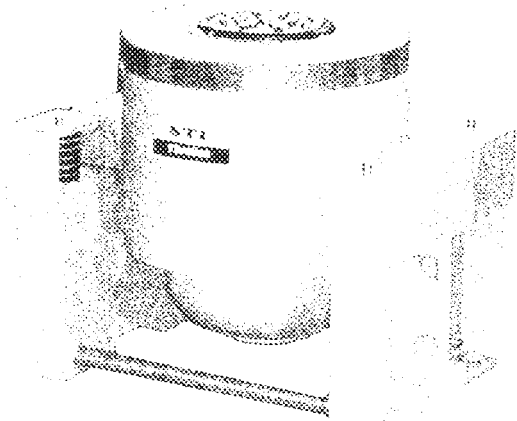


高重心产品振动试验进行中

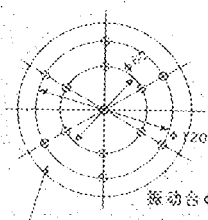
DC-5000-50电动振动试验系统

通用型电动振动台

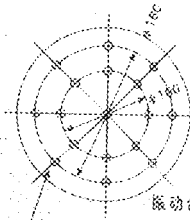
- 引进日本IMV公司技术制造的振动台体
- 双磁路、无骨架动圈
- 高加速度，低畸变
- 空气弹簧支撑
- 可配水平滑台与温控箱



7-M8深16
D-200



13-M8深16
D-300



17-M8深16
D-600

通用型电动台是我厂引进日本IMV公司电动台专有技术。台体采用“双磁路结构”、“无骨架动圈”、“空气弹簧支撑”、“瓦轴隔振”、“摆臂悬挂系统与直线轴承导向”等国际先进技术。使该系列振动台具有波形畸变小，承载能力强，导向性能好，保护功能齐全，配套性好，体积小等突出优点。

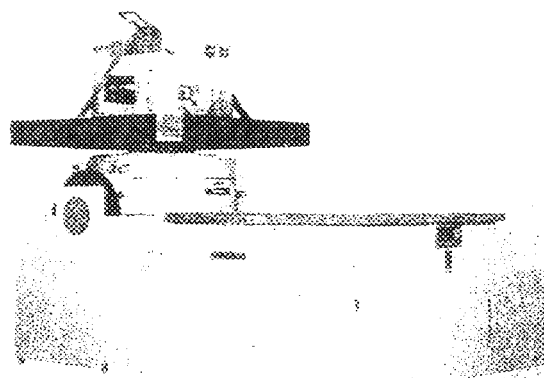
通用型电动振动台系列品种齐全，激振力从1000N-10000N，频率范围从5Hz-4500Hz；最大位移为25mm(p-p)；最大承载能力达200kg。

D系列电动振动试验系统

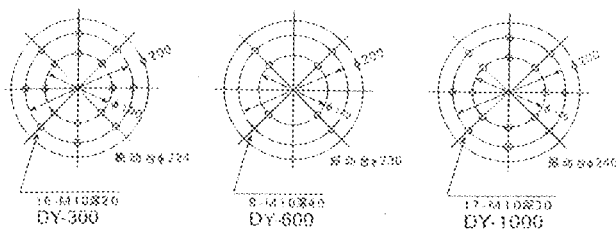
系统型号		D-100-2	D-150-2	D-200-3	D-300-3	D-600-5	D-1000-10
系统指标	振动频率范围 Hz	5-4500	5-4500	5-4500	5-4000	5-3000	5-3000
	额定正弦推力 N	980	1470	1960	2940	5880	9800
	额定随机推力 Nrms	980	1470	1960	2940	5880	6860
	最大加速度 m/s^2	490	735	980	980	980	1176
	最大速度 m/s	2.00	2.00	2.00	2.00	2.00	2.00
	最大位移 mm P-P	25	25	25	25	25	25
	最大载荷 kg	70	70	70	120	200	120
振动台台体	振动台台体型号	D-200	D-200	D-200	D-300	D-600	D-1000
	运动部件质量 kg	2	2	2	3	5.5	8.3
	台面尺寸 ϕ mm	110	110	110	150	200	200
	容许偏心力矩 N×m	196	196	196	196	245	250
	外形W×H×D mm	660×630×530	660×630×530	660×630×530	660×720×530	790×630×560	900×780×710
	台体重量 kg	320	320	320	320	620	950
功率放大器	功率放大器型号	SA-2	SA-2	SA-3	SA-3	SA-5	SA-10
	最大输出功率 kVA	2	2	3	3	5	10
	外形W×H×D mm	550×1700×800	550×1700×800	550×1700×800	550×1700×800	550×1700×800	550×1700×800
	功率放大器重量 kg	200	200	220	220	240	260
	功率放大器工作方式	开关	开关	开关	开关	开关	开关
	系统所需功率 kVA	4.5	4.5	4.5	5	10.5	18.2

低频运输试验电动振动台

- 承载能力强
- 可配水平滑台与温控箱
- 下限工作频率达2Hz
- 最大位移可达51mm



DY-1000-8电动台



电工电子产品的运输包装件振动试验，特别是对于生产家用电器的企业正在越来越受到关注。这种试验主要用于评定包装件在正弦振动或共振情况下的强度及包装对内装物的保护能力，这种模拟运输试验还可以在实验室里及时发现产品结构上的缺陷，以便通过改进设计使得产品到达用户手中时，不因经过运输而使其性能发生变化。这种试验的试验频率比较低，一般在3-4Hz，最大位移达47mm，DY系列电动台可满足试验要求。

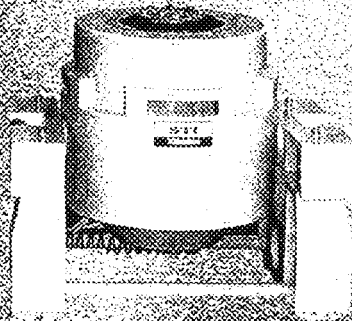
特点

- 工作频率范围为2Hz-2000Hz，最大位移可达51mm，能满足国际“运输包装基本试验正弦（定频或变频）试验方法”的规范要求。
- 振动台采用滚轮和直线轴承作导向装置，使轴向刚度尽可能小。
- 空气弹簧支撑，使振动台承载能力强，低频特性好。
- 数字式正弦控制仪，克服了以往由于采用模拟电路而使压缩控制频率下限不能太低的缺陷，而且频率稳定性高。

DY系列低频试验电动振动台主要技术参数

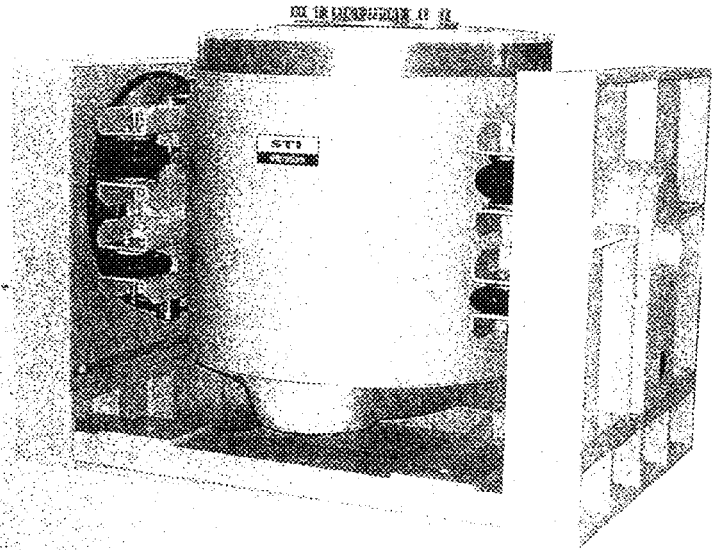
系统型号		DY-200-2	DY-300-3	DY-600-5	DY-1000-8
系统指标	振动频率范围 Hz	2-2000	2-2000	2-2000	2-2000
	额定正弦推力 kN	1.96	2.94	5.88	9.80
	额定随机推力 kNrms	1.96	2.958	4.115	5.86
	最大加速度 m/s^2	245	367	490	653
	最大速度 m/s	1.50	1.50	1.00	1.00
	最大位移 mm P-P	40	40	51	51
最大载荷 kg		130	130	300	300
振动台台体型号		DY-300	DY-300	DY-600	DY-1000
振动台台体	运动部件质量 kg	8	8	12	15
	台面尺寸 ϕ mm	224	224	230	240
	容许偏心力矩 N×m	343	343	490	666
	外形W×H×D mm	720×670×560	720×670×560	790×710×600	1000×850×700
	台体重量 kg	350	350	600	1200
功率放大器型号		SA-2	SA-3	SA-5	SA-8
功率放大器	最大输出功率 kVA	2	3	5	10
	外形W×H×D mm	550×1700×800	550×1700×800	550×1700×800	550×1700×800
	功率放大器重量 kg	200	220	240	270
	功率放大器工作方式	开关	开关	开关	开关
	系统所需功率 kVA	5	6	10.5	15

DC系列电动振动系统



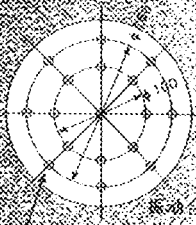
DC-1000-13电动台

- 大推力、低能耗、高可靠性
- 高加速度、长行程、低畸变
- 承载能力强
- 可配水平滑台与温控箱



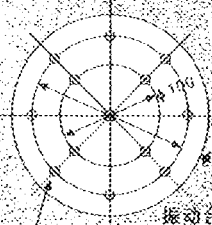
DC-5000-50电动台

- 大推力、大台面、高加速度、承载能力强
- 高可靠性、满功率长期运行



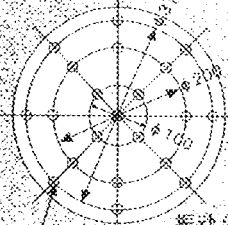
振动台 ϕ 200

17-M10深25
DC-1000



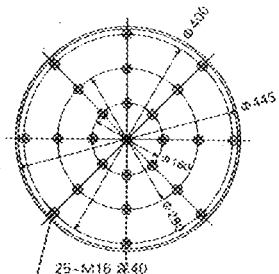
振动台 ϕ 280

13-M12深38
DC-2200



振动台 ϕ 400

21-M10深38
DC-3200



25-M16深40
 ϕ 445振动台台面螺孔布置图

公制	英制
ϕ 400	ϕ 406
ϕ 280	ϕ 304.1
ϕ 160	ϕ 203.1

注：本系列台面螺孔有公制、英制两种可选，用户在订货时请注明。

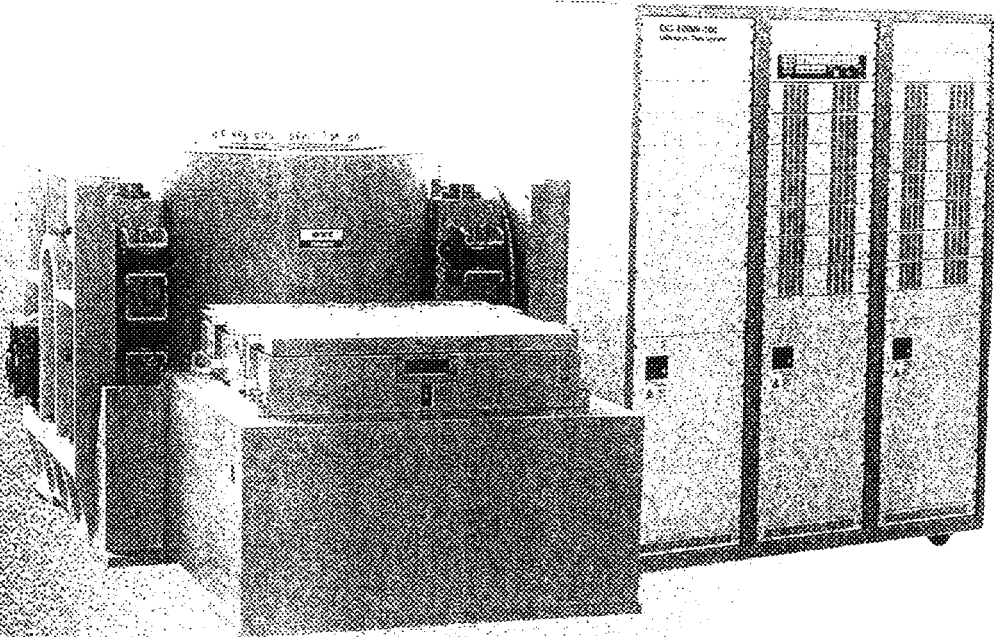


DC系列电动振动系统技术参数

系统型号		DC-1000-13	DC-1500-16	DC-2200-26	DC-3200-36	DC-4000-40	DC-4500-45	DC-5000
系统指标	振动频率范围 Hz	5-3000	5-3000	5-3000	5-2500	5-2500	5-2500	5-2500
	额定正弦推力 kN	9.8	14.2	21.56	31.36	39.2	44.1	49
	额定随机推力 kNms	9.8	14.2	21.56	31.36	39.2	44.1	49
	最大加速度 m/s^2	1020	784	980	980	980	882	980
	最大速度 m/s	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	最大位移 mm P-P	51	51	51	51	51	51	51
	最大载荷 kg	140	300	300	500	800	1000	1000
振动台台体型号		DC-1000	DC-2000	DC-2200	DC-3200	DC-4000	DC-4500	DC-5000
振动台台体	运动部件质量 kg	9.5	18	22	32	38	50	50
	台面尺寸 ϕ mm	200	280	320	400	445	445	445
	容许偏心力矩 N×m	392	300	490	490	980	980	980
	外形W×H×D mm	920×785×610	900×900×790	900×990×790	1000×1050×880	1420×1100×1210	1500×1170×1310	1500×1170×1310
	台体重量 kg	950	1600	1600	2000	3200	3800	3800
功率放大器型号		SA-13	SA-16	SA-26	SA-36	SA-40	SA-45	SA-50
功率放大器	最大输出功率 kVA	15	20	30	40	50	60	65
	外形W×H×D mm	550×1700×800	550×1700×800	550×1700×800	550×1700×800	1100×1700×800	1100×1700×800	1100×1700×800
	功率放大器重量 kg	290	390	410	410	900	920	920
	功率放大器工作方式	开关	开关	开关	开关	开关	开关	开关
	系统所需功率 kVA	20	28	33	42	72	82	90

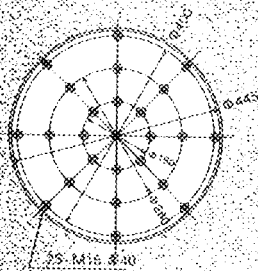
DC系列电动台采用“双磁路结构”、“无骨架动圈”、“空气弹簧支撑”、“直线轴承”、“耳轴隔振”、“开关型功率放大器”等国际先进技术，使该系列振动台具有大推力、大位移、高承载、导向性能好、波形畸变小、高速度、高随机推力保护功能齐全等优点。开关功放可使振动台系统输出更大的随机均方根值推力。

★根据用户要求，可在振动试验系统中选配HCC电动台静态动态自动中心保持装置。



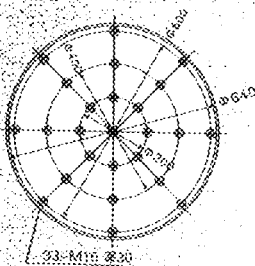
随
试验;
动振动
打破了
该
用户长

DC-10000-100/SC-1010



Φ445振动台面螺孔布置图

公制	英制
Φ400	Φ406.4
Φ260	Φ261.6
Φ160	Φ203.2

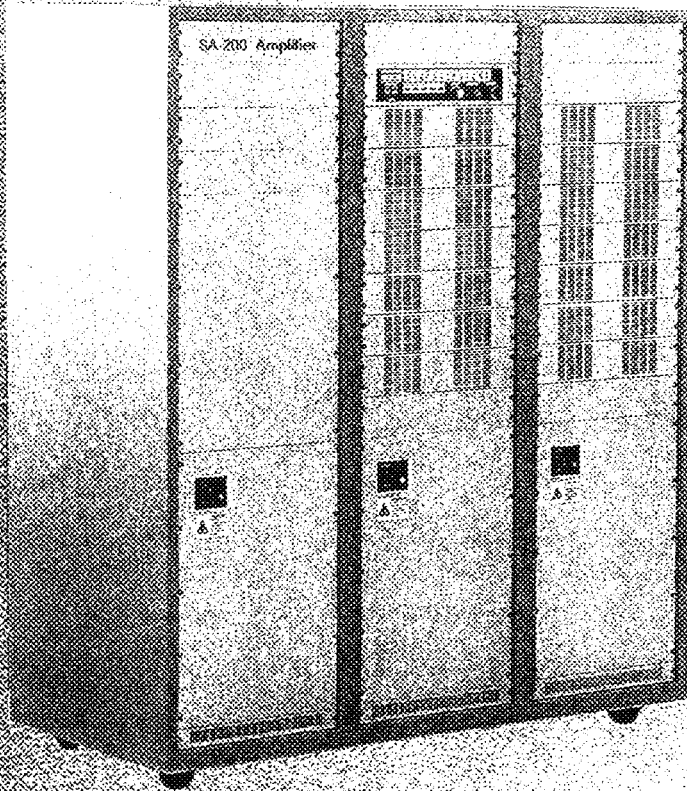


Φ640振动台面螺孔布置图

公制	英制
Φ560	Φ609.6
Φ400	Φ406.4
Φ293	Φ293.2

*注: 本系列台面螺孔有公制、英制两种可选, 用户在订货时请注明。

系统型号		DC-500
系统指标	振动频率范围 Hz	2-2E
	额定正弦推力 kN	49.1
	额定随机推力 kNrms	49.1
	最大加速度 m/s ²	980
	最大速度 m/s	2.0
	最大位移 mm P-P	51
	最大载荷 kg	100
振动台台面型号		DC-6
振动台台面	运动部件质量 kg	50
	台面尺寸 φ mm	445
	容许偏心力矩 N×m	980
	外形W×H×D mm	1580×120
	台面重量 kg	400
功率放大器型号		SA-1
功率放大器	最大输出功率 kVA	65
	外形W×H×D mm	1100×170
	功率放大器重量 kg	110
	功率放大器工作方式	开关
	系统所需功率 kVA	85
热交换器型号		DHE-
热交换器	冷却水流量 l/min	220
	热交换器重量 kg	450
	热交换器功率 kW	2.2
	热交换器外型尺寸 mm	850×190



SA系列开关功率放大器是我
MOSFET和IGBT技术，输出功率
以其优良的性能，高可靠性得到用
户最多的开关功率放大器。

特点：

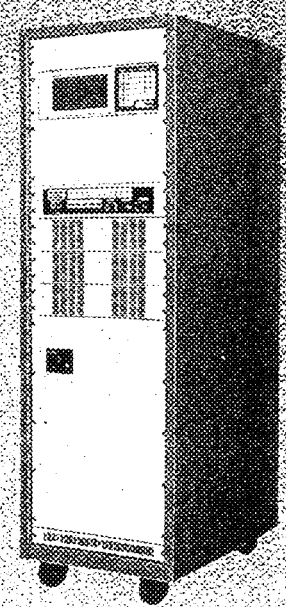
1. SA系列功率放大器专为推动电
2. SA系列功率放大器模块化设计
3. 开关频率达150kHz，减少了功
4. SA系列功率放大器具有多种保
 - a. 漏电断路器开关
 - b. 台体过位移，过热，漏水，热交
 - c. 功放过热，过电压，过电流
 - d. 风机和油泵过载
5. EMI防护机箱机柜和电缆

我厂国外先进技术，创新开发的新一代功率放大器。SA系列开关功率放大器体现最新的功率从到500kVA，模块组合方便，全系列空气冷却。SA系列功率放大器自98年推出以来，得到用户好评，成为用户更新设备，完善试验的首选。SA系列功率放大器是国内首家推出，

电动机设计，功率放大器内含励磁直流电源，风机冷却电源，水平台滑台油泵电源。设计方便，可以匹配任何振动台厂家的台体。

功率器中滤波电感元件的尺寸，减轻了功率放大器的重量。功率放大器的效率高。波形失真小。保护和信号互锁。

具交换

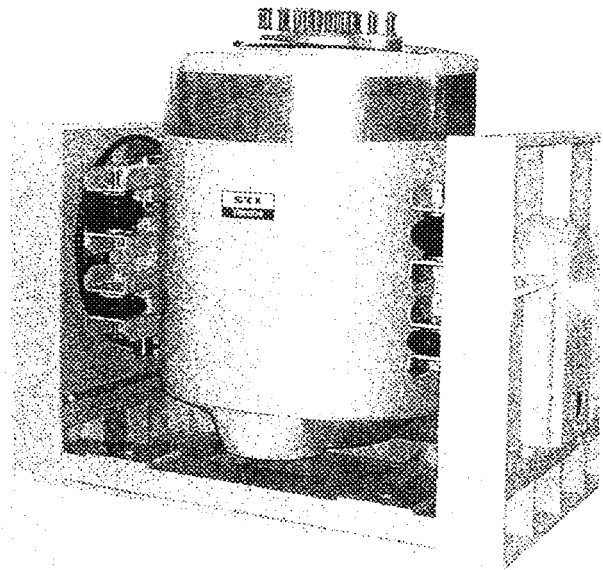


100mm大位移试验电动振动试验系统

特点

大位移(100mm p-p)、大台面、大承载、速度高

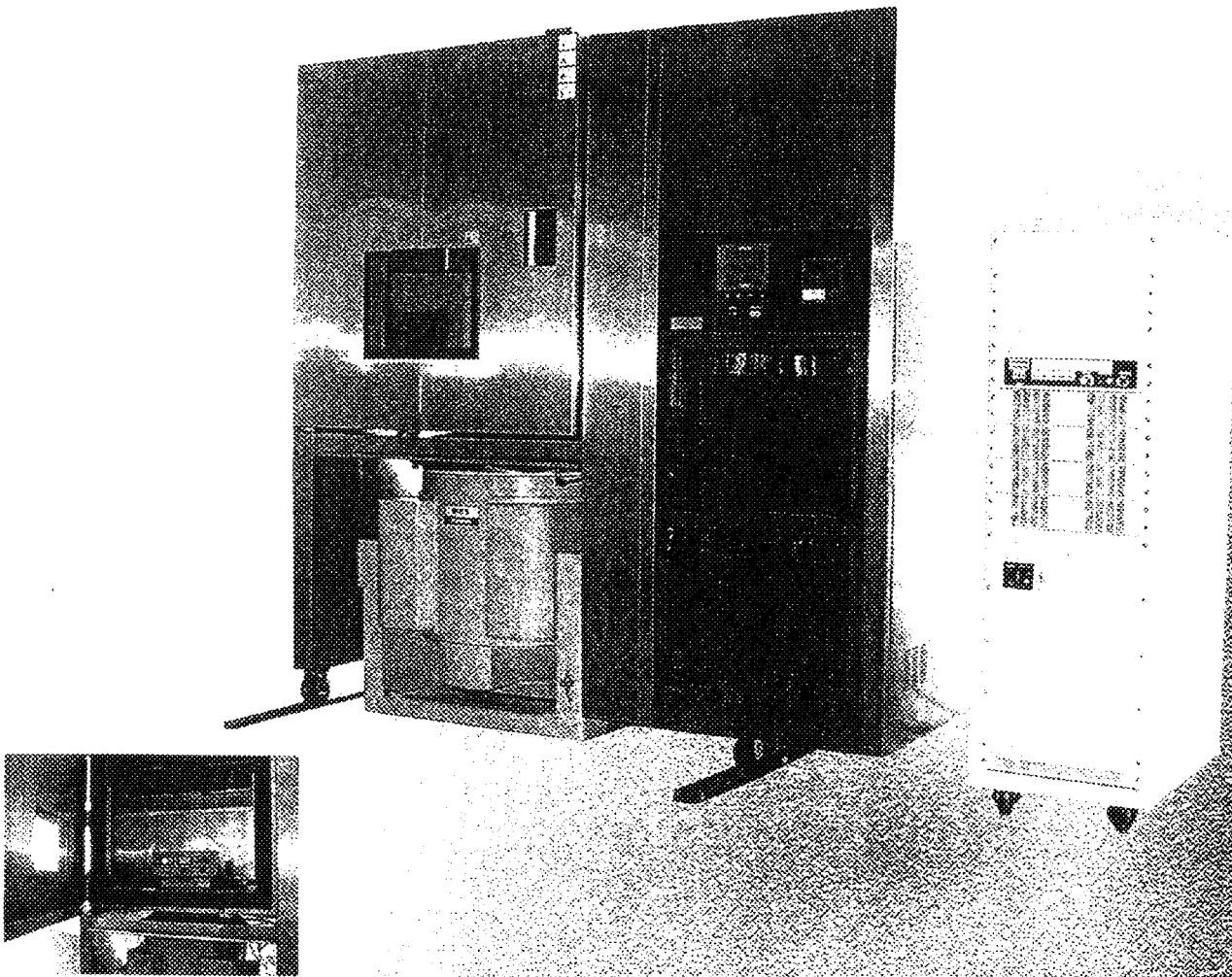
可满足航空、航天、汽车、舰船等领域产品大位移振动试验。



DC-3000-40/L

大位移系列试验电动振动系统主要技术参数

系统型号		DC-1500-25/L	DC-2000-30/L	DC-3000-40/L	DC-4000-50/L	DC-5000-60/L
系统 指 标	振动频率范围 Hz	2-3000	2-3000	2-2500	2-2500	2-2500
	额定正弦推力 kN	14.7	19.8	29.4	39.2	49
	额定随机推力 kNrms	14.7	19.8	29.4	39.2	49
	最大加速度 m/s ²	58.8	650	735	784	816
	最大速度 m/s	2	2	2	2	2
	最大位移 mm p-p	100	100	100	100	100
	最大载荷 kg	300	300	500	800	1000
振 动 台 体	振动台台体型号	DC-2000L	DC-2000L	DC-3000L	DC-4000L	DC-5000L
	运动部件质量 kg	25	30	40	50	60
	台面尺寸 φ mm	280	400	400	445	445
	容许偏心力矩 N×m	700	900	1500	1500	1500
	外形W×H×D mm	1000×1100×850	1000×1100×950	1500×1410×1100	1520×1410×1100	1520×1410×1100
	台体重量 kg	1750	2350	3450	4200	4300
功 率 放 大 器	功率放大器型号	SA-25	SA-30	SA-40	SA-50	SA-60
	最大输出功率 kVA	25	30	40	50	70
	外形W×H×D mm	550×1700×800	550×1700×800	550×1700×800	1100×1900×800	1100×1900×800
	功率放大器重量 kg	410	410	500	1000	1050
	功率放大器工作方式	开关	开关	开关	开关	开关
	系统所需功率 kVA	30	30	57	87	95
冷却方式		强制风冷				



特点

综合环境试验系统主要是气候箱和振动试验台的综合，试验时将温度(高温或低温)、湿度、振动(正弦振动或随机振动)以及电应力按规定的周期综合在同一气候试验箱中施加到样品上进行温度、湿度振动的综合试验。与单一因素作用相比，更真实地反映电工电子产品在运输和实际使用过程中对环境变化的适应性，暴露产品的缺陷，是新产品研制，样机试验到产品合格鉴定试验全过程的重要试验手段。

STI生产的电动振动台，可与国内外制造气候环境试验箱厂家的产品配套，并负责总成，为用户提供各种规格和性能的综合环境试验系统。

主要技术参数

温度范围：-70~+200℃

湿度范围：20-98%R.H

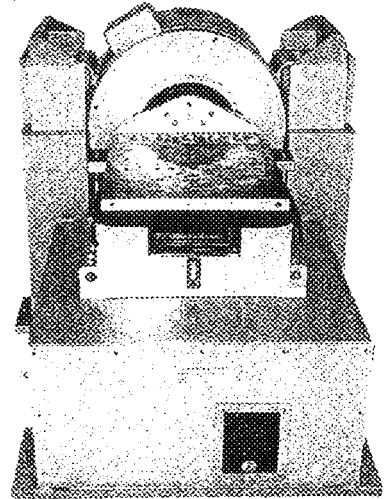
气候箱容积：225L-60000L

振动台激振力：980N-196kN

水平滑台与附加台面

特点：S系列水平滑台和TBV系列附加台面主要用于与D系列通用型电动台，DY系列低频运输试验电动台和DC系列开关功放型电动台配套使用，以便在电动台上实现水平方向振动和拓展垂直电动台台面尺寸的目的。

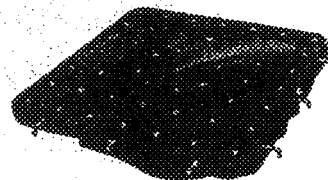
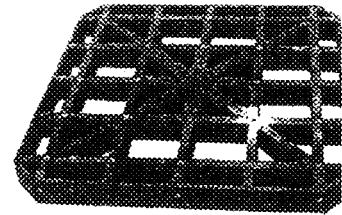
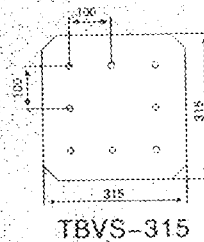
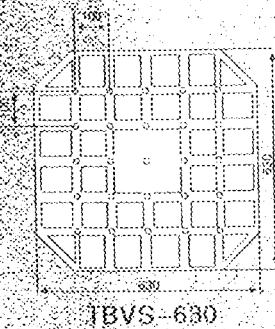
水平滑台抗偏载、抗倾覆力矩强，台面与挡油框基本密封，以确保操作人员安全，有效防止灰尘及异物掉入；配上阻尼器可有效防止台面漂移和过冲。



水平滑台主要技术参数

型号	水平滑台尺寸(mm)	最大试验负载(kg)	台面材料	运动部件质量(kg)		上限工作频率	最大位移(mm-p)
				小、中型振动台	大型振动台		
S-0303	300×300×25	100	铝合金	11	---	2000	25
S-0404	400×400×25	150	铝合金	18	---	1500	
S-0505	500×500×25	150	铝合金	25.8	---	1250	
			镁合金	21	---		
S-0606	600×600×25	200	铝合金	36	---	1000	
			镁合金	28	---		
SC-0505	500×500×45	300	铝合金	41	48	2000	51
			镁合金	31	38		
SC-0606	600×600×45	300	铝合金	56	61.5	2000	
			镁合金	41.5	47.5		
SC-0707	700×700×45	400	铝合金	74.5	80	2000	
			镁合金	54.5	60		
SC-0808	800×800×45	400	铝合金	93.5	101.5	2000	
			镁合金	70	78		
SC-0909	900×900×50	500	铝合金	---	131	1500	
			镁合金	---	95		
SC-1010	1000×1000×50	500	铝合金	---	162	1500	
			镁合金	---	118		
SC-1212	1200×1200×50	500	铝合金	---	225	1250	
			镁合金	---	165		
SC-1515	1500×1500×60	1000	铝合金	---	425	1000	
			镁合金	---	303		
SC-2020	2000×2000×70	1500	铝合金	---	836	600	
			镁合金	---	585		

附加台面螺孔布置图

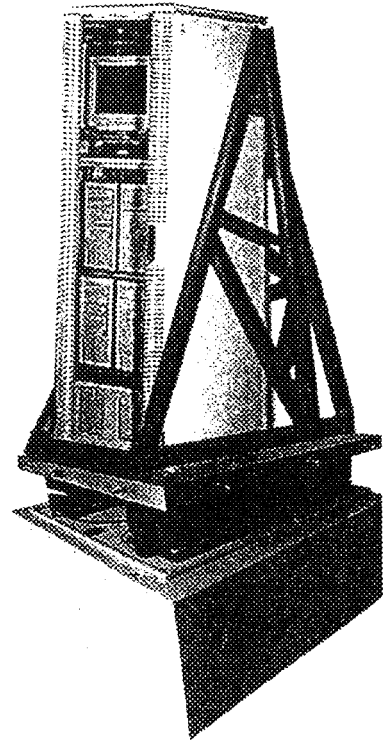
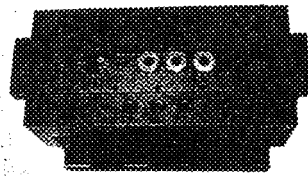


附加台面基本参数

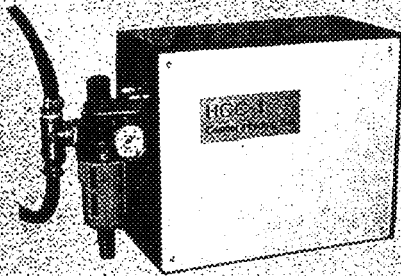
型号 Model	尺寸(mm) Size of table (mm)	材料 Material of table	质量(kg) Mass(kg)		形状 Shape	上限频率 Frequency upper limit (Hz)
			小、中型振动台 Small and bit vibrator	大型振动台 Big vibrator		
圆形附加台面						
TBVR-25G	φ 250 × 60	镁合金 magnesium alloy	2.5	---	圆形状	2000
TBVR-30G	φ 300 × 70	镁合金 magnesium alloy	4.5	---		2000
TBVR-400A	φ 400 × 80	镁合金 magnesium alloy	5.5	---		1200
TBVR-400B	φ 400 × 200	镁合金 magnesium alloy	21	---		2000
TBVR-500A	φ 500 × 80	镁合金 magnesium alloy	6.5	---		1000
TBVR-500B	φ 500 × 150	镁合金 magnesium alloy	18	---		1500
TBVR-500C	φ 500 × 250	镁合金 magnesium alloy	---	35		2000
TBVR-600	φ 600 × 250	镁合金 magnesium alloy	---	50		2000
TBVR-630A	φ 630 × 150	镁合金 magnesium alloy	18	---		1000
TBVR-630B	φ 630 × 250	镁合金 magnesium alloy	---	55		2000
TBVR-800	φ 800 × 250	镁合金 magnesium alloy	---	80		2000
TBVR-1000	φ 1000 × 400	镁合金 magnesium alloy	---	145		2000
TBVR-1200	φ 1200 × 400	镁合金 magnesium alloy	---	185		2000
方形附加台面						
TBVS-300	300 × 300 × 30	镁合金 magnesium alloy	5.2	---	板状	1000
		铝合金 aluminum alloy	7.5	---		
TBVS-315	315 × 315 × 30	镁合金 magnesium alloy	5.8	---	板状	1000
		铝合金 aluminum alloy	8.5	---		
TBVS-400	400 × 400 × 50	镁合金 magnesium alloy	15	---	板状	600
		铝合金 aluminum alloy	22.5	---		
TBVS-500A	500 × 500 × 50	镁合金 magnesium alloy	14.5	---	格栅状	500
		铝合金 aluminum alloy	22	---		
TBVS-500B	500 × 500 × 250	镁合金 magnesium alloy	---	45	倒方台状	2000
TBVS-600A	600 × 600 × 40	镁合金 magnesium alloy	25	---	板状	350
TBVS-600B	600 × 600 × 250	镁合金 magnesium alloy	---	46.5	倒方台状	2000
TBVS-630	630 × 630 × 45	镁合金 magnesium alloy	12.5	---	格栅状	360
		铝合金 aluminum alloy	19	---		
TBVS-750	750 × 750 × 250	镁合金 magnesium alloy	---	85	倒方台状	2000
TBVS-800	800 × 800 × 70	镁合金 magnesium alloy	30	---	板状	350
		铝合金 aluminum alloy	45	---		
TBVS-900	900 × 900 × 110	镁合金 magnesium alloy	---	83	格栅状	400
		铝合金 aluminum alloy	---	125		
TBVS-1000A	1000 × 1000 × 110	镁合金 magnesium alloy	---	78	板状	350
		铝合金 aluminum alloy	---	110		
TBVS-1000B	1000 × 1000 × 250	镁合金 magnesium alloy	---	175	倒方台状	1500
TBVS-1200	1200 × 1200 × 130	镁合金 magnesium alloy	---	90	格栅状	300
		铝合金 aluminum alloy	---	135		
TBVS-1500	1500 × 1500 × 200	镁合金 magnesium alloy	---	200	格栅状	200
		铝合金 aluminum alloy	---	300		
温控转接器						
TBVY-110	φ 110 × 160	镁合金 magnesium alloy	DC-200:1.40	---	圆柱状	3000
TBVY-150	φ 150 × 180	镁合金 magnesium alloy	DC-300:1.85	---		2500
TBVY-225	φ 225 × 180	镁合金 magnesium alloy	DC-1000:5.4	---		2000
TBVY-240	φ 240 × 160	镁合金 magnesium alloy	DY-600:6	---		2000
TBVY-280	φ 280 × 180	镁合金 magnesium alloy	---	DC-2000:6.5		2000
TBVY-320	φ 320 × 180	镁合金 magnesium alloy	---	DC-2200:11		2000
TBVY-400	φ 400 × 180	镁合金 magnesium alloy	---	DC-3200:22		2000
TBVY-450	φ 450 × 180	镁合金 magnesium alloy	---	DC-5000:25		2000

高压静压轴承

该轴承采用高压全密封油压系统，可大幅提高承载能力和抗倾覆力矩、抗偏转力矩。适用于大型、高重心试件的水平振动试验需求。



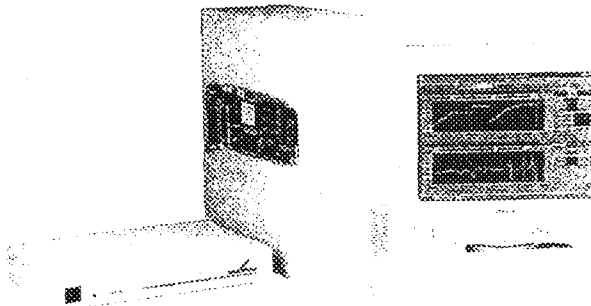
电动台静态动态自动中心保持装置



HCC-1型中心保持装置通过非接触传感器检测电动振动台台面中心位置，并通过调节空气弹簧的空气量保持振动台面中心位置，使系统保持在最佳工作状态。

LASER

(美国DACTRON公司)



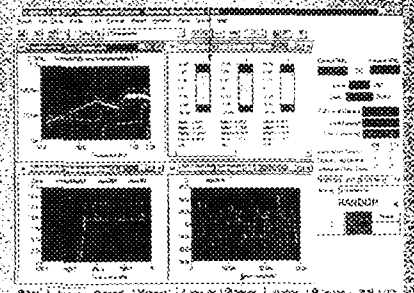
融快速、高精度、多功能于一体，满足多种振动试验要求。其卓越性能无论是在实验室、还是在工业控制现场都是你最理想的选择。

24位输入/输出提供了前所未有的精度；多60MHz DSP处理器确保快速的闭环控制时间；采用并行多DSP处理器结构实现了真正的振动实时控制，不依赖PC，运行速度更快，控制更好。

控制系统输入通道可由4个扩展至16个；通道同步采样，高达96kHz的采样频率；所用通道可用于多点控制和幅值相位控制。完备安全的自动自检功能，确保试验设备的安全。

基于Windows NT/2000/XP/ME的应用软件，自动生成Word试验报告；USB2.0接口和PC机简单联接。

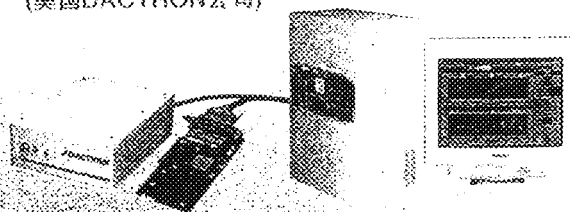
硬件性能	
输入	
模拟通道	同步采样，差分输入，阻抗 > 500kΩ，复合平均加权
滤波器	模拟抗混叠滤波器，160dB数字滤波
信号源	电压输入；ICP传感器直接输入(内置恒流源4.7mA，开路30Vpeak)
A/D	24位
动态范围	120dB，在FFT模式中最小为110dB
相位匹配	从DC - 10000Hz，在±0.5°之内
输出	
D/A	24位
滤波器	160dB/oct数字滤波，模拟滤波
频率范围	高达48000Hz的采样频率
动态范围	110dB
总谐波	< -95dB



软件性能	
随机振动 (Random)	真高斯信号输出、回路时间100ms，控制动态范围95dB，高达1600线的分辨率
正弦扫频振动 (Sine)	高质量模拟信号输出、回路时间10ms，控制动态范围100dB、跟踪滤波器
谐振搜索、驻留 (RSOT)	自动搜索、相位跟踪、实际周期计数
典型冲击 (Shock)	全部脉冲图谱、0.5-3000ms脉冲宽度、灵活补偿、SRS分析
SRS综合	1/48倍频程，pyro-shock，最小加速度或最大间隔脉冲纠正，最佳的波形或被衰减的正弦波
冲击响应谱	Bellcore(过冲)、地震波、撞击试验、16k点数、编辑和补偿
谱路模拟	时间间隔从几分钟至几小时，建立波形工具、实时驱动发生器和自适应控制
正弦+随机 (SOR)	12帧，模拟平滑扫频或定频
随机+随机 (ROR)	12个窄频带、交叉扫频、突然开启/关闭
随机+正弦+随机 (SROP)	12帧加12个窄频带，具有正弦+随机和随机+随机的所有特性
信号分析 (RTPRO)	PSD分析、瞬态捕捉、SRS分析、正弦分析、模态数据采集

COMET

(美国DACTRON公司)



性能卓越、价格合理、功能运行可靠、操作方便是振动控制的理想选择。

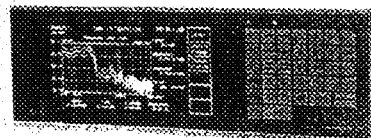
提供2个输入通道和1个输出通道，具有随机振动、正弦扫频以及典型冲击三种振动控制方式。用户也可选配谐振搜索、驻留软件。

基于Windows NT/2000/XP/ME的应用软件，PCI即插即用使用方便，快速生成Word报表。

随机振动 (Random)	高高阶信号输出、回路时间100ms、控制动态范围95dB、高达800线的分辨率
正弦扫频振动 (Sine)	高质量模拟信号输出、回路时间10ms、控制动态范围100dB、跟踪滤波器
典型冲击 (Shock)	全部脉冲图谱、0.5-3000ms脉冲宽度、灵活补偿、SRS分析
谐振搜索、驻留 ★ (HSDT)	自动搜索、相位跟踪、实际周期计数

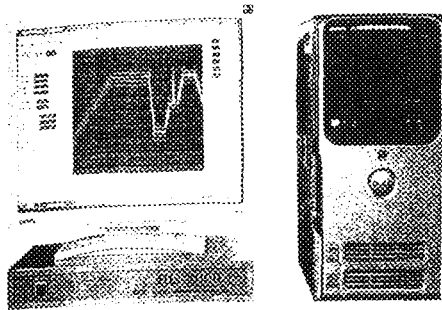
硬件性能	
输入	
模拟通道	同步采样、差分输入，阻抗 > 500kΩ
滤波器	模拟抗混叠滤波器、150dB数字滤波
信号调理	电压输入、ICP传感器直接输入的电荷放大器4.7mA、开路30V/peak
A/D	24位
动态范围	120dB，在FFT模式中最小为110dB
输出	
D/A	24位
滤波器	160dB/oct数字滤波模拟滤波器
频率范围	高达22000Hz的采样频率
动态范围	110dB
总谐波	< -95dB

MC-1140数字式随机振动控制仪
(日本IMV公司原装)



主要技术指标

随机振动控制		正弦振动控制	
通道数	4个独立通道	通道数	4个独立通道
频率	125.250.500.1000.2000.4000Hz(最低控制频率1Hz)	频率	1-5000Hz
分辨率	100.200.400.800线	扫描方式	线性、对数
动态范围	>65dB	扫描速率	0.1/99.9oct/min; 0.1-99.9Hz/s
控制误差	偏差0dB	控制动态范围	>90dB
回路时间	1.2S < 2000Hz. 100线	控制方式	最大值、平均值、有效值
控制	最大值、平均值	操作方式	扫频、定频、交越点扫频、手动
冲击振动控制		幅度控制精度	±5%
脉冲波形	半正弦波、锯齿波、梯形波、三角波、合成波、半正弦波	实时信号显示	以加速度或位移显示扫描响应曲线实时显示当前频率值
脉冲持续时间	0.5-100ms		响应值、参数值、监测值、驱动值扫描时间、扫描次数等
脉冲峰值设定范围	>65dB		
动态范围	0.1-100000m/s²		
控制误差	偏差0dB		



RC-2000

采用国际上最先进的分布式系统机构体系, 32位浮点DSP处理器, 24位AD/DA高分辨率以及自适应控制算法, 将振动控制系统技术性能提高到一个新的水平。

模块化和低噪声设计技术, 独立于计算机的控制箱, 采用USB2.0和计算机简单联接; 基于Windows NT/2000/XP/ME的应用软件, 自动生成Word试验报告。

4到8个输入通道同步采样, 所用通道可用于多点控制和幅值限位控制, 手动紧急中断, 完备的开环检测、过载检查, 中断容差带检查等自检功能, 确保试验设备的安全。多种控制功能可供选择, 性价比高。

性能	
输入	
模拟通道	同步采样, 差分输入
滤波器	模拟抗混叠滤波器, 160dB数字滤波
信号类型	内置ICP恒流源和电荷放大器, 电压, IFC传感器以及电荷型加速度传感器直接输入
A/D	24位
输入阻抗	220kΩ
信噪比	大于100dB
输出	
D/A	24位
滤波器	160dB/oct数字滤波, 模拟滤波
输出阻抗	30Ω
幅值精度	2mV

控制功能	
随机振动	高斯信号输出, 闭环时间100ms, 控制动态范围90dB, 高达1600线的分辨率, 频率范围DC-4800Hz
正弦扫频振动	正弦波形幅值控制, 回路时间10ms, 控制动态范围100dB, 跟踪滤波器, 频率范围1.0-5000Hz
典型冲击	有限长时域波形控制, 多种脉冲图谱, 0.5-3000ms脉冲宽度, 灵活补偿, 频率范围DC-22000Hz
谐波搜索、驻留	基于O域、普通函数幅值的识别, 自动搜索, 定幅驻留或跟踪驻留
正弦+随机	多达12级的正弦信号, 模拟平滑扫频或定频, 独立打开/关闭
随机+随机	多达12个窄带随机, 交叉扫频, 突然开启/关闭
随机+正弦+随机	12级加12个窄频带, 具有正弦+随机和随机+随机的所有特性
瞬态冲击	有限长时域波形控制, 预存Bellcore Z1和Z2、Z3, 正弦, 爆发正弦, 或从文件中调入任意时域波形
冲击响应谱	快速响应系统的非线性加载的变化, 半周期正弦波加正弦, 指数波形或汉宁窗, 编辑、补偿
路通仿真	长时间时域再现, 建立波形工具, 实时驱动发生器和自适应控制

RC-2000-2

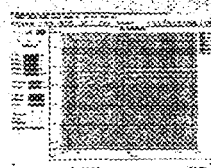
结构精巧、使用安全可靠、操作方便, 采用当前流行的PCI标准PC总线, 同时实现Windows2000/XP即插即用功能, 自动生成Word试验报告。

2个输入通道, 1个输出通道, 完备的自检功能, 确保试验设备的安全。

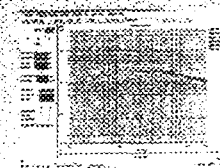
正弦、随机和典型冲击三种控制功能, 性价比高。

性能	
输入	
模拟通道	同步采样, 差分输入
滤波器	模拟抗混叠滤波器, 160dB数字滤波
信号类型	内置ICP恒流源和电荷放大器, 电压, IFC传感器以及电荷型加速度传感器直接输入
A/D	24位
输入阻抗	220kΩ
信噪比	大于100dB
输出	
D/A	24位
滤波器	160dB/oct数字滤波, 模拟滤波
输出阻抗	30Ω
幅值精度	2mV

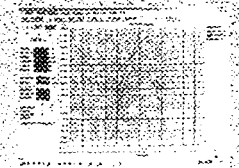
控制功能	
随机振动	高斯信号输出, 闭环时间100ms, 控制动态范围90dB, 高达1600线的分辨率, 频率范围DC-4800Hz
正弦扫频振动	正弦波形幅值控制, 回路时间10ms, 控制动态范围100dB, 跟踪滤波器, 频率范围1.0-5000Hz
典型冲击	有限长时域波形控制, 多种脉冲图谱, 0.5-3000ms脉冲宽度, 灵活补偿, 频率范围DC-22000Hz



正弦振动控制



随机振动控制



冲击试验控制

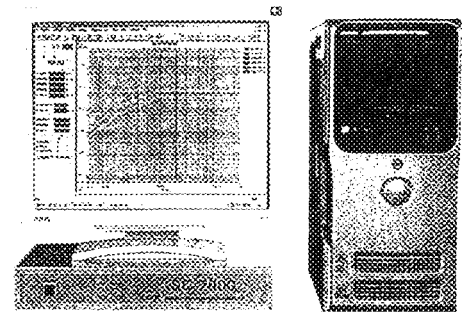
SC-2000

数字式正弦振动控制仪

结构精巧、使用安全可靠、操作方便，采用当前流行的PCI标准PC总线，同时实现Windows2000/XP即插即用功能，自动生成Word试验报告。

单个的输入和输出通道，完备的自检功能，确保试验设备的安全。

单正弦控制功能，功能可扩展，性价比高。



信号类型	信号类型内置IPC恒流源和电荷放大器,电压,IPC传感器以及电荷型加速度传感器直接输入
频率范围	1~5000Hz
波形失真度	<0.3%
控制动态范围	95dB
幅值控制精度	±0.5dB
试验操作方式	扫频、定频或手动
回路时间	10ms
扫频速率	线性: 0~6000Hz/min; 对数: 0! 100Oct/min
目标谱	以表格的方式定义目标谱

正弦振动控制仪主要技术指标

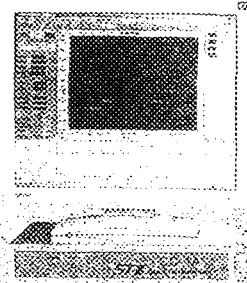
技术数据 Specification		型号 Model	KD-20(可记忆、可打印)	KD-3
信号频率范围(Hz)	Signal frequency range(Hz)		2~5000	5~5000
频率响应(dB)	Frequency response(dB)		±0.5dB	±0.5dB
波形失真度(%)	Waveform distortion(%)		≤0.5	≤0.5
测量范围	Measuring range		1~3000m/s ² 1~1000cm/s 0.01~100mmip-pi	1~3000m/s ² 1~1000cm/s 0.01~100mmip-pi
显示方式	Display		液晶屏显示 Liquid crystal screen	频率: 数字 测量 电表 Frequency: digital Measuring: meter
测量准确度(%)	Measuring accuracy(%)		≤5%	≤5%
控制频率范围(Hz)	Controlled frequency range(Hz)		2~5000	5~5000
控制动态范围(dB)	Control dynamic range(dB)		≥80	≥80
控制方式	Control mode		峰值8个交越点 9段幅级 Peak 8 crossover points 9 vibration levels	峰值3个交越点 4段幅级 Peak 3 crossover points 4 vibration levels
控制精度(dB)	Control accuracy(dB)		±1.5	±1.5
电源(V 50Hz)AC	Power(V 50Hz)AC		220 ± 10%	220 ± 10%
外形尺寸(L × H × W)(mm) Dimensions L × H × W(mm)			430 × 170 × 430	440 × 198 × 450
重量(kg)	Weight(kg)		14	14.5
标准	Standard		GB 10586-2008	

CC-1A

数字式冲击测量仪

本测量仪是我厂秉承多年开发经验之杰作，结构简单，性能优良，操作方便，硬件采用模块化和低噪声设计技术，独立于计算机，采用USB2.0负责接口箱与PC机的通讯，系统自动去除噪声，避免误操作；自动记录试验结果数据、对试验结果实时检查与监视。

测量采用DSP实现，使PC机仅负责与用户交互及显示，真正实现了Windows的多任务机制和图形界面，用户操作方便，显示形式丰富。



主要性能	
信号类型	内置ICP恒流源和电荷放大器,电压,ICP传感器以及电荷型加速度传感器直接输入
采样频率	高达192KHz,可扩展到1MHz的采样频率
测量峰值加速度	1~100000gn
测量脉宽	0.2~3000ms
支持标准	国标、美军标、国军标、用户定义
测量波形	半正弦波、梯形波、后峰锯齿波等
滤波器	自主设置
工作条件	环境温度0~40度,相对湿度不超过90%,电源电压AC110~220±10% 50~60Hz

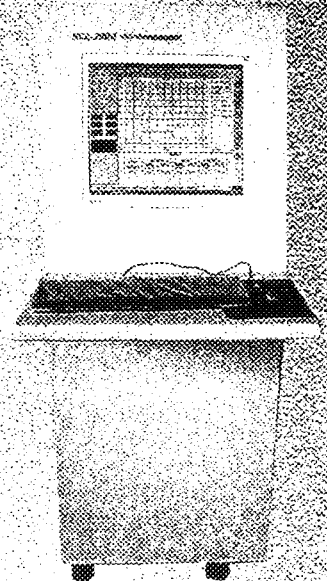
KCL-2000

数字式冲击控制测量分析仪

本冲击控制测量分析仪是针对本厂CL冲击台系列产品所设计开发的一种控制测量软件，满足实时控制和同步测量，外形结构简单、新颖、性能稳定、操作方便，是您最理想的选择。

因其内置ICP恒流源和电荷放大器，所以传感器类型适用于电压、ICP以及电荷式三种加速度传感器；采用高性能浮点DSP处理结构，24位AD/DA，测量精度高；USB2.0接口和计算机简单联接，基于Windows2000/XP系统的应用软件，使用方便。自动生成Word试验报告，计算机实时显示工作状态、上升高度、以及测量的幅值加速度、脉宽和速度变化量以及他们相对于设定值的测量误差。

信号类型	内置ICP恒流源和电荷放大器,电压,ICP传感器以及电荷型加速度传感器直接输入
信号调理	模拟滤波器和160dB/Octave数字抗混叠滤波器
采样频率	高达192KHz,可扩展到1MHz的采样频率
电压范围	±10V
控制高度精度	自动记录跌落和上升高度,重复性好,精度高
安全措施	自动检测,紧急急停按钮,报警提示
测量峰值加速度	1~100000gn
测量脉宽	0.5~3000ms,可扩展
支持标准	国标、美军标、国军标、用户定义
测量波形	半正弦波、梯形波、后峰锯齿波等
工作条件	环境温度0~40度,相对湿度不超过90%,电源电压AC110~220±10% 50~60Hz

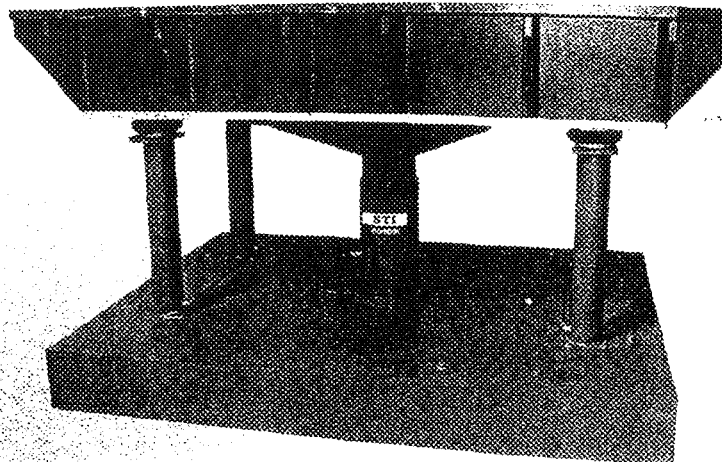


适用范围

液压振动台广泛用于汽车道路模拟试验，建筑、大坝、桥梁的振动特性及模态试验研究、地震研究及大型机电产品的振动试验。

特点

液压振动台的主要优点其工作频率下限可低至0.1Hz,负载大,台面大,运动行程大,最大可至±100mm。



ES-15

液压式振动台主要技术指标

参数	型号	ES-1	ES-2.5	ES-5	ES-10	ES-15	ES-20	ES-30	ES-50
最大正弦激振力(N)		10000	25000	50000	100000	150000	200000	300000	500000
额定频率范围(Hz)		0.5-120	0.5-120	0.5-100	0.5-80	0.5-80	0.5-50	0.5-50	0.5-50
最大试验负载(kg)		300	500	1000	2000	3000	4000	6000	10000
额定加速度 (m/s ²)	垂直	30	40	40	40	40	40	40	40
	水平	20	40	40	40	40	40	40	40
额定速度(m/s)		0.157	0.78	0.5	0.5	0.5	0.5	0.5	0.5
额定位移(mm)		50	25	25	25	25	25	25	25
工作台尺寸(mm)		600×600	600×600	800×800	1000×1000	1000×1000	1200×1200	1200×1200	1500×1500
垂直台体重量(kg)		340	1500	2500	3000	3500	3800	4000	5600
垂直台体尺寸(mm) (L×H×W)		600×570×600	660×560×400	800×700×800	1000×700×1000	1000×800×1000	1200×1000×1200	1200×1000×1200	1500×1000×1500
水平台体重量(kg)		3250	3000	3800	4500	4800	5000	5300	7500
水平台体尺寸(mm) (L×H×W)		1833×858×850	1633×850×800	2050×850×1000	2300×850×1000	2500×900×1200	2750×900×1400	2750×900×1400	3500×1000×1500
电液仪型号		KE-2/RC-2000	KE-2/RC-2000	KE-2/RC-2000	KE-2/RC-2000	KE-2/RC-2000	KE-2/RC-2000	KE-2/RC-2000	KE-2/RC-2000
电液仪重量(kg)		200	200	200	200	200	200	200	200
电液仪尺寸(mm)		600×1600×480	600×1600×480	600×1600×480	600×1600×480	600×1600×480	600×1600×480	600×1600×480	600×1600×480
其它部分重量(kg)		1280	3510	4000	5500	5500	5800	6500	7500
电源容量 (AC 200V/50Hz)		17kVA	55kVA	75kVA	110kVA	190kVA	210kVA	300kVA	450kVA
标准		IEC58-2-6(Fe), JB/T8228-2000, JJG638-90							

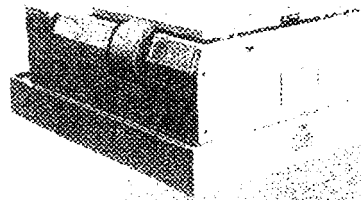
注：1. 电液仪行程可以根据客户要求定制。
2. 台面尺寸可以根据要求定制。

特点:

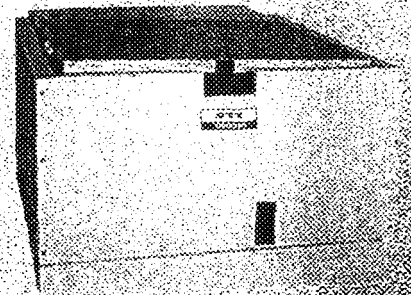
机械振动台系列以其低频率、大负载、价格低廉,而适用于实验室中作垂直和水平振动。可以不停机自动调节振幅大小和连续无级改变频率,并能定振扫频,是电工电子、仪器仪表、家用电器等行业进行产品耐振和可靠性试验不可缺少的设备。



J-25



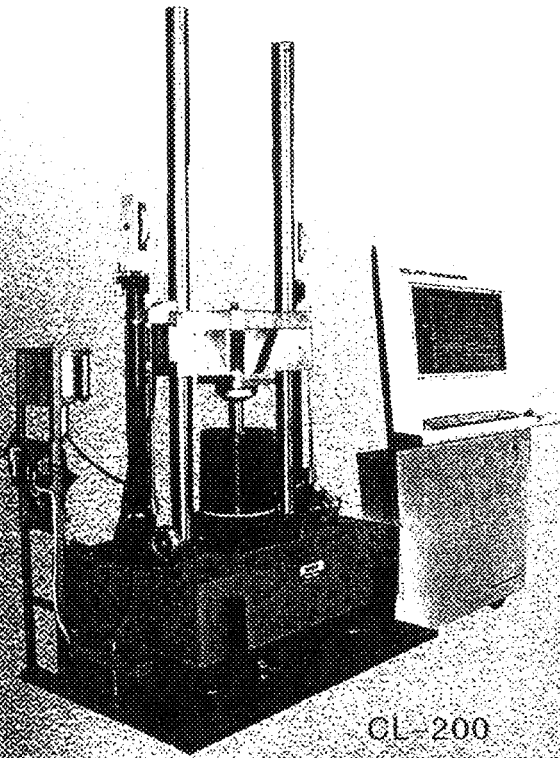
J-100



J-500

机械式振动台主要技术指标

	J-25	J-70	J-100	J-250	J-500
最大试验负载(kg)	25	70	100	250	500
额定频率范围(Hz)	10-80	10-80	5-60	5-60	5-60
扫频范围(Hz)	10-60	10-60	5-60	5-60	5-60
额定位移(mm p-p(空载))	10	6	10	10	10
额定加速度(m/s ²)	100	100	100	100	100
振动方向	垂直、水平	垂直	垂直、水平	垂直、水平	垂直、水平
主电机功率(kW)	1.1	3	4	10	10
工作台尺寸(mm)	400×400	520×500	700×800	1200×1000	1200×1000
台体重量(kg)	500	650	900	1800	2000
台体尺寸(L×W×H)(mm)	950×850×550	1300×840×500	1780×1100×560	1490×1780×850	1490×1780×850
电控仪型号	KJ-2	KJ-2	KJ-4	KJ-5	KJ-5
电源电压(V/50Hz)AC	220±10%	220±10%	220±10%	380±10%	380±10%
电控仪重量(kg)	20	20	20	150	150
电控仪尺寸(mm)	440×160×440	440×160×440	440×180×520	550×610×1780	550×610×1780
消耗功率(kVA)	1.1	3	4	12	12
标准	GB2423.10-95,IEC68-2-6(Fc), JJG189-97,GB/T13309-91				

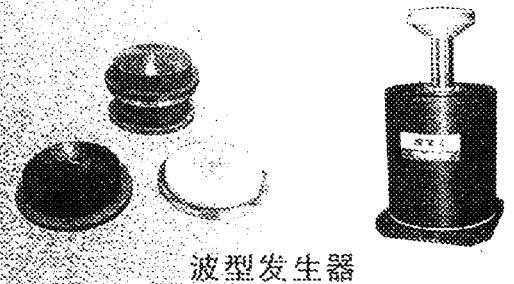


CL-200

冲击台特点

本试验台采用古典力学自由落体方式，模拟实际使用环境，精确逼真，适用于航空、航天、舰船、兵器、电子、汽车等工业、科研领域中大型试件的抗冲击试验。冲击波形可以选择：半正弦波；后峰锯齿波；梯形波。系统免地基，采用进口空气弹簧防振，液压阻尼，安装使用方便。对周边仪器设备无影响。采用气液增压，强力摩擦抱闸防二次冲击机构，试验精确并且安全可靠。

本产品满足：GB2423.5, GJB150, IEC68-2-27等标准。



波型发生器

冲击台主要技术参数

参数	型号	CL-50	CL-100	CL-200	CL-300	CL-500	CL-1000
最大试验负载(kg)		50	100	250	300	500	1000
脉冲持续时间(ms)		50-1	50-1	30-1	30-1	18-3	18-3
脉冲峰值加速度 (m/s ²)	半正弦	150-6000	150-6000	150-6000	150-6000	150-7000	150-2000
	后峰锯齿	150-1000	150-1000	150-500	150-500	150-500	150-500
	梯形	150-1000	150-1000	150-500	150-500	150-500	150-500
工作台尺寸(mm)		500×500	500×500	800×650	1000×800	1200×1000	1200×1200
台体重量(kg)		3800	3900	4500	6500	7500	8500
台体尺寸(L×W×H)mm		1750×1000×2850	1750×1000×2850	1900×1200×2850	2300×1550×3000	2500×1750×3000	2500×1750×3000
测震控制仪型号		KCL-2000					
测震控制仪重量(kg)		100					
测震控制仪尺寸(L×H×W)mm		460×1400×1000					
消耗功率(kVA)		1.3	1.3	2	3	3	3
电源电压(V/50Hz)AC		三相380 50Hz					
标准		GB2423.5, GJB/T6868-93, GJB-150, GJB-360, JJG541-88					

专利号: ZL002248962.9

高加速度冲击试验台

主要性能参数

产生波形: 半正弦

台面尺寸: 80mm x 80mm

试样质量: 2kg

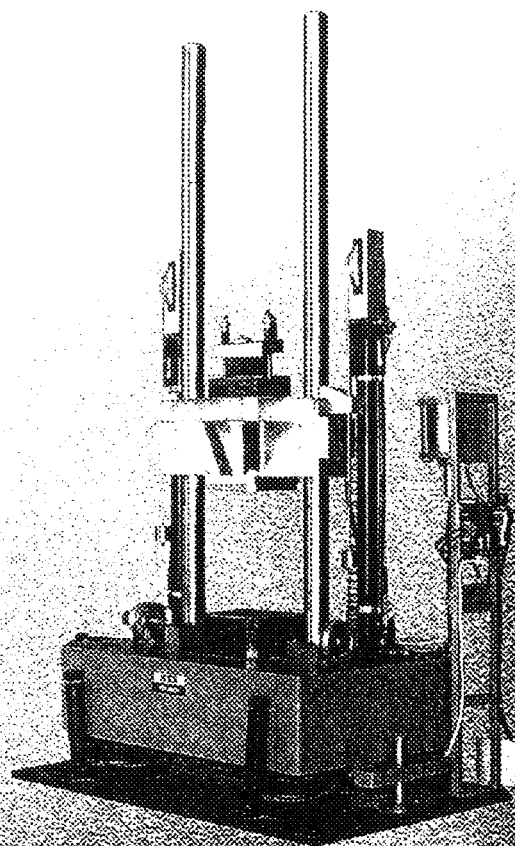
最大加速度: 100000g

脉冲宽度: 0.05ms-2ms

试验项目: 冲击试验

试验标准: GB2423 电工电子产品环境试验

GJB150 军用设备环境试验方法

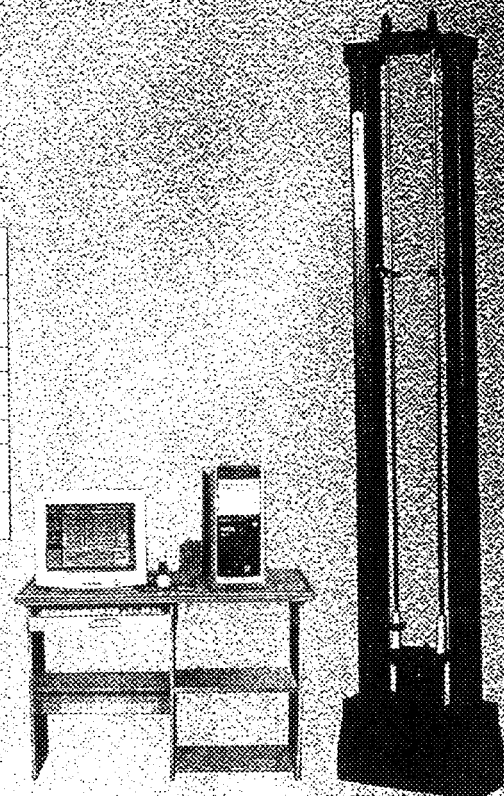


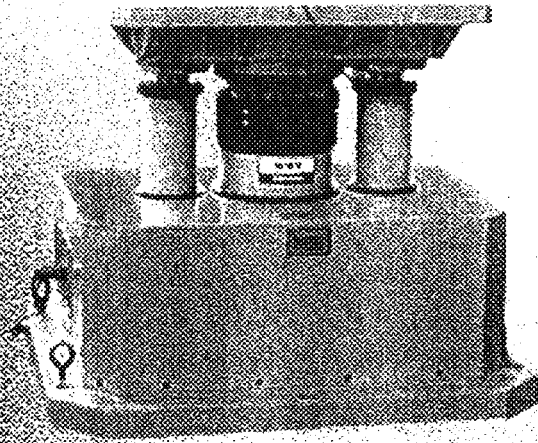
高加速度冲击台特点:

本试验台采用古典力学落体方式, 模拟实际使用环境, 精确逼真, 适用于航空、航天、电子元器件等工业、科研领域的轻量级、小尺寸试件的抗冲击试验。本产品满足: GB2423.5 IEC68-2-27 GJB150等标准。

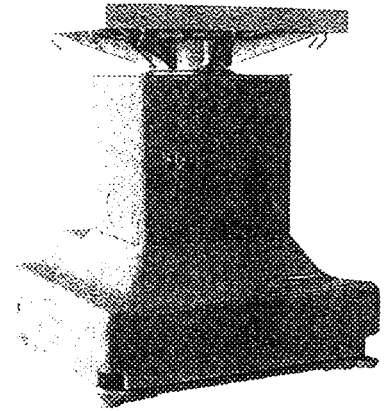
高加速度冲击台主要技术参数

参数	型号	CL-02	CL-10
台面尺寸(mm)		115 x 115	200 x 200
最大负载(kg)		2	10
冲击波形		半正弦波	
最大加速度(m/s ²)		30000	15000
最大速度变化(m/s)		3.83	4.78
脉冲持续时间(ms)		11-0.2	
落体高度(mm)		最大 1600	
冲击试验台		450 x 180 x 1980	500 x 250 x 2000
冲击试验台		100	112
试体质量(kg)			





P-500

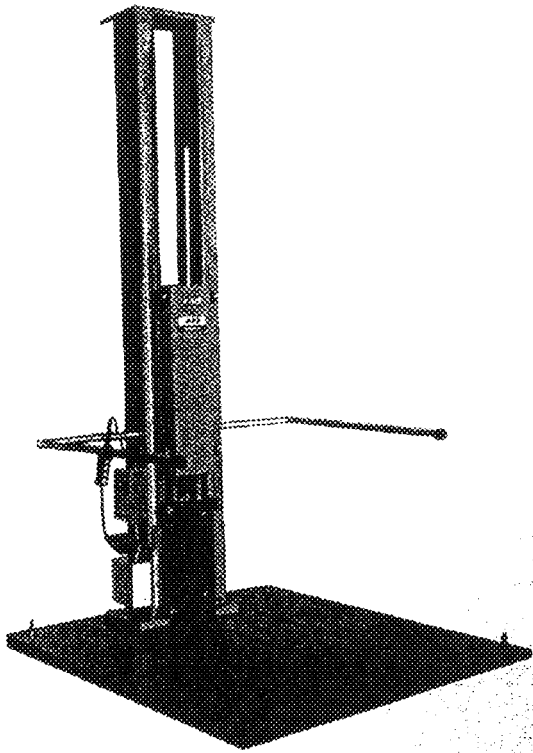


P-100

碰撞试验台主要技术指标

参数	型号	CP-100	P-100	P-250	P-500	P-800	P-1000
最大试验负载(kg)		100	100	250	500	800	1000
脉冲重复频率次数(次/min)		1-80	1-100	20-80	20-80	20-80	20-80
脉冲持续时间(ms)		6-18	6-18	6-18	6-18	6-18	6-18
脉冲峰值加速度(m/s ²)		50-1000	50-400	50-400	50-400	50-200	50-200
脉冲波形		半正弦	半正弦	半正弦	半正弦	半正弦	半正弦
工作台尺寸(mm)		500×700	500×700	800×1000	800×1000	1000×1000	1000×1000
台体重量(kg)		1200	760	1600	1600	2000	2000
台体尺寸(L×H×W)mm		800×700×900	700×900×1200	1310×1040×1180	1310×1040×1180	1400×1100×1200	1400×1100×1200
控制仪型号		KP-2000	KP-2000	KP-1	KP-1	KP-1	KP-1
电源电压(V/50Hz)		AC380V/50Hz					
电控仪重量(kg)		15	15	40	40	40	40
电控仪尺寸(L×H×W)mm		460×170×430	460×170×430	500×1750×800	500×1750×800	500×1750×800	500×1750×800
消耗功率(kVA)		1.3	1.3	7.5	7.5	11	11
测量仪		CC-1/CC-1A					
标准		GB2423.5, JB19391-1999, GJB-150, GJB-360, JJG497-2000					

专利号: ZL00261916.4



DLJ-200



DLJ-100

气动式跌落试验台特点:

本试验台主要用于考核包装件在实际运输、装卸过程中受到跌落冲击的影响程度, 评定包装件在搬运过程中耐冲击强度和包装设计的合理性。本产品结构先进, 在跌落过程中货物托架先快速向下运动然后再旋转运动, 加速度大于7g, 保证托架与包装试件的自由分离, 实现包装试件的自由跌落, 冲击振动小, 稳定可靠, 是真实完成面棱、角跌落试验的跌落试验台。

满足 ISO-2240-1985、IEC68-2-27

GB/T4857.5等标准。

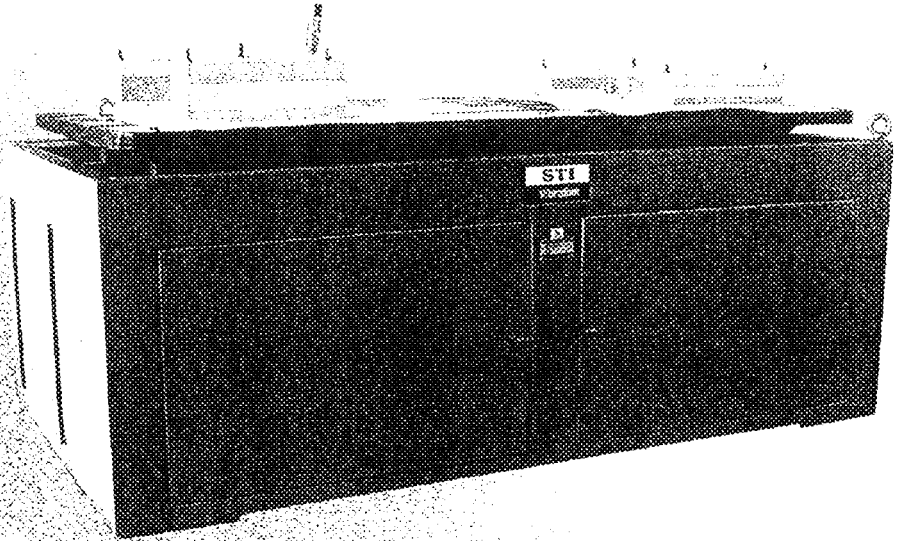
零跌落试验台特点:

本试验台主要用于考核包装件在实际运输、装卸过程中受到跌落冲击的影响程度, 评定包装件在搬运过程中耐冲击强度和包装设计的合理性。本产品结构先进, 在跌落过程中由于弹簧储能的原因, 使货物托架先于包装试件向下运动, 加速度大于5g, 保证托架与包装试件的清楚分离, 实现包装试件的自由跌落, 冲击振动小, 稳定可靠, 满足 ISO-2240-1985、IEC68-2-27

GB/T4857.5标准。

跌落试验台技术参数

序号	型号	DLJ-50	DLJ-100	DLJ-150	DLJ-200
1	最大载重kg	50	100	150	200
2	包装件跌落高度mm	300-1200	350-1200	0-1200	0-1200
3	包装件最大外形尺寸mm	700×400×400	800×600×600	1000×1000×1000	1200×1200×1200
4	跌落方式	自由跌落	自由跌落	自由跌落	自由跌落
5	冲击面尺寸mm	1600×1100	1600×1100	1800×1400	1800×1400
6	设备外形尺寸mm	1600×1100×2300	1600×1100×2800	1800×1400×2950	1800×1400×2950



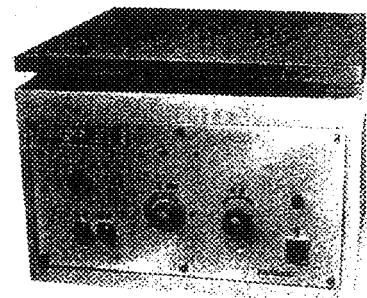
QJ-300

汽车模拟运输台主要技术指标

技术数据	型号	QJ-300	QJ-500	QJ-1000
最大试验负载(kg)		300	500	1000
模拟路面		模拟三级路面汽车振动	模拟三级路面汽车振动	模拟三级路面汽车振动
振动波形		正态平稳随机过程	正态平稳随机过程	正态平稳随机过程
强化系数		6.3±10% (典型值)	大于1:1	1:1
主频率		$f_1=3\pm 1\text{Hz}, f_2=7\pm 1.5\text{Hz}$		
工作台面尺寸(mm)		2200×1100	2000×1300	2700×1650
台体重量(kg)		2400 (包括配重)	6400	6000
台体尺寸(L×H×W)(mm)		2328×1360×932	2500×2160×1340	2900×2100×1600
电源及消耗功率(V/50Hz)AC		三相380 3kVA	三相360 6.5kVA	三相380 9kVA

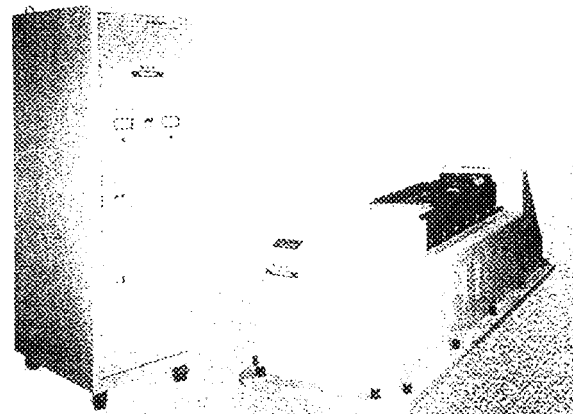
ZD-25型通用振动器主要技术指标

最大试验负载: 25kg	15kg负载: 0.5mm(49.3m/s ²)
频率: 50Hz	25kg负载: 0.25mm(24.7m/s ²)
振动方向: 垂直	外形尺寸(L×H×W)mm: 400×350×315
工作台尺寸: 400×350(mm)	重量: 39kg
最大位移: 空载: 0.75mm(74m/s ²)	电源: AC220V, 50Hz, 700VA



SP-40型水平冲击试验台主要技术参数

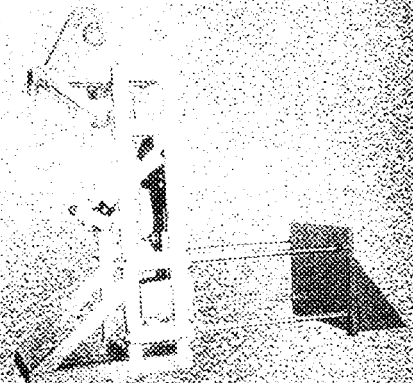
- 最大负载(kg):25
- 脉冲峰值加速度(m/s^2):2500-15000
- 脉冲持续时间(ms):2-0.3
- 脉冲波形:半正弦波
- 台面尺寸(mm):200×300



SP-40

CPC-200型水平冲击试验台主要技术参数

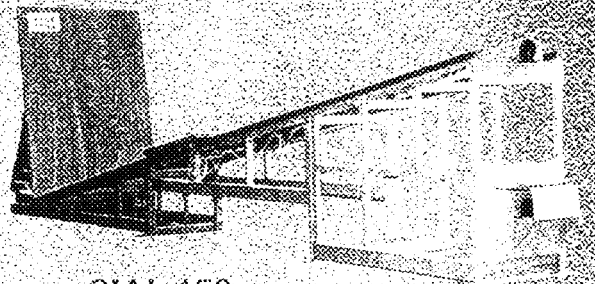
- 摆锤质量(kg):150, 200
- 摆锤最大摆角(度):80
- 峰值加速度(m/s^2):100-1000
- 脉冲持续时间(ms):1-3
- 脉冲波形:半正弦波



CPC-200

SMJ-150型斜面冲击试验台主要技术参数

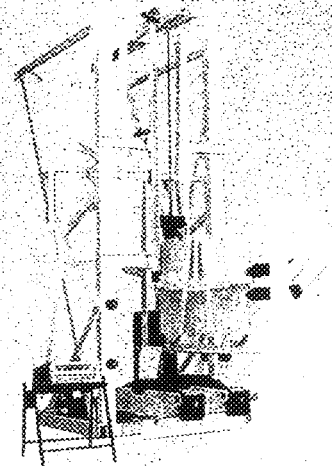
- 最大负载(kg):200
- 冲击速度范围(m/s):1.5-2.8
- 试件最大尺寸(mm):1800×1000×1000
- 台车台面尺寸(mm):1000×1000
- 导轨平面与水平夹角(度):10

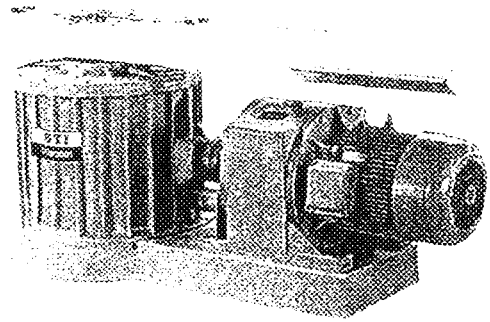


SMJ-150

CS-200型自由落锤式冲击台

自由落锤式冲击机的用途是试验舰船仪表和电器设备耐冲击的稳定性。本试验设备具有落锤与摆锤，可分别产生三个互相垂直方向的冲击，即正面冲击、垂直冲击和侧向冲击，适用于被试产品的重量不超过200kg，以及被试产品的静力矩不超过12000kg.cm的试验。





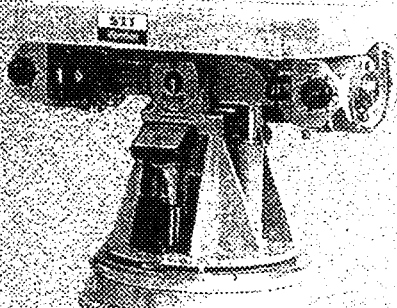
HSB 系列转臂式离心机

HSP 系列转盘式离心机

技术规格	型号	HSP-3000	HSP-50	HSP-40	HSP-30
最大载荷(g)		3000	50	40	30
总载荷(kg)		15	0.5	0.4	0.3
加速度 (m/s ²)		30-2000	100-200000	5000-400000	5000-800000
试样允许高度(mm)		200			
试样试验方向			XYZ三个方向分别进行	XYZ三个座标六个方向分别进行	
试样倾斜角(度)		290	100	30-100	
启动时间(min)		≥3	≥3	≥4	
连续工作时间(min)		60	30	5	5
电源及消耗功率		AC 380V 1.5KVA	AC 380V 0.9KVA	AC 380V 6.5KVA	
外形尺寸(mm) L×W×H		924×916×1242	900×800×830	830×830×830	
接电装置		15A 500V 5A			
重量 (kg)		1500	1000	1500	
控制系统		工控机控制			
满足标准		GB2423 GJB150 GJB360 MIL-STD-810F MIL-STD-202F IEC68-2-7 MIL-STD-883C			

HSB 系列转臂式离心机

技术规格	型号	HSB-20	HSB-100	HSB-200	HSB-500
最大载荷(kg)		20	100	200	500
总载荷(kg)		40	200	400	1000
加速度 (m/s ²)		50-1000	20-1000 (20-2500)	20-1000	20-500
试样最大尺寸(mm)		300×300×200	500×500×400	700×700×300	1000×1000×100
试样倾斜角(度)		750	1500	3500	5000
启动时间(min)		≥3	≥3	≥5	≥15
连续工作时间(min)		60	60	60	30
电源及消耗功率		AC 380V 5KVA	AC 380V 8KVA	AC 380V 10KVA	AC 380V 12KVA
接电装置		12A, 500V 5A	60A, 500V 5A	30A, 500V 5A	30A, 500V 5A
主机外形尺寸(mm)		1350×470×800	Φ4000×1400	Φ8000×1500	Φ11000×1800
控制箱外形尺寸(mm)		516×430×335	630×400×430	630×450×430	630×450×430
试样数量占桶容积(%)		3	4.5	9	12
重量 (kg)		2500	3000	6000	3000
控制系统		工控机控制			
满足标准		GB2423 GJB150 GJB360 MIL-STD-810F MIL-STD-202F IEC68-2-7 MIL-STD-883C			

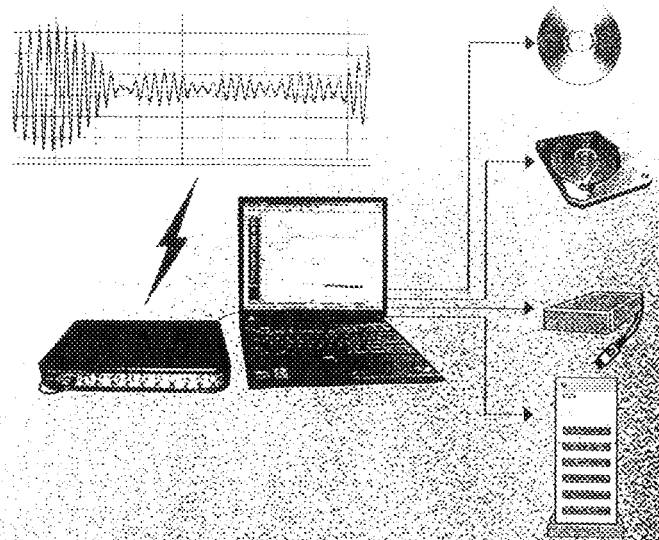


YB 系列摇摆试验台

YB 系列摇摆试验台

技术规格	型号	YB-500	YB-1000
最大载荷(kg)		500	1000
试样重心高(mm)		500	500
首摆角位移		±4°	±4°
横摆角位移		±45°	±45°
侧摆角位移		±22.5°	±22.5°
俯仰角位移		±45°	±45°
纵倾角位移		±22.5°	±22.5°
台面尺寸(mm)		1350×1000	1200×1500
电源及消耗功率		AC 380V 22KVA	AC 380V 37KVA
台体尺寸		1350×1000×1950	
台体重量(kg)		1500	
满足标准		GJB150 GB2423	

AVANT数据记录仪是集高速数据采集、信号调理、数据存储、数据分析、计算机系统和报告软件于一体的全数字式数据记录仪。系统可与多种类型传感器连接,具有多通道同步采集,高速 USB 2.0数据通讯,操作简便等特点。该记录仪信噪比大于100dB,能够以每通道96 KHz的速度像磁带机那样无间隙连续记录波形,直接存入硬盘,缩短从数据采集到存储、分析的时间。配合使用直流电源,成为车载测量的理想设备。



系统性能

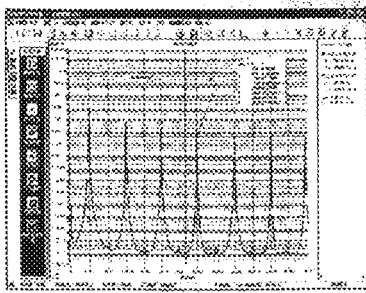
4-32输入通道同步采样
采样频率20Hz-96KHz, 192KHz(可选)
24位模数转换器(ADC)
信噪比大于100dB

主要应用

车载道路谱记录
监测发动机压力、温度、振动
压缩机的振动监测与缺陷检测
电力机车的功率监测
监测电气系统运行状态
轧钢机械的调试和故障监测

特点

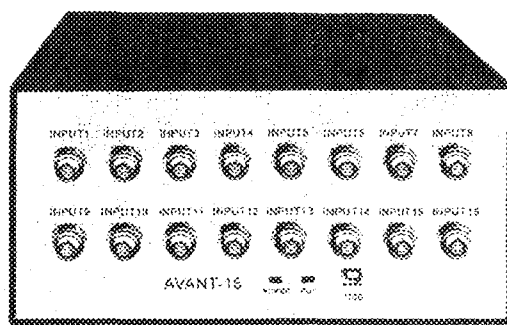
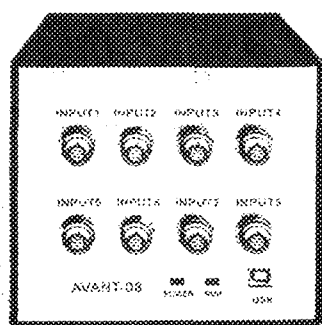
大容量全数字记录
高精度、无间隙幅值与相位测量
多种数据存储格式
内置ICP恒流源,支持多种传感器类型
多种时域采样、平均和触发功能
光标指示、信号计算等多种辅助功能
报告自动生成



离线分析器

配合数据记录仪,分析存储在硬盘上的数据,具有丰富的离线分析功能:

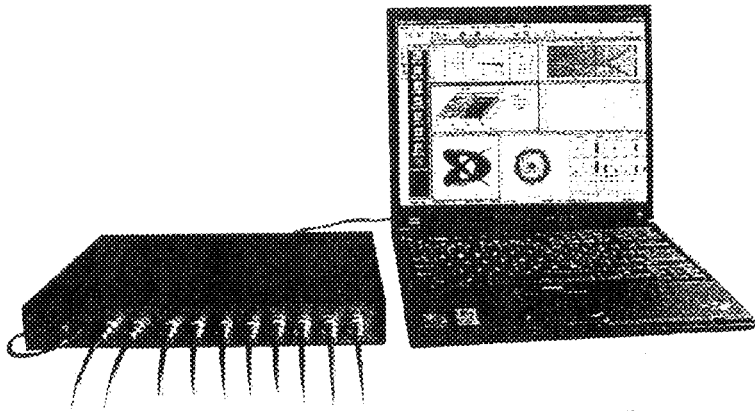
时域波形、自相关分析、互相关分析、轨迹图;实时谱分析、自功率谱(ASP)、互功率谱(CSP)、功率谱密度(PSD)、传递函数(FRF)、相干函数、FFT、冲击响应谱(SRS);柱状图。



AVANT多通道动态应变仪采用国际先进的电子自动平衡技术，优化电路设计，选用最新的高精度、低漂移、低噪声仪表放大器元器件，具有精度高、漂移小、噪声低等优点。基本配置为8/16个输入通道，系统可以通过扩展线串接多台仪器，组成更多通道的应变仪；在基本配置时采样频率高达96kHz；仪器与PC机采用USB2.0通讯，即插即用；配接不同类型的应变片及应变式传感器，除了测量结构和材料的应变外，还可以测量力、压力、扭矩、温度、加速度、速度、位移等多种物理量，是专为工程量和大专院校实验室设计的高质量的一系列应变仪。

系统性能指标

输入通道数	基本配置为8或16通道，可通过串接多台仪器得到更多通道
适应桥模式	半桥或全桥
输入方式	差分
输入接口	6芯的LEMO接插件
输入阻抗	2MΩ，每个输入对地1MΩ
供桥电压	2.5V、5.0V、10.0V可选
供桥电流	每通道最大50mA，有过流保护
输入量程	±2mV、±5mV、±10mV、±20mV、±50mV、±100mV、±200mV、 ±500mV、±1V、±2V、±10V
调零范围	±500mV分成65536档
最大输入电压	±40V峰值
耦合方式	DC或数字AC
A/D位数	24位
采样率	32Hz到96KHz，基本配置时最高可到96KHz，通道扩展时每增加一倍的通道数， 最高采样率相应减半
输入带宽	DC~30KHz
滤波器	模拟和数字抗混叠、去纹波滤波器
精度	≥+100mV, ≤-100mV 量程0.1%
	±50mV 量程0.3%
	±20mV 量程0.3%
	±10mV 量程0.5%
	±5mV 量程0.8%
±2mV 量程1.2%	
偏置误差	最大100μV
自动调平衡	16位DA转换器
半桥电阻	10KΩ 0.1%
短路校准方式	两个电阻36KΩ、11.6KΩ
短路开关阻抗	典型为1.7Ω，最大为2.5Ω
短路开关漏电流	25℃时小于0.5nA；70℃时小于2.5nA
电源	AC 100 - 240/50 - 60Hz/1.5A



AVANT系列实时动态信号分析仪

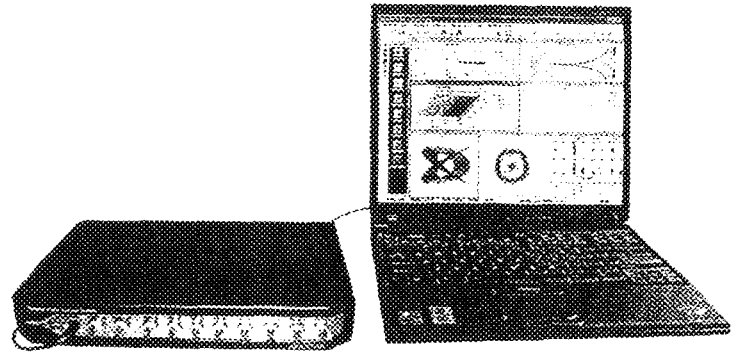
本分析仪是集信号调理、采集、数据存储、分析、报告生成于一体的实时数据采集与分析的系统，具有4-16个输入通道，1-2个输出通道。通过USB2.0与计算机相连，能够以每通道96kHz的速度象磁带机一样连续记录波形，直接写入硬盘。为广大用户提供完善实时的信号测量和分析的平台。

充分利用了Windows多任务机制和图形界面功能，基于Windows2000/XP的应用软件提供了丰富的显示功能，可以实时方便地观察测试运行状态和各类测试结果。

提供了完善的时域分析、频域分析、统计分析、幅值域分析、信号源、数据存储等功能，实时采集、分析各类信号特性，可广泛应用于振动、噪声测试分析领域。

信号类型	内置ICP恒流源，电压，ICP传感器直接输入
滤波器	各通道独立的模拟和160dB/Octave数字抗混叠滤波器
分辨率	24位A/D转换器
电压范围	±10V
信噪比	> 100dB
输出动态范围	100dBfs
输出阻抗	30Ω
时域	时间波形，自相关和互相关函数，轴心轨迹图
频域	实时频谱分析，自功率谱，互功率谱，功率谱密度，频率响应函数，相干分析，FFT
幅值	直方图
信号源	正弦，方波，三角波，脉冲，正弦扫描，白噪声，脉冲随机，伪随机，线性调频，直流，猝发

AVANT动态信号分析仪是具有国际一流水准的集信号调理、采集、存储、分析、报告生成于一体的实时信号测量与分析系统。该系统采用了国际上先进的分布式系统结构，以及最新的双DSP处理器处理技术、低噪声硬件设计技术、高分辨率A/D、D/A转换技术和高速USB2.0接口技术，是用户进行信号分析测量的高质量可靠平台。



系统性能

4-16输入通道，1-2输出通道
AC、DC等耦合方式
实时分析频率42KHz，采样频率96KHz
24位ADC和DAC
110dB动态范围
内置ICP恒流源
高速USB2.0接口，即插即用

特点

性能价格比和可靠性高
高精度、宽动态范围
实时、多功能
内置ICP恒流源
基于Windows，操作简便
自动生成Microsoft Word试验报告
即插即用，使用方便

实时数据采集与分析

时域	时间波形、自相关和互相关函数、轴心轨迹图
频域	实时频谱分析、自功率谱、互功率谱、功率谱密度、频率响应函数、相干分析、FFT
幅值	真方图
信号源	正弦、方波、三角波、脉冲、正弦扫频、白噪声、脉冲随机、伪随机、线性调频、直流、猝发

线性分析

采用ANSI/IEC 1986标准，用于各种工业噪声的分析

- 频谱分析、声压分析
- 1/1、1/3倍频程分析
- 分析频率20-20KHz
- A、C、线性加权

模态分析

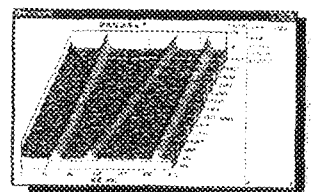
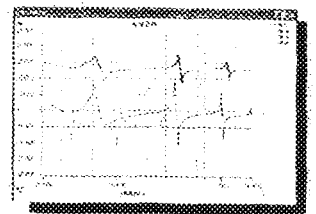
提供模态数据记录功能，与国际主流的模态分析软件组合实现模态分析。系统含多个激励信号源，通过计算节点位移、应变、应力和反力等未知量对结构体进行定性和定量分析。广泛应用于土木工程、汽车、船舶、飞机、机械结构等。

分析功能：静力分析、模态分析、谐波分析、瞬态动力分析、曲线分析、显式动力分析。

阶比跟踪

实时监测、分析旋转机械的振动、噪声随转速变化的关系，广泛应用于航空航天、冶金、石化等领域。

- 转速分析：生成平滑的机器阶态转速变化曲线。
- 转速计算：从瀑布图中提取平滑的机器阶态转速曲线。
- 阶比跟踪：机器阶态转速与振动信号综合处理，生成各个阶次的幅值及相位变化曲线。





军用电子元器件及器材贮存控湿仪

用 途

该贮存控湿仪能适应各种电子器件湿度要求的全自动、多功能除湿平台。它除湿能力强，可将贮存箱体内空气中的相对湿度从90%RH降至10%RH范围内，根据使用要求可任意控调节控制湿度，满足所有电子产品贮存所要求的干燥程度。专门用来贮存分类管理各种精密配件、电子元器件、芯片、光学晶体等电子产品，防止生霉、生雾、氧化腐蚀、金属锈蚀、材料变形、老化断裂、电子器件失效等，使各种精密配件和电子器件始终处于良好性能状态。该产品能在常温下达到低湿状态，解决了多年来贮存湿度达不到常温低湿的技术难题，使用时环保、节能、无耗材、无噪声、无污染，达到智能化、数字化管理。

可广泛应用于航空、航天、兵器、电子、船舶、汽车、仪器、仪表等工业及大专院校、科研院所。



根据用户需求可以配备人体、元器件、板级静电装置

产品特点

- 该仪器箱体采用双层 1.2mm 厚钢板、中间填充 1.5mm 隔热阻燃材料、内配有化学稳定性强、具有较高吸附能力的进口分子筛，热稳定性高、能反复加热再生进行吸附除湿；
- 采用新型智能材料形状记忆合金弹簧来控制排湿和吸湿门打开和关闭，该材料寿命可达数万次；
- 采用高分子电容式湿度传感器和感温元件及 A/D 转换电路和补偿电路来进行控制，全机采用防磁场设计，并配有防静电手套和箱体消静电装置，可以快速消除元器件隔层内的静电荷；
- 另外该仪器还具有环保、节能、隔热、防火、气密性强、智能化管理等特点，一旦设定到要求的相对湿度，整个系统内自动控制，无需人员操作。

主要技术参数

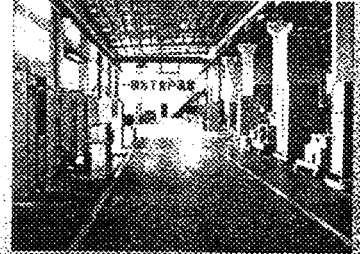
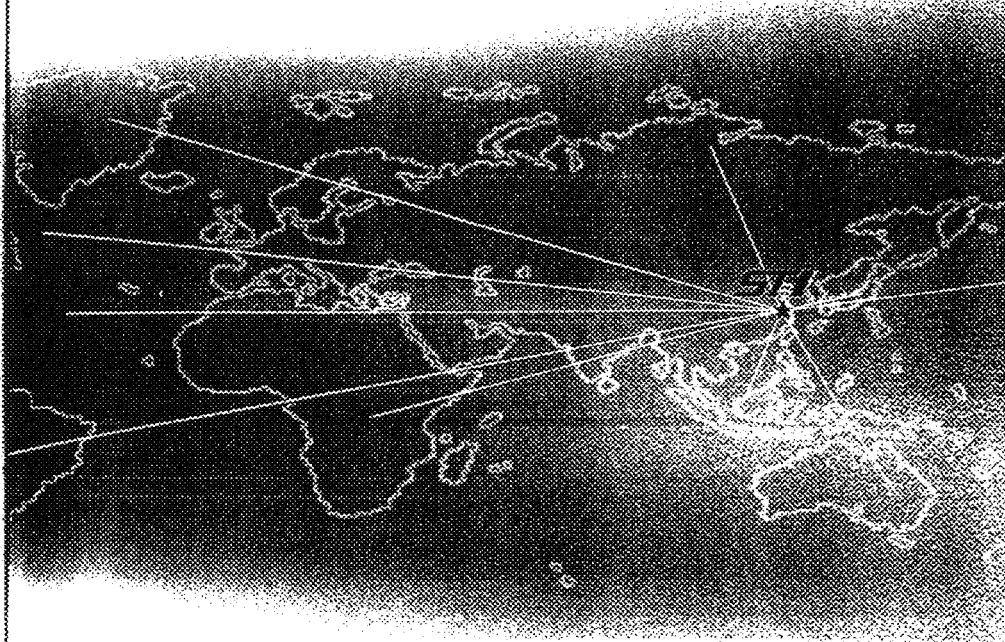
- 环境温度 $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$ 误差值 $\pm 2\%$ 之内
- 控湿范围 $10\%\text{RH} \sim 90\%\text{RH}$ 误差值 $\pm 3\%$ 之内
- 噪 声 $\leq 20\text{db}$ 超低静音
- 干燥剂 每个机芯分子筛 ≤ 200 克反复加热 8000 次以上
- 记忆合金 控制排湿门关闭、开启，可达数万次
- 密封性能 当湿度达到设定值，不开启门，包括断电箱内湿度至少保持 100 小时以上
- 功 率 平均功率 5W 以内（每个机芯）
- 电 压 $220\text{V} \pm 10\%$ 50Hz
- 内置离子风机，箱内能自动消除静电
- 配有氮气充注接口，根据用户要求可配小型氮气机
- 箱体内采用 LED 冷光照明系统
- 采用多样式可调抽屉托盘

规格及外形尺寸

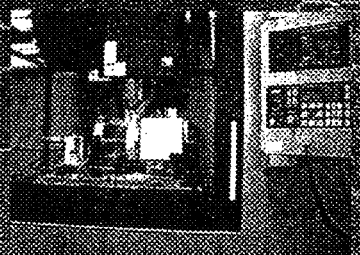
- W600 × D550 × H1800mm
- W600 × D550 × H1200mm
- W600 × D550 × H800mm



誠信 創新



▲ 設備部



▲ 先進的加工工序



▲ 振動技術研討會



▲ 學術交流



声明

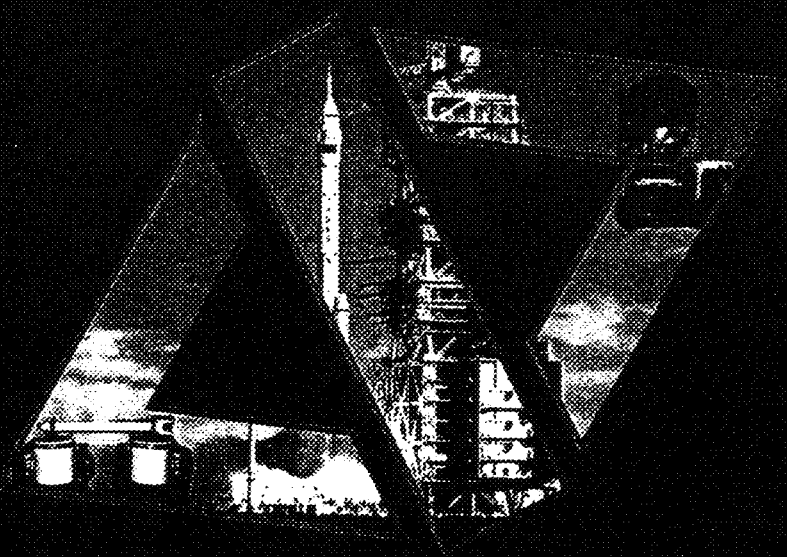
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东菱公司不断提升自己的创新理念、人性化的经营、打造自己的人才平台和优秀团队，成为科技创新和优质产品的摇篮。

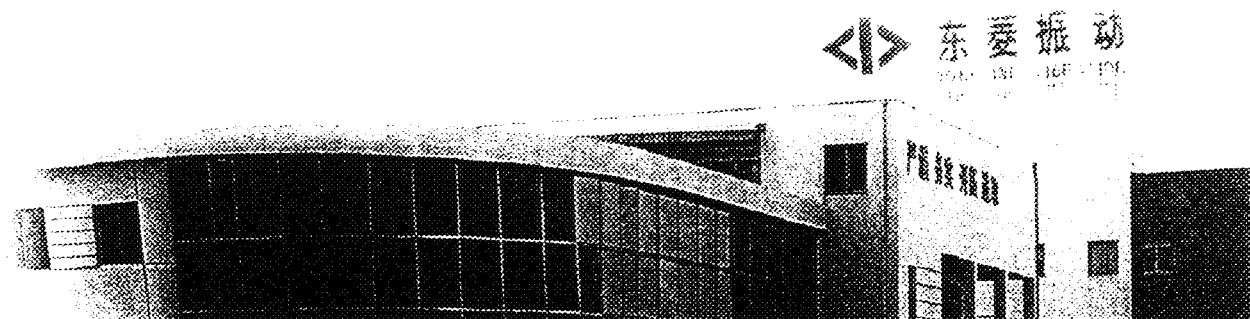
东菱公司把国际最先进的标准和最苛刻的客户作为提升自己的杠杆，把质量作为检验我们素质的标尺，把“造中国精品、创世界品牌”作为我们的追求……

从80平米简陋工棚，到近万平米现代化厂房；

从单一产品，到十多类60多款产品，20多个中国独创、世界领先（国内第一台160kN、180kN、200kN大推力水冷振动台，第一台50000g高加速度冲击台，第一台100mm大位移电动台，世界最大70kN风冷电动振动台……）；

从产品的销售到实验室设计，设备选型，测试实验，同类产品维修、改造等多领域服务；

从国内销售，到走出国门“振动世界”，赢得包括美国、英国、德国、法国、日本、以色列、俄罗斯等国专家、客户的认同和赞誉；





第一篇

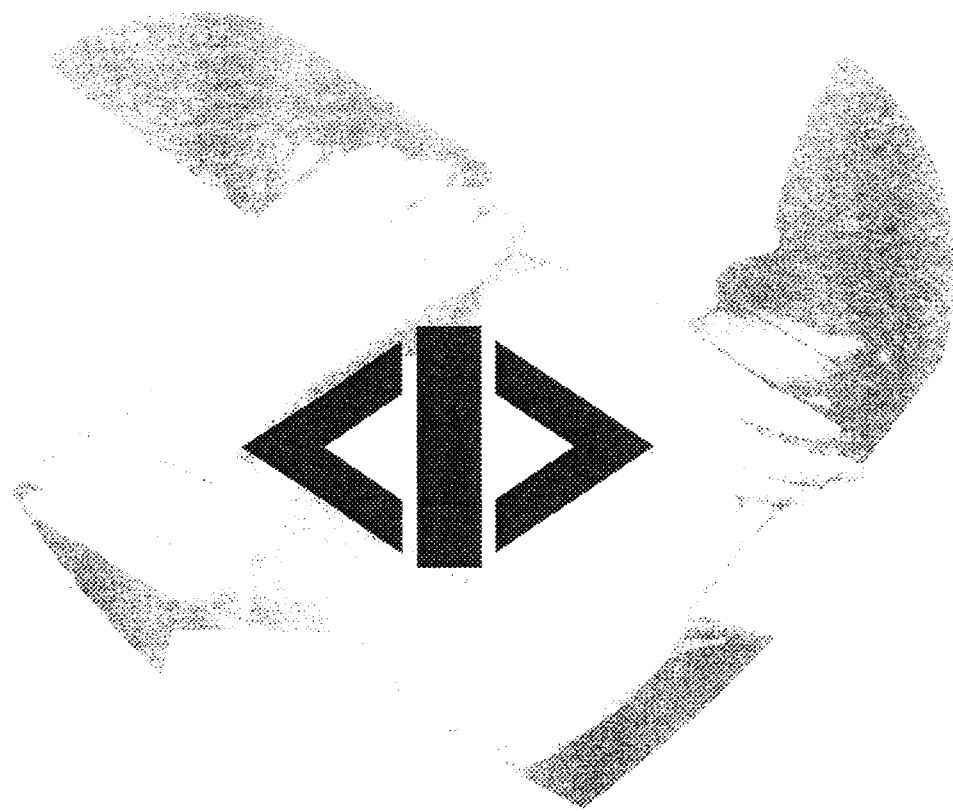
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第三篇

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第五篇




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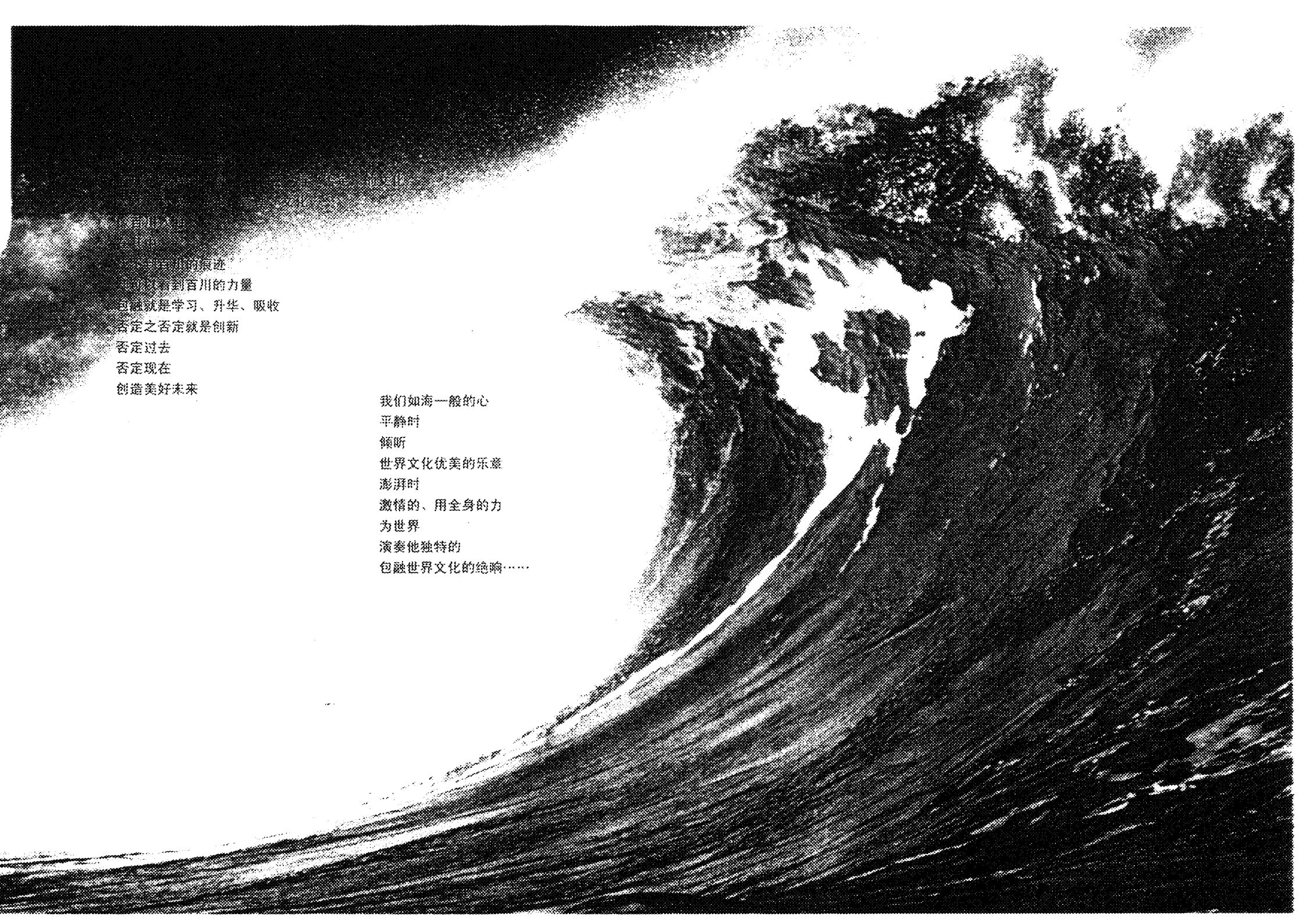
一颗颗

澎湃的心 / 严谨务实的心 / 开拓进取的心 / 追求完美的心

以人为本的心 / 科技创业的心 / 以诚会友的心

真情服务的心 / 为国争光、为民族争气的心

我们每刻都在为  突破



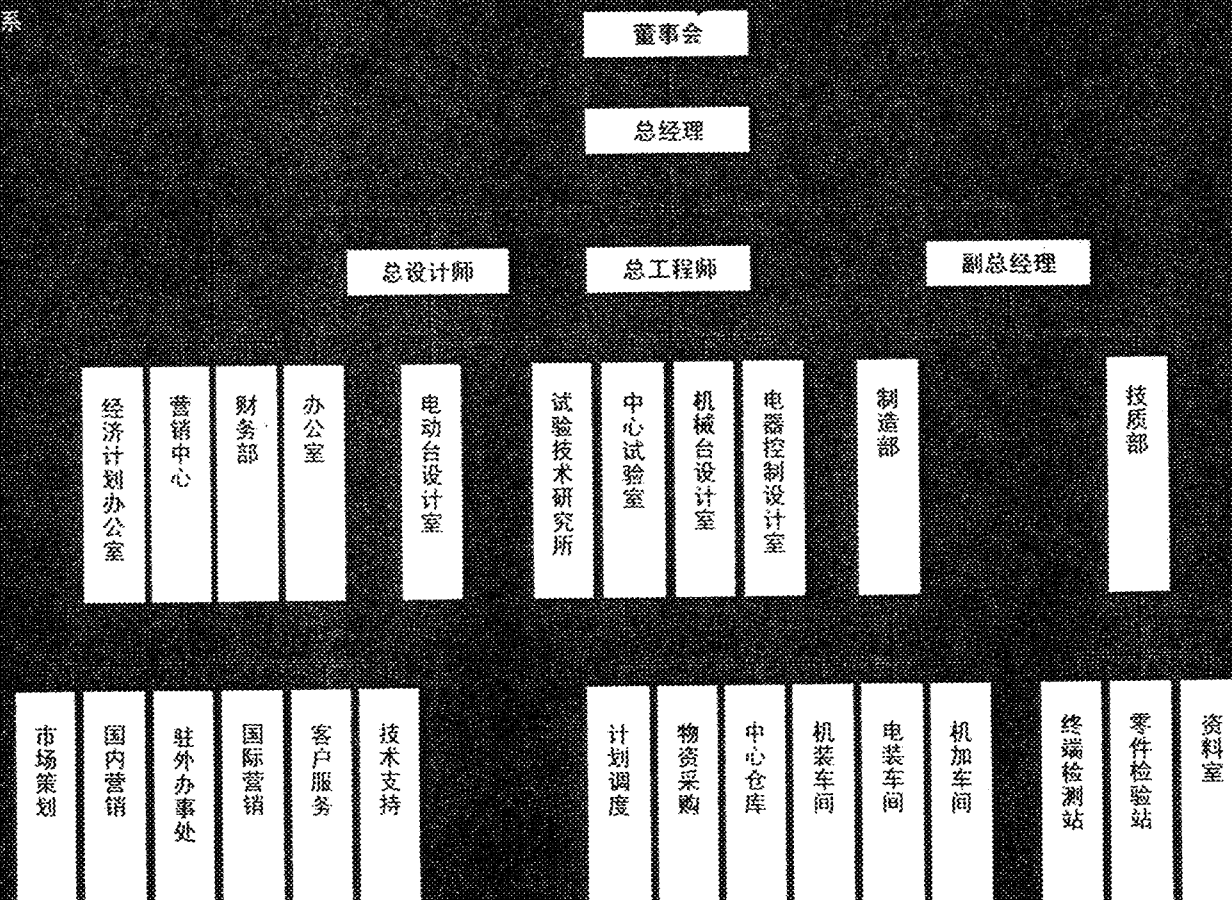
浪花的痕迹
可以看见百川的力量
包融就是学习、升华、吸收
否定之否定就是创新
否定过去
否定现在
创造美好未来

我们如海一般的心
平静时
倾听
世界文化优美的乐章
澎湃时
激情的、用全身的力
为世界
演奏他独特的
包融世界文化的绝响……

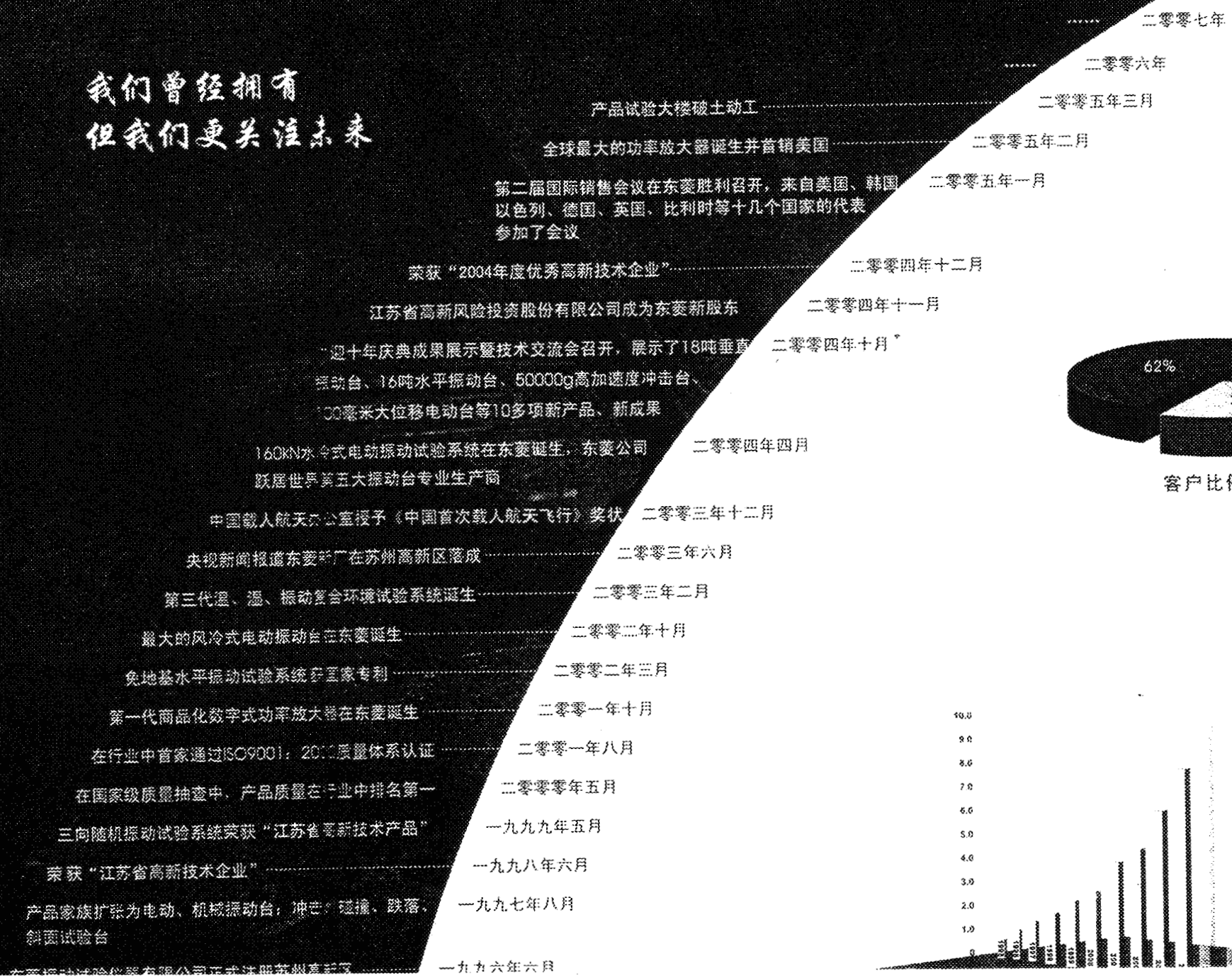
一方水土养育一方人，
 灵韵而内敛的苏州，
 赋予创业者以勇气和才气，
 东菱的每一个步伐，
 都凝聚着东菱人以人为本、科技兴业的理念。

百舸争流的今天，
 东菱人步履更加矫健，
 因为我们拥有充满战斗力和凝聚力的企业文化，
 适合企业自身发展的优秀管理体系，
 具有开拓精神和创造力的科技研发团队，
 客户至上的服务体系

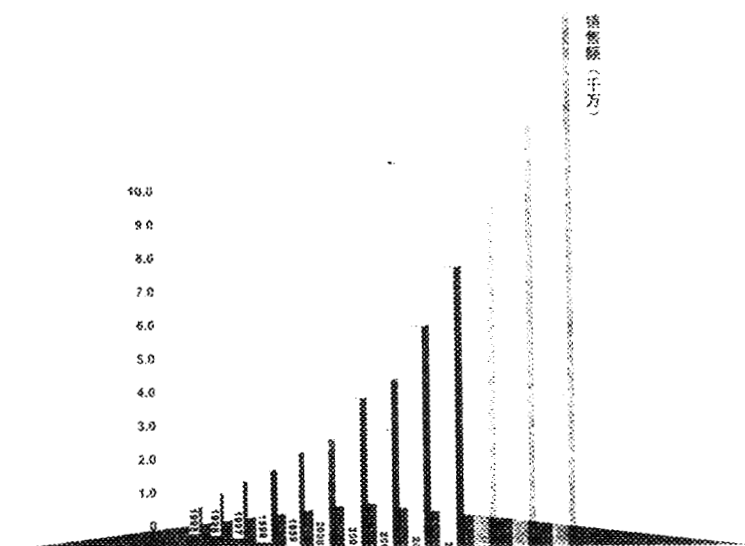
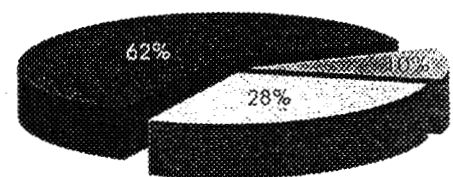
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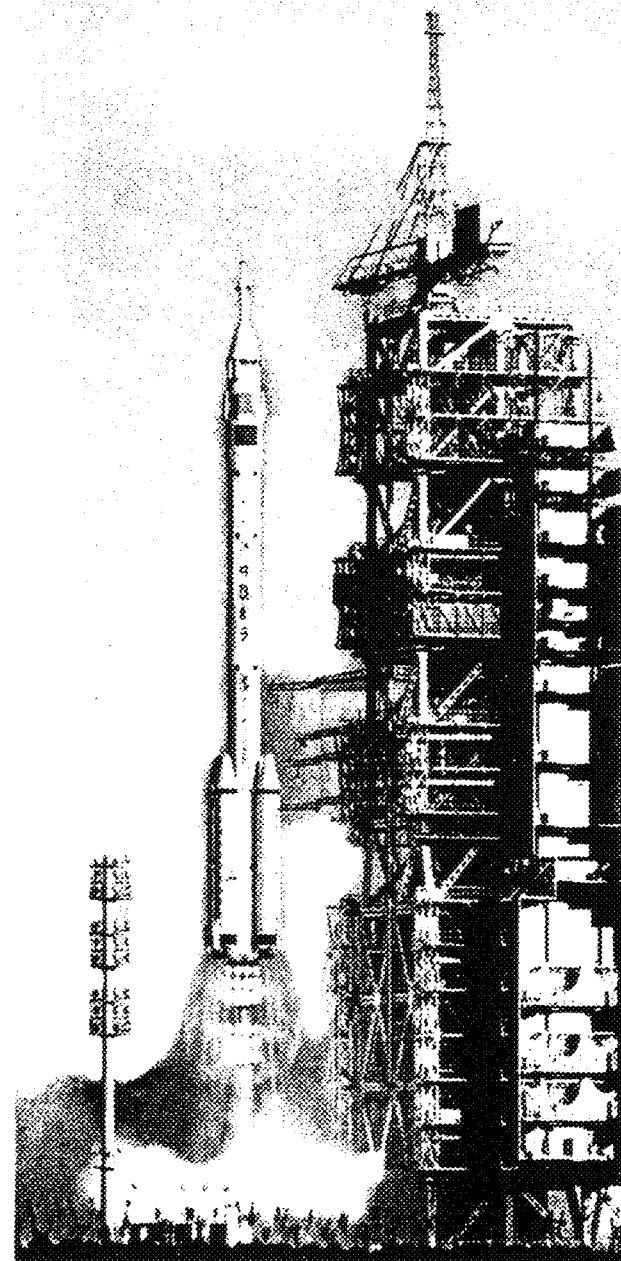
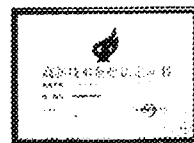
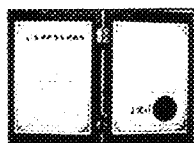
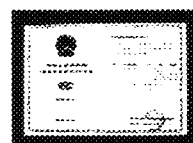
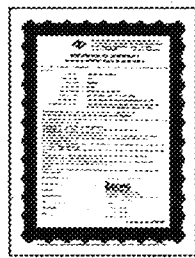
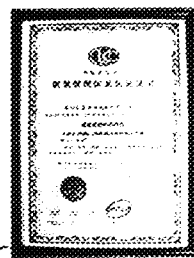
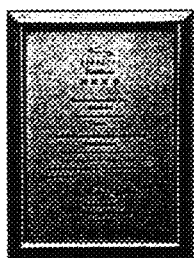
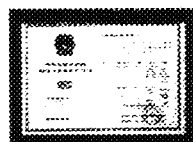
我们曾经拥有 但我们更关注未来



■ 军工企业
■ 民用企业
■ 高校、科

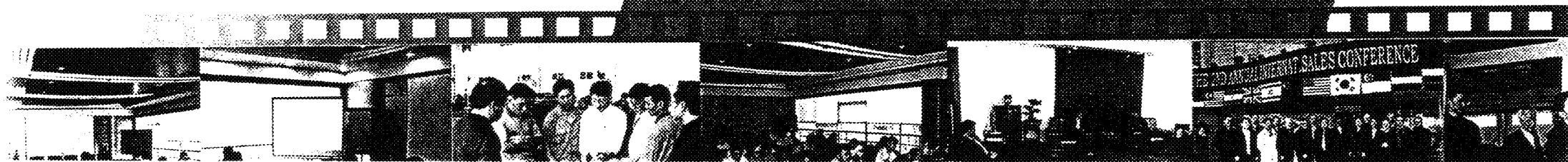
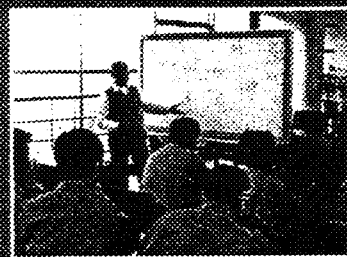
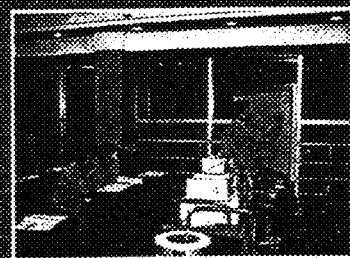


昨天，我们为神五保驾护航



学习是企业持续发展的金钥匙

人贵有知，
学贵有恒。
一个企业只有不断的学习，
制造出新鲜的“血液”，
才会永葆青春，
活力无限。

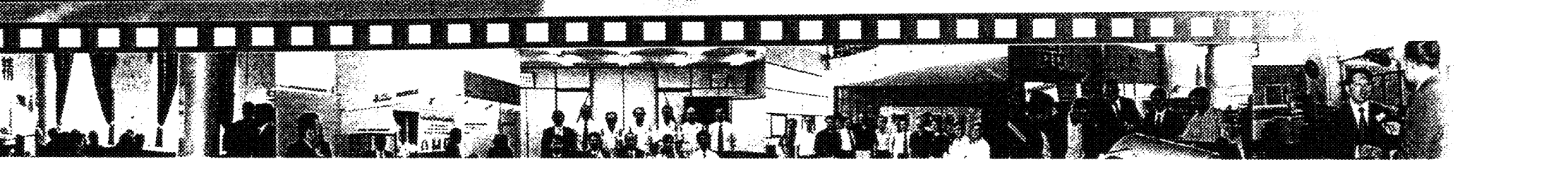


用心交流，创造完美品质。

在与国外同行的合作中，
他们科学、严谨的敬业作风不仅在东菱员工的心中深深扎下了根，
而且在文化的磨合中产生了一种新的诠释，
形成了一套完善的符合国际质量水平的评估体系。



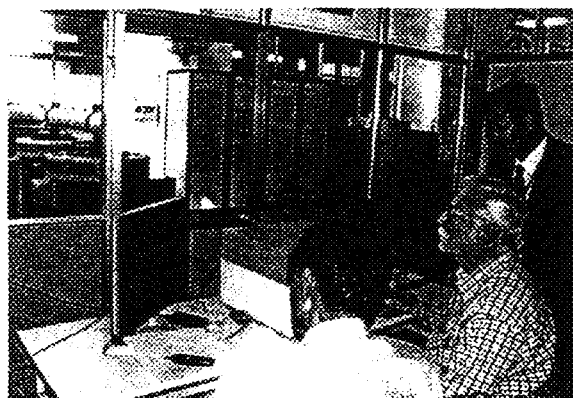
欧洲航天技术中心（欧洲航天局European Space Technology Centre）官员、专家在东菱考察。



东菱人坚持走科技兴业之路。
公司组建了两个专家室，
三个设计室，
一个中心试验室，
一个计量检测中心，
一个试验技术研究所，
一个集社会各方专家组成的技术委员会，
技术人员占员工总数的46%，
有三分之一的员工从事着新产品开发的相关工作，
形成了以行业资深专家为核心的科研团队。
同时，
加强与国内高等院校、科研机构横向联合，
利用最新科技成果，
不断推出新产品。



总设计师江运泰研究员给技术人员授课



美国SD公司控制专家在东菱现场实施多台同步试验

用心，为生活添活力，为人生添魅力



优良的品质 和 热情周到的服务，
是东菱公司对用户永远的承诺。

公司服务热线、网站等服务窗口

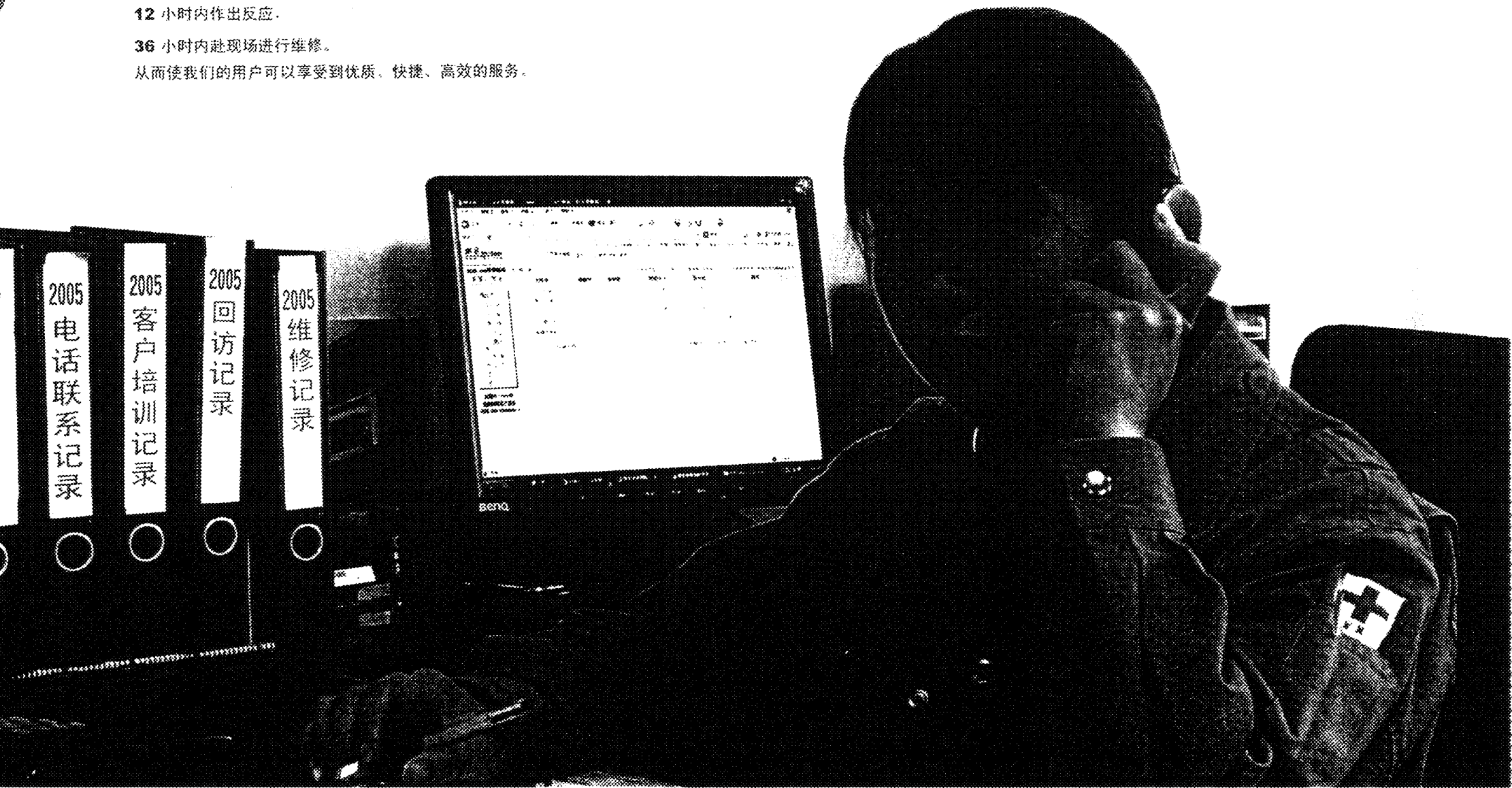
24 小时为客户开通。

接到用户设备故障报告后，

12 小时内作出反应。

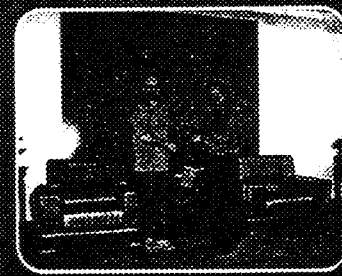
36 小时内赴现场进行维修。

从而使我们的用户可以享受到优质、快捷、高效的服务。





新加坡国家计量中心专家
接受产品技术培训



美国售后服务工程师接受操作

为确保维修服务的快速响应，及时、有效地排除故障，公司配备专职维修人员并具备备品、备件专项储备支持：

设有专职维修工程师接洽业务：

设专门的产品维修资料库，建立能效跟踪信息管理系统。

我们的服务：

售前

- 技术咨询；
- 设备选型；
- 产品试验方案；
- 实验室建设方案等。

售中

- 客户沟通，进度通报；
- 指导、调试、试机等；
- 配合计量。

售后

- 技术培训：操作使用、日常维护保养、常见故障检测和排除；
- 定期回访：设备巡检，排除故障隐患，传递最新信息；
- 根据用户需求可进行其它有偿性专项服务。

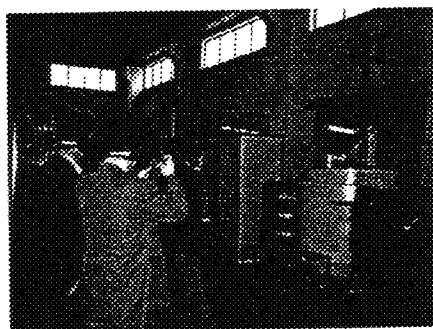
其他服务

其它服务

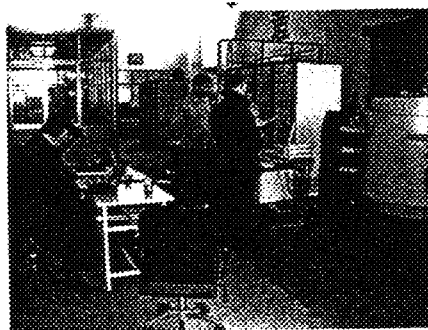
东菱公司不仅关注对本公司产品的服务，还致力于行业规范建设和行业产品维修。

- 国内外相关力学试验设备的维修、改造、升级；
- 控制软件的开发；
- 特殊夹具和台面的设计、制作；
- 提供相关试验

⋮

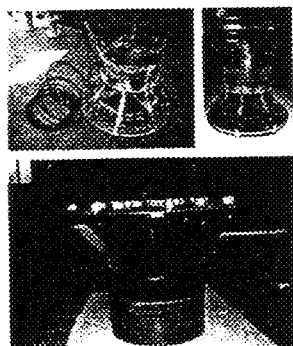


东菱公司18吨水冷电动振动台为韩国现代汽车的排气管做正弦加随机的高强度试验。

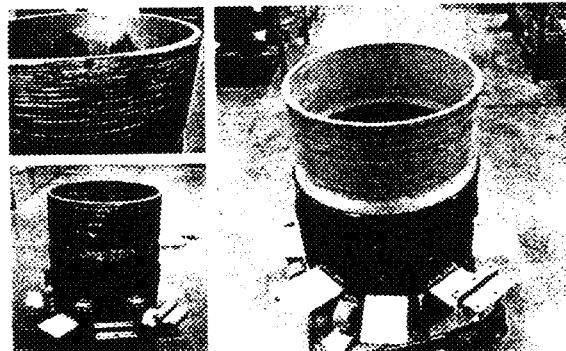


欧洲航天技术中心（欧洲航天局 European Space Technology Centre）官员、专家对东菱公司18吨电动振动台系统进行测评。

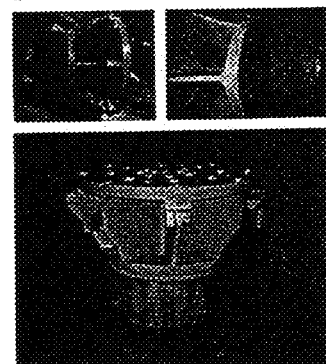
损坏的国外同行生产的动圈



损坏的国外同行生产的动圈



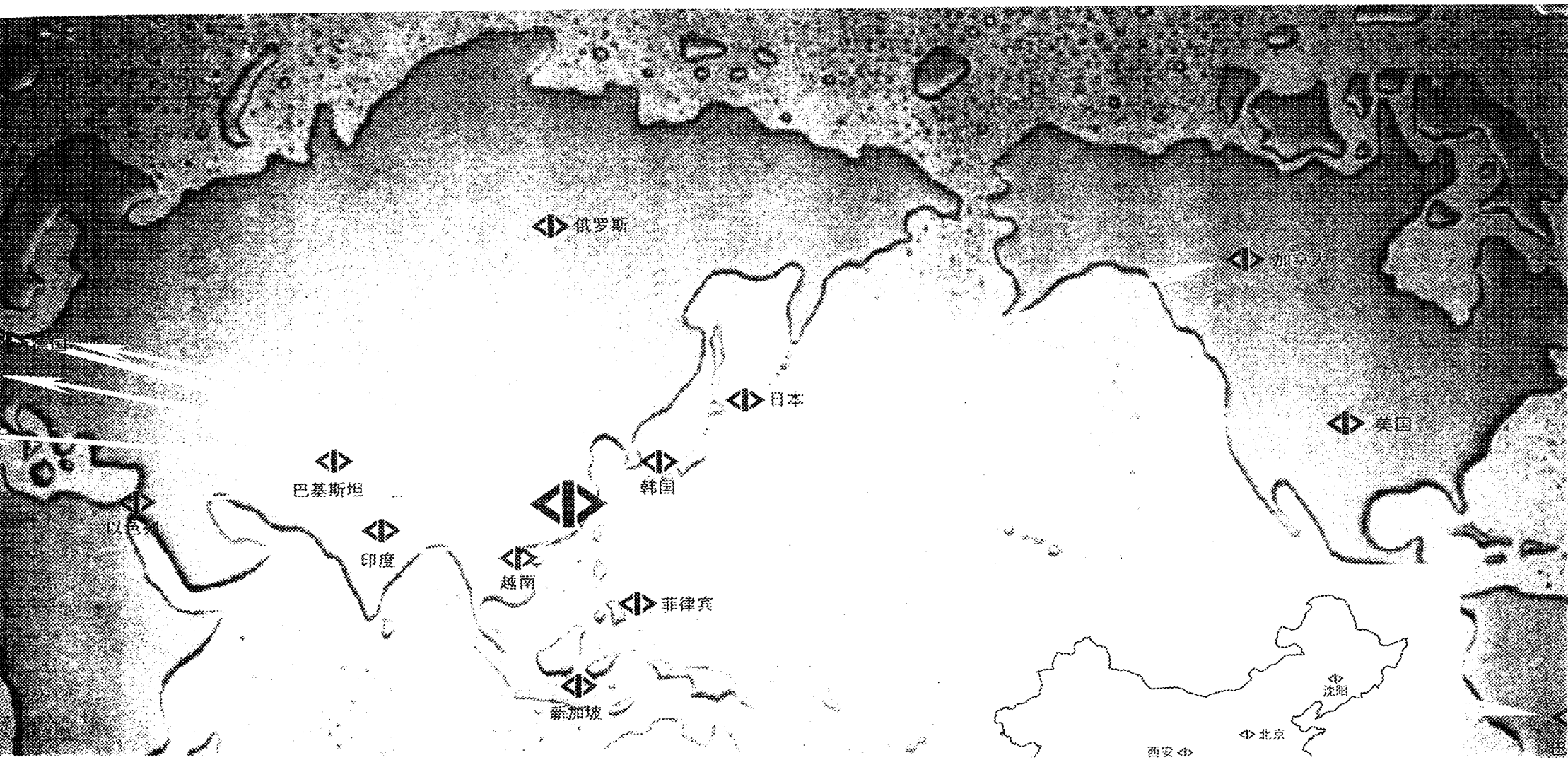
损坏的国外同行生产的动圈



从“东菱制造”振动台起，我们就致力于建立自己的销售和售后服务网络；在国内，已形成北京、西安、东莞、上海、成都等销售和售后服务体系；在国际，形成了以美国ETS公司为代表的国际代理和服务体系。

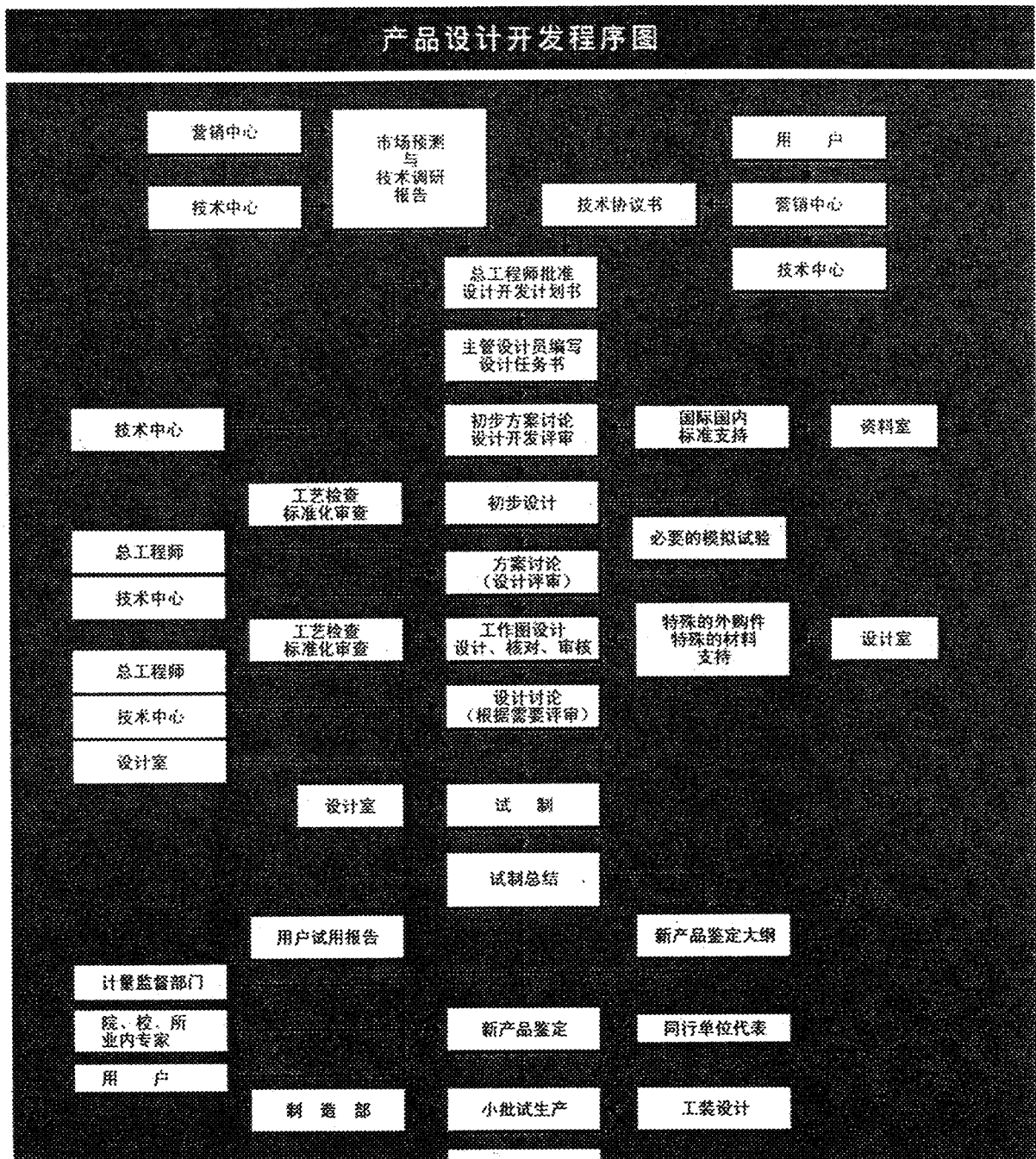
东菱公司坚持对每一个代理商进行全面系统的培训，使其具备独立进行售后服务的能力。

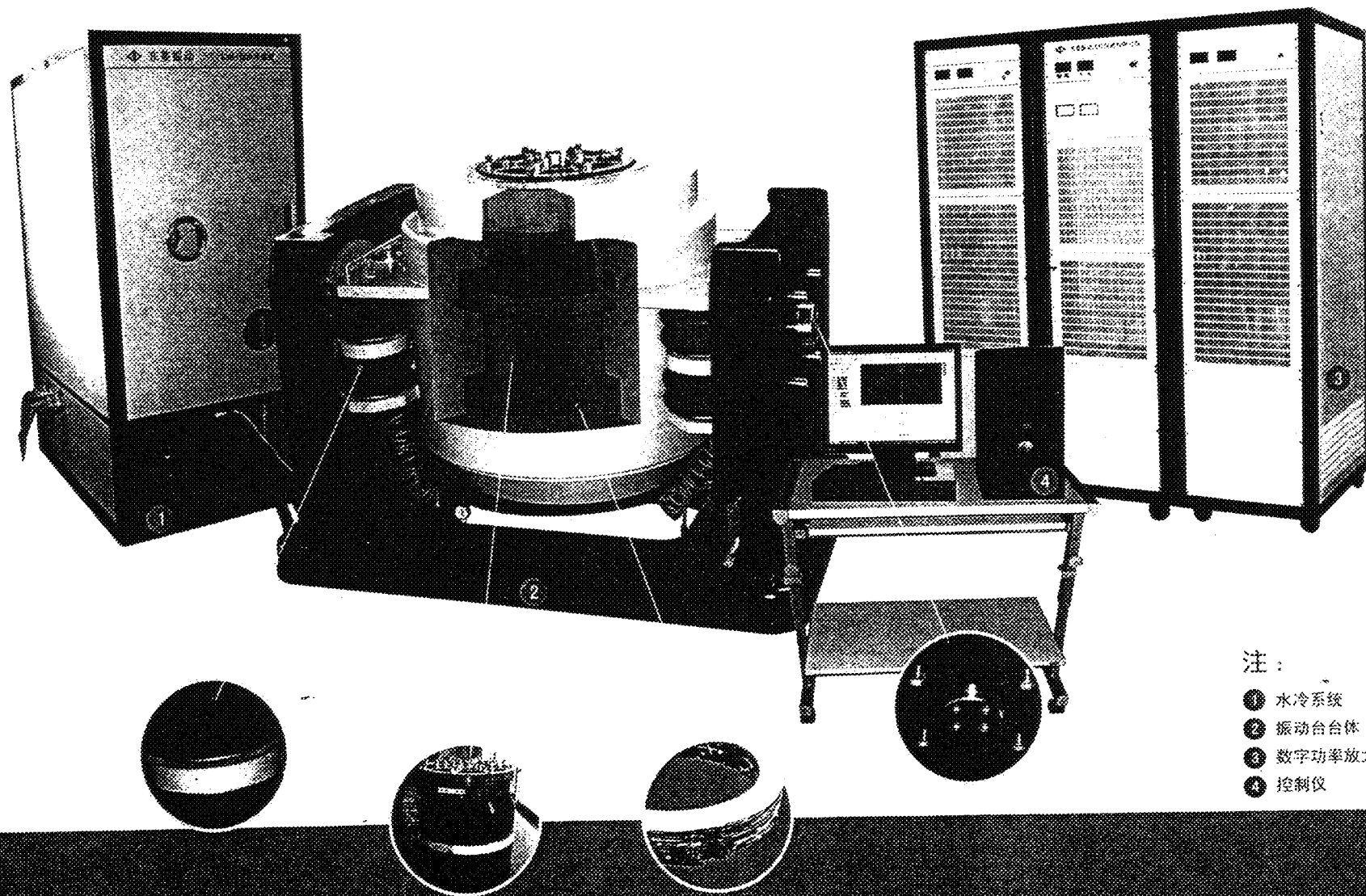
精益求精 · 通达天下



像制作艺术品一样，
精工细致地打造我们的产品

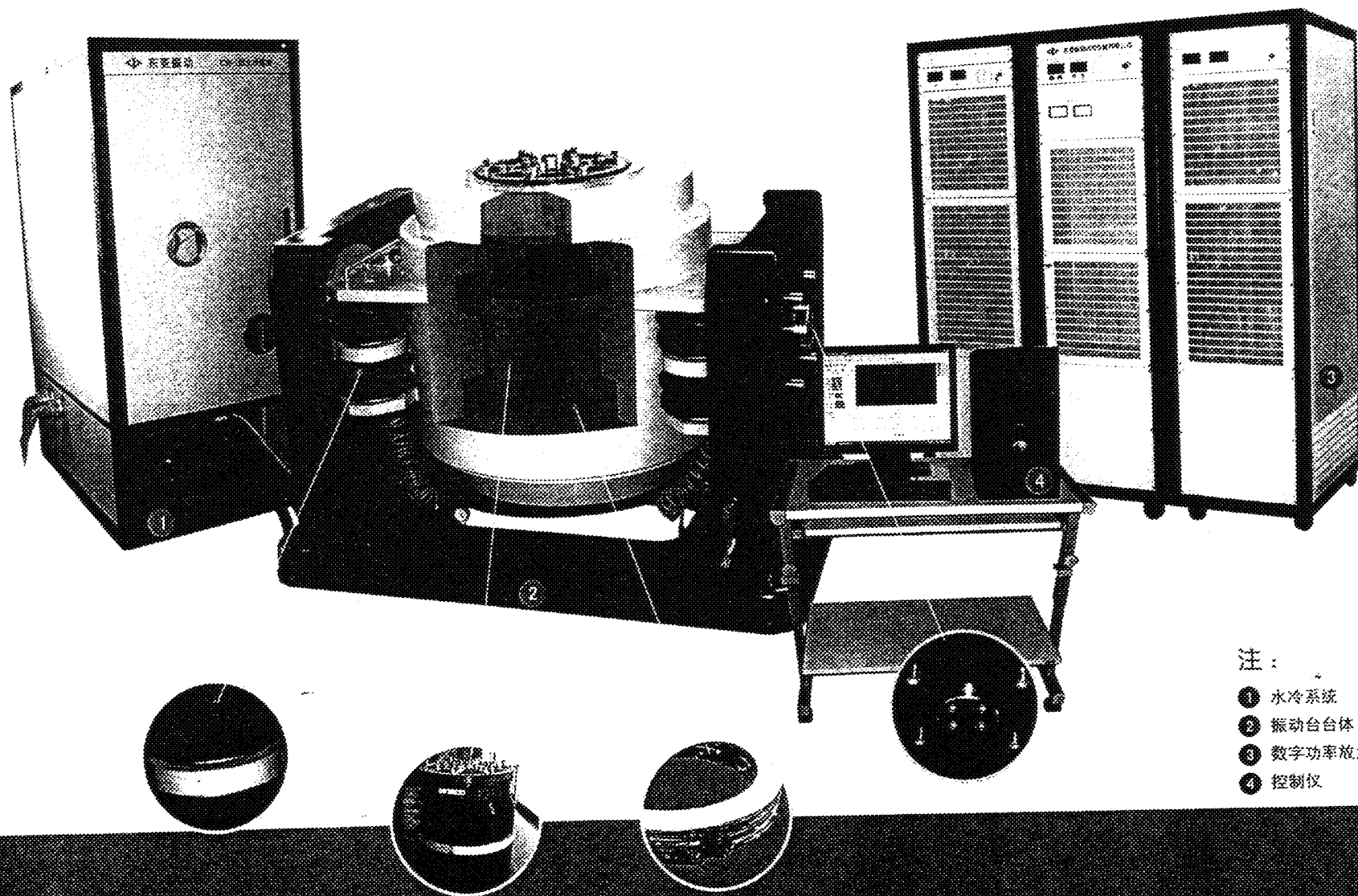
从公司成立的那天起，每一个东菱人就始终牢记着质量理念“质量是衡量我们素质的标尺”，并把它贯穿于日常工作中，落实到每个环节上。





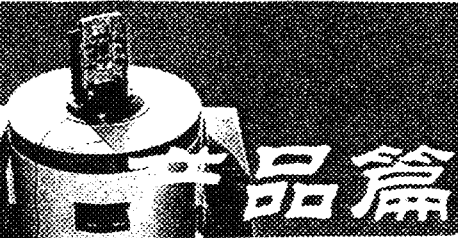
注：

- ① 水冷系统
- ② 振动台台体
- ③ 数字功率放大器
- ④ 控制仪



注：

- ① 水冷系统
- ② 振动台台体
- ③ 数字功率放大器
- ④ 控制仪



产品篇

ES 电动振动试验系统

本公司生产的电动振动系列产品，采用“双磁路结构”、“自生成骨架动圈”、“直线轴承和滚轮导向”、“耳轴隔振”现代先进技术和专用工艺，可分别完成三轴向的正弦振动试验和宽带随机振动试验，可完成经典（半正弦、梯形、后峰锯齿）脉冲和冲击响应谱试验。可配置气候箱，完成力学与气候多环境综合试验，可用于国防、兵器、航空、航天、通讯、电子、电工、交通、家电等领域产品的试验检测。根据需要，可为用户提供气候、力学等多环境的综合环境试验装置。

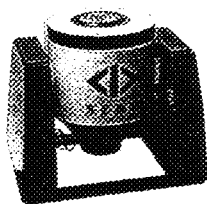
配套控制仪有 SVC、RVC、SD、Super 等系列备选。

选型指南

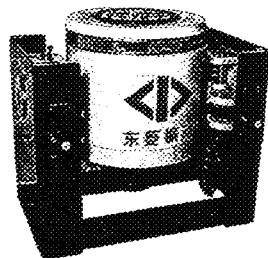
- 由于受试件重心高度、重心位置及惯性力矩和倾覆力矩的影响，建议在选择设备时推力留有一定的余量，安全系数一般为理论推力的1.2倍以上。
- 根据试验需要和可能的发展趋势选择振动控制仪器。

性能特点

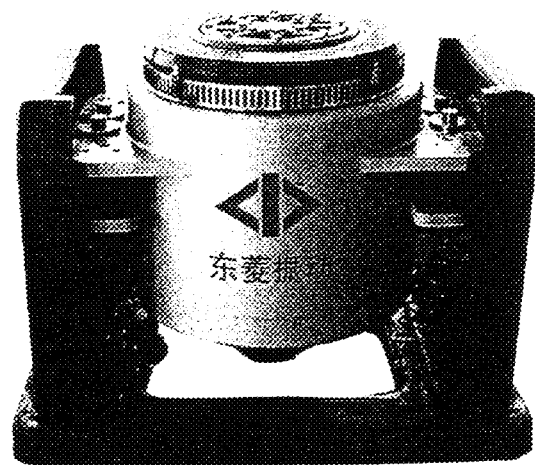
- 精心设计的动圈骨架，较高的一阶轴向共振频率；
- 双磁路，漏磁低，结构紧凑、合理；
- 复合导向机构，导向刚度大、抗偏载能力较强；
- 台体翻转机构，操作轻松方便；
- 先进的动圈绕制工艺，保证了动圈的高可靠性；
- 新型的风道设计，增强冷却效果；
- 中心承载气囊，提高振动台的承载能力，改善低频性能；
- 动圈采用航天材料加固；
- 载荷支撑光电自动对中（OPCS）装置及智能温度监控装置。



ES-3



ES-10



ES-60

产品篇

主要技术指标

参数	型号	ES-1	ES-1.5	ES-2	ES-2A	ES-3	ES-3A	ES-6	ES-6A	ES-10	ES-20	ES-30	ES-40A	ES-40B	ES-50	ES-50A	ES-60	ES-60A	ES-70
额定正弦激振力 (kgf)		100	150	200	200	300	300	600	600	1000	2000	3000	4000	4000	5000	5000	6000	6000	7000
额定随机激振力 (kgf)		100	150	200	200	300	300	600	600	1000	2000	3000	4000	4000	5000	5000	6000	6000	7000
频率范围 (Hz)		5~4500	5~4500	5~4000	2~3000	5~4000	3~3000	5~3000	2~3000	5~3000	5~3000	5~3000	5~3000	5~2800	5~2600	5~2800	5~2600	5~2800	5~2800
额定速度 (m/s)		1.2	1.2	1.6	1.4	1.6	1.4	1.6	1.4	1.8	2	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
额定加速度 (m/s ²)		400	600	800	250	1000	350	1000	500	1000	1000	1000	1000	800	1000	1000	1000	1000	850
额定位移 p-p (mm)		25	25	25	40	25	40	25	51	51	51	51	51	51	51	51	51	51	51
一阶谐振频率 (Hz)		3400	3400	3400	2700	2900	2700	3300	2800	2400	2600	2400	2400	2200	2200	2400	2200	2400	2400
最大负载 (kg)		70	70	70	140	120	140	200	300	300	300	300	500	500	1100	1100	1100	1100	1100
运动部件等效质量 (kg)		2.5	2.5	2.5	8	3	8.5	6	12	10	20	30	30	50	50	63	60	60	70
工作台面直径 (mm)		Φ150	Φ150	Φ150	Φ230	Φ150	Φ230	Φ200	Φ230	Φ240	Φ320	Φ370	Φ370	Φ440	Φ440	Φ440	Φ440	Φ440	Φ440
台体质量 (kg)		550	650	650	720	720	720	830	930	1010	1700	2400	2400	4500	4500	4500	4500	4500	4500
隔振频率 (Hz)		3	3	3	3	3	3	3	3	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
消耗功率 (kVA)		4	4.5	5.5	5.5	6.5	6.5	16	16	21	42	48	56	56	86	86	90	90	107
功放功率 (kVA)		1	2	2	2	3	3	6	6	10	20	30	40	40	50	50	60	60	70
功放尺寸	L (mm)	720	720	720	720	720	720	720	720	720	840	840	840	840	840	820	820	820	820
	W (mm)	550	550	550	550	550	550	550	550	550	560	560	560	560	590	590	590	590	590
	H (mm)	1295	1295	1295	1295	1295	1295	1295	1295	1295	1350	1750	1750	1750	1940	1940	1940	1940	1940
台体尺寸	L (mm)	694	694	694	694	694	694	780	790	790	982	1180	1290	1290	1775	1775	1775	1775	1775
	W (mm)	520	520	520	520	520	520	530	530	660	1050	1140	1140	1285	1285	1285	1285	1285	1285
	H (mm)	620	620	620	620	620	620	680	680	783	730	820	820	1130	1130	1130	1130	1130	1130

SVC、RVC、SD、Super等系列

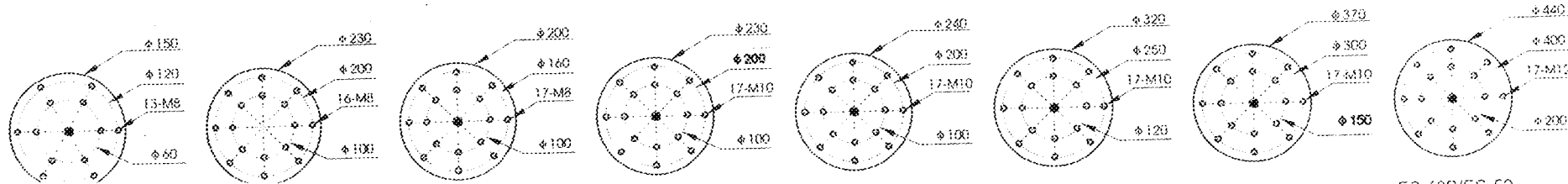
GB/T13310-1991、GB2423、10-1995、JJG190-1997、JJG948-1999、IEC68-2-64(FC)、GJB150-86、GJB360、IEC68-2-64(FH)

振动控制仪

适用标准

工作环境(℃)

温度0~40℃, 湿度≤80%(不结露)



ES 电动振动试验系统

水冷式电动振动台和风冷式电动振动台大体结构和工作原理类似，其不同之处是冷却方式不同，水冷方式具有很高的冷却效率，一般适用于大型振动台。

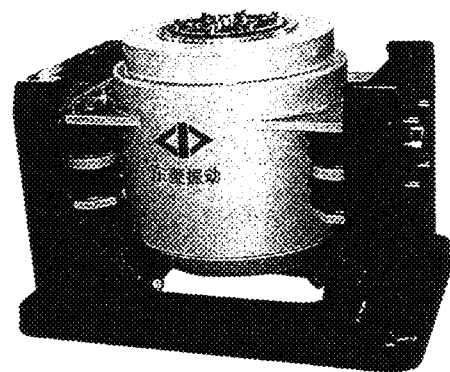
该种形式的振动台普遍应用于航空、航天、船舶、兵器、汽车等领域的较大部件和整机试验。可分别完成三轴向的正弦振动试验、宽带随机振动试验以及经典（半正弦、梯形、后峰锯齿）脉冲和冲击响应谱试验。配置气候箱，还可完成多环境综合试验。

选型指南

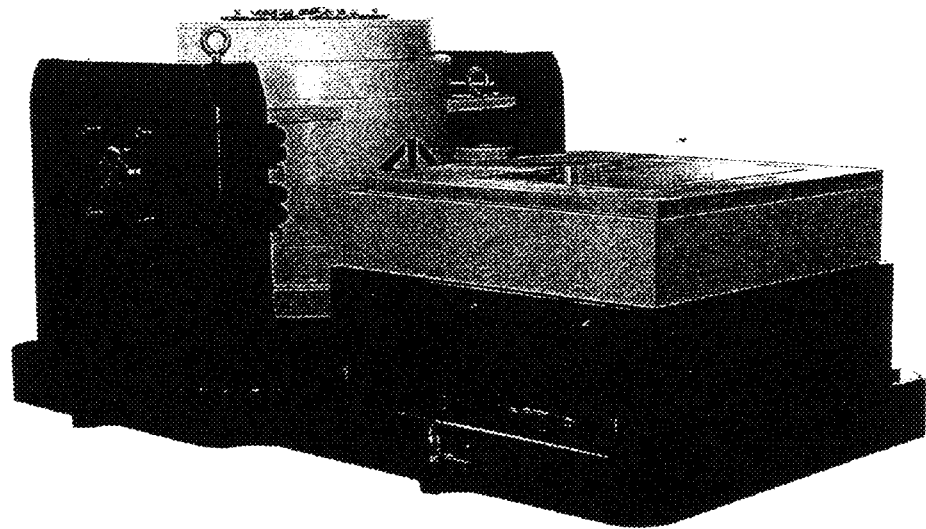
- 由于受试件重心高度、重心位置及惯性力矩和倾覆力矩的影响，建议在选购设备时推力留有一定的余量，安全系数一般为理论推力的1.2倍以上。
- 根据试验需要和可能的发展趋势选择振动控制仪器。

性能特点

- 创新了动圈的结构设计，提高了动圈的共振频率；
- 结构紧凑合理；
- 复合导向机构，导向刚度大，抗偏载能力强；
- 承载能力强；
- 力功比达1:10，正弦随机出力比1:1，冲击正弦出力比2:1；
- 先进的动圈绕制工艺，保证了动圈的高可靠性；
- 三水内冷，冷却效率高、可靠性好；
- 光电自动对中（OPCS）装置及智能温度监控装置。



ES-120



产品管

主要技术指标

参数	型号	ES-80	ES-80A	ES-100	ES-100A	ES-120	ES-120A	ES-140	ES-140A	ES-160	ES-160A	ES-180	ES-180A	ES-200	ES-300
额定正弦激振力 (kgf)		8000	8000	10000	10000	12000	12000	14000	14000	16000	16000	18000	18000	20000	30000
额定随机激振力 (kgf)		8000	8000	10000	10000	12000	12000	14000	14000	16000	16000	18000	18000	20000	30000
频率范围 (Hz)		5~2500	5~2300	5~2500	2~2300	5~2500	5~2300	5~2200	2~2050	5~2200	5~2050	5~2200	5~2050	5~2050	5~1600
额定速度 (m/s)		2	2	2	2	2	2	2	2	2	2	2	2	2	2
额定加速度 (m/s ²)		1000	800	1200	1000	1200	1200	1000	935	1000	1000	1000	1000	1000	1000
额定位移p~p (mm)		51	51	51	51	51	51	51	51	51	51	51	51	51	51
一阶谐振频率 (Hz)		2100	1900	2100	1900	2100	1900	1900	1650	1800	1650	1800	1650	1650	1300
最大负载 (kg)		1300	2500	1600	2500	1600	2500	1600	2500	1600	2500	1600	2500	1600	4000
横向刚度 (N/mm)		20000	20000	20000	20000	20000	20000	25000	25000	25000	25000	25000	25000	25000	32000
轴向悬挂刚度 (N/mm)		80	80	80	80	80	80	120	120	120	120	120	120	120	180
运动部件等效质量 (kg)		80	100	80	100	80	100	140	150	140	150	140	150	150	280
工作台面直径 (mm)		Φ480	Φ850	Φ480	Φ650	Φ480	Φ650	Φ590	Φ650	Φ590	Φ650	Φ590	Φ650	Φ650	Φ770
台面质量 (kg)		7300	7300	7300	7300	7300	7300	11000	11000	11000	11000	11000	11000	11000	21000
隔振频率 (Hz)		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
消耗功率 (kVA)		140	140	160	160	180	180	200	200	230	230	250	250	280	420
功放尺寸	L (mm)	1770	1770	1770	1770	1770	1770	2360	2360	2360	2360	2360	2360	2950	3540
	W (mm)	820	820	820	820	820	820	820	820	820	820	820	820	820	820
	H (mm)	1920	1920	1920	1920	1920	1920	1920	1920	1920	1920	1920	1920	1920	1920
台面尺寸	L (mm)	1930	1930	1930	1930	1930	1930	2100	2100	2100	2100	2100	2100	2100	2630
	W (mm)	1280	1280	1280	1280	1280	1280	1430	1430	1430	1430	1430	1430	1430	1800
	H (mm)	1360	1360	1360	1360	1360	1360	1520	1520	1520	1520	1520	1520	1520	1910

振动控制仪

适用标准

工作环境

SVC、RVC、SD、Super等系列

GB/T13310-1991、GB2423、10-1995、JJG190-1997、JJG948-1999、IEC68-2-64(FC)、GJB150-86、GJB360、IEC68-2-64(FH)

温度5~35℃，湿度≤80%（不结露）

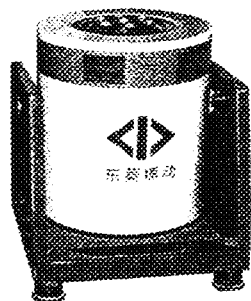
* 根据需要，工作频率可以从1Hz开始。

新品研发中

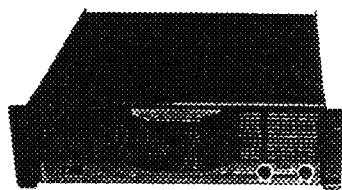


产品篇

ESS/ESD 标准振动台/激振器



ESS-015



PA-1200

标准振动台主要技术指标

参数	型号	标准振动台	
		ESS-015	ESS-025
额定正弦激振率 (N)		150	250
频率范围 (Hz)		5~10000	5~6000
最大加速度 (m/s ²)		200	300
最大速度 (m/s)		1.2	1.2
最大位移 p~p (mm)		6	10
最大负载 (kg)		2	2.5
运动部件质量 (kg)		0.75	1.25
一阶谐振频率 (Hz)		7000	5800
工作台面尺寸 (mm)		Φ90	Φ90
消耗功率 (VA)		250	300
台体尺寸	L (mm)	320	320
	W (mm)	380	320

永磁式小型电动振动台

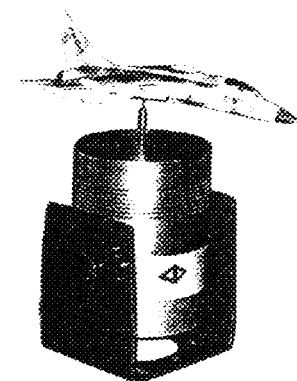
指标	型号	ESM-002	ESM-005	ESM-010	ESM-020	ESM-050
额定正弦激振率 (N)		20	50	100	200	500
额定位移 p~p (mm)		10	10	10	10	20
空载加速度 (m/s ²)		100	200	250	400	500
频率范围 (Hz)		10~4000	10~4000	10~4000	10~4000	10~3500
一阶谐振频率 (Hz)		3500	3200	3200	3100	2800
台面直径 (mm)		Φ30	Φ60	Φ80	Φ90	Φ100
动圈质量 (kg)		0.2	0.25	0.4	0.5	1.0
工作环境		温度 0~40℃, 湿度 ≤80% (不结露)				



ESM-005

激振器主要技术指标

参数	型号	激振器		
		ESD-010	ESD-020	ESD-045
额定正弦激振率 (N)		100	200	450
频率范围 (Hz)		10~4000	10~5000	5~3000
最大加速度 (m/s ²)		—	—	1000
最大速度 (m/s)		—	—	1.6
最大位移 p~p (mm)		10	10	25
最大负载 (kg)		2.5	0.7	—
运动部件质量 (kg)		0.5	0.7	0.45
消耗功率 (VA)		100	200	500
台体尺寸	L (mm)	180	200	239
	W (mm)	185	210	152
	H (mm)	215	240	220
适用标准		GJB150.16-86		



ESD-020

CS 系列综合环境试验系统

CS系列综合环境试验系统是为完成有关温度、湿度、气压和振动的综合试验要求而特殊设计的，设计时充分考虑了不同工况的要求，广泛应用于产生快速温度变化的综合环境的可靠性试验、鉴定试验和应力筛选试验等。产品满足标准：JJG-298-82。

性能特点

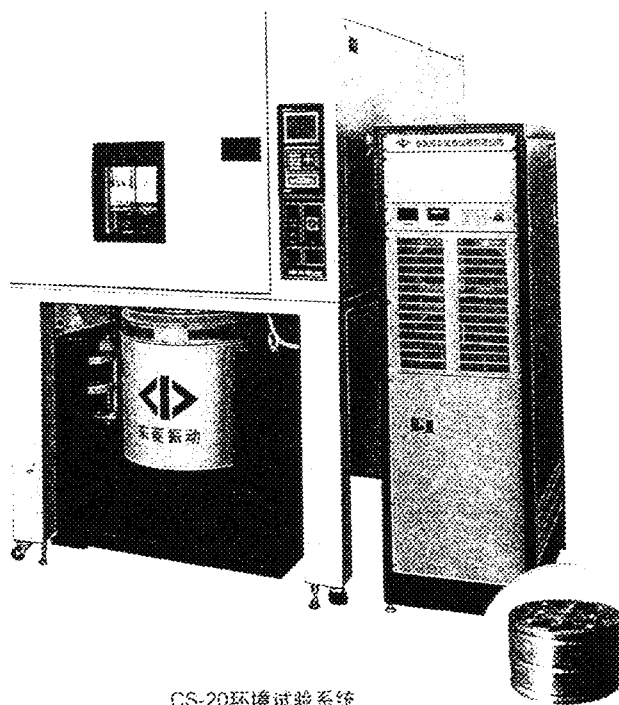
- 双重制冷系统，制冷性能优越；
- 计算机动态监视试验箱的操作系统，并在断电恢复后自动启动，从而减少了停机时间；
- 振动、温度、湿度、气压等综合环境的作用帮助您尽快发现产品的缺陷；
- 先进的触屏控制器，方便编辑程序；
- 可拆卸的试验箱底板设计，与各种电动振动台配套连接；
- 隔热处理的多层观察窗，视野开阔。

主要技术参数

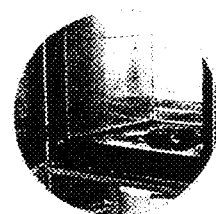
- 气候箱容积：225~10000L
- 湿度范围：20~98% R.H
- 温度范围：-70~200℃
- 配套振动台：ES全系列

产品用途

- 综合环境可靠性试验
可以将湿热环境、气压环境和振动环境结合起来；
- 可靠性增长试验
在设计阶段，可用于创造旨在暴露设计问题的多种试验环境；
- 可配置多种型号的压缩机组，既可用于单台也可用于多台试验；
- 可靠性鉴定试验（RQT）；
- 产品可靠性验收试验（PRAT）；
- 例行试验；
- 应力筛选（ESS）试验；
- 为了确保综合系统实现最优性能，我们设计制造了整套综合环境试验系统。用户不必再花费大量时间、精力和经费去拼接一个综合系统。



CS-20环境试验系统



产品篇

LT 水平台



水平台是电动振动台实现三向振动试验的一种型式，它分为联体式 and 分体式。一般情况下，选择联体式有助于整体刚性，方便安装。本公司的LT整体式水平台已获得国家专利，一般不需专用地基。

LT水平台由水平台面、V型导轨、连接头、花岗岩平板、水平台基座、内置式静压油源所组成。

水平台面的面积、厚度决定活动系统的质量，也会影响台面的上限频率，以下列出的台面指标，属本公司标准产品，如有特殊要求，可商议。

配置LT水平台的振动系统可实现航天、航空、船舶、汽车、电子等部件或整机完成二维、三维方向的振动试验。也可以配合温、湿试验箱形成复合环境试验系统。

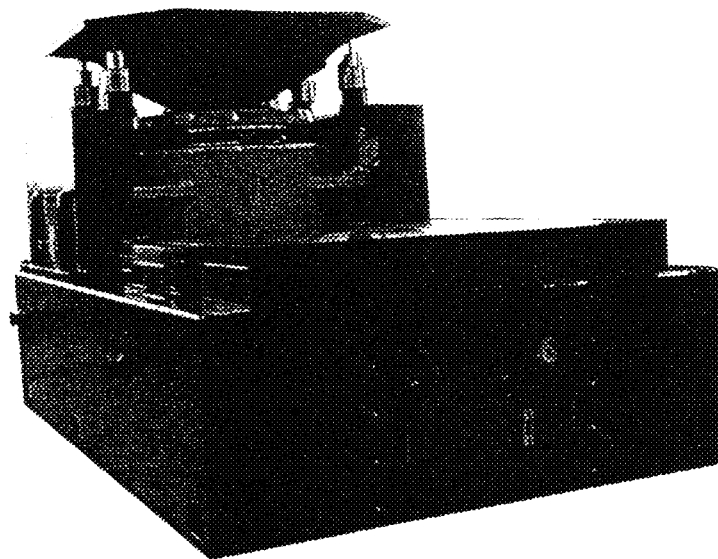
适用标准：JB/T 6869-93

性能特点

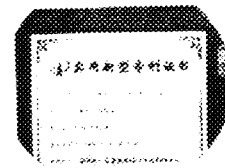
- 以较小的载体（台面）质量实现较大的加速度和较高的工作频率，提高整体负载能力及性能；
- 与振动台一体设计（整体式），刚度好，安装调试方便；
- 采用V形导轨进行导向；
- 内置式供油泵，结构紧凑、操作方便。

选型指南

- 选择水平台，需确定台面大小和水平振动的工作频率；
- 水平台与振动台连接使用，应考虑水平台台面质量及其连接头质量的影响；
- 在同等的情况下，台面尺寸变化将影响试验的各种性能及指标；
- 具体情况请参照系统选型说明；



ES-50/LT1313



水平基架专利证书

主要技术指标

型号	台面尺寸 (mm)	负载范围 (kg)	运动部件质量 (kg)
LT0303	300×300×30	5~2000	9
LT0404	400×400×30	5~2000	14.3
LT0505	500×500×30	5~2000	22.4
LT0606	600×600×30	5~2000	32
LT0707	700×700×30	5~2000	44
LT0808	800×800×40	5~2000	80
LT0909	900×900×40	5~2000	96
LT1010	1000×1000×50	5~1600	149
LT1111	1100×1100×50	5~1600	197
LT1212	1200×1200×50	5~1200	234

主体结构

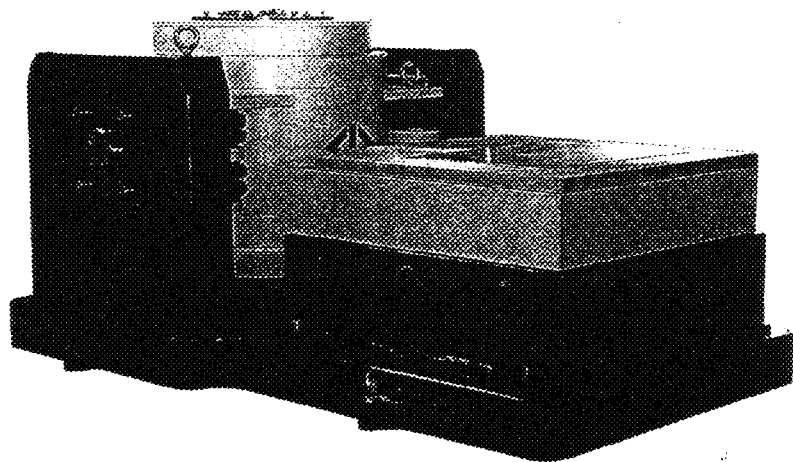
温度0~40℃，湿度≤80%（不结露）

LTB 水平台



LTB水平台和LT水平台外形相似，也是用于实现三向分别振动试验的一种电动振动台。不同之处在于，导向机构采用静压轴承，用静压轴承来限制水平台面的上下及横向运动，从而使得台体的抗倾覆力矩得到了大幅的提高。

配以LTB水平台的振动系统，适用于航空、航天、船舶、汽车、仪器、仪表等行业作三向振动试验。



ES-150/LT1212



性能特点

- 极高的承载能力；
- 极高的抗倾覆、滚动、摇摆力矩的能力；
- 技术性能好，可靠性高，摩擦力小。

选型指南

- 适用于大负载、高加速度、试件重心高的试验；
- 其他情况类似LT水平台；
- 若有特殊要求，可具体商谈；
- 静压轴承有710和810两种型号可选。

主要技术指标

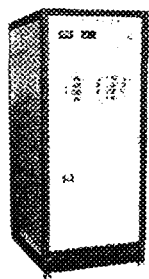
型 号	台面尺寸 (mm)	频率范围 (Hz)	运动部件质量 (kg)
LTB1010	1000×1000×50	5~2000	149
LTB1111	1100×1100×50	5~1600	197
LTB1212	1200×1200×50	5~1600	234
LTB1313	1300×1300×50	5~1200	275
LTB1414	1400×1400×60	5~1000	382
LTB1515	1500×1500×60	5~1000	439
LTB1616	1600×1600×60	5~800	500
LTB1717	1700×1700×60	5~800	564
LTB1818	1800×1800×60	5~800	632
LTB1919	1900×1900×60	5~500	704
LTB2020	2000×2000×60	5~500	781
工作环境	温度5~35℃，湿度≤80%（不结露）		

DA 数字式功率放大器

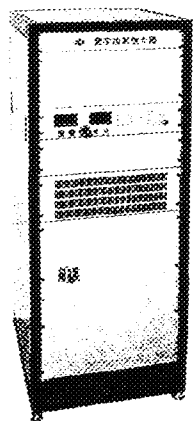
东菱振动试验仪器有限公司研制生产的 DA 系列开关功率放大器由逻辑模块和功率模块组成，具有结构紧凑、配置灵活、高效节能、稳定可靠、体积小重量轻、便于安装和维修、输出电压高、信噪比大以及操作方便等突出优点。

关键元器件全部由美国摩托罗拉公司、仙童公司、日本三菱公司等世界知名公司供货，质量稳定可靠。

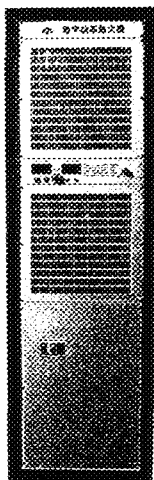
新一代数字开关功放的推出，提高了振动试验系统的技术含量，开辟了中国电动振动试验系统广阔前景，推动了电动振动系统向大功率、大激励力方向的进步；并将为发展国防和尖端科技提供可靠的保障。同时也将给我国的电动振动试验设备进军国际市场拓展了空间。



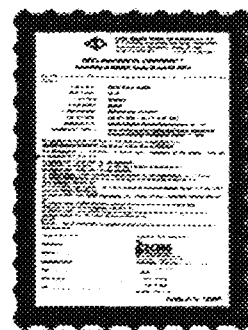
10kVA 数字功率放大器



40kVA 数字功率放大器



75kVA 数字功率放大器



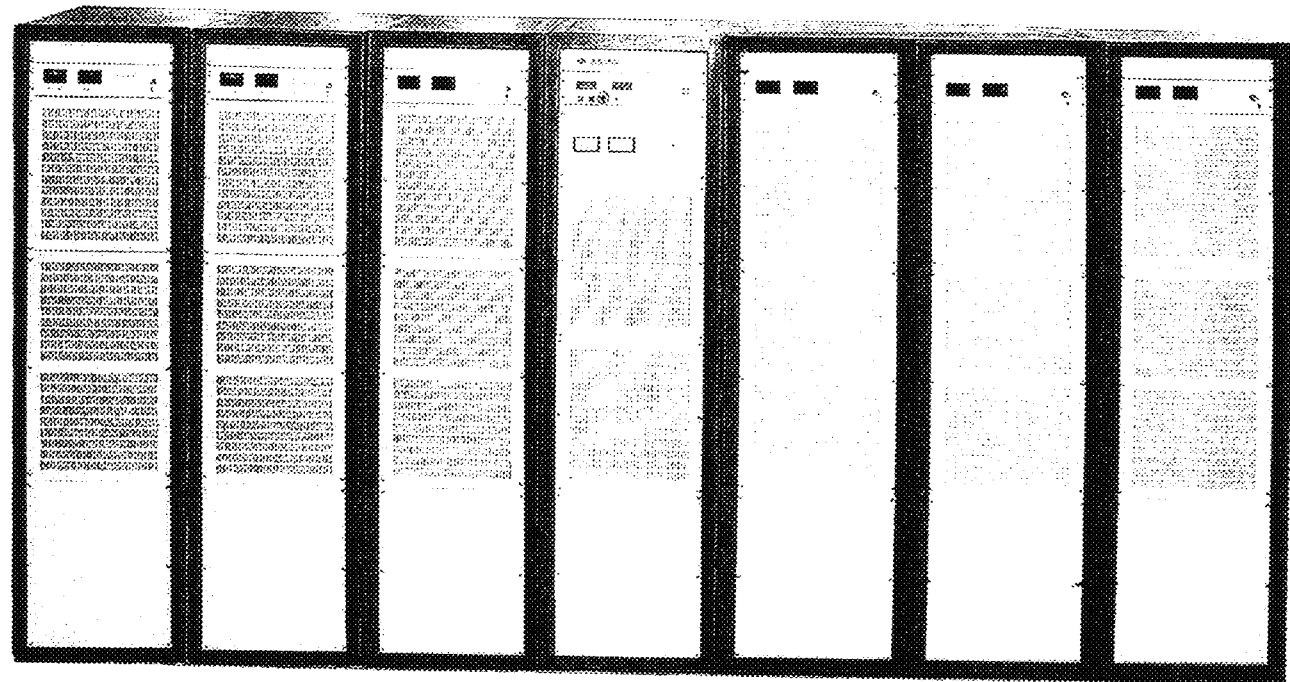
CE 认证

性能特点

- 若干个功率模块并联工作，方式灵活多变，用户可根据实际需要的容量，增减功率模块和功放电源模块即可，不必更换机架；
- 采用功率因数补偿装置，功率放大器功率因数可达92%，使电网容量得以充分利用；
- 电子自动均流技术，并联均流不平衡度 $\leq 3\%$ ；
- 采用正弦倍频脉宽调制技术，功率放大器信噪比高，波形失真小；
- 功率器件采用场效应模块（可选用IGBT模块），电流容量大，单个模组功率大于20kVA；
- 采用软开关谐振技术，转换效率高，电磁兼容性好；
- 功率模块的转换效率可达95%，功率放大器强制风冷；
- 保护功能齐全，功率放大器设置了电网过压、电网欠压、电网缺相、逻辑故障、功率模块直通、功率模块过温、输出过流、输出过压、驱动电源、台体过位移、台体过温、外部连锁等保护电路；
- 具备LCD显示和远程控制功能（可根据要求选配）。

技术指标

- 功率范围：3-480kVA
- 输出电压：100V
- 输入阻抗： $\geq 10k\Omega$
- 信噪比： $\geq 65dB$
- 谐波失真（电阻负载）： $< 1.0\%$
- 输出电压测量误差 $\leq 5\%$
- 输出电流测量误差 $\leq 5\%$
- 输出电流：以120A阶跃增加，最大可达4800A。
- 输出电流波峰系数： ≥ 3
- 直流稳定性：输出端零点漂移不大于50mv/8h
- 频响5-3500Hz： $\pm 3dB$
- 中频增益： ≥ 80
- DC/AC转换效率大于90%
- 负载性质：阻性，容性，感性任意
- 并机均流不平衡度： $\leq 3\%$
- 平均无故障工作时间（MTBF） > 3000 小时



480 kVA 数字功率放大器

产品篇

SVC 系列正弦振动控制仪

SVC系列正弦控制仪是针对电动振动试验台进行正弦试验而设计的控制测量仪器。

SVC—1的控制核心采用微处理器，信号部分采用可编程DDS产生高精度的信号，并通过高分辨率的A/D、D/A转换实现高精度的测量与控制。提供正弦扫频和定频两种工作模式，并支持开环及闭环两种控制方式。系统可实现定位移、定速度及定加速度扫频控制。采用了自动增益控制器，调节范围大、压缩平稳、工作可靠，且对振动台及功率放大器都有很好的保护作用。



SVC—1

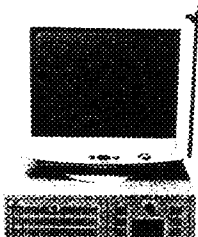


SVC—2

SVC—2在SVC—1的基础上更进一步优化了电路结构，采用全数字化模式，增强可靠性，使用友好的操作界面，使操作更为简单明了。采用液晶显示器显示控制过程中的各种数据及曲线，使用户对试验情况一目了然。同时系统新增了WDT保护，有效提高了系统的安全性。具备如下特点：液晶显示扫频曲线、试验报告打印、31个交越点、失电记忆、开机自检、误操作保护。

SVC-3 性能特点

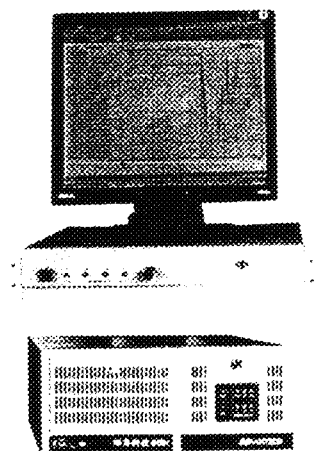
- 基于PC机控制和 Windows 操作系统；
- 人机界面友好，界面显示多元化（加速度、速度、位移、曲线都可显示）；
- 参数输入灵活，操作方便；



主要技术指标

指标	SVC—1	SVC—2	SVC—3
频率范围	2~9999Hz	5~5000Hz	2~5000Hz
频率稳定度	±0.3%Hz/8h	±(0.3%+0.3)Hz/8h	±0.1%Hz/8h
输出电压RMS	3V (在压缩控制时为7V)	5V	7V
输出波形	正弦波	正弦波	正弦波
非线性失真度	≤1%	≤1% (满输出)	≤0.5% (满输出)
频率响应	≤0.5dB	≤1dB	≤1dB
输出阻抗		≤100Ω	
动态范围	≥80dB	≥60dB	≥80dB
控制精度	0.5dB	1dB	0.5dB
扫频方式		指数、线性	
单程扫频时间 (min)		0.01~99.99	
定时范围 (min)	0.1~9999	1~999	0.01~9999
时间精度	≤0.01%	≤0.01%	≤0.01%
测量范围	加速度: 0.1~3000m/s ² (2Hz~5000Hz) 速度: 0.1~100cm/s (2Hz~500Hz) 位移p~p (mm): 0.1~100mm (2~85Hz)	加速度: 0.1~5000m/s ² 速度: 0.1~500cm/s 位移p (mm): 0.1~50mm	加速度: 0.05~10000m/s ² 速度: 0.1~300cm/s 位移p (mm): 0.1~100mm
测量精度	≤5%	≤5%	≤5%
测振频率	2~9999Hz±0.5dB	5~5000Hz±1dB	2~5000Hz±1dB
参数设定	加速度、速度、位移任意，三个交越点，四段控制振级	加速度、速度、位移任意，31个交越点，交越频率可自动计算	加速度、速度、位移任意，32个交越点，交越频率
消耗功率	AC220V/±10%50Hz/80W	AC220V/±10%50Hz/50W	AC220V/±10%50Hz/260W

RVC 系列振动控制仪



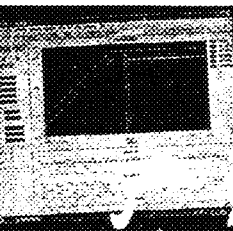
RVC-2

本公司开发的RVC-2振动控制仪能够较好地实现正弦、随机、冲击试验并具备正弦加随机、随机加随机、扫频驻留等功能，从而全面拓宽了振动试验的应用价值。此外该仪器还能满足客户对实录谱的控制要求（只需对实录谱进行数理统计并整理加工形成包络线即可输入）。

该系统主要包括智能接口、数据采集和低通滤波器三大部分。

主要技术指标

名称	型号	RVC-2	RVC-2A
	控制点数	1~4点	1点
	测量点数	1~7点	1~2点
	频率范围	2~5000Hz	
	频率示值误差	F<100Hz时误差在±1Hz; f>100Hz时误差≤±1%	
	控制回路时间	120m/s	200ms
	传感器灵敏度	1.00~9.99pc/ms ²	
	负载阻抗	≥1KΩ	
	输出电压RMS	5V	5V
正弦 振动 控制	波形失真度	≤0.5%	≤0.5%
	扫频方式	对数、线性、正反扫、定频、扫频驻留	
	扫频时间	0.1~100min(单程)	
	扫频精度	≤0.3%	
随机 振动 控制	谱线数	100~800线	
	动态范围	60dB	55dB
	窄带形状	相互独立	
	窄带或正弦数	0~10	
	窄带宽度	任意设定	
	冲击波形	半正弦、后峰锯齿、梯形	
冲击 控制	脉冲持续时间	0.2~50ms	
	冲击峰值加速度	10~15,000m/s ² (传感器灵敏度)	
	AD采样频率	100kdp/s	
	脉冲持续时间最小测量误差	±10us	
	工作环境	温度0~40℃, 湿度≤80%(不结露)	



SUPER系列振动控制仪

美国亿恒公司是东菱公司的OEM, SUPER系列振动控制仪(目前已推出SUPER-2、SUPER-8型号)是亿恒公司最新产品。它是基于双DSP结构的高性能振动控制仪,控制软件运行在Windows 2000/XP/NT下,PC软件负责用户参数设置、运行控制,以及显示等,闭环控制由控制箱内的DSP实现,真正实现了Windows多任务机制,用户操作方便。

合理的分布式和低噪声设计技术保证了系统具有高的控制动态范围和控制精度。SUPER振动控制仪实现了随机振动控制、正弦振动控制、典型冲击振动控制等控制功能。

SUPER系列振动控制仪设计上采用国际上最先进的分布式系统结构体系,其核心采用TI公司最新32位浮点TMS320C6000系列DSP处理器。系统采用低噪声设计技术、浮点数字滤波技术和24位分辨率的ADC/DAC转换。振动控制采用自适应控制算法,将振动控制系统技术性能提高到一个新的水平。

性能特点

- 性能价格比和可靠性高;
- 控制精度高、动态范围宽;
- 完善的自检和保护功能;
- 输入方式灵活多样;
- 基于Win2000/XP的应用软件,操作简便;
- 自动生成Microsoft Word试验报告;

SUPER-2 技术指标

1、控制性能指标
 随机性能指标
 动态范围: 85dB
 控制精度: ± 1 dB
 闭环时间: 100ms (典型值)
 频率范围: 从 0~4800Hz
 分辨率: 最大1600线

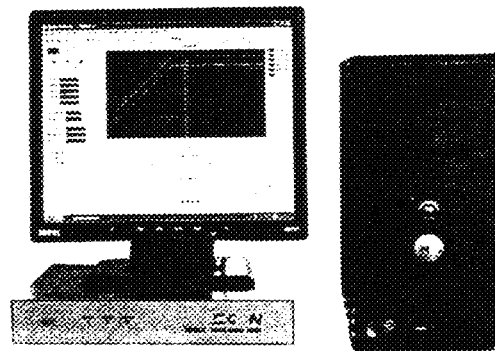
正弦性能指标
 动态范围: 95dB
 闭环时间: 10ms
 波形失真度: $< 0.3\%$
 信噪比大于100 dB
 频率范围: 1~5000Hz
 扫频速率: 线性扫频0~6000Hz/min;
 对数扫频0~100 Oct/min

典型冲击控制
 动态范围: 90dB
 脉冲持续时间: 0.5~3000ms
 频率范围: 0~21000Hz
 补偿方法: 前后脉冲补偿、
 前脉冲补偿、后脉冲补偿
 脉冲类型: 半正弦、前峰锯齿波、后峰锯齿波、
 三角波、矩形、梯形、钟型波

2. 硬件性能指标

输入
 通道数: 2个同步输入通道
 电压范围: ± 10 V的峰值电压
 分辨率: 24位模数转换(ADC)
 输入阻抗: 大于220 k Ω
 动态范围: 120dB
 信号调理: 内置了ICP恒流源和电荷放大器
 信噪比: 大于100dB

输出
 通道数: 1通道
 分辨率: 24位数模转换(DAC)
 电压范围: ± 10 V的峰值电压
 动态范围: 大于110dB



SUPER-2

SUPER-8 技术指标

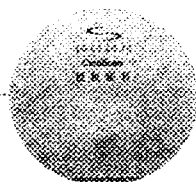
输出阻抗: 30

—输入
 通道数: 4个同步输入通道,可扩展至8通道输入
 电压范围: ± 10 V的峰值电压
 分辨率: 24位模数转换(ADC)
 输入阻抗: 220 k
 电路特性: 每通道独立的模拟滤波器+160dB
 数字滤波器消除非线性相位与混叠
 动态范围: 120dB
 信号调理: 电压或电荷输入,
 内置了ICP恒流源和电荷放大器
 信噪比: > 100 dB

—输出
 通道数: 2通道,一个为控制通道,一个为COLA通道
 分辨率: 24位数模转换(DAC)
 电压范围: 10V的峰值电压
 电路特性: 160dB数字滤波器+模拟滤波器
 消除非线性相变和影像
 动态范围: 大于110dB
 幅值精度: 2mV

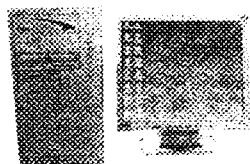
PUMA/JAGUAR

SD 振动控制仪

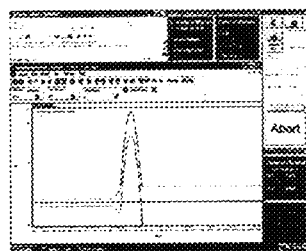


美国SD公司简介

美国SD公司 (SPECTRAL DYNAMICS) 是当今国际著名的控制、测量及相关软件的专业生产商, 总部位于美国硅谷, 其系列产品以其优越的性价比成为世界发达国家顶尖科研项目的首选。美洲豹 (PUMA) 振动控制仪系列产品是美国 SD 公司的控制仪代表产品之一, 东菱公司是该产品在中国的独家代理。

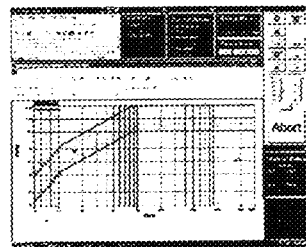


PUMA



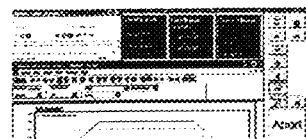
性能特点

- 数百个到数千个通道数字信号处理器同步采样, 通道间无相位差, 提供了更有效更安全的检查和更精确的测试结果, 适合大型振动试验系统;
- 动态识别并建立被控对象的数学模型实时更新控制参数, 从而实现真正的自适应控制。



美洲豹控制仪的升级

美洲豹PUMA有三个版本, Puma



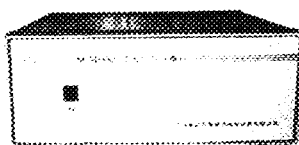
主要技术指标

参数	品牌	PUMA	JAGUAR
控制通道		4. 最大可扩展至16通道	8
测量通道		4. 最大可扩展至16通道	8 输入可扩展至500通道
输入阻抗		1MΩ	1MΩ
输出阻抗		60Ω	6Ω
输入电压范围		±10V的峰值电压	≤±35V的峰值电压
电压耦合		AC或DC	AC、DC或恒流源
控制方式		均方根、算术平均、最大值、最小值	
工作方式		PC机	工作站
动态范围		>80dB	>96dB
控制时间		<5ms	<5ms
控制精度		±1dB	±1dB
正弦		频率范围 1~5000Hz	0.1~10,000Hz
扫描速率	对数	0.1~800 Oct/min	0.3~800 Oct/min
	线性	0.003~300Hz/s	0.0003~300Hz/s
扫描方式		对数、线性	对数、线性、整数
类型		定频、扫频、扫频驻留	
动态范围		>90dB	>90dB
控制精度		≤1dB (120个自由度)	≤1dB (120个自由度)
随机		频率范围 5~5000Hz	5~10,000Hz
谱线数		100、200、400、800、1600与3200	
自由度		8~3000	8~10,000
类型		随机、正弦加随机*、随机加随机*、正弦加随机加随机*	
动态范围		90dB	90dB
加速度幅值		0.01~50,000g	0.01~100,000g
冲击		脉冲持续时间 0.1~5000ms	0.1~8000ms
频率范围		50~1kHz/min	25~1kHz/min
容差类型		MIL-STD-810或用户自定义	
冲击波形		半正弦、前峰锯齿、后峰锯齿、三角波、矩形、梯形或自定义	
数据处理		每1秒至999秒自动储存, 历史数据回放, 运行日志清晰	

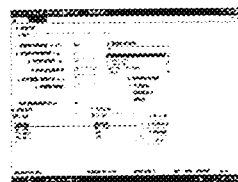
SCM系列冲击控制测量仪

SCM系列冲击控制测量仪是本公司最新开发的冲击、碰撞测量控制仪器。该系统根据本公司多年从事冲击、碰撞试验系统的研发、生产所积累的丰富经验，同时吸收了国内外多种测量仪器的优点设计而成的，能够对试验数据进行多种处理、统计，使得试验数据更为准确、详细、全面，从而使用户能够监控试验的细节，得到更为完整、系统的试验数据，并最终得到多种试验的统计分析报告。

软件系统工作于Windows98/2000/XP平台、DAO数据引擎，可以直接对试验台进行控制，以达到更佳的系统性能。



SCM控制箱



技术指标

- 控制精度：±3%；
- 测量精度：优于±3%；
- 脉冲持续时间：0.1~100ms（预置、自动）；
- 峰值加速度：50~500000m/s²（预置、自动）；
- 冲击波形：半正弦波、后峰锯齿波、梯形波；
- 满足标准：IEC68-2-27、GJB150、GJB360、GJB1217、JJG497-2000。

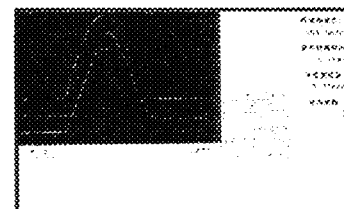
系统特性

控制部分特性：

- 脱机及联机（上位计算机控制）两种控制方式；
- 开机自检，工作日志保存；
- 提供反弹控制，无二次冲击；
- 系统提供报警功能；
- 数字控制冲击高度，精度高，重复性好；

测量部分特性：

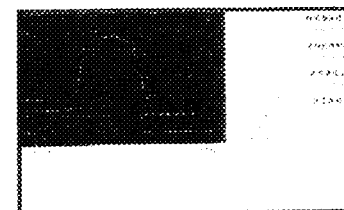
- 高速数据采集，自动增益调整，FIR数字无级滤波；
- Windows操作界面，DAO数据引擎；
- 冲击碰撞测量；
- 报表输出、自动容差带对准、自动跟踪冲击脉宽、历史数据查询、试验设置保存；
- 全部试验过程进行记录、保存，便于对试验进行监视；
- 全波形实时监视，提供从冲击前5D至冲击后10D的完整波形细节。



半正弦波形图



后峰锯齿波形图

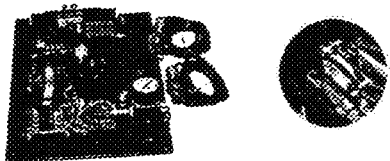


梯形波形图

选件/夹具系列

选件

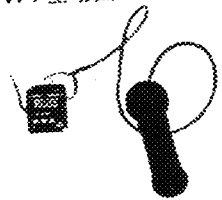
PEC型光电自动对中装置



电动振动台动圈装置自动平衡装置简称自动对中装置 (OPCS), 用于自动调整动圈平衡位置, 能够实现平衡位置的动态自动对中。

光电自动对中装置克服了电动振动台的磁场干扰, 并能够适用于各种不同位移的电动振动台。

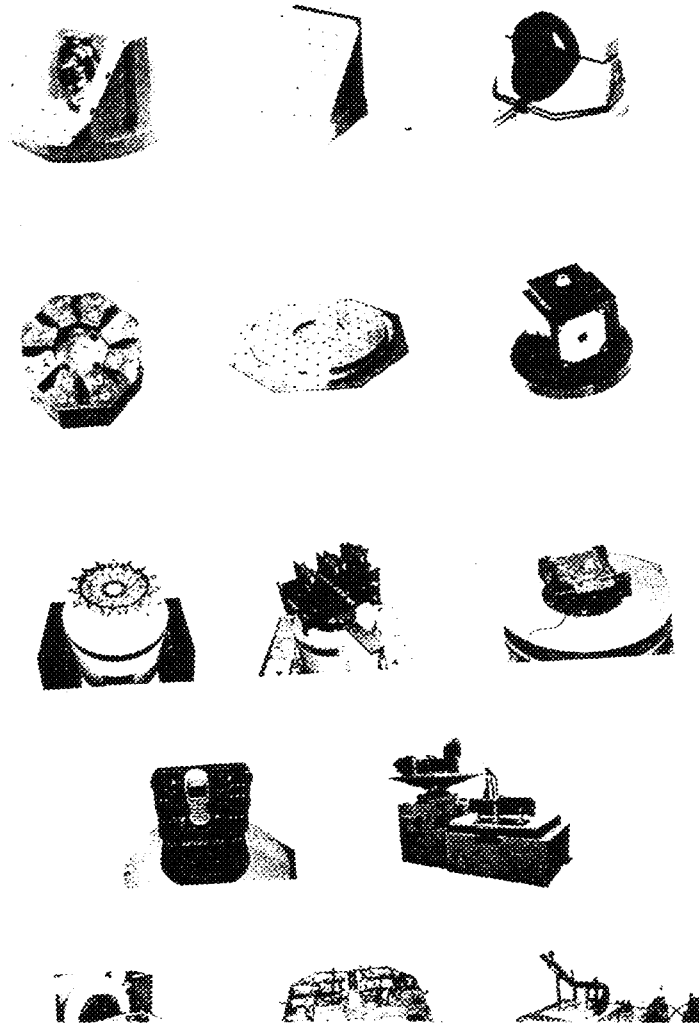
RMT型动圈智能温度监控装置



特点:

- 智能温度监控;
- 机电一体化设计, 稳定工作于电磁场等恶劣环境;
- 非接触式探测, 精度高、可靠性好;
- 微电脑数据处理, 量程显示与报警限任意设定。

夹具系列



产品篇

特 殊 产 品

4英寸大位移电动台

ES-40LS



性能特点

大位移、大台面、频率范围宽、滚轮导向，定位精度高，维修调节方便。

相对于同类产品的优势

动圈台面直径大；
位移量国内最大；
载荷动态平衡支撑。

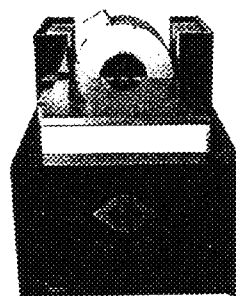
主要应用领域

航空、航天、汽车、船舶、兵器、机械、仪器仪表等领域。

主要技术指标

最大正弦激振力：40 (kN)
最大随机激振力：40 (kN)
频率范围：5~2500 (Hz)
最大加速度：800m/s²
最大速度：1.8m/s
最大位移 (P~P)：100mm
工作台面直径：Φ408

无油水平台



性能特点

直线运动精度稳定、可靠；承载能力和偏载能力强、性能稳定、性能指标高、使用方便。

相对于同类产品的优势

采用优质导轨、花岗岩平板、无油自润滑，工作场所无油污染。

主要应用领域

航空、航天、汽车、船舶、兵器、机械、仪器仪表等领域。

注：适用于台面大于600×600的水平台

无耳轴型振动台



性能特点

适合低工位使用，或与小型环境试验箱配用。

相对于同类产品的优势

无耳轴，体积小，重心低。

主要应用领域

航空、航天、汽车、船舶、兵器、机械、仪器仪表等领域。

注：根据用户要求，本公司电动台均可改成无耳轴型电动台。

内置风机式电动台



性能特点

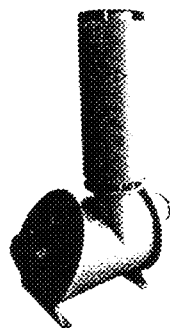
体积小、精巧、简洁。

主要应用领域

应用于小型零件、部件、整机的振动试验。

注：内置风机适用于推力在500N以下的电动台。

LN系列低噪音风机



性能特点

- 体积小、效率高；
- 噪声低（ $\leq 75\text{dB}$ ）；
- 结构紧凑、美观。

主要应用领域

可与各型风冷式电动振动台配套。

HS-50型电液式振动试验系统

HS-50型电液式振动试验系统是最新研发的产品，优秀的结构设计，可靠的工作性能是您的最佳选择。系统由控制仪、伺服放大器、液压泵站等部分组成，分为垂直振动和水平振动两种形式。

适用于汽车、船舶、军工以及高校进行振动试验与力学性能等试验。

性能特点

- 优异的低频工作性能，最低可至 0.5Hz ；
- 工作可靠、安全；
- 适用范围广。

主要技术指标

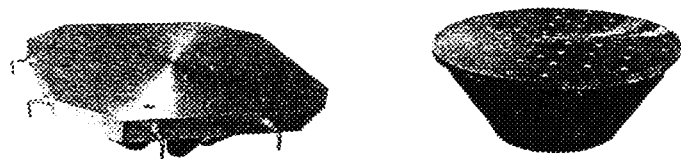
- 1、最大负载（kg）：3000
- 2、最大加速度（ m/s^2 ）：50
- 3、最大速度（ cm/s ）：40
- 4、最大位移（ $P-P_{\text{min}}$ ）：50
- 5、工作频率范围（Hz）：0.5~120（垂直）
0.5~100（水平）
- 6、台面尺寸（mm）：铝合金台面 800×800
- 7、振动方向：垂直、水平

液缸泵站参数

- 1、油压：21Mpa
- 2、泵站流量：110L/min
- 3、电动机功率：55kW

VT 扩展台

在实际振动试验时，试件或夹具往往会大于电动台动圈台面，这时就需要对原来的台面进行扩展，常用办法是安装一个辅助台面。有些试件需要特殊的安装，这就需要定制有定制的夹具来满足这种要求。上述两种情况都要满足一定的技术规范，如工作频率、台面重量、台面加速度、幅值均匀度和横向等，因此对这类台面或夹具都有较严格的要求。VT扩展台面及本公司制作的专用夹具，经过精确计算，精心设计，从结构、材料、制作工艺上保证获得用户所需的最优性能。



VT扩展台面

选型指南

振动台扩展台面有一些基本规格可供选择，更多的则是按实际使用要求定制。选型时，既要满足试品装夹要求，又要满足试验规范要求。要避免台面越大越好或指标越高越好，因为它会直接影响振动推力的大小，间接影响性能价格比。

性能特点

VT扩展台面及专用夹具，经过有限元计算、模态分析，从结构、材料、制作工艺上保证了产品质量。

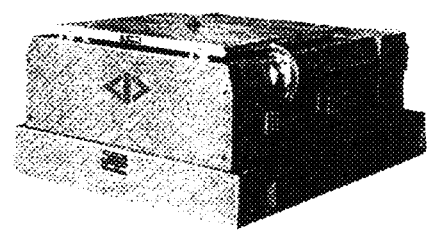


型号	参数	重量 (kg)	上限频率 (Hz)	台面尺寸 (mm)
VT300 (镁)		3.0	2000	φ 300
VT400 (镁)		6.5	2000	φ 400
VT500 (镁)		7.5	1200	φ 500
VT500 (镁)		27.0	2000	φ 500
VT600 (镁)		24.0	1000	φ 600
VT600 (镁)		48.0	2000	φ 600
VT800		52.0	1200	φ 800
VT1000		75.0	1000	φ 1000
VT0303		8.6	2000	300x300
VT0404		7.0	1500	400x400
VT0404		11.5	2000	400x400
VT0505		14.0	1000	500x500
VT0505		26.0	2000	500x500
VT0606		25.0	1000	600x600
VT0606		54.0	2000	600x600
VT0707		32.0	1000	700x700
VT0808		45.0	900	800x800
VT0808		84.0	1700	800x800
VT1010		83.0	650	1000x1000
VT1212 (镁)		105.0	350	1200x1200
VT1313 (镁)		132.0	300	1300x1300
VT1515 (镁)		180.0	200	1500x1500

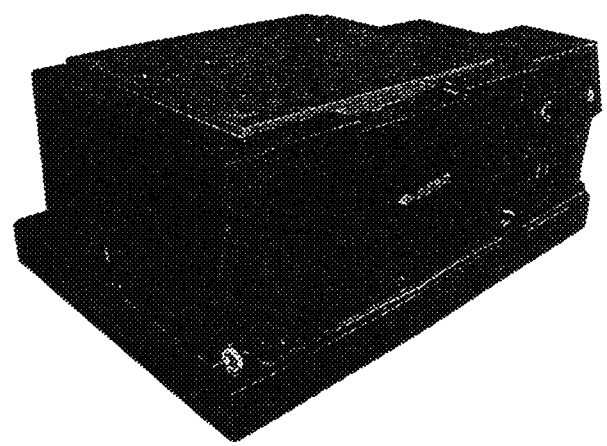
MS 机械振动试验系统/振动器

MS系列机械振动试验台系统，适用于试验室中做垂直，水平振动试验，并可自动扫频，是对电子产品、元件、组件、机电产品、仪器仪表等进行振动试验的力学环境试验设备。

适用于电子产品、元件、组件、机电产品、仪器仪表等进行低频振动试验。按照国家标准和国军标进行低频振动试验。模拟在实际工况中所经受的振动。寻找共振频率、作耐振和可靠性试验。



MS-100



MS-250

性能特点

- 无级调整激振机构以调节振幅大小；
- 导向、对称精度以保证精度指标；
- 连续无级改变振动频率；
- 光电测速反馈，提高控制精度；
- 零信号、飞车保护。

选型指南

- 根据试件的重量（包括夹具），选择相应负载能力的振动台；
- 在试验频率范围中选择适合试验要求的型号；
- 根据试件的振动要求，可选购不同功能的设备，例如垂直、水平、定频、调频、振幅大小。

主要技术指标

指标	型号	MS-25	MS-70	MS-100	MS-150	MHS-50	MHS-100	MHS-250	MHS-500	MHS-1000
最大负载 (kg)		25	70	100	150	50	100	250	500	1000
频率范围 (Hz)		10~80	5~60	5~60	5~60	5~80	5~80	5~80	5~80	5~60
*最大位移 p~p (mm)		10	10	10	10	10	10	5	5	5
*最大加速度 (m/s ²)		100	100	100	100	100	100	100	100	100
台面尺寸 (mm×mm)		400×400	800×700	800×700	800×700	660×550	830×650	1200×1000	1000×1800	1800×1600
振动形式		垂直、水平								
调幅方式		机械调幅					液压调幅			
消耗功率 (kVA)		1.6	5	5	5	5	5	8	12	20
适用标准		GB2423、GJB150、JJG189-97								

IF 系列工频（变频）振动器

IF 系列工频（变频）振动器适用于实验室及生产线上在垂直状态下对试件进行耐振检查及工艺试验。该振动器结构合理，工作可靠，操作简便。

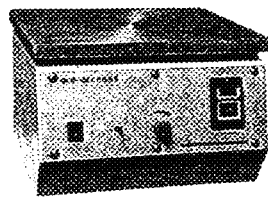
IF 工频振动器适用于电子元器件、组件、机电产品、器仪表进行振动试验。按照试验要求作相应产品的工艺试验和疲劳试验。

性能特点

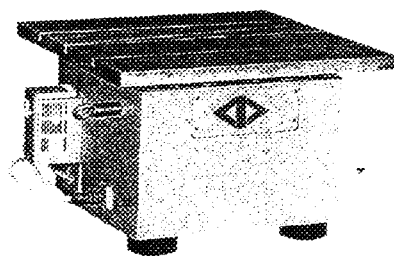
- 可实现桌面工作或轮式移动工作；
- 具备定频或变频两种机型（IF-30除外）。

选型指南

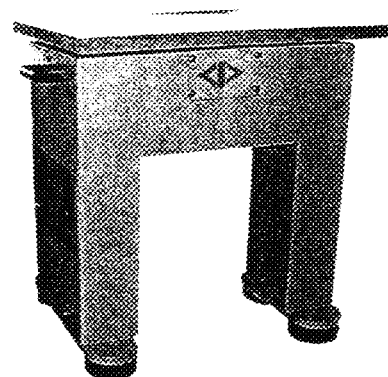
- 根据试件的重量（包括夹具），选择相应负载能力的振动台；
- 在试验频率范围中选择适合试验要求的型号；
- 根据试验要求，选购不同功能的设备。



IF-30



IF-50B



IF-70

主要技术指标

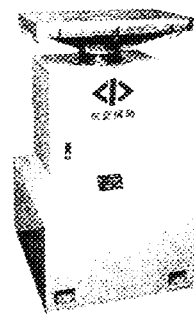
指标	型号	IF-30	IF-50	IF-50A	IF-50B	IF-50C	IF-70	IF-70A	IF-70B	IF-70C
最大负载 (kg)		30	50			70				
工作频率范围 (Hz)		50	50	30~60	50	30~60	50	30~60	50	30~60
*最大加速度 (m/s^2)		75	150							
*最大位移 p-p (mm)		1.5	2.5							
工作台面尺寸 (mm)		400×350	400×600	500×500		400×600	500×500			
激励方式		电磁式	单组离心式		双组离心式		单组离心式		双组离心式	
振动方向		垂直								
消耗功率 (kVA)		1	0.5				0.6			
电源电压 (V)		220	380	220	380	220	380	220	380	220
台体重量 (kg)		45	120							
外形尺寸	L (mm)	400	600	320		600	600			
	W (mm)	380	400	500		400	600			
	H (mm)	280	720	500		720	485			
工作环境		温度 0~40℃, 湿度 ≤80% (不结露)								

* 空载指标。

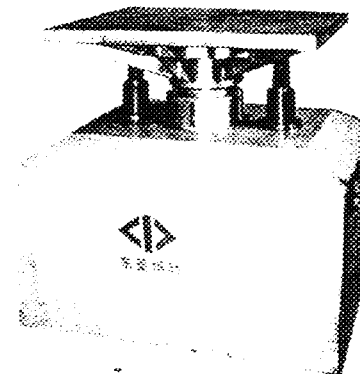
SB/B 系列冲击/碰撞试验台

SB系列冲击碰撞试验台集冲击、碰撞于一体，可用于评定被试产品在使用、装卸、运输过程中能承受的重复性机械碰撞环境下的适应性以及结构的完好性。适用于电子器件，仪器仪表及其它已包装的机电设备。

B系列仅为碰撞试验台。



SB-100



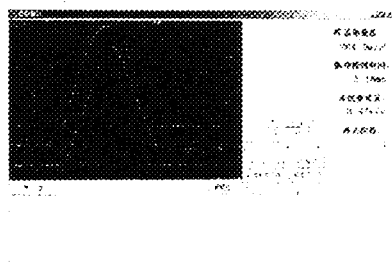
B-500

性能特点

- SB系列试验台可完成冲击碰撞两种试验；
- 光电反馈。

选型指南

根据试件重量（包括夹具）、试验参数（加速度、脉宽、频次），选择合适的试验台。



主要技术指标

项目	型号	SB-50	SB-100	B-200	B-500	B-800
最大负载 (kg)		50	100	200	500	800
峰值加速度 (m/s^2)		50~1000	50~1000	50~400	30~500	30~500
脉冲持续时间 (ms)		20~3	20~3	20~3	20~5	20~5
碰撞频次 (次/分)		10~80	10~80	10~80	10~60	10~60
最大跌落高度 (mm)		0~60	0~60	0~60	0~70	0~80
台面尺寸 (mm×mm)		500×700	500×700	500×700	800×800	1000×1000
外型尺寸	L (mm)	700	700	700	1000	1000
	W (mm)	1200	1200	1200	1900	2200
	H (mm)	900	900	900	1300	1300
台体重量 (kg)		1100	1100	1800	2800	3500
保护装置		门保护、飞车保护、零信号保护				
消耗功率 (kVA)		220V±10% 50Hz				
		2		6	8	
适用标准		GB/T2423.5-1995、GB/T2423.6-1995、IEC68-2-29、JJG497-2000、IEC68-2-27				
控制测量仪		SGM、SBC-3 (单片机)				
工作环境		温度0~40℃，湿度≤80% (不结露)				

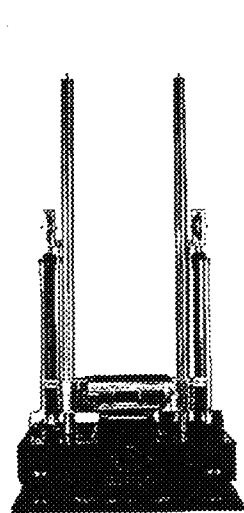
注：本表所提供的SB型的冲击加速度为空载指标。

SS 系列冲击试验系统

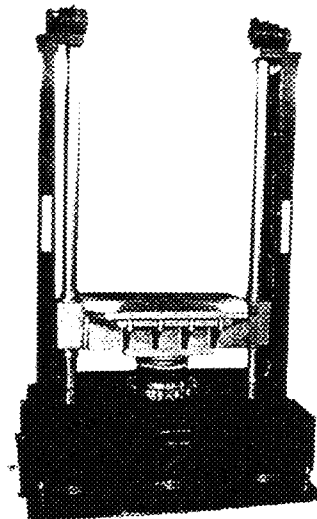
本设备可供各类产品做冲击试验，考核试品在冲击环境下功能的可靠性和结构完好性。本设备符合GB2423.5《电工电子产品基本环境试验规程Ea：冲击试验方法》及IEC68-2-27《试验Ea：冲击》和MIL-STD202F对冲击试验的要求。

性能特点

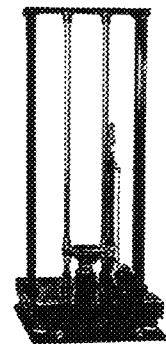
- 内置制动机构，无二次冲击，机座阻尼隔振；
- 冲击高度数字控制；
- 试验数据重复性好；
- 半正弦波、梯形波、后峰锯齿波形发生器可供选择；
- 隔振性能好；
- 安全性能好，在各种误操作、断电等异常情况下能够保证其安全性。



SS-100液压式冲击台



SSM-300机械式冲击台



SS-5冲击台



后峰锯齿波发生器



半正弦波发生器



梯形波发生器

主要技术指标

参数	型号	SS-2**	SS-5	SS-25	SS-50	SS-100	SS-200	SSM-200	SSM-300	SS-500	SS-800	SS-1000	SS-1200
最大负荷(kg)		2	5	25	50	100	200	200	300	500	800	1000	1200
台面尺寸(mm)		116X100	200X200	300X350	480X500	650X800	800X960	800X960	800X960	1050X1200	1200X1600	1200X1600	1200X1200
峰值 加速度 (m/s ²)	半正弦	200~15000	30000	15000	150~6000	150~6000	150~3000	150~3000	150~3000	150~2000	150~2000	150~2000	150~2000
	梯形波	—	—	150~1000	150~1000	150~1000	150~500	150~500	150~500	150~500	150~500	150~500	150~500
	后峰 锯齿波	—	100~1000	100~1000	100~1000	150~1000	150~1000	150~1000	150~500	150~1000	150~1000	150~500	150~500
脉冲 持续时间 (ms)	半正弦	11~0.5	18~0.2	18~0.5	30~2*	30~2*	30~2	30~2	30~2	30~6	30~6	30~6	30~6
	梯形波	—	—	18~6	18~6	18~6	18~6	18~6	18~6	18~6	18~6	18~6	18~6
	后峰 锯齿波	—	18~6	18~6	18~6	18~6	18~6	18~6	18~6	18~6	18~6	18~6	18~6
驱动方式		液 压						机 械		液 压			
外型尺寸 (mm)	L (mm)	700	900	1100	1260	1370	1555	1730	1786	1720	1800	1880	1800
	B (mm)	100	220	350	360	1000	1210	940	1200	1350	1650	1750	1750
	H (mm)	2120	2000	2200	2580	2580	2800	2587	2813	2880	2900	3000	3000
重量(kg)	150	550	650	2500	2600	3800	2500	4200	5100	7200	8200	8200	

SSH系列高加速度冲击试验系统

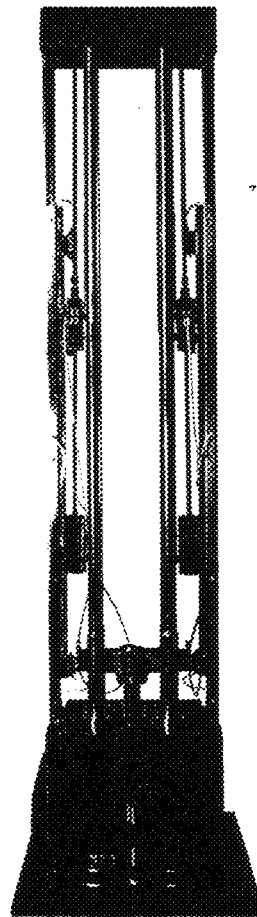
SSH系列冲击试验系统是本公司研发制造的高加速度冲击试验机，能够满足军工、家电等行业对试品作高加速度试验的要求。高加速度冲击试验台的研发成功，填补了国内峰值加速度超10000G的冲击加速度试验机的空白，是我们在冲击领域延伸拓展的一次成功探索，也是在此领域所作的一大突破！

性能特点

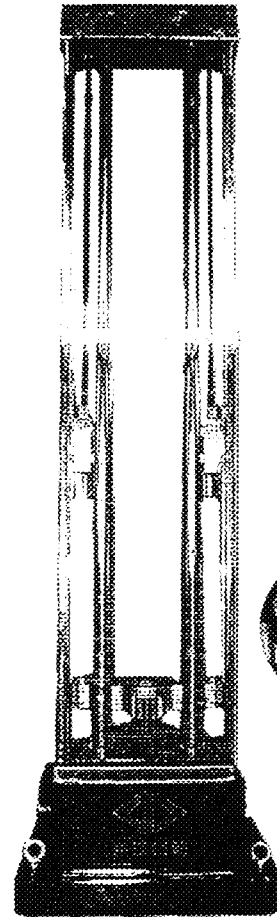
- 内置式高弹性储能装置，冲击最大末速度达12m/s；
- 台体配置空气弹簧隔振和阻尼装置，确保冲击曲线质量；
- 独创的冲击台面，结构性能优越（已申请专利）；
- 高效的台体减振装置；
- 冲击高度的数字式控制；
- 美观大方的安全护罩、提供了安全保障。

主要技术指标

参数	型号	SSH-1	SSH-10
最大负荷 (kg)		1	10
台面尺寸 (mm)		φ60	φ160
冲击波形		半正弦波	
峰值加速度 (m/s^2)		30000~500000	30000~200000
脉冲持续时间 (ms)		1~0.06	1~0.1
外型尺寸 (mm)	L	780	755
	W	985	800
	H	2900	2780
台体重量 (kg)		900	1000
电源电压 (V)		380 ± 10%	50/60Hz
消耗功率 (kVA)		0.4	0.5



SSH-1
50000g高加速度冲击台



SSH-10
20000g高加速度冲击台



台面构件

产品篇

IT系列斜面冲击试验台

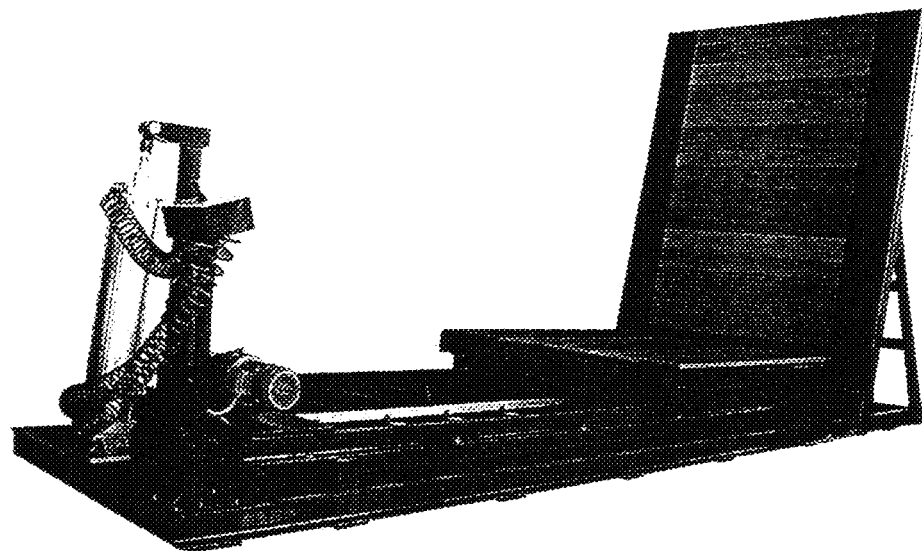
本公司研制开发的新一代斜面冲击试验台，已成为第三代产品，充分综合前苏联、日本和美国同类产品的优点。本机可模拟包装件在运输过程中的冲击和碰撞环境，作为科研机构、大专院校、包装技术测试中心、包装材料制造厂以及外贸、运输等部门进行斜面冲击的常用试验设备。

性能特点

- 结构设计合理；
- 可将台面调为水平，便于客户安装试件；
- 采用单片机技术，操作简单，集控制与测量为一体；
- 冲击次数、冲击末速度显示。

选型指南

根据试件的外形尺寸、重量及冲击末速度来选择合适的试验台。



IT300

主要技术指标

参数	型号	IT100	IT200	IT300	IT500
试件最大重量 (kg)		100	200	300	500
最大滑行长度 (mm)		2000 (至商定)		~1600 (至商定)	
冲击速度范围 (m/s)		1.39~2.42	1.845~4.125	1.35~2.57	0.59~2.35
冲击速度误差		≤ ±5%			±5%
	L (mm)	1000		1800	
试件最大尺寸 (mm)	W (mm)	1000		1800	
	H (mm)	1000		1800	
冲击面板尺寸 (mm)		1200×1800		1600×2200	
适用标准		JB/T5868-93			
工作环境		温度0~40℃，湿度≤80% (不结露)			

SM 系列稳态加速度试验机

SM系列稳态加速度试验机（又称离心机）分为转臂式和转盘式两种形式，采用匀速圆周运动方式，产生稳态加速度对试件作性能和结构的可靠性试验，也可以用作工艺筛选。公司建有大型SM稳态加速试验机专用试验基地用以对生产的离心机进行测试。

性能特点

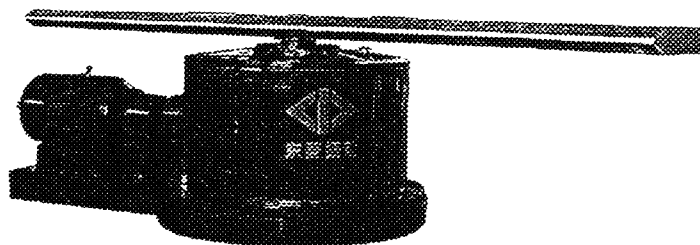
- 计算机实时控制；
- 实时显示试验曲线及容差、试验时间；
- 可实现多阶加速度试验；
- 对产品的试验过程实时监控；
- word报表输出；
- 集流滑环电流可达400A；
- 开路保护；
- 自动、手动控制。

选型指南

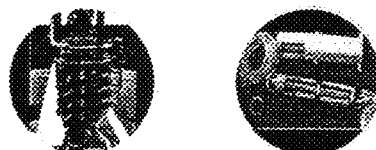
- 按试件重量、大小及试验参数，合理选择试验机并留有一定余量；
- 根据加速度梯度要求选择合适的转臂尺寸。

主要技术指标

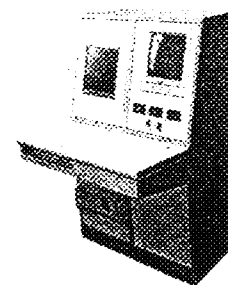
指标	型号	转盘式离心机				转臂式离心机			
		SM-04	SM-3	SM-30	SM-50	SM-100	SM-100A	SM-200	SM-500
最大载荷 (kg)		0.04	3	30	50	100	100	200	500
总载荷 (kg)		0.4	12	60	100	200	200	400	1000
加速度范围 (m/s^2)		5000~400000	100~2000	30~2500	30~500	30~1000	30~1000	30~1000	30~500
试品最大尺寸 (mm)		$\phi 20$	200×200×200	300×200×150	300×300×200	500×500×400	500×500×400	700×700×600	1000×1000×1000
试品中心安装计算半径 (mm)		80~100	260	1650	1350	1750	2250	2150	3000
启动时间 (min)		5	3	5	3	3	3	5	5
停机时间 (min)		5	3	5	3	3	3	5	5
连续工作时间 (min)		5	60	60	60	60	60	60	30
消耗功率 (kVA)		6	3	60	18	40	60	75	120
地坑直径 (mm)		--	--	$\phi 5000$	$\phi 4500$	$\phi 5500$	$\phi 6500$	$\phi 6500$	$\phi 8500$
适用标准					GB2423	GJB150			
* 接电装置 (选件)		15路 500V 5A	30路 500V 5A	60路 500V 5A	30路 500V 5A	60路 500V 5A	60路 500V 5A	60路 500V 5A	60路 500V 5A



转臂式离心机



导电集流滑环



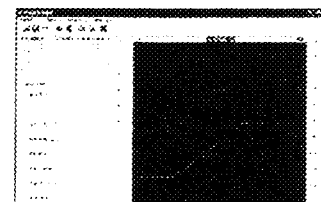
带监视器的控制系统
* 监视系统可选配



控制系统



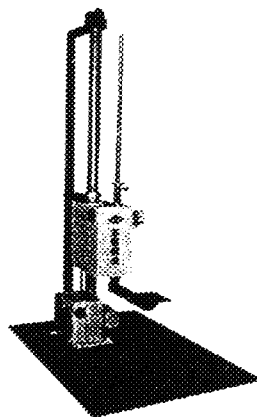
转盘式离心机



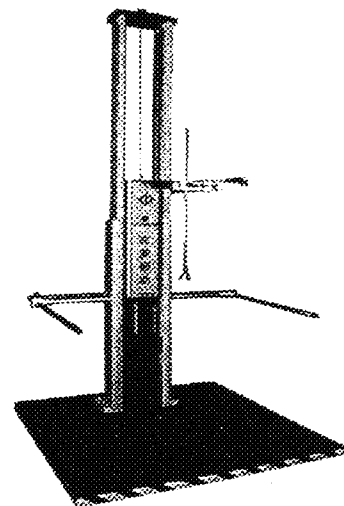
DT 系列跌落试验台

跌落台简介

DT系列跌落试验台采用双柱导向、液压缓冲。跌落高度可设置，能实现棱、面、角跌落试验。主要用于考核产品包装件在运输和装卸过程中的承受跌落能力，从而改进、完善包装设计。



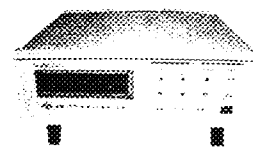
跌落试验台



零跌落试验台



能量吸收装置



跌落台控制仪

主要技术指标

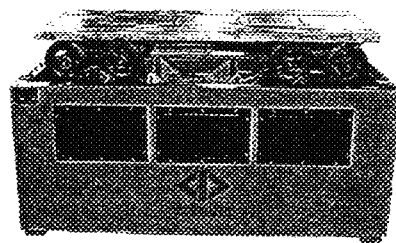
零跌落台简介

零跌落试验台采用板式双导轨导向、液压提升系统，跌落高度在设置后自动提升，适用于外形尺寸较大的包装试件做跌落试验。装卸试件方便、快捷。可实现面、棱、角较低高度跌落试验，跌落高度可以从零开始。

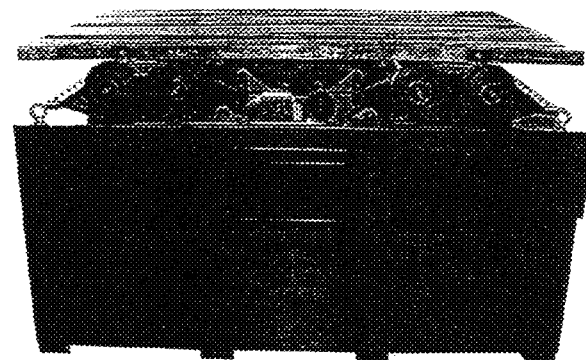
分类	型号	跌落试验台		零跌落试验台		
		DT-315	DT-320	DT-010	DT-012	DT-014
试件最大重量 (kg)		100	100	200	200	300
跌落高度 (mm)		300~1500	300~2000	0~1000	0~1200	0~1400
试件最大尺寸	L (mm)	1000	1000	1000	1200	1200
	W (mm)	800	800	1000	1200	1200
	H (mm)	1000	1000	1000	1200	1200
底板尺寸	L (mm)	1700	1700	1900	1900	2300
	W (mm)	1200	1200	1600	1800	2200
	H (mm)	22	22	60	60	60
试验方式				面、棱、角		
试验台外型尺寸	L (mm)	1700	1700	1900	1900	2300
	W (mm)	1200	1200	1800	1800	2200
	H (mm)	2512	2827	2800	3100	3400
台体重量 (kg)		800	900	2400	2800	3400
消耗功率 (kVA)		0.85	0.85	2.5	2.5	2.5
适用标准		GB/T4857.5-92、ISO2248-1985 (E)、GB2423.5、IEC68-2-27				

TT系列运输颠簸试验台

本设备是在实验室里模拟试件在公路运输中承受实际路况的能力，从而评定试件及其包装的可靠性。



TT-200



TT-1000

性能特点

- 分频段模拟宽带随机振动；
- 加速因子可调节；
- 交流变频控制。

备注：

本运输台在加载的情况下，于偏离台面中心长度方向三分之一处（此处设有传感器安装孔）采集试验数据，其加速度总均方根值应在汽车实地跑车数据规定的误差范围内。

主要技术指标

参数	型号	TT-200	TT-300	TT-600	TT-1000	TT-1200	TT-2500	TT-4500
最大载荷 (kg)		200	300	600	1000	1200	2500	4500
振动波形		宽带随机波						
加速度总均方根值 (m/s ²)		3.2						
模拟车速		25~35公里/小时						
模拟路面		三级公路中高级路面与四级公路中、低级路面						
加速等级		1:1						
试品重心高度 (mm)		<500	<600	<700	<700	<700	<1000	<1200
工作台面 (mm)		1500×700	1500×700	2000×1500	2400×1700	2700×1800	2700×1800	4000×2500
外型尺寸	L (mm)	1800	1800	2500	2630	3000	3000	4500
	W (mm)	936	936	2200	1920	2200	2200	2500
	H (mm)	1200	1200	1360	1400	1600	1600	2100
消耗功率		380V2.2kA	380V2.2kA	380V7.5kVA	380V11kVA	380V15kVA	380V30kVA	380V70kVA
设备重量 (kg)		1600	1600	5500	6000	7500	10000	15000

HT 系列水平冲击试验台

HT系列水平冲击试验台通过压缩弹簧储能，或压缩空气储能通过瞬间释放机构使台面获得水平方向上的运动速度，经过前部的冲击锤冲击砧座从而使试件获得所要求的冲击加速度及脉冲持续时间。

本公司开发的HT系列水平冲击台，具有冲击试验数据精确，冲击数据重复性好，并带有防二次冲击制动装置。

水平冲击台适用于各类产品的水平冲击试验。

主要技术指标

指标	型号	HT-15	HT-30	HT-50
冲击距离 (mm)		500~800	500~800	600~1000
最大负载 (kg)		15	30	50
冲击加速度 (m/s^2)		2000~15000	2000~12000	2000~16000
冲击持续时间 (ms)		3~0.4	2.5~0.4	2~0.4
冲击波形		半正弦波形		
台面尺寸 (mm)		150×200	250×320	350×450
外形尺寸	L (mm)	3000	3500	4200
	W (mm)	600	700	800
	H (mm)	900	900	1000
台体重量 (kg)		2000	2500	3500
消耗功率 (kVA)		2	2	4
工作环境		温度0~40℃，湿度≤80% (不结露)		

RT 系列摇摆试验台

RT系列摇摆试验台主要用于模拟在船舶、航母、潜艇、水上飞机等多种装备的摇摆试验和倾斜试验，以确定产品经受规定严酷等级摇摆和倾斜能力。

东菱公司研制生产的摇摆试验台吸收了国内外同行的优点，结合用户使用的要求，具有独特的竞争优势。

主要技术指标

- 1、最大载荷：500kg
- 2、试品中心高≤500mm
- 3、首摇角位移：(±4°)
周期 7~20s
- 4、横摇角位移：(±45°)
周期 3~14s
- 5、纵摇角位移：(±22.5°)
周期 4~10s
- 6、横倾斜角位移：(5~45°)
- 7、纵倾斜角位移：(5~22.5°)
- 8、台面尺寸：1350×1000 (mm)
- 9、油源功率：37kVA
- 10、控制功率：0.5kVA

B/W、B&K 传感器

动态特性

- 灵敏度从0.1mV/ms²到100mV/ms²，偏差小于5%
输出工作电压范围±5V。
- 灵敏度从0.3pc/ms²到30pc/ms²，偏差小于5%；
- 标准型低频从0.5Hz开始，特殊传感器可达0.1Hz；
- 横向灵敏度<5%。

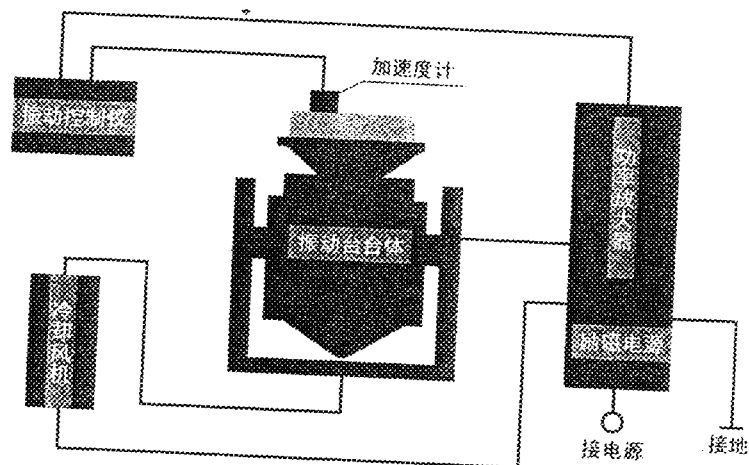
工程应用

- 传感器可以在-45℃到125℃温度范围内长期使用；
- 可与带恒流电源的数采系统直接连用，无需其它二次仪表；
- 长距离信号传送仍能保证信号的高质量。

产品特点

- 剪切式设计最大限度减小环境对信号的影响；
- 内装集成电路在美国本土设计与制造；
- 压电陶瓷有国产件和进口件两种供客户选择；
- 紧固件选用记忆金属，确保稳定的频响；
- 可以根据客户要求改装成绝缘安装底座，其绝缘电阻大于10⁹Ω。

产品配套使用图例



常用计算公式

推力F: $F = (m_0 + m) A$

加速度A: $A = 2 \pi f V$

速度V: $V = 2 \pi f D$

D — 位移峰峰值 (mm)

M₀ — 电动台活动系统等效质量 (kg)

M — 试品及夹具质量 (kg)



顶端输出



顶端输出



侧端输出



一轴输出



二轴输出

客户篇



国防军工企业、高校、科研院所

国防军工企业

528厂 (南京北方光电有限公司)
北京防化研究院第6研究所
兵器804厂 (西安北方兴华)
238厂 (国营湖北华中精密仪器厂)
电子工业部国营第799厂
东方机器厂 (东方机电集团公司)
贵阳128厂
国营893厂
(四川永星电子有限公司)
国营第795厂
(北京七星华电科技集团)
国营湖北华中精密仪器厂
航空818所、802所、
102所、24所
航天119厂、128厂、355厂
航天科技集团五院511所
洪都航空工业集团有限责任公司
湖北046基地
江西航海仪器厂
兰新通信设备公司
陕西宝成航空仪表有限公司
上海航天局第802所
天津船舶707所
西安航空发动机(集团)有限公司
襄樊610研究所
云南北方光电有限公司
中国船舶工业总公司第724所
中国航空工业第一集团公司
-北京长城计量测试技术研究所(304所)
中国航天科技集团7107厂
中国人民解放军第5715工厂
中国人民解放军第7410工厂
中航部公司608研究所

北京工业大学
广西大学
哈尔滨工业大学
沈阳航大(北航汽车仪表厂)
天津大学
西安石油学院
西北工业大学
安徽省产品质量监督检验所
成都市产品质量监督检验所
电子15所(华北计算技术研究所)
湖南电子产品检测分析所
青岛市产品质量监督检验检测局
铁道部科学研究院
信息产业部
- 电子第11、12、16、36、
40、50、63研究所
浙江省技术监督检测研究院
中国电子科技集团第九研究所
中国电子科学研究所
中国工程物理研究院
- 3所5部、9部4所
信息产业部电信传输研究所
国家汽车质量监督检验中心
信息产业部通信计量中心
.....

民用企业

阿文美地汽车系统(镇江)有限公司
北京金时石油测试技术有限公司
北京奥特来电器有限公司
博世汽车部件(苏州)有限公司
长春一汽徐港电子有限公司
东风汽车公司天运电子电器厂
飞利浦电子
济南鲁德贝车灯公司
江苏皓月汽车轴股份有限公司
江苏天壹科技有限公司
江阴奇阳汽车空调器有限公司
兰新通信设备集团公司
罗技电子
明基电通
品升电子(上海)有限公司
容城来福灯泡有限公司
上海比亚迪有限公司
上海大众联翔汽车零部件公司
上海沪工汽车电器有限公司
上海纽福克斯汽车配件有限公司
上海日立家用电器有限公司
上海日用友捷电气有限公司
松下电子
武汉精伦电子股份有限公司
西门子威迪欧汽车技术(芜湖)公司

襄樊东风汽车电气有限公司
扬州亚普汽车塑料件制造公司
浙江省天台县浩通仪表有限公司
珠海江海电子股份有限公司
上海贝尔有限公司
风帆蓄电池厂
武汉航空仪表公司
沈阳新乐精密机器公司
.....

展望篇

展望发展远景，
东菱公司将继续发挥自身优势，
重视规范化管理，
社会化运作和品牌战略，
把“造中国精品，创世界品牌”作为战略目标，
乘风破浪，勇往直前，
为把东菱公司建设成为国际同行业中最优秀的企业集团而努力。



USA

Entela Labs - Grand Rapids, MI
Cascade Tek - Hillsboro, OR
Mark IV - Detroit, MI
TSE Brakes - Fresno, CA
Garwood Labs - Pico Rivera, CA
Hi-Shear Technologies
- Torrance, CA
Environment Associates
- Chatsworth, CA
EP Energy
Dugway Army Base
Storagetek
Consolidate
Rexnord
Greening
EST
Wyle
Dallmar
Insight echnologies

Brazil

HP Brazil

Korea
Daeho Precision
Daewoo Heavy Industry
Kuyungsun
Kalech
Kamtech
Valeo
GPRC
Keimyung University
Kyungsin

Singapore
Tritech Co. Ltd

France

Societe Electricfil

Spain
CTA Centro de Tecnologias
- Aeronauticas
India
LRDE
ISRO Satellite Center



东菱振动

DONGLING VIBRATION

公司总部

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传真：(0512) 0512-66656669
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<http://www.testunit.com>
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地址：北京市海淀区紫竹院路1号人济山庄B-1007
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传真：(029) 029-88406592
邮编：710068

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电话：(0769) 0769-2553142 13326953985
传真：(0769) 0769-2428142
邮编：523508



The Chemical Company

Legal Department

VIA ELECTRONIC SUBMISSION
AND FEDERAL EXPRESS

November 29, 2006

Ms. Sheila Quarterman
Office of Export Services
Regulatory Policy Division
Bureau of Industry and Security
Department of Commerce
14th Street & Pennsylvania Avenue, NW
Room 2705
Washington, DC 20230

ATTN: RIN0694-AD75

Dear Madam:

BASF Corporation (BC) is pleased to submit comments in response to the Bureau of Industry and Security's (BIS) proposed rule revising and clarifying the U.S. policy on exports to the People's Republic of China (PRC) published in the Federal Register on July 6, 2006. BC manufactures and exports chemicals controlled under the Export Administration Regulations and the PRC is a major trading partner. As a result, the proposed amendments will impact our business processes as we ensure that exports to the PRC comply with any final rule that is published in response to the proposal.

As you are aware, BC is an active member of the American Chemistry Counsel (ACC). We are extensively involved with ACC activities as related to trade sanctions, export controls and compliance with the EAR. We have been involved with the monitoring and assessment of ongoing and emerging issues such as those outlined in BIS's proposed rule. To address members concerns with the proposed rule, ACC has developed detailed comments. BC supports the comments submitted by ACC. Although the comments submitted below do not address all aspects of the comments made by ACC, our position on those issues coincides with theirs. The purpose of our submission is to emphasis a concern over a particularly troublesome provision involving ECCN 1C995 mixtures.

Specifically, the proposed rule provides for a new control based on knowledge of military end-use on exports to the PRC of certain CCL items that otherwise do not require a license to the PRC. These items are listed in proposed Supplement No. 2 to Part 744 and include ECCN 1C995. 1C995 controls mixtures containing chemical weapon precursors controlled under the Chemical Weapons Convention (CWC) and by the Australia Group (AG) at concentrations less than 10% or 30%. BC believes that exports to the PRC of the products

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Helping Make Products Better™

that are regulated under 1C995 will not make a material contribution to the military capabilities of the PRC. We believe including these mixtures in the list of items subject to the military end-use requirements imposes an onerous compliance requirement on industry without furthering national security. Therefore, we are requesting that BIS remove 1C995 from Supplement No. 2 to Part 744.

The mixtures regulated under 1C995 contain chemical weapon precursors controlled under the CWC and the AG at concentrations less than 10% or 30%. In order to use these mixtures in the manufacture of a chemical weapon, the precursor must first be extracted from the mixture in which it is contained. BC believes that because the precursor must first be exacted, the utility of obtaining the mixtures for chemical weapon purposes is minimized, especially when considering the ease of extractability and final yields. For example, it may be extremely difficult if not impossible to remove the precursor from some of these mixtures due to the composition of the other components. In those cases where the precursor may be easily extracted, low final yields due to the limited amount of the precursor contained in the mixture may also be a deterrent from obtaining these mixtures for chemical weapons purposes. As a result, BC does not believe that these mixtures are a viable alternative for obtaining chemical weapon precursors. There does not appear to be a basis for the controls envisioned for 1C995 and therefore, no basis for the increased regulatory burden the proposal will impose.

BC manufactures paints and coatings used in the automotive industry. Some of these coatings contain triethanolamine, methyldiethanolamine and N-N-diethylaminoethanol in concentrations <30%. In fact, while some of these products contain these chemicals in concentrations of \approx 15%, many others contain between 5 % and 0.5 % and some <0.5%. In addition to the amine, which acts as a curing agent, these products also contain solvents, pigments and other resins. The solvents, pigments, and other resins interfere with extraction capabilities and make the removal of the amine nearly impossible. Thus, there would be no incentive to obtain these mixtures for use in the production of chemical weapons. Nonetheless, these products will be regulated under BIS's proposed rule and require additional compliance oversight.

As further support for our request for the removal of 1C995 from the proposal, triethanolamine, methyldiethanolamine and N-N-diethylaminoethanol (CWC Schedule 3 chemicals) are produced in the PRC. We have also determined through a search of a database containing a directory of world chemical producers that nearly two thirds of the chemicals found in 1C350 and 1C355 are produced in the PRC. No useful purpose would be served by controlling products containing these chemicals when the raw material is easily obtainable within the PRC.

Ms. Sheila Quarterman
Page -3-
November 29, 2006

BC understands that the list of mixtures controlled by IC995 contain chemicals other than those specifically mentioned in these comments. However, the argument concerning the unlikely use of these mixtures in the production of chemical weapons because of the low concentrations is germane to all IC995 mixtures. Indeed, other CWC and AG countries do not specifically control chemical weapon precursor mixtures containing less than 10% or 30% of the listed or scheduled chemical precursor for exactly that reason and imposing these control on the U.S. companies places them in a competitive disadvantage.

In summary, BC is requesting that BIS remove IC995 from proposed Supplement No. 2 to Part 744. We believe that these mixtures are not a viable alternative for obtaining chemical weapons precursors, will not further the military capabilities of the PRC and gives an unfair advantage to European and Asian competitors in the PRC who can sell without additional end use screening, end-use certificates or license requirement. BASF appreciates the opportunity to submit comments on the proposed rule and respectfully request that BIS takes them into consideration when issuing the final rule.

Sincerely,



Claudia Elias
Regulatory Manager
Product and Trade Regulations



70 Maxess Road
Melville, NY 11747
631 396 5000
Fax: 631 396 5075

Fax

To: Sheila Guartsman From: Nancy Auletta

Fax: 202 - 482 - 3355 Pages: 6 including this one

Phone: _____ Date: 11/30/06

Re: China Rules CC: _____

Urgent For Review Please Comment Please Reply Please Recycle

• Comments:

Please consider the following letter regarding the China rules.

NU HORIZONS

NU HORIZONS ELECTRONICS CORP.

70 Maxess Road • Melville, NY 11747
Tel: 631-396-5000 • Fax: 631-396-5075

November 30, 2006
Ms. Sheila Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry & Security
Department of Commerce
14 St. & Pennsylvania Ave. NW, Room 2705
Washington, DC 20230
Attn: RIN 0694-AD75

Re: Comments on Revisions and Clarification of Export and Re-export Controls for the People's Republic of China (PRC): New Authorization Validated End-User

Dear Ms. Quarterman:

Nu Horizons Electronics Corp. would like to express our appreciation for the opportunity to comment on the proposed regulation for export, re-export, and in-country transfer controls to the People's Republic of China ("PRC") and the new authorization for Validated End User ("VEU").

Nu Horizons Electronics Corp. is a leading global distributor of advanced technology active components and system solutions, including analog, clock and timing devices, communications, computer products, discretes, flat panel display solutions, interface, logic, memory, microcontrollers and microprocessors, opto electronics and power, to a wide variety of commercial original equipment manufacturers. With sales facilities in forty three locations across North America and Asia, and logistics centers in centralized locations throughout the globe, Nu Horizons partners with a limited number of best-in-class suppliers to provide in-depth product and solutions expertise to its customers.

Nu Horizons Electronics Corp. is sincerely committed to strict compliance with U.S. export control laws and to protecting U.S. national security. We have a strong record of compliance with BIS regulations and cooperation with federal authorities, and we want to maintain that record. While we understand that the PRC poses special challenges with respect to export controls, we believe compliance cannot be effective unless regulations are clear, enforcement policies are consistent, and the compliance burden is not so heavy as to put U.S. companies in a competitive disadvantage vis-à-vis our non-U.S. counterparts.

The proposed regulation creates serious concerns within our company, as well as the companies and trade associations in our industry. We believe the proposed regulation would not enhance U.S. national security, but would impose an onerous compliance burden on companies such as [Company name]. In the interest of making the proposed rule clearer and limiting the burden of compliance, we would like to outline some of the detrimental affects of the proposed rule both in terms of complicating trade between the U.S. and the PRC while at the same time creating trade barriers for U.S. companies in the global market.

1. **Many Affected Products Are Readily Available in PRC and Elsewhere**

The proposed rule casts a wide net over the 47 Export Control Classification Numbers ("ECCNs") that would be affected. However, it fails to take into consideration the fact that many products in these categories (i.e., 3A292, 3B991, 4A994, 4D994, 5A991, 5A992 and 5D992) are readily available in PRC, other parts of Asia, as well as Europe. Some of these products are manufactured by non-U.S. companies, such as Pintek Electronic Co. (Taiwan), Spectrum GmbH (Germany), GW Instek (Taiwan), Acer (PRC), Lenovo (PRC), Meilhaus Electronic (Germany), Huawei (PRC), and a host of other manufacturers. These products, therefore, will escape the strict controls contemplated by the proposed rule. The result will be a significant increase in purchases of these non-controlled products, to the detriment of U.S. companies, such as Nu Horizons, that try so hard to operate within stringent U.S. export controls. More importantly, there will be minimal, if any, counterbalancing advancement of U.S. national security interest.

2. **Excessive Due Diligence Burden**

The proposed regulation would significantly increase the risks and costs of compliance for Nu Horizons Electronics Corp. due to the global nature of our business. The expansive scope of the proposed rule, added to unclear terms and the lack of due diligence guidance, will significantly increase the compliance cost and potential liability for Nu Horizons and other American companies while drastically reducing any competitive advantage that we may have against foreign competitors. We urge BIS to consider the following concerns:

- The proposed rule would impose an undue burden on Nu Horizons Electronics Corp. to conduct due diligence that ultimately may prove to be meaningless. Nu Horizons has over 15,000 customers worldwide. Under the proposed rule, Nu Horizons will be required to inquire and investigate ultimate end-user and end-use information for each transaction involving a product that falls under the ECCN net. As the proposed rule provides no guidance on the scope of due diligence required, Nu Horizons may have to drill down to many levels beyond the first level customer to ascertain the ultimate end-user and end-use. Since Nu Horizons customers tend to be resellers, original equipment manufacturers or contract manufacturers, Nu Horizons will have difficulty gaining visibility beyond the first level customer.

Furthermore, this lengthy due diligence exercise could prove to be pointless. Nu Horizons investigation will involve, for the most part, asking the customers about the intended end-user and end-use for the products. Frequently, the customers would provide non-specific answers, either because they do not want to disclose their

customers to Nu Horizons for fear of direct competition from Nu Horizons or because they intend to incorporate Nu Horizons parts into their own products to be sold to thousands of customers and thus cannot provide specific end user or end use information. When confronted with burdensome requirements from Nu Horizons, these customers will likely turn to our non-U.S.-based competitors who will be more than happy to sell them these products without asking bothersome questions.

- The expansion of the PRC end user certificate requirement will cause lengthy delays. Even if the Chinese Government decides to cooperate, they do not have sufficient resources to issue certificates efficiently. In our experience, it takes up to six months for a request for end user certificate to get processed. Our customers will not wait that long when they can get the same products from our non-U.S.-based competitors.
- The definitions of "military end use" and "support" are overly broad. They expose U.S. companies like Nu Horizons to considerable liability and raise numerous questions. For example, if an exporter has information that a product could be used for the design of both military and civilian products, would the "military end use" definition apply? What if an exporter knew that at the present time the item would be used for the production of civilian items, but that they might be used in the future to produce a military product? Does the definition of "deployment" include simple transportation of military items (or the possibility of transportation of such items)? Does BIS expect exporters to interpret the USML the same way Department of State does currently, in that items not specifically described but that are specially designed, modified, adapted or configured for military use could be subject to their jurisdiction? If read broadly, these definitions could, for example, affect sales of components that are used in the production of items that are intended for sale to military and commercial customers even though such items have no real military value or function. These definitions raise many questions. BIS must provide specific examples to the exporting public to explain how it would apply these terms in different contexts.
- The proposed new control based on BIS notification that an item is or may be intended for military end-use in the PRC does not specify how much notice BIS would give before such notices become effective and so exporters may find themselves required to act quickly to halt exports on short notice. Additional guidance from BIS is necessary.

3. The Proposed Regulation Will Be Unilateral

We understand that currently, the U.S. is the only party to the Wassenaar Arrangement intending to implement a conventional arms embargo with respect to PRC. Some European members have already made clear that implementation of the Statement of Understanding on Control of Non-Listed Dual-Use Items will not apply to PRC. Without participation by other Wassenaar members, the proposed rule is virtually guaranteed to be ineffective in denying these controlled items to PRC. In fact, it will encourage other countries to design U.S. technology out of their products.

4. No Gain for National Security

In light of the ready availability in the PRC and elsewhere of products subject to the proposed controls and the lack of commitment from other Wassenaar members to endorse the proposal, it is extremely unlikely that the proposed regulation will have any impact on the military capability of the PRC. Under the circumstances, we have difficulty understanding how this proposed regulation could advance U.S. national security. In contrast, it is abundantly clear that its broad scope will add significant compliance burden to already burdened U.S. companies and will, over time, reduce our ability to compete in the global market and detrimentally impact the U.S. labor market.

5. Validated End User Rule Is Unclear and Offers Little Benefit to Nu Horizons Electronics Corp.

We commend BIS' attempt to ease restrictions on exports to civilian end-users in the PRC; however, in its current form, the Validated End User ("VEU") program is ill-defined and would be of little benefit to Nu Horizons. The following illustrates the concerns raised by the VEU programs:

- While the VEU program may benefit companies that have a small customer base, it would not benefit a company like Nu Horizons that sells to more than 500 customers in the PRC that will in turn resell to other Chinese end-users. Nu Horizons would have to spend Herculean efforts to get all of those customers through the VEU process. The additional administrative burden for managing the VEU certification, recordkeeping and reporting requirements can be likened to an application for a Special Comprehensive License and follow up management of the license to fulfillment. Systems would need to be updated to flag, monitor and report the quoting, sale and shipping of the 47 ECCNs as well as the VEU status of the PRC customer. Nu Horizons would have to train employees on the processes, including but not limited to these functions: sales, marketing, credit management, transportation, export administration and warehouse operations. We would have to incur significant start up costs to put the program in place.
- Given the number of customers that we have, the VEU program would be cost prohibitive and, therefore, of little benefit to Nu Horizons.
- BIS has not provided a meaningful incentive for U.S. exporters to apply for VEU status. Companies are asking, "Why would a U.S. company "A" want to go through the administratively burdensome and costly process of preparing and submitting a VEU application for PRC customer "B," only to have B listed on the BIS website, which then would allow all competitors shipping goods subject to the EAR to "piggy back" on company A's efforts? Under this scenario, company A would definitely lose a competitive advantage under this process, while applying for an export license, which is a similar and perhaps less cumbersome and costly process, would protect A's competitive advantage.

While BIS may believe that PRC companies will come forward to apply for VEU status, our experience indicates that in the PRC market, few customers would willingly come forward with information about their business or willingly sign any documents required by the U.S. companies to meet due diligence standards.

Conclusion

In summary, this proposed regulation will impose significant costs and diminish the competitiveness of U.S. companies, as well as interferes with important U.S. policy goals towards the PRC, without offering any tangible enhancement to U.S. national security. Nu Horizons Electronics Corp. urges BIS to withdraw this proposed rule. The U.S. national security interests will be better served if BIS were to work with industry groups to develop a more fact-based policy of controls.

We appreciate the opportunity to submit these comments to BIS and hope that they are helpful to the rulemaking process. Nu Horizons Electronics Corp. would be pleased to join with the many industry associations and individual companies that are willing to assist BIS in developing a policy that would enhance U.S. national security while preserving the global competitiveness of U.S. companies.

Respectfully submitted,

Nancy Auletta
Export Compliance Officer
Nu Horizons Electronics Corp.

AeA
Alliance for Network Security
American Chamber of Commerce in Hong Kong
Business Roundtable
Business Software Alliance
Coalition for Employment through Exports
Computer Coalition for Responsible Exports
EDA Consortium
Electronic Industries Alliance
Emergency Committee for American Trade
General Aviation Manufacturers
Global Technology Distribution Council
Information Technology Council
International Safety Equipment Association
National Association of Manufacturers
National Association of Wholesaler - Distributors
National Council on International Trade and Development
National Foreign Trade Council
Semiconductor Industry Association
Software & Information Industry Association
U.S. Chamber of Commerce
U.S.-China Business Council
U.S. Council for International Business
United States Information Technology Office

November 30, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th St. and Constitution Avenue, NW
Room 2705
Washington, DC 20230

Attention: Sheila Quarterman

RIN 0694-AD75

RE: Proposed Rulemaking Concerning Revisions and Clarification of Export and Re-export Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 Fed. Reg. at 38,313, July 6, 2006)

Dear Ms. Quarterman:

We appreciate the opportunity to submit the following comments on behalf of the undersigned organizations in regard to the above referenced notice of proposed rulemaking. Our organizations

represent hundreds of U.S. companies doing business throughout the world that would be adversely impacted by the proposed rule.

All of our members are committed to protecting U.S. national security. They have a strong record of compliance with BIS regulations and cooperation with federal authorities, and they want to maintain that record. We also agree that China poses special challenges with respect to export controls due to the complexity of our bilateral trade relationship, the role of their government, including the military, in normal commercial activity, the opacity of their intentions, and the difficulties of compliance, particularly when the export is technology or know-how.

Although our fundamental view is that the regulation should be withdrawn and reconsidered in its entirety after thorough consultation with exporters, the comments that follow are also provided in the interest of making the proposed regulation clearer, simpler and less burdensome with respect to national-security-related decisions that company employees must make. Our members have found that compliance is most effective when regulations are clear and enforcement policies are consistent.

The proposed rule is a major rule

We believe the impact of the proposed regulation will be sufficiently great that it should be considered a "major rule." The compliance costs associated with this proposed rule are likely to result in an annual effect on the economy of more than \$100 million and are also likely to result in significant adverse effects on the ability of U.S.-based enterprises to compete with foreign-based enterprises in export markets. We disagree with BIS' conclusion that the impact does not justify major rule status, and we request that BIS' analysis on that matter be made public. We also believe that because of the complexity of the rule and the possibility of further substantial changes in it, that, if BIS decides to go forward with it despite our recommendation, it should reissue it in proposed form in order to provide an opportunity for further private sector review.

No benefit to changing the *status quo*

The Administration has not demonstrated that this proposed change would provide any additional security benefit and has not articulated a clear purpose for it. It is extremely unlikely that it will have any impact on the military capability of the People's Republic of China (PRC). If its purpose is to deny the Chinese military access to the listed items, it is destined to be ineffective due to widespread foreign availability of the controlled items, including production in China, and the fact that all indications thus far are that it will be unilateral and will not be implemented by our allies. Conversely, if its purpose is to make sure that U.S. exporters are not the source of these otherwise widely-available items, the regulations will impose a very high and exclusive cost on U.S. industry. Regardless, given that the equivalent of products exported by U.S. industry to China are readily available to China's military from alternative sources, both foreign and indigenous, U.S. exports could not make a material contribution to the PRC's military capability, as the latter would already have access to these products and technologies from such sources.

The proposed regulation is also difficult to reconcile with broader U.S. policy towards China and other U.S. strategic goals. We believe that the regulations could well have a serious deleterious impact on the significant political, military and foreign policy relationships developed with China as well as the bilateral economic relationship. Senior Administration officials have repeatedly stressed that the United States wants China to be a "responsible stakeholder" in the community of nations and

have sought to engage China on everything from military-to-military exchanges to international trade issues. Yet the effect of these special regulations serves to undercut that effort and diminish China's role as a "responsible stakeholder." We also are aware that senior Chinese officials have already raised serious concerns about this proposal on numerous occasions, a not insignificant development since the expanded issuance of end user certificates that it would require will depend on their cooperation.

The items covered by the proposed regulation are widely available

Many of the items that would be subject to controls under this proposal ("List of Items Subject to the Military End-Use License Requirement") are widely available from other sources, including in some cases from within China. For example:

- 1) Attachment 1 identifies 35 items in Export Control Classification Numbers (ECCNs) 7A994, 8 in 6A998, 7 in 5A991-2, and several in other categories, covering a wide variety of aerospace communication and navigation equipment that is already manufactured in China or by numerous European competitors.
- 2) Attachment 2 is a document also provided to BIS separately by the Alliance for Network Security that demonstrates the widespread availability of items in ECCNs 5A/D002 and 5A/D992. As the chart makes clear, these items are already manufactured in China by Huawei, and also elsewhere by other foreign manufacturers.
- 3) Attachment 3, a study by Strategy Analytics, demonstrates the widespread foreign availability, including in China, of numerous 5D002 items which should not be added to the supplement in the proposed regulation. It is clear from the study that OS technologies are not only available but are already in wide use in China, and that there is an enormous opportunity for market growth in China for U.S. producers that will be jeopardized if the supplement is expanded to cover these items.

The proposed regulation will be unilateral

At present, indications are that the United States is the only party to the Wassenaar Arrangement intending to implement the Statement of Understanding on Control of Non-Listed Dual-Use Items with respect to China. Some of our European partners -- including the United Kingdom, Germany, and Italy -- have already made clear that implementation of the Statement of Understanding will not apply to the PRC. As a result of this lack of participation by other Wassenaar members, the proposed regulation is virtually guaranteed to be ineffective in denying these items to China. Senior BIS officials have implicitly acknowledged this fact by indicating their intent to visit their Wassenaar Arrangement counterparts to seek to persuade them to adopt similar restrictions. Based on our own experience with other regulators and their statements thus far, we are sceptical that any significant results can be achieved. It has been suggested in the past that BIS defer implementing the regulation until it can demonstrate that our Wassenaar Arrangement partners have adopted and are enforcing similar regulations, and we endorse that proposal.

Excessive compliance burden

While the regulation would produce no discernable benefits, the costs to American businesses -- as well as to our bilateral relationship with China -- would be substantial.

The proposed rule would significantly increase the risks and costs of compliance for American companies that operate globally. Ambiguous definitions, an absence of due diligence guidance and the sheer expansiveness of the proposed rule significantly increase the potential liability for American companies and make it an enormous administrative challenge for our members while simultaneously placing them at a significant disadvantage against foreign competitors. Other comments will provide details about compliance costs that will make clear they would increase significantly if this regulation is implemented. We urge the Commerce Department to consider the following specific concerns:

- The proposed regulation's application to re-exports multiplies the already significant compliance burden on U.S. firms and effectively means that exporters of components will have to determine whether their customer's product is a military item. The re-export provision is likely to reinforce the perception of American firms as unreliable suppliers, as foreign customers consider the use of their product further downstream in other markets and design-out U.S. components. It is also guaranteed to be ineffective and unwelcome by our trading partners, who have not applied similar restrictions. Clarifying that the *de minimis* content rule applies would be a helpful step, but it will not eliminate the problem since the U.S. exporter generally does not know his customers' content percentages and thus must undertake the same due diligence procedures for each case, and it will not stop the ongoing trend in Europe to "design out" U.S. components in order to avoid entanglement in the U.S. regulatory scheme. The best solution would be to recognize that U.S. exporters are not in a position to obtain reliable information from their customers about their intentions with respect to resale or sale after incorporation into a new product and to apply the "is informed" rule to all such cases with respect to resales to third parties. A less preferable but nonetheless helpful step would be for the regulation to make clear precisely what information the exporter needs to obtain -- and in what form he needs to obtain it -- in order to satisfy himself that the reexport would not be intended for Chinese military end use.
- The reversion to the existing broad standard of knowledge is overly burdensome to companies and will add substantially to compliance costs. We are puzzled by this change, since BIS was clear in its many presentations of the draft regulation throughout the first six months of 2006 that an "actual and positive" knowledge standard would be used. For example, asked at a Materials Processing Equipment Technical Advisory Meeting about the knowledge standard, Deputy Assistant Secretary for Export Administration Matt Borman indicated that, "our view is that it should be based on knowledge, but actual knowledge, not reason to know." From a compliance perspective, however, as noted immediately above, the best approach would be to limit the application of the regulation to an "is informed" standard, similar to the one adopted by the United Kingdom's Department of Trade and Industry for the implementation of its Wassenaar commitments. While we believe the proposed rule is overly broad in its application to many thousands of individual products, there could be a circumstance where the U.S. Government would have specific information suggesting that a particular export of such a product could materially enhance China's military capabilities. In such a circumstance, the U.S. Government would be in a far better position to identify the potential threat, and U.S. companies would welcome such guidance in the form of special notice from the U.S. Government not to engage in a particular export. We suggest BIS change the application of this rule solely to "is informed" circumstances. Despite BIS assertions, we believe compliance with the proposed regulation would be substantially more burdensome than compliance with the Enhanced Proliferation Control Initiative (EPCI), which contains some of the same features. EPCI is limited to WMD-related sectors, which makes it substantially narrower in focus, more specific, and its targets more easily discernible than the broad concept of "military end use" in this proposed regulation. Companies that have extensive

compliance programs tell us that the definitions in the proposed regulation will be much more difficult to build into their due diligence questionnaires than in the case of EPCI.

- The lack of due diligence guidance associated with the proposed rule also increases compliance costs to American business and is likely to lead to delays in the compliance process. In addition, since the facilitation and transfer provisions also apply to entities throughout the supply chain, the proposed rule would dramatically broaden the compliance risks for freight forwarders and other facilitators without providing any guidance to assist these entities.
- The expansion of the Chinese end user certificate requirement is significant and is likely to create lengthy backlogs. Even if the Chinese Government decides to cooperate, it is clear that they do not have sufficient resources to issue certificates efficiently. Requiring the certificate number rather than a copy of the certificate will not speed up the process, as it is the issuance of the certificate not its receipt that will be the bottleneck. This requirement would also provide an argument for more end-use visits by the Commerce Department, which would further slow down licensing in the absence of an increase in U.S. Government staff in China beyond the one that is currently there. BIS should not implement this provision of the proposed regulation until it has obtained the Chinese government's agreement to provide end user certificates in a timely manner.
- The definitions of "military end use" and "support" are too broad. In particular, the expansive definition of military end use attaches considerable liability to a broad range of industries and raises numerous questions. For example, if an exporter has information that a product could be used for the design of both military and civilian products, would the "military end use" definition apply? What if an exporter knew that at the present time the item would be used for the production of civilian items, but that they might be used in the future to produce a military product? Does the definition of "deployment" include simple transportation of military items (or the possibility of transportation of such items)? Does BIS expect exporters to interpret the USML the same way the Department of State does currently, in that items not specifically described but that are specially designed, modified, adapted or configured for military use could be subject to their jurisdiction? If read broadly, these definitions could, for example, affect sales of components that are used in the production of items that are intended for sale to military and commercial customers even though such items have no real military value or function. These definitions raise many questions. BIS should provide specific examples to the exporting public to explain how it would apply these terms in different contexts. In addition, BIS could simplify the compliance process significantly and also increase the likelihood that our trading partners and competitors would adopt similar measures if it limited the application of its definitions to items on the International Munitions List (IML) rather than on the IML and the USML.
- The proposed new control based on BIS notification that an item is or may be intended for military end-use in the PRC does not specify how much notice BIS would give before such notices become effective and so exporters may find themselves required to act quickly to halt exports on short notice.

The Validated End User proposal is unlikely to be attractive to exporters

The Validated End User (VEU) program in its current configuration remains unattractive and would be of little utility to the American business community. While we support the VEU concept and commend BIS' good intentions in attempting to facilitate exports to civilian end-users, the proposed

VEU framework is unlikely to benefit our member companies in its current form. The benefits of the program are unclear from the proposed regulation and the criteria specified by which VEU candidates would be evaluated are overly-broad, vague and ill-defined. Exclusions to the certification would also limit its usefulness. Finally, the negative consequences of a company being denied VEU status poses a downside risk most U.S. companies would be unwilling to take. All of these factors indicate that the VEU will not be useful to our member companies or effective in facilitating exports to China. The following suggestions could make VEU more attractive to the US exporting community:

- Cleared VEUs should be eligible to receive products/technology associated with any eligible ECCN (not MT or CC). If the entity has the *bona fides* to receive this special treatment, it should not be limited to a specific category of product or technology. This would also limit the need for BIS to continuously republish a list of ECCNs assuming the program becomes successful. At a minimum, there should be an expedited route to adding additional ECCNs to an already authorized VEU.
- BIS should clarify that VEU should be allowable for employees of companies that are normally employed inside the United States if they are nationals of a country eligible for VEU status (i.e., for a US company that seeks VEU status and employs Chinese nationals).
- BIS should adopt a time limit for approving or rejecting VEU applications.
- BIS should clarify that audits associated with VEU would be expressly limited to direct activities under the authorization and would not extend to other areas of compliance.
- BIS should publish a model VEU application that would give US exporters and potential VEUs guidance on BIS expectations.
- Including a "party's agreement to on-site compliance reviews..." and a detailing of "the party's relationships with U.S. and foreign companies" as approval criteria will limit VEU attractiveness without producing a corresponding benefit, since it is still the Chinese government, as a practical matter, that would have to approve visits.
- Similarly, the interagency evaluation of the "status of export controls in the eligible destination and the support and adherence to multilateral export control regimes of the government of the eligible destination" are criteria that are wholly outside the applicant's purview and, in any event, properly apply to an entire country and not to an individual company. BIS should certainly take these criteria into account in deciding whether or not to permit VEU applications from a country, but once the decision is made to do so, there is no need to reconsider it with respect to each application from that country.
- Restrictions on the end use of the export also limit VEU applicability.
- BIS should make clear that failure to obtain VEU status is not considered a "red flag." Since the VEU process is essentially creation of a "white list," great care must be taken to ensure that BIS does not end up creating an implicit "black list" of those who are not on the VEU list.
- BIS should also delete its comment that validated end users found not to be complying with the requirements of VEU status will be subject to "other actions, as appropriate" in addition to removal from the VEU list. We believe that non-compliance with the VEU rules should result only in removal of VEU status. If actions by the end user also violate other provisions of the law or regulations, then action is appropriate under those provisions, not under the VEU provisions. If companies believe that they could be subject to adverse actions above and beyond removal of VEU status, they will be reluctant to apply for it.


In summary, this proposed regulation presents significant costs to American companies and interferes with important U.S. policy goals towards China without offering any tangible benefit or achievable

purpose. This unilateral control is certain to be ineffective and will dramatically increase the costs of compliance to businesses.

We appreciate the opportunity to submit these comments to the Department of Commerce and hope that they are helpful to the rulemaking process. Please feel free to contact us if we can be of further assistance in this matter.

Sincerely,


William T. Archey
President & CEO
AeA


Roszel C. Thomsen II
Counsel
Alliance for Network Security


Jack Maisano
President
American Chamber of Commerce in Hong Kong


John J. Castellani
President
Business Roundtable

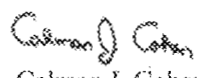

Robert W. Holleyman, II
President & CEO
Business Software Alliance


Edmund B. Rice
President
Coalition of Employment through Exports



Dan Hoydysh
Chairman
Computer Coalition for Responsible Exports


Bob Gardner
Executive Director
EDA Consortium


Dave McCurdy
President & CEO
Electronic Industries Alliance


Calman J. Cohen
President
Emergency Committee for American Trade


Peter J. Bunce
President and CEO
General Aviation Manufacturers Association


Tim Curran
CEO
Global Technology Distribution Council

Rhett Dawson
President
Information Technology Industry Council

Daniel K. Shipp
President
International Safety Equipment
Association

John Engler
President & CEO
National Association of Manufacturers

Dirk Van Dongen
President
National Association of Wholesaler --
Distributors

Michael J. Ford
Member, Board of Directors
National Council on International Trade
and Development

William A. Reinsch
President
National Foreign Trade Council

George Scalise
President
Semiconductor Industry Association

Ken Walsh
President
Software & Information Industry
Association

Thomas J. Donohue
President and CEO
U.S. Chamber of Commerce

John Frisbie
President
US-China Business Council

Peter M. Robinson
President
U.S. Council for International Business

Greg Shea
President and Managing Director
United States Information Technology
Office

Flight Display System			
Multifunctional Display	7A994		Beijing Aviation Science & Technology Co.
Control Panel	7A994		
Attitude Heading Computer			
Attitude Heading Computer	7A994		Chengdu Aero-Instrument Corp.
Flux Detector	7A994		Taiyuan Aero-Instrument Co. Ltd.
Mount	7A994		Shanxi Baocheng Aviation Instrument Co.
Electric Compensator Unit	7A994		
Digital Navigation Receiver			
Navigation Receiver	7A994		None
Mounting Bracket	7A994		
Navigation Control	7A994		
Distance Measuring Equipment			
Mounting Tray	7A994		None
Antenna	7A994		
Automatic Direction Finder			
Mounting Bracket	7A994		Haite Group Co.
Antenna	7A994		
Navigation Control	7A994		
Radio Altimeter			
Radio Altimeter	7A994		Beijing Aviation Science & Technology Co.
Mounting Tray	7A994		
Radio Altimeter	7A994		
Antenna	6A998		
Transponder			
Mounting Tray	6A998		CARERI
Navigation Control	6A998		
Antenna	7A994		
VHF Communication Transceiver			
Mounting Tray	7A994		None
	7A994		

Thales, BAE, Smith, Elmer,
Marconi

Navigation Control	7A994
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Description	Part Number	Company/Supplier
Traffic Alert and Collision Avoidance System (TCAS)		
Receiver/Transmitter	6A998	None
Control	6A998	
TCAS Directional Antenna	6A998	
Indicator	6A998	
		Thales



ATTACHMENT 2

Attachment C

Networking Items Should Be Excluded from MEUR Because of Availability in China

Because of widespread availability of networking hardware, software and technology in China, from Chinese sources and from other sources, we respectfully submit that such items should not be subject to MEUR. We have selected four representative vendors of networking equipment. Two of them are American companies (Cisco and Juniper), one is a Chinese company (Huawei) and the final one is a French company (Alcatel), illustrating the global competitiveness of this dynamic industry. Items described below are classified under ECCNs 5A/D002 and 5A/D992. (Hardware otherwise classified under 5A991 is controlled under 5A002 or 5A992, as appropriate, after software with encryption has been added. All encryption is based on industry standards, in order to facilitate interoperability, and have similar performance.)

1. Marketplace for Routers

	Cisco	Huawei	Alcatel	Juniper
Core	Carrier Routing System (CRS-I)	Net Engine 5000E		T-640 TX
Edge	XR-12000 Series 7600 Series 10000 Series	Net Engine 80E Net Engine 40 E / 20 MA 5200G	7750 Service Router 7450 Service Switch	M320 M120 E320
Mid-range	7200 Series	Net Engine 16E/8E/5	7710 Service Router	M10i M7i
Access	3800 Series 2800 Series 1800 Series	AR 46 AR 28 AR 18		J6300 J4300 J2300

2. Marketplace for Switches

	Cisco	Huawei	Alcatel	Juniper
Core Distribution	Catalyst 6500	Quidway S8500	OmniSwitch 9800 OmniSwitch 9700	
Aggregation / Edge Class	Catalyst 4500	Quidway S6500	OmniSwitch 7800 OmniSwitch 7700	



Metro Medium	Catalyst 3750 Catalyst 3560	Quidway S5600 Quidway S3900 Quidway S3500	OmniSwitch 6850 OmniSwitch 6800 OmniSwitch 6600	
Small Office	Catalyst 2960 Catalyst Express 500	Quidway S3000	OmniStack LS6200	

3. Marketplace for Voice and IP Communications

	Cisco	Huawei	Alcatel	Juniper
IP Phones	7900 Series Unified IP Phones IP Communicator	ViewPoint 8210 Videophone ViewPoint 8220 Videophone	IP Touch 8 Series Phones	
Call Control	Unified Call Manager BTS 10200 Softswitch	USYS- MediaX3600 SoftX3000- Softswitch	OmniPCX Enterprise 5020 Media Gateway Controller	
Customer Contact	Unified Contact Center		OmniGensis	
Applications	Unified CRM Connector Fax Server		OmniTouch Unified Communications	

4. Marketplace for Wireless Networking

	Cisco	Huawei	Alcatel	Juniper
Access Points	Aironet Access Points	Quidway Wireless Access Points	OmniAccess Wireless Access Points	
Controllers	4400 Series Wireless LAN Controllers 2000 Series Wireless LAN Controllers	MA5200F	OmniAccess 6000 OmniAccess 4324 OmniAccess 4308	



Integrated WLAN	Wireless Services for ISRs Catalyst 6500 WLSM	Aolynk BR Series Aolynk DR Series		NetScreen-5GT Wireless Odyssey
Mobile Solutions	Mobile Solutions	UMTS/WCDMA CDMA 2000 GSM Mobile Core Network	Mobile Network Solutions	

5. Marketplace for Network Security Products

	Cisco	Huawei	Alcatel	Juniper
Firewalls	PIX 500 Series Security Appliances ASA 5500 Series	Eudemon 1000/500/200/100 Series Firewalls		Netscreen Integrated Firewall Security Platforms
VPN	VPN 3000 Series Concentrators ASA 5500 Series	Eudemon 1000/500/200/100 Series Firewalls		Netscreen Integrated Firewall Security Platforms SSL VPN Appliances
Intrusion Prevention	IPS 4200 Series Sensors ASA 5500 Series	Quidway S8500 IDS Module		Intrusion Prevention Product Line
Integrated Security Software	IOS Firewall	Intranet Security Solution		JUNOS

6. Marketplace for Optical Networking Products

	Cisco	Huawei	Alcatel	Juniper
Metro Core	ONS 15600 MSPP ONS 15454 MSPP	OptiX Metro 1050/3000/5000	1670 SM	



Alliance for
Network
Security

Metro Edge / Access	ONS 15327 MSPP ONS 15310 ONS 15302/305 MSPP	OptiX Metro 100/500/1000	1642 Edge Multiplexer 1660 SM Optical Multi-Service Node	
Metro DWDM	ONS 15454 MSTP ONS 15500 Series Metro DWDM	OptiX METRO 6100/6040 DWDM OptiX BWS 1600G DWDM	1696 Metrospan (Metro WDM)	

THE OPPORTUNITIES FOR OPERATING SYSTEM SOFTWARE SUPPLIERS IN THE CHINESE CONVERGED DEVICE MARKET

Revenues derived from the sale of devices using operating systems (converged devices) in the Chinese handset market represent a US\$2 Billion opportunity in 2006 and will swell over 50% to US\$4 Billion opportunity in 2011. The IPTV market, while facing near-term regulatory and business delivery issues, has a bright long-term future and major service providers continue to drive developments forward towards the launch of commercial IPTV service. These lucrative opportunities have suppliers, multi-national companies based in the US, Japan, Europe, and Asia, positioning to participate in the market in the long term, and US specific non-tariff trade barriers will significantly restrict US-based operating system suppliers from participating in this market. This white paper provides an assessment of the handset market in China and the role operating systems play in realizing this opportunity. This paper also summarizes the key global operating system players and the global and market level strategies they are implementing to drive their separate solutions into the Chinese converged device market.

October 2006

1 Executive Summary

Non-tariff trade barriers will significantly restrict operating system suppliers from participating in the Chinese market.

As the suppliers of the primary technology driving sales, Operating System vendors are well positioned to benefit from the projected future growth in the Chinese converged device market. These vendors currently face significant regulatory and business model challenges in the medium term, and should be allowed to concentrate freely on driving revenues and user growth for their mobile service provider customers.

The multi-functional capabilities and rich application sets offered via software-based operating systems will be the primary driver of the long term appeal of these devices. Basic cellular phones cannot match this capability, and mobile operators in China are anxious to have richer functionality, in order to enable growth in sales revenues via consumption of data services. This is the core value proposition of the operating system on converged devices vs. the lower functionality, low value approach of conventional cellular handsets.

The Chinese handset market will reach 105 million units in 2006 and will grow at a compound annual rate of 6% through 2011 to reach 137 million total handsets sold in that year.

Converged devices will emerge as one of the main device segments within the Chinese cellular device market. This total device market, by the end of 2006, will be the second largest single country market worldwide.

The operating system in a converged device serves as the platform to deliver rich, multi-tasking application functionality while simultaneously maintaining and managing voice and data connectivity. This rich application functionality is a core, long-term requisite that mobile service providers will aggressively utilize to drive (data) revenue growth in the Chinese cellular market.

All of the major operating system suppliers have established and are executing on long-term strategies to localize and develop the Chinese converged device market opportunity.

Operating system suppliers are each positioning around the core application-enhancing assets that they own in their system solutions. Strategies are diverse, with Research in Motion using

push email and messaging, Microsoft using productivity via Office™ applications and rich media, Symbian leveraging highly integrated communications utility and rich media functionality on Nokia devices, and Access/Palmsource leveraging low-cost open source assets.

Service providers continue to push for commercialization of IPTV services:

- In December 2005, Shanghai Telecom and Shanghai Media Group have collaborated with Siemens to create commercial services this year;
- In May 2006, China Telecom selected infrastructure equipment providers; In May 2006 China Netcom made its equipment vendor selections public;
- China's state administration of radio, film and television (SARFT) is reportedly close to issuing licenses for local IPTV services to one or more vendors;

There are concerns with the government's ability and willingness to offer licenses for IPTV services. There are also concerns about the requirement for service providers to negotiate distribution agreements with local telecom operators and the need to secure SARFT approval on these agreements. However, these issues are centered primarily on business issue of the acceptable rates and pricing structures, issues that are common with any new commercial IP services.

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2 The Chinese Converged Device Market

2.1 China Handset Market Overview & Summary

The Chinese handset market opportunity is immense. Total subscriptions will grow 14% and reach 429 million at the end of 2006, while cellular penetration, as measured against penetration of the total population, will reach 25% by the end of 2006¹. 15% of the world's active cellular users are accessing cellular services in China.

Table 2.1: Chinese Cellular User & Subscription Metrics

China Cellular Users	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	CAGR
Total Subscriptions (M)	206.6	257.6	317.8	376.1	429.1	472.6	508.6	535.6	556.6	574.6	6.0%
Cellular Users (M)	150.1	187.1	231.7	280.0	326.9	369.0	403.0	433.4	457.9	480.5	8.0%
Population Penetration	11.6%	14.3%	17.6%	21.1%	24.5%	27.4%	29.8%	31.8%	33.4%	34.8%	7.3%

This subscription growth, combined with improving handset replacement dynamics, creates one of the largest cellular device markets globally. In 2006, 105 million cellular handsets will be sold in China, making it the country with the second largest handset sales totals globally. Handset sales are projected to grow at a 6% 5-year compound annual growth rate (CAGR) through 2011, to 137 million units annually being sold in 2011².

In 2006, subscriptions sold on pre-paid service tariffs will grow to account for 66% of total subscriptions, and will continue to rise through 2011 to reach 73% of total subscriptions in that year. Furthermore, annual revenues per user (ARPU) will reach US\$110, a third of the global average of US\$318 per user.

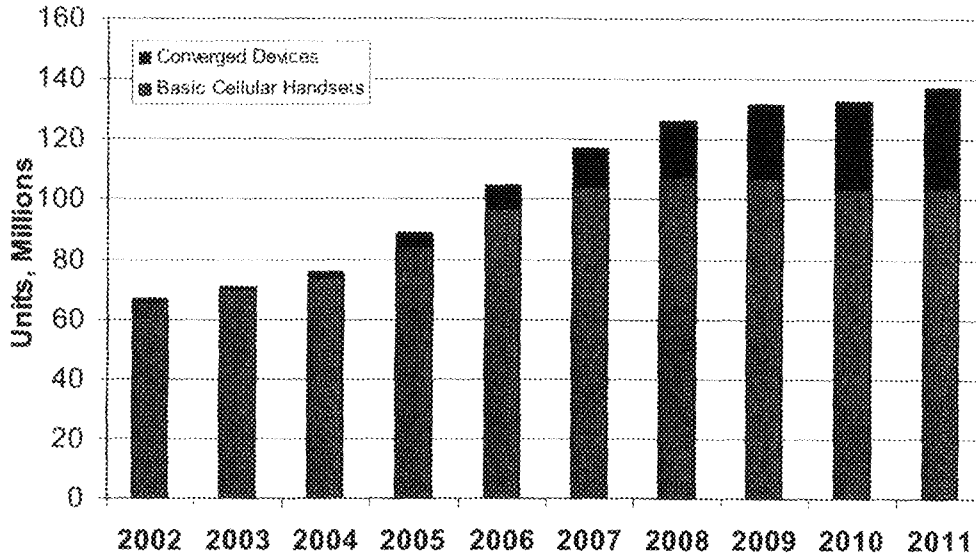
Users buying on unsubsidized pre-paid tariffs with very low annual spending profiles for services have historically purchased handsets in lower price ranges. In China, this is the norm, and the metrics on Chinese average revenue per user (ARPU) and pre-paid penetration contribute to the fact that most handsets sold in this market today are lower price, more basic product configurations. Furthermore, this is likely to be the case continuing through the medium term. Strategy Analytics estimates that the average selling price (ASP) for cellular handsets in China is approximately US\$85 at the end of 2005, and will fall gradually through 2011 to near US\$75.

¹ Strategy Analytics, Wireless Network Strategies estimate, September, 2006.

² Strategy Analytics, Wireless Device Strategies estimate, October 2006.

2.2 China Operating System-enabled Converged Device Market Potential

Exhibit 2.2: Chinese Cellular Device Market Historical Sales & Projections, 2000-2011



As the suppliers of the primary technology driving sales, Operating System vendors are well positioned to benefit from the projected future growth in the Chinese converged device market.

The multi-functional capabilities and rich application sets offered via software-based operating systems will be the primary driver of the long term appeal of these devices.

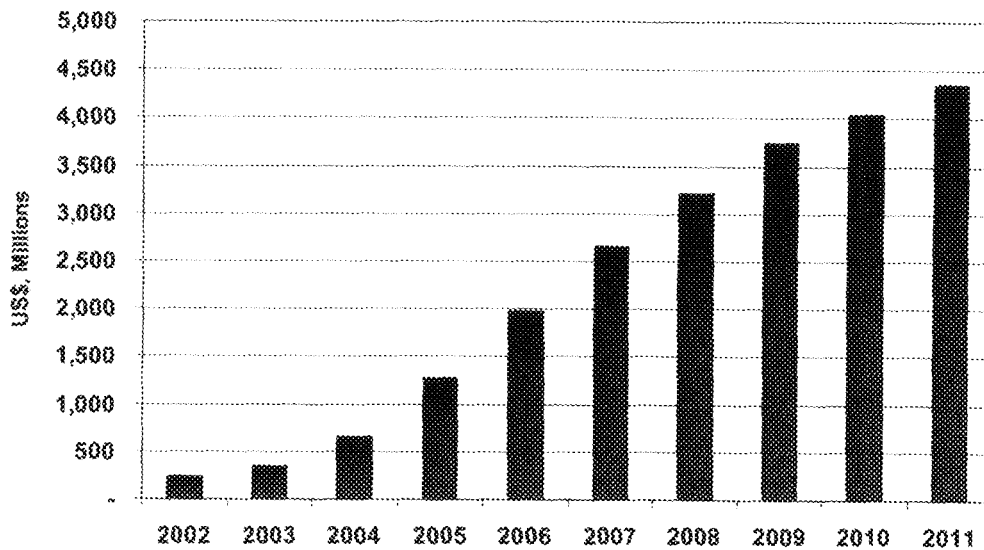
Basic cellular phones cannot match this capability, and mobile operators in China are anxious to have richer functionality, in order to enable growth in sales revenues via consumption of data services. This is the core value proposition of the operating system on converged devices vs. the lower functionality, low value approach of conventional cellular handsets.

Sales of converged devices in the Chinese market are estimated to account for 8% of total cellular device sales in 2006, or roughly 8 million units. This trails the global penetration of

converged device sales, which are projected to reach 85 million units globally, or 9% of total cellular-enabled devices sold worldwide³.

This equates to just under US\$2 Billion in device revenues in 2006, and this will grow nearly 50% to US\$4 Billion opportunity in 2011.

Exhibit 2.3: China Converged Device Revenues, US\$ Millions, Historical and Projected



Several factors are contributing to this lower penetration of sales:

- Generally lower levels of corporate/enterprise IT and systems support;
- Lower broadband penetration in households, creating a general lack of awareness of the benefits of internet and connected mobile technologies beyond cellular voice and SMS;
- Higher level of grey-market⁴ device sales;

³ Strategy Analytics, Wireless Device Strategies estimates, June 2006.

⁴ Devices purchased in other regional and/or country markets, then resold in domestic market.

-
- Lower spending levels on both services and device purchases in China.

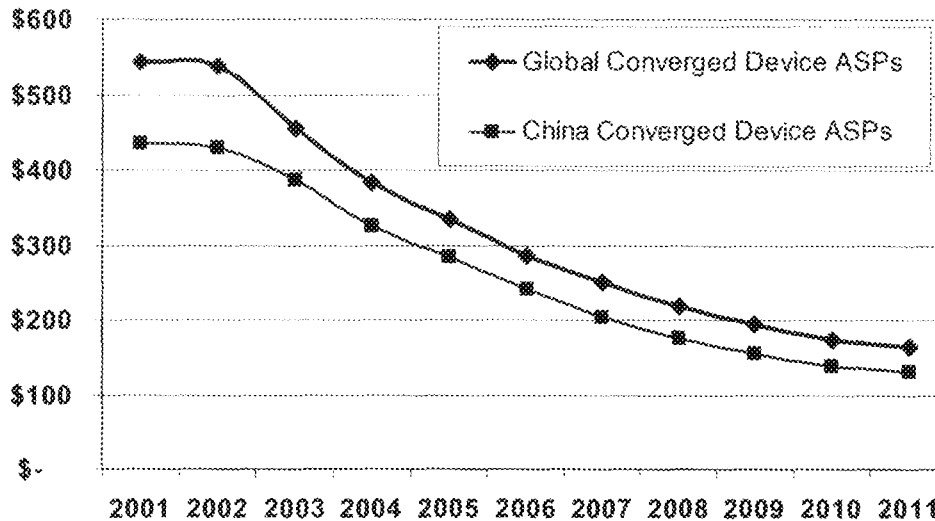
However, as illustrated in Exhibit 2.2, converged device sales in China are projected to grow at a 35% 5 year CAGR through 2011 to reach 33 million units⁵. This growth will be driven by a number of factors:

- Cellular service providers are keen to attempt to drive ARPU levels by offering richer sets of applications and devices to their users. China Mobile and China Unicom are already working with nearly all of the top original equipment manufacturers (OEMs and Operating System (OS) suppliers to improve their converged device portfolios and will increasingly look to these devices to offer the broadest set of data-revenue generating applications in the long-term;
- Handset suppliers continue to lower the bill of materials (BOM) costs in their converged device offerings, and ASPs for these devices are expected to fall significantly over the next several years (see Exhibit 2.3).
- As converged device prices fall, OEMs will be able to increasingly offer a wider array of segmented converged devices targeted for delivering specific application sets to a wider range of mass market users. Like the Nokia N Series devices, these media-centric designs, at much lower selling price points, will drive longer term adoption beyond business/enterprise users into more mass market, consumer oriented user segments.

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⁵ Strategy Analytics, Wireless Device Strategies, October 2006.

Exhibit 2.4: Global and China Converged Device ASPs, Historical and Projected



2.3 Operating System Supplier Status in China⁶

2.3.1 Research In Motion

In May 2006, Research in Motion announced a device and email solution to be offered via China Mobile, China's largest cellular service provider. To be offered via its GPRS (2.5G) network, Research in Motion expects to begin selling devices through China Mobile in Q3 2006.

In April 2006, the second largest cellular service provider in China, China Unicom, launched a Redberry™ branded push email service that closely copies Research in Motion's successful Blackberry™ product line. While there is more than anecdotal evidence that this could constitute trademark and/or copyright infringement, Research in Motion has been subdued in its response. Confident in the superior nature of its email solution, Research in Motion appears to be willing to allow this brand-mimicking to continue in order to avoid "upsetting the apple cart" and possibly derailing its efforts to drive long-term adoption of its own products with a lawsuit against one of the top service providers in China.

⁶ More information is included on each of these operating system vendors in section 4.

2.3.2 Symbian

As it is experiencing in global sales, Symbian-enabled device sales are being driven in China primarily by Nokia. Nokia's competitive position in the global handset market (all device types) has seen China become one of its core markets for localized manufacturing, research & development, and distribution resources. Nokia has consistently had nearly 30% market share of all handsets sold in China for the past several years, which equates to roughly 25 million handsets⁷ or nearly than 10% of Nokia total global volumes⁸ in 2005.



With this level of market commitment, Nokia has been proactive in supporting popular internet content brands and service providers in China via its Symbian-enabled converged devices:

- In March 2005, announced that it's N Series line of converged device products, the N70, N90 and other select Series 60 devices (all Symbian-enabled) would support Baidu Wireless Search services. Nokia now provides customized, mobile presentation of content searches from a variety of Baidu online communities.
- Launched the Nokia 6708 model with Chinese handwriting recognition feature in October 2005.
- Symbian reported that it held a 62% share of OS-enabled converged device sales in China in Q1 2006. Nokia sold 100% of this volume, estimated to be approximately 1.1 million units, approximately 10% of Symbian volumes in the quarter.⁹

2.3.3 Access/Palmsource

Access purchased the Palmsource OS in November 2005 with the intention of transitioning the OS to a Linux or open source-based platform. In February 2006, Access announced that the OS will now be known as the Access Linux Platform (ALP), an open and flexible Linux-based platform tailored for converged devices.

⁷ Includes both traditional cellular handsets and cellular converged devices.

⁸ Strategy Analytics estimates, based on Nokia annual sales of 265 million handsets sold globally in 2005.

⁹ Strategy Analytics estimates, Canalys estimates, Symbian China OS-enabled estimates.

Today, Palm (the device vendor based in the US and now separate from the US supplier after a spin-off in 2004) supports the Palmsource OS on an increasingly smaller segment of its device sales globally, and also supports the Microsoft Windows Mobile OS. Samsung and several smaller Chinese OEMs are offering Palm-enabled products globally and in China, respectively. Access is actively involved in the process of transitioning the OS to an open source platform, but information on its status and devices that are available which are supporting the platform is minimal at present, suggesting slow take-up in the global and Chinese device community.

2.3.4 Microsoft



Microsoft has a larger strategy to drive sales of its IT computing software products and services in China and has been promoting these corporate initiatives since the early 2000s. Its effort to sell Windows Mobile™ operating system enabled converged devices is one of these major corporate initiatives in the Chinese market.

Microsoft has been attempting to drive an application development community in China for several years. In May 2006, Microsoft signed a working agreement with TechFaith Wireless, a handset design company, to develop converged devices for the Chinese market.

Chinese mobile device manufacturers offering Microsoft Windows Mobile OS-enabled converged devices include Lenovo Mobile, Amoi, HTC/Dopod, and Mio Technologies.

2.3.5 Linux

China Mobile and China Unicom are part of a regional alliance with cellular service providers in South Korea and Japan to support the development of an application development ecosystem for mobile Linux-based products.

The Chinese government, via several different regulatory bodies including the MII subsidizes Linux research and development, to some unknown degree, for domestic competitors, i.e. RedFlag and others. It is important to note, however, that this support for Linux by these major service providers is not exclusive, and they continue to offer products from other OS suppliers. In fact, both major cellular service providers currently offer devices utilizing OS products from at least three of the four major OS suppliers globally.

The mid-term potential for Linux-based OS products is primarily in basic cellular handsets. In this product segment, OEMs stand to benefit from the low cost nature of the system and the

more basic requirements of these communication-centric products vs. the more robust processing requirements of converged devices. Many domestic handset OEMs, including TCL, Ningbo Bird, Lenovo, Haier, ZTE, Huawei, G2B, Gtek, offer basic handsets utilizing the Linux OS, but converged devices utilizing Linux will be limited to only 2 to 3 million units in 2006, roughly 25% of converged devices sold¹⁰. Share of Linux-enabled converged devices in China is projected to remain relatively static at this level through 2008¹¹.

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¹⁰ Strategy Analytics estimates.

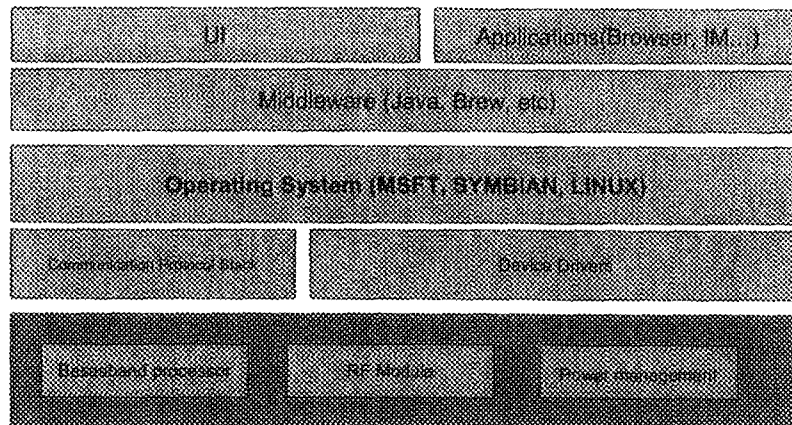
¹¹ Strategy Analytics estimates.

3 Role of the Operating System in the Converged Device Domain

The operating system in a Converged device serves as the platform to deliver rich, multi-tasking application functionality while simultaneously maintaining and managing voice and data connectivity. These devices utilize advanced features and computing architectures, including but not limited to:

- **Cellular connectivity.** This is the core communications technology enabling WAN connectivity. This technology is integrated into the device and provides value-added functionality linked to productivity and entertainment applications.
- **Advanced mobile computing architectures** that include several application processors (i.e. media engines, graphics processors, etc.) in addition to RF baseband computing cores;
- **large blocks of embedded memory**, as well as Removable Storage Media support;
- **Rich Personal Area Network (PAN) connectivity**, including Bluetooth, Wifi/WLAN, USB, infra-red, etc;
- **High-resolution color LCDs**, often touch-screen panels;
- **QWERTY or partial-QWERTY keypads** to facilitate messaging and text-based communications;
- **Rich entertainment/media functions** like media players and high resolution cameras;
- **Rich productivity applications**, including email/messaging, scheduling, spreadsheet, database, and word processing, contact management and scheduling (Personal Information Management or PIM);

Exhibit 3.1: Converged Device Configuration



Converged Devices utilize “Open” operating systems. These are called ‘open’ operating systems because:

- These systems, or platforms, deliver key productivity and communications solutions in the mobile and desktop computing environment;
- These systems have their own application development ecosystems, which is organized and managed by the OS owners, which serve to manage, support, and enhance wider usage of the operating systems across device and application markets for both consumer and business/enterprise users.

The major Open Operating Systems on offer in the Chinese and global mobile device market today include Symbian, Microsoft, Research in Motion, Palm, and Linux. Relevant supporting companies, locations, current market positions and product summaries are included in Section four (4), “Operating Systems - Competitive Market Assessment.”

Since voice and increasingly data communications are the core value of the product, converged devices integrate communications into the productivity and entertainment applications when mobile. Users can run several applications on the device, either simultaneously (multi-tasking) or individually. Via the communications feature, users can also link to the internet (choosing the most convenient WAN or PAN connectivity option) to update, exchange, or manage vital data located in other network nodes, extranets, etc. that is required in the application. The

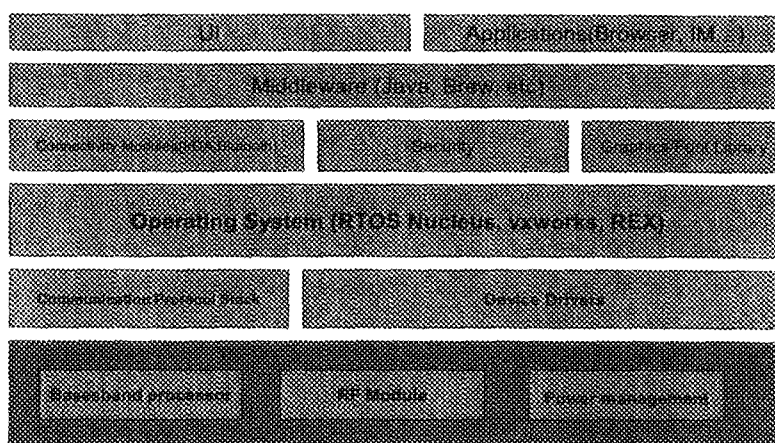
In short, the operating system supports rich communications, productivity, and entertainment application capabilities that utilize the advanced features and connectivity technologies found on converged devices.

most widely known example of this functionality is the Blackberry, which allows users to synchronize, review, create and send email from the converged Blackberry device.

This differs from typical or average cellular handsets in several important areas:

- Typical cellular handsets use streamlined computing architectures. These devices often complete all the application processing on the single baseband core which is used primarily to process the basic RF communications. As RF signal processing is increasingly resource intensive, especially on advanced network deployments (i.e. 3G) this serves to limit the breadth and richness of applications that the typical cellular handset can support.
- Typical cellular handsets utilize more basic sets of value-added features, i.e. smaller and lighter designs; lower resolution LCDs, smaller levels of embedded memory, etc.

Exhibit 3.2: Typical Cellular Handset Configuration



OEMs and service providers offer these more streamlined device capabilities in order to keep average selling prices (ASPs) low for voice-centric cellular users. These users, who often do not require rich application functionality beyond basic text (SMS) messaging will often seek out lowest price and best brand combinations for these products. This makes it low price a key component of handset products targeting this segment.

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4 Operating Systems - Competitive Market Assessment

This section includes 5D.002 items regarding identification of the major operating system vendors with a summary of key products and supporting organizations.

Operating System (OS) vendors competing in the global market today include Symbian, Microsoft, Research in Motion, Palm/Access, and Linux/Open Source. These vendors develop their OS products for mobile/portable cellular device OEMs to offer on their devices in markets in which they compete in globally. Supporting devices across the range of network technologies deployed globally, these vendors also develop related or complementary OS components that support or enhance the usability of their products in different markets and market segments. Device OEMs are required to license the OS from these OS vendors, and usually if not always pay licenses on a per-unit sold basis, at either a fixed price or as a percentage of the handset sales price.

4.1 Symbian

Table 4.1: Symbian Summary

Symbian, Ltd.		http://www.symbian.com/
Location:	Headquarters are based in London, United Kingdom with offices in the United States, Europe and Asia (Bangalore, Beijing, Seoul and Tokyo)	
Product Mftg. Location(s):	London, with research and product development resources in the United States, Europe, and Asia.	
Key facts:	Founded, 1998, employees, 1366	
Key stakeholders:	Nokia (47.9%), Ericsson (15.6%), Panasonic (10.5%), Samsung (4.5%), Siemens (8.4%) and Sony Ericsson (13.1%)	
Current Licensees:	Mobile phone manufacturers that license Symbian OS are Arima (Taiwan), Ben Q (Taiwan), Fujitsu (Japan), Lenovo (China), LG Electronics (S. Korea), Motorola (U.S.A), Mitsubishi (Japan), Nokia (Finland), Panasonic (Japan), Samsung (S. Korea), Sharp (Japan) and Sony Ericsson (Japan/Sweden).	
Key products:	Symbian OS™	
Others:	Nokia has several User Interfaces (Series 60 and Series 80) designed to run specifically on the Symbian OS; NTT DoCoMo has developed the MOAP user interface for its FOMA™ 3G network; UIQ Technology, a wholly owned Symbian subsidiary, has developed the UIQ interface that runs exclusively on Symbian and is currently deployed on devices from Sony Ericsson Mobile Communications.	

Nokia is a key driver of Symbian OS development, until last year having had a majority ownership interest and now still the single largest shareholder in the Symbian entity. Nokia is

also the nearly sole company driving Symbian device sales to date. For example, in Q2 2006 Symbian reported that 12 million devices utilizing the Symbian OS were shipped. Nokia reported that it sold 9 million Symbian enabled devices under its brand, accounting for 75% of the devices sold that quarter. Symbian reports that there is an installed base of 86 million units globally. Strategy Analytics estimates that Nokia-branded devices account for 90% of those or 77 million Symbian-enabled devices. While there are twelve (12) licensees of the Symbian OS, Nokia still accounts for the overwhelming share of Symbian enabled devices sold. Motorola, Samsung and LG have yet to offer a Symbian device commercially.

Besides Europe, Japan is the other major market where Symbian devices are utilized to some meaningful albeit minimal level to date.

Symbian's strategy is to offer a communications intensive platform at low-cost to licensees, to facilitate broader usage across consumer mass market segments that require low-cost device solutions. Symbian applications are efficiently integrated with communications capabilities of their devices, affording value-added functionality based on the primary services offered by cellular service providers.

4.2 Research in Motion

Table 4.2: Research in Motion Summary

Research in Motion, Ltd. (RIMM)		http://www.rim.net/
Location:	Based in Waterloo, Ontario, with offices in North America, Europe and Asia Pacific.	
Product Mftg. Locations:	Canada, with product development resources in the United States and Europe.	
Key facts:	Founded in 1984.	
Key stakeholders:	Publicly owned and traded. RIMM, NASDAQ National Market and Toronto Stock Exchange.	
Current Licensees:	Does not currently offer its OS for licensed use. Does license Blackberry Connect™, the push email component of its wireless messaging platform, to the top 6 global handset OEMs, but currently accounts for 95% ¹² of its own OS-enabled devices sold.	
Key products:	Provides platforms and solutions for seamless access to time-sensitive information including email, phone, SMS messaging, Internet and intranet-based applications. RIM technology also enables a broad array of third party developers and manufacturers to enhance their products and services with wireless connectivity. The company has an increasingly strong presence in the business and corporate mobile email market, via its BlackBerry® wireless platform, as well as its wireless device product line, software development tools, radio-modems and software/hardware licensing agreements.	

¹² Strategy Analytics estimate, as of end of calendar Q2 2006.

Research in Motion (RIMM) does not currently license its operating system to other handset OEMs. It derives 72%¹³ of its revenues from the sale of Blackberry™ devices that it sells directly to service providers and 19%¹⁴ of its revenues from services associated with its Blackberry Wireless email solutions. Due to the popular nature of its Blackberry wireless email products in the corporate/enterprise market (the company reported that at the end of its fiscal 2Q 2006, that it had 6.2 million subscribers to its email platform globally), there is a growing base of application developers designing applications to run on the platform.

4.3 Microsoft

Table 4.3: Microsoft Summary

Microsoft Corporation		http://www.microsoft.com/
Location:	Redmond, Washington U.S.A. with corporate office locations on major continents globally.	
Product Mfg. Locations:	The United States, with product development and research resources contributing globally.	
Key facts:	Founded 1975, public issue in March 1986.	
Key stakeholders:	Bill Gates	
Current Licensees:	Licensees include Motorola (U.S.A), Samsung (S. Korea), Benq Siemens (Taiwan), HTC (Taiwan), HP (U.S.A.), Palm (U.S.A.), Intermec, Symbol Technologies (recently acquired by Motorola), Lenovo Mobile (China), Amoi (China), Dopod (acquired by HTC in June 2006, China), Mio Technology Ltd. (China), Compal Computing (Tawian) and numerous other Asian-based contract and original equipment manufacturers.	
Key products:	Its products for Converged device and cellular handset products are designed to offer rich internet, email, and Office™ application functionality. Microsoft Smartphone and Windows Mobile OS products are licensed products created and managed within its Mobile and Embedded Devices Business Group. Its Windows Media and Activesync products are also licensed to mobile device OEM and enabling technology suppliers.	

Microsoft entered the converged device market in 2001, using its experience of offering OS products on unconnected PDA devices and experience gleaned from competing with Palm and several proprietary OS players (Ericsson, Psion) to make entry into the mobile converged device market.

A market leader in operating systems deployed in desktop, network computing, and Exchange™ based email systems for both consumer and enterprise users, Microsoft seeks to extend this

¹³ Source: RIMM fiscal Q2 2006 report, Sept 28, 2006.

¹⁴ Source: RIMM fiscal Q2 2006 report, Sept 28, 2006.

expertise into the converged device market via its mobile computing platform. In converged devices, its strongest competitive position is currently in the North American market where it holds a 17% market share¹⁵ of OS enabled converged devices sold in 2005 Windows Mobile OS in all major cellular markets globally.

Microsoft has a close working relationship with High Tech Computers (HTC). HTC offers Microsoft OS-enabled products exclusively, via both OEM-branded Windows Mobile products and contract equipment manufactured (CEM) products for other device vendors and cellular service providers like O2 in the UK and Cingular T Mobile in Europe and the US. HTC accounted for more than 75% of Microsoft-enabled OS converged devices sold in 2005, and will continue to play an important role in driving Microsoft-enabled converged device sales globally.

4.4 Palmsource

Table 4.4: Palmsource/Access Summary

Palmsource owned by Access Co., Ltd.		http://www.access-us-inc.com/
Location:	Headquarters in Tokyo, Japan, with offices in Germany, China, Taiwan, Korea, France, and the U.S.A.	
Product Mftg. Locations:	Japan.	
Key facts:	Founded April 1979, 1256 group employees, capitalization of 31.28 Billion Yen ¹⁶ or US\$272 million.	
Key stakeholders:	NTT Docomo, Inc.	
Current Licensees:	For its Palmsource OS, licensees include Palm (U.S.A.), Samsung (S. Korea), Motorola, Kyocera Wireless (U.S.A.), Sharp (Japan), and a number of smaller Chinese OEMs, including Haier and Amoi. 14 of the top 15 OEMs license their Netfront browser or components of their Netfront Mobile client suite.	
Key products:	Netfront browser/iMode browser, Netfront Mobile Client Suite of applications for cellular phones, Palmsource operating system, Netfront User interface and other products for portable/mobile consumer electronics products (i.e. Netfront software is used in the Sony Playstation Portable, PSP®).	

Palmsource was purchased by Access Co., Ltd. in November 2005. The original operating system deployed in the early Palm handhelds, the installed base of Palmsource-enabled devices swelled globally to in excess of 20 million devices globally in 2004. Sales of the platform began to slide

¹⁵ Strategy Analytics estimates. for full year 2005.

¹⁶ Using exchange rates and capitalization information as of January 31, 2006.

as the OS vendor did not anticipate the need to support its OS in the mobile or cellular-connected user environment.

As users began to migrate away from unconnected devices in 2004, Palmsource struggled to maintain its position in the OS marketplace. In 2005, among other initiatives aimed at stabilizing its global position, Palmsource mobilized resources to begin integrating Linux-based software code into the Palmsource OS for future product demand in China and other Asia-Pacific markets. Its purchase of China Mobilesoft, a Linux platform supplier was part of this effort.

Access purchased Palmsource and its mobile OS products in November 2005 with the intention of transitioning the OS to a Linux or open source-based platform. In February 2006, Access announced that the OS will now be known as the Access Linux Platform (ALP), an open and flexible Linux-based platform tailored for converged devices.

Today, Palm (device vendor, a different company from the OS supplier) supports the Palmsource OS on an increasingly smaller segment of its device sales globally, and also supports the Microsoft Windows Mobile OS. Samsung and several smaller Chinese OEMs are offering Palm-enabled products globally and in China, respectively. Access is actively involved in the process of transitioning the OS to an open source platform, but information on its status and the commercial availability of devices supporting the platform is minimal at present, suggesting slow take-up in the global and Chinese device community.

4.5 Linux

Table 4.5: Linux Summary

Linux - Open source	
Location:	A community of developers using open source code to develop operating system products for a variety of different computing environments, one of which includes mobile computing via converged devices.
Product Mftg. Locations:	Most development efforts happening in Asia, with a concentration of efforts in S. Korea, Japan, China. Organizations contributing from Europe and North America.
Key stakeholders:	Montavista software, Motorola, Access, Linux Phone Standards Forum (LiPS), Open Source Development Labs started.
Current Licensees:	License is not required for Linux based open source OS products in theory. The community development efforts are meant to provide public development and leverage of development resources. However, several companies are aggressively seeking to establish products that differentiate on a competitive position established on Linux-based systems, among them Montavista and Motorola. These players are not likely to make their system developments available to their competing OEM or

	software suppliers.
Key products:	The Mobile Linux Initiative, a working group designed to optimize the Linux operating system for handheld devices. That group is working to unify developments around the mobile Linux kernel, focusing on such functions as power management, boot time, and system footprint; Linux Phone Standards Forum (LIPS) Forum is to create application programming interfaces that will allow developers to build applications that will interoperate across Linux handsets made by all manufacturers; Motorola Moto-linux and several handsets available, including Ming A1200, A728, A760, A768, A910, A780. Motorola reports 5 million Linux enabled handsets sold globally (cumulatively) through Q2 2006 ¹⁷ . Samsung ships several Linux-based smart phones, and the SCH-i519 Smartphone was its first Linux Smartphone that began shipping in 2003. Samsung also worked with Infineon to develop a Linux based Smartphone platform (announced at 3GSM in 2005) and has since launched two new smart phones, the Otopia and the i858.

The appeal of low-cost, open source handset development via the Linux platform has been debated in the global device market since 2000. Linux has been very successful in displacing other platforms in network switching and process-intensive computing environments in the last decade.

The requirement for a closely integrated link between communications and application functionality of the operating system has proven to be a stumbling block for Linux OS diffusion into the mobile converged device market globally. Several OEMs, including Sharp, have had limited success in driving Linux device adoption, especially in mature cellular markets in Western Europe and North America. The resource-intensive nature of the OS, combined with the lack of an established ecosystem of supporting application developers has virtually limited Linux OS-based converged device sales to nil in these markets.

In Asia Pacific, Linux OS development has continued to gain steam. Mobile operators and IT software players in Korea, China, Taiwan, and Japan have developed a core group of suppliers and developers for Linux based products. This development, led by players like China Mobilesoft and Montavista, among others, has been fragmented until 2005. With broader commitment to the deployment of the Linux OS from Motorola (the company has stated that it will deploy Linux across its converged and traditional cellular handset products in the future), the platform is gaining some momentum with sales concentrated in Asia Pacific.

The recent launch of several Linux consortiums - specifically the Mobile Linux Initiative and the Linux Phone Standards Forum (LIPS) - continue to create momentum for broader Linux OS support in Asia and Western Europe.

¹⁷ Source: Motorola, Montavista Software.

4.6 Others, Proprietary

Handset OEMs and CEMs utilize their own operating system products in various product segments. These operating systems are primarily meant to meet the need for communications support and basic application functionality on a mid tier, basic cellular handset. VXWorks, Rex, etc, and several other proprietary Real Time operating systems (RTOS) developed by handset OEMs and their software suppliers are used in these product categories. The main purpose of these operating systems is to support basic communications and application functionality on streamlined computing architectures at a total lower cost. These products do not directly compete in the same product segments with converged devices running open operating systems, but will still account for over 70% of cellular in 2007.

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5 Definitions

ARPU - Average Revenue per User. A metric utilized by cellular service providers to measure average services spending levels for their current, active cellular customer base.

ASP- Average selling price. In this report, this refers to the price that handset OEMs charge to cellular service providers for their devices. This is essentially the wholesale or trade price.

CEM - Contract Equipment Manufacturer. Manufacture devices on contract for other OEMs and/or service providers.

Converged device - Also known as smart devices, smart phones, and wireless PDAs. These devices utilize advanced computing architectures and connectivity technologies that provide a much higher level of functionality and application potential than typical cellular handsets. The support of voice and data communications "converges" with rich application and multi-tasking capabilities on these devices at a level typically much higher than what is available on an ordinary or average cellular handset. These devices utilize an operating system to deliver rich, multi-tasking application functionality while simultaneously maintaining and managing voice and data connectivity. These devices support a rich set of communications, entertainment, and productivity applications that are typically not found on basic, mass market cellular handsets utilizing a real-time operating system. Integrated support for Wide Area Connectivity serves as the core value of these devices, allowing key user data, information, and communication to be actively managed and updated while the user is mobile.

Data-centric - The data or packet based communications functions are the main usage/functionality. Basic voice and SMS functions are also present.

Emerging Market - Countries with cellular service penetration below 50% of the total population. Nearly all also demonstrate per-capita income levels across the total population that are significantly lower than developed or mature cellular markets in Europe and the United States.

IPTV - Internet Protocol Television. Television programming delivered in internet protocols, via broadband internet services.

MMS - Multi-Media Messaging, a cellular messaging protocol enabling both text and data messages. MMS enabled devices allow users to both send and receive text messages as well as images, videos and other data file formats.

DEM - Original Equipment Manufacturer. In this report, these are also called 'cellular handset vendors.'

PDA - Personal Digital Assistant. A device that offers enhancements based on productive use of Personal Information Management (PIM) applications, i.e. contact management, scheduling, messaging, etc.

Personal Area Network (PAN) - Technologies that provide short-range connectivity, typically from device to device, either wirelessly or via cable connection. i.e. Bluetooth, Wifi/WLAN, USB, infra-red. Data transfer rates vary depending on the technology.

PIM - Personal Information Management.

Pre-paid - Cellular service delivered on a "pay as you go" basis, where users pay upfront for monthly services and cannot use an amount beyond their self-determined pre-paid level of service.

RF - Radio frequency. Cellular radios work in certain licensed radio frequencies which vary depending on market and regulatory factors.

SMS - Short Messaging Service, a cellular text messaging protocol used globally by cellular service providers. Also called 'text messaging', offers 160 symbol message length and can be enhanced (EMS) to support longer, concatenated messages and icons.

Subscriptions - An active cellular service delivered to a user, billed and paid monthly.

Voice-centric - Voice and basic SMS functions are the main applications utilized or offered.

Wide Area Network (WAN) - Technologies, i.e. cellular, PCS, 3G, Wimax, that use radio frequency to provide voice and/or data connectivity in distances from a few meters to several miles, depending on network configuration. Data transfer rates vary depending on the generation of RF technology used for connection.

2.5G - Cellular handsets supporting the GSM/GPRS interface. Broadly defined by the International Telecommunications Union as devices that can theoretically support data transfer speeds below 144 kbps.

3G - Third generation wireless products. Broadly defined by the ITU as products that can deliver data transfer speeds of 144kbps or higher without additional hardware and/or silicon based enhancements.

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CUMMINS INC.
GOVERNMENT RELATIONS

FACSIMILE TRANSMITTAL SHEET

TO: Sheila Quarterman	FROM: Carly Van Way
COMPANY: Office of Exporter Services	DATE: 12/1/2006
FAX NUMBER: 202-482-3355	TOTAL NO. OF PAGES INCLUDING COVER: 39
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RE:
Comments of Cummins Inc. regarding
the Proposed Rule: 71 Fed. Reg. 38313

URGENT FOR REVIEW PLEASE COMMENT PLEASE REPLY PLEASE RECYCLE

NOTES/COMMENTS

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December 1, 2006

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ATTN: RIN 0694-AD75

Dear Ms. Quarterman:

Cummins Inc. ("Cummins") hereby submits our comments regarding the Proposed Rule that the Bureau of Industry and Security ("BIS") published for public comment on July 6, 2006, 71 Fed. Reg. 38313. We thank you for the opportunity to provide comments on these important issues.

I. Summary

Cummins is dedicated to supporting the efforts of the U.S. government to protect its national security interests. A carefully targeted and transparent export control program can be an effective tool in protecting those national interests. We support U.S. efforts to re-evaluate and modernize export control regulations to meet changing circumstances. However, we are concerned that the current proposal will not be effective in achieving its stated national security and foreign policy goals. We believe it is overbroad, complex, and poses significant compliance difficulties for U.S. companies producing and selling diesel engines. We urge that it be withdrawn or significantly modified.

Cummins is strongly committed to complying with the applicable laws of the U.S. and all countries in which we conduct business. We are also committed to increasing value to our shareholders. In order to increase value, Cummins must continue to grow its business outside the United States, including growing its business in China. Unfortunately, we believe the Proposed Rule would not only be ineffective with respect to diesel engine availability in achieving its stated national security and foreign policy goals, it would also cause significant economic harm to Cummins, our U.S. suppliers, and our Chinese joint venture partners and customers.

Steven M. Chapman
Group Vice President - Emerging Markets
and Businesses

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If BIS decides to proceed with the type of export control described in the Proposed Rule, Cummins recommends that, at a minimum, BIS remove certain Export Control Classification Numbers ("ECCNs") from proposed Supp. No. 2 to Part 744. We recommend the removal of these ECCNs because the items they would control are already abundantly available from Chinese companies as well as foreign sources, often at substantially higher levels of technology than would be controlled by the Proposed Rule. Attempting to control these relatively low level readily available technology items would be completely ineffective with respect to diesel engines in achieving the stated goals of the Proposed Rule.

In support of our recommendation we have prepared for your consideration a white paper detailing Chinese and foreign sources of the items described by ECCNs 9A990, 9D990, 9E990, 8A992, 8D992, and 8E992. The white paper is found at Attachment A.

Our specific comments on the Proposed Rule are provided below.

II. About Cummins Inc.

Cummins Inc., a global power leader, is a corporation of complementary business units that design, manufacture, distribute and service engines and related technologies, including fuel systems, controls, air handling, filtration, emission solutions and electrical power generation systems. Headquartered in Columbus, Indiana (U.S.A.), Cummins serves customers in more than 160 countries through its network of 550 Company-owned and independent distributor facilities and more than 5,000 dealer locations. Cummins reported net income of \$550 million on sales of \$9.9 billion in 2005.

III. Cummins experience in China

Cummins has enjoyed a long and positive history of conducting business in China. Former Cummins Chairman, Irwin Miller, visited China in 1975 as one of the earliest American industry leaders seeking business opportunities in China. The first office was established in 1979. Today, with 22 legal entities, Cummins is the largest foreign investor in the China diesel engine industry. The company provides a complex and broad product manufacturing platform, and nationwide distribution and aftermarket support through a mix of joint ventures, wholly owned entities, and partner relationships.

Cummins manufactures in China through its joint ventures a complete line of diesel engines for trucks, buses, electrical power generation, marine propulsion, and marine electrical power generation. Cummins also exports many of these items to China. Much of our manufacturing both in China and the U.S.

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would be negatively impacted by the compliance burdens of the Proposed Rule, as well as enhance the perception in the Chinese market that U.S. companies are unreliable suppliers and business partners.

IV. Specific comments on Proposed Rule

Our comments are concerned primarily with one element of the Proposed Rule, namely, the proposed new section 744.21 of the Export Administration Regulations ("EAR") and its related provisions. That new section would contain a general prohibition that "[Y]ou may not export, reexport, or transfer any item listed in Supplement No. 2 to Part 744 to the PRC without a license or under a license exception...if, at the time of the export, reexport, or transfer, you know...that the item is or may be intended, entirely or in part, for a 'military end-use' in the PRC."

Cummins offers for your consideration the following points about this provision:

1. The items controlled under the ECCNs in new Supp. No. 2 that are of particular concern to Cummins, namely, those relating to diesel engines, are produced indigenously in China already. Moreover, there are abundant foreign sources for the technology required to develop or produce diesel engines. These sources of diesel engine technology are found in numerous Sino-foreign joint ventures, as well as foreign technology consulting firms. Therefore, the Proposed Rule would not hamper Chinese military development that may involve the use of diesel engines in the slightest degree.
2. The controls are unilateral and would harm the ability of Cummins and other U.S. companies to conduct business in China.
3. The ECCNs of particular concern to Cummins are currently controlled for antiterrorism reasons. When taken out of the antiterrorism context and applied to China, certain technical anomalies and inconsistencies in these ECCNs become readily apparent. These technical problems would undercut the good faith attempts by companies to comply with the Proposed Rule.
4. Three of the ECCNs that would be subject to the Proposed Rule, namely, 8A992, 8D992, and 8E992, are described by that Rule in an ambiguous and inconsistent manner.

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5. The Proposed Rule is too complex, too broad in scope, and too ambiguous to enable companies to manage effective compliance programs for its provisions. Enforcement of the rule as written would require tremendous taxpayer resources and would be largely ineffective.

Each point will be discussed below.

1. The items controlled under the ECCNs of particular concern to Cummins are already produced indigenously in China.

Cummins is primarily concerned with certain ECCNs that would be included in the new Supp. No. 2 to Part 744, namely:

- 9D990 – "Software", n.e.s., for the "development" or "production" of equipment controlled by 9A990¹ or 9B990.
- 9E990 – "Technology", n.e.s. ("not elsewhere specified" on the CCL), for the "development" or "production" or "use" of equipment controlled by 9A990 or 9B990.
- 8A992.f – "Vessels, n.e.s., including inflatable boats, and specially designated components therefor, n.e.s."
- 8A992.g – "Marine engines (both inboard and outboard) and submarine engines, n.e.s.; and specially designed parts therefore, n.e.s."
- 8D992 – "Software" specially designed or modified for the "development", "production" or "use of equipment controlled by 8A992.
- 8E992 – "Technology" for the "development", "production" or "use" of equipment controlled by 8A992.

Currently all of the above ECCNs are controlled for antiterrorism ("AT") reasons and, as such, have not previously been controlled to China.

¹ 9A990.a controls "Diesel engines, n.e.s., for trucks, tractors, and automotive applications of continuous brake horsepower of 400 BHP (298kW) or greater (performance based on SAE J1349 standard conditions of 100 Kpa and 25 degree)."

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These ECCNs apply directly or indirectly to the following types of diesel engines:

- a. Vehicle engines having 400 or greater horsepower;
- b. Marine propulsion engines of all sizes; and
- c. Marine power generator sets of all sizes.

All three types of engines are manufactured by Cummins in China today, through its joint ventures; by numerous Chinese competitors with indigenous and licensed foreign technology; and by numerous Sino-foreign joint ventures. The Chinese diesel engine market is discussed in greater detail in Attachment A. Based on the wide availability of domestic and foreign diesel engines in China, it is readily apparent that any attempt by BIS to control the supply of these types of diesel engines, their software, and their technology to the Chinese military would be ineffective.

2. The proposed controls are unilateral and would harm the ability of U.S. companies such as Cummins to continue conducting business in China.

As Attachment A shows, there are a number of ongoing joint development programs between Chinese and foreign companies to design, develop, and manufacture a variety of diesel engines. It is unrealistic for the U.S. to assume that these foreign countries will automatically implement export controls restricting these joint development programs just because the U.S. has promulgated its unilateral control.

Of course, the U.S. has the option of initiating discussions with these other countries seeking to establish appropriate export controls on diesel engine technology. We respectfully suggest that the U.S. renew its diplomatic efforts to achieve multilateral agreement in the Wassenaar Arrangement prior to imposing unilateral export controls on items such as diesel engines, which are produced abundantly in China and many other countries.

3. The ECCNs of particular concern to Cummins contain ambiguities and inconsistencies that undercut compliance and enforcement efforts.

The ECCNs listed in new Supp. No. 2 are controlled for AT reasons. They contain few if any technical parameters. While it might be useful to employ broad control categories in order to achieve antiterrorism goals, given that terrorists typically use whatever means are available to them and lack a genuine manufacturing base, such broad categories do not work when applied to the

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context of modern manufacturing and sales activities in a very large, rapidly modernizing economy such as the one found in China.

These inherent ambiguities and inconsistencies are illustrated by ECCNs 9A990, 9D990, and 9E990.

Because they reference 9A990, which controls diesel engines having 400 horsepower or greater, ECCNs 9D990 and 9E990 would apply to the software and technology, respectively, relating to several series of large capacity engines Cummins exports to and manufactures in China.

Two anomalies are apparent when one attempts to apply these ECCNs to commercial manufacturing and sales activities in China today.

First, 9A990 refers only to "engines" and does not include their specially designed parts. Since 9D990 and 9E990 refer to 9A990, it follows that the software and technology that would be controlled under the Proposed Rule would only be that which is required to "develop", "produce" or "use" complete engines, and not their parts. It is far from clear what this means.

Engine manufacturers use technical data to make discrete parts and then assemble the parts into complete engines. For example, it is unclear if 9E990 should be interpreted to include technical data required to produce all of the engine parts required for an engine having 400 horsepower or greater. Further, it is also unclear how to classify software and technology for engine parts common to engines rated at above and below 400 horsepower.

Thus, the inherent ambiguities of AT controlled items such as those described by ECCNs 9A990, 9D990, and 9E990 pose significant compliance challenges to manufacturers seeking to understand how to comply with the Proposed Rule. We recommend that BIS examine the scope of control under these ECCNs as they are currently written and consider clarifying them before incorporating them in the Proposed Rule.

A second anomaly concerns the broad scope of 9A990, 9D990, and 9E990. Since the only performance parameter in these ECCNs is the 400 horsepower benchmark, it follows that all vehicle engines made by Cummins rated at 400 horsepower or greater, regardless of their other design features, would be subject to control to China under the Proposed Rule.

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For example, Cummins manufactures the K19 engine series in China. These engines are rated at 700 horsepower and, therefore, would fall within the scope of 9A990. They are specifically designed for and used in huge haul trucks, excavators, drills, and wheel loaders operating in open pit mines in China. This equipment is very powerful and durable. But it moves slowly. Cummins manufactures this engine series but is not aware of any actual military application for it.

It is not clear what BIS would accomplish by controlling the software and technology for the K19 engine series. Moreover, BIS cannot credibly defend the Rule by saying that it would have no impact on Cummins because knowledge of military end-use is not present.

Yet one foreseeable impact of the Rule would be a compliance burden relating to a control that essentially is an "empty box." Cummins would be required to extend its export compliance program to cover transactions concerning the K19 engine series, a type of diesel engine that the Government and Cummins agree, from the outset, has no known military end-use. Further, requiring that a manufacturer like Cummins obtain a confirmation from the Original Equipment Manufacturer of a large mining haul truck that it does not intend to sell the truck to a person who will use it for military purposes would be baffling to industry and impose costs on manufacturers with no foreseeable gain in protecting the national security.

4. Three of the ECCNs that would be subject to the Proposed Rule, namely, 8A992, 8D992, and 8E992, are described by that Rule in an ambiguous and inconsistent manner.

The Proposed Rule describes the Category 8 items that would appear in new Supp. No. 2 to Part 744 as follows.

Category 8 – Marine

- (i) 8A992 Underwater systems or equipment, not controlled by 8A002, and specially designed parts therefore.
- (ii) 8D992 "Software" specially designed or modified for the "development", "production" or "use" of equipment controlled by 8A992.
- (iii) 8E992 "Technology" for the "development", "production" or "use" of equipment controlled by 8A992.

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Three ambiguities or inconsistencies are apparent in the quoted portion of the Proposed Rule

First, section (i) describes 8A992 as "Underwater systems or equipment." The quoted phrase describes only a subset of the items falling under 8A992. As you know, the current heading for 8A992 reads "Vessels, marine systems or equipment, not controlled by 8A001, 8A002 or 8A018, and specially designed parts therefor." That ECCN contains 11 paragraphs, each of which describes different and in some instances very broad ranges of equipment. Thus, 8A992 is much broader than "underwater systems or equipment."

If BIS intends for the Proposed Rule to apply to all 11 paragraphs of 8A992 it will capture a broad range of products beyond underwater propulsion equipment – including auxiliary power generation for small and mid-sized water craft. If, by including the phrase "underwater systems or equipment", BIS intends for the Rule to apply only to a subset of 8A992 it should clearly state so.

Second, sections (ii) and (iii) describe the software and technology counterparts to 8A992, namely, 8D992 and 8E992, respectively. As written in the Proposed Rule, the references to ECCNs 8D992 and 8E992 do not contain the same qualifying language "underwater systems or equipment."

Again, it is difficult to know if BIS intends for the Proposed Rule to apply to software and technology relating to equipment falling within the scope of all 11 paragraphs of 8A992 or only the software and technology relating to paragraph e to 8A992.

Cummins requests that these provisions of the Proposed Rule be clarified before BIS proceeds with a final rule. We currently interpret the Proposed Rule to mean that BIS intends to control only underwater propulsion equipment described in 8A992.j, as well as that equipment's related software and technology. We do not interpret the Proposed Rule to cover items described in 8A992.e, f, or g, or those items' related software and technology.² We request BIS clarify that a narrow reading of this provision is correct.

² Because 8A992.i controls "specially designed components" for vessels, "i.e.s.", it would apply to our complete line of marine power generator sets. These generator sets use diesel engines to run generators that produce electricity for boats. Since they are "specially designed components" for vessels, the Proposed Rule would apply to any marine power generator set used by a Chinese OEM to outfit a Chinese Coast Guard or naval vessel. Yet all these diesel engines do is run generators to produce electricity. They are not weapons systems. As such, it is doubtful whether these generator sets would make a "material contribution" to the Chinese military.

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Third, consider the broad scope of some of the paragraphs found in 8A992. An example that is especially of concern to Cummins is paragraph 8A992.g. That paragraph contains no minimum performance standard. Therefore, it applies to the smallest as well as the largest marine engines that could be made and that are not controlled by other ECCNs.³ As such, 8A992.g controls the entire line of marine propulsion engines made by Cummins.

Our smallest marine engines made in China are used to power yachts, ferries, and commercial fishing vessels. Our largest marine engines are used to power large river dredging barges, which move at slow speeds. Most of these applications have no apparent military utility.

To illustrate the point, suppose that a particular series of Cummins marine propulsion engine is used by a Chinese Original Equipment Manufacturer ("OEM") in a vessel the OEM makes for the Chinese Coast Guard. If that vessel could be called a "Coast Guard Patrol Craft" as that phrase is used in the International Traffic in Arms Regulations ("ITAR"), 22 CFR Parts 120-130, the engine would be subject to the Proposed Rule.

But a significant compliance problem arises from the interplay between the Proposed Rule and the ITAR. The categories of the U.S. Munitions List provided in the ITAR use very broad and vague language with respect to vessels and marine equipment.⁴

capability. Moreover, marine power generator sets are widely available from Chinese and foreign sources as detailed in the White Paper.

³ Because "marine" is not defined in the EAR and 8A992.g uses the phrase "n.e.s." or "not elsewhere specified," this paragraph controls engines powered by AA batteries commonly found in toy boats.

⁴ USML Category VI controls "Vessels of War and Special Naval Equipment." Category VI(b) controls "patrol craft without armor, armament or mounting surfaces for weapon systems more significant than .50 caliber machine guns or equivalent and auxiliary vessels." Illustrative examples of Category VI items are provided in Section 121.15, which includes at subsection 121.15(b)(iii) "Coast Guard Patrol Craft (e.g., including but not limited to WPB)." "WPB" is not defined in the ITAR. It is generally understood to be a Navy/Coast Guard designation referring to a cutter's capabilities in terms of the length of time they can spend on patrol without replenishment.

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Consequently, the question arises how BIS would apply the knowledge requirement in the Proposed Rule to the supplier of marine diesel engines to a Chinese OEM. Would BIS expect the engine supplier to exercise due diligence by inquiring specifically of its OEM customer about their plans to build a WPB cutter for the Chinese Coast Guard, as opposed to an auxiliary supply vessel of similar weight, draft and length?

If BIS intends for the Proposed Rule to apply to all paragraphs of 8A992, Cummins recommends that BIS remove this ECCN, along with 8D992 and 8E992, from the new Supp. No. 2 to Part 744. If BIS intends for the Rule to apply only to a particular paragraph, it should clearly state so, and it should clarify that 8D992 and 8E992 would apply only to software and technology, respectively, relating to that paragraph.

5. The Proposed Rule is too complex, too broad in scope, and too ambiguous to enable companies to manage effective compliance programs.

The Proposed Rule operates like an accordion. It uses ECCNs subject to AT controls to greatly expand the scope of application, with little regard to technology levels. Then it uses the requirement of an export, reexport or transfer made with "knowledge" to shrink the scope of the Rule. But then it applies a very broad definition of "military end-use" to expand its application to a wide variety of design, development, and manufacturing activities.

While it could be argued that the Proposed Rule references the International Munitions List, U.S. Munitions List ("USML"), and "-A018" ECCNs to shrink the scope of application, in reality, the reference to the USML does not reduce the scope at all. If anything, the reference to the USML further expands the Proposed Rule's scope because of the broad categories found in that list.

Furthermore, we note that the current definition of "knowledge" in Part 772 of the EAR would apply both to that term as it is used in the Proposed Rule and to its use in section 764.2(e). As such, we do not believe that the presence of a knowledge requirement in the Proposed Rule would narrow the scope of application of the rule. An earlier version of the Proposed Rule reportedly would have adopted a narrower definition of "knowledge," namely, actual knowledge of military end-use, which would have applied only to items subject to that Rule, and not to items subject to other restrictions under the EAR. However, BIS ultimately dropped that narrower definition of "knowledge" in favor of the current broader definition of the term.

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Consequently, the knowledge requirement of the Proposed Rule should be examined in light of recent enforcement cases that have applied key provisions of the EAR containing the term "knowledge." Foremost among those provisions is section 764.2(e), which states that:

No person may order, buy, remove, conceal, store, use, sell, loan, dispose of, transfer, transport, finance, forward, or otherwise service, in whole or in part, any item exported or to be exported from the United States, or that is otherwise subject to the EAR, with knowledge that a violation of the EAA, the EAR, or any order, license or authorization issued thereunder, has occurred, is about to occur, or is intended to occur in connection with the item.

BIS frequently alleges that exporters have committed violations where knowledge is a required element of the violation, just as it would be in the Proposed Rule. From our analysis of the administrative enforcement cases listed on BIS's EFOIA webpage, it appears that in 45 of the total of 95 cases concluded in FY 2006 BIS alleged that the exporter or reexporter violated section 764.2(e), in that it "acted with knowledge" that a violation of the EAR "has occurred, is about to occur, or is intended to occur."

We further note that during FY 2006 BIS alleged knowledge violations in one case where an exporter's salesman knew generally of the U.S. embargo against Iran. In another case, BIS alleged knowledge violations where an exporter had previous experience in the licensing process and had received warning letters from the Office of Export Enforcement. Therefore, it appears from BIS's administrative enforcement cases that BIS has taken a firm position in interpreting the term "knowledge." BIS interprets "knowledge" to have a broad scope of application to transactions subject to the EAR. Moreover, BIS takes the position that there is a low evidentiary threshold for proof that a person has knowledge that it or another person has violated, is about to violate, or intends to violate the EAR by engaging in an unauthorized transaction.

Consequently, we believe that inserting a knowledge requirement in the Proposed Rule fails to narrow the scope of application of the Rule in a meaningful way so long as the current definition of that term is used.

Because export compliance issues often arise in a highly charged geopolitical atmosphere, we are concerned that BIS would seize upon a company's general awareness of the new regulation, or of the EAR, as a basis for alleging that a company committed a knowing export, reexport or transfer to a Chinese military end-use. BIS might use the benefit of hindsight to infer that the

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company knew or should have known about its customer's intentions for military end-use, or about its customer's history of supplying items to the Chinese military. If BIS intends for the knowledge requirement to have the practical effect of narrowing the scope of application of the Proposed Rule, we recommend that BIS reconsider the definition of "knowledge."

V. Conclusion

For the above mentioned reasons, we urge the Department to withdraw the Proposed Rule or significantly modify it to reflect the facts of the global diesel engine industry.

We appreciate the opportunity to submit these comments.

Sincerely,

A handwritten signature in black ink, appearing to read 'Steven M. Chapman'.

SMC/sc

Steven M. Chapman
Group Vice President - Emerging Markets
and Businesses

Ms. Shelia Quarterman
December 1, 2006
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Attachment A

Cummins Comments on BIS's Proposed Military End-Use Regulation

**The Diesel Engine Business in China:
The Cummins Perspective**

December 2006

Introduction

This paper is in response to the Proposed Rule the Bureau of Industry and Security published for comment on July 6, 2006, 71 Fed. Reg. 38313. The purpose of the paper is to provide data on the current level of Chinese capabilities in the design, development and production of diesel engines in order to demonstrate that further controlling diesel engine technology and software to China for military end-uses, as defined in the Proposed Rule, would not accomplish the policy goal stated in the Proposed Rule of preventing exports that would make a material contribution to China's military capability.

In order to illustrate this position, this paper provides data on 1) the Chinese diesel engine market; 2) the technical level of the Chinese domestic industry both in the commercial and military sectors; 3) the technical level being supplied to China from foreign sources, non-U.S.; and 4) the distinction between commercial and military levels and demands.

I. Executive Summary

a. Availability of Commercial Diesel Engines in China

- i. China's demand for diesel engines for the commercial sector is growing. The fast paced growth in the Chinese economy has driven the demand for diesel engines in trucks, buses, heavy duty construction vehicles, vessel engines and power generators. In addition, as the Chinese government strengthens emissions standards for diesel engines, the level of technology required is advancing rapidly to meet both emissions and commercial requirements.
- ii. China's commercial market demand is met by a combination of Chinese state-owned enterprises (SOEs), private Chinese companies, joint ventures and foreign companies. The following is a list of major Chinese engine manufacturers in China, including wholly domestic, foreign non-U.S. invested, or foreign non-U.S. owned. (Note: This chart does not include U.S. diesel manufacturers because the purpose of the paper is to provide data on the level of diesel engine technical capabilities available in China regardless of U.S. participation in the market.)

Manufacturer	Country	Location
Weichai Power	China	China
Yuchai Group	China	China
Shanghai Diesel	China	China
Shan'xi North Power Co.	China	China
Hebei North China Diesel	China	China
FAW Jiefang Automotive	China	China
DJ M/Renault	China/France	China
Shanghai Diesel/Hino	China/Japan	China
FAW/Deutz	China/Germany	China
SAIC/IVECO	China/Italy	China
Qingling Motors/Isuzu	China/Japan	China
China Shipbuilding/Mitsubishi/Wärtsilä	China/Japan/Finland	Japan
Technology / Engineering Development Consultants	Country	Location
AVL	Austria	China
FEV	Germany	China

- iii. As the above chart demonstrates, the China market is supplied with diesel engines from a variety of internal and external sources. In order to meet emissions standards, numerous Chinese firms are producing diesel engines at the same or even at a more advanced technology level than Cummins Inc. (Cummins) currently produce in China.

Note: At least three Chinese diesel engine producers began manufacturing engines to meet the Euro III emissions standard in China in early 2006. While Cummins imports Euro III certified engines into China, it will not manufacture its own Euro III engines in China until the first quarter of 2007.

For the commercial market, this means that Chinese companies are currently producing engines at higher power ratings and with higher emission certifications. Numerous Japanese and European companies are also manufacturing diesel engines in China for the commercial market at these higher power ratings and emission standards certifications than Cummins currently produces in China. Cummins will begin to manufacture engines with comparable emissions certifications and higher power ratings in 2007.

- iv. Multinational component manufacturers are bringing technology to China to take advantage of these growing market and global sourcing opportunities, which in turn is raising the level of available technology in country. These components are used worldwide in the production of diesel engines and are incorporated in Chinese produced diesel engines, as well as, in both foreign non-U.S. and U.S. diesel engines.

b. Direct Sources of Diesel Engine Technology for the Chinese Military

- i. Chinese State Owned Enterprises (SOEs), often with the assistance of European diesel engine manufacturers and European diesel engine technology consulting firms, are providing diesel engines and diesel engine technology to the Chinese military. These engines are being provided into the full range of military vehicles and vessels, ranging from transport vehicles to tanks and submarines.
- ii. Due to this cooperation and China's own inherent abilities in diesel engine design, development and production, the Chinese military presently has access to diesel engines and diesel engine software and technology at levels to meet their demands for the full spectrum of military vehicles. The paper provides details on a number of the companies, both Chinese and foreign non-U.S., that are supplying engines for these end-uses.
- iii. If the proposed rule is implemented as drafted, U.S. manufacturers will face restrictions when doing business in China that their foreign competitors will not. Since, as this paper details, China already possesses the technical capabilities, such restrictions would not restrict China's military capabilities in relation to diesel

engine design, development and production, but could instead result in lost business or increased compliance costs for US companies without a corresponding national security benefit.

- iv. Example: Shaanxi Diesel Manufacturer is reportedly working with German MTU to produce the 16V-396 diesel under license for the new Yuan class diesel-electric submarine. This is the same diesel engine used to power the German Type 212 diesel-electric submarines.¹
- v. Example: European companies also directly export diesel engines to military end-users. Reports indicate that two French-made SEMT Pielstick diesel engines (approximately 21,000 hp) are the primary propulsion for the Type 054 (Jiangkai Class) multi-role missile frigate. Similar diesel engines are used on the French La Fayette class frigate. China reportedly received the first batch of these diesel engines from France in 2003. These diesel engines are considered to be some of the most advanced power plants for naval use. The secondary propulsion is two indigenous Shaanxi diesels, which are Chinese copies of the MTU 20V 956TB92, rated at 8,840 hp (6.5 MW).²

c. **Current Engine Technology and Software Levels in China**

- i. On the commercial side, foreign companies have provided and continue to provide technology and software for the design, development, production and use of diesel engines. These technology transfers come in the form of consulting agreements, licensing agreements and joint ventures that have been in place for more than a decade. In many instances, the Chinese partner has now become the expert on these diesel engines manufactured in China, as they have been the primary party in design modification and improvement.
- ii. Example: AVL, an Austrian technology & engineering development consulting firm, worked jointly with Weichai Power to produce a new innovative line of diesel engines that will meet the Euro III emissions standards and possibly Euro IV emissions standards in the future. This was a joint development project involving complete cooperation on a technology and software level.
- iii. This type of joint cooperation between Chinese and foreign companies has grown rapidly in the last few years and points to growing cooperation on diesel engine joint development and production between China and foreign partners.
- iv. On the military side, European firms are apparently executing licenses to transfer diesel engine technology to the Chinese military. These licenses have already

¹ Sinodefence, "Yuan Class Diesel-Electric Submarine," September 1, 2006, <<http://www.sinodefence.com/navy/sub/yuan.asp>>, Nov 2006.

² Sinodefence, "Type 054 (Jiangkai Class) Multirole Missile Frigate," September 16, 2006, <<http://www.sinodefence.com/navy/surface/type054jiangkai.asp>>, Nov 2006.

been utilized to produce diesel engines for China's military vehicles and vessels. (Note: See section on Chinese Domestic Military Diesel Engine Manufacturers that details foreign assistance in developing diesel engines for Chinese SOFs that are part of the Chinese military industrial base and the information on the engines in China's advanced military platforms.)

d. Conclusions and Observations

- i. The inherent technical abilities in China, developed either domestically or with foreign assistance or transfers, demonstrate that China is already fully capable of producing diesel engines at power ratings and emission standards certifications at comparable technology levels to what Cummins currently produces and plans to produce in China.
- ii. For commercial end-use, Cummins has numerous competitors in the form of Chinese domestic customers, foreign joint ventures and wholly owned foreign enterprises that design, develop and produce diesel engines at equivalent or higher power ratings and emission standards certifications.
- iii. For military end-use, the Chinese clearly already have developed or have access to the technology and software to produce diesel engines for its military vehicles and vessels from numerous domestic and foreign sources.
- iv. Therefore, tightening the levels of control on diesel engine technology and software, as considered in the Proposed Rule, would not accomplish the goal of preventing the export of items that could make a material contribution to China's military development, because China's military development has access to the levels of technology and software it needs to meet its military demands from its own companies and foreign non-U.S. companies.

Note: It is important to understand that much of the diesel engine technology and software, as the paper details, has already been supplied to Chinese domestic companies and joint ventures. This software and technology is now owned and controlled by Chinese entities in China and should be reviewed on that basis, not on the basis of foreign availability.

- v. Based on these factors, Cummins respectfully requests that the removal of ECCNs 9D990, 9E990, 8D992 and 8E992 related to diesel engines from Supplement 2 of the Proposed Rule. Cummins believes that controlling the software and technology covered under these ECCNs would not have a positive result in accomplishing either of the policy goals stated in the Proposed Rule, in that it would have no impact on Chinese military development and would serve to hinder US exports to civilian end-uses in China.

II. China's Domestic Diesel Engine Market

- a. **China is already a global player in diesel engine manufacturing:** China produces about 10 million of the 28 million engines manufactured globally each year. A brief breakdown of the market is as follows:
 - i. Approximately 8 million diesel engines produced in China are for the agriculture market.
 - ii. After adjustments, Cummins competes in Chinese markets that total about 1.5 million diesel engines.
 - iii. The breakdown is as follows: Of the 10 million diesel engines produced in China, about 75% are one-cylinder agriculture engines. Of the remaining 2.5 million engines, about 1 million units are multi-cylinder (i.e. more than one cylinder) small cylinder engines (with power below 80kw mainly used in agriculture and small truck applications), and low-speed diesel engines (such as marine engines). This leaves a market of approximately 1.5 million units in a size in which Cummins participates.
 - iv. Technology related to emissions standards are what prevent China from becoming globally competitive in diesel engines, not the technology or access to technology to produce military specification diesel engines. This, however, has been changing and will continue to change through 2012, as China rapidly tightens its domestic emission standards and produces more and more diesel engines that meet European and U.S. emission standards.

Note: It is well known in the global diesel engine industry that emission standards requirements are what have traditionally prevented China from becoming more competitive in the global diesel engine market. This report, however, details China's increased ability to produce diesel engines that meet the more stringent emissions requirements. Once China is able to produce to European and U.S. emissions standards, Cummins predicts that China will become increasingly more competitive in the global market.

v. Chinese Customs Data on Diesel Engine Imports

The following data was collected from Chinese Customs and covers the period from January 2004 to September 2006. As is the case in most areas, items covered under ECCNs are narrower than the number of items covered under an HTS code. The data, however, is still beneficial in that it demonstrates the market share of U.S. versus non-U.S. companies in imports and provides a base line for reviewing the detailed data provided later in this report. For example, to date in 2006, U.S. imports only make up slightly more than 5% of total diesel engine imports into China. (Note: the data shows the imports in USD into China under these Harmonized Tariff Schedule (HTS) Codes a.k.a. HS Codes internationally.)

China Customs Data on Diesel Engines for 2004

HS Code	Type	2004			
		World		United States	
		Units	Value (USD)	Units	Value (USD)
	Total	102,486	1,149,150,563	6,796	157,028,121
84081000	Marine propulsion engines, diesel	2,273	341,667,465	441	30,510,495
84082010	Engines, diesel, output≥132.39kw, for vehicles of Ch. 87	14,898	160,415,968	1,854	23,678,520
84082090	Engines, diesel, of an output<132.39kw, for vehicles of Ch 87	24,619	49,946,143	118	1,399,284
84089010	Engines, diesel for locomotives	164	8,492,893	54	4,859,018
84089091	Engines, diesel, nes, output≤14kw	1,847	2,819,012	74	86,518
84089092	Engines, diesel, nes, 14kw<output<132.39kw	38,290	199,290,961	344	1,836,292
84089093	Engines, diesel, nes, output≥132.39kw	20,386	386,509,121	3,911	94,658,084

Chinese Customs Data on Diesel Engines for 2005

HS Code	Type	2005			
		World		United States	
		Units	Value (USD)	Units	Value (USD)
	Total	114,720	1,169,905,905	6,303	152,239,214
84081000	Marine propulsion engines, diesel	2,924	452,027,985	542	38,378,451
84082010	Engines, diesel, output≥132.39kw, for vehicles of Ch. 87	13,239	141,472,679	1,522	21,747,396
84082090	Engines, diesel, of an output<132.39kw, for vehicles of Ch 87	37,489	72,096,513	209	1,906,154
84089010	Engines, diesel for locomotives	120	15,482,147	68	4,609,698
84089091	Engines, diesel, nes, output≤14kw	3,340	3,310,843	34	26,972
84089092	Engines, diesel, nes, 14kw<output<132.39kw	43,235	196,938,259	619	3,044,060
84089093	Engines, diesel, nes, output≥132.39kw	14,373	288,577,479	3,309	82,526,483

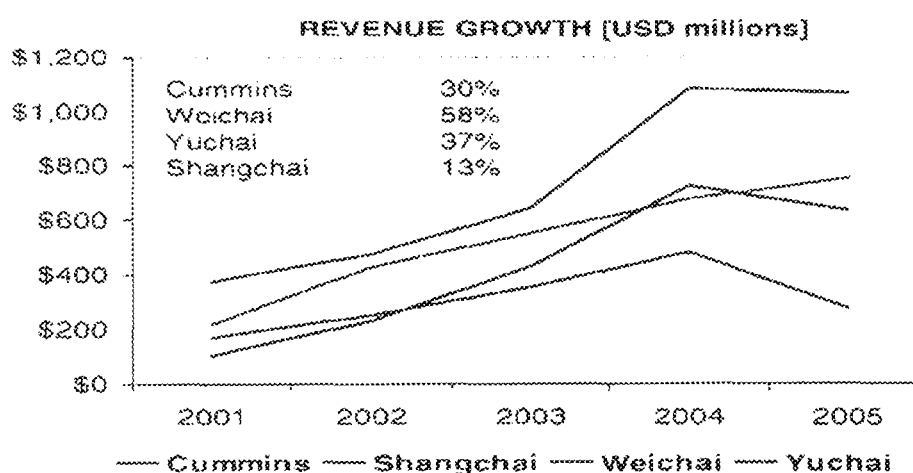
Chinese Customs Data on Diesel Engines for 2006 through September

HS Code	Type	2006 (Jan - Sept)			
		World		United States	
		Units	Value (USD)	Units	Value (USD)
	Total	123,223	1,103,633,772	6,514	150,172,081
84081000	Marine propulsion engines, diesel	2,294	457,593,858	540	30,819,128
84082010	Engines, diesel, output≥132.39kw, for vehicles of Ch. 87	10,050	109,728,229	1,220	16,896,542
84082090	Engines, diesel, of an output<132.39kw, for vehicles of Ch 87	31,849	59,384,210	19	145,432
84089010	Engines, diesel for locomotives	111	13,383,927	62	7,243,325
84089091	Engines, diesel, nes, output≤14kw	12,153	3,335,203	6	8,118
84089092	Engines, diesel, nes, 14kw<output<132.39kw	54,465	231,813,999	513	2,989,782

b. Competition in the China Market is Stiff

- i. **Strong Chinese domestic competitors have emerged:** While Cummins' market share and profits have been solid, the competition has been stiff. As the above chart demonstrates, the U.S. market share for imports to China is very small in comparison to the totals from other countries.
- ii. In addition, Chinese competitors such as Weichai Power Co. Ltd., Yuchai Group and Shanghai Diesel have grown rapidly over the past five years and are beginning to expand their market share domestically in China and internationally. The following chart shows the revenue growth of Cummins and these three major diesel manufacturers:

Sales Revenue Growth for Major Diesel Engine Makers in China



Note: Shanghai refers to Shanghai Diesel
 Weichai refers to Weichai Power Company
 Yuchai refers to Yuchai Group

- iii. **Major Chinese Domestic Commercial Engine Manufacturers Have Emerged:** As stated above, China has a number of domestic diesel engine manufacturers, which include: Weichai Power; Yuchai Group and Shanghai Diesel. The following are details on these companies, their partnerships and the technology levels.
- iv. **Weichai Power Co. Ltd.**
www.weichai.com/e_default.shtml

Weichai Power Co., Ltd. ("Weichai Power") was founded by Weifang Diesel Engine Factory together with domestic and foreign investors. Weichai Power specializes in the research and development, manufacturing and sales of diesel engines. The

products are widely applicable to different markets, including heavy-duty vehicles, coaches, construction machines, vessels and power generators.

The majority of Weichai Power's business is in the manufacture of high-speed heavy-duty diesel engines. The two main products of the company are the WD615 and WD618 diesel engines, which have a horsepower rating range of 158HP to 433HP and are widely used in heavy-duty vehicles and coaches, construction machines, marine vessels and power generator engines. Currently, the revenue from WD615 Euro II engines constitutes the majority of Weichai Power's sales.

In 2004, approximately 60.7% of the company's sales income were from the heavy-duty vehicles market, approximately 27.7% from construction machines market and the remaining 11.6% were from the application of marine vessels, coaches etc. In 2004, Weichai Power's revenue exceeded US\$1.2 billion, maintaining a performance that has annually doubled its revenue over the past four years. Weichai Power said it anticipated that its 2005 revenues would reach US\$2.4 billion.

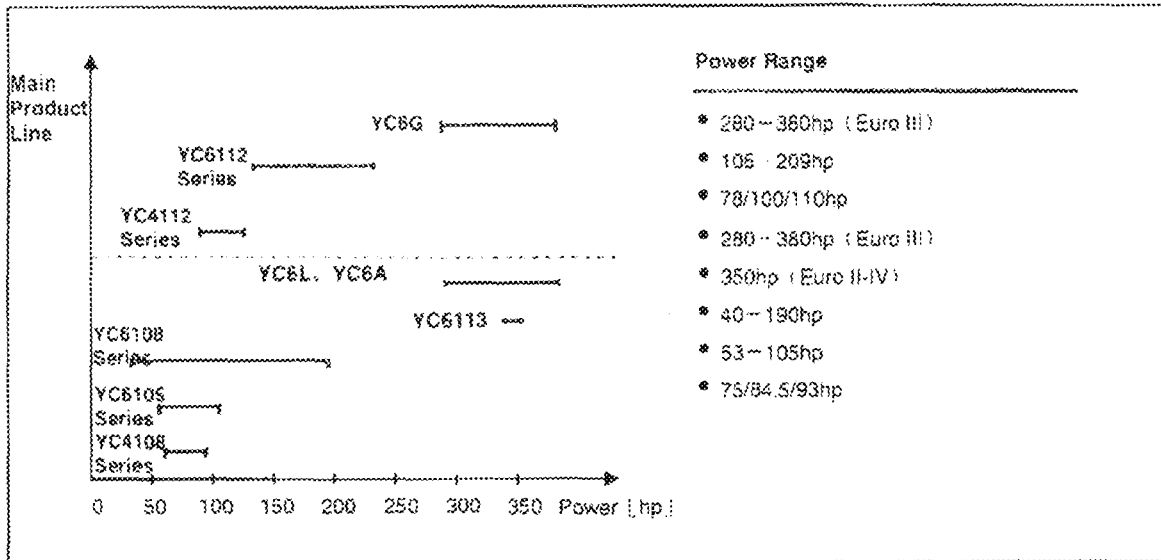
In 2005, Weichai Power announced production of its WP12 series diesel engines. The Weichai Power Landking WP12 series Euro III diesel engine was co-developed by Weichai Power and AVL Company, Austria. It is a totally new design, meets the requirements of Euro III, and has the potential to meet the Euro IV standard. The engine can be widely used in heavy-duty vehicles, coaches, construction machines, marine vessels and power generators. The anticipated production rate is expected to be 50,000 units per year. Weichai Power's new product line demonstrates the ability of Chinese companies to produce the more technologically advanced engines needed to meet the Euro III emissions standards China is requiring in 2005. (Further details of the Weichai Power - AVL joint development of the WP12 is provided later in this paper.)

v. **Yuchai Group**
www.yuchai.com

Established in 1951, Yuchai Machinery Guangxi ("Yuchai Group") is the largest manufacturer of internal combustion engines and the largest manufacturer and exporter of medium and small engineering machinery in China. Yuchai Group was formed by a combination of Yuchai Machinery Group Co., Ltd. and Yuchai Machinery Co., Ltd. and includes 25 holding and joint venture subsidiaries. In 2005, Yuchai Group's sales revenue were \$725 million, which equated to 230,228 units sold, a net income of \$61 million and a net income margin of 8%.

Yuchai Group's diesel engines come in five categories with ten series. Together they total over 1200 models used in light, medium and heavy-duty trucks, travel coaches, forestry/farm machinery, small to medium watercraft and power generators. These diesel engines start at 65 horsepower and range up to 380 horsepower. The Yuchai Group's diesel generator sets, which it has been producing for more than 40 years, are widely used in military, civil, marine and other fields.

The following chart shows the power range for a number of the Yuchai engines and the corresponding platforms:



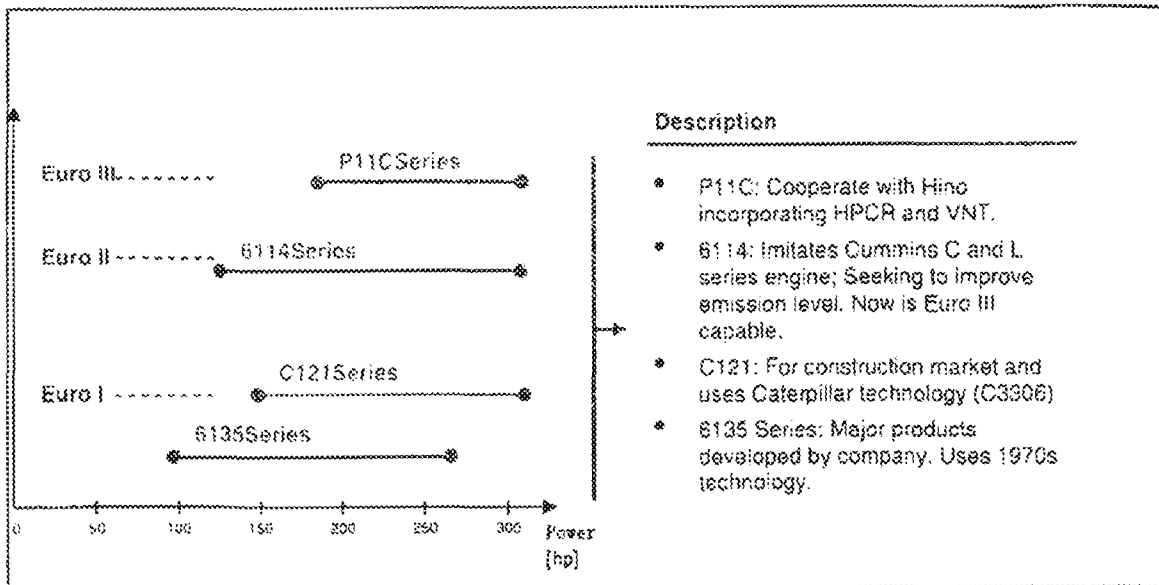
Their new product development, which will be accomplished in cooperation with global partners, will focus on: higher power range engines; higher emission standard engines; and passenger car diesel engines. For example, Yuchai is cooperating with Yamaha in the joint development of a high speed marine engine. Additionally, they are focusing their R&D efforts on electronic control and High Pressure Common Rail (HPCR) fuel system and have been developing Euro IV and hybrid fuel technology engines since 2005.

vi. Shanghai Diesel

<http://www.sdccic.com/>

The Shanghai Diesel Engine Limited Liability Company ("Shanghai Diesel") began operations in 1947. It is located along the Huangpu River and encompasses an area of approximately 820,000 square meters. Shanghai Diesel employs more than 4,000 people. At present, Shanghai Diesel focuses on the design, development and manufacture of diesel engines, the fuel oil systems, and the diesel oil power sets. Their diesel engines range in power from 60-600 horsepower, and the end-uses include trucks, passenger trains, project machinery and ships. Shanghai Diesel sells its products domestically in China as well as in more than 50 countries around the world. In 2005 Shanghai Diesel's revenues were \$389 million, with 66,859 units sold and a net income of \$0.7 million. Shanghai Diesel has a strong R&D department and possesses its own fuel injection technology. This combined with its cooperation with Japanese companies make them a formidable competitor both inside and outside of China. Shanghai Diesel recently signed an agreement with Hino, a Japanese firm, to produce the P11C engine which is Euro III certified. They also cooperate with Denso (Japan) to produce fuel systems and Mitsubishi (Japan) to produce turbochargers.

The following chart details several Shanghai Diesel engine lines:



vii. Summary

These Chinese domestic manufacturers produce diesel engines at equivalent levels and for the same end-uses as Cummins. These diesel engines and their related software and technology would fall under the scope of the EAR. Most would be classified under the general designation of EAR99, and the others would fall under ECCN 9A990 on the CCL. As is clearly evident from the information provided above, the Chinese domestic diesel engine manufacturers have the technology, software and equipment to manufacture diesel engines falling under the scope of ECCNs 9A990, 9D990, and 9E990.

11. Chinese Domestic Military Diesel Engine Manufacturers

- a. The following section provides information on the domestic Chinese military engine sector. The purpose is to provide background information on three of the enterprises supplying engines to the Chinese military and technical specifications for engines they produce.

Note: The information in this section was collected from websites, as footnoted, interviews and corporate filings.

- b. The Chinese military engine sector is dominated by a small number of domestic SOEs. As detailed below, these Chinese domestic companies are producing engines for the Chinese military with foreign assistance. For the vehicle and marine vessel engines China is not producing domestically, it receives direct engine exports from Russia and Europe. The specifications provided show that some of these diesel engines would be

above the control levels for diesel engines listed on the CCL and would fall under the scope of the U.S. Munitions List if they were of U.S. origin.

- c. The following are three examples of the Chinese SOEs producing diesel engines for the Chinese military.

i. **Shan'xi North Power Co., Ltd.**

<http://www.snpc.com.cn>

Shan'xi North Power Co., Ltd. (Shan'xi Power") is a wholly state-funded enterprise that is under the China North Industries Group Corporation ("NORINCO"). Its sole shareholder is the Arms Corporation Shan'xi Arms Industry Management Bureau and its primary business is the production of air-cooled diesel engines, small-type general oil engines, and the pump filters and spare parts for motorcycles and diesel engines.

One of its primary engine lines is the 413F series air-cooled diesel, which is produced based on the German KHD (owned by DEUTZ) technology. The current product series B/F8L413F is used in numerous applications, including heavy-duty trucks, engineering machines and generator units. The specific product parameters for the 413F series are shown in the following chart:

Model	F8L413F	BF8L413F	F12L413F	F6L413F
Cylinder no. / layout	V type 8 cylinders	V type 8 cylinders	V type 12 cylinders	V type 6 cylinders
Bore*stroke (mm)	125*130	125*130	125*130	125*130
Displacement (L)	12.763	12.763	19.144	9.572
Compression ratio	15.8	15.8	18	
Rated output/ rotating speed (KW / (r/min))	188/2500	235/2500	282/2500	150/2500
Max. torque /rotating speed (Nm / (r/min))	1170/1500		1226/1500	
Min. fuel consumption rate (g/kWh)	212	212	208	205

ii. **Hebei North China Diesel Engine Co., Ltd.,**

<http://www.chbdp.com>

Hebei North China Diesel Engine Co., Ltd. ("Hebei Diesel") is solely funded by NORINCO, and is a professional manufacturer of diesel engines for both military and civilian use. Hebei Diesel is currently licensed by the German DEUTZ company to produce BFM1015 water-cooled diesel engines, which are widely used in special military vehicles, luxury buses, and heavy-duty buses, specialty cars, engineering machines, oil equipment and power generation.

The specific product parameters are as follows:

Model	BF6M1015	BF6M1015 C/MV	BF6M1015 CP/MV	BF8M1015 C/MV	BF8M1015 CP/MV	
Cylinder number/ layout	V-type 6 cylinders	V-type 6 cylinders	V-type 6 cylinders	V-type 8 cylinders	V-type 8 cylinders	
Bore/stroke (mm)	132/145	132/145	132/145	132/145	132/145	
Displacement (L)	11.906	11.906	11.906	15.874	15.874	
Compression ratio	17	17	17	17	17	
Max. rated speed (rpm)	2100	2100	2100	2100	2100	
Rated output (kw/RPM)	Continuous output	214/2100	261/2100	287/2100	348/2100	383/2100
	Intermittent working	223/2100	273/2100	300/2100	364/2100	400/2100
	Involuntary intermittent working	231/2100	286/2100	314/2100	381/2100	419/2100
	Automotive power	240/2100	300/2100	330/2100	400/2100	440/2100
Max torque speed (rpm)	1300	1300	1300	1300	1300	
Max. torque (Nm)	1473	1773	2040	2164	2721	
Min. fuel consumption rate (g/kWh)	198	188	188	189	189	
Min. idle speed (rpm)	550	550	550	550	550	
Dimension (L × W × H) - Mm	841 × 932 × 1174	841 × 932 × 1174	841 × 932 × 1174	1010 × 955 × 1174	1010 × 955 × 1174	
Weight (kg)	830	830	830	1060	1060	
Emission standard	EURO II	EURO II, EURO III	EURO II, EURO III	EURO II, EURO III	EURO II, EURO III	

Note: Hebei Diesel's parent, NORINCO, is an investment organization authorized by the State to oversee the performance of state-owned assets. The group has the decision-making power of investment, beneficial interest in assets, authority to examine and approve foreign affairs, import and export permits, and the contract rights in projects and combines product operation with capital operation. NORINCO's main business activities are the manufacture of weapons.

iii. **FAW Jiefang Automotive Company Ltd. Dalian Diesel Engine Company**
<http://www.fawdidiesel.com.cn>

FAW Jiefang Automotive Company Ltd. is a heavy-duty truck manufacturer with technology support from the FAW Group Corporation R&D Center. It was wholly funded by the FAW Group and was established in 1951 based on the original First Automobile Works. The company was one of the earliest enterprises engaged in the trial manufacturing of diesel engines for vehicles in China and has now become a professional diesel engine producer. The company's main business

activity is the manufacture of heavy-duty trucks under the Jiefang brand name, which are provided for both military and commercial end-use. In 2003, FAW Group began negotiations with the German DEUTZ company, and now has a DEUTZ workshop where it produces DEUTZ diesel engines. The specific product parameters are as follows:

Model	BF6M1013 -24	BF6M1013 -26	BF6M1013 -28	BF6M2012 -20	BF6M2012 -22
Cylinder number	6	6	6	6	6
Bore*stroke (mm)	108X130	108X130	108X130	101X126	101X126
Displacement(L)/ displacement per cylinder	7.2/1.2	7.2/1.2	7.2/1.2	6.06/1.01	6.06/1.02
Type	Straight-line water-cooled	Straight-line water- cooled	Straight-line water-cooled	Straight-line water-cooled	Straight-line water-cooled
Air intake method	Turbocharged, inter-cooled	Turbocharged, inter-cooled	Turbocharged, inter-cooled	Turbocharged, inter-cooled	Turbocharged, inter-cooled
Rated output/ rotating speed (kW/PS/r/min)	175/240/2300	195/265/2300	206/280/2300	147/200/2300	162/220/2500
Max. torque/ rotating speed (Nm/r/min)	854/1400	954/1400	1050/1400	735/1500	770/1500
Fuel consumption rate(g/kWh)	200	200	200	200	200
Valve number per cylinder	2	2	2	2	4
Compression ratio	18.1	18.1	18.1	18	
Fuel-supplying mode	Mechanical / Electronic	Mechanical / Electronic	Electronic	Mechanical / Electronic	Electronic
Injection pump	Unit pump	Unit pump	Unit pump	Unit pump	Unit pump
Injection pressure (bar)	1100-1600	1100-1600	1600	1600	1600-1800
Weight (kg)	650	650	650	550	550
Emission	EURO II/III	EURO II/III	EURO II/III	EURO II/III	EURO II/III

d. Foreign Company Sales/Transfers to China's Military

i. The following are three examples of foreign cooperation for China's military vehicles and marine vessels, through either direct engine sales or technology transfers:

ii. Example I: The Type 99 Main Battle Tank (MBT):

The Type 99 MBT is the PLA's third generation indigenous MBT. The main contractors are Beijing-based China North Vehicle Research Institute (NEVORI, also known as 201 Institute) and Inner-Mongolia First Machinery Group Co., Ltd. (FIRMACO) of Baotou, Inner Mongolia. The 201 Institute of Beijing and 617 Factory (part of FIRMACO) of Baotou, Inner Mongolia originally proposed a third-generation MBT design based on the German Leopard 2 MBT, featuring a German-made 1,200hp diesel engine. The PLA, however, was reluctant to fund the program

because it favored purchasing or locally producing the Leopard 2. Negotiations with Germany lasted for a few years before the acquisition plan was finally cancelled due to financial difficulties. The program then went back to indigenous development, with three experimental prototypes (1224, 1226, 1226F2) introduced in the early 1980s.

The program entered full scale development in the mid-1980s, when China North Industries Corporation (NORINCO), the parent of both the 201 Institute and the 617 Factory, was officially awarded the contract for the development and manufacture of the third-generation MBT in the spring of 1989. The first prototype known as the Type 90-II was built and tested in early 1990.

Propulsion: The Type 99 MBT is powered by a liquid cooled, turbocharged 1,500hp diesel derived from the German MB871ka501 diesel technology. At its current battle weight of 54t, this gives a power-to-weight ratio of about 27.78. The maximum speed by road is 80km/h and 60km/h cross country. The acceleration is from 0 to 32km/h in 12 seconds. The transmission provides seven forward and one reverse gear.³

iii. Example 2: North-Benz Heavy Duty Truck

North-Benz heavy-duty trucks are based on German Mercedes-Benz truck technologies and built by North-Benz Heavy-Duty Truck Co. Ltd., a joint venture formed by Inner-Mongolia First Machinery Group Corporation (FIRMACO) of Baotou, Inner Mongolia; China North Industries Corporation (NORINCO); and DaimlerChrysler. The truck is available in 4X4, 6X6, and 8X8 configurations. A number of North-Benz trucks are currently in service with the PLA as heavy-duty cargo carrier and weapon system chassis.

The propulsion for the vehicle is a German DEUTZ 1013/1015 liquid-cooled turbocharged diesel engine rated at 220-480hp. Some variants are powered by a DEUTZ 513F air-cooled diesel for the use in northern desert and snow regions. The unique transmission and fuel designs guarantee the vehicle to function normally in temperature between -40°C and 50°C.⁴

iv. Example 3: Marine Diesel Engines

The Type 054 (NATO codename: Jiangkai Class) is the new generation multi-role frigate for the PLA navy. The first two hulls, Ma'anshan (525) and Wenzhou (526), were delivered to the PLA Navy East Sea Fleet in 2005. Equipped with a mixture of Russian- and Chinese-made systems, the 3,400t frigate design incorporates strong stealth features similar to the French La Fayette class. The subsequent ships designated Type 054A are reportedly equipped with Russian 9M317 (SA-N-12) Shtil

³ Sinodefence, "Type 99 Main Battle Tank," <<http://www.sinodefence.com/army/tank/type99.asp>>, Nov 2006.

⁴ Sinodefence, "North Benz Heavy Duty Truck," November 27, 2005, <<http://www.sinodefence.com/army/transport/northbenz.asp>>, Nov 2006.

air-defense missiles and guidance radar. At least two additional ships are currently under construction.

The propulsion of the Type 054 is a combined diesel and diesel (CODAD) arrangement. The primary propulsion is reported to be two French-made SEMT Pielstick diesel engines (~21,000hp). The similar diesel engine is used by the French La Fayette class frigate. China reportedly received the first batch of the diesel engines from France in 2003. These diesel engines are considered to be some of the most advanced power plants for naval use. The secondary propulsion is two indigenous Shaanxi Diesel Engine Works (a division of Shan'xi North Power) engines. These engines are a Chinese copy of the MTU 20V 956TB92 rated at 8,840 hp (6.5 MW).

It is believed that SEMT-Pielstick has been licensed by the French government to produce diesel engines for numerous PLA Navy surface ships and submarines.⁵

- v. There have also been a number of press reports on the European supply of diesel engines to China for military use. In marine diesel engines, it was reported that Germany and France have supplied China with diesel engine technology to help modernize its navy. German diesels are used in China's "Song-A" conventional attack subs.⁶

vi. Summary

As the information above demonstrates, the engines being produced for Chinese military end-uses as defined in the Proposed Rule are being designed, developed and produced by Chinese SOEs solely or in joint cooperation with foreign companies. European companies, in particular, have been willing to partner with Chinese SOEs in developing and producing these diesel engines. Cummins respectfully submits that the level of software and technology the Proposed Rule seeks to control would not prevent the Chinese military from obtaining diesel engines because this demand is being met from the sources detailed above.

IV. Joint Ventures

- a. In addition to the above-described Chinese domestic companies, a number of joint ventures and licensee agreements between Chinese domestic companies and foreign companies also produce diesel engines that would fall under the scope of the EAR, whether classified as EAR99 or under ECCN 9A990. These companies include Volvo (Sweden), Mercedes Benz (Germany), Iveco (Italy) and Mitsubishi (Japan). These companies, which represent Cummins' major international competitors, are

⁵ Sinodefence, "Type 054 (Jiangkai Class) Multirole Missile Frigate," September 16, 2006, <<http://www.sinodefence.com/navy/surface/type054jiangkai.asp>>, Nov 2006.

⁶ Taipei Times, "Embargo hasn't stopped EU weapons technology from flowing into China," February 3, 2005, <<http://www.taipetimes.com/News/taiwan/archives/2005/02/03/2003222041>>, Nov 2006.

continually trying to expand their presence in China through joint ventures, technology licensing, and strategic alliances.

- b. For example, the following chart identifies a number of the international engine makers and the joint ventures and alliances they have formed in China in the heavy truck and marine engine markets:

Chinese Partner	Foreign Partners	Country of Origin
DFM	Renault	France
Shanghai Diesel	Hino	Japan
FAW	Deutz	Germany
SAIC	IVECO	Italy
Qingling Motors	Isuzu	Japan
China Shipbuilding Industry Co.	Mitsubishi/ Wärtsilä	Japan

- c. **DFM and Renault** have a technical license agreement to produce Renault dc11 engines. The engines are assembled in China and the DFM technical center works directly on the engine drawings. The military does not currently appear to be using this JV engine; however we expect that to change in the future, as the product becomes more localized.
- d. The **Shanghai Diesel - Hino** joint venture is a 50-50 JV with a total investment of US\$29.98 million. Under the first phase, the JV started producing the Hino P11C engine. In the second phase, they will begin producing the J08 C engines. The plant has an annual capacity of 15,000 and began production in 2004. Military applications for the product will be available in 2 to 3 years.
- e. **FAW-DEUTZ** have a technical license agreement to produce the BFM 2012, 2013 and 1013 series 4 and 6 cylinder engines. DEUTZ transferred the technology for these engines, and they are now completely produced in China. FAW produces 30 categories of on-highway diesel engines and nine for construction end-uses ranging in power from 122 HP to 300 HP. There are multiple military applications for the engines, but most are transport and power generation related. Examples include: Artillery and missile units, heavy-duty cargo carriers, and towing vehicles. Some specially modified Deutz powered trucks are also serving as the chassis for heavyweight workshop shelters and missile weapon systems.
- f. **SAIC and IVECO** signed an agreement in 2006 to establish a 50-50 joint venture that will be called Shangqi IVECO. After the approval of the joint venture, IVECO will acquire a 67% share in Chongqing Hongyan Heavy Duty Vehicle Group. The two partners then plan to invest 120 million Euros in a new engine company. IVECO will invest 40 million Euros to produce heavy duty truck and construction engines. The capacity for the new company will be 30,000 units per year. IVECO engines are being used in a variety of special purpose military applications. For example, the NJ2045/2046 Cross-Country Carrier is a specially tailored 4X4 military version of the IVECO commercial minibus. The vehicle is in service with the PLA as a utility truck,

for medical evacuation, border patrol, as a paratrooper carrier, and as an anti-tank missile carrier. The vehicle is air transportable and can be air dropped with multiple parachutes.

- g. The **Qingling Motors-Isuzu** joint venture is a 50-50 joint venture located in Chongqing with a total investment of US\$1.5 billion. It is Isuzu's fifth joint venture globally. The joint venture will import the new Isuzu world-class 340-380 HP engine and the 130-250 HP CNG engine. While there is no evidence of current military applications for this engine, some could exist in the future.
- h. **Wärtsilä, China Shipbuilding Industry Corporation (CSIC) and Mitsubishi Heavy Industries (MHI)** are establishing a joint venture to manufacture large, low-speed marine engines in China. CSIC will hold 50% of the joint venture, Wärtsilä 27% and Mitsubishi 23%. The investment will total around 75 million Euros, invested over several years. Production is scheduled to start during the fourth quarter of 2008. Military applications for the engines are highly likely, and Mitsubishi technology has some historical ties to the PLA. In 1996, Mitsubishi engine and vehicle technology was incorporated into the HY473/962, a standard tank transporter. A modified variant of that vehicle is in service with the Second Artillery Corps as a ballistic missile transporter-erector-launcher (TEL) tractor truck.
- i. **MTU** has a wholly foreign owned enterprise (WFOE) located in Suzhou. The WFOE began production in mid-2006, and produces 12, 16 and 18 cylinder engines. These engines are being used as G-drives for military power generation applications. MTU also has a history of working with the PLA. MTU engines are currently being used to power the Type 053H2G/H3 (Jiangwei Class) Multi-role Missile Frigate and the Type 052 (Luhu Class) Multi-role Missile Destroyer. Locally produced copies of MTU technology are being used to power the Type 052B (Luyang Class) Multirole Missile Destroyer and the Type 054 (Jiangkai Class) Multi-role Missile Frigate. Furthermore, there are unconfirmed reports that Shaanxi Diesel Engine Works is currently building the German MTU 16V-396 diesel under license to power the Yuan Class submarine.
- j. To demonstrate how these engines compare to those manufactured by Cummins, the following chart shows the parts and systems in common between the many engines produced in China. These parts and systems are also used in Cummins engines.

Key Competitors
(Predominantly Auto & Bus)

Engine Producer	ECM/ECU	Fuel System/ Fuel Pump	Injector	Sensor	SCR
Yuchai (Euro 3 & 4)	* BOSCH	* Delphi * BOSCH * Local (such as Chengde Weite)	* Delphi * BOSCH	* BOSCH	* Mercedes Benz
Weichai (Euro 3)	* BOSCH	* BOSCH	* BOSCH	* BOSCH	* Unknown
Shanghai (Euro 3)	* Denso	* Denso	* Denso	* BOSCH	* Unknown

Nichai (Euro 3)	* WOODWARD	* BOSCH * Denso	* BOSCH * Denso	* BOSCH * Motorola	* Unknown
Dachai (Euro 3)	* BOSCH	* BOSCH	* BOSCH	* Oxygen Sensor Interface Module	* Unknown
Chaochai (Euro 3)	* Unknown	* BOSCH	* BSI Smart Injector	* Siemens VDO * BOSCH	* Unknown
Yunnan (Euro 3)	* Unknown	* BOSCH	* BOSCH	* BOSCH	* Unknown
CNHTC Hangfa (Euro 3)	* Denso	* Denso * CNHTC Chongqing (Euro II)	* Denso * CNHTC Chongqing (Euro II)	* Unknown	* Unknown
Isuzu (Euro 3)	* Mechanical	* ZEXEL (License BOSCH)	* Unknown	* Unknown	* Unknown
MAN (Euro 3)	* Bosch	* Unit Pump (Euro III)	* BOSCH	* BOSCH	* Unknown
Kubota	* Unknown	* Denso	*	* Unknown	* Unknown
Tianjin Perkins	* BOSCH	* BOSCH	* BOSCH	* BOSCH	* Unknown
Iveco	* BOSCH	* BOSCH (Euro III)	* BOSCH	* BOSCH	* Unknown

V. Foreign Technology Suppliers

- a. In addition to the Chinese companies and joint ventures discussed above, a number of foreign companies are providing cutting edge technology to China for the development and production of diesel engines. Two of the major foreign technology suppliers are AVL of Austria and FEV of Germany. Following are details on technology projects these companies are working on in and with China.

b. AVL

<http://www.avl.com/wo/webobsession.servlet.go/>

AVL – Austria worked jointly with Weichai Power to produce the Landking WP12 series Euro III diesel engine. This diesel engine adopts a new design concept suited to the requirement of Euro III and has the potential to meet the Euro IV standard. It is environmentally friendly and economical with all the specifications of fuel consumption, emission, noise and reliability reaching a world class level. The Landking series diesel engine is mainly used in heavy-duty trucks, luxury buses, special vehicles as well as engineering machinery, vessels and generating sets. Landking vehicle diesel engine has the largest displacement of its kind in China.

The Landking WP10 series Euro III diesel engine was also co-developed by Weichai Power and AVL and is likewise designed to suit the requirements of Euro III with the potential to meet the Euro IV standard. It is environmentally friendly and economical with all the specifications of fuel consumption, emission, noise, reliability reaching the world advanced level. The WP10 has basically the same characteristics and specifications as the WP12.⁷

⁷ Weichai Power, "Landking WP12 series Euro III diesel engine," < http://www.weichai.com/e_default.shtml >, Nov 2006

The company currently has over 100 employees in China, and is growing. It opened a world-class R&D Center in Shanghai in 2004. The main activity of the new Technical Center is the design, simulation and development of both gasoline and diesel engines used in all forms of transport and industrial applications. The work in the Technical Center is performed in close collaboration with AVL's HQ in Austria.

c. **FEV**

<http://www.fev.com/content/public/default.aspx?id=571>

FEV – Germany has also worked in China to provide diesel and gasoline engine technology for Chinese automotive companies. Such companies would include Dalian Diesel and Brilliance. On May 11, 2005, FEV China Co., Ltd. opened its new high-tech power train development center in Dalian, a harbor city in Liaoning Province about 600 km east of Beijing. This technology development center provides engine design, electronic calibration development, performance and emissions solutions, and components validation expertise. Technical services include design analysis, engine development, vehicle integration, transmissions design, supplier handling, product reliability planning, manufacturing and quality systems.

The technology development center is managed by two of FEV's engine experts:

- Gerhard Braun who has a vast array of experience working in China designing engines and leading engine development projects. He will implement FEV's fundamental principles in Dalian and support FEV's clients with high quality services.
- Wen-Hui Zhang has held leading positions in the Chinese engine industry and was previously the head of FEV's Beijing Representative Office
- They are supported by Dr. Michael Houben and Dr. Ernst Scheid of the FEV China Board, located at FEV's headquarters in Germany.

Currently, FEV China has more than 100 employees, and is also growing rapidly. A total of six German expatriates are assisting in the set-up of the organization. The first engine was successfully completed in the summer of 2005.⁸

- d. **Summary:** As demonstrated above, the Chinese companies are actively working with European engineering and technology consulting companies to develop larger horsepower and higher emission compliant engines. These Chinese firms also are joining forces with international original equipment manufacturers (OEMs) to expand market share and to compete with Cummins, both in China and internationally. Again, this information demonstrates that the diesel engine manufacturing technology, software and equipment under the scope of the ECCNs at issue in the Proposed Rule are readily available within China and from foreign sources outside the United States.

⁸ Meuse: Rhine Journal, "FEV's China Powertrain," June 5, 2005.
<http://198.63.55.197/html/Bus_20050605075246.html>, Nov 2006.

VI. Cummins in China

a. **History.** Former Cummins Chairman, Irwin Miller, visited China in 1975 as one of the earliest American industry leaders seeking business opportunities in China. The first office was established in 1979. Today, with 22 legal entities, Cummins is the largest foreign investor in the China diesel engine industry. The company provides a complex and broad product-manufacturing platform, and nationwide distribution and aftermarket support through a mix of joint ventures, wholly owned entities, and partner relationships.

b. Cummins Legal Entities in China

i. The following charts show Cummins entities in China

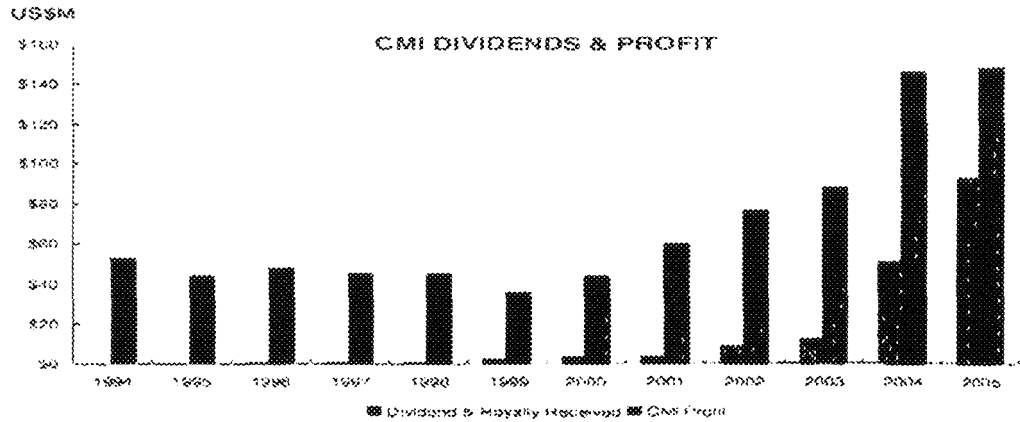
Consolidated Entities	Business Nature
CCI - Cummins (China) Investment Co., Ltd. includes 8 Branch Companies	Holding Distribution
Cummins Engine (Shanghai)	
Pingshuo Mining Site Rebuild Centre	Distribution
CEBJ - Cummins (Beijing) Co., Ltd.	Distribution
CEBA - Cummins Beijing Power Generation Assembly	Manufacturing
CIHK - Cummins Hong Kong Ltd.	Distribution
CPDC - Cummins (SH) Trading & Service Co., Ltd.	PDC
FGS - Fleetguard Shanghai Trading	Filter Sales
CXMC - Cummins Xiangfan Machining Plant	Component Mfg.
Wuxi Holset Engineering Co., Ltd.	Turbocharger Mfg.
Wuxi Newage Alternators Co., Ltd.	Alternator Mfg.
East Asia R&D Centre	Technical Center

China JV's	Business Nature
DCEC - Dong Feng Cummins Engine Co., Ltd.	Engine Mfg
CCEC - Chongqing Cummins Engine Co., Ltd.	Engine Mfg
XCEC - Xi'an Cummins Engine Co., Ltd.	Engine Mfg
BFCEC - Beijing Foton Cummins Engine Company Ltd.	Engine Mfg.
SCEC - Shenzhen Chongfa Cummins Engine Co., Ltd.	Distribution
SHVC - Shanghai VC Lubricating Oil Co., Ltd.	Distribution
Shanghai Fleetguard	Filter Mfg
Nelson Exhaust JV	Exhaust Mfg
Wuxi Vane Wheel	Component Mfg

c. China Market for Cummins

i. The China market represents a large opportunity for Cummins, with an estimated total market size of around \$6 billion. In 2005, consolidated and unconsolidated sales in China were \$1.1 billion. The China operations are also a significant source of profit for the corporation. From 1994 to 2005, Cummins China contributed a total of \$834 million to the bottom-line. During this period \$175 million in profits were repatriated to the United States. Details are summarized below:

ii. Profit, Dividends, and Royalties Received and Repatriated



d. Cummins Customers in China

i. Cummins sells both imported and locally made engines to Chinese OEMs. Its OEM customers include large Chinese commercial vehicle OEMs like Dongfeng Motor Co. Ltd., Yutong Bus, King Long Bus, and Huanghai Bus. In the construction market, our OEM customers include both Chinese and foreign construction equipment manufacturers such as Xugong, Liugong, Doosan, Komatsu, and Daewoo.

ii. Major Cummins OEM Customers in China

Construction OEMs	Automotive OEMs
Hyundai Construction Equipment	Dongfeng Motor Co. Ltd
Doosan Construction Equipment	Yutong Bus
Xuzhou Construction Machinery	Xiamen Kinglong Bus
Liugong Machinery Co Ltd	Suzhou Kinglong Bus
Sany Heavy Industry Co., Ltd	Ankai Bus
Komatsu (Chang/hou)	Huanghai Bus

e. **Principal End-uses of Cummins engines**

- i. Cummins engines are mainly used in the transportation, manufacturing, and raw materials extraction sectors.

Engine Application Markets	End-Use Markets
Truck	Logistics, rural/urban delivery, inter-city freight
Bus	Tourism, public transportation, inter-city Transportation
Mining Equipment	Coal and other raw materials extraction
Oil and Gas Equipment	Oil and gas drilling
Rail	Rail transportation
Power General	Manufacturing (primary power supply), residential commercial building (standby power supply)
Construction	Road and other infrastructure construction, urban regeneration
Marine	Sand dredging, water transportation

VII. **Chinese Commercial Demand for Diesel Engines**

- a. China seeks materials, technology and tooling from foreign sources because these foreign materials, designs, processes, and tooling have already gone through long and arduous testing procedures in order to receive internationally recognized commercial certifications. It is not cost effective for either the Chinese companies or their foreign partner(s) to go through new testing and certification when previously certified materials, processes and tooling already exist.
- b. China understands the global division of labor and the production of diesel engine manufacturing. Unlike other sectors, diesel engine technology from foreign sources is an easy alternative with European engineering companies like AVL and FEV, as described above, willing to provide reverse technology solutions and direct technology transfers. The decision to procure these items from foreign sources is a practical decision, not one based on lack of capability.
- c. China's demand for diesel engines for the commercial sector is growing. This growth is due to heavy fixed asset investment in transportation infrastructure, the country's increasingly prosperous population, and China's increasing role within the worldwide division of labor and production.

- d. Multinational component manufacturers are bringing technology to China to take advantage of these growing market and global sourcing opportunities. This is raising the level of available technology in country.
- e. In the diesel engine sector, China has ample access to components from a variety of internal and external sources. Numerous high technology companies in the United States, Japan and Europe supply diesel engine technology to China for use in a variety of commercial applications. As detailed above, a combination of Chinese-foreign joint ventures and wholly-Chinese enterprises are manufacturing commercial diesel engines using foreign and domestically engineered technology. To close the technology gap with international diesel engine makers, the local companies are actively developing larger horsepower engines compliant to more demanding emission standards with the help of international engineering and technology consultants such as AVL (Austria) and FEV (Germany). These Chinese competitors are also partnering with international OEMs to expand market share and to compete with Cummins.
- f. The commercial demand for more advanced engines is driven mainly by emissions requirements. While China's regulatory emissions standards are generally lagging behind both the U.S. and European standards, this is changing rapidly. The current level of legislated emissions is Euro II, which is a rough equivalent to U.S. EPA 98. The Chinese will require Euro III emission standards starting in 2008. This is why AVL and Weichai Power developed the WP series engines previously described. Cummins has also already licensed Euro III and Euro IV technology to all of our Chinese partners in preparation for new emission requirements and with the intention to decrease emissions and improve the environment with cleaner engines.
- g. The Chinese diesel engine manufacturing companies are seeking to become globally competitive in the commercial diesel engine market. To reach that goal they are working internally and with foreign partners to develop engines that meet the more rigorous emissions standards of the U.S. and Europe. Chinese legislation is also soon requiring their domestic engines to meet these more rigorous emissions standards. These emissions requirements are what are driving the Chinese to partner with foreign companies who already have certified technologies, processes and equipment to meet these standards. Military engines are not required to meet emissions standards, but instead focus on meeting military specific requirements, such as the ability to function in extreme environments.

VIII. The Future of Engine Technology in the China Market

a. Increasing numbers of joint ventures and technology transfers

- i. European companies have announced plans to increase cooperation with China on the design and development of commercial diesel engines. For example, in the past few months alone, MTU established a new assembly plant in Suzhou to produce MTU 2000 series diesel engines in China. Beiqi Foton, Weichai, Bosch, and AVL.

signed a strategic alliance agreement to develop Weichai-branded Euro IV engines for Foton heavy-duty trucks. Weichai and Bosch signed a strategic cooperation agreement for joint fuel system research on high-speed diesel engines. International investment and technology accessibility is increasing rapidly. In many ways, Austria's AVL and Germany's Bosch are becoming the "Microsoft-Intel (Win-tel)" of the diesel engine industry in China.

b. Engine Software Standards and Protocols

- i. Engine manufacturers use commercially available software applications to ensure compliance with environmental regulations. These software applications are used to operate service tools; run engine diagnostics; and operate manufacturing tools for engine calibration.
- ii. Cummins provides various levels of software to support the operation and service of our engines. Cummins software is proprietary and is licensed commercially to our partners to promote the use of Cummins and international standards. Cummins also participates in standards discussions at local and international levels to establish accepted software protocols, ranging from vehicle network communications to diagnostic standards.
- iii. China is in the early stages of establishing its engine software standards and protocols. Cummins has the opportunity to shape and influence the content and intent of these standards. It is U.S. Government policy that industry drives the development of standards. The U.S. Government continually advocates that China be more transparent in its standard setting process and allow U.S. companies to be involved in developing standards in China.
- iv. If export controls limit or give the appearance of limiting the ability of Cummins to participate in developing China's standards, Cummins and other U.S. companies will be disadvantaged and forced to re-develop products to meet Chinese market standards. The opportunities naturally associated with standards development will go to non-U.S. multinationals and their Chinese partners. The European and Japanese companies, who will not be under equivalent restrictions, will be involved in China's standards development and thus gain a great advantage over Cummins and other U.S. companies.

IX. Foreign Export Controls not a Factor for Competitors

- a. The major foreign competitors of Cummins do not appear to Cummins to be constrained in the least by their countries' export controls. While France, Germany, and Japan join the United States as founding members of all of the multilateral export control regimes (i.e., the Wassenaar Arrangement, Missile Technology Control Regime, Nuclear Suppliers Group and Australia Group) these countries are clearly not restricting the export of diesel engines or engine technology to China under their respective export control systems. In addition, these countries do not appear to

impose substantial restrictions on exports of machine tools and measuring equipment to diesel engine factories in China.

X. **Government and Industry Cooperation**

- a. In conclusion, Cummins wishes to emphasize its commitment to working cooperatively with the U.S. Government on export compliance. Cummins fully believes that true government and industry cooperation is essential to an effective export control system, where both government and industry are promoting responsible actions by all parties. Cummins would point out that it is a founding member of the American Chamber of Commerce Export Compliance Working Group (ECWG). The ECWG is dedicated to providing factual data on the Chinese market to assist the U.S. Government in developing an informed export control policy toward China. Cummins provides this report in the same spirit and hopes the data provided gives a clear picture of the actual level of equipment, technology and software available in the Chinese diesel engine market.

From: "Bill Primosch" <WPrimosch@NAM.ORG>
To: <publiccomments@bis.doc.gov>
Date: Thu, Nov 30, 2006 7:19 PM
Subject: RIN 0694-AD75: NAM Comments on Commerce/BIS Proposed Rule on Revisions of China Export Controls and New Validated End-User Authorization

This email contained an attached file "NAM Comments on BIS China Catch-All Rule 12-1-6.tif" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?0E1B455C955BE415EEBA8D52AC205C89456F750F00008067> Per BIS policy, the file(s) attached to this message have been held in quarantine. If you are certain the file is a legitimate business document, forward this message to the BIS Help Desk (ITHELP) and ask to have the attachment(s) released.

All unclaimed attachments are deleted automatically after fourteen (14) calendar days.

Attached is a letter to Ms. Sheila Quarterman, Bureau of Industry and Security, from National Association of Manufacturers President John Engler providing NAM comments on the proposed rule "Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (RIN 0694-AD75)."

The NAM has serious concerns about the proposed rule and recommends that it be withdrawn and a special advisory committee that includes industry representatives be formed to review the entirety of U.S. interests on this matter and consider alternative approaches to advancing national security goals. The letter provides a more detailed explanation of the NAM's position.

I would appreciate it if you could confirm that the e-mail with attachment has been received.

Thank you for your assistance.

William Primosch

Senior Director, International Business Policy

National Association of Manufacturers

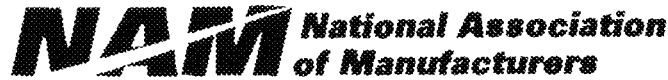
1331 Pennsylvania Ave., NW Suite 600

Washington, DC 20004

(202) 637-3145

bprimosch@nam.org

John Engler
President and CEO



December 1, 2006

Ms. Sheila Quarterman
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
U.S. Department of Commerce Room 2705
14th St. and Constitution Avenue, N.W.
Washington, DC 20230

RE: Proposed Rulemaking Concerning Revisions and Clarification of Export and Re-export Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 Red. Reg. at 38, 313, July 6, 2006 and RIN 0694-AD75)

Dear Ms. Quarterman:

I write on behalf of the National Association of Manufacturers (NAM), the nation's largest multi-sector industry association, to comment on the proposed rulemaking concerning Revisions and Clarification of Export and Re-Export Controls for the People's Republic of China (PRC) and New Authorization Validated End-User ((71 Red. Reg. at 38.313, July 6, 2006). **The NAM has serious concerns about the proposed rule and recommends that it be withdrawn and a special advisory committee that includes industry representatives be formed to review the entirety of U.S. interests on this matter and consider alternative approaches to advancing national security goals.**

The U.S. Government has a long-established policy of seeking to prevent exports that would make a material contribution to China's military capability while also facilitating U.S. exports to legitimate Chinese civilian end-users. The NAM recognizes the complex challenges that the Administration faces in developing policies toward China that satisfy a variety of national interests. We agree that it is important to control the export of sensitive products and technologies that could be used by the Chinese military to harm the United States. While we appreciate the legitimate goals of the proposed rule, we do not believe that the rule will, in fact, enhance U.S. national security because of the wide availability of the newly controlled items from non-U.S. sources and the lack of commitment by our allies to impose similar restrictions.

The net effect will, in our judgment, be to undercut other U.S. policy objectives and hamper, rather than facilitate, exports to legitimate Chinese civilian end-users. Imposing unilateral requirements like those in the "catch all" rule will disadvantage U.S. exporters vis-à-vis foreign competitors and encourage foreign customers in China, or in other countries that sell to China, to "design out" U.S.-made components and subsystems when making international purchases.

Manufacturing Makes America Strong

We are particularly concerned about the impact of compliance with the proposed rule on small and mid-size enterprises (SMEs). Over 19,000 SMEs currently export to China. These companies have limited resources for managing export licensing compliance, and the additional costs and complications are likely to discourage many from entering the China market or continuing their business there.

The NAM has also co-signed a joint letter with other associations that summarizes common business concerns about the proposed rule. This letter highlights issues of particular interest to NAM members.

Trade Context of Proposed Changes

The global marketplace for dual-use products has changed dramatically over the past two decades. Many products that could be sourced mainly or even exclusively in the United States and a small number of other countries are now widely available, even in newly industrializing economies, such as South Korea, Taiwan, Brazil and even China itself. Moreover, this trend has accelerated in recent years as developing countries have opened their economies to foreign investment and reduced trade barriers. Rapid dissemination of new technology has also been a factor in increasing the global availability of high-technology products. Advanced-technology products quickly become commodity products as the technologies become more widely available, particularly in the newly industrializing economies.

The other important change relevant to controlling high-technology exports to China is the emergence of a global manufacturing model in most large companies and many small and mid-size companies as well. Manufacturers now increasingly depend on global supply chains to compete in their market segments. Foreign markets, notably emerging economies, provide important new sales opportunities. But they have also become important for companies' global supply chains and access to foreign technical talent. Restricting high-technology exports and technology transfers to China, therefore, does not simply affect sales in that market but has broader implications for the competitiveness of manufacturing companies.

Finally, U.S. manufacturers give particular attention to restrictions on high-technology exports because they are most competitive in these product areas. Emerging economies, such as South Korea, China and Taiwan, are developing advanced manufacturing capabilities and are able to compete in a broader range of products previously dominated by the United States and other industrialized countries (e.g., automotive products, electrical equipment, machine tools and information technology products). China itself has increased its share of global trade in high-technology exports from one percent in 1990 to seven percent in 2003. Maintaining competitiveness in high-technology products in the global marketplace, therefore, is increasingly important for the future of manufacturing in the United States. U.S. high-technology industries export a higher percentage of their production than other industries. Their exports now account for 24 percent of total U.S. goods exports. With the U.S. trade deficit surpassing \$768 billion in

2005 and set to reach another record in 2006, the impact of further restrictions on high-technology exports merits careful review.

China's Unique Role in the Global Economy and U.S. Economic Relations

Since China began opening its economy to the outside world in the 1980s, U.S. policy has been to encourage bilateral trade and investment. U.S. manufacturers responded and have played an important role in facilitating China's further integration into the global market place through trade, investment and a variety of business partnerships. China's accession to the World Trade Organization (WTO), which the United States strongly supported, served to further open China's economy by reducing barriers to trade and internal restrictions on foreign businesses.

In 2006 China emerged as the third largest market for foreign products after the United States and Germany. Many major U.S. manufacturers now see China as their most important overseas growth market. But so also do competing manufacturers in other economies, notably Japan, the European Union, South Korea and Taiwan. Competition is intense for market share in China, notably in the automotive, aerospace, chemicals, energy and information technology sectors. In recent years, overall U.S. market share in China has declined even as U.S. exports to China increased. Between 2000 and 2005, U.S. market share fell from 9.9 percent to 7.4 percent (Chinese data). As the Chinese market continues to grow and develop, competition among alternative suppliers will undoubtedly increase. The U.S. trade deficit with China was \$201 billion in 2005 and is expected to grow by 10-15 percent in 2006 to another record level. Restrictions on high-technology exports exacerbate that trend.

It is against this backdrop that we conclude the "catch all" rule will have little if any impact on enhancing U.S. national security while imposing substantial additional costs on U.S. high-technology manufacturers that will harm overall U.S. economic interests. We note, in particular, the following vulnerabilities in assumptions that underlie the "catch all" proposal. In the next section, we discuss specific concerns and possible ways for addressing at least some of them.

Vulnerabilities in Assumptions Underlying the "Catch All" Proposal

--Global availability of controlled items

The proposal suggests that the United States is either the sole or principal source of the covered items and thus by itself can restrict China's access to these items (i.e., para. 9 "Items Subject to the Military End-Use License Requirement of 744.21"). Many of these items, however, appear to be widely available from non-U.S. sources and in some cases China itself. The joint business letter cites several examples such as aerospace communication and navigation equipment and information security software. Wide availability of these products will vitiate unilateral U.S. efforts to impose its own controls on exports to China. NAM members have told us that they believe global availability to be a major flaw in the proposal.

--Lack of multilateral support for additional controls

The proposed requirements lack support from our other partners in the Wassenaar Arrangement. So even those items that have limited availability in Europe and Japan are unlikely to be affected by new U.S. controls. We understand that several European partners have already opposed applying the Statement of Understanding on Control of Non-Listed Dual-Use Items to trade with China. Some U.S. officials have suggested that U.S. unilateral action on additional China controls will give our partners incentive to impose similar restrictions and follow U.S. leadership. Yet allied governments have given no indication that they plan to change their position, and indeed some may well find U.S. unilateral action as an incentive not to act because it gives domestic companies commercial advantage vis-à-vis U.S. competitors. Lacking support by other key suppliers, the impact of additional controls will be minimum at best and more likely totally ineffective.

--Over-reliance on cooperation of Chinese authorities

The proposal assumes a high degree of cooperation of Chinese government authorities in determining the end-use of the controlled items by Chinese entities and issuing end-use certificates in a timely manner. Given the close association of the central government with many public and business entities, notably the "state-owned enterprises" (SOEs), we question whether it can be fully objective in determining the end-use of controlled items. The end-use certificate, then, may be of limited value in fulfilling the goals of the proposed rule. We also have concerns that the new requirements will result in delays in U.S. companies receiving end-use certificates. The expansion of the end-use certificate requirements will place an additional cost and administrative burden on the Ministry of Commerce. The ministry will have little incentive to provide additional resources to meet the demand for expedited services, particularly when other suppliers are prepared to offer the same items without an end-use certificate. This will inevitably put U.S. suppliers at a further competitive disadvantage. The Chinese government has not, to our knowledge, publicly confirmed that it would cooperate in implementing the proposed new requirements. And indeed statements by senior Chinese officials expressing concern about the proposed rule suggest that a high degree of cooperation will not be forthcoming.

--Inconsistency with Other U.S. China Policy Objectives

For nearly three decades the United States has maintained a consistent policy of engaging China and encouraging its opening to the outside world. U.S. business has played a key and even leading role in that effort by exposing Chinese at all levels to American business representatives and business practices. Even the tragic events at Tiananmen Square in 1989 did not fundamentally alter this policy although limitations were placed on some bilateral activities, notably in the military area. Over the past several years, contacts with China have expanded dramatically, particularly on trade and foreign policy matters. The United States is actively seeking Chinese cooperation on variety of issues important for U.S. interests, including North Korea, regional economic cooperation in APEC, the WTO Doha Round, climate change, revaluation of the Chinese currency, and protection of intellectual property rights.

Even military-to-military contacts have increased in an effort to promote more understanding between the two military establishments. These positive contacts have been encouraged by repeated Administration statements that China should become a "responsible stakeholder" in global affairs and work more closely with other leading nations in addressing common international concerns.

The proposed rule, therefore, appears to many in the business community to be not only inconsistent with overall U.S. policy towards China but counterproductive in advancing U.S. foreign policy, national security and economic goals. It sends a mixed signal to China and the U.S. business community, on the one hand singling out China for unilateral controls to limit high-technology exports and on the other encouraging more trade. We are concerned that it is likely to do neither and will, by adding another significant irritant in the relationship, make it more difficult for the United States to pursue non-trade goals as well.

Specific Concerns

In addition to these broad concerns, the NAM has several specific concerns that we highlight below.

--Application to the re-export of U.S. products

The application of the proposed rule to re-exports of U.S. products, including U.S.-made components in foreign products, creates particular difficulties. The need to seek a U.S. license for using U.S.-made components in products sold to China will further encourage foreign manufacturers to design out U.S. inputs and use only foreign-made inputs rather than to risk the uncertainty and delay of obtaining a license. The compliance liability is also potentially severe for U.S. suppliers as they often do not know the final destination of foreign products that contain their inputs. A helpful clarification would be to apply an "is informed" rule to determine whether U.S. exporters have "knowledge" of re-exports going to China for military end-uses (see below).

--Use of existing "knowledge" standard

The use of the existing "knowledge" standard for determining "military end-use" will result in substantial compliance costs and liabilities for U.S. exporters. It is unreasonable to assume that civilian commercial representatives will know whether dual-use items are being used for military end-uses unless they are specifically informed or given access to confidential business information. The challenge is even greater as companies seek to trace end-use further down the supply chain to the ultimate end-user of the final assembled product, which may be several entities beyond the original purchaser of the U.S.-made item. BIS has stated that the "knowledge" standard is not new and will be the same standards applied in the Enhanced Proliferation Control Initiative (EPCI). EPCI, however, applies to only a small, well defined universe of items relating to weapons of mass destruction. If the proposed rule is implemented, we recommend that it set a narrower "is informed" standard of knowledge.

--Overly broad definition of "military end-use"

The proposed rule establishes an overly broad definition of "military end-use" that includes "use for the production of, design, development, maintenance, operation, installation, deployment, repair, overhaul or refurbishing" of controlled items. This definition captures a wide range of applications common to both civilian and military end-uses. It will be extremely difficult for commercial representatives to know with certainty whether items are being used solely for commercial purposes. Also, certain terms such as "maintenance" and "deployment" are vague and open to a variety of interpretations. If the proposed rule is implemented, we support applying this definition of "military end use" only to items on the International Munitions List as there is multilateral agreement on the need for control of these items.

--Problems in implementing new Validated End-User program

The Validated End-User (VEU) concept in the proposed rule is creative approach to facilitating advanced technology exports to selected end-users. In the Chinese context, though, it poses difficult and, quite possibly, irresolvable problems. As outlined in the proposal, the VEU program stipulates a variety of requirements for the Chinese end-user that, taken together, constitute a heavy compliance burden. The benefits of applying for VEU status, however, are limited. Approved participants are only authorized to receive specified items, and this may be of limited usefulness where companies frequently introduce new or upgraded products. Companies that apply also face the downside risk that they may be rejected in part because of issues beyond their control, such as what the Chinese government may or may not do on adherence to multilateral export control regimes or on approval of on-site visits by U.S. officials. Rejection of a VEU application may imply that Chinese end-users should be treated less favorably than they would if they had not applied at all.

If the proposed rule is implemented, the VEU program should be further clarified to enhance the benefits of VEU status, eliminate requirements that are beyond the end-user's control, and limit the downside risk of applying if an application is rejected. The program should also enable end-users to receive authorization, in a timely and cost-effective manner, to purchase new or improved versions of controlled products from U.S. exporters.

The NAM also recommends that BIS use the VEU model as a foundation for establishing a program to facilitate the exemption of U.S. intra-company transfers from export licensing. Such a program would allow American companies to transfer controlled items and technology more easily between their U.S. facilities and wholly owned and controlled subsidiaries in China. NAM member companies have identified the licensing of technology transfers to their subsidiaries in China as a particularly burdensome and, in their view, unneeded requirement since they control the end-use of the technology. If the Validated End-User program could resolve this issue, it would make a significant contribution to improving the export licensing system for many companies.

Recommendation to Withdraw Proposal for Further Study

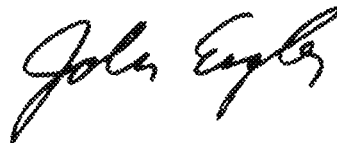
In light of the serious issues raised about the impact of the proposed rule on U.S. interests, we strongly recommend that it be withdrawn for further study. A precedent has already been set for this action by withdrawal of the proposed "deemed export" rule. In that case, the Commerce Department decided to create a special advisory committee, of which I am a member, to consider all aspects of the issue and make recommendations that take into account U.S. commercial, scientific and other national interests. Given the complexity of the China "catch all" proposal and its implications for a broad range of U.S. interests in China, the NAM believes that the Commerce Department and the Administration as a whole would benefit from establishing a similar advisory committee to review this issue and offer its recommendations.

A special advisory committee could draw together experts from a variety of fields and help to examine more thoroughly the impact of new controls on foreign policy, national security and economic interests. I also personally believe that having industry representatives on the committee and encouraging more dialogue with U.S. business executives knowledgeable of both China and global trade would help to develop recommendations that are more attuned to the realities of the marketplace and more likely to be effective in their implementation.

We appreciate this opportunity to comment on the proposed rule. NAM member companies want to do their part in protecting U.S. national security and preventing sensitive dual-use items from being used in ways that harm the United States. In its current form, however, we believe that the rule is likely to do more to disadvantage rather than advance both U.S. national security and U.S. economic interests.

Thank you for considering our views.

Sincerely,



John Engler

JE/wp

From: Robert Rarog <Robert.Rarog@Sun.COM>
To: <publiccomments@bis.doc.gov>
Date: Fri, Dec 1, 2006 3:15 PM
Subject: RIN 0694-AD75

This email contained an attached file "RIN 0694-AD75. Sun Micro.doc" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?0EABEAC3EFE1F0333B28195E13667C1A45708D56000B0891>
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All unclaimed attachments are deleted automatically after fourteen (14) calendar days.

Dear Ms. Quarterman:

Attached is are comments from Sun Microsystems on the July 6 Proposed Rule Concerning Revisions and Clarifications of Export and Reexport Controls for the PRC and New Authorization Validated End-User.

Regards,

Robert Rarog

December 1, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th St. and Constitution Ave. NW
Room 2705
Washington, DC 20230
Attention: Sheila Quarterman

RIN 0694-AD75

RE: Proposed Rulemaking Concerning Revisions and Clarifications of Export and Reexport Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 Fed. Reg. at 38313, July 6, 2006)

Dear Ms. Quarterman:

Sun Microsystems, the world's leader in networked systems, appreciates the opportunity to comment on this proposed regulation. China is an important growth market for Sun, and any expansion of export screening or increased compliance risk could have significant impacts on our ability to compete in that market.

Items subject to national security controls should not be used for military applications by potential adversaries, and lists of such items should be reviewed periodically. However, while items that have been previously decontrolled may be brought back under control for legitimate reasons, such adjustments should be narrowly focused and relatively rare.

Dual-use items are on the Wassenaar dual-use control list because of their strategic utility, and the fact that controls on them have a reasonable chance of being effective. Items are removed from this list either because they are no longer deemed to be strategically significant enough to warrant control, or because controls on them are likely to be ineffective due to their availability from decontrolled sources or their mass market characteristics.

Items that have been removed from the Wassenaar list have already undergone a thorough and exhaustive analysis under these criteria by the US Departments of Commerce, Defense, State, Energy and others involved in the interagency process. Moreover, their removal has already been approved by other Wassenaar members, which have similarly analyzed them in terms of both strategic value and controllability. After removal from

control lists, such items are also legally available to military end-users in China from Wassenaar sources, in addition to any availability from indigenous or non-controlled sources that may have been the case prior to their removal.

As the proposed military end-use rule has as its major objective re-imposition of controls on classes of items already removed from the multilateral control lists, Sun opposes this part of the proposed rule on principle. It has long been established in both US statute and regulation that unilateral or symbolic controls on such items are competitively harmful while serving little or no real national security objective. Specifics on the additional screening burdens and export compliance risk that this proposal will cause only add to reasons why it should not be implemented.

Sun reiterates that selected items can and should be recontrolled as conditions warrant. We also applaud BIS and other participating agencies in their efforts to restrict the technical scope of the list in the months leading to its publication. However, we remain convinced that the coverage of the proposed military end-use restriction remains too broad for information technology and other products.

Our comments on specific provisions of the proposed rule are as follows:

Additional Screening Burden and Compliance Risk

Unlike EPCI-proscribed proliferation end-uses, the the potential range of “military” activities is very broad; end-user/use screening may need to encompass a large number of transactions in a very large and complex market.

Sun manages an average of over 2000 customer contacts in China per month, all of which must undergo some degree of export screening. While the scope of the proposed end-use restriction is now limited to certain categories of IT products, as a practical matter if any item covered by the end-use restriction is offered either as an option or as a feature of a product configuration in China, a screening mechanism must be developed to detect and stop it for all orders.

The result is added complexity, risk, and cost affecting transactions far beyond the scope of the items listed. The analytical effort needed to “resolve” orders where military end-use as defined in the proposal is unclear, where the potential for military end-use is present in non-military institutions (e.g., universities), or where there is some financial, geographical or other connection to military institutions, translates into delays and uncertainty for multiple transactions.

Validated End-Use Authorization

Sun views the proposed VEU as a positive and original idea, but one that will be rarely used in the Information Technology industry. Unlike some industries whose business models in China encompass multiple sales to a few customers, computer companies

typically deal with a relatively large number of customers, with limited repeat business. In addition, the VEU's similarity to an export license application in terms of application complexity and technical limitations make it very similar to validated license applications available in principle today.

The fact that US exporters (rather than Chinese customers) are likely to bear the burden of application, and that approval can be exploited by competitors, makes this arrangement even less attractive.

The VEU concept could be useful if applied to products and technology required by US subsidiaries in China, as an alternative to the current "site license." However, to be beneficial it would have to be broader in scope, be subject to approval guidelines, and have an accelerated amendment procedure.

The VEU concept could also be useful in China (or in other countries) to positively identify entities that carry no risk of proscribed end-use. This could serve to assist company screening efforts for classes of entities for which the risk of such end-use is unclear.

As an alternative, Sun strongly recommends a validated exporter authorization, sometimes known as the "gold card" concept. This approach would permit exporters who met certain program control standards to export a pre-identified range products to any qualified customer in China.

Military End-Use and the Knowledge Standard

The expansive definition of "knowledge" used in the proposal, while consistent with that currently found in Part 772 of the EAR, ensures that extensive additional screening will have to be implemented to detect potential military end-uses. The similarly broad definition of "military end-use" drawn from the ITAR not only covers a very wide range of activity, but will require substantial analytical effort to resolve ambiguous real-world situations. This will in turn cause useless delay and cost in substantial numbers of customer transactions.

ECCN-specific Comments

Category 4 - Computers

As computer equipment has recently undergone a prolonged and thorough review of both strategic utility and foreign availability resulting in a Wassenaar control threshold of .75 Weighted Teraflops (WT), Sun finds the end-use restriction threshold of .1 WT in the proposed rule problematic.

In its April 26, 2006, notice on this change, BIS stated:

The 0.75 WT control level recognizes the foreign availability of the computing capacity illustrated by the Chinese commodity cluster systems currently ranked on the Top-500 List of fastest HPCs in the world. The 0.75 WT level continues to control high-end proprietary HPCs, such as those used by the Department of Defense and the Department of Energy for advanced research, development, and simulation, while removing controls on the lower-end, more widely available systems.

This conclusion rightly recognizes that computer systems and/or capacity substantially above the .1 WT level subject to the proposed military end-use requirement are available from decontrolled sources, including from within China itself. As a result, imposing a new military end-use requirement on systems of .1 WT or above will have no effect on procurement by the Chinese military, which can purchase these systems from US sources legally today if it so chose.

Multiple examples of HPC installations by established companies in China have been cited in open literature. Some are nodes of the China National Grid project, such as the Dawning 4000A, which came online in April of 2004. This system employs 2560 2.2GHz Intel Itanium processors and is rated at 110 Tflops with a 67.8% Linpack efficiency.

Foreign and indigenous capability already recognized by the Government indicates that no new military end-use restriction should be imposed below the .75 WT level. If the requirement is imposed despite this evidence, it must be no lower than .5 WT in order to continue to release mid-range 32-socket servers using the latest commercial processors. We also strongly urge that a clear statement be inserted in the rule clarifying that "electronic assemblies" designed or modified to be capable of enhancing performance by aggregation beyond that threshold are not themselves subject to the military end-use requirement.

Category 5, Part 2 – Information Security

Proposed language in Section 744.21 appears ambiguous as to whether it applies to items controlled by ECCN 5A/D002, but which qualify for shipment under license exception ENC, to the military end-use requirement. BIS has stated that its intent was not to subject NS (multilaterally controlled) items to the military end-use restriction, and this intent should be clearly specified in the rule. Sun fully agrees, and would emphasize that extension of the military end-use requirement to items now deliverable under ENC would require a substantial and disproportionate modification of screening processes and procedures.

Conclusion

In conclusion, we believe that the proposed military end-use restriction is extensive, complex, and unlikely to have any significant impact on China's military capabilities.

While we recognize the need to reevaluate controls as conditions change, this should be done on a very selective basis with clear multilateral support. The current proposal will introduce substantial administrative burdens and compliance risk with little potential benefit to national security

Due to extensive known modifications of this proposal since its July publication, particularly relating to the technical descriptions of items potentially subject to the military end-use restriction, we also feel that it is essential that the rule be reissued in proposed form prior to any implementation.

We again thank BIS for this opportunity to comment on the proposed rule.

Sincerely,

Hans Luemers,
Senior Director,
International Trade Services,
Sun Microsystems

From: <mmoneill@rockwellcollins.com>
To: <publiccomments@bis.doc.gov>
Date: Fri, Dec 1, 2006 4:36 PM
Subject: RIN 0694-AD75; Comments for the Revision of Exports Controls to PRC

This email contained an attached file "RC Catch-all Comments.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?1E22901158C762180741BFDA45A7885B4570A03A000C187C>
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All unclaimed attachments are deleted automatically after fourteen (14) calendar days.

Maggie O'Neill
Manager, International Business Affairs
Rockwell Collins, Washington DC Office
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Rockwell Collins
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1 December 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th Street and Constitution Avenue, NW
Room 2705
Washington, DC 20230

Attention: Sheila Quarterman

RIN: 0694-AD75

Re: Proposed Rulemaking Concerning Revisions and Clarification of Export and Re-Export Controls for the People's Republic of China (PRC) and New Authorization Validated End-User

Dear Ms. Quarterman:

For over 70 years, Rockwell Collins has been recognized as a leader in the design, production, and support of communication and aviation electronics for customers worldwide. We supply avionics and cabin electronics to business aviation and commercial air transport operations worldwide.

Rockwell Collins appreciates the opportunity to comment on the above referenced Notice for Proposed Rulemaking. The proposed changes to current regulations grow out of good intentions and some valid concerns. However, if implemented as drafted, the primary effect would be to curtail exports by U.S. companies on many products that are already available to China through indigenous and foreign companies.

Our company is committed to protecting U.S. national security and supporting the foreign policy goals of the U.S. government. We have a strong record of compliance with BIS regulations and we want to maintain our reputation. We acknowledge the fact that China poses a unique challenge with respect to export controls due to the complexity of our bilateral trading relationship and the role of their government in normal commercial activity. But we need to recognize that China is the fastest growing market for civil aviation and will become the second largest market worldwide, after the U.S., within five years.

The following comments are intended to make the proposed regulation clearer and less burdensome for U.S. exporters, with respect to national security.

Foreign Availability

If the purpose of this proposed rule is to deny the Chinese military access to the listed items, we put forward the question of availability, outside of U.S. suppliers. Our market research shows there is widespread foreign and indigenous availability of the avionic items covered by the proposed rule. We have attached a foreign availability matrix of some of our avionic products for your review.

Given that the equivalent of products exported by U.S. industry to China are readily available to China's military from alternate sources, U.S. exporters could not make a material contribution to the PRC's military capability. Moreover, at present, the U.S. will be the only country implementing the Statement of Understanding on Control of Non-Listed Dual-Use Items with respect to China. The allies reveal that they will not be implementing similar Wassenaar Arrangement regulations. If proposed controls are unilateral, it would impose a high cost on U.S. exporters.

Compliance Burden

The cost to our business, as well as to our relationship with Chinese partners, would be substantial. The proposed rule would significantly increase the risks and costs of compliance to operate globally. Unclear definitions, a lack of due diligence guidance and the expansiveness of the proposed rule significantly increase the potential liability for our company. It will be an enormous administrative challenge, not to mention a disadvantage against our foreign competitors. The regulation would also cause Rockwell Collins to incur significant customer penalties for missing turn-around-time commitments that are often a contractual requirement.

There would be an additional compliance costs to shoulder: the training and hiring additional compliance staff to process the administrative requirements, additional costs for processing and recordkeeping for the additional license applications, creating and maintaining an internal process for the new regulation and training new engineers and project managers if current Chinese suppliers are not granted end use certificates.

The proposed regulation's application to re-exports multiplies the already significant compliance burden created by the regulation. The re-export provision is likely to reinforce the perception that U.S. firms are unreliable suppliers, as foreign customers consider the "design-out" of U.S. components.

The expansion of the Chinese end user certificate requirement is significant and could lead to prolonged back-ups in the process. The Chinese Ministry of Commerce has made clear that it does not have the resources to issue certificates in a timely fashion. This requirement would also require more end visits by the Department of Commerce, which would cause a further delay in the licensing process in the absence of an increase in U.S. government staff in China beyond the one currently in country. This portion of the proposed regulation should not be implemented until BIS obtains an agreement from the Chinese government to promptly provide end user certificates to U.S. exporters.

Outsourcing

Rockwell Collins has concerns about the proposed rule's impact on its outsourcing relationships with China National Aeronautical Radio Electronics Research Institute (CARERI) and Aeronautics Computing Technique Research Institute (ACTRI). The language of the rule is unclear regarding the impact on Chinese companies in which the organizational structure is split between commercial and military applications. Moreover, there is a concern about our Chinese partners' ability to get an end use certification and ultimately Verified End User status.

CARERI belongs to the China Aviation Industry Cooperation I (AVIC I). CARERI is a specialized research institution for the airborne electronic equipment of the Chinese aviation industry. A portion of CARERI's business is developing products and providing services to the Chinese military. However, CARERI has designed two departments solely for Rockwell Collins tasks: 1) Software Engineering Department and 2) Software Testing and evaluation Centre to separate from the other military departments.

ACTRI is a subsidiary under AVIC I. ACTRI is the only designated computer research institute for the aviation industry in China. Its major businesses include airborne equipment, airborne software and aeronautic computing. Similar to CARERI, ACTRI also develops military products.

Xi'an Aero-Software Co., Ltd., founded in 1999, is a joint-venture company between ACTRI and China National Aero-Technology International Supply Corporation (CATIC Supply). It is an independent entity and mainly works on Rockwell Collins projects. However, similar to the previous entities, Xi'an Aero-Software also works on military applications.

If all outsourcing to China had to cease, it would cost Rockwell Collins almost \$6 M to reroute the work done by these specially trained business partners.

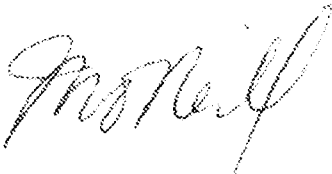
Validated End User

Almost all PRC aircraft manufactures build both commercial and military aircraft. Almost all of Rockwell Collins' industrial partners engage in product and technological development for both commercial and military applications. The regulation is vague as to how BIS will determine whether the Chinese entity is strictly commercial in nature.

We commend BIS in its attempt to facilitate the licensing process for U.S. exporters. But in its current form, the Validated End User (VEU) program, the benefits of the program are unclear and the criteria specified by which the VEU candidates would be evaluated are broadly and vaguely written. The negative consequences of a Chinese business partner denied VEU status poses a downside risk for our interests in China, which will be close to \$100 M in 2007.

In closing, Rockwell Collins supports U.S. national security and its foreign policy goals. However, we believe the proposed regulation would impede the business interests and restrict the marketing efforts by Rockwell Collins. Due to the size and complexity of the proposed rule, we respectfully ask that BIS that reissue it in proposed form in order to provide the exporting community an additional opportunity for review and input.

Sincerely,

A handwritten signature in cursive script, appearing to read "M. O'Neill".

Margaret O'Neill
Manager, International Business Affairs
703.516.8238

Attachment: Foreign Availability Matrix

Description	ECCN	China Indigenous Capability	Foreign Availability
HF Equipment			
Receiver-Exciter	5A991	Panda Radio Corporation Haihua Radio Manufacturer	Thales, BAE, Smith, Elmer, Marconi
400w Power Amplifier	EAR99		
1Kw Power Amplifier	EAR99		
4Kw Power Amplifier	EAR99		
Audio Distribution Unit	5A991		
Line Flattener	5A992		
Antenna Coupler	5A991		
1Kw Power Supply	EAR99		
Radio Control Software	7A994		
Modem	5A991		
High Speed Modem	5A991		
HF Data Communication System	5D991	None	
HF Communication Link	7D994		
HF Airborne Radio System			
Receiver/Exciter	7A994	None	Thales, BAE, Smith, Elmer, Marconi, Rhodes & Schwartz
Receiver/Exciter	7A994		
Control	7A994		
Antenna Coupler	7A994		
Antenna Coupler	7A994		
Bandpass Flattener	7A994		
Receiver/Exciter	7A994		
Antenna Coupler	7A994		
Control	7A994		
Mount	7A994		
Mount	7A994		

Description	ECGN	China Indigenous Capability	Foreign Availability
Flight Display System			
Multifunctional Display	7A994	Beijing Aviation Science & Technology Co.	Thales, BAE, Smith, Elmer, Marconi
Control Panel	7A994		
Altitude Heading Computer			
Altitude Heading Computer	7A994	Chengdu Aero-Instrument Corp.	
Flux Detector	7A994	Taiyuan Aero-Instrument Co. Ltd.	
Mount	7A994	Shanxi Baocheng Aviation Instrument Co.	
Electric Compensator Unit	7A994		
Digital Navigation Receiver			
Navigation Receiver	7A994	None	
Mounting Bracket	7A994		
Navigation Control	7A994		
Distance Measuring Equipment	7A994		
Mounting Tray	7A994	None	
Antenna	7A994		
Automatic Direction Finder	7A994		
Mounting Bracket	7A994	Haite Group Co.	
Antenna	7A994		
Navigation Control	7A994		
Radio Altimeter			
Radio Altimeter	7A994	Beijing Aviation Science & Technology Co.	
Mounting Tray	7A994		
Radio Altimeter	7A994		
Antenna	6A998		
Transponder	6A998		
Mounting Tray	6A998	CARERI	
Navigation Control	6A998		
Antenna	7A994		
VHF Communication Transceiver	7A994		
Mounting Tray	7A994	None	
Navigation Control	7A994		

Description	ECCN	China Indigenous Capability	Foreign Availability
Traffic Alert and Collision Avoidance System (TCAS)			
Receiver/Transmitter	6A998	None	Thales
Control	6A998		
TCAS Directional Antenna	6A998		
Indicator	6A998		



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November 30, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th St. and Constitution Ave. NW
Room 2705
Washington, DC 20230

Attention Sheila Quarterman

RIN 0694-AD75

RE: Proposed Rulemaking Concerning Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 Fed. Reg. at 38.313, July 6, 2006)

Dear Ms. Quarterman,

Cascade Microtech welcomes the opportunity to comment on this important proposed rule. Exports to China are important to our company, and there is no doubt that the changes proposed could have a substantial impact on our business and export compliance risk.

In general, we agree that items subject to national security controls should not be used for military applications by potential adversaries, and that lists of such items should be reviewed periodically. Moreover, we expect that when control lists are reviewed, occasions will arise where items previously decontrolled may be brought back under control for legitimate reasons.

However, dual-use items are placed on the Wassenaar control lists because of their strategic utility, and the fact is that controls have a reasonable chance of being effective when applied by all signatories to the agreement. In a world with an increasingly globalized marketplace a unilateral policy of symbolic controls is competitively harmful while serving little or no real national security objective. The proposed military end-use rule has as its major objective re-imposition of controls on widely available, low- and mid-level technology items previously removed from the multilateral control lists, and it should be opposed based on principle. Specifics on the additional screening burdens and difficulty of export compliance resulting from this proposal only add to reasons why it should not be implemented.



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The combination of broad definitions of military end use and the knowledge standard create the rock and mountain of Sisyphus for the exporting community. In an economy like China's, where the military infrastructure is intertwined with the civilian economy, a broad definition of support can stop business even if it does not directly contribute to a specific military end use. Universities, for example, are extremely problematic, as many universities in China (as in the US) engage in research for the military. The due diligence required for compliance with the proposed rule would dictate that none of our wafer probers, classified as 3B992, at a Chinese university can be used for any project that may in some shape or form, directly or indirectly, contribute to the Chinese military. The burden imposed by the proposed rule will effectively shut Cascade and other US companies from the Chinese university market and encouraging Chinese customers to purchase from our foreign competitors. Over the past decade, the US market share in the university market has declined from 70% market share to 20% due to increasing export controls and difficulties in securing visas for training Chinese personnel in the United States. As is, the proposed rule will ensure that US industry loses the remaining market share in Chinese university market.

To conclude, the effects of the proposed regulation will be twofold. On one hand the proposed rule will have a negative impact on US presence in China, in favor of foreign competitors. On the other hand, it will force US companies to establish research, development, and manufacturing operations outside of the United States in order to develop products which would not contain U.S. technology in order to remain in the Chinese market, at the expense of the US labor force. Given the effects of the proposed rule, we urge BIS to reconsider the list of controlled products and evaluate each set of products and technologies in the light of both potential threats to national security and foreign availability. We would be pleased to respond to any additional questions and concerns that may not have been addressed in this letter, in a manner and time that would be mutually convenient.

Sincerely,



Rafael Saakyan
Cascade Microtech

From: "Donald Alford Weadon, Jr." <dweadon@weadonlaw.com>
To: <publiccomments@bis.doc.gov>
Date: Sun, Dec 3, 2006 9:28 PM
Subject: RIN 0694-AD75

This email contained an attached file "BIS Catch All Rule Comments.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?F602BCDD911E1E6E90002AC113DDB571457387C50002285C>
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All unclaimed attachments are deleted automatically after fourteen (14) calendar days.

We are pleased to submit our comments, attached as a PDF file, to the BIS Proposed Catch-all Regulation.

Best regards,

Donald Alford Weadon, Jr.
Carol A. Kalinoski

Weadon & Associates
International Lawyers
International House
3338 N Street, N.W.
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WRITER'S DIRECT E-MAIL dweadon@weadonlaw.com

December 3, 2006

VIA PDF E-MAIL SUBMISSION TO
<http://www.regulations.gov>
AND publiccomments@bis.doc.gov

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th Street and Constitution Avenue, NW
Room 2705
Washington D.C. 20230

Attention: Sheila Quarterman

RIN 0694-AD75

Re: Proposed Rulemaking Concerning Revisions and
Clarifications of Export and Re-export Controls
for the People's Republic of China (PRC); New
Authorization Validated End-User (71 FR at
38,313, July 6, 2006)

Dear Ms. Quarterman:

On behalf of my colleague Carol Kalinoski, Esq. and myself, we appreciate the opportunity to submit the following, detailed comments in regard to the above-referenced notice of proposed rulemaking.

The Proposed Rule Must be Withdrawn and Reconsidered

At the outset, the proposed Rule is demonstrably flawed and has been widely recognized as being both dysfunctional as well as problematic with respect to the delicate, ongoing formulation of U.S. China Trade Policy (see, Exhibit A, Article Draft for Asia Times of December 2, 2006 "Schizophrenic U.S. China Policy Will Impair Paulson Delegation Visit").

Moreover, the "hard sell" by BIS for a Major Rule which has been termed by Assistant Secretary Padilla a "done deal", flies in the face of the general avoidance by BIS of

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both established rulemaking procedures (which under the Act involve intimate consultations with the Undersecretary's Technical Advisory Committees as well as other consultations which are required for a "Major Rule") and common sense.

It is a classic example of a "Ready, Fire, Aim" agency mandate.

Strategic and Congressional Experts View the Rule
Negatively and Indicate Withdrawal as the Best Option

Also, there is little enthusiasm among both members of the reshaped Congress and the generally Sinophobic U.S.-China Economic and Security Review Commission ("USCC"). The USCC Chairman, Larry Wortzel, recently opined that he expects BIS to take the Regulation "back to the drawing board" in light of the manifold problems, the least of which is the unilateral nature of the Regulation. In this, he was supported by the Commission.¹

Congress remains unimpressed in many quarters, and Chairman Wortzel cited their concerns, especially those of Congressman Manzullo amongst others, notably regarding the way the Regulation "...went out" and the lack of prior dialogue with our European Allies. The initial public comments from industry are understandably harsh in this regard.

The Stated Objective of the Rule is
Neither Obvious Nor Generally Supported

The stated objective of the proposed Rule is to restrict generally available U.S. goods and technologies otherwise eligible for sale to China which would make an undefined "material contribution to [China's] military capabilities." We recognize the substantial concerns

¹ In their just published annual report, while being concerned by China's military modernization, the USCC clearly noted that U.S. export controls are ineffective in large measure due to the fact that they are unilateral, noting the failure of the Wassenaar nations to accept the tenets of the proposed Regulation (although BIS was selling it to Industry as being congruent with the Wassenaar Arrangement and the Wassenaar Conventional Military Catch-all, which it wasn't). The Report sums up that "...export controls are likely to be substantially effective only if they are multilateral..."

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regarding China's military development and future posture have been raised by some elements of the the Pentagon and the USCC. However, other credible voices state that these government reports exaggerate the strength of China's military buildup. In addition, there is no agreement on this concern among our European or Asian strategic allies at Wassenaar.

We believe that all assessments need to be heard in the debate so that the Administration and BIS does not cherry-pick facts to support "revising" U.S. export controls in haste and in a way that will adversely affect legitimate trade with China, while seeking consensus on defining the risk and appropriate measures to be taken in response.

Hence, we recognize the need for reaching consensus before there is a final rule dramatically and breathtakingly rolling-back U.S.-China export control thresholds to pre-1981 levels as the Rule clearly intends.

The Process and Procedure Used to Roll Out the Rule is Seriously Flawed

From the day when BIS first surfaced the general contours of the Rule (2005) during the Sinophobic rush to reform the now withdrawn Deemed Export expansion, it was seriously and substantively criticized (see, Exhibit B, "Impending 'Military Catch-all' Rules Threaten China Trade", The Export Practitioner, October 2005).

Among the initial criticisms levied was that the public justification of the initial formulation of the Rule was stated to be a direct consequence of the Wassenaar December 2003 "Statement of Understanding on Control of Non-Listed Dual-Use Items." However, upon cursory review, the Wassenaar Statement did not support the BIS China initiative. In fact, none off the Wassenaar nations have signed on to the BIS initiative.

Also, the Rule has been, since its inception, a Protean masterpiece, changing as it went along. Literally a week after the initial publication of the Rule (July 6, 2006), BIS announced a countrywide series of short conferences to "explain" the Rule. Week after week, in conferences and Industry webinars, the explanations went on and on, and the details of the Rule kept morphing, leading many Industry observers to question exactly what it was that they were commenting upon. It remained a moving target, with BIS

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essentially "making it up as they went along". See, Exhibit C, "BIS China Catch-all Remains Moving Targets for Comments", *The Export Practitioner*, November 2006.

To quote former BIS Undersecretary David McCormick, proper export control process is a "good government issue". clearly, the process and procedure attendant to the proposed Rule and its "roll out" violate this standard.

The "Gang of 47" is Unwarranted and Unwise

The unilateral selection by BIS of 47 bundles of non-Wassenaar controlled commodities in nine categories on the Commerce Control List ("CCL") for stringent control to military end uses in China is both unwarranted and unwise.

Had BIS not abandoned in the 1990s the statutory framework of "foreign availability", it would have easily found (as many comments prove) that virtually all of these commodities are either ubiquitous in China or freely available elsewhere among our trading partners, hence eligible to full decontrol. None of these commodities are Wassenaar controlled, hence are freely exportable to China. This position is thus unwarranted, and the stringency of control on these items is curious, if not unprecedented in light of the low level of the stated "threat". See, Exhibit D, "Turning the Screws on U.S. China Exporters", *Asia Times*, August 3, 2006.

The Export Control Policy Shift is Unwarranted

The breathtaking and draconian reversal of U.S. export control policy on the "Gang of 47" is also unwarranted. In one broad measure, BIS jettisons years of progress in U.S. trade policy and reverts to a pre-1981 posture of presumed denial, even eliminating the preexisting five categories of strategic military concern which allowed for thoughtful case-by-case processing. To some observers, this proposal is punitive in nature, not based upon a rational evaluation of U.S. national security. See, Exhibit E "U.S. Blunders on China Military Export Rule", *Asia Times*, September 22, 2006.

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The Extension of Liability is Dramatic and Unwarranted

The extension of liability proposed in the new Rule is breathtaking, leading observers to term it a "liability bomb". See, a detailed evaluation in Exhibit F "China Catch-all Proposal Raises Liabilities Concerns", The Export Practitioner, October 2006.

Expanding the scope of liability to not only the exporter, but also to all parties "involved in the transaction" including carriers, lawyers, bankers and the like, is unwarranted and curious. Moreover, in light of the vacuous and ill-defined terms utilized in the proposed Regulation ("military end use", "material contribution to the military capabilities of the PRC" and the like), there is no reasonable due diligence roadmap provided for U.S. exporters or foreign customers who intend to include such articles in their products for export to China.

The New Authorization VEU is "Overwrought and Underthought"

The authorization VEU is clearly "overwrought and underthought". (See, Exhibit G, "VEU in BIS' China Catch-all Has Serious Shortcomings", The Export Practitioner, September 2006.) The March 29, 2006 draft of the proposed Rule contained a proposed License Exception Certified End User which attempted to resuscitate a uniformly rejected General License CEU ("Gold Card") proposed by the Director of the Defense Technology Security Administration, Dr. Stephen D. Bryen, in 1987.

The CEU concept was panned by Industry and the BIS Technical Advisory Committees, only to have the Authorization VEU be crafted out of whole cloth and substituted without further thought or knowledge of Industry (or the TACs) in a June 29th draft of the proposed Regulation which was ultimately shared with the Chinese to immense displeasure.

Numerous observers have taken the "Authorization VEU" out for a test drive, so to speak, and found it grievously flawed and subject to serious problems. Not only is the process vague but also not AES compatible. The VEU evaluation process is not transparent and the standards more than subjective. Moreover, the processes for use of the authorization are both burdensome and intrusive, including audit obligations for which neither the VEU exporter nor the Chinese consignee (not to mention MOFCOM and BIS) are staffed

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to accommodate. For most exporters and Chinese consignees, obtaining a validated BIS license is far preferable to wrestling with VEU status and the pernicious penumbra of perpetual post-export problems, and the continuing audit and onsite inspection exposure which are unique features of this new "benefit".

That BIS is touting VEU for use in India at this time is more than curious. Clearly, it should be reformulated in consultation with the TACs and Industry and then "flight tested" with our closest trading allies to work all the "bugs out of the system" before being unleashed upon our most complex strategic trade relationships.

Conflict of Laws Have Been Overlooked

The Authorization VEU will require significant, open-ended submission of information to the U.S. Government which will clearly be in contravention to Chinese national security law. (See, Exhibit H, "Chinese National Security Legal Impediments to the Authorization Validated End User of the Proposed China Military Catch-all Rule" of October 27, 2006). This disability also arises under Indian law, as well as the law of Switzerland, Germany and other U.S. trading partners.

Clearly, this issue should have been thought through prior to publication of the proposed Rule, and is a clear criterion for withdrawal and reconsideration.

Ill-conceived Unilateralism Will Foment
Destructive Commercial Mischief, Damaging to U.S. Firms

The handmaiden of unilateralism in trade controls is commercial mischief, where countries not burdened by the unilateral prohibition can interfere or otherwise destroy legitimate China business of U.S. companies through the mere suggestion *sub rosa* to a U.S. government official that there is the prospect of prohibited military end use of the U.S. commodities.

See, Exhibit I, "A Restriction on Trade and Security," Financial Times OpEd of July 31, 2006.

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Commercial Disruption Assured on Numerous Levels
Without Any Increase in U.S. National Security

The mere pendency of this flawed Rule is causing commercial disruption (see, Exhibit A, *supra*).

Already, both Chinese and European trading partners are mobilizing poorly concealed campaigns to "design out" U.S.-origin goods and technologies to avoid fickle application of the forthcoming China Catch-all. Also, aware of the new enforcement drive by BIS, foreign firms want to avoid being dragged into the complications of the Catch-all's "liability bomb".

Also, as a direct consequence, U.S. foreign trading partners are dusting off their blocking statutes. And the Chinese have established more rigorous central government controls over foreign direct investment, reminiscent of the now-capricious CFIUS process. Releasing this Rule without appropriate thought and consultation is triggering an expensive wave of trade retaliation damaging to U.S. Industry.

And there is no showing whatsoever of how the consequences of this Rule will in any way enhance U.S. national security or otherwise confront a "grave threat" facing the Nation.

Substantive Criticism of Flaws in the Rule
Ignored by BIS for Years

From the outset in 2004, all the above substantive criticisms have been directed at the proposed Rule in its many incarnations. See, Exhibit J, "New U.S. Export Controls Threaten China Trade", Asia Times, January 11, 2006.

None of these criticisms have been either substantively addressed or corrected by BIS. Perhaps this is the fate of a proposal which "is a done deal," but it is, in the end, not "good government."

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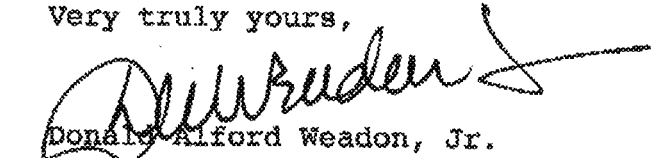
The U.S.-China relationship will dominate this century and clearly deserves better coordination, consultation and tending.

* * *

We recommend that the proposed Rule be withdrawn, reconsidered and re-engineered. It may be possible to fashion a logical and multilateral enhancement of U.S. export policy to China, but it must be done with transparency and with collegial consultations with Industry and the Wassenaar Allies to avoid significant damage to U.S. companies and the U.S. economy.

We look forward in assisting in that effort.

Very truly yours,



Donald Alford Weadon, Jr.



Carol A. Kalinoski

DAW:hbs
1945W

Exhibits

Exhibit A

Article Draft for The Asia Times of December 2, 2006
"Schizophrenic U.S. China Policy Will Impair Paulson
Delegation Visit"

SPEAKING FREELY

**Schizophrenic U.S. China Policy
Will Impair Paulson Delegation Visit**

By Donald Alford Weadon Jr. and Carol A Kalinoski

In a matter of days, the pragmatic U.S. Treasury Secretary, Henry M. Paulson, Jr. and Federal Reserve Chairman, Ben S. Bernanke will lead an unprecedented pride of U.S. Cabinet secretaries (notable among them the Secretaries of Commerce, Labor, Energy, Health and Human Services and U.S. Trade Representative Susan C. Schwab) will land in Beijing for a week of high level, high stakes consultations. The topics will include market access, intellectual property rights protection and the remarkable U.S. trade deficit with China.

But, accompanying them like a odiferous dark cloud will be the prospect of the China Military Catch-all Rule (see, "U.S. Blunders on with China export rule", Asia Times, September 22, 2006), now concluding the last days of a extraordinary 150 day public comment period before being acted upon by the proposing Bureau of Industry and Security of the U.S. Department of Commerce.

The pendency of this roundly disparaged proposal is truly a spanner in the works for any consistent U.S. trade policy with China, and represents the undiminished power of post-Cold War attitudes towards China which, despite the recent election mandate, still energizes elements of the Bush Administration.

While Paulson, all too familiar with China, well knows that atmospherics are critical to effective, high level negotiations, it is telling that he has neither commented upon the dysfunctional rule nor has insisted that the plug be pulled on what even Larry Wortzel, Chairman of the Congressionally-chartered (and generally Sinophobic) U.S.-China Security Review Commission has recently termed a poorly crafted and ineffectively unilateral regulation.

The stated objective of the proposed Rule is to embargo generally available U.S. goods otherwise eligible for sale to China which could make an otherwise undefined "material contribution to [China's] military capabilities". There is a growing body of informed comment, both in academia and industry, which believes that modernization of the Chinese Military is not exactly a bad thing in a global community. Multilateral export controls can contain significant military advances, but it is clear that the unilateral embargo of decontrolled and ubiquitous dual use goods and technologies which have no essential military character is a strategic misstep. While it may make the U.S. Administration's anti-China cabal feel good, it will wreak havoc upon ordinary commercial and financial relationships between the United States and China, as well as those between the United States and its trading allies doing robust business with China.

That the United States has been unable to achieve any consensus among the Wassenaar Arrangement nations on this issue is an indication of how benighted an idea the proposed Catch-all really is. Certainly, if it had any utility, the U.S. would have been able to obtain "buy in" from at least one allied government over the past two and a half years during which BIS alleges it has sought consensus.

But nothing attains momentum in Washington, D.C. like a bad idea, and the stakes are high for BIS and the Administration in making this proposal "stick". While earlier BIS China initiatives have been hastily withdrawn (the extension of the Deemed Export regime to individuals born in China, regardless of their citizenship, was recently withdrawn after harsh criticism and tossed to a blue ribbon panel), it has been made clear by BIS and the Administration from the outset that the military Catch-all would be rammed down the throats of Industry regardless of the damage it would do to the U.S. economy or China trade relations. In fact, newly confirmed Assistant Secretary of BIS, Chris Padilla, insisted both in confirmation hearings and as recently as last month that the roll out of the final Catch-all rule was a "done deal".

But Industry comments lodged thus far have been aggressively negative on all fronts and urge withdrawal and collegial re-engineering of the Rule. A few comments,

though, are curious. Anxious not to rile BIS and possibly fearful of a denial of "access" and other retaliation by upset BIS caretakers (BIS has been without an Undersecretary for over six months), one group merely laid out yards of negatives and dysfunctions, but failed to call for withdrawal, a most unusual situation: in other U.S. regulatory regimes, the mere recitation of only a few of the identified disasters in the proposed Rule would mandate withdrawal. By all accounts, however, the Rule is due for withdrawal and significant structural overhaul after detailed consultation with the Wassenaar allies, U.S. industry and the BIS Technical Advisory Groups -- something lacking in the preparation and initial roll-out of the proposed Catch-all Rule.

But regardless, the Chinese do read the U.S. Federal Register daily, can easily access the public comments, and have been acutely aware of the manifold problems and Industry opposition to the proposed Rule well before the initial publication on July 6, 2006.

And, having concluded that the United States is not capable of creating a consistent and sustainable position on trade issues where there is a glimmer of "mutual benefit", the Chinese will, as they have done before with other hapless U.S. emissaries (Haig, Shultz and others), quietly divide and conquer, sending Mr. Paulson and his fellow emissaries home with a scintilla of dignity but absolutely no results.

The U.S. taxpayer and the all-important U.S.-China relationship -- which will dominate this century -- deserve better coordination, consultation and tending.

Donald Alford Weadon Jr is a Washington, DC-based international lawyer. An expert in trade controls and China trade, he has counseled firms in export controls and customs issues in China for nearly three decades, and can be reached at dweadon@weadonlaw.com. Carol A Kalinoski chaired the BIS Operating Committee, the principal US government export control dispute resolution panel, for nearly nine years. She practices law at Carol A Kalinoski & Associates in Washington, DC, and can be contacted at kalinowski2003@yahoo.com.

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Exhibit B

"Impending 'Military Catch-all' Rules Threaten China Trade
The Export Practitioner, October 2005

The Export Practitioner

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Front Page

October 2005 Volume 19, Number 10

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IMPENDING "MILITARY CATCH-ALL" RULES THREATEN CHINA TRADE

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Donald Alford Weadon, Jr. *
Carol A. Kalinoski*

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In less than five years, China has evolved from a significant commercial competitor to a geopolitical adversary in the eyes of some U.S. regulators. Their attitude is seen in the Hughes/Loral satellite scandal, the Wen Ho Lee affair, the congressional Cox Report, and the establishment of the congressional U.S. China Economic and Security Review Commission. To them, Beijing's incessant thirst for ever-increasing levels of technology to fuel its economy and military modernization - and the tactics by which it has sought to obtain this technology -- necessitates tougher controls on the export of or access to U.S. technology and commodities to China.

Earlier this year, the administration proposed an expansion of the "deemed export" rule in order to scrutinize individuals of Chinese and foreign birth, even though they had been citizens of allied nations since their youth. Industry and academia violently reacted to this proposal, essentially faulting it for useless overreaching which would damage industry's and academia's access to serious minds, and thus adversely impact innovation. Over 315 lengthy, almost entirely negative comments were lodged during the public comment period.

The Next Step

Now, as an additional bulwark to stem technology loss to China, the administration will soon propose the much heralded "military catch-all" rule. Portrayed as a reflection of a multilateral agreement under the Wassenaar Arrangement, this rule, even when viewed in the most favorable light, is neither congruent with the Wassenaar Statement of Understanding on the Control of Non-Listed Dual Use Items (SOU) of December 2003 nor will it serve to stem the availability of decontrolled dual-use commodities to China or other embargoed countries for use in their military programs.

Rather, the rule will have a serious impact on U.S. industry while benefiting other Wassenaar members, who will continue to supply China freely within the ambit of the SOU. Other U.S. companies will be damaged as firms, including other American companies, which manufacture in China will opt for "designing out" U.S. parts and components as a hedge against the dangers to their supply chains arising from the rule and its enforcement.

Background

While the "catch all" rule has yet to be published, the Bureau of Industry and Security (BIS) has been sharing drafts of the regulation with its technical advisory committees and discussing its impact in public sessions, being careful to note that the rule was undergoing interagency review and might be changed.

In sum, the rule consists of a determination that any U.S. exporter of any commodity subject to the EAR, including EAR99 commodities that normally don't require a license for export to most destinations, who "knows" or is "informed" that the commodity is intended for "military end use" in any country subject to an arms embargo, either international, regional or unilateral, must seek prior BIS approval by way of an export license application or not undertake the transaction.

For exports and re-exports of all such commodities, where the transaction would make direct and significant contribution to the military capabilities of the embargoed nation, license applications would be processed on a case-by-case basis with a presumption of denial.

In addition, the forthcoming rule would establish a new restriction on the activities of U.S. persons who knowingly support a military end use in an embargoed destination. While there is no definition for "support", clearly selling decontrolled commodities to such an end use would be within the new restriction. The "military end use" definition reflects the Wassenaar SOU definition, but the Defense Department is expected to broaden the scope in the interagency process to capture commercial entities that are selling commercial, off-the-shelf products to the military of the embargoed nation.

The draft rule identifies China as one of the nations subject to the embargo, with a special licensing policy that is more restrictive for national security controlled items. And finally, it establishes a broad new "Red Flag" for military end users.

Preliminary Issues

While various industry, legal and trade groups have been wrestling over the past months with the specifics of the rule that have been revealed by BIS, the draft does raise a number of serious issues for all exporters of any size.

The impending rule and its mechanics are in essence a transaction control, more properly under the purview of the Treasury Department's the Office of Foreign Assets Controls (OFAC). The facilitation or transfer provisions directly apply to banks, freight forwarders and others in the logistics chain, and when viewed through the lens of the corporate knowledge doctrine, the opportunities for serious liability exposure abound.

If considered an "export control," it is a disfavored unilateral control in "multilateral control" clothing, as none of the other Wassenaar nations implement the SOU comparably, and none implement the SOU against China.

The rule also raises issues of significant liability for U.S. persons and companies with no reasonable avenues of due diligence whereby they could limit their exposure to liability other than to apply for authorization from BIS. Based on the current interagency environment, especially at Defense, and in light of limited resources at BIS and State, such licenses will be seriously delayed for want of resources, lack of definitional clarity and the lack of a published list of entities or projects which trigger the rule's prohibitions or its new "red flag".

Also, all potential non-U.S. suppliers are not similarly restricted and can supply the goods straight away. The result is the prospect of the loss of commercial opportunity for U.S. firms in a highly competitive global market, without any positive impact upon the foreign military entity or its projects.

Third-Party Transactions

The impact of the rule on third-party transactions, licensed foreign manufacture arrangements, joint ventures, and the like is yet to be firmly understood, but at this preliminary stage it appears it will be substantial and commercially disruptive. Even distribution arrangements may be adversely affected. To some minds, the fallout from this rule might be more significant than the storied Fruehauf case which gave rise to an array of potent foreign blocking statutes at the end of the last century.

Whether this rule will be allowed to gut many of the EAR license exceptions is still not clear. But what is clear are the commercial and political risks U.S. companies and their foreign entities might face under the laws of the targeted country when they seek or otherwise provide to BIS information on military end users and their programs.

Will exasperated American companies disinvest in the U.S. and shift production abroad to protect their shareholder's equity in the China marketplace? Will there be adverse action by China where U.S. suppliers are forced to stop meeting sales commitments or contractual requirements under existing sales or licensing agreements? Will there be threats of impairment of intellectual property protections?

The dark downside of the rule is significant, especially when industry observers believe that the present state of regulation provide adequate tools to stem any meaningful support of disfavored foreign military projects or programs.

Commentary

A product of the growing congressional and administration paranoia over China, this rule will not be subject to a "competitiveness" analysis as it is rushed into print in time for the December Wassenaar plenary session. Industry observers point to the administration's failure to note the obvious foreign availability of the wealth of decontrolled commodities which would be caught by the draft rule.

As noted in our earlier writings on the "deemed export" expansion proposal, this rule is emblematic of the proposition that we have lost the industry-government consensus on export controls which has been the foundation of sound export control law and practice for the past three decades (see *The Export Practitioner*, July 2006, page 4).

It suggests the need for the Defense Science Board and the National Academy of Sciences to reconvene and reexamine U.S. export controls in light of the China situation rather than to rely on problematic regulatory initiatives which violate essential export control policies laid down by expert industry-government panels in the past.

One of the more disturbing prospects of the implementation of a regulation, which is not congruent with multilateral controls, is that it encourages mischief in trade relations. As has been the case with similar situations in the past, foreign competitors knowledgeable in -- but not subject to -- the vagaries of the rule will have an incentive to provide authorities anonymous -- "brown envelope" -- allegations about the military nature or ties of a particular foreign consignee, knowing that once the allegations reach the BIS Office of Export Enforcement (OEE) an "is informed" letter will be dispatched to the U.S. party. This will essentially put the U.S. company's performance "on hold" even though the U.S. party may have won the contract legitimately and no export license would otherwise have been required for performance.

But once burdened by an "is informed" letter, the U.S. contractor will labor mightily to either prove the bona fides of its Chinese customer or to expeditiously obtain a license from a calcified BIS. In light of interagency scrutiny of China

transactions and scarce resources, such a license could take months to process and be approved. Meanwhile the foreign competitor, armed with the fact of the enhanced U.S. scrutiny, can approach the Chinese customer and blatantly represent that the licensing issue is force majeure, which would allow the customer to abrogate the contract with the U.S. supplier, and that it, the foreign supplier, is ready, willing and able to fulfill the stalled contract.

China has been a fertile field for such shenanigans in the past, and with the glaring differential in applicability and interpretation of the Wassenaar GOU among the United States and the other Wassenaar member nations, the forthcoming catch-all places U.S. firms in a clearly disadvantageous commercial position without any meaningful enhancement of U.S. national security.

The Need for Industry Response

While trade associations, academic and industry coalitions are presently laboring to address these regulations even in advance of their publication for comment, the ambient political environment merits more pro-active initiatives on the part of companies who see this regulation as being injurious or vexatious to their legitimate commercial interests without any concomitant benefit to U.S. national security.

Some industry lobbyists contend there is little to be gained by seeking congressional support to oppose the coming rules. They note that most lawmakers don't want to be seen helping exports of potential national security products to China. Moreover, the heads of the key congressional committees with jurisdiction over export controls are powerful and have intimidated other members of Congress, as well as top administration officials.

Despite these concerns, there are important steps exporters should take in addition to submitting comments on the regulation during the public comment period.

First, firms can submit a temperate, matter-of-fact letter to their congresspersons and senators outlining the competitive detriment, potential job loss and lack of national security enhancement embodied in the regulation. The letter can offer to discuss the issue in person with the senator or the representative.

Second, they can send a more pointed letter to the chairmen of the BIS technical advisory committees whose charters covers their products. Finally, they can write a similar letter to the President's Export Council Subcommittee on Export Administration (PECSEA).

Failure of companies to go on the record will be telling, as mere lobbying by trade organizations and industry coalitions may not be enough to forestall this ill-conceived regulation.

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Exhibit C

"BIS China Catch-all Remains Moving Targets for Comments"
The Export Practitioner, November 2006



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BIS CHINA CATCH-ALL REMAINS MOVING TARGET FOR COMMENTS

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By Donald Afford Weedon, Jr. and Carol A. Kallnoski*

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Since our previous article outlining the significant liability concerns that exporters and others have with the Bureau of Industry and Security's (BIS) proposed China catch-all rule, agency officials have busily promoted the proposal in many venues (see *The Export Practitioner*, October 2006, page 4). Somehow, much of their public explanation of why the rule benefits national security or doesn't hurt trade is either at odds with the published proposal or with other BIS public statements explaining the rule.

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This article seeks to analyze recent BIS statements and "supplemental guidance" offered to the exporting public and to examine key issues on which industry might want to focus its comments on the proposal. BIS has extended the deadline for public comments to Dec. 4, 2006.

Public Explanations and New Guidance

Recognizing the concern and uncertainty within the export community, BIS chartered a series of five public sessions across the country to explain the proposed rule during the initial four-month public comment period. As exporters expressed their continuing confusion over and skepticism regarding the proposal, BIS published on its website "Supplemental Guidance" to the proposed rule on Oct. 13, 2006.

The guidance failed to address most of the serious criticisms that were raised about the rule in public meetings, industry webinars and private sessions BIS officials held with industry groups. Instead, the guidance reiterates the broad strokes of the Authorization Validated End User (VEU), minimizes the "liability bomb" imbedded in the rule, and emphasizes the focus on "military end-use" without precisely defining the term.

The only interesting item was the statement that the rule would not "revise the de minimis requirements set forth in section 734.4" of the Export Administration Regulations (EAR).

This leaves open the Enhanced Proliferation Security Initiative (EPCI) liability issue concerning sales to foreign manufacturers in third countries of commodities governed by the proposed regulations when the U.S. exporter has knowledge that the commodities will be substantially transformed into a product or system being sold to China for "military end use".

Because of the technical nature of many of the questions that exporters have asked, the main job of responding to industry so far has fallen to Deputy Assistant Secretary Matthew Borman. Newly confirmed Assistant Secretary for Export Administration Christopher Padilla has now joined that effort to give political-level support and justification to the proposal.

Analysis of Padilla Comments

Starting with his testimony before Congress during his confirmation hearings on September 27, Padilla has underscored his support of the controversial administration policy of retarding the modernization of China's military through the restriction of U.S. sales of commodities readily available in the global marketplace, including software and technology still not controlled by our Wassenaar trading allies.

In an exclusive interview with *The Export Practitioner*, Padilla stressed that the drive behind the proposed China rules comes from the top levels of the Bush administration, (see related feature article in this issue).

"A lot of people ask me, where does this rule come from? Is this just bureaucracy on autopilot? And I want to address that because I was involved in this to some degree when I was at the State Department when this rule was considered at very senior levels interagency," Padilla told *The Export Practitioner*.

"I really want to emphasize that it does derive from broader U.S. foreign policy with China and particularly the military end use controls," he said. "Essentially, it was driven by a concern about civilian technology undermining the arms embargo," he explained.

"And what we've seen in China is that, like the U.S. military, the Chinese military is increasingly relying on commercial technology, commercial off the shelf technologies," he said.

Padilla Wants Focus on VEU

Paradoxically, Padilla also argues that the companion goal of the rule is to streamline the export licensing process through the VEU to reduce the number of licenses to China. He fails to address, however, the adverse affects the proposed regulation would have on overall U.S. trade with China and the enhanced liability exposure for U.S. exporters and their service providers.

The assistant secretary made it clear in a recent presentation to an ad hoc industry group on October 19 that the final version of the rule is not likely to be much different from the proposed version and that industry should focus its comments on how make the VEU process work and not just on criticizing the proposal.

Though commentators who have been decidedly unenthusiastic over the problems presented by the rule might quarrel with his observations, it is clear to the authors that there are serious and unresolved functional, policy and liability issues raised by the proposal for which BIS has not offered a solution. We continue to recommend that the proposal should be withdrawn for rethinking just as the Deemed Export proposal was withdrawn and handed over to an expert advisory committee and as the Safe Harbor and Red Flags proposal was quietly withdrawn on Oct. 18 (see related story in Inside BIS).

Substantively, Padilla has indicated a growing and troubling role for the Office of Export Enforcement (OEE) in the VEU mechanism, from VEU determinations to oversight and auditing. Enforcement of the new China export licensing provisions also will be an OEE assignment.

"The proposed new China regulation will be on our enforcement screen," BIS Assistant Secretary for Export Enforcement Darryl Jackson told BIS Update 2006 on Oct. 17. "We will, of course, consider how best to deploy our enforcement resources in response to the new regulations," he said.

Jackson pointed to enforcement cases in the last year involving exports to China as evidence of his office's focus on China. "Our cases also reflect the ongoing concern that China should not be allowed to divert dual-use goods and technology to modernize its military," he told Update.

Vague Definition of Military Capabilities

The input and role of the Department of Defense in the VEU authorization process remains vague, as does the weight of its recommendation at the table.

Defense is already touting the national security/EPCI "cross over" aspects of the China proposal to recommend denial of China-bound transactions in the interagency Operating Committee dispute resolution process. One wonders how the VEU designation mechanism will really work and what role other agencies will play.

The role of Defense in the VEU review process is particularly troubling because the proposed regulation lacks an objective standard by which the determination will be made of what constitutes a "material contribution to the military capabilities of the People's Republic of China". In both the rewrite of Section 742.4(b)(7) National Security section of the EAR and new Section 744.21 of the Enhanced Proliferation Security Initiative (EPCI), the licensing review standard is whether the proposed transaction "would make a material contribution to the military capabilities of the People's Republic of China".

The application of that review standard is very different from what "would make a material contribution to the Chinese military". We are at a loss for how the interagency will apply the standard to determine "material contribution" to the "capabilities" of the Chinese military.

The licensing review standard elsewhere in Section 744, either for nuclear explosive devices, missile-related, or chemical-biological weapons of mass destruction, focuses on activities related to these areas. It will be a subjective analysis for the interagency to determine whether a proposed transaction "would make a material contribution...to (Chinese) military capabilities." The license review standard as currently written in the proposed rule is vague and subjective in comparison to a determination that the proposed transaction will go to a military end-use as defined in the proposal.

Padilla says BIS has proposed the creation of a new interagency committee to review VEU requests, but he admits the details have not been worked out on how it will operate, whether other agencies will have veto power in the committee or if there will be an escalation process to resolve interagency disagreements.

Moreover, one wonders from these comments whether the bulk of the rule and its operational details, from VEU designation to appeal, have received the thoughtful consideration that industry expects and will need, so the regulations will have the least adverse effects on U.S. trade.

It is generally accepted that BIS is making the rule up as it goes along. Not only is this a questionable approach to federal rulemaking on a subject that will adversely effect U.S. trade with its most important trading partner for the future, but it also makes the proposal a moving target that increases the difficulty of industry's effort to comment upon it.

Informed Comments are Essential

Former Under Secretary David McCormick termed the BIS role in export regulation a question of "good governance". We naturally agree. It is essential for companies both big and small to participate in the comments process, not only to advance their own interests but also to ensure that BIS has the benefit of industry's perspectives and insights.

Industry comments can illuminate potential problems that the private sector is best positioned to anticipate. If individual firms do not comment, imbalanced input will result in everyone being subject to a problematic regulatory regime. This is particularly important because BIS has failed to respond to a wide variety of substantive insights and criticisms such as:

- The lack of precision in the definition of "military end use."
- The absence of an objective standard by which the determination of what constitutes a "material contribution" to the military capabilities of the People's Republic of China.
- What entities are to be identified as being "China military."
- "Foreign availability" and how this regulatory process - abandoned by successive administrations despite being enacted as a principal foundation of export controls in 1979 -- will work to remove commodities from the "Gang of 47".
- The "Liability Bomb" presented by the proposed rule for exporters and their transaction partners or advisors, including banks, freight forwarders and shippers.
- The lack of meaningful avenues for exporters to undertake liability-reducing due diligence.
- The myriad dysfunctions in the Authorization VEU, including the incompatibility of VEU with the Automated Export System (AES) as now configured.
- The effect of a denial of VEU status on a particular Chinese entity and whether this will constitute a "red flag" that might place the failed candidate on the Unverified or Denied Party Lists.
- The proposed rule's lack of any recognition of contract sanctity.
- Conflicts with domestic Chinese domestic national security law with respect to the provision of information by Chinese or American entities in support of a VEU application or subsequent, intrusive questions posed with respect to the application; likewise, with information access or provision of such during VEU audits.
- Conflicts with other national laws when extraterritorial application of the regulation affects reexports from third countries to China.
- How the unilateral nature of the rule -- despite BIS claims of multilateral support for tightening controls -- won't result in unacceptable "commercial mischief".

These are but a few of the abundant unresolved issues which mandate the withdrawal of the proposal for reconsideration and re-engineering. Fortunately, BIS has already demonstrated how to reconsider troubled regulatory initiatives: withdraw the rule and form a committee to study the issue. This is something BIS probably should have done at the outset when the Bush administration directed BIS to create such an unprecedented, unilateral regime.

Both Padilla and others in BIS have warned for some time that Congress would act if industry opposed this rule, a dire prediction worthy of the Halloween season. However, the November elections may produce such a fundamental change in the Congress that this threat will become illusory. China will remain a top concern for Congress regardless of which party is in control, but the focus of that attention is likely to be more on economic and exchange rate issues than security. In short, it is incumbent upon industry to speak up so that this bad idea does not become a worse reality.

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Exhibit D

"Turning the Screws on U.S. China Exporters"
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SPEAKING FREELY

Turning the screws on US-China exporters

By Donald Alford Waadon Jr and Carol Kalneski

Speaking Freely is an Asia Times Online feature that allows guest writers to have their say. Please click here if you are interested in contributing.

WASHINGTON - The great geopolitical game being played out between the China and the United States took yet another ominous turn on July 6 when the US Bureau of Industry and Security (BIS) published for public comment the highly problematic "China Military Catch-all Rule", which, if made final, will dramatically and adversely impact trade and finance between China and the United States and its allies.

The proposed rule seeks to block modernization of the Chinese military by imposing new licensing requirements on exports, re-exports or transfers of US-origin commercial commodities or

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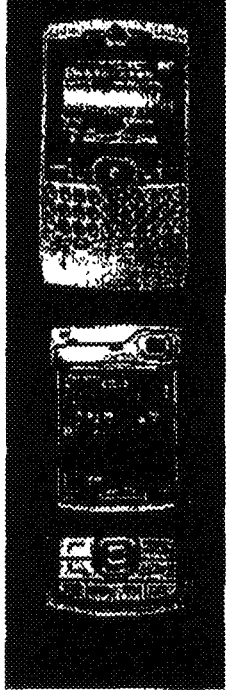
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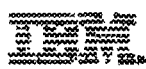
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technology in 47 fairly expansive categories (from machine tools to medical chemicals, from microprocessors to music equipment) for potential "military use" in China. Heretofore, these commodities had freely flowed to China without a license.

Washington is concerned that China is modernizing its military by utilizing commercially available commodities and technologies. But industry observers note that the proposed rule will not

achieve the desired result, and its publication is triggering protective measures by allied nations, which include recommendations to "design out" US parts and components in large and expensive civilian and military projects with long lead times.

When originally floated late last year, the proposed rule generated significant adverse comments from industry, academia and the BIS Technical Advisory Committees manned by experts from both industry and government alike (see [New US export controls threaten China trade](#), January 11). Notwithstanding these warnings, the BIS has charged ahead, despite the fact that a sister initiative, which sought to restrict access to certain technologies by individuals born in China but who held nationality in another country, was shouted down this spring by a chorus of 315 adverse comments from industry and academia.

The new proposed rule signals a breathtaking rollback of export licensing policy to Cold War levels. The rule restricts commodities widely available from Asia, Europe, Israel and even China, coupled with a remarkable liability umbrella, which includes the US exporter, the Chinese importer, all companies in the chain of title, shippers, forwarders, financial institutions (eg letters of credit, project finance, mergers and acquisitions), accountants, lawyers and the like.

Thus the proposed rule seriously raises the stakes for US firms addressing the Chinese markets, and European and Asian firms that trade with China and use US-origin systems, parts and components. US-allied nations are dusting off their blocking statutes to stem the extraterritorial impact of this new rule on their domestic companies.

The proposal is rife with contradictions and loose language. The operative term "military use" lacks clarity, as many items made to military specifications are not addressed, and the status of the system or program being supplied as being military in nature may be difficult to establish because of backlogs and dysfunction at the US State Department's Directorate of Defense Trade Controls, the federal munitions-licensing agency.

Moreover, the supposed benefits are illusory. A new "authorization" called "validated end user" (VEU) is proposed to speed exports in certain authorized categories without a validated license to properly qualified Chinese entities; in reality, it is a renamed version of a discredited mechanism promoted by the Defense Department in the mid-1980s and soundly rejected.

Featuring significant paperwork obligations for all parties, intrusive and extensive information requirements, high compliance costs, audit exposure, and open-ended annual reporting obligations, the VEU has yet to be perceived as any sort of benefit. The interagency process to obtain VEU authorization does not yet exist, and it would take at least a year under present US and Chinese Ministry of Commerce (MOFCOM) staffing levels and conflicted interagency review to get the VEU evaluation process up and running.

Finally, there is no description of what benefits would flow to any entity dubbed by the BIS with this vaunted status. The BIS publicly admits that "the details have yet to be worked out".

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Yet this hasn't stopped the BIS regularly proclaiming to the press and the export community that the proposed rule is a "win-win" proposition that would advance both "US security and economic interests", described as "pragmatic hedging". Observers counter that the ubiquitous availability of the newly restricted commodities makes this claim empty at best. US economic interests will be gravely impacted by this unilateral action, which does not find favor with allies in the Wassenaar commercial export-control group.

The shock waves from this tsunami of unilateralism will be felt on many shores, but most impact will be on US firms in the Chinese market that understand how competitive momentum, once lost, can never be regained. With no reasonable avenues for liability-limiting due diligence provided, and the clear prospect of commercial mischief by companies that fail to win major contracts, the adverse impact on the full range of sales, manufacturing, technology-licensing ventures and trade financing with China could be adverse.

To stem industry unrest, the BIS held an unprecedented public meeting in Washington last month to "explain" the rule to a dubious public. The meeting was crowded and contentious. The BIS implied that it was "making it up as they went along", and attendees left with the stunning realization that the procedural underpinnings of this proposed initiative are not yet fully conceptualized. Industry dissatisfaction has prompted BIS management to withdraw from industry events to explain the rule. This initiative is not yet ready for "prime time".

Chinese reaction to the proposed rule has been muted but adverse, as could be expected. Citing previous agreements to enhance trade, MOFCOM spokesman Chong Quan noted that the proposal "was unfavorable for benefits of enterprises ... and the healthy development of Sino-US trade and economic relations". He also expressed his desire that the US "could give up its Cold War mentality".

Sadly, the administration of President George W Bush is committed to imposing this flawed piece of regulation on exporters to further the ever-deepening hostility toward China held in some quarters of the White House and Congress. But the Chinese continue to remind the US that the dangerous trade imbalance they hold over the United States will continue to grow unless and until the Washington permits China to purchase high-value equipment, a sector where the US still maintains some comparative advantage, but an area on which the government is turning the export screws.

The proposed rule can be accessed [here](#) (pdf file).

Donald Alford Weadon Jr is a Washington, DC-based international lawyer. An expert in trade controls and China trade, he has counseled firms in export controls and customs issues for nearly three decades, and can be reached at dweadon@weadonlaw.com. Carol Kalinoski chaired the BIS Operating Committee, the principal US government export-control dispute-resolution panel, for nearly nine years. She practices law at Carol A Kalinoski & Associates in Washington, DC, and can be contacted at kalinoski2003@yahoo.com.

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Exhibit E

"U.S. Blunders on China Military Export Rule"
The Asia Times, September 22, 2006

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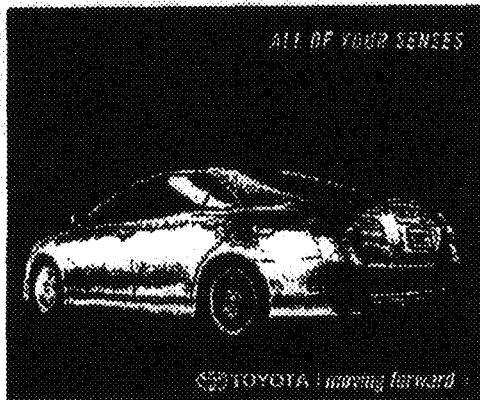
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SPEAKING FREELY
US blunders on with China military-export rule
By Donald Alford Weadon Jr and Carol A Kalinoski

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WASHINGTON - On July 8, the US Bureau of Industry and Security (BIS) published for 120-day public comment the problematic "China Military Catch-all Rule". As we described in our previous article ([Turning the screws on US-China exporters](#), Asia Times Online, August 3), this proposed regulation, if



published as a final rule, will dramatically and adversely impact trade and finance between China and both the United States and its allied trading partners.

Not so curiously, BIS has been scooting around the United States and the Internet trying to quell the fears of industry that the proposed rule is a "liability bomb" and signals a major impediment in US-China Trade. At public and closed meetings, and in webinars with industry groups, senior BIS officials have tried to answer both general and technical questions from industry trade administrators and their lawyers about significant aspects of the proposal that either have no definition or run counter to procedures elsewhere in the US export regulations.

Sadly, with each session, it becomes more evident that this proposed rule has not been thought through, and in response to specific questions, the BIS officials either provide "new" interpretations of the language of the regulations or ask industry for "their" interpretations for evaluation in the comment period.

To experienced observers, this is clearly making up a regulation on the fly, a rather dismal prospect. But more important, as the form and substance of the regulation are changing by the day, the industry is faced with an inscrutable moving target in the

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preparation of meaningful comments. What exactly are they commenting on?

This is not exactly a comforting prospect when vast liability and disruption of important trade relations with Chinese customers and Western trading partners are at stake.

The proposed rule seeks to block modernization of the Chinese military by imposing new licensing requirements on exports, re-exports or transfers of US-origin commercial commodities or technology in 47 fairly expansive categories (from machine tools to medical chemicals, from microprocessors to musical equipment) for potential "military use" in China. Heretofore, these commodities had freely flowed to China without a license.

The US is concerned that China is modernizing its military by using commercially available commodities and technologies - ironically comparable to the US congressional mandate of two decades ago that commercial-off-the-shelf (COTS) be the standard for US defense procurement.

Industry observers note that the proposed rule will not achieve the desired result, and its publication is triggering protective measures by allied nations, which include recommendations to "design out" US parts and components in large and expensive civilian and military projects with long lead times.

When originally floated late last year, the proposed rule generated significant adverse comments from industry, academia and the BIS Technical Advisory Committees manned by experts from industry and government alike (see [New US export controls threaten China trade](#), Asia Times Online, January 11). Notwithstanding this cautionary warning, BIS has charged ahead, despite the fact that a sister initiative, which sought to restrict access to restricted technologies by individuals born in China but who held nationality in another country, was shouted down this spring by a chorus of 315 adverse comments from industry and academia.

The new proposed rule signals a breathtaking rollback of US-China export licensing policy to pre-1981 Cold War levels. The rule restricts commodities widely available from Asia, Europe, Israel and even China itself, coupled with a remarkable liability chain that includes the US exporter, the Chinese importer, all companies in the chain of title, shippers, forwarders, financial institutions (eg letters of credit, project finance, mergers and acquisitions), accountants, lawyers, consultants and the like.

Thus the proposed rule seriously raises the stakes for US firms addressing the Chinese market, as well as European and Asian firms who trade with China and use US-origin systems, parts and components in their products or services. Allied nations are dusting off their blocking statutes to stem the extraterritorial impact of this rule on their domestic companies.

The operative term "military use" lacks clarity, as many items made to military specifications are not addressed, and the status of the system or program being supplied as being military in nature may be difficult to establish because of backlog and dysfunction at the US State Department's Directorate of Defense Trade Controls, the country's munitions licensing agency.

The purported benefits are illusory. A new "authorization" called "validated end user" (VEU) is proposed presumably to speed exports in certain authorized categories and end-users without an individual validated license to properly qualified China entities. In reality, it is a renamed version of a discredited mechanism promoted by the Defense Department in the mid-1980s and flatly rejected.

Featuring significant paperwork obligations for all parties, intrusive and extensive information requirements, high

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compliance costs, audit exposure, on-site inspections, and open-ended never-ending annual reporting obligations, the VEU has yet to be perceived as any sort of benefit.

The interagency process to obtain VEU authorization does not yet exist, and it would take at least a year under present staffing levels in the US and in China's Ministry of Commerce (MOFCOM) and conflicted US interagency review to get the VEU evaluation process up and smoothly running. Finally, there is no description of what benefits would flow to any entity dubbed by BIS with this vaunted status. BIS publicly admits that "the details have yet to be worked out".

Yet this hasn't stopped BIS from regularly proclaiming to the press and the export community that the proposed rule is a "win-win" proposition that would advance both "US security and economic interests", described as "pragmatic hedging". Observers counter that the ubiquitous availability of the newly restricted commodities makes this claim empty at best. US economic interests will be grievously impacted by this unilateral action, which does not find favor with allies in the Wassenaar commercial export control group. A quick sartorial check on the emperor's wardrobe is urgently called for.

The shock waves from this tsunami of unilateralism will be felt on many shores, but the most impact will be upon US firms in the Chinese market, which well know of its unforgiving competitive momentum that, once lost, can never be regained. With no reasonable avenues for liability-limiting due diligence provided and the clear prospect of commercial mischief by companies that fail to win major contracts (a "brown envelope" to US officials alleging military ties by the Chinese customer could derail a deal at any stage), the adverse impact on the full range of sales, manufacturing, technology licensing ventures, project and trade financing with the People's Republic of China could be adverse.

Chinese reaction to the proposed rule has been muted but adverse, as can be expected. Citing previous agreements to enhance trade, MOFCOM spokesman Chong Quan noted on July 12 that the proposal "was unfavorable for benefits of enterprises ... and the healthy development of Sino-US trade and economic relations". He also expressed his desire that the US "should give up its Cold War mentality".

Sadly, the US administration is committed to imposing this flawed piece of regulation upon US exporters and trade with China to further its ever-deepening hostility toward China in some quarters of the White House and Congress (the latest gauntlet was last week's emergency regulation banning any Department of Defense procurement of goods or services from Chinese firms linked to China's military).

But the Chinese continue to remind the US that the dangerous trade imbalance they hold over the United States (which set yet another record this month) will grow unless and until the US permits China to purchase high-value equipment, a sector where the US still maintains some competitive advantage, but an area where the US is turning the export screws. US Treasury Secretary Henry Paulson will hear this message with clarity during his current visit in China.

Donald Alford Weedon Jr is a Washington, DC-based international lawyer. An expert in trade controls and China trade, he has counseled firms in export controls and customs issues for nearly three decades, and can be reached at dweedon@weedonlaw.com. Carol A Kalinoski chaired the BIS Operating Committee, the principal US government export control dispute resolution panel, for nearly nine years. She practices law at Carol A Kalinoski & Associates in Washington, DC, and can be contacted at kalinoski2003@yahoo.com.

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Exhibit F

"China Catch-all Proposal Raises Liabilities Concerns"
The Export Practitioner, October 2006

The Export Practitioner

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CHINA CATCH-ALL PROPOSAL RAISES LIABILITIES CONCERNS

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By Donald Alford Weadon, Jr and Carol A. Kalinoski *

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Subscription

In our previous examination of the Bureau of Industry and Security's (BIS) proposed China military catch-all rule, we sought to deconstruct its objectives, its unilateral methodology and the deleterious consequences of the rule upon both U.S.-China trade and U.S. trade with our allies (see *The Export Practitioner*, September 2006, page 4).

Renewal

Expires: 2-9

Last Chance!

BIS and its new management team maintain a curious enthusiasm for the rule. In their public and private explanations of the rule in advance of the receipt of public comments, BIS officials continue to beg the question of what exactly are or will be the objectives of the rule and the true nature of its mechanisms.

Renew Now!

In the words of newly-confirmed Assistant Secretary for Export Administration Chris Padilla at his Senate confirmation hearings, BIS still believes that this rule encourages "legitimate civilian trade while hedging against concerns about rapid military modernization" in China.

While our previous commentary is at odds with this perspective, and with the deadline for comments fast approaching, we thought a final examination through the lens of risk management would provide ample evidence that the proposed rule is a "liability bomb." We believe it is so flawed that it should be withdrawn for serious reconsideration and re-engineering.

Expansion of Scope of Liability

The proposed unilateral rule broadly extends liability for certain exports, re-exports, and transfers to China in a number of ways, all disproportionate to the alleged harm. First, the rule expands the scope of the catch-all of the Enhanced Proliferation Control Initiative (EPCI) in Section 744 of the Export Administration Regulations (EAR) to military end-uses in China and to activities of all U.S. persons that "support" or "facilitate" an export or reexport to certain military end-uses in China.

While the definition of "military end-use" in this new section conjoins preexisting restrictions on a wide swath of activities related to items on the U.S. Munitions List and the International Munitions List of the Wassenaar Arrangement, BIS adds a license requirement on an expansive list of 47 categories of commodities.

BIS would require licenses for non-Wassenaar controlled items that span the Commerce Control List from machine tools to medical chemicals and from microprocessors to music equipment and all aircraft parts when exported to China for potential "military end-use". BIS has explained that these newly controlled items "have the potential to advance the military capabilities of the PRC".

Since the list was published, industry has informed BIS that all these items are widely available from foreign and Chinese sources. Many companies and trade organizations are frantically lobbying BIS to eliminate their commodities from the list; others are legitimately concerned that their commodities will be added to the list.

Liability for Facilitators of Exports

The rule also expands coverage of the China military catch-all to those U.S. persons that "support" a violative transaction, where "support" means "any action, including financing, transportation, and freight forwarding, by which a person facilitates an export, re-export or transfer that does not have a required license to a Chinese military end-use."

Thus, such participants in an export transaction need to engage in significant due diligence to avoid liability exposure under the new catch-all provision. Sadly, BIS has not provided any due diligence road map or safe harbor for the exporter or any of the participants in such a transaction, leaving them with no alternative but to join in a license application. One can only wonder what sort of paperwork and certification blizzard awaits exporters from their forwarders, banks and lawyers as they scramble to attenuate their liability.

Moreover, there is no provision for contract sanctity in the rule. If enacted as published, all existing contracts and relationships would be immediately and adversely subject to the regulation.

Finally, exporters who choose to use the new Validated End-User (VEU) authorization -- whatever it might look like when published as a final rule - also would be exposed to potential paperwork and audit liabilities, which will last at least five years from the date of the export from a prosecutorial perspective under the present statute of limitations.

Principal Definition is Vague.

The rule is driven by a number of vague definitions. The most glaring of these is the definition of "military end-use". The proposal would apply Section 744.21, which defines "military end-use" to mean "incorporation into, or use for the production, design, development, maintenance, operation, installation, or deployment, repair, overhaul or refurbishing" of items identified on the U.S. Munitions List (USML) and the International Munitions List of the Wassenaar Arrangement.

In deciding whether an export meets this definition, an exporter or anyone in the transaction liability train might cautiously render a licensing self determination or seek an official commodity jurisdiction (CJ) determination from State's already backlogged Directorate of Defense Trade Controls (DDTC). Either approach is risky.

A self-determination can only refer to inconsistent, contradictory or otherwise unintelligible prior CJ determinations and then only anecdotally, because DDTC does not published its CJs. Were the exporter to request a CJ from DDTC, no exports of the item would be permitted to China pending State's ruling because China is a prohibited destination under the ITAR.

Moreover, what constitutes a "military end use" or "military end -use" is already fogged by inconsistent definitions used by BIS. A controlled entertainment device containing encryption sold for use in a military barracks is not considered to have met either definition. Clarity on this issue is not likely to be forthcoming.

Parsing the Patriot Act

With the renewal of the Patriot Act in March 2006, civil penalties for EAR violations were raised to \$80,000 per count, further increasing the potential liability of exporters. BIS has started to apply this higher fine to violations that have occurred after enactment of the new law.

Hence, the liability aspects of the proposed China rule take on even more disproportionality and concern. An export will be a violative transaction when it is not covered by either a license or a VEU and a military end-use may be involved.

BIS enforcement officials have said they intend to continue the past policy of citing each violation connected to an export in their administrative charges. Thus, in addition to the specific export cited in a Charging Letter, BIS may add another \$50,000 per shipment charge for making a false statement on a Shipper's Export Declaration or Automated Export System (AES) filing.

As seen in many BIS administrative settlements in recent years, the agency is also likely to add a charge for "exporting with knowledge" of a violation.

So, a maximum \$150,000 per export penalty will be the starting point for an exporter caught crossing a poorly defined line, or one who is turned in by a competitor wise in the ways of the proposed rule's vagaries. If even a few exports are involved, the tab could rise sharply. For multiple transactions, the potential liability could soar.

This tougher penalty structure will affect the exporter, as well as the other participants in the transaction who share the responsibility for the violation.

Making matters more interesting is the venerable "corporate knowledge doctrine" which can be used to find corporate intent when culpable knowledge is cobbled together from shards of knowledge of several employees, each of whom may have a "piece of the puzzle." When this knowledge adds up to 100 percent, sufficient knowledge is deemed to exist for potential criminal prosecution. With the range of the potentially culpable reaching remote participants in a transaction, the doctrine has a rich brew from which aggressive or determined enforcement officials can deduce intent.

This exponential boost in liability exposure is again disproportionate to the purported harm, especially when it involves ubiquitously available goods generally not requiring a license and decontrolled within the Wassenaar Arrangement. And with BIS doling out ten-year export denial orders for export violations, we again note that this proposed rule presents a "liability bomb" of significant proportions despite the stated hope that it will greatly facilitate trade with China.

Best Practices Demand Reconsideration

So much for the highlights of the liability picture. There are more devils lurking in the details. It has been recently said to the authors "then why don't you propose something better?" Well, we would if asked.

But that is not the issue here: the rule is flawed and wildly resonant in disproportionate liability and cannot be fixed by patches or convenient "work arounds". Facing significant uncertainty and disruption in trade, not to mention the prospect of

commercial mischief from foreign competitors not similarly burdened, the exporting public needs to firmly comment and ask for the proposed regulation's retraction.

Then, BIS should do as the law commands: request the statutorily constituted Technical Advisory Committee to draw up a proposed approach in consonance with the Wassenaar protocol. Then we can move forward with confidence.

Until then, however, the proposed regulation is not yet ready for "prime time" and is a liability bomb, which will stifle legitimate U.S. trade with China, and boost the China trade of our trading partners at the expense of the U.S. economy.

Donald Alford Weadon, Jr. is a Washington, DC-based international lawyer. An expert in trade controls and China trade, he has counseled firms in export controls and customs issues for nearly three decades and can be reached at dweadon@weadonlaw.com. Carol A. Kalinoski chaired the BIS Operating Committee on Export Policy, the principal U.S. government interagency export control dispute resolution panel, for nearly 6 years. She consults on export and trade controls and practices law at Carol A. Kalinoski & Associates in Washington, D.C., and can be contacted at kalinoski2003@yahoo.com.

Exhibit G

"VEU in BIS' China Catch-all Has Serious Shortcomings
The Export Practitioner, September 2006

The Export Practitioner

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VEU in BIS' CHINA CATCH-ALL HAS SERIOUS SHORTCOMINGS

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By Donald Alford Weadon Jr. and Carol A. Kalinoski*

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Renewal

Expires: 2-9

Last Chance!

Renew Now!

After the Bureau of Industry and Security (BIS) proposed its new China Military Catch-All and Authorization Validated End User (VEU) regulations in the July 6, 2006, Federal Register, the agency set out on an unprecedented national roadshow to answer industry questions about the proposal. BIS officials tried to address exporting community concerns about what the rule actually means (see *The Export Practitioner*, August 2006, page 14).

The clear answer is that BIS doesn't know yet, and they will be "making it up as they go along". With each presentation, new elements are being offered, which makes one wonder exactly what regulation the public is being asked to comment upon during the four-month comment period ending November 3, 2006. Nature abhors moving regulatory targets.

Nowhere is this more evident than in the new Authorization VEU. The VEU was substituted for License Exception CEU (Certified End User), which appeared in an earlier draft of the BIS proposed rule. That earlier draft drew negative reviews from BIS technical advisory committees in March of this year.

BIS had been promising China a serious licensing benefit in return for the proposed new restrictions on trade with potential military end-uses of 47 classes of commodities currently eligible for export to China without a license. The VEU was supposed to be that benefit. The VEU, however, is unlikely to ever fulfill that promise.

Deconstructing the VEU

The troubled provenance of the VEU is worth noting. At the height of the Cold War in the mid 1980s, the Department of Defense proposed a General License Certified End User ("CEU") to serve as a "Gold Card" to allow the immediate export of certain controlled commodities to reliable entities in the Eastern Bloc. It was stillborn and never published, despite all manner of glowing hype from the then-director of the Pentagon's Defense Technology Security Administration (DTSA).

Therefore, it was interesting to see the resurrection of this discredited idea as License Exception CEU in the early catch-all drafts. It was more interesting to see this proposed methodology thrown over the side and replaced with a more problematic "authorization VEU" in the July 6 proposal. Proposed for location in a new EAR Section 748.15 instead of Part 740, this new animal has resisted definition in the BIS Q&A public meeting sessions.

So in order to evaluate the VEU Authorization for viability, we will assume the VEU will be implemented as proposed and walk through how it might work - or not work - for exporters who might use this authorization.

Once one gets over the question of what an "authorization" is, one has to understand how it might be used. Unlike old General Licenses or the current License Exceptions, where the exporter had to ensure that the prerequisites of the license or exception were satisfied -- including classification for commodity applicability and end-use and end-user screening -- before affecting an export, the definition, scope and use of this new "authorization" has yet to be defined.

Agreed, this is a "new animal" per BIS' explanation, but much like the chimera, it is made of disparate parts and keeps changing its shape. In one of the more recent BIS information sessions, industry was told that the VEU will become a "General Prohibition" as opposed to a "permission to export...eligible items for use in an eligible destination" as opposed to "a license-free transaction".

Obtaining VEU Approval

The VEU process begins with the approval of a foreign entity as a VEU. At the outset, BIS indicated that this would be through a non-defined interagency review and Advisory Opinion process. Such processes currently can take months. Now, BIS is advising industry that it may designate VEUs based upon prior BIS license data.

Foreign firms can self-nominate themselves and seek VEU status and U.S. firms can apply as a "sponsor" through the Advisory Opinion process. Wondrous tales of 30-day approval abound. The exporter requesting VEU authorization must submit an exhaustive, non-specific "range of information", including such vague and undefined factors as "the party's record

of exclusive engagement in civil end-user activities" or "the party's compliance with U.S. export controls" or "the party's capability to comply with the" VEU requirements.

More problematic is the "party's agreement to on-site compliance reviews by representatives of the United States Government" and a detailing of "the party's relationships with U.S. and foreign companies." Potentially, the interagency evaluation of the "status of export controls in the eligible destination and the support and adherence to multilateral export control regimes of the government of the eligible destination" will surely be a deal killer for some VEU candidates because BIS is highly critical of China's failure to implement and enforce an effective export control system.

Moreover, the proposed regulation does not address the possibility that a submission of this type of information could be characterized as a "trade secret" or a "state secret" under Chinese law and, if so, could have deleterious consequences. India, Switzerland and some countries in the European Union bar comparable information submissions. In this respect, it is puzzling that BIS did not "test drive" this new VEU authorization with entities located in a closely allied country to work out the kinks before offering it in a highly sensitive destination.

VEU designation will also be by Export Control Classification Number (ECCN) subparagraph number. There appears to be no limit to the number of ECCNs a VEU could qualify for. It is clear, however, that once a VEU is approved for ECCN 3A002.b.4, for example, the authorization may not be used for 3A002.b.3 commodities unless they are specifically covered by the VEU. If they aren't covered, a time consuming reapplication process will be required; thus wreaking havoc in planning for evolving product lines.

In light of the fact that there will be significant time and paperwork involved in obtaining VEU status, one can only wonder how VEU cost-benefit will be viewed by industry.

Once a company expends the cost and effort in obtaining listed VEU status for a prized consignee in China, BIS will publish a notice of the entity's VEU status and authorize all exporters to benefit from this designation. Thus, all of the sponsoring firm's competitors immediately can take full advantage of the authorization for shipping competing products to the same consignee without incurring their own application costs. And because the VEU apparently would cover only the entity in question and not its subsidiaries, which would have to apply separately for VEU status, the costs may far outweigh any benefits in just this aspect alone.

Housekeeping Post-VEU Approval

Assuming that the VEU status is granted a foreign entity, other restrictions and additional obligations apply to both the VEU authorized foreign company and their potential U.S. shipper before one can utilize the authorization.

First, there are "end-use restrictions", including the requirement that the eligible item be used either at the end-user's own facility or at a location over which the end-user "demonstrates effective control".

Second, the items must be consumed during use or subsequent BIS approval is required to dispose of, transfer, or reexport obsolete equipment or inventory. This may perpetually bind both the VEU and the original exporter who chooses to use the VEU authorization. The mandatory acceptance of annual reports and routine BIS audits of all parties to the VEU transaction will further reduce the attractiveness of this licensing benefit.

Additional paperwork obligations are imposed on exporters utilizing the VEU authorization. An exporter must obtain and retain the VEU's certifications, and comply with VEU export reporting requirements, which presently are undefined, per the EAR's five-year rule. The exporter utilizing the VEU authorization would be held to new and extensive liability standards if the VEU were found to have "diverted" the exported item or a product produced therefrom to "military use".

Mechanics of VEU Utilization

While also "under construction", it is already apparent that the Automated Export System (AES) may not be ready for the VEU export modality due to the present inability of the AES system to accommodate full ECCN suffixes. While all software is modifiable, recent experience demonstrates that it has taken years to effect simple conforming modifications to AES, indicating that VEU exports may have to skip AES and revert to paper Shipper's Export Declarations (CF 7525-V). That would be a bit of a step backward and increase paperwork and will become impossible when Census issues now-proposed regulations to make AES mandatory for all exports.

At a meeting of a BIS technical advisory committee in July, BIS Deputy Assistant Secretary Matthew Borman conceded that BIS would have to work with the Census Bureau to figure out how a VEU export would be identified in AES.

Roll-Back in US-China Licensing Policy

Almost as disturbing as the "liability bomb" buried in the catch-all's innards is the reversion back to the pre-1981 licensing and review policy in both the proposed changes to the national security controls applicable to entities in the PRC under Section 742.4 and the policy of denial for the 47 listed ECCNs going to military end uses. The proposed rule will restrict

U.S. exports to China of commodities widely available from Asia, Europe, Israel, and even within China. If made final, it could dramatically and adversely impact trade and finance between China, the United States, and its allies.

Since World War II, the United States has led the evolution of a system of multilateral export controls, which has worked well to stem transfers of militarily useful commercial commodities and technology to fractious or unstable nations. Multilateralism was and is the key to success. As late as 1998, the U.S. Congress banned unilateral national security export controls. The BIS initiative lacks the assent of our allies, a troublesome slap to the multilateral system known as the Wassenaar Arrangement. Times have changed.

Unique VEU Liability Issues

Prudent exporters may well consider not basing their significant export relations with entities in China upon a VEU designation. The entire catch-all approach as currently envisioned is not based upon the multilateral Wassenaar agreement, even though the regime's 2003 Statement of Understanding on Control of Non-Listed Dual-Use Items is touted as the foundation of the proposed rule. As noted in the past, few if any Wassenaar signatory nations recognize an arms embargo on China; hence, they are free to ignore this initiative and this could establish a rich environment for commercial mischief.

Once a competitor knows that an American company is relying on VEU to export commodities in support of a large contract or joint venture, all it will take is a "brown envelope" allegation that the VEU is doing business with the military to pull the entity off the VEU list. This would stymie the U.S. exports until the effected exporters scurry to get a license. The foreign firm, unencumbered by the U.S. unilateral restrictions, can then offer immediate delivery or availability.

This expansion of liability is not balanced by a clear "due diligence roadmap" for the exporter. Also, in light of the liability prerequisites, prudent exporters will want to conduct some form of due diligence with the VEU prior to export to be on the safe side.

It has occurred to many exporters that obtaining validated licenses -- even with the likely delay in getting Chinese Ministry of Commerce End User Certificates -- may present a far safer way to export to China rather than a VEU in light of the significantly reduced paperwork, reporting, audit and compliance obligations.

Can the VEU Be Saved?

Americans are ever optimistic by nature and believe anything broken can be fixed. But experience indicates that the VEU concept is stillborn and cannot be "fixed".

The creation of such an insufficient mechanism in a world of dynamic changes in national and economic security concerns is a most unwise abdication of national security decision making and oversight, which sensibly should remain in governmental hands.

The answer is not a VEU retreat. Rather, the answer has been obvious for years: expediting the efficiency of the licensing process. This would include an enhanced ECASS or a complete database redesign for the 21st century, more and better trained licensing officers in all reviewing agencies, and concerted use of the established dispute resolution mechanism in Executive Order 12951, as amended.

Other initiatives would also help, including streamlining and rationalizing license conditions, better utilization of licensing precedents, better efficiency in pre-license checks and post-shipment verifications, publishing commodity classifications, and aggressive foreign availability oversight. But this will take managerial vision, effort, resources, and creative thinking on the part of BIS and its interagency colleagues. The authorization VEU appears dead on arrival in the present liability and commercial environment.

We appreciate BIS's good faith attempts to directly address the public's concerns. But rather than yet another roadshow, we believe that the taxpayer and the international business community would be better served by BIS withdrawing this portion of its proposal. It is time to take a deep breath and return to the drawing board in partnership with industry and academia. We should endeavor to meet these challenges together.

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Exhibit B

"Chinese National Security Legal Impediments to the
Authorization Validated End User of the Proposed China
Military Catch-all Rule"
Memorandum of October 27, 2006

WEADON & ASSOCIATES
ATTORNEYS AT LAW

MEMORANDUM

To: China Law Committee

From: Donald Alford Weadon, Jr.

cc: Export Control and Embargo Committee

Date: October 27, 2006

Subj: Chinese National Security Legal Impediments to the
Authorization Validated End User of the Proposed
China Military Catch-all Rule

The China Military Catch-all Rule's Authorization Validated End User runs afoul of Chinese National Security Law, and is "dead on arrival" in its present form.

While some may argue that the application of these Chinese Laws are uneven, current application of Chinese Business Law indicates that this may not be the case in the National Security area¹, presenting unacceptable liability exposure to U.S. firms and their employees posted to China in a management position.

The Law

The much of the information requested by the U.S. government from Chinese companies for application for VEU status (as well as the on-site compliance review audits to be conducted by the U.S. government), may be characterized as state secrets under the protection of Chinese Law (key excerpts attached as Exhibit A).

Under article 3 of the State Security Law of the People's Republic of China, "all state organs ... public organizations, enterprises and institutions shall have the duty to safeguard the security of the State." Article 4 states that any act committed by any organization or individuals "endangering the security of the People's Republic of China shall be prosecuted according to law".

Article 21 of the Law of People's Republic of China on Guarding State Secrets states that "when state secrets have to be furnished for the benefits of contacts and cooperation with foreign countries, approval must be obtained in line with the prescribed procedures." Also, according to Article 11 of this

¹ See, "Chinese Checks", a most pertinent article by China scholar Dr. Harry Harding (attached as Exhibit B).

WEADON & ASSOCIATES
ATTORNEYS AT LAW

Memorandum

law, when people are not sure whether a matter is a state secret, they should submit inquiries to the State Secret Guarding Department will determine the classification.

Most provinces in China enforce this law by enacting their own local enforcement procedures. But this process does not have an established single entry point or nationally transparent procedure.

Therefore, the State Security Law of PRC and the Law of PRC on Guarding State Secrets explicitly impose the duty on Chinese citizens and managers of enterprises not to commit any act that may endanger the "security, honor and interests of the State", and it is their responsibility to clarify the matter when they are uncertain about the classification of any information they wish to provide a foreign person, entity or government.¹

The VEU Information and Procedural Requirements

The information requirements of the VEU process are broad-gauge at the outset. In its explanation of the information requirements, BIS states in the proposed regulation that:

"In conjunction with other relevant agencies, BIS proposes to evaluate prospective validated end-users on the basis of a range of specific factors, which include the party's record of exclusive engagement in civil end-use activities; the party's compliance with U.S. export controls; the party's capability to comply with the requirements for VEU; the party's agreement to on-site compliance reviews by representatives of the United States Government; and the party's relationships with U.S. and foreign companies." [71 FR 38313 at 38315]

Furthermore, in the provisions of the Proposed Rule applicable to the procurement of VEU status and VEU operations (EAR Section 748.15, proposed at 71 FR 38320), the information requirements necessary to obtain VEU status [Section 748.15(a)(1)] and the information which must be made available

¹ We have recently been informed by colleagues in Beijing regarding the undertaking of corporate due diligence investigations of state-owned Chinese enterprise. It was intimated that there is Chinese Company Law which requires certain formalities to be followed in doing such a private investigation. The formalities were described to include steps such as requesting a visit to the state-owned-enterprise. If such a request was rejected, then the request was referred to "consultation" with the Chinese government partner. These steps are reported to take at least a month. At this stage we are seeking further advice, but the process appears to be congruent with the National Security Laws discussed herein.

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Memorandum

upon both request and upon BIS audit [Section 748.15(f)(2), proposed] are significant:

"(2) Audits. Users of authorization VEU will be audited on a routine basis. Upon request by BIS, exporters, reexporters, and validated end-users must allow inspection of records or on-site compliance reviews. For audit purposes, records, including information identified in paragraphs (e), (f)(1) and the note to paragraph (e) of this section, should be retained in accordance with the recordkeeping requirements set forth in part 762 of the EAR." [71 FR 38313 at 38321]

The information so identified includes both detailed administrative and transactional information. The transactional information, which would include not only what was manufactured but also to whom it was shipped clearly falls within the ambit of the above-cited Chinese laws unless specifically cleared by the Chinese authorities.

As liability attaches to both the entity and its owners, as well as to individuals (such as managers), it is clear that absent a cogent agreement between the United States and China providing either a blanket approval of this information sharing or a transparent procedure by which the Chinese government would vet such information requests to ensure propriety, the VEU mechanism is fatally hamstrung by existing Chinese law as it presents an unacceptable liability exposure to U.S. firms and their overseas managerial employees.

And, as Dr. Harding clearly points out and general experience supports, Chinese enforcement of its many laws may be affected by a "protectionist backlash".

Conclusion

The Authorization VEU is, absent an appropriate agreement between the United States and Chinese Governments, offensive to Chinese Law. Clearly, this was not contemplated by the drafters; the proposed rule should therefore be withdrawn for re-engineering, as it is fatally flawed.



This memorandum was researched and co-authored by Ms. Jinying Wu who recently received her LL.M. at Georgetown and is a legal intern at Weadon & Associates.

Exhibit A

Key Chinese Statutes

State Security Law of the People's Republic of China

Article 3 Citizens of the People's Republic of China shall have the duty to safeguard the security, honour and interests of the State, and must not commit any act endangering the security, honour or interests of the State.

All State organs, armed forces, political parties, public organizations, enterprises and institutions shall have the duty to safeguard the security of the State.

Article 4 Any organization or individual that has committed any act endangering the State security of the People's Republic of China shall be prosecuted according to law.

"Act endangering State security" as referred to in this Law means any of the following acts endangering the State security of the People's Republic of China committed by institutions, organizations or individuals outside the territory of the People's Republic of China, or, by other persons under the instigation or financial support of the aforementioned institutions, organizations or individuals, or, by organizations or individuals within the territory in collusion with institutions, organizations or individuals outside the territory:

Law of the People's Republic of China on Guarding State Secrets

Article 11. State organs and units at various levels shall, in accordance with the stipulations on the specific scopes and categories of state secrets, classify the state secrets arising in these organs and units.

When people are not sure whether a certain matter is a state secret or which category of state secrets it should be classified into, the question shall be determined by the state secret-guarding department, the secret-guarding department of a province, an autonomous region or a municipality directly under the Central Government, the secret-guarding department of a city where the government of a province or an autonomous region is located, the secret-guarding department of a larger city approved by the State Council, or an organ examined and approved by the state secret-guarding department. Pending the classification of the secret, the state organ or unit where the matter has arisen shall initially take security measures in conformity with the category proposed for its classification.

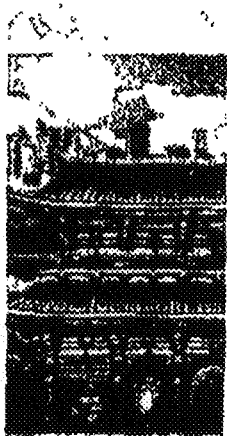
Article 21. When state secrets have to be furnished for the benefits of contacts and cooperation with foreign countries, approval must be obtained beforehand in line with the prescribed procedures.

Exhibit B

Harding Article

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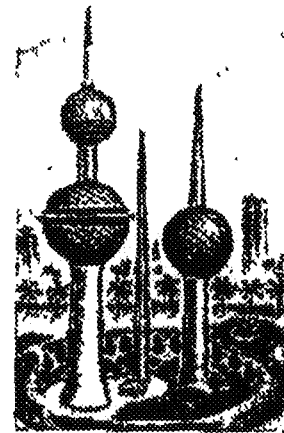
By **HARRY HARDING**
October 24, 2006; Page A18

China's economy has proved a seductress that's hard for investors to resist. From encouraging foreign direct investment to signing up with the WTO, Beijing has embraced foreign capital and know-how. Foreigners, in large part, have been rewarded with double-digit growth rates and cheap labor. But this happy affair is running into problems: Over the last few months, there is a growing perception that foreign companies have done too well from their investments. The Party leadership has publicly accused a few of capturing "excessive" market shares, acquiring too many stakes in China's strategic industries, and buying state assets at bargain prices. Above all, there seems to be a concern that overseas investors own too much of the technology crucial to China's economic development.

These sentiments aren't only murmured in private. Li Deshui, a former economic official, was quoted in March as criticizing

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"malicious acquisitions aimed at establishing monopolies." He cited beer, soft drinks and skin-care products as areas where foreign companies had done too well at the expense of their local counterparts.

Beijing's defensive economic nationalism is not primarily about restricting imports, although there has been some of this. For instance, China's high tariffs on imported automobile parts are currently the target of a case being brought before the WTO by the U.S. and the European Union.

The main focus is on making it more difficult for foreign companies to operate in China. Take foreign ownership of local companies operating in "strategic sectors," such as banking and brokerage houses. The most prominent example so far has been Beijing's rejection of Citigroup's attempt to buy 45% of Guangdong Development Bank last year, as part of a consortium that would have taken majority control. Despite the state-owned lender's heavy losses, Beijing refused to waive the 20% cap on the stake any single foreign investor can take in a Chinese bank. As a result, Citigroup was forced to scale down its bid, as were other foreign banks interested in buying Guangdong Development Bank. The deal has yet to be completed.

China's regulators are even designating automobile and machine-tool companies as sensitive sectors, making foreign acquisitions in these areas subject to particularly stringent scrutiny. Earlier this year, Hangzhou Advanced Gearbox Group halted three years of talks on a joint venture with Germany's ZF Group, saying it would be a mistake to give the foreign automotive-supplier company greater access to the Chinese market. Last week, private-equity fund Carlyle Group agreed to buy 50% of Xugong Group Construction Machinery Co. -- hardly the 85% it had originally intended to purchase. This followed a high-profile campaign against the deal by Sany Heavy Industries Co., one of Xugong's main domestic competitors.

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Beijing is also placing new obstacles in the way of foreign companies that seek to establish independent, wholly owned operations in the mainland. Beijing has officially complied with its commitment to open up the domestic construction market, as part of the agreement on China's accession to the WTO in 2001. But it has placed formidable obstacles in the way of foreign companies trying to take advantage of this opportunity. Under regulations issued in December 2003, these companies are required to employ at least 200 staff in China before being allowed to sign any contracts in the country. Foreign companies wanting to compete for infrastructure projects must also have at least \$36 million in registered capital in China.

Beijing's regulators are now codifying further protectionist language into law. In September, six ministries enacted regulations that give the Ministry of Commerce expanded power to block foreign purchases of local companies. The law's language is vague; a purchase that disturbs "the social or economic order or harm the public interest," for instance, could be reviewed. Foreign investors are also fretting about the country's new antimonopoly law, which has been drafted but not yet enacted.

China is also attempting to build "national champions" that can compete with foreign companies in the global marketplace. Beijing is well aware that, despite the country's integration into the global economy, it currently occupies a narrow slice of the value chain. China serves mainly as an assembly platform for manufactured goods, albeit of increasing sophistication. While that role brings in considerable revenue, it only represents a small fraction of the total value of the country's export goods. Other links in that value chain earn far more, such as research and development, product design, branding, marketing and distribution. The best-known examples of this trend are Lenovo's acquisition of IBM's personal computing division, and the creation of a Chinese-controlled joint venture between TCL and Thomson to produce television sets. The purchases help Beijing

pursue its goal of boasting 50 of the world's 500 largest companies within the next decade.

This goal is laudable, taken on its own. The problem for foreign companies is that Beijing is willing to use tactics which give their Chinese counterparts an unfair advantage. These measures include state subsidies through politically motivated bank lending at below-market rates. For instance, Cnooc Ltd.'s abortive bid for Unocal Corp. last year was backed by several billion dollars in cheap loans from its government-owned parent company. It's also possible in future that Beijing will challenge patents and cap domestic retail prices to reduce the royalties paid to foreign patent and copyright holders.

China's economic nationalism is a marginal adjustment to, rather than a fundamental repudiation of, Beijing's broader embrace of globalization. As China's Commerce Minister Bo Xilai has argued, Beijing will not abandon the foreign economic policies that have served it so well. There's also no shortage of critics of economic nationalism within China, both among economists committed to free-market models, and among local companies who fear their own competitiveness may be compromised by state interference in the economy.

Nonetheless, the protectionist backlash is unlikely to go away anytime soon. Other "China risk" factors may receive far more publicity -- from the threat of a financial crisis to a political collapse, or even a conflict with the U.S. over Taiwan. But for companies doing business with China, it is the new surge in economic nationalism that poses, by far, the biggest threat for the foreseeable future.

Mr. Harding, director of research and analysis at Eurasia Group, chaired the firm's task force on the risks associated with developments in China over the next 10 years.

Exhibit I

"A Restriction on Trade and Security"
The Financial Times OpEd of July 31, 2006

A restriction on trade and security

By Donald Wedder

Published: July 31 2006 19:29 | Last updated: July 31 2006 19:29

The emergence of the "China threat" has created a deluge of dire threat assessments. Now America's commercial export control agency, the Bureau of Industry and Security, has proposed dramatic new export restrictions that alarm US industry, concern our trading allies and befuddle the Chinese by failing to address the stated threat and leaving significant uncertainties in their wake.

Since the second world war, the US has led the evolution of a system of multilateral export controls that has worked well to stem transfers of military useful commercial commodities and technology to fractious or unstable nations. Multilateralism, via a body of like-minded allies known as the Wassenaar Arrangement, has been the key to success. In 1988, the US Congress banned unilateral national security export controls. Times have changed and policy clarity is urgently required.

The first BIS China initiative - to control access to certain commercial technologies by individuals born in China but with other nationalities - was quietly withdrawn this spring after overwhelming criticism from the legal, academic and commercial communities and the expert BIS government-industry technical advisory committees.

The second proposed China rule, when initially floated last year, generated comparable adverse comment from those long active in the China marketplace and aware of its unforgiving competitive momentum - which, once lost, cannot be regained. When published last month, the proposal raised such concern that the BIS held an unprecedented public meeting to clarify the rule with industry and academia, demonstrating clearly that it has yet to work out many details.

The net effect of the rule is to restrict unilaterally the "sale, re-export or transfer" of 47 commercial commodity categories if destined for potential military use in China. The affected items range from aircraft parts and machine tools to medical chemicals, from microprocessors to music equipment. BIS proposes tightening licence review standards to pre-1981 cold war standards of stringency, a breathtaking policy reversal. Those liable for violating the rule include the exporter, shipper, financial institutions, lawyers and virtually anyone who supports or facilitates the transaction. With no avenues to allow exporters to perform liability-reducing due diligence, and with higher penalties under the Patriot Act, fines for even minor infractions skyrocket, creating an exorbitant umbrella resembling a mushroom cloud.

Promised benefits are few. A new authorisation called "validated and user" has been offered, with merely the name changed from an idea rejected as unworkable in the 1980s. The paperwork burden for Chinese companies to achieve this coveted status and American companies to avail themselves of it are overwhelming, especially considering that both the Chinese ministry of commerce and BIS have insufficient staff to man the administrative oars. A benefit delayed is a benefit denied.

The rule presents countless drawbacks for China and America's other trading partners, which now are re-evaluating their relations with US suppliers to avoid being drawn into the expanded liability web and are purchasing elsewhere. Cynical manipulation of this liability bomb can fatally disadvantage US companies that have secured contracts or ventures in China. One brown envelope slipped to a US official alleging a Chinese company has military ties could derail a deal.

What threat is BIS and the White House seeking to address? Can the US prevent the Chinese military from modernising by restricting readily available commercial items? Hypocritically, BIS notes the threat of China's military acquiring parts and systems from the private sector: the US Congress mandated the defence department to procure commercial off-the-shelf items more than two decades ago. Comparisons of defence spending to gross domestic product do not necessarily indicate a gathering storm of Chinese militarism.

BIS says that its China initiatives have been tailored to boost trade while enhancing security. The opposite may well be the case: lacking confidence in consistent US export policy, European and Asian firms are already "designing out" US parts and components from commercial products, defence and space systems while dusting off "blocking statutes" to bar extrajurisdictional impact of the proposed rule. Since China can freely procure the targeted goods and

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technology from Europe, Asia and Israel, where is the security or trade benefit for the US?

This BIS initiative lacks the assent of our allies and is therefore destructive to the Wassenaar control system. And China reminds us that the dangerous US trade imbalance will grow unless it is permitted to purchase high-value equipment -- a sector where the US still holds a competitive advantage.

Congress, in all its legislation to control commercial exports since 1948, has insisted a balance be struck between robust trade and national security within a multilateral framework. The flawed China proposal skews the balance and is disruptive to trade relations. It is time to restore the balance with a sensible, multilateral policy which addresses a real threat.


The writer is a Washington-based international lawyer specialising in export controls to China


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Exhibit J

"New U.S. Export Controls Threaten China Trade"
The Asia Times, January 11, 2006



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SPEAKING FREELY

New US export controls threaten China trade

By Donald Alford Weadon Jr and Carol A Kalinoski

Speaking Freely is an Asia Times Online feature that allows guest writers to have their say. Please click here if you are interested in contributing.

WASHINGTON - To many US policymakers and regulators, China has evolved from a significant commercial competitor to a geopolitical threat. For them, Beijing's incessant thirst for ever-increasing levels of energy and technology to fuel its economy and military modernization - and the tactics by which it has sought to obtain this technology - necessitate tougher controls on the access to US technology and commodities.

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In early 2005, the administration of US President George W Bush proposed an expansion of the "deemed export" rule to scrutinize and license technology access for individuals of Chinese and foreign birth, even if they had been citizens of allied nations since their youth. Industry and academia violently reacted to this proposal, in essence faulting it for useless overreaching that would damage the access of industry and academia to talent, and thus adversely impact US innovation. More than 315 lengthy negative comments were lodged.

Now, as an additional bulwark to stem technology loss to China, the US administration will soon propose a much heralded

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"military catch-all" rule. This rule is in operative conflict with a 2003 multilateral Statement of Understanding (SoU) among US-allied nations, which has little likelihood of stemming the flow of commercial commodities to China for use in military programs.

Additionally, the rule will have a serious impact on US industry while allowing other nations to supply China basically unfettered. The US economy will be damaged as firms, including other US companies that manufacture in China, opt for "designing out" US parts and components to avoid dangers to their supply chains arising from the enforcement of the rule.

The actual regulation has yet to be published, but the US Bureau of Industry and Security (BIS) has been sharing drafts. In sum, the rule requires any US exporter of commercial goods who "knows" or is "informed" that the commodity is intended for "military end use" in any country subject to an arms embargo (either international, regional or unilateral) to seek a US export license - or not undertake the transaction.

For exports and re-exports where the transaction would make a "direct and significant contribution" (as yet undefined) to the military capabilities of the embargoed nation, such license applications would be denied. The rule would also establish new restrictions on the activities of US persons who knowingly support a military end use in China.

In essence, the rule is a disfavored unilateral control in "multilateral control" clothing, since no other allied nations implement the SoU comparably, and none implement the SoU against China. Moreover, the facilitation or transfer provisions of the rule directly apply to banks, freight forwarders and others in the logistics chain, and when viewed through the lens of the corporate-knowledge doctrine, the opportunities for serious liability exposure abound for service providers as well.

The rule also provides no reasonable avenues of due diligence where one could limit exposure to liability. Based on the current compliance environment, even approvable licenses will be seriously delayed for want of resources, lack of definitional clarity and the lack of a published list of entities or projects that would trigger the rule's prohibitions.

All potential non-US competitors are not similarly restricted and could supply most goods straight away. The prospect is the loss of commercial opportunity for US firms in a highly competitive global market, without the intended negative impact upon a Chinese military entity or its projects.

The impact of the rule on third-party transactions, licensed foreign manufacture arrangements, joint ventures, and the like is not yet firmly understood, but at this preliminary stage it appears to be substantial and commercially disruptive. Even distribution arrangements may be adversely affected. Some expect the direct fallout from this rule to be the triggering of an array of potent foreign blocking statutes among European nations. US companies and their foreign entities might also face risks under the laws of China when they seek or otherwise provide information on military end users to the US government to obtain export authorizations.

Will exasperated US companies disinvest in the United States

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and shift production abroad to protect their shareholders' equity in the growing China marketplace? Will there be adverse action by China whereby US suppliers are forced to slow or stop meeting sales commitments or contractual requirements under existing sales or licensing agreements? Will there be retaliatory threats of impairment of intellectual-property protections by the Chinese authorities? Time will tell.

Ultimately, the rule is evidence that the US has lost the industry-government consensus on export controls that has been the foundation of sound export control law and practice for the past three decades, thus allowing problematic ad hoc initiatives that violate sound policies laid down by expert industry-government panels in the past.

But the dire consequences of the rule seem not to faze threat-obsessed US regulators, who have yet to articulate the nature and size of the Chinese threat they perceive, despite evidence that present export regulations provide more-than-adequate tools to stem any meaningful support of disfavored Chinese military projects or programs. The proposed rule places US firms (and their Chinese customers) in a clearly disadvantageous position, without any meaningful enhancement of US national security.

Donald Alford Weadon Jr is a Washington, DC-based international lawyer. An expert in trade controls and China trade, he has counseled firms in export controls and customs issues for nearly three decades, and can be reached at dweadon@weadonlaw.com. Carol Kalinoski chaired the BIS Operating Committee, the principal US government export-control dispute-resolution panel, for nearly 10 years. She practices law at Carol A Kalinoski & Associates in Washington, DC, and can be contacted at kalinoski2003@yahoo.com.

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Cross Sector Report

Export Compliance Working Group

American Chamber of Commerce
People's Republic of China

December 4, 2006

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Executive Summary

I. Introduction

The Export Compliance Working Group ("ECWG") under the American Chamber of Commerce in the People's Republic of China ("Amcham") submits the following report in response to the Proposed Rule the Bureau of Industry and Security published for comment on July 6, 2006, 71 Fed. Reg. 38313. The report provides a market analysis on the current level of Chinese capabilities in numerous industry sectors the Proposed Rule could impact. Each industry chapter contains data focusing on three distinct areas: 1) the technical level of the Chinese domestic industry; 2) the technical level being supplied to China from foreign sources, non-U.S.; and 3) the distinction between commercial and military levels and demands in each industry.

II. Objective

The objective of this report is to provide tangible data to the United States Government on items covered under the Proposed Rule. The ECWG believes the data collected will be useful to the United States Government in assessing the impact of the new control levels on the Chinese military capabilities and the facilitation of legitimate exports to Chinese civil end-users. The ECWG respectfully submits that the items discussed in this report are below if not well below the current technical levels of the Chinese military and, therefore, could not make a material contribution to the Chinese military capabilities. If these items, as this report demonstrates, cannot make a material contribution to the Chinese military capabilities, including them in the Proposed Rule does not enhance the stated U.S. Government policy "to prevent exports that would make a material contribution to the military capability of the People's Republic of China ("PRC"), while facilitating U.S. exports to legitimate Chinese civil end-users.

The ECWG believes this report provides valuable information that will benefit the U.S. Government and industry by allowing the U.S. Government to accurately target export controls to fulfill the stated policy goals of increasing exports to legitimate commercial end-users while preventing exports that make a material contribution to the Chinese military capabilities.

III. Scope

This report covers 32 out of the 47 items listed in Supplement 2 to Part 744 of the Proposed Rule. (Note: The report only addresses these 32 items because these are the items ECWG member companies chose to address.) The report is divided into chapters based on industry sectors, as this provided the best format for presenting a clear picture of the technical capabilities, both domestic and foreign, currently available in China. The ECCNs for each item falling under each industry sector are listed at the beginning of each chapter.

The report contains the following industry sectors and the corresponding ECCNs:

A. Chapter I - Composite Material

1. 1B999
2. 1C990
3. 1D999
4. 1D993
5. 1E994

B. Chapter II – Machine Tools

1. 2B991
2. 2B993
3. 2B996

C. Chapter III – Information Security and Telecommunications (I): Servers, Integrated Circuits, and Encryption

1. 4A994
2. 4D994
3. 4E992
4. 3D991
5. 3E991
6. 5A992
7. 5D992
8. 5E992

D. Chapter IV – Information Security and Telecommunications (II): Telecom Equipment, Test Equipment, and Software

1. 5A991
2. 5B991
3. 5D991
4. 5E991

E. Chapter V – Navigation and Avionics

1. 7A994
2. 7B994
3. 7D994
4. 7E994

F. Chapter VI – Diesel Engines and Marine Engines

1. 9D990
2. 9E990
3. 8A992
4. 8D992
5. 8E992

G. Chapter VII – Helicopters

1. 9A991
2. 9D991
3. 9E991

IV. Summary Points

An analysis of the research conducted across the various industry sectors revealed a number of patterns relating to the Chinese domestic capabilities, foreign supply from non-U.S. companies to China, and the distinction between the commercial and military sectors.

A. Chinese Domestic Capabilities

1. *Chinese Domestic Companies*

In each chapter, the report identifies Chinese state-owned and private sector companies producing items at levels above the control levels in the Proposed Rule. The report provides background information on these entities and details their capabilities.

2. *Joint Ventures in China*

Joint ventures between Chinese entities, both state-owned and private sector, and foreign partners, non-U.S., exist in every industry sector. These joint venture companies design, develop and produce items above the control levels in the Proposed Rule. In almost all instances the joint ventures have been provided with technology through licensing or joint development agreements.

3. *Wholly Owned Foreign Enterprises in China*

Foreign companies, non-U.S., have also established enterprises in China in many of the industry sectors. These enterprises design, develop and produce items above the control levels in the Proposed Rule.

Note: All of the above business' types are incorporated in China according to Chinese laws and regulations. Their capabilities should, therefore, be treated as domestic Chinese capabilities.

B. Foreign Imports -- non U.S.

Non U.S. foreign companies freely export products, software and technology not only at levels well above those in the Proposed Rule but above the current control levels set under the Wassenaar Arrangement. **The ECWG learned that these exports are to civil end-uses, dual civil and military end-uses, and solely military end-use. The research as detailed in the report clearly demonstrates that non U.S. foreign entities are directly contributing to the military capabilities of the PRC through direct product sale of dual-use and military items, joint research and development of dual-use and military items, and joint production of dual-use and military items, where the end-use is known**

to be the Chinese military. The levels of these items are technical generations above the control levels in the Proposed Rule.

C. Commercial vs. Military Sectors in China

1. *Commercial Sector*

Commercial demand across the various industry sectors in China is growing. Additionally, Chinese companies are aggressively seeking to become globally competitive in medium to high technology products. Because of this, Chinese companies are seeking to raise the quality of their products to meet the standards requirements of the foreign countries to which they export. Meeting these standards requires that equipment, software, manufacturing processes, material specifications, safety codes, and quality, among others, be certified, which is a timely and expensive process. It is much more cost effective and a better business model to partner with foreign companies and/or procure materials, equipment, software and technology that has already been certified, than go through the arduous process of developing these items indigenously and receiving certification. Based on the research, the EC WG has found that this is what is driving Chinese companies to purchase foreign items, not an inability to develop, design and produce these items on their own.

2. *Military Sector*

Chinese military demand is primarily met by domestic state-owned enterprises. This is in line with both the policy and legal guidelines for Chinese military procurement, which prevents the involvement of foreigners in the military procurement process.

When the Chinese military does procure items from foreign sources, it finds them readily available from primarily Russia and Europe. European and Russian companies have provided direct military sales and joint development assistance to China's PLA, Navy, and Air force programs. As recently reported in the Associated Press, China accounted for 45 percent of Moscow's \$6 billion in arms exports last year as Beijing upgraded its arsenal with Russian fighter jets, submarines and other high-tech weaponry.¹ Eurocopter of France is currently engaging Chinese helicopter manufacturers to jointly develop the state-of-the-art Z-15 intermediate helicopter, which will include army and naval support variants, and is also providing assistance that will go into the Chinese development of the WZ-10 third generation attack helicopter. The Type 99 Main Battle Tank is powered by a liquid cooled, turbocharged 1,500hp diesel derived from the German MB871ka501 diesel technology.

¹ Joe McDonald, "Russia Out in Force at China Air Show," Associated Press, 30 Oct 2006.

As is detailed in the report, there are countless examples of military joint development projects with European countries and Russia and direct sales of dual-use and military items to the Chinese military establishment.

V. Conclusion

The ECWG strongly believes in working as a cooperative partner with the U.S. Government on export controls. The intent of this report is to provide the U.S. Government with detailed information on the Chinese market, so U.S. export controls are set at a level that truly increases U.S. national security through preventing the export of items that can make a material contribution to the military capabilities of the PRC. The data, however, related to the items in this report, plainly demonstrates that the Chinese military has inherently or has direct access to the items at levels well above those in the Proposed Rule. The ECWG respectfully, therefore, submits that controlling the items listed in this report at the levels in the Proposed Rule will have no impact on Chinese military capabilities but will only serve to inhibit legitimate commercial trade.

Note: This report was written based on extensive market research conducted on the ground in China. Due to a desire to limit the size, the scope of industry sectors covered and time limitations, the report only details the best examples pertaining to each industry sector. The ECWG stands ready to provide additional information if the U.S. Government deems necessary.

VI. Recommendation

The ECWG requests that the U.S. Government review the items in Supplement 2 to Part 744 addressed in this report and remove or limit the scope of those items it deems would not make a material contribution to Chinese military capabilities.

CHAPTER I

Composite Materials

I. List of ECCNs:

1B999: Equipment controlled by 1B999.e specially designed for the production of structural composites, fibers, prepregs and preforms controlled in Category 1, n.e.s.

1C990: Fibrous and filamentary materials, not controlled by 1C010 or 1C210, for use in "composite" structures and with a specific modulus of 3.18×10^6 m or greater and a specific tensile strength of 7.62×10^4 m or greater.

1D999: Specific software controlled by 1D999.b for equipment controlled by 1B999.e specially designed for the production of structural composites, fibers, prepregs and preforms controlled in Category 1, n.e.s.

1D993: "Software" specifically designed for the "development", "production", or "use" of equipment or materials controlled by 1C210.b. or 1C990.

1E994: "Technology" for the "development", "production", or "use" of fibrous and filamentary materials controlled by 1C990.

Under existing U.S. export control regulations, composite materials and tooling, along with related software and technology, falling under ECCNs 1A002, 1A202, 1B001, 1B101, 1B201, 1C010, 1C210, 1D002, 1D101, 1D201, 1E001, 1E102 and 1E202 require a license to China. The Proposed Rule would add controls to items falling under 1B999, 1C990, 1D999, 1D993 and 1E994.

In May of 2006, the ECWG provided the Bureau of Industry and Security with a full market analysis of the composite material and tooling sector in China. That report demonstrated that composite materials and tooling, along with related software and technology, were available in China above the current control levels. The ECWG submits the report in its entirety as Attachment A as comment on the Proposed Rule as it relates to the ECCNs listed above.

II. Summary

The U.S. Government provided positive feedback on this report when it was submitted in May. The U.S. Government also followed up on the report by sending a delegation to China that visited a number of the companies detailed in the report. The ECWG believes the report along with the first hand knowledge of this sector the U.S. Government delegation gained during its trip provide irrefutable evidence that the Chinese:

- A. Have ample access to composite materials from a variety of internal and external sources. Numerous companies in the U.S., Japan and Europe supply aerospace grade composite materials (prepregs) to China.
- B. China produces its own materials (prepregs) for use in the military sector. These materials are at a higher level than what foreign suppliers are providing for commercial end-use in China but well below the level of composite materials being produced for U.S. military aircraft such as the F-22 and Joint Strike Fighter (JSF).
- C. One Chinese company is designing, developing and manufacturing composite parts for commercial aircraft completely on its own from start to finish. For example, they have solely designed, developed and currently produce an aircraft frame out of carbon composite materials. This is well above the build to print level, which is the level most foreign companies and joint ventures are currently providing to the commercial aircraft sector in China.
- D. European companies have announced plans to increase cooperation with China on the design and development of composite parts for commercial aircraft. Airbus recently announced it will partner with Chinese companies on the design and development of composite parts for the A350. Airbus stated that this would be at the build to spec level. Published reports state that at least 50 Chinese engineers are currently in Europe receiving training from Airbus on the A350 project.
- E. The Chinese military is already producing composite parts at the build to spec level. The demands on the military side also do not coincide with the commercial aircraft specification requirements. The glass transition temperature required for military aircraft is necessarily higher than that for commercial aircraft.
- F. On composite tooling, it is available in China from foreign sources, but the work is predominantly being carried out by hand. The growing demand to produce composite parts for the commercial aircraft sector, however, is requiring an increase in Chinese production efficiency and quality. This will necessitate the purchase of composite tooling from foreign sources.

Since the submission of the Composite Materials Report in July 2006, the ECWG has collected new information about Chinese composite tooling capabilities based upon a site visit to Changhe Aircraft Industry Corporation. The Composite Workshop at Changhe occupies a total floor area of 8000m², including a clean room that occupies 1200 m². 96 Skilled workers and 13 Engineers are employed at the composite workshop where 20 items of fabrication equipment are used. Changhe plans to build a large new composite facility, which it will fill with brand new top level composite

tooling equipment as it has done with the new Changhe machining line. For details about this, please refer to Chapter II on Machine tools and Chapter 7 on Helicopters.

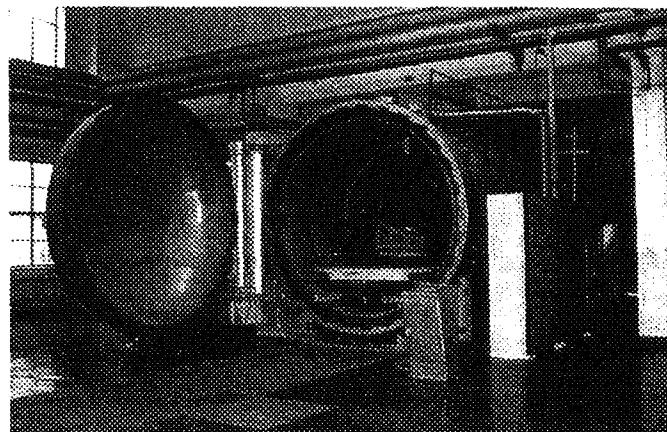
Below is a list of the current composite tooling equipment used by Changhe Aircraft.

Note: Although some of these tools may not be controlled under current or proposed export control regulations, they are included below to provide a clearer picture of the overall composites capabilities in China.

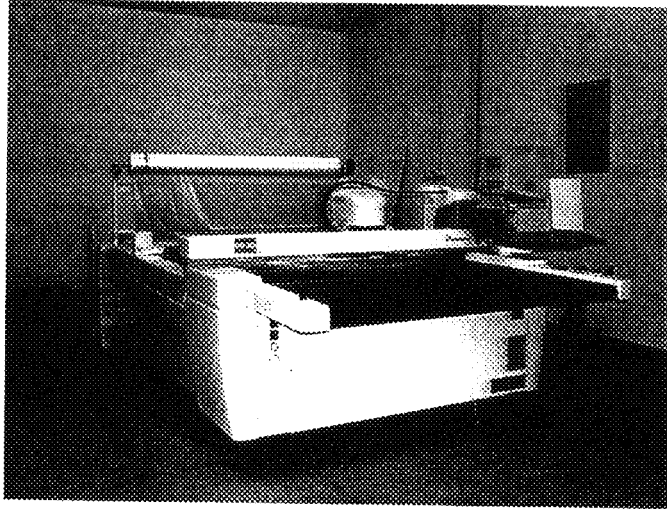
1. Imported Scholz Autoclave: $10\text{m} \times \phi 4.5\text{m}$



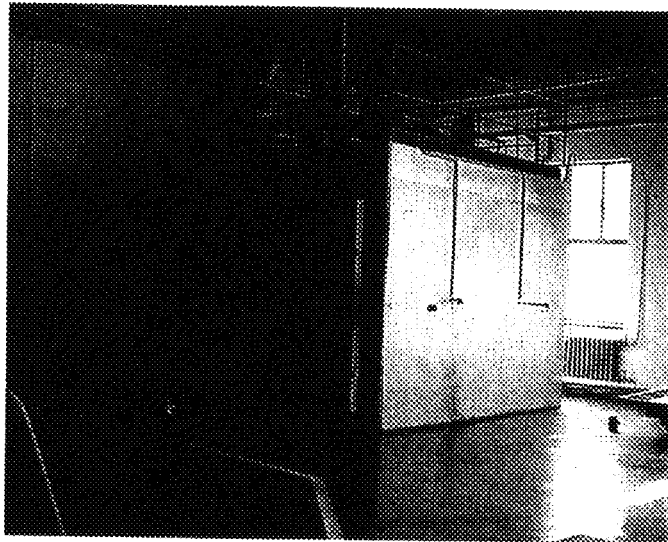
2. Domestic Autoclave: $7\text{m} \times \phi 2.5\text{m}$



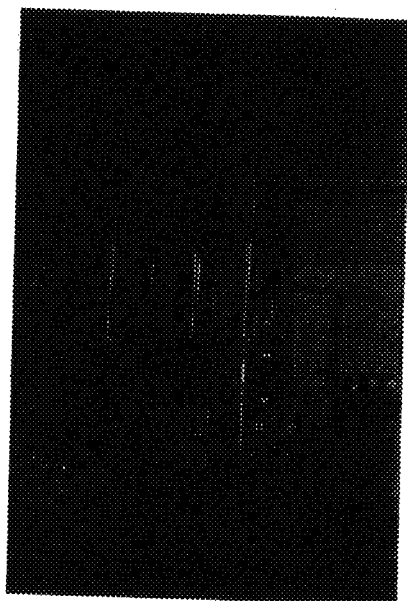
3. Composite material roofer



4. Oven: 2m×2.5m×2m



5. 500T hot press



6. 50T hot press



- G. If U.S. industry is prevented from providing composite tooling to China, this market demand will be met by European companies. The current composite tooling equipment in China is from Germany and Switzerland and includes autoclaves, tape winding machines, hot meld machines and UD dip machines.
- H. The Chinese will also fund its internal industry to develop composite tooling as it did in the machine tool sector. In the machine tool sector this funding led to an increase in the number of Chinese machine tool companies from one or two in 2002 to the current level of eight. These Chinese machine tool companies now compete directly with the U.S. companies at a high level.

III. Conclusion

China's capabilities in composite materials and tooling, along with related software and technology, are far above the control levels in the Proposed Rule. The ECWG hopes that the U.S. Government would take into account the attached report, combined with related information from the chapters on Machine Tools, Navigation and Avionics and Helicopters in reviewing whether the control levels in Proposed Rule would serve any benefit in preventing material contributions to Chinese military capabilities. The ECWG respectfully submits that they do not.

CHAPTER II Machine Tools

I. List of ECCNs:

2B991: Limited to machine tools controlled under 2B991 having “positioning accuracies”, with all compensations available, better than 0.010 mm along any linear axis; and machine tools having the characteristic of one or more contouring “tilting spindles” controlled by 2B991.d.1.a.

2B993: Limited to gear making and/or finishing machinery not controlled by 2B003 capable of producing gears to a quality level of better than AGMA 12.

2B996: Dimensional inspection or measuring systems or equipment not controlled by 2B006.

Currently, machine tools falling under ECCN 2B001 on the CCL require a license to China. The 2B991 category in the Proposed Rule has been trimmed down to include limited sub-categories, and the 2B993 category has been limited to controlling a quality level better than AGMA 12 rather than AGMA 11.

Data collected from the Chinese market shows that a select number of Chinese machine tool companies have reached the technological level described by the proposed controls above. These Chinese companies are currently developing and producing several lines of high level machine tools, as detailed in this chapter. Although this is not the standard for all Chinese machine tool companies, these companies are taking on large scale improvement and innovation programs to build up a strong base of high level machine tool equipment. Some of these Chinese companies are gaining the ability to produce aerospace quality machine tools. Shenyang Machine Tool Group Company has sold 5-axis tools to Hongdu Aviation and Guilin Machine Tool Company has provided high level milling and machining centers to the Chinese aviation industry. BMEI had its breakthrough this year into the aerospace machine tools industry with the sale of three 5-axis simultaneously controlled machining centers to China’s aviation and aeronautical industry for making large size vane parts.²

This market data shows that Chinese entities, through a combination of Chinese SOEs, wholly foreign-invested enterprises, and joint ventures, have developed the capability to produce machine tools better than the levels specified in the Proposed Rule. Chinese entities have achieved these capabilities through indigenous development as well as investment and assistance from German, Japanese and other foreign machine tool conglomerates.

²严曼青, “从科技精英到‘小巨人’,” 机电商报 (Machinery & Electronics Business), 13 Nov 2006.

In addition to the growing and maturing domestic availability, high technology foreign machine tools are widely available to Chinese end-users. Where Chinese machine tool companies are unable to satisfy the domestic demand in high technology machine tools, Chinese end-users are purchasing state-of-the-art equipment from Japanese, German, Italian, British, Korean, Taiwanese and other foreign companies. Foreign companies are directly supplying these high level tools to China through local offices, assembly plants, and local production facilities.

Given the rapidly growing market for machine tools, many foreign European and Asian companies have seized the opportunity to partner with the Chinese to produce and provide the most advanced machine tools and gain greater market share. These joint venture and foreign enterprises have entered the Chinese market, contributing to both civil and military capabilities. Joint ventures and wholly owned foreign enterprises, which import key foreign technologies and rely upon the local Chinese workforce, are quickly and efficiently feeding the Chinese domestic capability by providing technology for assembly and production of high level machine tools. This is reflected, for example, by the joint venture between Okuma of Japan and Beijing No.1 Machine Tool. Joint partnerships and domestic development in machine tools have taken place independent of U.S. participation in the market.

U.S. machine tool sales to China are already restricted under licensing requirements for items falling under current ECCN 2B001. Given the existing domestic and joint venture development, and the foreign availability of high level machine tools, U.S. companies could not make a material contribution to China's military development. China's military demands are already satisfied by domestic and foreign supply, which is far above the level of control in the Proposed Rule. Imposing further restrictions on the U.S. machine tool company sales to China will have no effect in hindering China's machine tool industry, but it will further damage the U.S. machine tool industry by cutting U.S. companies out of the Chinese market.

The sections below include details about this Chinese domestic capability as well as the foreign availability in machine tools in China.

II. Overall China Market

China is today's largest consumer and importer of machine tools. Imported machine tools in China reached a total value of \$5.9 billion in 2004, with approximately 8% of these imports from U.S. sources. Japan held 33% of imports, Taiwan 21% and Germany 15% of machine tool imports in 2004.³ In 2005, China imported \$6.7 billion worth of machine tools, which made up 61% of China's total machine tools consumption for the year.⁴

³ U.S. Commercial Service in China. Market Research Report, "2005 Machine Tool Exporters Guide to China." < http://www.buyusainfo.net/docs/x_4756327.pdf> Oct 2006.

⁴ Gardener Publications Inc., "Machinery & Electric Products Export Guidance" as found in Machine Info 2005, < <http://mep128.mofcom.gov.cn/jchnew/hypl/39665.asp>> Oct 2006.

China's rapidly growing demand for machine tools is prompted by the establishment of individual large-scale national and international projects as well as general development in certain key industries. Some examples of projects fueling the domestic demand for machine tools include: the three gorges dam project, the many building projects leading to the 2008 Olympics, the booming local car industry, the industrialization of the farming industry, the privatization and upgrade of formerly state-owned manufacturing plants, and the push for improvement in the Chinese aerospace industry.

A large portion of China's machine tool output is constituted by low level and common machine tools, with over half of China's current machine tool demand for high and middle level machine tools met by foreign imports.

Chinese domestic capability in high level machine tools is growing rapidly. In 2005, approximately 59,600 units of CNC machine tools were produced in China, among which the proportion of high-grade products had significantly increased from previous years. Domestically produced CNC machine tools have quickly gained market share in China's market, rising by nearly 3% in 2005. Meanwhile, Japan, Taiwan, Germany and Korea are increasing investment and participation in the Chinese machine tool industry, gaining greater market share and equipping China with the technology to power domestic production.

III. Chinese National Machine Tool Strategy

Chinese companies are following an overall strategy in growing their domestic high technology machine tool capabilities. The goals are set forth in government directives to provide strong support in the machine tool industry. Meanwhile, Chinese companies follow a pattern of development and technology acquisition that includes indigenous development and research, foreign investment, joint partnerships in R&D and manufacturing, and Chinese acquisitions of foreign companies.

A. Five Year Plan Targets Machine Tools for Investment

According to China's Eleventh Five-Year Plan of the Machinery Industry and its Development, China plans to focus on the machinery industry as a foundational area for accelerated development, because this industry will affect many other industries that China also hopes to grow. To the end of cultivating an internationally competitive high quality machinery industry by 2010, China will exploit all available new technologies and information techniques. The government has indicated that it will provide support to the large Chinese enterprises to help them accelerate their product development and apply new techniques, which will advance and upgrade the whole sector. The national plan focuses on restructuring in four areas, one of which is numerical controlled machine tools.

By the end of the Eleventh Five Year Plan in 2010, China estimates that the Chinese market share of numerically controlled machine tools held by domestic companies will account for 50 percent of the value and 65 percent of the output volume. China hopes to narrow the gap between the production of the basic mechanical parts and the complete system large scale equipment.⁵

B. Joint Partnerships with Foreign Firms

Foreign-invested enterprises are estimated to account for nearly 14% of China's machine tool manufacturers. These enterprises take the form of both wholly owned foreign enterprises and joint ventures. Both types of foreign invested enterprises involve transfers of component parts, technology, and internationally proven manufacturing processes and management techniques from the foreign partners to the Chinese partners. Below is a non comprehensive list of wholly owned foreign enterprises (WOFEs) and joint ventures in machine tools in China.

1. Wholly Owned Foreign Enterprises (WOFEs):⁶

- DMG Gildermeister factory in Shanghai, est. 2003
- Riello (Italy) metal-cutting tools facility in Shanghai, est. 2003
- TGI (South Korea) factory in Xingdao Bonded Zone: drills and milling tools
- Danielli plant in Beijing Development Area
- Little Giant in Ningxia Hui Autonomous Region (Japan)
- NOEMA-Spinner in Nanjing (Taiwan and Germany)

2. Joint Ventures:

- Beijing First Machine Tools Plant and Okuma (Japan)
- Yawei Machine Tool Company, SMS (Switzerland) and Selema (Italy)
- Shanghai Mechanical Press Plant and Acupress (Canada) to produce numerical controlled shearing and bending machines

C. Acquisitions of Foreign Firms

Several Chinese machine tool companies, which have reached a level of economic stability and technological achievement, have begun purchasing branches of foreign companies and establishing their own foreign branches for research and development, manufacturing and international sales. Through the acquisition of foreign branches, Chinese companies are acquiring new

⁵ China Daily, BizChina Machinery, "10th Five Year Plan," 18 Apr 2006, <http://www.chinadaily.com.cn/bizchina/2006-04/18/content_570635.htm> Oct 2006. [Note: This article mistakenly cites this as the Tenth Five Year Plan, but this is simply a translation error.]

⁶ Price Waterhouse Coopers, "Machinery and Equipment Market in China: China Risks and Rewards," Sept 2005.

technologies and new equipment that is boosting their own development and production capabilities. A list of the most prominent Chinese acquisitions is included below:

- Wuxi Kaiyuan Machine Tool Group: set up a UK operation with British investors to produce grinders
- Qinchuan Machine Tool Group: acquired 60% shares in UAI (US)
- Shanghai Mingjing Machine Tool Company: acquired majority stakes in Wohlenberg (Germany) and Ikegai Corporation (Japan) in 2001
- Dalian Machine Tool Group (DMTG): purchased Ingersoll CM Systems and Ingersoll Production Systems (U.S.), and the F. Zimmermann GmbH (Germany) in 2003
- Beijing No. 1 Machine Tool Works: purchased Werkzeugmaschinenfabrik Adolf Waldrich Coburg GmbH & Co.KG (Germany) from HerkulesGroup in October 2005

IV. Chinese Domestic Availability

Market data about the Chinese machine tool market demonstrates that a select number of Chinese domestic companies are able to produce machine tools better than the proposed U.S. controls on machine tool exports to China.

While several Chinese domestic companies are capable of producing high-level machine tools, we have selected three of the top Chinese companies for the analysis below. These companies are: Shenyang Machine Tool (Group) Co., Ltd., Dalian Machine Tool Group Corp., and Guilin Machine Tool Co., Ltd.

1. Shenyang Machine Tool (Group) Co., Ltd. (SMTCL)

The Shenyang Machine Tool (Group) Co., Ltd. (SMTCL) is one of China's largest machine tool companies. SMTCL was founded in December 1995 with funding from the Shenyang City State-owned Asset Management Administration Bureau. Today, SMTCL contains a number of subsidiaries, some of which are branches from the original Shenyang Machine Tool Company and others which were acquired when SMTCL purchased other machine tool companies. The SMTCL conglomerate includes: Shenyang Machine Tool Co., Shenyang Machine Tool Foundry Co., Shenyang Machine Tool No.3 Mechanical Works; Yunnan CY Group Co., Kunming Machine Tool Co., and Schiess GmbH located in Germany.

SMTCL manufactures mechanical-electrical integration equipment and instruments, such as CNC machining centers, large bridge type gantry machines, grinders, CNC boring-milling machines, worm wheel gear grinding machines, CNC bending machines, CNC punching machines, coordinate measuring machines and other advanced equipment. In 2005,

SMTCL produced approximately 60,000 units of metal-cutting machine tools, including about 10,000 units of CNC machine tools.

SMTCL produces most of the machine tool components in-house, while others are sourced from other provinces in China, including: Liaoning, Tianjin, and Shandong. SMTCL customers come from across China, and some products are exported globally.

Shenyang began construction on a CNC machine tool industrial park in July 2004. To date phase I of the project is complete and employees have been assigned to this location. The final phase of the project is still under construction, but completion of the park is estimated in March or April 2007.

According to published SMTCL information from the company website and promotional sales materials, SMTCL and subsidiaries produce high level CNC and 5-axis machine tools. China Czechoslovakia Machine Co., Ltd., which is a subsidiary of SMTCL, sold such 5-axis machines to Hongdu Aviation Industry Group Ltd., an AVIC II company.⁷

Note: Hongdu Aviation also uses the following tools: (1) 5-axis numerical control gantry milling machines produced by China Aviation Processes Research Institute in cooperation with France, delivered in 1997; (2) 5-axis horizontal numerical control fabrication center by Mandelli Co. of Italy, delivered in 2000; (3) Numerical knife grinding machine produced by Schneeburger of Switzerland, delivered in 1999; (4) 3-axis numerical metering machine produced by Qingdao Qianshao Machine Tools Factory, delivered in 2001.⁸

The following is a non comprehensive sample of the high-end tools that SMTCL and subsidiaries produce:

- **SSCKZ80A:** Shenyang Machine Tool Group Co. produces a 5-axis CNC turning/milling center with tilting spindles called the SSCKZ80A-5 5-axis with a stated positioning accuracy of 0.008.
- **VMC630:** China Czechoslovakia Radial Drilling Machine Tool Works produces a vertical machining center, the VMC630, with a stated positioning accuracy of +/-0.005/300.
- **VM650:** Yunnan Machine Tool Group's VM650 vertical machining center has a stated positioning accuracy of +/-0.005.

⁷ Verified through phone interviews with SMTCL, China Czechoslovakia Machine Co., Ltd. and Hongdu Aviation Industry Group, Ltd.

⁸ Hongdu Aviation, "Brief to Numerical Control Machining Factory," <<http://www.hongdu-aviation.com/english/html/about5-3.htm>> Nov 2006.

- **MB200x40/5x:** Shenyang Machine Tool Group Co. makes a 5-axis gantry profiler/machining center with tilting spindles, the MB200x40/5x, with a stated positioning accuracy of 0.010.

2. *Dalian Machine Tool Group Corp. (DMTG)*

The core company of Dalian Machine Tool Group Corporation (DMTG), the Dalian Machine Tool Plant, was founded in 1948. The establishment of DMTG in 1995 was a merging other state-owned companies in the Dalian area into one consolidated machine tool industry DMTG. In 2000, the former state-owned Dalian Special Purpose Machine Research Institute was also merged with DMTG, further increasing its technical force and scale in its manufacturing systems. DMTG now employs 6,229 workers, of which 815 are technicians.

Today, DMTG has 22 subsidiaries, joint ventures and cooperation agreements with international partners from the U.S., Germany, Japan, Korea, Switzerland and Israel. Five of these are joint ventures established with German, Japanese, Korean and Taiwanese companies, and two are wholly-owned subsidiaries of the U.S. In 2002 and 2003 respectively, DMTG acquired Ingersoll Production Systems and Ingersoll CM Systems. One year later, DMTG became the main shareholder of F. Zimmermann GmbH, Germany. These acquisitions brought DMTG a higher level of technology as well as offices and plants abroad. Details about the DMTG joint venture with the German Index machine tool company, Index Dalian Machine Tool Ltd., are included in the joint-venture section below.

From 2000 to 2004, DMTG boasted the largest sales revenue of machine tool companies in China.

DMTG has five manufacturing product lines with 300 individual products. These five product lines are: (1) Special purpose machines with flexible manufacturing systems; (2) vertical and horizontal machining centers; (3) CNC lathes including turning and milling centers; (4) high speed precision lathes and machine tool accessories; (5) auto power assembly and power transmission components.

Dalian Machine Tool Group can produce machine tools better than the proposed control level in the Proposed Rule. The following is a sample of some DMTG products:

- **CHD25:** 5-axis CNC turning/milling center machine with tilting spindles [Note: 9-axis with 5-axis simultaneous].
- **VDL500:** Vertical machining center with a stated positioning accuracy of +/- 0.005.

3. Guilin Machine Tool Co., Ltd. (GMTC)

The Guilin Machine Tool Co., Ltd. (GMTC) was established in July 1993 as the successor to the original Guilin Machine Tool Factory, which was constructed in 1951. GMTC has received many awards for its high quality machine tool products from the Chinese government.

In order to maintain its competitiveness in the rapidly developing machine tool market, GMTC has engaged in research and development cooperation with universities and research institutes throughout China such as: Beijing University of Aeronautics and Astronautics (Beihang University), Huazhong University of Science and Technology, and other research institutes. Together, these universities, institutes and GMTC have cooperated to raise the company's overall technical level and the technical innovation ability.

To date, GMTC produces 28 machine tool types, with nearly 400 models. 18 of these are high-technology CNC machine tools, with 180 different specification variations of these CNC machines. GMTC has placed a high priority on machine tool innovation.

GMTC produced and developed several models, which GMTC has sold to aerospace, national defense, automobile and other key industries, including: XK2316/3-5X, XHZ77125A/3, XKZ2330/12, XHZ2925/16, XHZ2330/6, XHZ2320/83, XK716/3-5X. GMTC has also provided 5 axis simultaneously controlled Plano-type milling machines and machining centers to China's aviation and aeronautical industry.⁹ Although not all of these models are caught by the Proposed Rule, this provides a clearer picture of the level at which Chinese machine tool companies satisfy domestic military demand.

Below is an example of a GMTC machine tool that reaches the level of proposed control:

- **XK2316/4-5X:** Bridge Type Gantry Machine, model XK2316/4-5X, a 5-axis simultaneous tool with tilting spindles

V. Chinese Joint Ventures and Wholly Owned Foreign Enterprises in China

In addition to developing top level machine tools in their existing China-based factories, Chinese companies are purchasing foreign companies and establishing joint ventures with foreign partners. These measures provide the Chinese companies with technology and manufacturing branches outside of China.

⁹ China Industry News, "桂林机床新品开发投入大," 14 Sept 2006, <<http://www.cinn.cn/show.asp?classid=15&id=29538>> Nov 2006.

Several Chinese machine tool companies have established joint ventures with foreign machine tool companies. These joint venture companies have been established for the production and assembly of high level machine tools. Japanese and German companies have been among the most prominent partners and investors in the Chinese machine tool industry.

1. OKUMA-BYJC (Beijing) Machine Tool Co., Ltd.

Okuma-BYJC (Beijing) Machine Tool Company, established in December 2003 as a joint venture between Beijing No.1 Machine Tool (BYJC) and Okuma of Japan, is located in the Shunyi Linhe Industrial Development Zone of Beijing. The Okuma-BYJC facility was planned as China's largest manufacturing base for numerical control machine tools.¹⁰ BYJC is one of the largest and most advanced machine tool companies in China. As the foreign partner, Okuma contributed by transferring its advanced flexible manufacturing systems (FMS) production lines and intellectual property management system to the joint venture to improve its products, manufacturing and logistics.¹¹

The company's business scope includes the design and production of numerically controlled machine tools, product installation, and after-sales service. Okuma-BYJC facilities are temperature controlled for a top-of-the-line manufacturing line. The grounds cover 30,000 m², with an indoor production facility occupying 20,000 m². Okuma-BYJC has a precision installation room and precision measurement center, which ensure the quality of processing and fitting these parts. The company also uses an environmental management information system (EMIS).

Okuma-BYJC produces and sells machine tools using technology provided by Okuma. The primary products include: MAR-560V numerically controlled vertical machining center and MAR-500H horizontal machining center. They estimate this year's production to be 700 machine tools and the output value to reach 500 million RMB. Within the next three years, Okuma-BYJC expects to reach a yearly output of 1200 machines and an output value of 900 million RMB. The quality of the machine tools manufactured by BYJC-OKUMA (Beijing) Machine Tool Co., Ltd. has reached the level of Japan OKUMA.¹²

¹⁰ Asian TOP Panel, "China to Build Largest Numerical Control Machine Tools Plant," The Japan Society of Mechanical Engineers JSME, Engineering in Brief E-mail Newsletter No.7, July 2002. <<http://www.jsme.or.jp/English/emnews07.htm>> Nov 2006

¹¹ China Daily, "SOEs Gain Foreign Input," 19 Oct 2002, <http://www.chinadaily.com.cn/en/doc/2002-10/19/content_140255.htm> Nov 2006.

¹² Fayin Digital-control, "China Machine Tool Industry Faced New Opportunity," 7 July 2005. <<http://www.fimom.com/english/newslst.asp?id=124>> Nov 2006.

- **MAR-560V:** This numerically controlled vertical machining center has a stated positioning accuracy of $\pm 0.004\text{mm}$
- **MAR-500H:** This numerically controlled horizontal machining center also has a positioning accuracy of $\pm 0.004\text{mm}$.
- **CXBA6130 5-axis:** This CNC Turning/Milling Center is a BYJC 5-axis simultaneous controlled machine with tilting spindles and no stated positioning accuracy
- **XNAV2415 5-axis:** This Gantry Planomiller is a BYJC 5-axis simultaneously controlled with tilting spindles and no stated positioning accuracy.

2. Index Dalian Machine Tool Ltd.

Index Dalian Machine Tool Ltd. was established in January 2001 as a joint venture between German Index and Dalian Machine Tool Group Corp., with Index as the greater shareholder. The company was established to assemble and sell the TNA300/TNA400 turning center in the Chinese market. Index Dalian has one production center and two assembly workshops, the newest of which is currently in the final stages of completion and will begin operations by the end of 2006.

To date the Index Dalian branch only produces the TNA300/TNA400 model turning center for the Chinese domestic market and non-domestic customers that have been pre-approved by German Index. The production and technical service departments employ primarily Chinese citizens, but both are headed by a German technician.

Index Dalian was the successful trial facility in which German Index planned to replace its own production of these turning center models with the Index Dalian production. By the end of 2006, German Index will turn over all of its international sales and orders for the TNA300/TNA 400 over to the Index Dalian facility. With this increase in orders, Index Dalian plans to significantly increase its production capacity.

Some of the machine components for the TNA300/TNA400 are purchased locally in China, but most of the core parts are provided by German Index. Currently, Index Dalian has no local R&D facilities because all of its technology comes from the parent company, German Index.

The main clientele in China includes military enterprises such as Xi'an Aero-Engine (Group) Ltd. and Xi'an Xibei Optoelectronic Instrument Factory, and the commercial auto and engine industries.

- **TNA 400:** The TNA400 model CNC turning center has a stated positioning accuracy of 0.008.

3. *NOEMA-Spinner (Nanjing) Co., Ltd.*

In October 1996, NOEMA-Spinner was established as a wholly-owned foreign enterprise of EUMA-Spinner in Nanjing.

EUMA-Spinner Corporation was established in January 1995 as a joint venture between Germany and Taiwan. Technology from Spinner of Germany was introduced to manufacture a range of CNC machine tools such as the column traverse type vertical machining center (ME series), EH horizontal machining center, and EV MVC vertical machining center. Since the partnership, EUMA has established a European Headquarters in Munich and has cultivated a vast sales network in Europe in addition to developing and implementing plans for new factories and sales centers in Mainland China. EUMA hopes to promote its machines in over twenty cities, including: Beijing, Shanghai, Nanjing, Shenyang, Xinan, Wuhan, Chongqing Guangzhou, and others.

NOEMA-Spinner was established to market EUMA-Spinner CNC Machine tools and CAD/CAM/CAE professional computer auxiliary designing software. The NOEMA-Spinner Nanjing facility, which also includes a special show ground for EUMA-Spinner machines and complete training and service facilities, assembles and sells the EV810 and EV1020 3-axis Vertical Machining Centers for the domestic Chinese market. According to a phone interview with NOEMA-Spinner's Nanjing sales representatives, all of the EUMA-Spinner machine tools listed on the EUMA-Spinner website, which includes high level 5-axis tools, are produced in the Nanjing facility.¹³ The two machining centers listed below have been confirmed by Spinner as the main products manufactured at the Nanjing facility:

- **EV810 Vertical Machining Center:** This 3-axis high speed machining center has a stated positioning accuracy (JIS) of $\pm 0.004\text{mm}/300$.
- **EV1020 Vertical Machining Center:** This machine also has a stated positioning accuracy (JIS) of $\pm 0.004\text{mm}/300$.

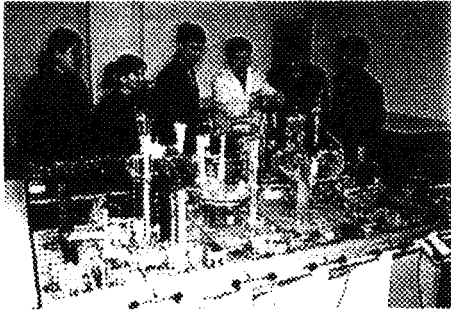
VI. Vocational Training Institutes: Sino-Foreign Cooperation

One of the greatest challenges for Chinese manufacturing and machining, as is in the case in almost all industries in China, is quality and efficiency in production and machining lines. The following section includes details about two vocational training institutes located in Tianjin for training in electrical engineering, metal processing and machine tooling. Although these training centers may not invest great resources in engineering research and development, they do demonstrate the depth of cooperation between Europe and China in the area of strategic manufacturing. In the overall economic development

¹³ LTI Associates, Telephone interview with NOEMA-Spinner sales representative in Nanjing, 23 Nov 2006.

of China, such training and cultivating of a skilled labor force may prove to be more valuable for China's economic and military development than the transfer of technology.

1. Tianjin Sino-German Vocational Training Center (AFZ)

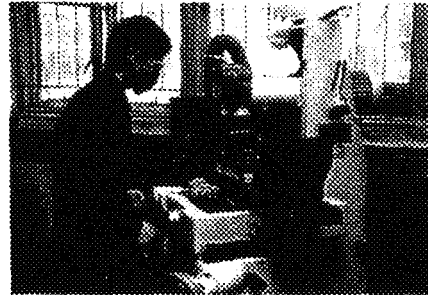


The Tianjin Sino-German Vocational Training Center (AFZ) was established in July 1985 with the support of the Tianjin City Government and the Ministry of Education in Beijing. AFZ Tianjin is a vocational school, which trains students in the fields of electrical engineering and metal engineering. Primary activities consist of advanced technical training courses for qualified employees and skilled workers in these areas, but the center also offers English and German language

courses. The goal of AFZ is to train qualified, motivated and responsible employees that are able to contribute to the development and improvement of economically efficient practices and high quality standards. To reach this goal, AFZ emphasises education as an interplay between practice and theory.

Further education of instructors is also a key goal of AFZ. On behalf of the Ministry of Education in Beijing, AFZ plans to establish a new system of cooperative education, based upon the German concept, *Berufsakademie*, and to extend AFZ courses to new sectors such as automobile mechanics.

The teaching staff at AFZ includes German and Spanish experts and more than 200 qualified Chinese teachers of which over 60 percent have attended training programs abroad. Over 90 percent of the modern equipment employed at AFZ is imported from abroad, and the value of this equipment is greater than 200 Million RMB. The AFZ currently holds courses for more than 4500 students.



Majors and courses include the following areas:

- Processing Technology of Numerically Controlled Machine Tool
- Maintenance Technology of Numerically Controlled Machine Tool
- Mould Design and Manufacturing
- Mechanical and Electrical Integration
- Electric Automation
- Computer Controlling Technology

- Information Security Technology
- Computer Network Technology
- German and English Language

2. *Tianjin Sino-Spanish Machine Tool Vocational Training Center (CSMC)*

The Tianjin Sino-Spanish Machine Tool Vocational Training Center (CSMC) was built in December 2003. CSMC is a vocational training center established as a result of the collaboration between the Spanish and Chinese governments and the cooperation between the Tianjin Technology Institute and the Machine Tool Spanish Promotional Group lead by Proschools. The Spanish government provided \$9.76 million USD to purchase equipment for the CSMC workshops.

Located in Tianjin, CSMC has defined one of its main objectives as helping and servicing Spanish Machine Tool manufacturers. In August 2005, Lantek and CSMC signed a collaboration agreement in which Tianjin CSMC agreed to provide Lantek with logistic and human support for their installations and customer support in China. Lantek is a Spanish company that develops and sells CAD/CAM software for the sheet metal industry. According to Alberto Martínez, Lantek's CAD/CAM division Managing Director, "Lantek's presence in China has significantly increased during the last two years thanks to several agreements with leading Chinese sheet metal manufacturers to provide Lantek's software with their machines. In Lantek, we think that this is the perfect moment to establish our own branch office in a country where the growth expectations are spectacular. Thanks to this collaboration agreement we can provide a qualified support service to our current and future customers in one of the most industrialized areas in China."

According to Jose Ignacio Artamendi, Tianjin CSMC Director, "This collaboration agreement shows that the expectations generated by the CSMC in order to enforce the service that the Spanish companies offer their customers in the great Chinese market are being met. Furthermore, CSMC is playing a significant role in enforcing the image of the Spanish machine tool technology in general and the Basque Country in particular. One of the main objectives of the center is to serve as a reference and a facility to be used by those companies interested in establishing or doing business in China by helping them with machine tool demonstrations, educational actions or marketing tasks."¹⁴

¹⁴ TenLinks, Inc. "Lantek Signs Collaboration Agreement with Tianjin CSMC." 25 Aug 2005. <http://www.tenlinks.com/NEWS/PR/Lantek/082505_tinajin.htm> Nov 2006.

Training courses at the CSMC include:

- Distance Diagnosis Technology
- Maintenance Technology of Numerically Controlled Machine Tool
- Digital Tridimensional Measuring Technology
- Operation of Numerically Controlled Processing Center
- Numerically Controlled Grinder Operation
- Numerically Controlled Machine Tool Operation
- Electro-processing Machine Tool Operation
- Electronics
- Pneumatic Hydraulics
- Principle of Electric Drive Numerical Control
- Typical Numerical Control System
- Installation, Testing and Maintenance for Numerically Controlled Machine Tool

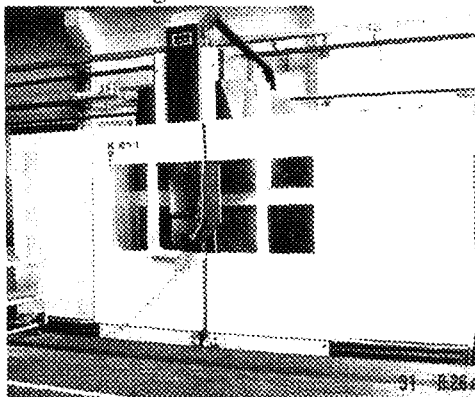
VII. Foreign Imports

The best way to fully understand the level of engagement from non-U.S. foreign companies in the Chinese market is to review the tooling in one of the Chinese aircraft manufacturing plants. Chang He Aircraft Industry Corporation ("Chang He"), which is a manufacturer of small fixed wing and rotary wing aircraft, completed construction this year on a machine shop that is two blocks long in size. [Note: A full description of Chang He and its programs is provided in the Helicopter Chapter.] This new structure is now being filled with state-of-the-art machining equipment, most of which has already been purchased from European and Japanese machine tool companies. This building is temperature controlled and equipped with good lighting. They estimate that the machining line will be up and running in approximately 6 months.

The following equipment has already been installed at Chang He in either the old machine shop or the new machine shop described above:

1. Fidia

Chang He has purchased a total of four machine tools from Fidia of Italy. Following are the specifications and pictures of two of the Fidia machines at Chang He:



Fidia High speed vertical 5-axis N/C machining center

Specifications:

Made in Italy
Manufacturer: FIDIA
Model Number: K211
X : 2700; Y : 1100; Z : 1000
A : -110 ~ 40°
C : ±180°
S : 24000
F : 24000

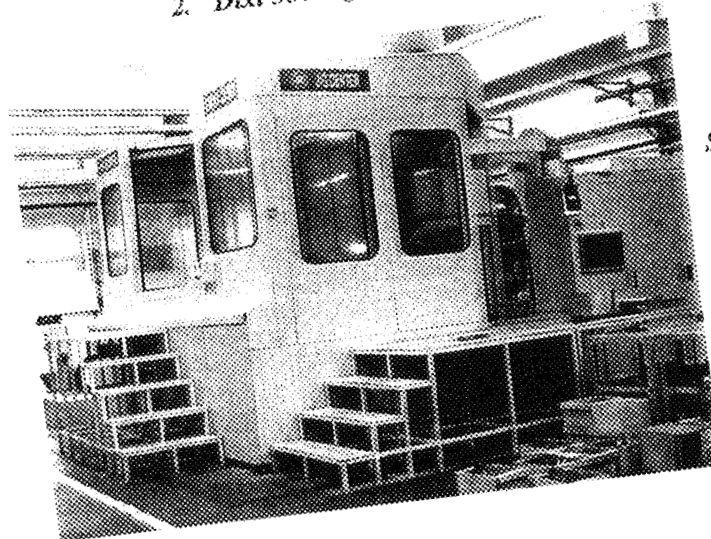
**Fidia High speed
vertical twin-head 5-
axis N/C machining
center**

Specifications:

Made in Italy
Manufacturer: FIDIA
Model Number: 2K411
X : 3000; Y : 2000;
Z : 1000
A : -110---40°
C : ±180°
S : 24000
F : 24000



2. Dixi 350 Jig Center

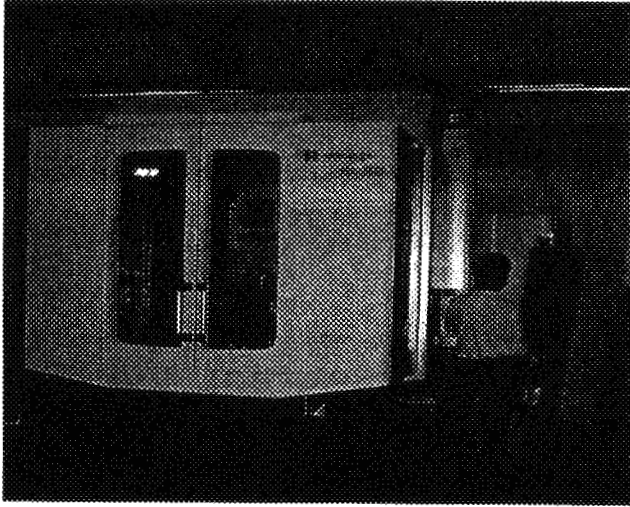


**4-axis precision N/C
boring lathe**

Specifications:

Made in Switzerland
Manufacturer: DIXI
Model Number: DIXI350
X : 1000; Y : 1000; Z : 1000
A :
B :
S : 5000
F : 10000

3. *Hardinge Hansero 555Deckel Matto DMU 125P:*



N/C grinding machine

Specifications:

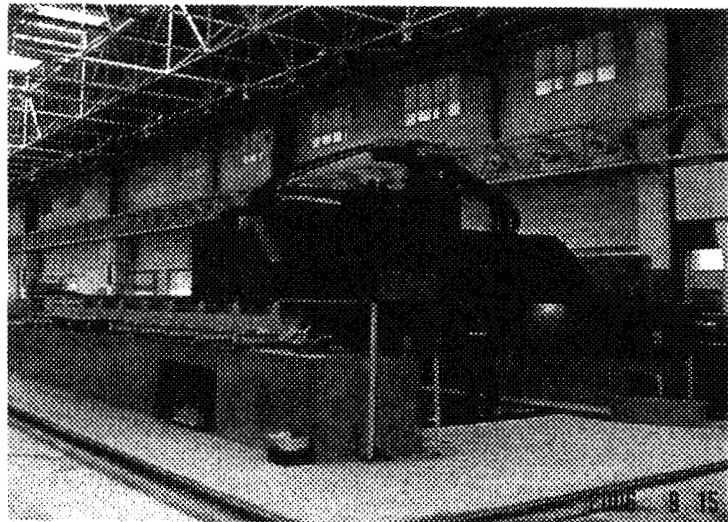
Made in the USA
Manufacturer: Hardinge
Model Number 555
φ : 2700
S : 15000
F : 10000

4. *VStar Forest-Liné:*

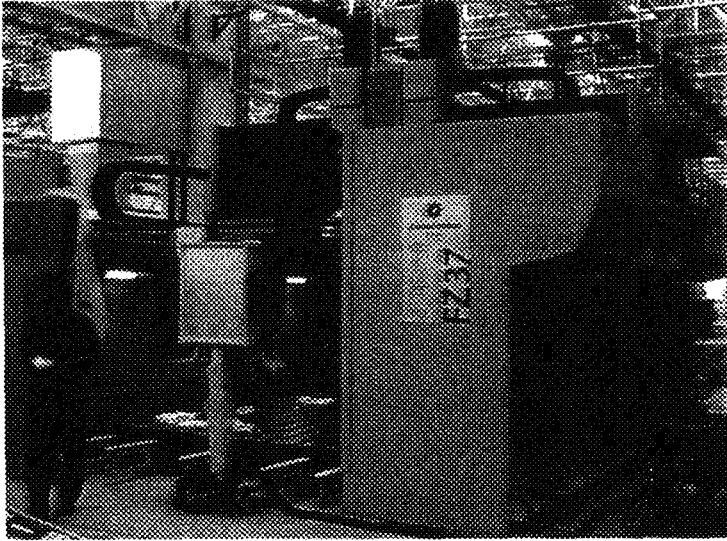
High speed 5-axis N/C
gantry machining
center

Specifications:

Made in France
Manufacturer: Forest Lin
Model Number: VSTAR
X : 6700; Y : 3500;
Z : 1000
A : -110~40°
C : ±410°
S : 24000
F : 40000



5. *Zimmerman Boko FZ37:*



**High speed vertical
5-axis N/C
machining center**

Specifications:

Made in Germany
Manufacturer:
ZIMMERMANN
Model Number: FZ3
X : 6000; Y : 3000;
Z : 1000
A : -110 ~40°
C : ±180°
S : 24000
F : 24000

Note: Chang He has two of these machines.

6. *Chang He also has the following:*

1. Hexagon Metrology Global Advantage 153010
2. FPT Sino Dynamic Precision
3. Three of the Cincinnati Machines AV0054
4. Rambdaudi H45L 5 axis tool, purchased 2 years ago
5. Mazak Megaturn

VIII. Summary

China's machine tool demand is being met by a rapidly growing domestic machine tool industry and top of the line non-U.S. foreign machine tools. The top Chinese domestic companies are producing four and five axis machine tools at levels better than those in the Proposed Rule. The non-U.S. foreign machine tools, which still dominate the high end Chinese market, are readily available. Additionally, these non-U.S. foreign companies are more aggressively investing technology and money into joint ventures and wholly owned foreign enterprises in China. The data above clearly shows that export controls, even at the current levels, have not prevented China from obtaining the state of the art machine tools it needs for military modernization. On the contrary, China has been able to purchase all of the machine tools it needs for both commercial and military purposes. The only tangible result of the current controls has been the rapid decline in U.S. market share, which today is below 8% and declining. Further lowering these controls would appear to be futile and would clearly not hamper China's military capabilities in any capacity.

Chapter III

Information Security and Telecommunications (I): Servers, Integrated Circuits, and Encryption

Part I: Servers

I. List of ECCNs:

4A994: Limited to computers not controlled by 4A003, with an Adjusted Peak Performance ("APP") exceeding 0.1 Weighted TeraFLOPS (WT).

4D994: "Software" specially designed or modified for the "development", "production" or "use" of equipment controlled by 4A101, 4A994 with an Adjusted Peak Performance ("APP") exceeding 0.1 Weighted TeraFLOPS (WT), 4B994 and materials controlled by 4C994.

4E992: "Technology" for the "development", "production", or "use" of equipment controlled by 4A994, as described in this Supplement No. 2 to Part 744, and 4B994, materials controlled by 4C994, or "software" controlled by 4D993 or 4D994.

Computers with an Adjusted Peak Performance ("APP") exceeding 0.75 Teraflops (WT) currently require an export license to China (see ECCN 4A003). Under the proposed new China policy computers and related software and technology with an APP exceeding 0.1 WT would require an export license to China if going to a military end-use as defined in the draft proposal.

The ECWG has conducted an analysis of the high end computer market in China to determine the level and number of computers exceeding the 0.1 WT level and the ability of Chinese companies to produce computers above this level. The following chapter details our findings.

II. Overall China Market

By the end of 2006, China's total GDP is projected to reach US\$2.429 trillion, more than doubling in just six years time. With a strong growing economy, China plans to invest a vast amount of money on data informatization, creating a huge market for computer-related equipment. Servers and information storage systems are especially needed to store, manage, process, and retrieve the rapidly increasing volume of data.

Chinese telecommunication operators, the biggest consumers of high-end servers and storage systems, will need new equipment to support next generation 3G networks. Numerous government agencies have plans to modernize their computer systems, intending to spend hundreds of millions of dollars in the next decade.

In 2005, China imported more than 484,000 servers, which generated revenues of US\$2.25 billion. In the first quarter of 2006, 134,000 servers were shipped to China, an increase of 26% over the same period a year ago. CCW Research expects blade servers, with sales of US\$66.08 million in 2005, to experience the greatest growth. The blade server market in China is forecasted to reach 759.49 million, with compounded annual growth rates of 59.4% by 2010.

According to the China Storage System Market Quarterly Tracker Q4 2005 report released by Analysis International, the market value of storage systems reached US\$251.90 million at the end of 2005. During the fourth quarter of 2005, 14,000 storage systems were imported to China, an increase of 16.4 percent over the previous year. While the telecommunication industry is the biggest purchaser of storage products in China, the financial industry has also been a force driving the rapid growth of the information storage systems market in China.

American companies such as Hewlett-Packard (HP), IBM, Sun Microsystems, Dell, and EMC have traditionally dominated the Chinese server and storage system market. In 2005, HP, IBM, and Dell were the three biggest importers of servers in China, combining to seize 63.9% market share. In terms of revenue for overall server sales, IBM dominated China's market share with 40.4 percent, followed by HP and Sun with 21.5 percent and 10.1 percent respectively.

The competition in the storage systems market is even more intense with market share and revenues more evenly distributed. In terms of server imports to China, HP, EMC and IBM were in the lead, with market share of 25%, 23.9% and 22.7% respectively. However, in terms of market value, IBM accounted for 24.4 percent of the total revenues. HP was a close second with 23.9 percent and EMC came in third with 17.2 percent. IBM's market value increased slightly, while HP and EMC remained stable compared with the first quarter of 2006.

III. Servers in China

Despite the dominance of U.S. companies in the Chinese server market, there is evidence of domestic Chinese capabilities in this area. A review of the top 500 high performance computers in the world showed that 16 of top 402 high performance computers in the world are located in China.¹⁵ The following lists details these computers and includes the ranking, location, manufacturer and performance level of each:

¹⁵ Top500.org Supercomputer Sites. "November 2006 Top500 List." Nov 2006. <<http://www.top500.org/lists/2006/11>> Nov 2006.

No. 57	
Location:	China Meteorological Administration
Manufacturer:	IBM
Computer:	eServer pSeries 655 (1.7 GHz Power4+)
Processors:	3200
Rmax (Gflops):	10310
Rpeak (Gflops):	21760
Nmax:	
Nhalf:	
No. 82	
Location:	Shanghai Supercomputer Center
Manufacturer:	Dawning
Computer:	Dawning 4000A, Opteron 2.2 GHz, Myrinet
Processors:	3200
Rmax (Gflops):	10310
Rpeak (Gflops):	21760
Nmax:	
Nhalf:	
No. 192	
Location:	Chinese Academy of Sciences
Manufacturer:	Lenovo
Computer:	Deepcom 6800 Itanium 2, 1.3 GHz, OsNet
Processors:	1024
Rmax (Gflops):	4193
Rpeak (Gflops):	5324.8
Nmax:	491488
Nhalf:	0
No. 220	
Location:	Classified
Manufacturer:	Hewlett Packard
Computer:	Cluster Platform 4000 DL 145 Cluster
Processors:	1044
Rmax (Gflops):	3958.8
Rpeak (Gflops):	5011.2
Nmax:	0
Nhalf:	0
No. 254	
Location:	Xinjiang Oil
Manufacturer:	IBM
Computer:	Blade Center HS20 Cluster, Xeon EM64T 3.4 GHz, Gig Ethernet
Processors:	1064
Rmax (Gflops):	3755
Rpeak (Gflops):	7235.2
Nmax:	0
Nhalf:	0
No. 269	
Location:	Petroleum Company H
Manufacturer:	IBM
Computer:	Blade Center HS20 Cluster, Xeon EM64T 3.4 GHz, Gig Ethernet
Processors:	1064

Rmax (Gflops):	3755
Rpeak (Gflops):	6553.6
Nmax:	0
Nhalf:	0
No. 301	
Location:	Geoscience J
Manufacturer:	IBM
Computer:	Blade Center HS20 Cluster, Xeon EM64T 3.4 GHz, Gig Ethernet
Processors:	980
Rmax (Gflops):	3593.65
Rpeak (Gflops):	6664
Nmax:	0
Nhalf:	0
No. 311	
Location:	Geoscience I
Manufacturer:	IBM
Computer:	Blade Center HS20 Cluster, Xeon EM64T 3.4 GHz, Gig Ethernet
Processors:	960
Rmax (Gflops):	3520.31
Rpeak (Gflops):	6528
Nmax:	0
Nhalf:	0
No. 339	
Location:	Galactic Computing (Shenzhen) Ltd.
Manufacturer:	Galactic Computing
Computer:	Supercomputing Blade System GT4000
Processors:	562
Rmax (Gflops):	3413
Rpeak (Gflops):	4046
Nmax:	0
Nhalf:	0
No. 348	
Location:	Institute of Scientific Computing / Nankai University
Manufacturer:	IBM
Computer:	Nankai Stars xSeries Xeon 3.06 GHz, Myrinet
Processors:	768
Rmax (Gflops):	3328
Rpeak (Gflops):	4700
Nmax:	0
Nhalf:	0
No. 397 to 402	
Location:	Gaming Company (B)
Manufacturer:	Hewlett Packard
Computer:	6 Blade Clusters BL-20P, Pentium4 Xeon 3.2 GHz*
Processors:	860
Rmax (Gflops):	3076.7
Rpeak (Gflops):	5504
Nmax:	0
Nhalf:	0

*Note: Gaming Company (B) has a total 6 of these Blade Cluster at the exact same specs

It is of interest to juxtapose the Dawning 4000A, Opteron 2.2 GHz, Myrinet, which is rated at number 82, with the computers of similar level. The chart below shows computers rated from numbers 81 through 90. As the chart shows, a number of the computers of similar ability are supplied to U.S. defense related end-users, such as the Pacific Northwest National Laboratory, Los Alamos National Laboratory and Wright Patterson Air Force Base. Since computers at this level are custom designed, this demonstrates that China has the ability to supply equivalent level computers to its government and military as U.S. companies are supplying to the U.S. government and military.

No.	Purchaser	Computer/OEM	Processors	Year	Rmax	RPeak
81	Lawrence Livermore National Laboratory United States	Zeus - Appro Xtreme Server - Quad Opteron Dual Core 2.4GHz Infiniband Appro International	2304	2006	8181	11059.2
82	Shanghai Supercomputer Center China	Dawning 4000A, Opteron 2.2 GHz, Myrinet Dawning	2560	2004	8061	11264
83	Los Alamos National Laboratory United States	Lightning - Opteron 2 GHz, Myrinet Linux Networkx	2816	2003	8051	11264
84	SCS S.r.l. Italy	ProLiant BL460c EM64T Xeon 51xx 3GHz Hewlett-Packard	1024	2006	7987.2	12288
85	Pittsburgh Supercomputing Center United States	Cray XT3, 2.4 GHz Cray Inc.	2060	2005	7935.82	9888
86	Wright-Patterson Air Force Base/DoD ASC United States	Cluster Platform 4000 DL145 Opteron 2.8 GHz Infiniband Hewlett-Packard	2048	2006	7925	11469
87	University at Buffalo, SUNY, Center for Computational Res. United States	U2 - PowerEdge SC1425 3.2 GHz, Myrinet Dell	1536	2006	7737	9830.4
88	Lawrence Livermore National Laboratory United States	MCR Linux Cluster Xeon 2.4 GHz - Quadrics Linux Networkx	2304	2002	7634	11060
89	Statoil Norway	Cluster Platform 3000 DL380 Xeon 51xx 3.0 Ghz, Infiniband Hewlett-Packard	1024	2006	7495.7	12288
90	Lawrence Livermore National Laboratory United States	ASCI White, SP Power3 375 MHz IBM	8192	2000	7304	12288

IV. Chinese Domestic Capability

China's first server was manufactured in 1993, breaking the foreign monopoly on this product, but domestic companies remained a very small player in this market segment. It wasn't until the early 2000s when Chinese companies made large investments in technological research and development that they started capturing a portion of the market share. The Langchao Group, a Chinese information technology firm, invested

US\$253 million to increase production of Internet servers to compete directly with HP and IBM. Other domestic companies that are becoming more competitive include Langchao, Lenovo, Dawning Information Industry, Legend Holdings, Founder Group, and PowerLeader. Competition amongst server and information storage system suppliers will intensify as foreign companies aim to provide servers to lower-end markets with low-price strategies, while Chinese firms try to break into the middle and high-end market.

1. Dawning Information Industry (Beijing) Co. Ltd. ("Dawning")

Dawning was founded in June 1995. Dawning is primarily engaged in R&D and manufacturing of servers for the IT industry. It is headquartered in Shenzhen and is ranked among the top three sever providers in China.

Dawning's top of the line server is the Tianchao series, which includes the TC4000L, TC3000, TC1700 and industrial specific cluster systems. The TC4000L is a network technology oriented commercial cluster system developed and introduced by Dawning in 2003. It is now in use at BGP Geophysical and a number of other companies. The TC3000 is the most mature super UNIX server in the country. It has been deployed to Beijing Genomic Institute and Western High-performance Network Computing Center and many other organizations. The TC1700 is a mature IA-architecture cluster product introduced by Dawning in 2001. It is widely used in areas including oil, meteorology, military and environmental protection. In 2003, Dawning delivered its 1000th server of this level.

2. Beijing High Performance Computer Users Center (BHPCC)

BHPCC was established on July 25, 2000 and is supported by the China Meteorological Administration. BHPCC's main computers are Sunway supercomputers, which are produced by the National Research Center of Parallel Computer Engineering & Technology. In addition to the Sunway systems, BHPCC also owns the YINHE III (produced in 1997), Dawning, IBM SP, and Cray supercomputers. BHPCC's computers are used for China's weather information net and the connection between China telecom and the internet of Computer Network Information Center, Chinese Academy of Sciences (CNIC, CAS).

BHPCC has two computers at the Shanghai Supercomputer Center whose specifications are as follows:

SW-64P

Peak Performance	302.4Gflops
Computing Nodes	32 Dual-processor nodes
Service Nodes	1 Dual-processor nodes
CPU	Intel P4 Xeon, 2.4 GHz,66 CPU totally
System Memory	66GB

System Storage	2.7TB
Architecture	Cluster, Gig-Ethernet
Operating System	Redhat Linux 7.3
SW-I	
Peak Performance	384GFLOPS
Computing Nodes	96 computing nodes each node composed of 4CPUs and 1 message-processing CPU
CPU	Alpha, 500MHZ, 480 CPUs totally
Front End Computer	6 Alpha servers
System Memory	48GB
System Storage	1.28TB
I/O Nodes	16 nodes
Architecture	MPP
Operating System	64bits UNIX

3. National Research Center of Parallel Computer Engineering & Technology

The State Scientific and Technological Committee founded the National Research Center of Parallel Computer Engineering & Technology (NRPCET) in 1992, and it opened in 1996. The NRPCET headquarters is located in the new Beijing high technology development zone, and the director, Professor Jin Yilian, is a well-known computer expert from the Chinese Academy of Engineering. NRPCET's mission is to develop commercialized parallel computer systems and to gradually form an s Chinese High Performance Computer (HPC) manufacturing industry for both the domestic and overseas markets.

NRPCET is supported by the Computing Technology Institute of the Chinese Science Academy and Jiangnan Institute of Computing Technology. NRPCET applies the technology from these two entities into commercialized products. These technology resources combined with NRPCET's application R&D make them the leading Chinese supercomputer manufacturers in China.

4. Lenovo

Lenovo is the largest computer manufacturer in China. This is the Chinese company in this sector with the greatest amount of foreign cooperation.

V. Major Achievements in the Chinese Supercomputing Industry

- In October 1999, the first SunWay-I supercomputer was installed in the State Meteorological Agency to serve in weather forecasting. The Beijing HPC Application Center was founded based on this system.
- In January 2001, the Shanghai Supercomputing Center was founded. The second Sunway-I parallel supercomputer is the main computer system at the center. This Supercomputing Center will extend the wide range of HPC applications to various fields in the eastern China.
- The Sunway supercomputer is a large-scale scalable parallel computer system, with a peak speed of 384GFLOPS. The system's principal technical indexes come up to advanced world standards. The successful development of Sunway supercomputers enables China to register as the third country with the ability to develop large-scale HPC systems after the U.S. and Japan.
- The development of application systems has also advanced. Since the founding of the Beijing HPC Application Center, nearly 100 items of large-scale and medium-scale application software has been developed for dozens of entities in the petroleum industry, meteorology, aviation, life science, science research and national defense.
- Serialized production lines have been formed in the aspects of peripheral devices and information security, such as disk arrays, security routers, encryption equipment and firewalls. Those products have been applied to various fields and they are now taking more important roles in their own application.

VI. Chinese and Foreign Cooperation

In October 2004 Lenovo and Bull (France) announced the launching of a five-year co-operation in which Bull will provide Lenovo with NovaScale 5000 and 6000 server series based on Intel Itanium 2 processors and its FAME (Flexible Architecture for Multiple Environments) technology. Lenovo will market these servers throughout China, for Enterprise Database and Business Intelligence applications, Enterprise Resource Planning (ERP), Internet-based application servers and HPC.

In an extension of the co-operation agreement signed in Paris on January 28th, 2004 during the State visit of Chinese President Hu Jintao, the French CEA and the Chinese Ministry of Science and Technology (MOST) announced a co-operation agreement in association with Bull and ST Microelectronics around the development of an open computing platform. Taking into account the importance of information technologies in the social and economic development of China, MOST has chosen to develop an open IT platform with 3 major European players.

Based on Linux and an open distributed system, the platform is planned to run in multiple environments, including PCs, servers and mobile devices such as PDAs (personal digital assistants), in order to promote interoperability and the deployment of new on-line services and communications applications.

Bull has also announced the creation of a program within the "New Information Technologies" of the ENST (Higher National School of Telecommunications) and the University of Tongji within the framework of its partnership with Paris Tech. For 5 years, Paris Tech, which groups together 11 large engineering schools in Paris, has been developing in China an important engineer training program in partnership with nine of the main Chinese universities. In joining Paris Tech, Bull demonstrates its contributions to the Chinese higher-level training and the dissemination of French scientific and technical culture to Chinese universities. Within this framework, Bull aims to promote cooperation between the French and Chinese scientific and manufacturing communities.

VII. Summary

Chinese companies clearly already have in place and have access to HPCs above the proposed control level in the new China Policy. Their domestic companies and institutes are providing HPCs at high levels to the Chinese Government and Military. Additionally, Chinese companies are producing proprietary CPUs in China. They have not shown up on the commercial market to date, but this expected to change in the near future.

Part 2: Integrated Circuits

I. List of ECCNs:

3D991: "Software" specially designed for the "development", "production", or "use" of electronic devices or components controlled by 3A991, general purpose electronic equipment controlled by 3A992, or manufacturing and test equipment controlled by 3B991 and 3B992.

3E991: "Technology" for the "development", "production", or "use" of electronic devices or components controlled by 3A991, general purpose electronic equipment controlled by 3A992, or manufacturing and test equipment controlled by 3B991 or 3B992.

Integrated Circuits currently require an export license to China as defined in ECCN 3A001 and the software and technology related to 3A001 is controlled under ECCNs 3D001 and 3E001. Under the proposed new China policy license requirements would be expanded to the software and technology in the ECCNs listed above to produce

integrated circuits controlled under 3A991 for items going to a military end-use as defined in the draft proposal.

II. Overall Chinese Market

According to the U.S. Semiconductor Industry Association (SIA), China is now the third largest market in the world for semiconductors (after Japan and the US), and boasts the world's highest growth rate. China's official statistics show that in 2004, the semiconductor market size was \$35.1 billion, which accounted for about 16.5% of the \$213 billion global total. According to CCID, in 2005, China's IC market reached \$47.3 billion. The strong growth for semiconductors is driven by a large and fast growing domestic manufacturing industry of IT products and equipment. China now boasts the world's second largest electronics manufacturing industry, with total sales revenues of \$329.4 billion in 2004 and \$255.97 billion from January – September 2005.

According to the China Semiconductor Industry Association, by the end of 2004, China had about 50 foundries, 102 testing and packing factories, and 457 design firms. Although some industry insiders believe that there is already an investment bubble in China's semiconductor sector, investment continues to pour into the semiconductor sector due to strong sustained demand, preferential policies in form of tax breaks, government co-investments, and free or cheap land use. In the long run, it is evident that China's reliance on imported chips will decrease with the growth of the local manufacturing industry.

Due to large-scale investment and favorable government policies, Chinese domestic product has grown rapidly since 2000. Most locally-produced products, are low- to-medium end, and cannot effectively compete against imported products. Of domestically produced chips, about 50% are exported to meet overseas demand for low-end products. Local OEM vendors are moving into the semiconductor sector. In 2005, Huawei, ZTE Telecom and Hisense all set up independent subsidiaries focusing on semiconductor product development. According to CCID, Lenovo, China's largest computer manufacturer also released its computer security chip, becoming the fifth manufacturer with proprietary security chips after Atmel, National Semiconductor, Infineon and ST Microelectronics.

A number of new start-ups in chip design are worth noting. Actions Semiconductor, a designer of SoC for MP3 players, reached \$5 million in sales in 2003, increased sales to \$100 million in 2005, and is now listed on NASDAQ. Vimicro Corporation, a design firm specializing in multi-media processing chips, also reached sales of \$100 million in 2005, up from approximately \$12.2 million in 2003.

Despite this growth, China relies on imports to satisfy more than 85% of its current demand for chips, and the major foreign suppliers are already in the market. Among China's top ten suppliers, four are U.S.-based, three are from Europe, two are from South Korea and one is from Japan. The following are the top 10 players in the market, listed in order of market share:

1. Intel
2. Texas Instruments
3. Philip Semiconductor
4. ST Microelectronics
5. Samsung Electronics
6. Hyundai Semiconductor
7. Toshiba
8. Infineon
9. Freescale
10. Micron

III. Chinese Domestic Capabilities

Since the U.S. Government is aware of much of this growth of semiconductor foundries in China, the ECWG lists only the following example:

1. Semiconductor Manufacturing International Corporation (SMIC)

According to SMIC's website and publicly available articles, SMIC is a pure-play IC foundry that offers 0.35 μ m to 90nm IC manufacturing services. Established in 2000, SMIC is headquartered in Shanghai and has three 8-inch fabs including a dedicated copper backend line. SMIC acquired its fourth 8-inch fab facility, Fab 7, located in Tianjin. In Beijing, the foundry also has a 12-inch wafer facility that has been in production since July 2004. In May 2003, Fab 1 was one of the two recipients of the "Top Fab of the Year for 2003" by Semiconductor International. SMIC's joint ventures, a testing and assembly facility in Chengdu with UTAC and the manufacturing of on-chip color filters and micro lenses in Shanghai with Toppan, are also in production.

SMIC's technology capabilities include logic, mixed signal/RF, high-voltage circuits, system-on-chip, embedded and other memories, LCoS, and CIS among others. Key to SMIC's rapid technology development and excellent fab management are a strong R&D team made up of experienced engineers from North America, Europe and Asia, and a network of leading international technology and manufacturing partners.

SMIC provides a full suite of value-added services that include design services, mask making, IC manufacturing, and testing. Packaging and final testing are offered through SMIC's assembly and packaging facility in Chengdu or third-party vendors. With strong internal offerings and collaboration with a global network of design service, IP, Library and EDA providers, SMIC offers its customers wide-ranging and flexible design support. SMIC's mask operation is one of China's most advanced; with 0.5 μ m to 90nm capabilities and a testing facility for logic, mixed

signal and memory devices.

SMIC offers ASIC design services from taking in design specifications, RTL or gate-level netlist, to GDSII file generation. They have taped out numerous multimillion gates chips with first silicon success. Their backend design team can now take customer's RTL to GDS and tackle the timing closure, signal integrity, power integrity, design for manufacturability issues with proven flow and methodologies.

SMIC ASIC service also provides turnkey service which includes front end design, back end design, mask tooling, wafer manufacturing, circuit probing, packaging, final testing, and logistics to deliver the parts.

SMIC can also tap into a global network of more than 20 Design Services Partner Alliance (DSPA) partners for design implementation services. Their DSPA partners are located in the United States, Taiwan, China, Japan, Korea and Europe.

SMIC currently offers design implementation services for logic, mixed-signal and embedded non-volatile memory technologies at the 0.35µm to 0.13µm nodes, to include:

- Logic-level implementation
- Circuit audits and simulations
- Synthesis
- SCAN insertion and ATPG
- Place-and-Route
- RC extraction
- Delay calculation
- Static timing analysis
- Formal verification
- Physical Verification

SMIC technology file support for customers is as follows:

Category	File Type	90µm	0.13µm	0.15µm	0.18µm	0.25µm	0.35µm
DRC/LVS	Calibre (Mentor Graphics)	✓	✓	✓	✓	✓	✓
	Dracula (Cadence)		✓	✓	✓	✓	✓
	Hercules (Synopsys)	✓	✓	✓	✓	✓	✓
RC Extraction	Assura (Cadence)	✓	✓	✓	✓	✓	✓
	StarRCXT (Synopsys)	✓	✓	✓	✓	✓	✓
	HyperExtract (Cadence)		✓	✓	✓	✓	✓
	Fire & Ice (Cadence)		✓	✓	✓	✓	✓
	Dracula LPE (Cadence)		✓	✓	✓	✓	✓
	Assura RCX (Cadence)	✓	✓	✓	✓	✓	✓

	«Calibre (Mentor Graphics)	✓	✓	✓	✓	✓	✓
	Astro (Synopsys)	✓	✓	✓	✓	✓	✓
APR	SE (Cadence)	✓	✓	✓	✓	✓	✓
	First En (Cadence)	✓	✓	✓	✓	✓	✓
	Magma (Magma)		✓	✓	✓		
	Virtuoso (Cadence)	✓	✓	✓	✓	✓	✓
Layout	Laker (Silicon Canvas)	✓	✓	✓	✓	✓	✓
	IC Station (Mentor Graphics)	✓	✓	✓	✓	✓	✓
	✓Available						

Note: Numerous site visits have been conducted at SMIC, and information from those visits supports the information provided above, in that SMIC either is producing or clearly has the capability to produce at the levels described above.

IV. Summary

SMIC is at the high end in capabilities to carry out ASIC design and production in China, but there are a number of foundries in China above the control levels proposed in the draft new China Policy. These foundries were the subject of extensive U.S. Government reviews in the past five years. Controlling levels of ASIC design, production and use software and technology at levels far below the Chinese domestic capabilities would not serve to inhibit Chinese military development.

Part 3: Encryption

I. List of ECCNs:

5A992: Equipment not controlled by 5A002, except mass market encryption commodities and software described in §§ 742.15(b)(1)(i) and 742.15(b)(2); certain “short-range wireless” commodities and software described in § 742.15(b)(3)(ii); and commodities and software with limited cryptographic functionality described in § 742.15(b)(3)(iii).

5D992: “Information Security” “software” not controlled by 5D002, except mass market encryption commodities and software described in §§ 742.15(b)(1)(i) and 742.15(b)(2); certain “short-range wireless” commodities and software described in § 742.15(b)(3)(ii); and commodities and software with limited cryptographic functionality described in § 742.15(b)(3)(iii).

5E992: "Information Security" "technology", not controlled by 5E002.

Under the proposed new China Policy encryption items currently controlled under ECCNs 5A992, 5D992 and 5E992 only for AT reasons would require a license if going to military end-use as defined in the new China Policy.

II. Chinese Domestic Market and Capabilities

As the U.S. Government is very aware, China has been very active in the development and production of encryption software and technology. The best example of this is through a review of the highly publicized and controversial Chinese Wireless LAN Authentication and Privacy Infrastructure (WAPI) encryption standard. In late 2003, China announced it would implement the WAPI encryption standard for wireless communications. This standard required that only the Chinese developed WAPI compliant encryption would be allowed in wireless devices in China. The WAPI encryption, which was developed wholly in China, was supplied to the following Chinese companies:

- Shenzhen Mingwah Aohan Technology (M&W)
Contact Han Yejin, 13901939911 or hyq@mwcad.com
- Wuxi Jiangnan Computer Technology Research Institute
Chai Yali, 13906195091
- Legend Holdings
Sun Guobin, 13501358051 sungb@lenovo.com
- Shanghai Koal Software
Hu Shihui, 13910396333
- Shenzhen Neusoft
Cao Bin, 13609822978, caob@neusoft.com
- Xingtang International
Huang Degen, 13901325955
- Huawei Technologies
Yao Zhenghui 13823539749 or Lan Wenguang 13560786516
- Chengdu Westone Information Industry Inc.
Lei Limin, 13911083956 lei@westone.com
- Xi'an IWNCOMM Co. Ltd.
Yang Yu 6873-1184 ext. 305
- Shenzhen ZTE
Sun Yingtong 13302478960 (Shenzhen), 13901388960 (Beijing) ytsun@sdic.com.cn
- Beijing Watch Data
Li Yong 13311121068 li-yong@watchdata.com.cn
- Beijing Newsy Technology Group

Zhu Wei 13911775962, zhuwei@newsy.com.cn

- Beijing Skynet
Zhang Feng 13801281673, 010-82357210, fengzhang@skynet.net.cn
- Tianjin Guorui Digital Security System
Li Zhongxian 13501262861(Tianjin), lzx@ncs-cyber.com.cn
- Shanghai Weihao Information Security
Zhu Qi & Chen Yuying, 13301616158(Shanghai), 021-5808-4811
- Langchao Electronics Information Technology Company
Kang Yulu 13606405089, ylkang@langchao.com.cn
- Wuhan Tianyu
Wang Tongyang 13329735912 (Wuhan) wty@whty.com.cn
- Sichuan SCU-NESEC Infosec Co., Ltd
Gong Haipeng 13808019944 (Sichuan) yygong@vip.sina.com.cn
- Beijing Topsec
He Weidong 13901034553, 010-82611122x6818, hwd@topsec.com.cn
- Jilin Information Technologies
Gong Jianping 13911586168(Jilin), jianping_gong@jlt.com.cn
- Yiyang Xintong
Yu Yang 13701138718 010 88129999x8276, Jennifer@boco.com.cn
- Jinan De An Computer Technology
Xue Fengying 13065082718 (Jinan) 0531-8037711
- Hubei Saint
Jin Yunqing 13971656505(Hubei) 027-87528082, jinyq@263.net
- Wuhan Andin
Yu Xianxuan 13707171398 (Wuhan) xxyu@andin.net

Foreign companies would have had to partner with one of the above listed companies in order to have the WAPI encryption placed in their products. In 2004 it became clear that China was not completely ready to implement this standard, so implementation was delayed until June 1, 2004. In a meeting with the Xi'an-based China Broadband Wireless IP Standard Group, which developed the new standard, foreign industry associations and companies learned that WAPI contained a number of problems. The Chinese claimed that WAPI has been remedied security holes in the Wireless Equivalent Privacy (WEP) protocol, which is part of the 802.11 wireless LAN standard. The international community, however, believes WAPI replicates many of the problems already solved for WEP. Multinational companies believe that WAPI would actually be insecure and only create a burden for manufacturers, who will have to meet one standard for China and another for the rest of the world.

III. WAPI

The WAPI situation, even with its implementation problems, demonstrates that China has an active encryption industry that is producing encryption products at an international level.

The list of companies the Chinese certified to implement WAPI encryption provides a view of the extent of Chinese encryption capabilities. As an example, details on one of these companies are provided below:

1. Beijing TOPSEC

Beijing TOPSEC ("TOPSEC") is a leader in the Chinese Network Security Industry. It is the largest domestic integrated provider of information security products and services. Founded in 1995 and headquartered in Beijing, TOPSEC has established three Research and Development centers that are located in Beijing, Wuhan and Chengdu. It also has branches in 32 cities and has over 1000 staff on information security, including R&D professionals, consultants and service staff.

In 1996, TOPSEC launched its firewall product, which was the first set of firewall products with independent copyright in China. After this, TOPSEC introduced security products such as VPN, IDS, filtering gateways, and security auditing and management. In 2001, TOPSEC organized and set up the TOPSEC security standard of interaction protocols, and put forward complete, collaborative, efficient and easy to manage security solutions that feature centralized management and auditing. At the end of 2004, TOPSEC took the lead in bringing forward the concept of Trusted Network Architecture (TNA) in the industry, emphasizing that the trusted security management should be the core of security construction, which included overall security management through multi-layered active recovery and colligated defense.

From 2000 to 2004, TOPSEC was the top Chinese domestic security company by market share. TOPSEC's annual market share of firewall in 2004 exceeded 16%, ranking it first among the domestic and international security companies. Up to now, TOPSEC has over 10,000 customers across the country, covering government, telecommunication, finance, military, energy, traffic, education, logistics, postal service and manufacturing.

As an example of TOPSEC's ability, the following details one their firewall products:

- **NGFW4000-UF (high Firewall):** The NetGuard Firewall 4000-UF is a new generation of firewall products by TOPSEC. The NGFW 4000-UF constructs a secure, efficient, reliable, widely applied, convenient and flexible firewall

system that is especially suitable for Gigabit networks serving as backbones for large or medium size enterprises having complicated structures, rich applications, broad bandwidth and heavy traffic.

Main Characteristics

- Based on an exclusive hardware platform and operating system.
- Implements the session inspection function and performs the access control to the application layer in OS kernel.
- Has at least 7 LAN interfaces, and this number can be extended by a plug-and-play module
- Can work in multiple work modes, including route mode, transparent mode, and route/transparent mode.
- Supports the Net Address Translation (NAT), including dynamic, static, two-way, and reserved mode.
- The route can be configured based on the source and destination addresses. Thus, the firewall can choose a different egress for different internal hosts.
- The source and the action can be bound together to define an access policy in which there are many different sources for the same destination.
- Similar to the central management IP interface of a switch, administrators can manage the firewall via any interface. Meanwhile, all the interfaces in the firewall can be used to route traffic.
- Supports URL filtering, content filtering, and keyword filtering.
- The firewall can be prevented from Ping of Death, TCP SYN floods, TCP/UDP port scan, IP spoof (ARP spoof), route attack (based on ICMP, RIP, or source), DNS spoof, and TCP connection spoof. Real-time monitor and alarm are also available.
- The firewall can be managed via serial port, GUI, and Telnet. All the communication between the manager and the firewall are encrypted by the SSL or SSH mechanism to enhance the security. It supports multiple management modes, including local, remote, and central management.
- Supports the most common used route protocols, such as OSPF, RIP, and RIPII.
- Supports IPX, NETBEUI, VOD, H.323v1/v2, and SSH.
- Supports DHCP and VLAN and can route the traffic between VLANs.
- Supports SNMP to be managed by the third party network management software.
- Can work in hot-redundancy and support STP.
- Supports the OTP Radius, Tacacs, and web-based certification.

Technical Index

Produce Name	Product Type	Throughput	Interface Description
Net Guard Firewall	NGFW4000-UF	1000M	One 10/100/1000BASE-T port, Six GBIC Model, Support Interface Type [SX/LX/ZX/T/AUTO]
	NGFW 4000-UF-VPN(S)	1000M	One 10/100/1000BASE-T port, Six GBIC Model, Support Interface Type [SX/LX/ZX/T/AUTO]
	NGFW 4000-UF-VPN(E)	1000M	One 10/100/1000BASE-T port, Six GBIC Model, Support Interface Type [SX/LX/ZX/T/AUTO]

System Components

- NG FW4000 (UF) (hardware): a high-class communication protection and control system based on secured operation system platform with independent copyright.
- Log Manager (software): a management software operating under systems of Windows 98 and Windows 2000 and being used to perform the visual auditing of visit log information provided by NG FW4000 (UF).

- FW Manager (software): a management software operating under systems of Windows 98 and Windows 2000 and being used to perform central management configuration of a number of NG FW4000 (UF) firewalls distributed in different networks

Hardware Configuration

Electrical Specifications

- a. Power supply: AC 110/220V 50/60HZ, 3.0A (max), 260W (max)
- b. Environment Regulations:

Operating Temperature: 0 - 45 Degrees Centigrade
 Non-operating Temperature: -20 - 65 Degrees Centigrade
 Relative humidity: 10 - 90%@40 Degrees Centigrade, non-condensation

National Standards:

GB/T18336-2001
 GB/T18019-1999
 GB/T18020-1999

Referenced Safety Regulations and Standards:

UL 1950
 EN 41003
 AS/NZS 3260
 AS/NZS 3548 Class A
 CSA Class A
 FCC Class A
 EN 60555-2
 VCCI (ClassB)
 Ability of anti-interference
 IEC 1000 4 2 (ESD)
 IEC 1000 4 3 (Radiation sensitiveness)
 IEC 1000 4 4 (Electric transient)
 IEC 1000 4 5 (Power supply)
 IEC 1000 3 2 (Harmonic)
 IEC 1000 4 5 (Power)

Certificates

- Sales License for Computer Information System Security Products by Ministry of National Security, License Number: XKC33181
- Sales License for Computer Information System Security Products by Ministry of National Security, License Number: XKC33181, number: CNISTEC2002TY1P
- Certificate for Military Information Security Products (0081)

IV. Summary

The WAPI standard and the example of TOPSEC provide an overview of Chinese encryption capabilities. It also demonstrates that China does not seek foreign encryption for its products going to government and military end-users. China repeatedly during the

WAPI discussions expressed its desire to have Chinese produced encryption in all products in China. As can be seen from TOPSEC's certification, it and other Chinese companies are certified to supply encryption products to the Chinese military and security apparatus. The ECWG does not know of any foreign companies certified to supply encryption to government and military organizations in China. The ECWG, therefore, respectfully submits that current licensing requirements and license exceptions already fulfill U.S. policy requirements for preventing material contributions to Chinese military capabilities.

CHAPTER IV

Information Security and Telecommunications (II): Telecom Equipment, Test Equipment, and Software

I. List of ECCNs:

5A991: Limited to items controlled by 5A991.a., 5A991.b.5., 5A991.b.7. and 5A991.f.

5B991: Telecommunications test equipment, n.e.s.

5D991: "Software" specially designed or modified for the "development", "production", or "use" of equipment controlled by 5A991 and 5B991.

5E991: "Technology" for the "development", "production" or "use" of equipment controlled by 5A991 or 5B991, or "software" controlled by 5D991, and other "technologies" as follows (see List of Items Controlled).

Telecommunication systems, equipment and components currently require an export license to China as defined in ECCN 5A001, and the software and technology related to 5A001 is controlled under ECCNs 5D001 and 5E001. Under the Proposed Rule license requirements would be expanded to 5A991, 5D991 and 5E991 for items going to a military end-use as defined in the draft proposal.

The Proposed Rule also adds controls to items falling under ECCN 5B991, which includes *all* telecommunications equipment without any listed exceptions. The inclusion of all "telecommunications test equipment, n.e.s." under ECCN 5B991 is very broad in its coverage. As it stands, this section does not distinguish between the layers and technical levels within the telecommunications and information network testing equipment.

II. Overall China Market

As China's economy continues to grow, the domestic commercial demand for electronic network and telecommunications measurement and testing instruments is on the rise. In particular, development and growth of the mobile phone and telecom network providers, emergency response infrastructure, wireless LAN networks, and digital TV and communications markets is opening opportunities for both foreign and domestic Chinese companies in the Chinese non-destructive test equipment industry.

In 2005, China's Ministry of Information Industry (MII), the Chinese government regulator for the telecommunications industry, projected that Chinese telecom carriers will invest \$25 billion to recruit 45 million fixed line telephone subscribers and 58 million cellular phone users.¹⁶

China's two mobile operators, China Mobile and China Unicom, will continue to expand their mobile networks in 2005. This expansion will increase their demand for base stations, switches and network optimization solutions. Chinese fixed line telecom operators, China Telecom, China Netcom and China Tie Tong, also plan to expand their wireless LAN networks, ADSL and other broadband access technologies in China.

Chinese telecom equipment manufacturers such as Huawei Technologies and ZTE are rapidly growing their market share in China and turning to South American, Southeast Asian and African countries for international business opportunities. These Chinese companies are increasing their business in the telecommunications equipment business, which was previously dominated by foreign companies. For more information on these telecom equipment companies, refer to Chapter III of this report.

With increasing awareness of the importance of government's ability to manage critical situations, there is a growing demand for emergency response systems in China. China has not yet developed a national technical standard for its emergency response system, but large Chinese cities such as Beijing, Tianjin, Nanning and Chengdu have started building public safety networks by introducing TETRA-based digital trunking systems that integrate with their existing analogue systems. More Chinese cities will follow in 2005.¹⁷

With the expansion of Chinese telecom equipment manufacturers, telecom carriers, and emergency response systems, Chinese companies will require more and more testing equipment to ensure maximum efficiency in these networks. Continued growth in this industry sector will fuel greater demand for telecommunication and network testing equipment.

III. Chinese Domestic Availability

The market data in China demonstrates that a large number of Chinese companies have achieved development and production capability in telecommunications equipment, testing equipment across technology layers, and software and related technology.

¹⁶ U.S. Commercial Service, "Computers and Telecommunications: Industry Overview Telecommunications," <<http://www.buyusa.gov/china/en/computers.html>> Oct 2006.

¹⁷ Ibid and Nokia Press Release, "Nokia and Beijing Just Top to build Beijing's government shared TETRA network for use during the 2008 Olympics." April 2003. <http://press.nokia.com/PR/200304/897510_5.html> Nov 2006.

A. Telecommunications Systems and Equipment

Chinese companies indigenously develop and produce equipment in the application, datalink and physical layers of technology. Huawei and ZTE are two examples of domestic Chinese companies that produce telecommunications systems and equipment, but these two companies also produce some testing equipment.

1. Huawei Technologies (Huawei)

Huawei Technologies (Huawei) is a leader in providing next generation telecommunications networks. The company provides innovative and customized products, services and solutions to create long-term value and potential growth for its customers. They have numerous products that compete at or near cutting edge western technology levels. Following is a sampling of some these top end products. A detailed specification sheet for each product is attached in Attachment B.

- Quidway S8500 Series 10G Multi-Service Core Routing Switch
- Quidway NetEngine 5000E Core Router
- Viewpoint 8210
- SmartAX MA5200F-2000 Broadband IP Access Equipment
- OptiX Metro 5000 Optical Transmission Equipment
- Eudemon 1000/500/200/100

In the Telecom Attachment there are detailed specifications of this equipment.

Additionally, Huawei has partnered with numerous foreign companies as customers and as strategic partners. A partial list of these partners includes:

- | | |
|----------------------------|-------------|
| • IBM | • HP |
| • Hay Group | • Inspur |
| • Price Waterhouse Coopers | • Metasolv |
| • FhG | • Micromuse |
| • Mercer | • Vallent |
| • Agere Systems | |
| • Intel | |
| • Motorola | |
| • Sun Microsystems | |
| • Qualcomm | |
| • Microsoft | |
| • Infineon | |
| • Siemens | |
| • 3Com | |
| • OSS Partners | |
| • BMC | |
| • Cramer | |

2. ZTE

ZTE was founded in 1985, with global headquarters in Shenzhen China, and has operations in more than 100 countries. ZTE has a complete telecommunications product line, covering every vertical sector of the wireline, wireless and terminal markets. It has an independent R&D capability and is capable of developing and producing market-leading, first-class technologies in wireless, switching, access, optical transmission, data, handsets and telecommunications software.

ZTE commits around 10% of its annual revenue to research and development and takes a leading role in a wide range of international bodies developing emerging telecoms standards. ZTE is the fastest growing telecom equipment supplier in the world, and China's only listed telecom manufacturer, with shares publicly traded on both the Hong Kong and Shenzhen Stock Exchange. In 2005, ZTE had sales revenue of RMB 21.5 billion and 27,000 employees worldwide.

ZTE was ranked as one of the 'Top 100 Information Technology Companies' by *Business Week* in 2005 and has teamed up with numerous global telecom companies, such as Alcatel, Ericsson, France Telecom and Portugal Telecom. It is China's largest wireless equipment provider with a global wireless capacity exceeding 100 million lines and has become one of the three largest DSLAM suppliers worldwide (*Source: Gartner*)

A sampling of their top of the line products includes:

- ZXJ10 Series Switches
- ZXR10 W800A Wireless Access
- ZXR10 T1200 Carrier Class Router

The Telecom Attachment contains the technical specifications for these products.

B. Telecommunications Testing Equipment

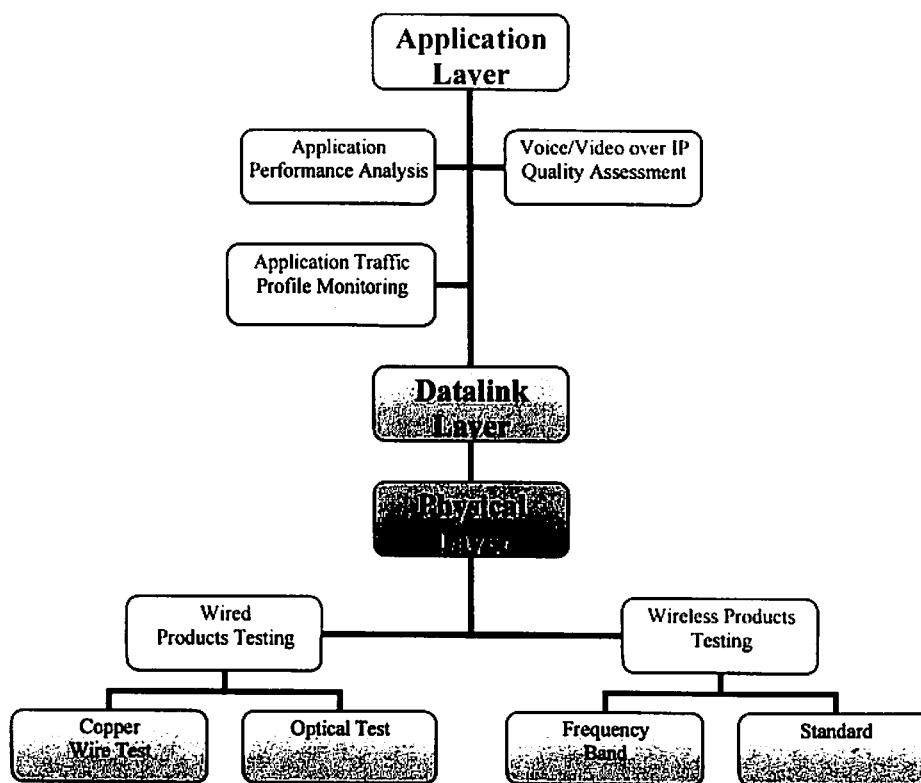
One testing device is difficult to compare against another device because each instrument may provide a single function in one device or a system of testing functions packaged in one device. Different companies package their technology in different systems and in various combinations. Each instrument may contain a number of different combinations of these functions. Furthermore, the technical level of each component may vary from one instrument to another.

Recognizing the difficulties in comparing non-destructive testing equipment, this chapter instead addresses the technology for the various equipment types

based on the breadth of functionality. In this way the report identifies the capabilities inherently available in China based on technical ability as opposed to based on configuration.

Telecommunications and Information Network Testing Equipment can be divided into three levels: the application layer, the datalink layer and the physical layer. The physical layer describes the medium through which communication signals are carried from the source to the destination (i.e. cable, airwave, etc.). The datalink layer describes the way that the communication signal is placed on the physical layer (i.e. GSM, 3G, FrameRelay, Ethernet, etc.), and the application layer describes the actual data exchange between various components of the communication system (i.e. VoIP, Video, ERP data, etc.). China has developed the technology to perform testing functions at all three of these levels. The chart below maps out these layers and their sub-categories in a simplified manner:

Figure 1: Telecommunications and Information Network Testing Technology Layers



The market data shows that a number of Chinese companies have the capability to produce telecommunications test equipment at various layers of the information network and telecommunications system. These Chinese

companies are reaching a technical capability on par with the technology that is commercially available through other foreign sources.

Application layer testing includes three sub-categories: application profile monitoring, application performance analysis, and voice/video over internet protocol (VoIP) quality analysis. Key advanced technology used in the application layer analysis include: NetFlow, response Time measurement, and R-Factor/PSQM measurement for Voice and Video quality assessment. Zhong Chuang, Well Telecom, and the 41st Institute are examples of companies that have the technology to produce testing equipment in these categories of application layer testing.

Zhong Chuang, Well Telecom, the 41st Institute, and Shaanxi Guigu Telecommunications Equipment Co., Ltd. produce equipment at the datalink layer. Finally, Zhong Chuang, the 41st Institute Shaanxi Guigu, Shandong Senter, and Shineway Technologies can all produce equipment at the physical layer.

1. Beijing Zhong Chuang Telecom Test Co., Ltd. (ZCTT)

Beijing Zhong Chuang Telecom Test Co., Ltd. (ZCTT) was established in 1995 and went public in 2003. ZCTT is a high-tech enterprise that specializes in the R&D, production, and marketing of communications testing equipment. ZCTT customizes its products for telecom carriers, distributors, service suppliers and component manufacturers. High investment in technology research and scientific innovation has put ZCTT among the top Chinese manufacturers, with high level testing equipment for both domestic and international markets. At the end of 2005, ZCTT purchased the Chinese company Well Telecom. Information about Well Telecom is included below the description of ZCTT products, but now these products, formerly made by Well Telecom, belong to ZCTT.

- **NetPecker-3G Network Test Instrument:** NetPecker-3G network test instrument, produced by Zhong Chuang Telecom Test Co. Ltd., is designed for monitoring, maintaining and optimizing UMTS network, network equipments and standard network interfaces. Built on highly efficient platform with mature technology, NetPecker-3G supports a wide range of protocols such as UMTS R99, R4, R5, GPRS, GSM, and TD-SCDMA, etc. It can simultaneously monitor all interfaces of lu, lub, and lur. It provides flexible options for users to edit protocol stack and configure interface modules to simultaneously monitor multi-layer protocols on different interfaces. It supports all 3G-protocol analysis, call loss analysis, call trace, multi-interface correlation analysis, standard index statistics, etc.

Detailed technical specifications for this product are included below:

Electric Interface

Interface type	No. of interfaces	Speed	Frame Structure	Encoding	Synchronous Mechanism	Standard
E1 Electric interface (2Mbit/s)	Rx: 8 Tx: 4	2.048MHz \pm 50ppm (TX), 2.048MHz \pm 50ppm (RX)	PCM30, PCM31, PCM31CRC and unframe	HDB3, AMI	Internal clock, circuit resumes, SETS	Comply with ITU-T G.703, G.704, G.706 and G.823 protocols
T1 interface	Rx: 8 Tx: 4	1.544Mbit/s Nx2.048Mbps (N=1-8), n X 64kbps	IMA cell flow	B8ZS, AMI		Comply with ITU-T G.703, G.704, G.706 and G.823 protocols

STM-1/OC3

Optical interface module	Interface rate: 155.520Mbps
	Tx optical power: -5~0dBm
	Rx optical power sensitivity: -37dBm
	Wavelength: 850nm/1310nm/1550nm (changeable)
	Mode: Single mold (SM) / multiple mold (changeable)
	Interface type: (LC)

- NetPecker-NGN Next Generation Network Tester:** NetPecker-NGN network composite tester is developed by ZCTT as the comprehensive simulation, monitoring, network maintenance and network optimization tools designed specifically for various major telecom operators, soft switch network equipment manufacturers, and R & D institutions. This tester provides a full NGN network test implementation solution, which can meet current NGN network maintenance demands and meet demands for the future network development trends.

Detailed specifications for this product are included below:

Specifications

Software technical specification

1. Protocols

MGC Protocol, H.248/MEGACO protocol, SIP protocol, SIP-T/SIP-I protocol, BICC protocol, SIGTRAN protocol, ISUP protocol, SCTP protocol and RTP/RTCP protocols

2. Tester-supported coding modes include:

G.711, G.721, G.722, G.723, G.723.1, G.726, G.728, G.729AB, PCMU, PCMA

Hardware technical specification

1. Network interfaces

※ 10/100M Base-T Ethernet interface

※ 75/120 Ohm compatible E1 acquisition interface

※ Analogue line interface

※ Time stamp accuracy: 100ns

2. Physical property

Work power supply: AC simulation 220V \pm 10%, 48Hz-networkHz

Work temperature: -10°C ~ +45°C

Storage temperature: -20°C ~ +70°C

Reliability: MTBF is greater than 30,000 hours

Processing capacity: 10M/100M line speed capture

- **NetCompass-SS7 No.7 Signaling Network Centralized Monitoring System:** NetCompass-SS7 is composed of a front-end acquisition computer, remote station, central station and WAN. The system adopts the distributed modular monitoring acquisition, distributed analytical processing and centralized monitoring & maintenance, which guarantees the system's high reliability, expandability, openness and safety, and also ensures the system has no bottleneck when transferring and processing data. The signaling acquisition module, access hardware module and system application software modules of NetCompass-SS7 signaling network centralized monitoring system are developed originally by ZCTT to enable future upgrading and maintenance. The system has won State Science & Technology Progress Second Class Award.

Function and Specification details for this product are included below:

Functions

The main functions of NetCompass-SS7 monitoring system include:

- **Whole network fault alarm monitoring function:** Monitor signaling link network alarm messages and inform maintenance staffs by automatic, accurate and timely alarm information according to the preset alarm thresholds;
- **Network performance analysis:** Statistical analysis of signaling network link and link-set performance indicators such as loading etc;
- **The entire process online real-time tests:** Implement call tracing function, signaling link real-time test function and etc;
- **Call service analysis:** Implement statistical analysis of inter-network and on-net call service completing rate, call duration and call loss etc;
- **Intelligent network analysis:** implement various sorts of analysis based on Intelligent network in order to carry out intelligent network service quality monitoring, and call tracing for intelligent calls and

statistical analysis of intelligent service traffic. It also offers analytical functions for intelligent network voice traffic billing information and master service economic benefit.

- **GSM/CDMA mobile service analysis:** Implement statistical analytical functions for various indicators such as mobile service, SMS service, wireless network optimization etc;
- **The system maintenance and configuration management:**
The system provides perfect self-management, authority hierarchy management and log management functions, record self alarm and fault information and is able to acquire the operation status of various equipments via system monitoring views so as to analyze self-stability. The system's module-level authority hierarchy controlling could limit each operating staff to specific modules. Perfect log management function can record system utilization and operation information.

Technical Indicators

System supports 256 remote stations, 65536 test links and 128 operation & maintenance terminals

Signaling synthesizing call accuracy: 99.99%; Signal element loss rate: $<10^{-7}$

Support GPS and BITS synchronization modes as well as NTP network synchronization mode, synchronization accuracy: Millisecond

System sets subscriber competence and passwords for guaranteeing system safe operation.

2. Well Telecom

Zhong Chuang Telecom Test Co., Ltd. invested 42.5 million RMB to purchase 100% of the stockholders' rights to Well Telecom. After December 31, 2005, Well Telecom became a subsidiary of ZCTT, which greatly reduced ZCTT's domestic competition in the field and increased its market share.¹⁸

Beijing Well Telecom Technology Corporation was a high-tech enterprise focused on the development and production of equipment for telecom network testing and maintenance. At its peak, Well Telecom employed 150 people, including 110 technical specialists in the fields of telecommunications and computers.

Well Telecom independently developed and patented technology in key telecom fields including: access networks, intelligent networks, mobile networks, IP networks and data networks. Well Telecom's products, such as WTF2000 Analyzer and SS7Mon Monitoring System, are widely used by large Chinese telecom carriers.

Two examples of Well Telecom's network testing equipment are included below:

- **WTF4000-VOIP Integration Analyzer:** WTF4000-VoIP Integration Analyzer was designed according to Chinese IP telephone technique and IP telephone gateway interconnecting technique criterion and TCP/IP, ITU-T protocol standard. This analyzer adopts specific packet capture and filter to confirm data security in full load network bandwidth testing. It support IP, H323 series protocol and suitable for operation, O&M, troubleshooting and status analysis of IP network.

Technical parameter

Work power source: Exchanges 220V \pm 10%, 48Hz-66Hz
Operating temperature: -10 °C ~ +45 °C
Memory temperature: -20 °C ~ +70 °C
Reliability: MTBF is bigger than for 20,000 hours
Test connection: 10M/100M Ethernet
Handling ability: 10M/100M line fast capture
When stamp precision: 100ns

Instrument arrangement

Main processor: PIV2.4, the 512M memory, the 80G hard disk
System software: Chinese Windows 2,000
Test module: 10/100M auto-adapted Ethernet card
The E1 data acquisition card (optional)

¹⁸ 中国易富网, "中创信测: 业绩回归 中短线关注" 20 Oct 2006.

<<http://www.eefoo.com/xxzyContent/2006/1020/200610205144.asp>> Nov 2006; and Sohu.com Inc., "中创信测 4250 万元收购沃泰丰," 30 Mar 2006, <<http://business.sohu.com/20060330/n242556251.shtml>> Nov 2006.

The SS7 letter command gathers the card (optional)

- **IP Integrated Digital Network Analyzer:** This integrated network analyzer uses advanced industry standard module designs, and operates on a Windows 2000-based platform. The analyzer monitors various characteristics of the network in real time including: network security, current capacity, performance, etc. It is suitable for large and medium enterprise network tests.

Technical parameter

Work power source: Exchanges 220V ± 10%, 48Hz-66Hz

Operating temperature: -10 °C ~ + 45 °C

Memory temperature: -20 °C ~ + 70 °C

Reliability: MTBF is bigger than for 20,000 hours

Test connection: 10M/100M Ethernet

Handling ability: 10M/100M line fast capture

When stamp precision: 100ns

Instrument arrangement

Main processor: PIV 2.4, the 512M memory, the 80G hard disk

System software: Chinese Windows 2.000

Test module: 10/100M auto-adapted Ethernet card

The E1 data acquisition card (optional)

The SS7 letter command gathers the card (optional)

3. The 41st Institute of China Electronic Technology Group Corporation (41st Institute)

The 41st Institute of China Electronic Technology Group Corporation (41st Institute) was formerly a professional electronic measurement instrument institute under the Ministry of Information Industry (MII) in the national defense industry. The 41st Institute describes its business scope as the research, advanced design, testing, and production of electronic measurement instruments, automatic measuring systems and various applied electronic products.

Products developed and manufactured by the 41st Institute are rated at a high technology level for both military and commercial end-users. According to an interview with the institute, products are indigenously researched and developed in-house. The institute has received numerous patents and national awards for its products.

Of the more than 300 items that the 41st Institute researched and developed during the Eighth and Ninth Five-Year Plans, about 100 were military products and about 200 were civilian products. Four items won national awards and about 60 items won ministerial and provincial science and technology progress awards. Some products have been put into mass production and widely applied to such top-end fields as microwave, millimeter wave, optical fiber, digital communications and radar, satellite and electronic warfare in national defense, research, communications and educational industries. The 41st Institute has reached the international

advanced level in many of these products and has won a number of international bids for testing instruments of optical fiber communication trunk.

While the institute has engaged in many Chinese government and military projects, it has also achieved success in the development of civilian products. It has developed such pillar products as electronic testing instrument, incubation equipment, communications equipment, car washing equipment, fire alarm system and cigarette control system, and undertaken various electronic system projects in industrial automation control and electronic technical application, combining military products with civilian products and achieving notable results.

Several examples of the commercial 41st Institute products are included below:

- **AV5211 Ethernet Analyzer:** The AV5211 Ethernet analyzer is a basic network analyzing system to test local area networks. It is used in network and network equipment R&D, production, approval, and service. The AV5211 analyzes performance, current capacity, protocol and compatibility.
- **AV5271 ATM Analyzer:** Portable and modular-structured, AV5271 ATM analyzer has physical interfaces including dual-path E1, E3, STM-1 electrical or STM-1 optical. The analyzer is capable of ATM service simulation, network damage simulation, GCRA service restoration and test, O.191 QoS test, cell filter and acquisition, UNI/NNI protocol decode and comprehensive physical layer error code and alarm test. It can be applied in R&D of ATM equipment, building, operation and maintenance of ATM network.
- **AV5237 Telecom / Datacom Analyzer:** The AV5237 Telecom/Datacom Analyzer combines a telecom analyzer and a datacom analyzer for use in telecom and datacom test at rates from 50b/s to 2Mb/s. It has multi-interface capability, can be configured as a DCE or a DTE and has a wide range of rates, carrying out transmission capability test, function test, electrical parameter test and CAS monitor. Measurement parameter: Error, Error Performance Analysis, slips, alarms, interval monitoring, 64kb/s Channel frequency and level, circular delay, duplication, duplication release and signal command. The AV5237 can carry out PCM transmission testing at sub-64kb/s, 64kb/s, N*64kb/s, 2.048Mb/s. It also provides datacom testing at rates from 50b/s up to 2Mb/s. The test set is used in development and production of communication, installation, authentication, operation and maintenance of telecommunication network.
- **AV5232E Bit Error Ratio Tester:** The AV5232E Bit Error Ratio Tester is used in the error measurement and error performance analysis for 50b/s~2Mb/s data communication and 2Mb/s, 8Mb/s telecommunication systems. The measurement and analysis conforms to ITU-T G.703, G.151, G.821 recommendation. It is used in the digital/data communication networks and the development, production, construction, maintenance of the communication equipment.

4. Shaanxi Guigu Telecommunications Equipment Co., Ltd.

The Shaanxi Guigu Telecommunications Equipment Co., Ltd., established in Xi'an city in 1993, is a high-technology enterprise focused on the scientific research, production, and sale of network maintenance and test equipment. Shaanxi Guigu has engaged in technical cooperation with Chinese universities and scientific research institutes, such as the Quantitative Measurement Center of the Ministry of Information Industry, Xi'an Jiaotong University, Xidian University (XDU), Northwestern Polytechnic University, Xi'an Institute of Posts & Telecoms, Datang Telecom, and Photomechanical Institute. This cooperation has increase the quality and innovation of Guigu's product R&D.

- **SGT-8B Telecommunication Cable Fault Tester:** Adopted with the advanced international electron measuring technique, and the integration of pulse-reflection principle, intellectual electric-bridge testing principle and advanced single chip technique. SGT-8B tester is applicable to the pinpointing position of line disconnection, mingled-crossed line, the faults of electric, defective insulation and other faults of all the city cables, HF cables and coaxial cables. It plays a very important role in line maintenance and construction carried out by telecom departments.

Technical Specifications

Pulse-reflection testing method:

- * Fully-automatic measuring range: 0~8km
- * Measurement accuracy:
1m when measuring range is less than 2km
8m when measuring range is more than 2km
- * Blind zone test: 0m
- * Pulse width: 60ns-10 μ s self-adjustment

Electric bridge testing method:

- * Test defective-insulation resistance, range of 0~30M Ω
- * Testing length: 9999m (non-segmented); 9999m \times 3 segment, segmented
- * Testing error: 1% \times whole-line length
- * Possess the functions of megohm meter and ohmic meter
- * Power consumption: 2.5W
- * Volume: 240 \times 160 \times 160mm
- * Weight: 2Kg
- * Operation Ambient temperature: -15 $^{\circ}$ C~-50 $^{\circ}$ C

- **SGT-4C Optical Power Meter:** SGT-4C Optical Power Meter, primarily used for measurement the power of continuous light signal, is controlled by the SCM microprocessor. It is applicable extensively to the construction and maintenance of the optic cable, fiber optic correspondence, fiber optic transducer and the field of fiber-optic CATV etc. SGT-4C optical power meter adopt advanced cooled mold craft mold, beautiful and durable.

Parameter	Unit	Technique index			
Type		SGT-4C01	SGT-4C02	SGT-4C03	SGT-4C04
Detector type		InGaAs			

Wavelength range	nm	1600~1700			800~1700
Work wavelength	nm	1300, 1310, 1480, 1550			850, 1300, 1310, 1480, 1550
Measure range	dBm	-70~-10	-50~-20	-50~-30	-70~-10
	W	0.1nW~10mW	10nW~100mW	10nW~1W	0.1nW~10mW
Measure accuracy		±5%			
Optic interface		FC, ST, SC adapter			
Resolution		dBm:0.01dBm W:(0.1~1)%			
Power supply		9V × 1 the charged battery, extra power supply			
Power	mW	30 mW			
Operating temperature	℃	0~+40			
Storage temperature	℃	-40~+70			
Size (L×W×H)	mm	30×80×170			
Weight	Kg	0.25			

- MPT2000E CDMA Protocol Analyzer:** MPT-2000E is a high-performance signaling analyzer which is specially used in installation, maintenance, fault diagnosis for telecommunication signaling network and equipments; it can provide a comprehensive inspection function for SS7, ISDN, V5.x, X.25 in wire & wireless signaling network; and it can also be used to check fixed network, cut-in network, GSM network of signaling and verification of new business opening (such as AIN) and other fields. MPT-2000E is designed to be a signaling analyzer system of multi-homing (32 signaling link), multi-protocol (can analyze several protocols at one time). The inspected links support various speed links on E1 interface, which includes 2M high speed signaling link, 64K signaling link, 32K signaling link, 16K signaling link, 8K signaling link and others. The second layer protocol supports MTP and LAPD signal; while the specific high layer application protocol consists of SS7, and especially protocols of IN, GSM, CDMA, GPRS and AN network.

5. Senter Electronic Co., Ltd.

The Senter Electronic Co., Ltd. develops, manufactures and distributes communication maintenance and testing instruments and systems. The company is located in the Zibo New High-Technology Area of Shandong Province. Senter was established in 1996 and approved as a High-Tech enterprise in 1999.

In 2002, Senter built a postdoctoral scientific research workstation for more advanced technology projects. In the domestic market, Senter's main customers are China Telecom, China Mobile and China Union, while in the international market Senter provides test equipment for telecom companies in the UK, India, Thailand, Malaysia and other South Asian countries. Below is a non-comprehensive list of Senter telecom testing equipment:

- **ST330 xDSL Tester:** This ST330 xDSL Tester can perform xDSL, LAN, and DMM Test, as well as Modem Emulation and File Management. xDSL tests include physical layer test, Modem parameter setting, PPPoE attribute, PPPoE dial, network layer test (Ping, Ipconfig, Route, Tracert), loopback test, webpage browsing function. LAN Test: Test Ethernet including netcard attribute, PPPoE attribute, PPPoE dial, network layer test (Ping, Ipconfig, Route, Tracert), webpage browsing, fixative IP scanning, Ftp Client and webpage speed test. DMM Test: Test xDSL line physical layer parameters including loop resistance, capacitance, insulation resistance and voltage. Modem Emulation: Emulate users Modem. File management includes saving records, browsing records, memory key storage and file transmission.

Functions & Specifications

- * Test ASL2+ Transmit parameters, also supporting ADSL, ADSL2 and READSL.
- * DSL line self-identification connection
- * Link and browse webpage to validate network connection.
- * TFT true color LCD with touch screen & Windows interface.
- * Support memory key, mouse and keyboard through USB port.
- * Can be used as ADSL2+ Modem.
- * Windows network test function (Tracert, Ipconfig, and etc)
- * 20 memory capacity to save records & exchange data through Memory key and LAN.
- * Maximal att. distance: 6.5 Km
- * Emulate PC to make dialing test
- * Emulate PC to ping IP address or make domain test
- * Emulate PC to browse webpage
- * Emulate FTP client
- * Test webpage speed by emulating user's PC
- * Track connection path from tester to remote computer or IP address(Tracert)
- * Display IP route list(Route)
- * Display current TCP/IP configuration and refresh DHCP & DNS(Ipconfig)
- * Software upgrading through Memory key or LAN
- * Test physical layer parameters (DMM)
 - AC & DC voltage: 0~400V
 - Loop resistance: 0~20000Ω
 - Capacitance: 0~1000nF
 - Insulation resistance: 0~50MΩ
- * Test ADSL2+ transmission parameters
 - ADSL2+ attenuation: 0~63.5dB
 - ADSL2+ noise margin: 0~32dB
 - ADSL2+ Upstream channel rate: 0~1.2Mbps
 - ADSL2+ Downstream channel rate: 0~24Mbps
 - DMT sub channel bit number: 0~15 (frequency points on different sub channel)
 - ADSL2+ Error number(CRC, HEC, FEC, NCD, OCD)
 - ADSL2+ local output power
 - ADSL2+ status: Signal loss, connection close.
- * Dimension: 166mm×126mm×50mm
- * Battery: Chargeable 2100mAH Li- battery
- * ADSL2+ standards: ITU G.994.1 (G.hs) , ITU G. 992.5, ITU G.992.5 Annex L, Compatible with ADSL, ADSL and READSL.

• **ST321 Network Tester:**

Functions

Wiring Diagram Test to Validate Cable Link Consequence,
 Network Layer Test,
 Cable Length Test, Maximal Distance 150m
 PPPoE Dialing
 DMM Test
 Touching Screen
 System Software Upgrade

Parameters

Test ports	Network layer test RJ45 Physical layer test RJ45
Test cable type	4 pairs non-shield cables & 4 pairs shield cables. (Includes CAT5, CAT5E, CAT6)
The max test distance	150m
DMM Test	
AC & DC voltage (V)	0~400
Loop resistance(Ω)	0~20000
Capacitance (nF)	0~1000
Insulation resistance (M Ω)	0~50
OTHER PARAMETERS	
Memory capacity	20 M
Display	240*320 LCT, touch screen, Windows interface
Power Supply	External: From adapter, 9.6V DC Internal: Rechargeable 2100mAh Li-ion battery
Battery Duration	2h (except Modem status)
Dimension/Weight	166mm*126mm*50mm/0.7kg (With battery)

• **ST230 Line Tester:**

Functions & Features

FSK/DTMF compatibility
 DTMF meets GB/T15279-94
 Dialing number display, caller ID display
 Checking wire pairs function
 Low voltage warning, auto power off and energy-save design
 Compact & simple

Specifications

- * DC voltage: range: 0~260V, error: $\pm 5\%$.
- * Insulation test range: 0~40M Ω display in two levels
- * Ring up user distance: ≤ 2 Km
- * Line break test distance: ≤ 2 Km
- * Monitor resistance: ≥ 1 M Ω
- * Incoming telephone number display is compatible with FSK/DTMF
- * Dialing index meets GB/T15279-94 standard
- * Battery: Chargeable 9V Ni-Mh battery
- * Dimension (mm) : 232*73*95
- * Weight: 0.5Kg

- **ST820 Fiber ID:** With safe and credible Great curve tech ST820 Optical Fiber Identifier could identify transmission directions without interrupting service and cutting fiber. The measure signal will not affect the normal signal because of low loss. And it can also test the speed with help of comparison light. There are

5 grades indication for identified signal and comparison light signal. It is very useful for proper core line choosing in field cutover and construction.

Specifications

- * Available wavelength range: 800 ~ 1700nm
 - * Available signal type: CW, 270Hz±5%, 1KHz±5%, 2KHz±5%
 - * Detector: InGaAs (photosensitive interface: 1mm, 2pcs)
 - * Sensitivity: -38dBm (@1550nm, bare fiber)
 - * Insert loss (1550nm): Φ250μm: 1.0dB; Φ900μm: 0.5dB; Φ3mm: 0.5dB;
 - * Adapter: Φ250μm for bare fiber; Φ900μm for tight tube fiber; Φ3mm for tail fiber
 - * Communication signal indications: Direction + discontinuous buzzer + intensity indicator light
 - * Comparison light indication: Direction + Frequency + Discontinuous buzzer + Intensity indicator light
 - * Signal Intensity indication: 5 grades LED indication
 - * Continuous working time: > 4 hours
 - * Working temperature: 0 ~ 40 °C
 - * Storage temperature: -20 ~ 60 °C
 - * Relative humidity: 0 ~ 95%
 - * Dimension: 160mm×35mm×30mm
 - * Weight: 200g
- **ST801 Optical Power Multimeter:** ST801 Optical Power Multi Meter combines the functions of a laser source and an optical power meter. The inner dual working wavelength of 1310nm and 1550nm wavelength assures the functions of stable laser source and optical power meter. It can realize the absolute & relative power test and optical loss test. It can be used for tasks in optical telecommunication, CATV, lab project development, etc.

Optical power meter module parameters

- * Wavelength range: 800 ~ 1600 nm
- * Detector type: InGaAs
- * Optical power test range: -45 ~ +25dBm, optional -70 ~ +3dBm
- * Uncertainty: ±5%
- * Resolution: linearity display 0.1%, logarithm display 0.01dBm

Laser source module parameters

- * Emitter type: Fabry_Perot LD
- * Dual wavelength switch: 1310±20nm, 1550±20nm
- * Spectral line width: ≤5nm
- * Output optical power: ≥-7 dBm
- * Output power stability degree: short time: ≤±0.05dB/15min, long time: ≤±0.1dB/8h

Other parameters

- * Low voltage indication: Voltage is lower than 7.2V
- * Auto shut off time: 6min
- * Battery working duration: 2h (laser source and power meter are both on); 8h (Only optical power meter on)
- * Battery: 9V/160mAh
- * Working temperature: 0 °C ~ 40 °C
- * Storage temperature: -10 °C ~ +60 °C

- * Weight: 0.2Kg
- * Dimension: 160mm×76 mm×28 mm

6. *Shineway Technologies, Inc.*

Shineway Technologies, Inc. was established 2000 to develop and manufacture advanced products and solutions in optical communications network testing and maintenance. Shineway also creates custom-built equipment for customers with specific requirements. Shineway's primary customers are telecommunication and network carriers around the world.

Below is one example of a Shineway product:

- **OPT-x/1x/2x:** The Shineway Tech OPM-X/1x/2x optical power meters are compact, lightweight and easy-to-use testing instruments for optical fiber network, with unique characteristics of quick testing. The pocket-size OPM series can support accurate testing of single mode and multimode optical fiber systems, with features of large LCD display, damp and shock proof design and dual-way powering system. The internal microprocessor and linear amplifier technology ensure the long-time accuracy. The wavelength range of OPM series covers from 633nm to 1625. And the measurement power range is from +27dBm to -70dBm. OPM-21/25 has a large memory capacity of 3200 records and can transfer the measurement data to a PC for editing and printing.

C. Software Telecommunications and Telecom Test Equipment

Beta Networks and Uniware are examples of Chinese software companies that offer Network Monitoring Solutions, which provide systems to cover the monitoring of application performance as well as communication network system performance. These companies provide products that retrieve information from the network/telecom equipment database and also, through its software agents, stores the data on servers, PCs and other network equipment that provide the measurement, making this equipment a cross between telecom equipment, software and testing equipment.

1. *Beta Networks*

Beta Networks is a high technology enterprise dedicated to the field of computer network monitoring, network analysis and management, and product R&D. These products are used by a broad spectrum of enterprises, universities and bureaus in industries including: electric power, finance, politics, public security, and others. Beta Networks provides high level IT products based on indigenous research and development. These products can be customized according to the requirements of the consumer.

Beta Networks offers network analysis and management systems within the following three product families:

- **Before Trouble Network Manager (BT NM):** The BT NM is an indigenously developed network management system from Beta Network. This Chinese network management system uses the most advanced network management technology to manage and maintain the servers, routers, telecom equipment, and computers on a day to day basis.
- **Beta SFlow:** BT SFlow Analysis is a data analysis and early warning software system that is based on the RFC-3176 international standard. This product is designed to integrate with equipment from the U.S. Foundry company, which is based upon the same standard. It can provide real-time analysis and the early warning about detected problems in the network data stream.
- **Beta NetFlow:** BT Netflow Analysis is the Netflow data stream network real-time data analysis and early warning software. This system is integrated with a Cisco Corporation router or high end layer 3 routing switches. Using this technology, network users can obtain real-time analysis data on the second to the forth network, and at the same time ensure network security.

2. *Uniware Co., Ltd.*

Uniware is China's leading provider of Infrastructure network operation management and value-added software. Established in July 1999, Uniware provides specialty software systems and total software solutions as well as relevant technical support and services to expand the operations, maintenance and value-added business of telecommunications and Internet operators. Uniware products are designed to meet the needs of these operators and the users of these networks in basic communications networks and data networks.

Uniware was built upon the research base of the Beijing University of Aeronautics and Astronautics (Beihang University). The company's R&D center receives support from this National University and the National Laboratory of Software Development. This R&D center is dedicated to the research and development of high computer technology, specifically basic and application software for advanced network environments.

Uniware has the only Chinese domestic software production platform, which is oriented towards specialty fields. This platform can ensure the quality and efficiency of software production and is able to mass-produce network operation management software. One of Uniware's software products, produced under the subdivision name "eUniVision," is detailed below:

- **eUniVision Network Management System Software:** eUniVision is software product line for network management systems. This new generation of products aimed at computer network enterprises takes the eUniVision telecommunication level network management system innovation and applies it to the network management system and platform, which is based on SNMP protocol. It can manage any SNMP-based network equipment. This product supports automatic network analysis of performance and safety, and monitors common network

service and status of the application system. Customers for this line of products includes: large scale enterprises, governmental bodies, schools and universities, telecommunications companies, and any other organizations that employ a network facility. Each customer can select different functions for the system to customize and optimize the products for the customer's requirements.

Comparison of Network Management Software Capabilities:¹⁹

Enterprise Management Software (EMS)		Independent Network Management Software Products (NMS)				
Company	Cisco	3Com	HP	IBM	CA	Unware
Product Name	Cisco Works	Supervisor	OpenView	Tivoli	UniCenter	ELin:Vision
Product Type	Specific equipment management system management system	Specific equipment management system management system	Comprehensive network management system	Comprehensive network management system	The enterprise synthesizes the network management system	The enterprise synthesizes the network management system
Functionality	Campus Manager Cluster Manager	-	NFM (node management) FTO (system operation management) ISM (Internet management)	NetView (network view management) Storage Manager (memory management) Monitoring (application management)	TNG (network management frame) Software Delivery (software distribution) Asset Management (property management) AutoSys (maintenance management)	Framework (system frame) Extension (may choose function module)
Overall characteristic	Cisco equipment best management software	3Com equipment management software	Specialized, is fine, specially suits the network management expert to use	Reported receives the IBM style, pays attention to the high-end user, specially IBM reorganization solution user	The function rich, the contact surface friendlier, the function quite is thin	In view of the domestic user design development, the function practical, the structure is compact
Movement platform	Any supports Java system	Microsoft Windows	HP-UX, Sun Solaris, Microsoft Windows	FreeBSD, Sun Solaris, Microsoft Windows, Linux, IBM AIX	Microsoft Windows	Backstage server: Linux, Sun Solaris Front end customer end: Microsoft Windows
Interface Language	English/Chinese binary select	English	English	English	English (partial Chinese)	Chinese
Management object	Cisco equipment and its constitution network	3Com network equipment	IT environment equipment, system and application software	IT environment equipment, system and application software	IT environment equipment, the system and the application software, maintain moves the record	IT environment equipment, system and application software, user activity
Systems supported			HP-UX, Sun Solaris, Microsoft Windows, Linux, IBM AIX and Compaq Tru64	FreeBSD, Sun Solaris, Microsoft Windows, Linux, IBM AIX/AS400	UNIX, Sun Solaris, Microsoft Windows	UNIX, Sun Solaris, Linux, Microsoft Windows
Network management characteristic	Visible equipment kneading board. Under Cisco private agreement support long-distance dynamic		Supports the IPX network the discovery Automatic disposition simple contact mission	Limits is assigning the pitch point movement examination advancement	The three dimensional engine room unfolds Support wireless network management	2 the level network discovered that, precisely discovers the analysis situs The highly effective SNMP gathering engine, reduces the network management initiation current capacity

¹⁹ This table was translated from eLin:Vision website: <http://www.eunivision.com/nms_dif.asp> Nov 2006.

	disposition					
System administration characteristic	Does not support	Does not support	Many Unix server operation management	Self-control	Provides the many kinds of system administration proxy The product intrinsic integration rate is high	Simultaneously supports the proxy type and the non-agent's -like system surveillance Provides to the CPU/memory/hard disk surveillance early warning
Using management characteristic	Does not support	Does not support	Monitors the Internet application the movement situation Provides the SLA management	In view of many kinds of large-scale applications development surveillance proxy	In view of many kinds of large-scale applications development surveillance proxy	Surveillance application advancement running status (www/email/ ftp/dns database) carries on the user experience survey to the standard service Oracle activity monitoring device
IP address management	Supports the Mac track	Does not support	The simple IP address tabulates	Does not support	Does not support	Supports uses the IP address situation to the user the track and the localization, through ties up with the MAC address decides, discovers the illegal IP user
IT property management	Does not support	Does not support	Does not support	Automatic collection and information management	Rich IT property collection and management function	Supports to the IT property information collection, the management and the statistics
Report form tool	Does not support	Does not support	Only supports the real-time data graphical display, has report form tool which the third party provides	Supports the real-time data graphical display	Provides the basic report form demonstration	The nimble convenience graph, the form report form production, redeposit
Data management	Does not support	Does not support	Collection to document data storage	Collection to document data storage.DB2	Based on MS SQL Server memory	Supports My SQL and Oracle
System parameter disposition	-	-	Needs the network management expert to dispose	-	The disposition quite is simple	The guide type contact surface, does not need the too many specialized knowledge, is easy to grasp
Modular design	-	-	The modular design, the product does not support a minute module to pack	The modular design, the product does not support a minute module to pack	The modular design, the product does not support a minute module to pack	The modular design, packs according to a user request minute module
System openness	Loop system	Loop system	Provides massive API, the user may two developments, but the difficulty is bigger	Loop system	Loop system	The support user has custom-made
Hardware request	High carries PC		The recommendation uses the IIP small machine	The advancement uses the IBM server	High end server system	The scale young user may choose PC.
Fixed price strategy	Unification fixed price	Unification fixed price	Pitch point scale fixed price (250)	Server CPU number	-	Regards the pitch point scale and selects and purchases the module the difference
Post-sale service	-	-	Small chronometer price	Small chronometer price	-	The free installment and training, each month pays a return visit, visits the service only to charge the travel expense (the Beijing area free)
Is suitable the user	Mainly by the Cisco equipment primarily network, only	Mainly by the 3Com equipment primarily network.	The network management aspect has the large-scale investment, has the network management	The network management aspect has the large-scale investment, has the network management	The network management aspect has the large-scale investment, the IT management	The network scale is bigger, the attention system usability and the usability, needs to have custom-made the

pays attention to the user which the equipment manages	only pays attention to the user which the equipment manages	expert, moreover HP-UX equipment more users	expert, moreover IBM equipment more users	structure is perfect, an attendant level higher uses	development and local serves the support user
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IV. Foreign Availability

The details provided in the previous section indicate the prevalence of Chinese domestically produced telecommunications and information systems testing equipment across all three layers of technology. In addition to these domestically produced products, which are sold on the Chinese commercial market at varying levels of technical capabilities, foreign companies also sell related non-destructive testing equipment on the Chinese commercial market. This section provides some examples of the most prominent non-U.S. foreign companies that participate in this market a high technical level.

1. Exfo (Canada)

Exfo was founded in 1985 in Quebec City, Canada. The Telecom Division of Exfo represents the company's main business activity with a full suite of test solutions and monitoring systems for network service providers, cable TV operators, telecom system vendors and component manufacturers in approximately 70 countries. In the past few years, Exfo has acquired numerous companies around the world, which has helped Exfo to build its business and knowledge base.

The company's original products were focused on the needs of installers and operators of fiber-optic networks. Customers use these field-portable testing products for the installation, maintenance, monitoring and troubleshooting of optical networks. In 1996, Exfo supplemented its product portfolio with an extensive line of high-end products that are mainly dedicated to research and development as well as manufacturing activities of optical component manufacturers and system vendors.

Exfo has been especially successful in the global market for its portable optical test solutions, and protocol and access test solutions that enable triple-play deployments and converged IP networking. Exfo's PC/Windows-based modular FTB-200, FTB-400 and IQS-500 test platforms host a wide range of modular test solutions across optical, physical, data and network layers, while maximizing technology reuse across several market segments.

Exfo has a wide range of testing equipment available for sale in China, but two sample products are listed below to demonstrate the technology level that the company provides to the Chinese market:

2. Anritsu (Japan)

Anritsu Group, formerly known as Anritsu Electronic Co. Ltd, is headquartered in Japan, and its major business includes: test & measurement instruments, information and communications, industrial automation, and electronic devices. Test and measurement equipment accounts for more than 50% of Anritsu's annual volume.

Since it purchased WILTRON in 1990, Anritsu has successfully achieved the multi-field development from low frequency and radio frequency to microwave and from optical fiber communication to mobile communication. Meanwhile, Anritsu has expanded its market around the globe. Anritsu has launched Ethernet solutions and mobile test solutions, including 3G testing solutions. Anritsu launched the all-purpose solutions of POS test, which is from 10M/100M to 10GE and from STM-1 to STM-64 for IP testing.

Anritsu started its research and investment in 3G testing in the late 1990s and most of its investments has been used in WCDMA system. Anritsu has already developed a set of solutions including signaling test, radio frequency test and function test. In Japan and other countries where 3G has been commercialized, Anritsu has gained a large market share in the area of WCDMA protocol, which has been certified as the standard for WCDMA mobile phone development.

Anritsu started cooperating and communicating with Chinese TD-SCDMA research institutions 2 or 3 years ago. Anritsu has added corresponding test function to some universal test instruments and will produce a series of products including signal source and signaling analyzer that support TD-SCDMA soon.

In 2004, the China Academy of Telecommunications Research of MII (CATR), which is responsible for managing communication policies, R&D, and equipment certification in China, ordered an Anritsu ME7873A WCDMA TRX Performance Test System for conformance testing of WCDMA 3G mobile phones. CATR plays a particularly vital role in introducing 3G services, and its purchase of the Anritsu system has opened the market for Anritsu to expand its presence in one of the world's fastest-growing markets.²⁰ Below are some details about the ME7873A Test System:

²⁰ Anritsu Press Release. "China Academy of Telecommunications Research of M.I.I. To Use Anritsu ME7873A W-CDMA TRX Performance Test System: Accelerating W-CDMA 3G Mobile Telephony in China," 23 Apr 2004, <http://www.anritsu.co.jp/e/news_events/040423e.asp> Oct 2006

- **ME7873A WCDMA TRX Performance Test System:** It is an RF Conformance test system for evaluating the Tx/Rx performance characteristics of WCDMA mobile terminals during R&D and verification, and for conformance testing to 3GPP standards. Specifications are listed below:

	Max. input level	+34 dBm (2.5 W)
General	Type N, 50 Ω	
	Input/Output connector	VSWR ≤1.2 (0 MHz to 2.4 GHz, for measuring Maximum Output Power) VSWR ≤1.5 (3.1 to 3150 MHz, for measuring Blocking characteristics, Frequency range 3) VSWR ≤1.7 (0 to 13 GHz, for measuring Blocking characteristics, Frequency range 3)
	Reference oscillator	Uses the MS16316A (Option 01 High stable reference recommendation oscillator provided; External reference input enabled (frequency: 10/13 MHz selectable, BNC connector)
Power supply		AC 100 to 120 or 200 to 240 Vac, 50/60 Hz, ±2710 VA, 1400 VA (typ.)
Dimensions and mass		1897 (H) x 1710 (W) x 757 (D) mm (excluding projections), 3560 kg
Operating temperature		+15° to +35°C (operation), 0° to +30°C (storage)
EMC		EN61326, 1997/A2, 2001 (Class A) EN61010-1, 2000 (Class A) EN61326, 1997/A2, 2001 (Annex A)
LVD		EN61010-1, 2001 (Pollution Degree 2)

*1: The general specifications are applied to use of the ME7417B RF Interface Unit (with 1 dB Attenuator connector).

3. AOIP SAS (France)

AOIP SAS is a subsidiary of the ASGARD group, which is based in Honfleur-Normandie, France and specializes in the manufacturing of high value added products and industrial subcontracting. AOIP's headquarters is located in Ris Orangis, France, where product R&D, product marketing and sales are conducted in the field of precision instruments and automation systems. AOIP products are manufactured by ALLIANSYS, also a subsidiary of the ASGARD group. AOIP has an approved distributor located in Shanghai, Pic Shanghai, which deals with the bulk of its China sales.

In the communication test field, AOIP offers LAN and telecom cable testers, including: LAN testers, Automatic fault locators and Megohmmeters / Ohmmeters. Some details about these products are listed below:

- **EasyLAN 300 MHz LAN cable tester:** The EasyLAN cable tester can perform the certification of LAN copper and fiber cables. This device, marketed as the first European tester, is composed of two units: one has a display and the other a sensor. Both are equipped with an intercom, so it is unnecessary to switch or change out the units. This tester offers a complete installation test and certification record using the Easysoft software program. The unit can also be used as a measurement instrument, in which case the PC is unnecessary. EasyLAN tests copper and optical cables up to category 6 and can perform required tests up to a bandwidth of 300 MHz and accuracy to TIA/EIA 568 Level III. It tests and certifies LANs including: Ethernet, ATM, Token-ring and Gigabit-Ethernet.

Technical specifications

Frequency	
1 to 300 MHz	
TIA/EIA 56B Level III accuracy	
Physical features	
Wire map	: Identify miswires
Length	: Accuracy \pm 0.3 m
Propagation delay	: Accuracy \pm 10 ns
Delay skew	
DC loop resistance	Accuracy \pm 0.5 Ω
NEXT, PSNEXT, ELFEXT, PSELFEXT, ACR, PSACR	
Return loss	
Attenuation	: According to the selected standard
TDR function	
Spurious voltage	: 0 to 2 V
Standards	
USA standard	: TIA/EIA 56B category 3, 5, 5E and 6
International standard	: ISO/IEC 11801 Class C, D, E IEEE 802.3-5
European standard	: EN 50173 Class C, D, E
Other	: AZ/NZS 3095
Connectivity options	
Copper cabling: Coaxial UTP FTP STP 5C/TP SF/TP and 5STP	
Fiber's LAN: multimode and singlemode	
Compliance	
EasyLAN certifies following networks:	
10BASE-2, 10BASE-5, 10BASE-T, 100BASE-TX, 1000BASE-T Ethernet, 4MB, 16MB TOKEN-RING, ATM 155/31.	

General characteristics

Display	
LCD graphical display 192x128 pixels	
Back light function.	
Menu in 5 languages: English, French, German, Italian and Spanish.	
Ports	
RS232 serial port SUBD 9	
Talk set interface with stereo jack.	
Battery	
Removable, rechargeable NiMH battery pack.	
Charging time: 3 hours.	
Battery life: 10 hours operation	
Dimensions and weight	
Dimensions: 260x165x60 mm (tester - remote unit).	
Weight: 1.1 kg/4.6 kg (complete set).	
ABS casing with protection sheath.	
Operating conditions	
0°C to 50°C and 20 to 90% RH without condensation.	

Other features

Memory capacity 1700 autotests.
Simultaneous management of 10 sites.
Built-in intercom.

- ISOPALM+ Cable Fault Locator:** This instrument is designed to identify and locate with high precision faults as insulation faults and break on the wires. The ISOPALM+ can conduct tests on loop resistance, megohmmeter, voltmeter and capacitance meter. ISOPALM+ stores into its memory a database of 4 cable parts allowing measurement onto heterogeneous cable and homogeneous cables.

functions

Insulation fault location Types of faults: - Fault between 2 wires on a same pair, - Fault on 2 wires on different pairs, - Fault between 1 wire and the ground. Methods used: Murray and Fabe (Kupfmuller); possibility to measure with one healthy wire or 2 healthy wires (one called "auxiliary"). Accuracy: 0.2% of the faulty wire resistance + 0.002 Ω in the reference conditions.	- 1 broken pair Using Sauty method (capacitance ratio or capacitance measurement). Insulation measurement Range from 0 to 1000 M Ω . Resolution variable from 0.1 M Ω . Test voltage: 150 V with current limitation for safety reasons. Accuracy: 4% rdg up to 50 M Ω .	Loop resistance measurement Range: 0 to 10,000 M Ω Accuracy: 0.5% rdg + 0.2 Ω .
Location of break on the wires Type of faults: - 1 broken wire	Capacitance measurement Range: 0.1 up to 2 μ F. Accuracy: 1% rdg.	DC/AC voltage measurements - Ranges DC voltage: 0 to 100 V 0 to 300 V AC voltage: 0 to 100 V RMS 0 to 300 V RMS - Resolutions: 0.1 V up to 100 V 1 V outside this value. - Accuracy: 1% rdg + 0.5 V

- RL 2200 Megohmmeter – Ohmmeter:** The RL2200 is particularly suited to maintenance, verification and reception of telephone lines, and more generally of all low voltage cables. Its unique dual display offers both digital readings, for high accuracy measurements, and analogue readings to «feel» measurements tendency and monitor threshold limits. The RL2200 measures loop resistance, insulation resistance, AC and DC voltages. Threshold limits can be set on resistance and insulation measurements.

Insulation resistance measurements

Ranges and measurement voltages:
- from 0.01 MΩ to 1 000 MΩ under 50 V

- from 0.1 MΩ to 10 000 MΩ under 500 V (500 V constant voltage for insulation > 5 MΩ).
- measuring current: < 1 mA.
Insulation threshold indication (beep) above adjustable limit.

Resistance range under 50 V.....

Analogue range	Range	Measured resistance	Digital range		Accuracy	
			Resolution	Analogue	Digital (1)	
0.03 MΩ to 3 000 MΩ	0.00 MΩ	0.00 to 10.00 MΩ	0.01 MΩ		5% + 0.01 MΩ	
	10.00 MΩ	10.00 to 30.00 MΩ	0.05 MΩ			
	30.00 MΩ	30.00 to 50.00 MΩ	0.10 MΩ	± 1 segment	10%	
	50.00 MΩ	50.00 to 99.50 MΩ	0.50 MΩ			
	100.0 MΩ	100.0 to 200.0 MΩ	1.0 MΩ			
	200.0 MΩ	200.0 to 400.0 MΩ	5.0 MΩ			
400.0 MΩ	400.0 to 700.0 MΩ	10.0 MΩ				
700.0 MΩ	700.0 to 1 000.0 MΩ	20.0 MΩ				

(1) Accuracy is given 1 year in ±(% of reading + nΩ) at 23±1°C

Resistance range under 500 V.....

Analogue range	Range	Measured resistance	Digital range		Accuracy	
			Resolution	Analogue	Digital (1)	
0.3 MΩ to 30 000 MΩ	0.0 MΩ	0.0 to 100.0 MΩ	0.1 MΩ		5% + 0.1 MΩ	
	100.0 MΩ	100.0 to 300.0 MΩ	0.5 MΩ			
	300.0 MΩ	300.0 to 500.0 MΩ	1.0 MΩ	± 1 segment	10%	
	500.0 MΩ	500.0 to 995.0 MΩ	5.0 MΩ			
	1 000 MΩ	1 000 to 2 000 MΩ	10 MΩ			
	2 000 MΩ	2 000 to 4 000 MΩ	50 MΩ			
4 000 MΩ	4 000 to 7 000 MΩ	100 MΩ				
7 000 MΩ	7 000 to 10 000 MΩ	200 MΩ				

(1) Over 1 year in ±(% of reading + nΩ) at 23±1°C

AC voltage measurements

Range 0 to 100 V AC, resolution 0.1 V, accuracy ±(1%rdgs. + 0.5 V).
Range 100 to 400 V AC, resolution 1 V, accuracy ±(1%rdgs. + 1 V).
Input impedance: 200 KΩ.
Average value translated to RMS without DC component.
Band width: 40 to 400 Hz (higher frequencies can be measured with lower accuracy).

DC voltage measurements

3 digits digital display.
Range 0 to 100 V DC, resolution 0.1 V, accuracy ±(1%rdgs. + 0.5 V).
Range 100 to 500 V DC, resolution 1 V, accuracy ±(1%rdgs. + 1 V).
Input impedance: 200 KΩ.

Resistance measurements

- Range : from 0 to 10 000 Ω
- Measuring current: < 1mA.

Continuity threshold indication (beep)
below adjustable limit.

Analogue range	Digital range		Accuracy (1)		
	Range	Measured resistance	Resolution	Analogue Digital	
0.3 Ω to 30 000 Ω	0.0 Ω to 999.5 Ω	0.0 to 100.0 Ω 100.0 to 500.0 Ω 500.0 to 999.5 Ω	0.1 Ω 0.2 Ω 0.5 Ω	± 1 segment	0.5% + 0.2 Ω
	1 000 Ω to 10 000 Ω	1 000 to 2 000 Ω 2 000 to 3 000 Ω 3 000 to 5 000 Ω 5 000 to 10 000 Ω	1 Ω 2 Ω 5 Ω 10 Ω		

(1) At 23 \pm 1 $^{\circ}$ C over one year and in \pm (% of reading + n Ω) on digital display.

V. Chinese Military Non Destructive Test Equipment

Telecom and test equipment used for military applications is procured from the same Chinese sources as listed in the sections above. The Chinese government and military entities procure their testing equipment primarily from the Chinese research institutes. The primary testing equipment supplier to the Chinese military is the 41st Institute. The 41st Institute has won numerous awards for its contributions to military technology, including an award for being among “The Advanced Units in Research and Production of Military Basic Electronic Products” and the “Top 10 Institutes for Military Electronic Components.” The 41st Institute also successfully provided instruments for Chinese satellite and spaceship projects, including the Shenzhou 5 Spaceship. The Chinese military acquires its testing equipment almost entirely from domestic sources.

Some public reports have indicated that Chinese governmental entities have also purchased top line telecom testing equipment from Japanese sources, as in the case of the China Academy of Telecommunications Research of MII purchase of the Anritsu WCDMA TRX Performance Test System.

VI. Summary

The Chinese telecom equipment industry, led by Huawei and ZTE, produces equivalent level products to the worldwide telecom companies from the United States and Europe. They supply telecom equipment to both the domestic and international telecom market and have the ability to supply the Chinese Government and Military at levels above those proposed in the Proposed Rule. The data provided in this chapter clearly demonstrates that numerous Chinese companies have also indigenously developed the ability to research and produce internationally competitive telecommunications testing equipment and relevant software and technology. In addition to the Chinese domestically produced items, Canadian and Japanese companies also offer a wide range of top level equipment

to Chinese consumers. Given that this equipment and software is available through both domestic and foreign sources in China, the ECWG requests that the scope of controls on these items be narrowed or removed from the list of items in the Proposed Rule.

CHAPTER V

Navigation and Avionics

I. List of ECCNs:

7A994: Other navigation direction finding equipment, airborne communication equipment, all aircraft inertial navigation systems not controlled under 7A003 or 7A103, and other avionic equipment, including parts and components, n.e.s.

7D994: "Software", n.e.s., for the "development", "production", or "use" of navigation, airborne communication and other avionics.

7E994: "Technology", n.e.s., for the "development", "production", or "use" of navigation, airborne communication, and other avionics equipment.

Under existing U.S. export control regulations, navigation and avionics equipment falling under the ECCNs 7A003 and 7A103 require a license to China. The Proposed Rule would add controls to items falling under 7A994 as well as the related testing equipment, software and technology falling under ECCNs 7D994, and 7E994.

The Proposed Rule would control all navigation and avionics related equipment, software, and technology without drawing a bottom line for these controls. The market data included in this chapter demonstrates that navigation and avionics related items are readily available in China at and above the proposed level of control. Chinese companies are producing this navigation and avionics equipment at technological levels equivalent to products supplied by foreign companies in China. Chinese companies have also developed the technology to produce relevant software, but they have chosen not to invest the money in manufacturing these items while they are readily available from European and Canadian sources at an acceptable market price.

Furthermore, this equipment has already been supplied by foreign sources for domestic Chinese commercial jet programs such as the ARJ21 and the MA60. The ECWG, therefore, believes equipment and technology that U.S. companies would provide at the levels delineated by the ECCNs listed in this chapter could not make a material contribution to the Chinese military capabilities. China has already acquired navigation and avionics products at and above these levels through both domestic and foreign sources.

II. Overall China Market

The navigation and avionics market in China has great potential in the coming years with the booming aviation industry and broad commercial aviation applications. Current growth predictions for China's commercial aviation industry indicate that China will

become the second largest aviation market in the world within the next twenty years. This growth will result in large purchases of aircraft and drastic expansion of the commercial aviation infrastructure. Recognizing the need for investment in this expanding industry, the Chinese government has developed plans to build new airports, update its air traffic control system, and develop the aircraft and aircraft part production industry in China.

Zeng Qinghong, Vice President of the PRC, addressed that in the Fifth Plenary Session of the 16th Central Committee of the CPC in 2005 and emphasized the need for development of China's high-tech industries including aviation and aerospace.

Yaliang National Aviation High-Tech Industrial Base, a designated aviation development zone located in Xi'an, was approved by the National Development and Reform Commission in 2004. This state-level high-tech industrial base integrates aviation industrial research and development, aviation-related equipment production, aircraft manufacturing, part and component machining, and aviation service facilities into one central location. Zeng Qinghong announced that Yaliang Aviation Base should serve as a model for integrating China's aviation industry and cultivating innovation and collaboration with foreign and domestic partners.²¹ Plans for a similar aviation development zone in Shanghai are under discussion.

China's Industrial Base of Civil Aviation (IBCA) is based in the Tianjin Binhai New Area. The IBCA was established jointly by CAAC and the Tianjin Municipal Government when an agreement was signed on October 16, 2005 to build up equipment manufacturing, R&D and technical services for the Chinese civil aviation industry. This base is located approximately 110km (30 minutes) from Beijing. The Binhai New Area, which covers an area of 2270 km², contains 7 industrial areas: Seaport Logistics, Seaside Leisure and Tourism, Chemical Industry, Advanced Manufacturing, Central Business District, High-tech Industry, and Aviation Industry. Within the IBCA, development is focused on cultivating the following industries: ATC equipment manufacturing, Special Equipment manufacturing, Aircraft parts & airborne equipment processing, Aircraft maintenance, and Aircraft parts and components maintenance. In addition, the new aviation base will contain the infrastructure for R&D in civil aviation as well as certification and test centers.²² Tianjin will also benefit from its proximity to top universities and training and research institutes in the aerospace and aviation fields, such as:

- Beijing University of Aeronautics and Astronautics
- Civil Aviation University of China (Tianjin)
- Tianjin Sino-Germany Vocational Technology Institute
- Tianjin Sino-Spanish Machine Tool Technology Training Center

²¹ Xi'an Yaliang National Aviation High-Tech Industrial Base Website. "Zeng Qinghong, vice president of PRC, visited Xi'an Yaliang China Aviation High-tech Industrial Base," 9 Nov 2005, <<http://en.caib.gov.cn/defaultroot/front/news/NewsEv.go?event=11&id=486>> Nov 2006.

²² Zhang Jialu ed., Tianjin ENORTH NETNEWS Co., "Unique Advantage Helps Civil Aviation Take-off," 22 Aug 2006, <<http://english.enorth.com.cn/system/2006/08/22/001391136.shtml>> Nov 2006.

- Beijing Precision Engineering Institute for Aircraft Industry
- Beijing Aeronautical Manufacturing Technology Research Institute
- China Aeronautical Project & Design Institute
- Beijing Institute of Aeronautical Materials
- China Aero-Polytechnic Establishment
- Aviation Industry Development Research Center of China
- Beijing Great Wall Metrology & Measurement Research Institute of AVIC I.

To date, the Tianjin IBCA has formed an integrated organization, developed a detailed land development plan, engaged in investment negotiations, finalized industry policies, and organized major key projects including the Airbus A320 single-aisle airplane plant. The A320 plant, which is a joint venture between Airbus and Zhongtian Aviation Industry Investment Company located in the Binhai New Area, will assemble the aircraft. The assembly line will include assembly workshops, paint shops, testing areas and a flight-test facility. Currently, preparatory work for the assembly line project has begun, including infrastructure planning, recruitment and equipment procurement.²³

Airbus reportedly has committed to increase yearly procurement in China to \$60 million (USD) by 2007, and \$120 million by 2010. Airbus also formally inaugurated its Airbus Engineering Centre in Beijing, in July 2005, which will conduct research and development. Airbus says it has already hired 54 Chinese engineers and will increase that number to 200 by 2008. Airbus also offered Chinese aviation firms what could amount to as much as 5 percent participation in the airframe of its upcoming A350 twin-aisle aircraft, to include both part design and production. The design will be performed by Centre engineers, while manufacture of the corresponding parts will be given to the Chinese aviation industry.²⁴

Note: For more information about the A350 in design and production in China, please refer to Chapter 1 - Composite Materials.

Chinese commercial regional jet programs such as the MA60 and the ARJ21 offer new opportunities for companies to supply aircraft components to Chinese commercial aircraft:

- The MA60 is an advanced regional turboprop aircraft developed by Xi'an Aircraft Company of AVIC I. Modern design concepts, new technological innovations, and state-of-the-art equipment were introduced in the MA60. The aircraft meets the regulations of CCAR Part 25 and FAR Part 25, and was certified by CAAC. The MA60 will take over short and medium-haul commuter operations. CATIC, which has taken over the marketing activities

²³ Chinese Ministry of Commerce Website, "Chinese companies to help assemble A320 jumbo jets." 22 Nov 2006.

<<http://english.mofcom.gov.cn/article/newsrelease/commonnews/200611/20061103815493.html>> Nov 2006.

²⁴ CompositesWorld.com, "Airbus Extends Partnerships in China, Australia." Jan 2006.

<<http://www.compositesworld.com/hpc/issues/2006/January/1140/1>> Nov 2006.

of the MA60 in recent years, has recently signed sales contracts for the MA60 with Indonesia, Zimbabwe, Zambia, Congo, Laos, and Vanuatu.²⁵

- The ARJ21 is also an AVIC I project, which involves cooperation among four AVIC I companies for the base aircraft: Shanghai Aircraft, Xi'an Aircraft, Shenyang Aircraft, and Chengdu Aircraft. Each of these companies contributes to various aspects of the aircraft design and manufacturing. This project is still in the development phase, but it is currently slated for flight in 2009.

Both of these commercial regional jet programs have benefited from cooperation among a wide range of companies, both Chinese and domestic, which have supplied various parts and components. These projects serve as examples of the increasing commercial aircraft opportunities that are opening up in China. The MA60 and the ARJ21 lay the groundwork for international commercial competition in basic aircraft components, including avionics and navigation equipment. With the success of these Chinese commercial programs and the rising demand in the Chinese aviation industry, more such opportunities will arise.

III. Chinese Domestic Availability²⁶

Chinese companies have the technical capability to indigenously produce navigation and avionics equipment at levels that satisfy the domestic military demand. Chinese companies and research institutes do not domestically manufacture the related integration software for commercial application because they are available in China through non-U.S. foreign suppliers at the required technological levels.

A. Avionics and Navigation Equipment

China can domestically produce avionics and airborne navigation equipment above the level of proposed control. In select cases, China's domestic production of these products is at a higher technical level than that of the products supplied by foreign companies. This high level technology is developed and produced by Chinese research institutes for government and military end-use, with some of the equipment available on the domestic commercial market.

²⁵ ShowNews Airshow China 2006, International Aviation, "MA60 Regional Airliner Gains Momentum in Export Markets," 31 Oct 2006 <<http://www.AviationNow.com.cn>> Nov 2006.

²⁶ Look at China National Aeronautical Radio Electronics Research Institute: 中国航空无线电电子研究所 (AVIC I); Shanghai Software Test & Evaluation Centre, some cooperation with Rockwell Collins Avionics and Communications (Careri); Lanzhou Aviation Electromechanic Inc. 兰州航空机电有限责任公司 (AVIC II) makes Airborne computers MSIC/LSIC types digital, navigators, navigation bombing system, air firing computer, etc.

1. Beijing Keeven Aviation Instrument Co., Ltd.

Beijing Keeven Aviation Instrument Co., Ltd., a national aerospace industry enterprise under AVIC I, was founded in 1958 and is located in the center of Beijing's Zhongguancun Science and Technology Zone. Keeven specializes in the development and production of automatic flight control systems, aviation gyro instruments, radio altimeters, and other avionics equipment.

Keeven has received nearly 40 awards from the Chinese central government and Chinese ministries. Keeven develops and produces a wide range of products, both for the commercial and military markets. At present, the project "Zhongguancun airspace technology zone" initiated by Keeven has been put into practice to establish an international high technology center for the transfer and innovation of state-of-the-art aerospace equipment.

On the commercial market, Keeven sells basic avionic equipment, including items such as the radio altimeter, automatic flight controls, gyroscopes, accelerometers, and control and display systems. Some of this equipment, such as the radio altimeter, was developed nearly 20 years ago with the assistance of the French.

2. AVIC I: Suzhou

[Note: Formerly known as "Suzhou Changfeng Co., Ltd."]

Suzhou Changfeng Co., Ltd. is now a subsidiary of the China Aviation Industry Corporation (AVIC I). This Chinese state-owned company, which specializes in avionics, mechanical equipment, and precision spare parts, develops and produces equipment for both military and commercial uses. Suzhou's products include temperature sensors and controllers, switch generators and assemblies, electronic display systems, engine control systems, inlet automatic adjustment systems, instruments and indicators, and sensors.

Suzhou produces the highest level Multifunction Display in China, and Keeven produces the second-best variant of this product. Both Chinese companies have developed the indigenous ability to manufacture this integrated avionics display system at the most advanced international level.

3. *Sichuan Institute of Piezoelectric and Acousto-optic Technology (SIPAT)*

[Note: Formerly known as the China Electronics Technology Group Corporation No 26 Research Division]

Sichuan Institute of Piezoelectric and Acousto-optic Technology (SIPAT), which was originally the No.26 institute of the Ministry of Electronic Industry, is the foremost Chinese institute specializing in research on piezoelectric and acousto-optic technology. Founded in 1970, and moved to the economic development zone of Chongqing in 1993, SIPAT employs approximately 900 people, of whom 100 are senior researches and nearly 200 are engineers. SIPAT's research areas cover surface acoustic wave (SAW) technology, piezoelectric and acousto-optic crystal materials, bulk acoustic wave (BAW) microwave delay lines, piezoelectric or ferroelectric ceramic materials and devices. This technology is applicable to a wide range of sectors, including: national defense, aviation, communications, and electronics. SIPAT produces and provides a range of military electronic systems.

SIPAT has been especially successful in its development of SAW technology and vibrating inertial technology, packaged in compact multi-function systems. Below are details for the SIPAT SAW filters and Piezoelectric Vibrating Gyro:

- **Surface Acoustic Wave filters:** SAW filters are electromechanical devices commonly used in radio frequency devices. Electrical signals are converted to a mechanical wave in a piezoelectric crystal; this wave is delayed as it propagates across the crystal, before being converted back to an electrical signal by further electrodes. The delayed outputs are recombined to produce a direct analog implementation of a finite impulse response filter. This hybrid filtering technique is also found in an analog sampled filter. SAW filters are limited to frequencies up to 3GHz. SIPAT makes a wide range of IF SAW Filters, with the highest frequency at 160MHz, and a number of RF SAW Filters at center frequencies between 250MHz and 1GHz. SIPAT makes a stabilizing monitor platform system for airplanes.
- **Piezoelectric Vibrating Gyro:** This gyro, which uses MEMs technology, is an angular velocity sensor that can be used for the stabilizing and monitoring systems of weapons systems, aircraft, medical apparatus and instruments, and geological prospecting. As compared with traditional gyros, the piezoelectric vibrating gyro uses a vibrating element instead of the rotor of traditional gyro which rotates at high speed and does not cause friction or wear, increasing its lifespan. It has a wide dynamic range and small nonlinear error therefore most suitable for uses in strap-down inertial system. It has low power consumption and can withstand nuclear radiation.

4. NAV Technology Co., Ltd.

Registered in the Zhongguancun Science Park, Beijing, NAV Technology Co., Ltd. is a high-tech enterprise, which was recently established as a sister company to YH Technology. Previously, YH developed and manufactured products and systems in the field of communication, navigation and modern signal processing, which included GPS navigation and inertial system. NAV Technology was recently established as to produce the inertial systems technology, while YH narrowed its scope to the GPS systems. NAV is moving to expand operations and hoping to gain greater international market share with its relatively inexpensive domestically integrated products.

NAV inherited technology from YH and now developed and produces product lines including: Accelerometers, Gyroscopes, Tilt Sensors, Magnetic Compasses, Inertial Measurement Units (IMU), Vertical Gyroscopes, Attitude & Heading Reference Systems, GPS/INS, and more. Products are targeted for land vehicle, airspace, ship, and tracking applications. The IMU and Magnetic Compass listed below are two examples of NAV products:

- **NV-IMU200 Inertial Measurement Unit:** This inertial measurement unit uses high reliable and quality MEMS accelerometers and Fiber Optical Gyros. This IMU has been full temperature compensated via testing data from -25°C ~ +70°C for zero point, SF, and misalignment. It has 20 bits AD conversion with resolutions less than 0.02 mg and 0.0006 °/s in a rugged design to protect the equipment against harsh environments. The IMU is vibration and EMI resistance.
- **MC301 Magnetic Compass:** This magnetic compass, for use in navigation and guidance systems, can be easily integrated into systems using a UART or SPI interface in ASCII format. The MC301 is a three-axis, tilt compensated compass that uses a two-axis accelerometer for enhanced performance up to a $\pm 60^\circ$ tilt range. With a 1° Heading Accuracy, 0.1° Resolution, 0.5° Repeatability, $\pm 60^\circ$ Tilt Range (Pitch and Roll) for 3200, this compass is compacted into a small, lightweight case. It has a 15 Hz Response Time, and a 40° to 85°C Operating Temperature Range.

B. Software and Integration Systems

The gap in Chinese production of avionics and navigation equipment lies in the software for integration of the airborne avionics equipment. China has conducted research on this integration software and claims the technical capability to produce this software. Chinese companies have made a business decision not to produce this software, because with the high cost of production and low demand for the software, companies could not justify local production.

This software produced by Canadian and French companies is widely available in the Chinese market at reasonable prices. For details about the software systems offered by these foreign companies, see the section below on Foreign Availability.

IV. Joint Venture Availability

1. *Xi'an Chinastar M&C Ltd.*

Xi'an Chinastar M&C Ltd. was founded in 1996 and later became a joint-venture with Panweld Holding Limited Singapore in Aug 2004. Chinastar specializes in the R&D, production and sale of sensors, specifically inertial sensors and automotive electronic sensors. In addition to its own development and production, Chinastar also acts as a distributor for other types of sensors through its commercial networks and permanent branches in Beijing, Shanghai and Qingdao.

Chinastar has received patents for several of its indigenously developed technologies and products. Chinastar also collaborates with scientific institutes in Shaanxi province for the research and development of products.

Although Chinastar sells a wide variety of both its own products and products from other domestic and foreign companies, the three products listed below are samples of Chinastar technology:

- **CS-3ARS Series Gyroscope:** Measures angular rate in three orthogonal axes. The 3-axis angular rate sensors use MEMS "solid-state" chips on each axis. This gyroscope, which has a self-test function, can be used in automotive electronics, guidance and control of aircraft, and other systems.
- **CS-3LAS Accelerometer:** Measures acceleration in three axes. This accelerometer uses MEMS "solid-state" chips on each axis and has a Self-Test function available. It can be applied to measure the acceleration, velocity, position and tilt in automotive-controls, inertial navigation, earthquake monitoring, and other systems.
- **CS-IMU Inertial Measurement Unit:** This unit, which contains accelerometers, pressure sensors and angular rate sensors, is a "solid-state" six degree of freedom inertial sensing system based on MEMS technology. With high accuracy, it can measure angular rate and linear acceleration in three axes of an inertial coordinates system. High precision temperature sensors are built in with an indicator that displays the voltage corresponding with the temperature change. The IMU also has a self-test function available for each of the six degree of freedom.

V. Foreign Availability

While Chinese capabilities in avionics and navigation equipment continue to increase through domestic R&D, European companies continue to supply high level equipment in the Chinese market. The section below contains details about a select number of these European companies:

1. *Thales Avionics*

Thales' Aerospace Division was established in July 2004, combining operations and teams from Thales Airborne Systems, Thales Avionics, Thales Computers, Thales Microelectronics and Thales MESL. As prime contractor, systems integrator or equipment supplier, Thales Aerospace provides high level intelligent onboard equipment, sub-systems, systems, and services for both the commercial and military markets. Thales is heavily involved in the top line aviation programs, both commercial and military, around the world.

Thales offers a comprehensive range of products including custom-tailored solutions for all types of commercial and military aircraft. Thales promotes its expertise in dual (civil/military) technologies at the competitive edge. With a Thales Avionics repair and support center located in Beijing, joint operated with Airbus China, and a Thales Avionics Hub in Singapore, Chinese customers can purchase state-of-the-art Thales avionics equipment directly from Thales. Thales product lines include integrated modular avionics (IMA) suites, cockpit display systems, flight management systems, flight control systems, communications, and navigation and surveillance systems.

Thales has designed a complete family of integrated modular avionics suites for both civil and military aircraft called TopDeck:

- **TopDeck:** This is a family of high-performance integrated modular avionics suites featuring latest-generation glass cockpit technology and ergonomics. It handles all primary functions, from flight control to centralized maintenance management, along with human-machine interface, navigation, communications, and surveillance.

2. *Rohde & Schwarz (R&S)*

Rohde & Schwarz (R&S) is a group of companies specializing in electronics, test and measurement, broadcasting, and radio communications. With company headquarters in Germany, R&S carries out global operations in more than 70 countries. Rohde & Schwarz supplies professional HF, VHF and UHF radio communications systems for stationary and mobile ground stations, on ships and on aircraft. Rohde & Schwarz provides voice and data transmission technology for

government authorities and armed forces around the world.

Since 1968, when development of the R&S XT 3000 V/UHF radio and the R&S XK 401 HF-SSB radio for the Tornado aircraft began, Rohde & Schwarz has expanded its business to provide military avionics equipment internationally for a wide variety of airborne platforms.

Several years ago, Rohde & Schwarz entered the commercial avionics market by introducing a civil airborne HF transceiver for data link operations in all versions of civil air-frames. In conducting the research for this report, the R&S Beijing Representative Office told the researchers that Rohde & Schwarz does not sell any commercial avionics in China, but that R&S only sells military avionics in China. Because the PRC military is the sole R&S avionics customer in China, they were unable to provide details about the avionics products R&S sells in China. The R&S website, however, provides detailed specification information for their line of military avionics VHF/UHF Airborne Transceivers. Below is one example:

- **VHF/UHF Airborne Transceiver MR6000R:** The R&S MR6000R transceiver of the R&S M3AR family is software re-programmable and is one of the world's smallest and most lightweight VHF/UHF airborne transceivers. It is possible to download several EPM (ECCM) waveforms for both NATO and non-NATO countries and use them alternately. The MR6000R is designed for installation in the avionics bay, and its architecture ensures form, fit and function replacement for existing AN/ARC-164 radio systems. The transceiver can be controlled by the Remote Control Unit GB6500 or a MIL-BUS according to MIL-STD-1553B. MR6000R has the following characteristics: 30 MHz to 400 MHz extended frequency range, channel spacing of 25 kHz and 8.33 kHz, Modular design, SMD technology, weight less than 3.5 kg, and VHF FM immunity.

3. *Dy4 Systems*

Dy 4 Systems is the world's leading provider of harsh environment, high-performance processing solutions for real-time, embedded Defense and Aerospace applications. Dy 4 describes these systems as commercial off-the-shelf modules, system-level products and services that are used in industrial and harsh environments, including mission-critical aerospace, industrial control, semiconductor manufacturing and defense platforms.²⁷ Dy 4 specializes in the design and manufacture of high-end VME open architecture systems, which are used worldwide in military and aerospace applications requiring high reliability when operating in rugged or harsh environments.

²⁷ LWN.net, "Metro Link and DY 4 Systems to Offer 3D Graphic Solutions for Military/Aerospace Market," 13 March 2001, <<http://lwn.tucows.com/2001/0315/pr/pr288.php>> Nov 2006.

Headquartered in Ottawa, Canada, with additional facilities in Leesburg, Virginia and Cardiff and Milton Keynes, United Kingdom, Dy 4 has annual sales of approximately \$70 million and serves nearly 300 customers in 26 countries. Dy 4 specializes in using leading commercial technologies to create products that work reliably in harsh environments. Key customers include BAE Systems, DRS Technologies, General Dynamics, Northrop Grumman, Lockheed Martin and Raytheon.²⁸ Dy 4 Systems has sold integrated hardware and software products through a direct sales force in the US, UK and Australia, and elsewhere through a global network of distributors.

Dy 4 has targeted aerospace and defense markets.²⁹ Sources have indicated the Dy 4 Systems has provided key technology to Chinese military-related research institutes and state-owned enterprises for aerospace and aviation equipment. This technology was supplied to fill the capability gaps at these institutes and enterprises. The research was unable to determine the details about the specific products that were supplied, at what time they were supplied, and whether or not Dy4 continues to supply to Chinese entities today. According to a Ploughshares Monitor article from 1996, Dy 4 is among the Canadian companies that have engaged in military sales in Asia by supplying tank and military vehicle computer components. The source does not supply any details about Dy 4 sales specifically to China.³⁰

In 2000, Dy 4 Systems became a wholly owned subsidiary of C-MAC Industries.³¹ C-MAC Industries is a Montreal-based designer and manufacturer of integrated electronic manufacturing solutions, primarily serving the communications, automotive, instrumentation, defense and aerospace equipment markets worldwide. C-MAC merged with Solectron, the parent company to Force Computers, in December 2001, and early 2002 Force Computers announced that Dy 4 would become one of its business units.³² In 2004 Solectron sold Force Computers and Dy 4 Systems to Curtiss Wright Controls based in North Carolina.³³

²⁸ Curtiss-Wright Controls Inc. Press Release, "Curtiss-Wright Controls Completes Acquisition of Dy 4 Systems, Inc.," 2 Feb 2004, <<http://www.cwcembedded.com/downloads/02-02-04%20press%20release.pdf>> Nov 2006.

²⁹ Embedded Star, "Tilcon Software and Dy 4 Systems Aim for Aerospace and Defense Markets," 7 Apr 2004, <<http://www.embeddedstar.com/press/content/2004/4/embedded13976.html>> Nov 2006.

³⁰ Ken Epps, *The Ploughshares Monitor*, vol 17, no.2, "The push for Canadian military sales to Asia: Feeding the tigers," June 1996, <<http://www.ploughshares.ca/libraries/monitor/monj96b.html>> Nov 2006.

³¹ CBC News, "C-MAC to take over DY 4 Systems, 6 Oct 2000, <http://www.cbc.ca/money/story/2000/10/05/cmac_dy4001005.html> Nov 2006.

³² Electronicstalk, "Dy 4 Systems join the Force family," 22 Jan 2002, <<http://www.electronicstalk.com/news/for/for104.html>> Nov 2006.

³³ In February 2004 Curtiss-Wright Controls purchased Dy 4 Systems from Solectron and incorporated Dy 4 as a business unit under the Embedded Computing organization of Curtiss-Wright Controls. Source: Embedded Star, "Curtiss-Wright Targets Rugged Embedded Computing by Acquiring Dy 4," 4 Feb 2004, <<http://www.embeddedstar.com/press/content/2004/2/embedded12685.html>> Nov 2006.

4. Vertex Inertial Technology Engineering (VIT)

Vertex Inertial Technology Engineering (VIT) was founded in 2004 and headquartered in Vienna, Austria with the purpose of commercializing analytic sensor fusion algorithms technology that was developed and tested by the founding scientists and engineers. VIT specializes in navigation, inertial reference and air data sensor integration technology, engaging in development, design, manufacturing, marketing, sales and support of compact low-cost inertial navigation systems (INS) integrated with Global Positioning System (GPS) for aviation, land and industrial applications.

VIT's flagship product is the VIT1000 portable glass cockpit system with perspective flight guidance, based on the VIT aviation INS/GPS system, VITANS, and its in-house-developed "Pictorial Indication" software. Other products include: unmanned air vehicle (UAV) Flight Control System, flight data recorder, land-based navigation and motion sensing system and personal navigator.

- **CompaNav-2:** This is an inertial-GPS integrated system intended for navigation and attitude determination of aircraft. Combining GPS data with MEMS inertial sensors measurements, CompaNav-2 precisely outputs the complete set of navigation and motion parameters of the aircraft, including: coordinates, height, pitch, roll, heading, speed, accelerations, and angular velocities.
- **TekFCS:** The TekFCS is a unique software and hardware complex designed as total solution for guidance and navigation of commercial and civil Unmanned Aerial Vehicles (UAV).

5. IXSEA

IXSEA is a company based in France, which specializes in high technology navigation, positioning, imaging, and surveying equipment. IXSEA products are aimed at scientific, offshore, defense and space customers with a range of systems and solutions for navigation, positioning, imagery, moorings and survey applications. IXSEA also develops and produces equipment for use on aircraft and airborne systems.

Among the IXSEA products available for the China market is the AIRINS position and orientation system:

- **AIRINS:** This product has been designed for high accuracy position and orientation for the new generation of airborne mapping sensors. AIRINS provides high accuracy position and orientation data in real-time, even in tough conditions. This product features high performance FOG, high accuracy position, GPS hybridization algorithms, compatibility with most GPS receivers, and vibration / shock resistance in a small single integrated system.

VI. Chinese Military Avionics and Navigation Capability

The avionics and airborne navigation equipment for the Chinese military is provided by Chinese state-owned enterprises and institutes as well as non-U.S. foreign companies.

Beijing Keeven and AVIC I: Suzhou Changfeng are two examples of state-owned companies that conduct R&D activities in the area of avionics and navigation equipment, relevant software, and testing equipment for the Chinese government and military. These companies also sell some products on the commercial market, but the bulk of their business is on the military and government side.

R&S of Germany is an example of one of the foreign companies that supplies avionics equipment directly to the Chinese military. Public reports indicate that China may also be seeking potential partners in Europe, Russia, and Israel to co-develop avionics and weapon suites for its 4th-generation fighter aircraft. These avionics that China is seeking from European companies would be far above the level of anything that U.S. companies could contribute under the parameters of the navigation and avionics equipment covered by ECCN 7A994.

As noted in the sections above, both Chinese and foreign companies supply avionics and navigation equipment directly for Chinese military use. In the areas of relevant software, these SOEs have conducted R&D but have not begun domestic production of this equipment due to the small commercial market and high investment required. These items are widely available from other European and Canadian companies. Thus, to date China has no need to produce these products.

VII. Future Development Requirements for Chinese Military Avionics and Navigation

As the purpose of the Proposed Rule is to prevent material contributions to Chinese military capabilities, it is important to look at next steps in Chinese aviation development plans. According to numerous open sources, China is currently working on an advanced 4th generation fighter design that is predicted to enter service as early as 2015. The Shenyang Aircraft Industry Co. (SAC)/601 Institute and Chengdu Aircraft Industry Co. (CAC)/611 Institute are both working on their own designs for a twin-engine multi-role fighter with enhanced stealth capability and maneuverability comparable to the U.S. F/A-22. The SAC/601 Institute program is known as J-12, and the CAC/611 Institute program, which may be designated as the J-13, is an enlarged twin-engine stealth version of its J-10 fighter.

All designs are expected to feature an internal weapons bay to reduce RCS. Both designs will incorporate an advanced FBW system based upon the Active Control Technology developed by 601 Institute and tested on its J-8IIACT technology demonstrator. Its fire-control radar could feature an active phased array (possibly Type 1475/KLJ5). These projects are believed to have benefited from Russian aviation and weapon technologies.

and it is anticipated that Russia will provide assistance in terms of software support for calculating the RCS of various designs.

Details on the two programs are as follows:

A. Shenyang J-12 Program

In 1998 the U.S. Office of Naval Intelligence (ONI) reported that an advanced F/A-22-class twin-engine stealth fighter known as J-12 was under development at SAC. An F-22 style wind tunnel model of aircraft was shown briefly in an AVIC I promotional video at the 2002 Zhuhai Air Show. Later in 2003 an Internet source photo revealed a fighter mockup for wind tunnel test which may be linked to the J-12 project. As more details of the fighter began to emerge, it was understood that the fighter will also be fitted with an internal weapon bay and possibly active phased array radar.

For the Chinese military, the J-12 project will require technology advancement in a number of fields including: materials, high-performance aviation engine, electronics, flight control software, and stealth technologies. A project of this scale will also require a huge amount of investment and considerable knowledge of complex project and manufacturing management. While China may be able to benefit from some "off-the-shelf" dual-use technologies available in the commercial market, it will almost definitely seek assistance from its traditional military technology suppliers such as Russia and Israel. However, none of these two countries possess the experience of developing an advance fighter of this class.

Russian Sukhoi Company (JSC), which has developed close ties with SAC over the licensed co-production of its Su-27SK fighter as J-11, has been reportedly working with SAC in developing this next-generation fighter technology and sub-systems. Although Russia has not yet been able to develop an operational stealth fighter, the J-12 project may benefit from its technologies in two particular areas: thrust vectoring engine and stealth design. China may also seek potential partners from Russia, Israel and Europe to co-develop avionics and weapon suites for its 4th-generation fighter aircraft.

B. Chengdu J-13 Project

CAC and its subordinate, the 611 Aircraft Design Institute, are working on an enlarged twin-engine version of the J-10. The new fighter, which was reportedly designated J-13, inherited the J-10's canard delta design and resembles the Russian Mikoyan MiG MFI (Project 1.44) fifth-generation fighter demonstrator in many aspects. The J-13 design is less radical in terms of design and technology compared to the Shenyang J-12, and therefore may stand a better chance of becoming successful.

It was reported that Russian MAPO-MIG has been working with Chengdu since the late 1990s to develop a new generation fighter based on the J-10 design. The J-13 may be powered by two improved AL-41 turbofan engines with thrust-vectoring nozzles and possibly supersonic cruise capability too, giving a maximum take-off weight of 20t. The overall performance is anticipated to be superior to the EF-2000 and French Rafale (in stealth & agility) but still inferior to F/A-22 (in electronics & super cruise).

Considering this information and the activities of European and Russian entities detailed earlier in the report, a logical assumption is that China would be looking to partner with European companies to fill in the gaps in aviation technology it can not gain from Russia. This is especially significant in light of the current dynamics in worldwide military aircraft development and supply. For example, Eurofighter produces the EF 2000 Typhoon mentioned above, and the partners in the consortium are England, Germany, Italy and Spain. As this chapter and others fully demonstrate, German and Italian defense companies are aggressively working with the Chinese military on developing next generation military platforms. If this trend is applied to the technology gained from the EF 2000, this would fill the void in technology the Russians cannot supply.³⁴

VIII. Summary

Taking into account the Chinese aviation industries capabilities, the number of aviation related joint ventures and foreign companies in China, and the support being supplied to China from Russia and Europe on cutting edge military aviation projects, the ECWG does not believe the control levels for the commercial navigation and avionics equipment, software and technology in the Proposed Rule could possibly have any impact on Chinese military aerospace capabilities.

³⁴ Sources for this section include. 1) SinoDefense, "J-XX 4th Generation Fighter Aircraft," 2 June 2006. <<http://www.sinodefence.com/airforce/fighter/jxx.asp>> Nov 2006.; 2) 超级大本营军事论坛 <<http://bbs.cjdy.net/>> Nov 2006.; 3) Turkish Daily News, "EU Plans to Sell Eurofighter (typhoon) To Pakistan Through Turkey," 29 May 2006. Found in: <<http://www.pakistaniddefenceforum.com/lofiversion/index.php/t57817.htm>> Nov 2006.; 4) Chinese Military Aviation, "Fighters," Nov 2006. <http://mil.jchina.com.cn/huitong/j-10_j-11_FC-1.htm> Nov 2006.

CHAPTER VI

Diesel and Marine Engines

I. List of ECCNs:

8A992: Underwater systems or equipment, not controlled by 8A002, and specially designed parts therefor.

8D992: "Software" specially designed or modified for the "development", "production" or "use" of equipment controlled by 8A992.

8E992: "Technology" for the "development", "production" or "use" of equipment controlled by 8A992.

9D990: "Software", n.e.s., for the "development" or "production" of equipment controlled by 9A990 or 9B990.

9E990: "Technology", n.e.s., for the "development" or "production" or "use" of equipment controlled by 9A990 or 9B990.

Under existing U.S. export control regulations, the equipment controlled under 8A992, the software and technology related to 8A992, and the software and technology related to 9A990 does not require a license to China. The New China Rule proposes to add controls to items falling under ECCNs 8A992, 8D992, 8E992, 9D990 and 9E990.

II. China Market and Domestic Companies

China produces about 10 million of the 28 million engines manufactured globally each year. Approximately 8 million diesel engines produced in China are for the agriculture market and the remaining 2 million engines for the non-agriculture market.

Chinese domestic companies have been growing rapidly over the past five years and expanding their market share both in China and internationally. Two such companies, Weichai Power Co. Ltd. and the Yuchai Group, are detailed below:

1. *Weichai Power Co. Ltd.*

Weichai Power Co., Ltd. ("Weichai Power") was founded by Weifang Diesel Engine Factory together with domestic and foreign investors. Weichai Power specializes in the research and development, manufacturing and sales of diesel engines. The products are widely applicable to different markets, including heavy-duty vehicles, coaches, construction machines, vessels and power generators.

The majority of Weichai Power's business is in the manufacture of high-speed heavy-duty diesel engines. The two main products of the company are the WD615 and WD618 diesel engines, which have a horsepower rating range of 158HP to 433HP and are widely used in heavy-duty vehicles and coaches, construction machine engines, vessel engines and power generator engines. Currently, the revenue from WD615 Euro I Engines constitutes the majority of Weichai Power's sales.

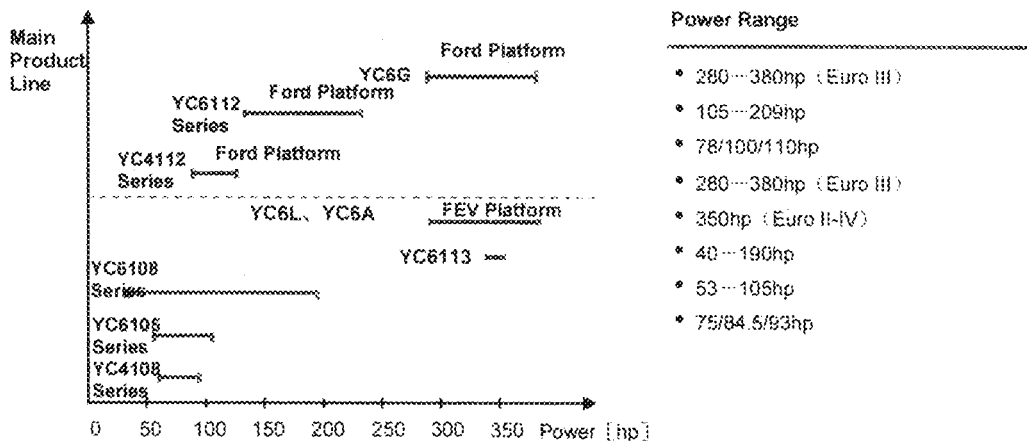
In 2005, Weichai Power, however, announced production of its WP12 series diesel engines. The Weichai Power Landking WP12 series Euro III diesel engine was co-developed by Weichai Power and AVL Company, Austria. It is a totally new design and meets the requirements of Euro III and has the potential to meet the Euro IV standard. The engine can be widely used in heavy-duty vehicles, coaches, construction machines, vessels and power generators. The anticipated production rate is expected to be 50,000 units per year. Weichai Power invented this new product line, so Chinese companies would have time to meet the Euro III emissions standards China is requiring in 2008.

2. Yuchai Group

Established in 1951, Yuchai Machinery Guangxi ("Yuchai Group") is the largest manufacturer of internal combustion engines and the largest manufacturer and exporter of medium and small engineering machinery in China. Yuchai Group was formed by a combination of Yuchai Machinery Group Co., Ltd. and Yuchai Machinery Co., Ltd. which includes twenty five holding and joint venture subsidiaries. In 2005, Yuchai Group's sales revenue were \$725 million, which equated to 230,228 units sold, a net income of \$61 million and a net income margin of 8%.

Yuchai Group's diesel engines come in five categories with ten series. Together they total over 1200 models used in light, medium and heavy-duty trucks, travel coaches, forestry/farm machinery, small to medium watercraft and power generators. These diesel engines start at 65 horsepower and range up to 380 horsepower.

The following chart shows the power range for a number of the Yuchai engines and the corresponding platform:



Their new product development, which will be accomplished in cooperation with global partners, will focus on: higher power range engines; high emission standard engines; and passenger car diesel engines. For example, Yuchai is cooperating with Yamaha in the joint development of a high speed marine engine. Additionally, they are focusing their R&D efforts on electronic control and HPCR and have been developing Euro IV and hybrid fuel technology engines since 2005.

III. Chinese Domestic Military Diesel Engine Manufacturers

The Chinese military engine sector is dominated by a small number of domestic State Owned Enterprises (“SOEs”). For the vehicle engines China cannot produce, it receives significant assistance either in direct engine exports or joint development from Russia and Europe. The specifications for these engines are beyond the control level of the items listed on the CCL and would fall under the scope of the U.S. Munitions List if they were of U.S. origin.

Following is information researchers provided on three of the Chinese SOEs producing diesel engines for the Chinese military.

1. Shan’xi North Power Co., Ltd.

Shan’xi North Power Co., Ltd. (Shan’xi Power”) is a wholly state-funded enterprise that is under the China North Industries Group Corporation (“NORINCO”). Its sole shareholder is the Arms Corporation Shan’xi Arms Industry Management Bureau and its primary business is the production of wind-cooled diesel engines, small-type general oil engines, and the pump filters and spare parts for motorcycles and diesel engines.

One of its primary engine lines is the 413F series of wind-cooled diesel, which was produced based on the German KHD Company’s technology. The current product series B/F8L413F is used in numerous applications, including heavy-duty

trucks, engineering machines and generator units. The specific product parameters for the 413F series are shown in the following chart:

Model	F8L413F	BF8L413F	F12L413F	F6L413F
Cylinder no. / layout	V type 8 cylinders	V type 8 cylinders	V type 12 cylinders	V type 6 cylinders
Bore×stroke (mm)	125*130	125*130	125*130	125*130
displacement (L)	12.763	12.763	19.144	9.572
Compression ratio	15.8	15.8	18	
Rated output/rotating speed (KW/(r/min))	188/2500	235/2500	282/2500	150/2500
Max. torque /rotating speed (Nm / (r/min))	1170/1500		1226/1500	
Min. fuel consumption rate (g/kWh)	212	212	208	205

2. Hebei North China Diesel Engine Co., Ltd.,

Hebei North China Diesel Engine Co., Ltd. ("Hebei Diesel") is solely funded by NORINCO and is a professional manufacturer of diesel engines for both military and civil use. Hebei Diesel is currently licensed by the German DEUTZ company to produce BFM1015 water-cooled diesel engines, which are widely applied to special military vehicles, luxury buses, and heavy-duty buses, specialty cars, engineering machines, oil equipment and power generation.

The specific product parameters are as follows:

Model		BF6M1015	BF6M1015C/ MV	BF6M1015CP/ MV	BF8M1015C/ MV	BF8M1015CP/ MV	
Cylinder number/ layout		V-type 6 cylinders	V-type 6 cylinders	V-type 6 cylinders	V-type 8 cylinders	V-type 8 cylinders	
Bore/stroke	Mm	132/145	132/145	132/145	132/145	132/145	
Displacement	L	11.906	11.906	11.906	15.874	15.874	
Compression ratio		17	17	17	17	17	
Max. rated speed	RPM	2100	2100	2100	2100	2100	
Rated output	Continuous output	kW/RPM	214/2100	261/2100	287/2100	348/2100	383/2100

	intermittent working	kW/RPM	223/2100	273/2100	300/2100	364/2100	400/2100
	Involuntary intermittent working	kW/RPM	231/2100	286/2100	314/2100	381/2100	419/2100
	automotive power	kW/RPM	240/2100	300/2100	330/2100	400/2100	440/2100
Max. torque	Nm		1473	1773	2040	2364	2721
Max torque speed	RPM		1300	1300	1300	1300	1300
Min. idle speed	RPM		550	550	550	550	550
Min. fuel consumption rate	g/kWh		198	188	188	189	189
Weight	Kg		830	830	830	1060	1060
Dimension (L × W × H)	Mm		841 × 932 × 1174	841 × 932 × 1174	841 × 932 × 1174	1010 × 955 × 1174	1010 × 955 × 1174
Emission standard			EUR O I	EUR O II, EUR O III	EUR O II, EUR O III	EUR O II, EUR O III	EUR O II, EUR O III

Note: Its parent, NORINCO, is an investment organization authorized by the State to oversee the performance of state-owned assets. The group has the decision-making power of investment, beneficial interest in assets, authority to examine and approve foreign affairs, import and export permits, and the contract rights in projects and combines product operation with capital operation. NORINCO's primary location is at Sanlihe Road, Xicheng District, Beijing, and its main business activities are the manufacture of weapons and relevant furnishings.

3. FAW Jiefang Automotive Company Ltd. Dalian Diesel Engine Company

FAW Jiefang Automotive Company Ltd. is a heavy duty truck manufacturer with technology support from the FAW Group Corporation R&D Center. It was wholly funded by FAW group and was established based on the original First Automobile Works. The main business activity is the manufacture of heavy duty trucks under the Jiefang brand name. The company was founded in 1951 and was one of the earliest enterprises in the trial-manufacturing of diesel engines for vehicles in China. It has now become a professional diesel engines production base and also provides engines for military use. In 2003, FAW Group began negotiations with the German DEUTZ company about producing DEUTZ diesel engines. The company now has the DEUTZ workshop where it produces DEUTZ diesel engines. The specific product parameters are as follows:

Model	BF6M1013-24	BF6M1013-26	BF6M1013-28	BF6M2012-20	BF6M2012-22
Cylinder number	6	6	6	6	6
Bore*stroke (mm)	108X130	108X130	108X130	101X126	101X126
Displacement(L)/displacement per cylinder	7.2/1.2	7.2/1.2	7.2/1.2	6.06/1.01	6.06/1.02

Type	straight---line Water-cooled	straight---line Water-cooled	straight---line Water-cooled	straight---line Water-cooled	straight---line Water-cooled
Air intake method	turbocharged, inter-cooled	turbocharged, inter-cooled	turbocharged, inter-cooled	turbocharged, inter-cooled	turbocharged, inter-cooled
Rated output/ rotating speed (kW/PS/r/min)	175/240/2300	195/265/2300	206/280/2300	147/200/2300	162/220/2500
Max. torque/ rotating speed (Nm/r/min)	854/1400	954/1400	1050/1400	735/1500	770/1500
Fuel consumption rate(g/kW.h)	200	200	200	200	200
Valve number per cylinder	2	2	2	2	4
Compression ratio	18.1	18.1	18.1	18	
Fuel-supplying mode	mechanical/electronic	mechanical/electronic	electronic	mechanical/electronic	Electronic
Injection pump	unit pump	unit pump	unit pump	unit pump	unit pump
Emission	EURO II/III	EURO II/III	EURO II/III	EURO II/III	EURO II/III
Injection pressure (bar)	1100-1600	1100-1600	1600	1600	1600-1800
Weight (kg)	650	650	650	550	550

IV. Foreign Company Sales/Transfers to China's Military

Following are two examples of foreign cooperation in the supply either through direct engine sales or technology transfers to China's military vehicles and vessels:

A. The Type 99 Main Battle Tank (MBT)

The Type 99 MBT is the PLA's third generation indigenous MBT. The main contractors are Beijing-based China North Vehicle Research Institute (NEVORI, also known as 201 Institute) and Inner-Mongolia First Machinery Group Co., Ltd (FIRMACO) of Baotou, Inner Mongolia. The 201 Institute of Beijing and 617 Factory (now also a part of FIRMACO) of Baotou, Inner Mongolia originally proposed a third-generation MBT design based on the German Leopard 2 MBT, featuring a German-made 1,200hp diesel engine. However, the PLA was reluctant to fund the program because it was in favor of purchasing or locally producing the Leopard 2. Negotiations with West Germany lasted for a few years before the acquisition plan was finally cancelled due to financial difficulties. The program then went back to the indigenous development, with three experimental prototypes (1224, 1226, 1226F2) introduced in the early 1980s.

The program entered full scale development in the mid-1980s when China North Industries Corporation (NORINCO), the parent company of 201 Institute and 617 Factory, was officially awarded the development and manufacturing contract for the third-generation MBT program in the spring of 1989. The first prototype known as the Type 90-II was built and tested in early 1990.

Propulsion: The Type 99 is powered by a liquid cooled, turbocharged 1,500hp diesel derived from German MB871ka501 diesel technology. At its current battle weight of 54t, this gives a power-to-weight ratio of about 27.78. The maximum speed by road is

80km/h and 60km/h cross country. The acceleration is from 0 to 32km/h in 12 seconds. The transmission provides seven forward and one reverse gear.³⁵

B. Marine Diesel Engines

The Type 054 (NATO codename: Jiangkai Class) is the new generation multirole frigate for the PLA Navy. The first two hulls, Ma'anshan (525) and Wenzhou (526), were delivered to the PLA Navy East Sea Fleet in 2005. Equipped with a mixture of Russian- and Chinese-made systems, the 3,400t frigate design incorporates strong stealth features similar to the French La Fayette class. The subsequent ships designated Type 054A are reportedly equipped with Russian 9M317 (SA-N-12) Shtil air-defense missiles and guidance radar. At least two ships are currently under construction.

The propulsion of the Type 054 is a combined diesel and diesel (CODAD) arrangement. The primary propulsion is reported to be two French-made SEMT Pielstick diesel engines (~21,000hp). The similar diesel engine is used by the French La Fayette class frigate. China reportedly received the first batch of the diesel engines from France in 2003. The power plant is said to be one of the most advanced in Europe. The secondary propulsion is two indigenous Shaanxi diesels (Chinese copy of the MTU 20V 956TB92) rated at 8,840 hp (6.5 MW).

It is believed that SEMT-Pielstick has been licensed by the French government to produce diesel engines for numerous PLA Navy surface ships and submarines.³⁶

V. Joint Ventures

In addition to the above-described Chinese domestic companies, a number of joint ventures between Chinese domestic companies and foreign companies also produce diesel engines that would fall under the scope of the EAR, whether classified as EAR99 or under ECCN 9A990. These companies include Volvo (Sweden), Deutz (Germany), Iveco (Italy) and Mitsubishi (Japan). These companies, which represent Cummins' major international competitors, are continually trying to expand their presence in China through joint ventures, technology licensing, and strategic alliances.

For example, the following chart identifies numerous international engine makers and the JV's and alliances they have formed in China in the heavy truck and marine engine markets:

Chinese Partner	Foreign Partners	Country of Origin
DFM	Renault	France
Shanghai Diesel	Hino	Japan
FAW	Deutz	Germany

³⁵ Sinodefence, "Type 99 Main Battle Tank," March 19, 2006, <<http://www.sinodefence.com/army/tank/type99.asp>>, Nov 2006.

³⁶ Sinodefence, "Type 054 (Jiangkai Class) Multirole Missile Frigate," September 16, 2006, <http://www.sinodefence.com/navy/surface/type054jiangkai.asp>, Nov 2006.

SAIC	IVECO	Italy
Qingling Motors	Isuzu	Japan
China Shipbuilding Industry Co.	Mitsubishi/ Wärtsilä	Japan

Details on a number of these joint ventures are as follows:

1. DFM-Renault

The DFM-Renault Joint Venture produces Renault dci11 engines under a technical license agreement. The engines are assembled in China and the DFM technical center works directly on the engine drawings.

2. Shanghai Diesel-Hino

The Shanghai Diesel - Hino Joint Venture is a 50-50 JV with a total investment of US\$ 29.98. Under the first phase, the JV started producing the Hino P11C engine. In the second phase, they will begin producing the J08 C engines. The plant has an annual capacity of 15,000 and began production in 2004.

3. FAW-Deutz

The FAW -Deutz Joint Venture produces the BFM 2012, 2013 and 1013 series 4 and 6 cylinder engines. Deutz transferred the technology for these engines, and they are now completely produced in China. The JV produces 30 categories for auto diesel engines and 9 for construction ranging in power from 122 HP to 300 HP.

4. SAIC and IVECO

SAIC and IVECO have signed an agreement to establish a 50-50 joint venture that will be called Shangqi IVECO. After the approval of the joint venture, IVECO will acquire a 67% share in Chongqing Hongyan. The two partners then plan to invest .12 billion Euros in a new engine company. IVECO will invest 40 million Euros to produce HDT and construction engines. The capacity for the new company will be 30,000 units per year.

5. Qingling Motors-Isuzu

The Qingling Motors-Isuzu Joint Venture is a 50-50 JV located in Chongqing and has a total investment of US\$ 1.5 billion. It is Isuzu's fifth JV globally. The JV will import the new Isuzu world level 340-380 HP engine and the 130-250 HP CNG engine.

6. *Wärtsilä, China Shipbuilding Industry Corporation (CSIC) and Mitsubishi Heavy Industries (MHI)*

Wärtsilä, China Shipbuilding Industry Corporation (CSIC) and Mitsubishi Heavy Industries (MHI) are establishing a joint venture to manufacture large, low-speed marine engines in China. CSIC will hold 50% of the joint venture, Wärtsilä 27% and Mitsubishi 23%. The investment will total around 75 million euros, spread over several years. Production is scheduled to start during the fourth quarter of 2008.

7. *MTU*

Additionally, MTU has a Wholly Owned Foreign Enterprise (WOFE) located in Suzhou. The WOFE began production in mid 2006 and produces 12, 16 and 18 cylinder engines.

VI. Foreign Technology Suppliers

In addition to the Chinese companies and joint ventures, a number of foreign companies are providing cutting edge technology to China for the development and production of diesel engines. Two of the major foreign technology suppliers are AVL out of Austria and FAV out of Germany. Following are details on technology projects these companies are working on in and with China.

1. *AVL*

AVL-- Austria worked jointly with Weichai Power to produce the Landking WP12 series Euro III diesel engine. This diesel engine adopts a new design concept suited to the requirement of Euro III and has the potential to meet the Euro IV standard. It is environmentally friendly and economical with all the specifications of fuel consumption, emission, noise, and reliability reaching the world advanced level. The Landking series diesel engine is mainly used in heavy-duty trucks, luxury buses, special vehicles as well as engineering machinery, vessels and generating sets. Landking vehicle diesel engine has the largest displacement of its kind in China.

The structure of the WP12 diesel engine is as follows: The whole gear system is designed to lower the noise. Postpositive gear chamber drives the motor, hydraulic pump, injection pump and air compressor (the 1st or 2nd cylinder). It can output the torque of 1000 Nm. The turbocharger is middle-positioned. The electronic heating flange is adopted to replace the flame preheating starting device and solve the problem of the *white smoke* which usually happens when the engine gets started in winter. Multi layered compound material is used to lower the noise and enlarge the storage of the oil pan and prolong the period between oil changes.

The Landking WP10 series Euro III diesel engine was also co-developed by Weichai Power and AVL and is likewise designed to suit the requirements of Euro III with the potential to meet the Euro IV standard. It is environmentally friendly and economical with all the specifications of fuel consumption, emission, noise, reliability reaching the world advanced level. The WP10 has basically the same characteristics and specifications as the WP12.

2. FEV

FEV -- Germany has also worked in China to provide diesel and gasoline engine technology for Chinese automotive companies. Such companies would include Dalian Diesel and Brilliance. On May 11, 2005, FEV China Co., Ltd., opened its new high-tech powertrain development center in Dalian, a harbor city in Liaoning Province about 600 km east of Beijing. This technology development centre provides engine design, electronic calibration development, performance and emissions solutions, and components validation expertise. Technical services include design analysis, engine development, vehicle integration, transmissions design, supplier handling, product reliability planning, manufacturing and quality systems.

Currently, FEV China has 33 employees, a figure that is growing month by month. In addition, six German expatriates are assisting in the set-up of the organization. The first engine was successfully completed in the summer of 2005.

VII. Engine Software Standards and Protocols

Engine manufacturers use commercially available software applications to ensure compliance with environmental regulations. These software applications are used to operate service tools; run engine diagnostics; and operate manufacturing tools for engine calibration.

U.S. Companies, as well as other foreign companies, participate in standards discussions at local and international levels to establish accepted software protocols, ranging from vehicle network communications to diagnostic standards.


China is in the early stages of establishing its engine software standards and protocols. It is U.S. Government policy that industry drives the development of standards. The U.S. Government continually advocates that China be more transparent in its standard setting process and allow U.S. companies to be involved in developing standards in China.

If export controls limit or give the appearance of limiting the ability of U.S. Companies to participate in developing China's standards, U.S. companies will be disadvantaged and forced to re-develop products to meet Chinese market standards. The opportunities naturally associated with standards development will go to non-U.S. multinationals and their Chinese partners. The European and Japanese companies, who will not be under equivalent restrictions, will be involved in China's standards development and thus gain a great advantage over U.S. companies.

VIII. Summary

In the diesel engine sector, China has ample access to components from a variety of internal and external sources. Numerous high technology companies in the U.S., Japan and Europe supply diesel engine technology to China for use in a variety of commercial applications. As detailed above, a combination of Chinese joint ventures and Chinese enterprises are manufacturing commercial diesel engines using foreign and domestically engineered technology. To close the technology gap with international diesel engine makers, the local companies are actively developing larger horsepower engines compliant to more demanding emission standards with the help of international powertrain engineering consultants.

The following chart demonstrates the shared technology and components in the majority of domestic Chinese and internationally produced diesel engines:

Key competitors: 

Summary (predominantly Auto & Bus)

Engine Provider	ECM/ECU	Fuel System/Fuel Pump	Inlet Air	Exhaust	SCR
Isuzu (Bus & L) *	*BOCC R	*Bosch *BOCC R *Lucas (Bosch) or Cherehil/S&M	*Bosch *BOCC R	*BOCC R	*Mercedes Benz *Isuzu?
Volvo (Bus & L)	*BOCC R	*BOCC R	*BOCC R	*BOCC R	
Changchai (Bus & L)	*Denso?	*Bosch	*Bosch	*BOCC R	
Yuchai (Bus & L)	*Wipac/Bosch	*BOCC R *Denso	*BOCC R *Bosch	*BOCC R *Molins	
Isuzu (Bus & L)	*BOCC R	*BOCC R	*BOCC R	*Bosch/Bosch *Mercedes Benz/Bosch	
Changchai (Bus & L)	*YIT?	*BOCC R	*BOCC R/Bosch	*Bosch VVO *BOCC R	
Yuchai (Bus & L)	*YIT?	*BOCC R	*BOCC R	*BOCC R	
CUMMINS Nantong (Bus & L)	*Denso?	*Denso (Bus & L) *KANTO (Changchai) (Bus & L)	*Denso (Bus & L) *KANTO (Changchai) (Bus & L)		
Isuzu (Bus & L)	*Mitsubishi	*C&B/L (Bosch) BOCC R			
MAN (Bus & L)	*BOCC R	*Bosch (Bus & L)	*BOCC R	*BOCC R	
Nantong	*YIT?	*Bosch			
Yuchai/Perkins	*BOCC R	*BOCC R	*BOCC R	*BOCC R	
Isuzu	*BOCC R	*BOCC R (Bus & L)	*BOCC R	*BOCC R	

This chart, along with the previously provided information, demonstrates that China has ample indigenous sources for diesel engines and related software and technology to meet both commercial and military demands. The commercial demand and development is being driven by emission requirements, which is contrary to the military diesel engine requirements. The Chinese military demand is being met through sole and joint development in China, as well as direct exports from non-U.S. foreign companies. The ECWG, respectfully, submits that adding further controls on diesel engine related software and technology, when the Chinese military is clearly well ahead of the levels in the Proposed Rule, would not further U.S. export control policy goals relating to Chinese military capabilities.

CHAPTER VII

Helicopters

I. List of ECCNs:

9A991: "Aircraft", n.e.s., and gas turbine engines not controlled by 9A001 or 9A101 and parts and components, n.e.s.

9D991: "Software", for the "development" or "production" of equipment controlled by 9A991 or 9B991.

9E991: "Technology", for the "development", "production" or "use" of equipment controlled by 9A991 or 9B991.

The Chinese helicopter industry is in a state of transition. While previously China was predominantly focusing on military helicopter development, the opportunities are quickly growing in the area of commercial helicopters. To date U.S. companies have not been heavily involved in China due to U.S. restrictions prohibiting involvement in Chinese military development. This has not, however, prevented the Chinese from advancing in both its military and commercial helicopter sectors. They have found multiple willing partners to assist in the development and production of both military and commercial helicopters.

U.S. companies have not been involved in Chinese military helicopter development, due in large part to U.S. export regulations. The market data shows that current U.S. regulations have been effective in restricting the export of U.S. origin helicopters and related technology and software to the Chinese military. In fact it could be argued that the current regulations have been over-restrictive such that U.S. companies have been almost completely cut out of the Chinese commercial helicopter market.

Now that China's commercial helicopter industry is on the verge of blossoming, U.S. companies have an opportunity to compete with foreign companies from Russia, France, and Italy that currently dominate the Chinese helicopter market.

As detailed later in this chapter, non-U.S. foreign companies have aggressively partnered with the Chinese to provide joint development as well as direct sales across all levels of both the commercial and military helicopter market. Eurocopter, AgustaWestland, Thales and Turbomeca are all participating and supplying technical assistance and components for China's newest military helicopters.³⁷ The Chinese military level, which is being jointly developed and produced in China with the assistance of Russian, French,

³⁷ For information about Thales participation and assistance in the aviation industry, see the Thales Avionics section in Chapter V -- Navigation and Avionics.

and Italian companies is well above the civilian aircraft level U.S. companies would supply. Current U.S. restrictions prevent U.S. companies from participating in these military-related programs, so there is no need to increase restrictions on civil certified aircraft. The Chinese have the ability and the U.S. companies are only seeking to work with China in the commercial helicopter industry.

Placing further restrictions on the military side civil aircraft, parts and components, related technology and software are unnecessary. The Chinese commercial helicopter demand is growing, and U.S. companies should be fully allowed to compete with the Chinese domestic companies and other foreign companies in this commercial market.

II. Overall China Market

In the current Chinese civil helicopter market for the intermediate weight class, which ranges 7,000 to 15,000 lbs, Chinese sources occupy 27.91% of the current civil market, while French sources occupy 23.26% and Italian sources 2.33%. In the medium weight class, which ranges 15,000 to 35,000 lbs, there are currently no Chinese domestic sources in the civil market, but China has invested resources in researching new prototypes for the Medium and Intermediate class helicopters. Meanwhile, Russian helicopters take 54.55% of the civil medium helicopter market share, and French helicopters take 42.42%.

In the past, the Chinese helicopter market has been dominated by the military, with military demand far exceeding demand for commercial aircraft. The remarkably slow growth rate of the Chinese civil helicopter market is primarily due to Government restrictions on air space. 50 years after Hafei made its first helicopter, China's civil helicopter fleet numbers a meager 170 helicopters, whereas the military fleet, initiated at roughly the same time, is at least four times as large. In recent years, a new upward trend has developed in the Chinese commercial aircraft market. Since 2000, the civil helicopter fleet in China has more than doubled, from approximately 70 helicopters in 1999 to 170 today.

With increasing urban wealth and the prospect of China lifting strict airspace controls within the next few years, China expects a significant increase in commercial demand for helicopters. The China National Aero-Technology Import & Export Corporation (CATIC) estimates that China will need more than 10,000 helicopters by 2020, with a market value of \$84 billion, but more conservative estimates anticipate the demand to reach 1,867 civil helicopters by 2013, with a value of \$4.9 billion.³⁸ Civil helicopter applications in China are becoming clearer for a wide range of sectors, from hospitals to search and rescue, off-shore oil support to short-distance airport services, and TV news stations to film crews.

³⁸ John Morris, Aviation Week's Show News Online, "China's Helicopter Market Could Be World's Largest," 2002 <<http://www.aviationweek.com/shownews/02asia1/topsto03.htm>> Nov 2006.

III. Chinese Domestic Availability

China has two major helicopter manufacturing companies, both of which are state-owned: Harbin Aircraft Manufacturing Corporation (Hafei) and Changhe Aircraft Industry Corporation (Changhe). The Chinese Helicopter Research and Development Institute (CHRDI) oversees the early stages of research in indigenous Chinese and jointly-developed helicopter technologies before it passes off the final development and production phase to one of the Chinese helicopter manufacturers. The China National Helicopter Corporation (CNHC) performs engineering management for the helicopter industry in China, is responsible for management of overall concept feasibility studies, research, testing, trial production, mass production and service of all types of helicopters manufactured by Hafei, Changhe and CHRDI. CNHC is also responsible for the development of helicopter markets and organizing international cooperation and technical exchange. CNHC, CHRDI, Changhe and Hafei are all subsidiaries of AVIC II.

The section below first provides details on the commercial helicopter programs at Hafei and Changhe, followed by a section about China's military helicopter capabilities and programs. Helicopter technology can be difficult to separate into commercial and military categories because the base helicopters are in many cases the same. The distinction between commercial and military helicopters frequently lies in the mission-specific equipment added to the helicopter, but in some cases they also differ in the types of materials used. Because military helicopters are made to meet performance requirements, regardless of cost, this sometimes means that military helicopters use a greater percentage of composite materials. The section below, addresses the commercial Chinese helicopter variants that can be expanded for domestic or international commercial sales.

1. Harbin Aircraft Manufacturing Corporation (Hafei)

- **Z-9 Program:** Harbin Aircraft (Hafei) has been deeply involved in joint helicopter development programs with Eurocopter and other foreign companies. In July 1990, Hafei began cooperation with Eurocopter, producing many variants of the AS365N/N1 Dauphin II helicopter (Chinese designator Z-9). Hafei produced the first 50 Z-9 multirole intermediate helicopters under license during the period between 1980 and 1990, during which Eurocopter supplied all components and technologies. The Dauphin II/Z-9 is a intermediate-weight multirole helicopter that is powered by two turbine engines. Capable of carrying 11 passengers and 2 pilots, with a top speed of 305km/h and a range of 1000km, the Z-9 uses composite materials in its main and rear rotor blades, and its tail rotor is built into the vertical fin.³⁹

³⁹ U.S. General Accounting Office. Statement of Harold J. Johnson before the Joint Economic Committee. "U.S. and European Union Arms Sales Since the 1989 Embargoes: China." 28 Apr 1998. <<http://www.gao.gov/archive/1998/ns98171t.pdf>> Nov 2006.

These helicopters were supplied to both the civil and military market in China, with a handful of sales overseas. Since 1990, Hafei has continued production of the Z-9 and variants with a localization rate of more than 90%. Hafei is now upgrading it to the N3 model with assistance from Eurocopter and its engine supplier. In 2001, the earlier civil variant of the Z-9, the H410A, made its debut, but Hafei has developed an improved variant Z-9 for the civil aviation market, the H425. This helicopter features more powerful Turbomeca Arriel 2C engines, more modern avionics, and a wider cabin.

- **HC-120 Program:** The Chinese HC-120 light helicopter program was also developed through assistance from Eurocopter. Eurocopter took the lead in a joint-venture with China and Singapore. CATIC and Hafei took 24% ownership in the JV and was responsible for contributing the fuselage and body of the helicopter to foreign engineers for final assembly. Technologies Aerospace of Singapore took 15% ownership and was charged with developing the tail section of the helicopter. Meanwhile, Eurocopter, which took 61% ownership of the JV, had engineering leadership and overall responsibility. This was the first time that China shared investment and risks with foreign partners in helicopter production. Hafei now boasts an assembly line of HC-120 light helicopter and it is also a supplier of numerous components such as the fuselage for the other assembly line(s) of Eurocopter.⁴⁰ Annual production of the HC-120 has reached more than 100, and to date more than 100 helicopters have been exported to more than 20 countries.

The HC-120 is designed to meet both military and civilian requirements, including search-and-rescue and evacuation operations as well as reconnaissance missions. It has a maximum speed of 232km/h, a range of 748km and seats 5 passengers.

- **Z-15 Program:** AVIC II and Eurocopter announced in late 2005 that the two companies will launch a partnership to develop a new 6-ton helicopter (EC designator EC-175; Chinese designator Z-15). This Z-15 will be a state-of-the-art helicopter.

In November 2006, the European Commission approved French governmental aid of €100 million Euros for Eurocopter to develop the EC-175/Z-15 with China under state aid for research and development. This partnership will last from 2006 until 2011 and the French government's aid to Eurocopter will cover

⁴⁰ John Morris, Aviation Week's Show News Online, "China's Helicopter Market Could Be World's Largest." 2002 <<http://www.aviationweek.com/stownews/02asia1/topsto03.htm>> Nov 2006.

approximately 29% of Eurocopter's research and development spending.⁴¹ Eurocopter will be controlling the design of the dynamic components and rotorhead system.

Hafei was assigned as the primary Chinese partner company in this deal. The goal is to fill the production gap and meet the growing demand for medium class helicopters in China. Several variants for military support have been proposed for this helicopter, but it is currently still in the development phase. The first flight of the Z-15 is expected in 2009.

2. Changhe Aircraft Industry Corporation (Changhe)

Changhe Aircraft Industry Corporation was established in 1969 in the city of Jingdezhen, Jiangxi province. Changhe is the Chinese Aircraft SOE known for both Helicopter and Minibus manufacturing. Since its establishment, Changhe has served as the site of helicopter programs based upon both joint Chinese-foreign and Chinese indigenous development.

In the past couple years Changhe has undergone a large-scale improvement and modernization program. The enterprise has built several large new facilities equipped with top-of-the-line modern machining and testing equipment, and it has plans for further development in the next year. New facilities include a brand new machining center, a modernized sheet metal shop, a revamped testing center, and paint facilities. Changhe is planning to build a large composites facility that will house all composites work and a new flight center that will house the military helicopter programs in an entirely separate and self-sufficient facility 18km away from the main Changhe facilities. All of these recent improvements have greatly facilitated and increased Changhe's production capacity. Through the 1990s, Changhe was producing approximately two or three Z-8 helicopters per year, but today it can produce about one Z-8 per month.⁴²

- **Z-8 Program:** In 1977 and 1978, the PLA Navy purchased the Eurocopter SA 321 Super Prolon. One of these French-made helicopters was disassembled and reverse-engineered at Changhe, reportedly with the agreement of the French, to create the Z-8, a utility transport helicopter. The Z-8 has a maximum speed of 315km/h, a ferry range of 830km, flight endurance of 2.5 hours, and can carry a maximum of 39 passengers.

⁴¹ AFP News, Brussels, "French govt aid for Eurocopter project with China approved by EU," 14 Sept 2006

⁴² John Larkin and Nina Hsu, Site visit to Changhe Aircraft, 9 November 2006.

Since its first successful flight in 1985, localization of the helicopter has reached nearly 100% and Changhe has created new improved variations on the Z-8. Changhe is also considering a new civil variant of the Z-8.⁴³

- **Z-11 Program:** The Z-11 lightweight utility helicopter development program was initiated by Changhe in 1989 and officially approved by the Chinese government in 1991. This helicopter was developed without joint foreign cooperation, but it was a direct copy of the French AS 350B Squirrel helicopter. The Z-11 is a six-seat lightweight helicopter equipped with basic navigation and radio equipment (with the improved upgrade options on the Z-11MB1 variant), a maximum speed of 261km/h, range of 600km, and a flight endurance of more than 3.9hours.

As with the Z-8, localization rate had reached nearly 100% and Changhe has developed a number of variants, including a military training and an armed variant. The Z-11 was revealed in the 1996 Zhuhai Air Show, and the first armed variant Z-11W flew in December 1994. Reports have indicated that Changhe is designing a civil variant of the Z-11, for which it is seeking Western partners.⁴⁴

- **CA-109 Program:** In 1995, Changhe launched an equity Joint-Venture with Agusta of Italy to make various models of Italian helicopters, starting with the A-109 utility helicopter (Chinese designator CA-109) as the launch product.

Changhe is responsible for manufacturing the airframe and tail boom, and Agusta will supply engines and avionics for the helicopter, as well as staff training and other technical assistance. This CA-109 has a maximum speed of 289km/h, a range of 977km, and a maximum take-off weight of 2850kg.

China intends to promote the CA-109 in the domestic and international civil helicopter market, though the helicopter could also be adapted into an armed variant. Changhe Agusta Helicopter has received mass orders for the CA-109 from police forces for security operations during the 2008 Beijing Olympics.⁴⁵

⁴³ Brendan Sobie, "Harbin begins test flying upgraded civil version of license-built Z-9," *Flight International*, 13 Jan 2004.

⁴⁴ Brendan Sobie, "Harbin begins test flying upgraded civil version of license-built Z-9," *Flight International*, 13 Jan 2004.

⁴⁵ Chen Pianpian, "CA109 helicopter to service Beijing Olympic Games," *Zhuhai Special Zone News*, 3 Nov 2006, p.5a.

IV. Foreign Availability

The predominant foreign suppliers to the current Chinese helicopter market, both military and commercial, are Eurocopter (France), AgustaWestland (Italy), and MIL (Russia). Kamov (Russia) has also supplied naval helicopter fleets of significant sizes to China's naval air force. These foreign companies have contributed to Chinese helicopter programs and helicopter fleets on numerous levels. Details on these and other foreign companies involved in Chinese helicopter sales and joint-development are included in the section below.

1. Eurocopter

Eurocopter, a subsidiary of EADS in France, is one of the foremost and significant suppliers to China's military, because it has not only sold fully-assembled helicopters to China, but it has also engaged in various levels of partnerships with Chinese helicopter manufacturers to provide technology and technical assistance. All of the three services under the PLA operate helicopters made by Eurocopter either in Europe or in China through its Joint-Venture. Eurocopter has provided some degree of technical assistance in Chinese programs to build the HC-120 light helicopter, the Z-9 multirole intermediate helicopter, and the Z-15 intermediate utility helicopter (Chinese Medium Helicopter). Reports have indicated that Eurocopter has provided some design assistance and a rotor system to the Chinese for the WZ-10 attack helicopter, and the Z-8 utility helicopter was developed through reverse-engineering of the EC SA 321 Super Frelon sold by Eurocopter to the PLA Navy.

Recently, Eurocopter/Harbin sold 40 EC/HC-120 helicopters to the Chinese PLA Army Aviation Corps.

2. AgustaWestland

Agusta in Italy is perhaps the most aggressive European helicopter manufacturer tackling the Chinese military and para-military market. Agusta has sold A-109, A-119 or A-139 helicopters to many provincial police bureaus at remarkably low prices. Agusta is also courting the Chinese PLA Army Aviation Corps with its A-139 helicopters and is offering its EH-101 helicopters to the Chinese PLA Air Force to carry China's head of state.

In addition, Agusta has provided extensive technical assistance to Changhe Aircraft through the equity Joint-Venture established in November 1995 to make various models of Italian helicopters, starting with the CA-109 utility helicopter as the launch product. The Italian helicopter manufacturer also signed a contract in 1999 with AVIC II and

CATIC to develop gear box and transmission components for WZ-10 attack helicopter, which may also be used on the Z-15.

3. MIL Bureau

Russia's MIL Bureau and its factories in Ulan Ude and Kazan have been supplying MI-8 helicopters and its export derivative MI-17-1 HIP helicopters to the Chinese Military in large quantities. Since early 1990s, total purchases have reportedly exceeded 200 units, in various configurations such as utility, search-and-rescue, and medevac. Sources note that another 24 MI-17-1 are being assembled in Ulan Ude now, waiting to be delivered to the PLA Army this year.

4. Kamov

Russia's Kamov Bureau sold its first 24 Ka-28 Helix-A (Export version of Ka-27) Anti-Submarine helicopters to China's PLA Navy in the late 1990s. Reports indicate that additional such helicopters were sold to PLA Navy in the subsequent years in association with Russia's sale of destroyers to the same customer.

Hong Kong sources reported that China was engaged in negotiations with Russia for the acquisition of 40 Ka-29 Helix-B helicopters in early 2006. The Ka-29 Helix-B is intended to carry paratroopers and conduct electronic warfare. At the same time China sought to buy 20 Kamov Ka-31 Helix-B Radar Early Warning helicopters.

5. Turbomeca

Turbomeca has offered to provide the turbo-shafts for the China Medium Helicopter/Z-10 utility transport and attack helicopter. The French company has already provided turbo-shafts for the Z-11MB1 to provide better performance in high altitude regions.

V. Chinese Military Helicopter Capabilities

Although this chapter of the report focuses on civil aircraft and related parts, software and technology, as covered by ECCNs 9A991, 9D991 and 9E991, the section below gives some background on the Chinese military helicopter capabilities. As noted above, the base aircraft in both the commercial and military sectors typically require equivalent levels of technology. The typical distinction between commercial and military variants of a base helicopter is in the mission equipment added as a modification. For the military, this normally includes items such as weapon mounts, military communication systems, targeting systems including FLIR and laser designators, and defensive survivability equipment such as radar, missile and laser warning systems.

Nearly all of the helicopter programs detailed in the sections above have included modifications of the base aircraft to suit military transport, training, reconnaissance and other military operations. Only one known program, however, has designated its initial prototype as military aircraft: the WZ-10 Attack Helicopter. The WZ-10 program has been under development since the late 1990s under tight security at the Changhe Aircraft facility. Once the Changhe New Flight Center is built, the WZ-10 program and any future military helicopter programs will be moved to this self-sufficient facility, which is located 18km from the main Changhe facilities. Reports indicated that as many as six prototypes have been built since 2004. The WZ-10 is undergoing extensive flight testing before the design will be finalized and production will be approved.

The Z-15 helicopter project that is being jointly-developed with Eurocopter is a commercial project, but once the project is completed, several variants may be available for army support, naval antisubmarine warfare, and search and rescue. As noted in the previous section, this helicopter will be state-of-the-art technology.

The Chinese helicopter manufacturers have met part of the basic demand of its military through domestic supply. For the high end demand, the military continues to depend heavily on imports from Europe or production through their Joint-Ventures with European and other foreign partners.

Note: The ECWG wishes to again emphasize the technology, development and production carried out or license to the JV is owned by the JV and this should be considered as domestic Chinese capabilities.

VI. Summary

The Chinese helicopter industry is concentrating its R&D capabilities and research funding on the development of the high-end, state-of-the-art helicopters such as the Z-10 and Z-15, which it anticipates it will need in large quantities, with technologies and assistance from European companies. Meanwhile, China imports both high-end and low-end helicopters from overseas, to meet the immediate demand of its military. It imports the high-end helicopters, such as the Kamov and Agusta products, because the Chinese industry cannot yet make them or only a small number would be needed for now. It imports the low-end helicopters such as the MI-8 utility transport helicopters because it is easy and more cost-effective to source them overseas than to make them locally.

Recognizing that the base aircraft for both military and civilian helicopters is very similar and that military helicopters are distinguished primarily by the added mission-specific equipment, there remains a clear division between the commercial and military markets for U.S. companies hoping to enter the China market. The Chinese helicopter industry, in the past has been focused on military development. At this point, China has already acquired the technology and ability, through indigenous and joint development with non-U.S. foreign companies, to design and produce state-of-the-art helicopters, which can be altered for both military and commercial applications. Today, the Chinese commercial helicopter market is opening and expanding. Because, U.S. export control regulations

already prohibit U.S. companies from participating in any military or military-related programs, there is no need to restrict U.S. companies from participating in the Chinese commercial helicopter market at a level of and below existing helicopter technology in China.

Chart 1: Harbin Helicopter Projects

Project Name	Nature of Relationship	Foreign Entity	Project Description	Notes
HC-120 (EC-120) Light Helicopter	JV Foreign Partners. CATC and Hafei 24%, Singapore Aerospace 15%, 61% Eurocopter.	Eurocopter (France), Technologies Aerospace (Singapore)	EC-120: Singapore in charge of tail section, France responsible for engine, Hafei contributes body to foreign engineers for final assembly. Eurocopter has engineering leadership and overall responsibility. China built assembly line in Harbin. Designated HC-120 for China market. First time China shared investment and risks with foreign partners in helicopter production.	EC120 helicopter is designed to meet military and civilian requirements, including search-and-rescue and evacuation operations, as well as intelligence uses.
Z-9 Multirole Intermediate Helicopter	Cooperation since 1980	Eurocopter (France)	Since July 1980 made many variants of the AS365N/N1 Dauphin II helicopter (Chinese designator Z-9) under license to supply civil and military market in China. Several sold overseas. Until 1990, EC supplied all components and technologies. Production has continued with now higher than 90% localization of the AS365N/N1. Now upgrading N3 model with assistance from EC and its engine supplier.	The H410A and H425 are variants designed for the civil market. The Army versions are designated Z-9 (unarmed) and WZ-9 (armed), and naval version Z-9C. The helicopter first flew in 1981 and entered PLA service in the mid-1980s.
Z-15 Intermediate Utility Helicopter	Partnership between AVIC II and Eurocopter with Harbin as primary Chinese partner	Eurocopter (France)	December 2005: AVIC II and Eurocopter signed agreement to jointly develop new 6-ton helicopter (EC designator EC-175; Chinese designator Z-15). Aim to fill growing demand for medium class in China. Expected first flight in 2009 and certification in 2012.	Several variants for army support, naval antisubmarine warfare (ASW), and search and rescue (SAR) roles.

Chart 2: Changhe Helicopter Projects

Project Name	Nature of Relationship	Foreign Entity	Project Description	Notes
CA-109 Utility Helicopter	Equity JV	Agusta (Italy)	JV formed to make various models of Italian helicopters with CA-109 (Agusta designator A-109E) as the launch product. JV established Nov 1995. Changhe will serve as the main contractor responsible for the manufacture of the airframe and tail boom.	Will be promoted to domestic and international market. Initially target the civil market, but could also be developed into an armed variant for reconnaissance, surveillance, medical evacuation, and ground attack roles.
Z-8 Utility Helicopter	Reverse-engineering of purchased helicopters	France	Disassembly and reverse-engineering of Eurocopter SA321 Super Prolon purchased for PLA Navy. Z-8 includes WZ-6 (Chinese copy of Turboméca 3C III) turboshafts with similar performance. First Z-8 prototype successfully flew 1985. Localization rate nearly 100%.	Lacks Anti-Submarine Warfare mission equipment that was on the original SA321 Super Prolon, so Z-8 is only capable of transport and logistic roles. Considering developing civil variant.
Z-11 Lightweight Utility Helicopter	Development program initiated by Changhe in 1989 and officially approved by government in 1991.	None: No direct joint cooperation, but was a copy of AS 350B Squirrel.	Direct copy of the French AS 350B Squirrel. Localization rate nearly 100%. Developed a number of variants including the military training variant Z-11J, armed variant Z-11W, French Arriel 2B1A engine-powered Z-11MB1, and Z-11ME1.	Revealed Z-11 utility light helicopter during the 1996 Zhuhai Air Show. Over 40 of the military training variant Z-11J currently flying with PLA Army Aviation Corps Flight School. The armed variant Z-11W first flew in December 2004. Designing a civil variant.
WZ-10 Attack Helicopter	Joint development with CHRDI	None: no outside help with the attack helicopter's mission system, mainly due to security reasons	3 rd generation two-seat design comparable in size and performance to the European Tiger and South African Rooivalk. Under development since late 1990s under tight security. Work with European partners on common helicopter dynamic system, which can be used on both the proposed medium helicopter (CMH - Z-15) and the attack helicopter.	Attack helicopter for the PLA

Chart 3: Foreign-supplied Helicopter Components

Foreign Entity	Supplied Components	Project Name
Eurocopter (France)	Develop appropriate rotor system, including the main and tail rotor hubs and blades	CMH (Z-15) and possibly WZ-10 attack helicopter
	Supplied all components and technologies.	Z-9
Agusta (Italy)	Develop the gear box and transmission components	WZ-10, Z-15
	Providing design expertise, which may include the final choice on the powerplant options.	CMH
	Supply engines, avionics, staff training and other technical assistance	CA-109
Turbomeca (France)	Offered at least one unspecified powerplant, and its new 900kW-class Ardiden turbo-shafts specifically designed for 5/6t class helicopters	CMH; Z-10
	Z-11MB1 is fitted with a French-made 632kW Arriel 2B1A turbo shaft for better performance in high altitude regions.	Z-11MB1
	550kW (739hp) Turbomeca Arriel-JC1 turbo shaft, which is produced by SAEC at Zhuzhou as Wozhou-8A (WZ-8A). Hafei developing H410A/425/450 (variant of Z-9) powered by two improved 635kW (851hp) Arriel-II turbo shaft engines.	Z-9, H410A and H425 (variants)

Chart 4: Foreign Helicopter Sales

Foreign Entity	Helicopter Sales Details	Helicopter Name
Mil Design Bureau (Ulan-Ude Aviation Plant and Kazan Helicopter Plant JSC) (Russia)	Sold Soviet-built Mi-8 transport helicopters (1970s), many no longer used. Sold over 200 Mi-17 (upgraded variant of Mi-8) since 1990. Sold Mi-6 (1970s); reports that PLA may be negotiating to buy successor Mi-26.	Mi-8, Mi-17; Mi-26
Eurocopter (France)	AS 332L Super Puma transport helicopters purchased (1980s).	AS 332L Super Puma
Eurocopter (Formerly Aerospatiale)	Sold 13 examples of the French-made Aerospatiale SA 321Ja Super Frelon helicopter to PLA Navy in the (early 1970s); Sold small number of the French-made, Aerospatiale SA 316 Alouette III utility helicopter (early 1970s).	SA 321 Ja; SA 316

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Composite Materials Report

Composite Materials in the Aerospace Industry in China

AmCham Export Compliance Working Group
May 23, 2006

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I. Executive Summary

Introduction

The Export Compliance Working Group (ECWG) under the American Chamber of Commerce -- Beijing (Amcham) has prepared the following report on the Chinese aerospace composite material industry. The report provides a market analysis demonstrating the current level of the Chinese aerospace composite material sector, the current and future demand for composites in the Chinese aerospace industry, and the distinction between the commercial and military sectors in aerospace composite materials.

Objective

The objective of the report is to demonstrate to the U.S. Government the type of data the Amcham ECWG can provide on strategic market sectors. The report supplies information on the current levels of material, technology and equipment available in the Chinese aerospace composite materials sector, with the goal of assisting the U.S. Government in determining the following: 1) setting the level of control on aerospace composite materials, technology and tooling for China, 2) assessing specific end-users in China, and 3) evaluating the end-use for commercial versus military application. The Amcham ECWG believes this report provides valuable information that will benefit the U.S. Government and industry by increasing exports in the aerospace composite material sector to legitimate commercial end-users and end-uses while preventing exports that make a material contribution to the Chinese military capabilities.

Talking Points

Material Level and Availability

1. China's market demand for aerospace grade composite materials for the commercial sector is growing. This growth is due to the globalization of the commercial aircraft manufacturing sector and China's increased role within the worldwide division of labor and production in this sector.
2. The following is a list of current and future projects between Chinese and foreign aircraft manufacturers in the commercial aerospace industry: the ARJ21, Boeing 787 Dreamliner, Retro-fits on the Boeing 737 and 767 aircraft, Airbus A320, A330 A340, and A350, Embraer/Harbin 50 seat commercial aircraft, ZB9 Multi-Role Helicopter, EC120 Helicopter, Z15 Helicopter, and M340 Helicopter.
3. In the aerospace composite material sector, China has ample access to composite materials from a variety of internal and external sources. Numerous companies in the U.S., Japan and Europe supply aerospace composite grade materials (prepregs) to China for use in producing composite parts for commercial aircraft.

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4. China produces its own materials (prepregs) for use in the military sector. These materials are at a higher level than what foreign suppliers are providing for commercial end-use in China but well below the level of composite materials being produced for U.S. military aircraft such as the F-22 and Joint Strike Fighter (JSF).
5. **Conclusion:** This information should assist the U.S. Government in drawing a clear line between the level of materials with legitimate commercial end-uses and those which could make a material contribution to Chinese military capabilities.
6. **Recommendation:** The Amcham ECWG supports drawing this line at a level that would lead to decreasing the number of items requiring a license, decrease licensing time for commercial level items, and prohibiting the export of those items that contribute to China's military capabilities.

Technical Level and Ability

7. A combination of Chinese Joint Ventures and Chinese Enterprises are manufacturing composite parts for commercial aircraft using foreign supplied prepregs. This work is almost exclusively carried out on a build to print basis.
8. One Chinese company, however, is designing, developing and manufacturing composite parts for commercial aircraft completely on its own from start to finish. For example, they have solely designed, developed and currently produce an aircraft frame out of carbon composite materials. This is well above the build to print level foreign companies and joint ventures are currently providing to the commercial aircraft sector in China.
9. Additionally, European companies have announced plans to increase cooperation with China on the design and development of composite parts for commercial aircraft. Airbus recently announced it will partner with Chinese companies on the design and development of composite parts for the A350. Airbus stated that this would be at the build to spec level. Published reports state that at least 50 Chinese engineers are currently in Europe receiving training from Airbus on the A350 project.
10. The Chinese military is already producing composite parts at the build to spec level. The demands on the military side also do not coincide with the commercial aircraft specification requirements. The Glass transition temperature required for military aircraft is necessarily higher than that for commercial aircraft.
11. **Conclusion:** The inherent technical abilities in China combined with the technical levels planned with European aircraft manufacturers demonstrate that China is already fully capable of working at the build to spec level in producing

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composite parts in the commercial sector. This information should assist the U.S. Government in drawing a clear line between the levels of technology the U.S. Government can approve for export to China for legitimate commercial end-uses without making a material contribution to Chinese military capabilities.

- 12. Recommendation:** The Amcham ECWG supports drawing this line at a level that would allow the U.S. Government to approve licenses permitting U.S. companies to work at a technical level equivalent to what is already available inherently in China from its domestic industry or in cooperation with foreign companies.

Manufacturing Level and Ability

- 13.** Some composite tooling is available in China from foreign sources, but the work is predominantly being carried out by hand. The growing demand to produce composite parts for the commercial aircraft sector, however, is requiring an increase in Chinese production efficiency and quality. This will necessitate the purchase of composite tooling from foreign sources.
- 14.** If U.S. industry is prevented from providing composite tooling to China, this market demand will be met by European companies. The current composite tooling equipment in China is from Germany and Switzerland and includes autoclaves, tape winding machines, hot meld machines and UD dip machines.
- 15.** The Chinese will also fund its internal industry to develop composite tooling as it did in the machine tool sector. In the machine tool sector this funding led to an increase in the number of Chinese machine tool companies from one or two in 2002 to the current level of eight. These Chinese machine tool companies now compete directly with the U.S. companies at a high level.
- 16.** Some Chinese companies have expressed their willingness to adopt internal compliance programs, increase transparency and allow follow-up visits to ensure U.S. composite tooling is being used for commercial end-use.
- 17. Conclusion:** Preventing U.S. companies from exporting composite tooling to China will not halt or slow down China's procurement of such tooling. European companies, with little or no review and no follow-up, will provide composite tooling to China. China will also fund its own composite tooling industry, which will in turn speed up China's development in this area.
- 18. Recommendation:** The Amcham ECWG requests that the U.S. Government license tooling at a level equivalent to its competitors, which will in turn strengthen U.S. companies and provide the greatest assurance that the tooling will be for commercial use only.

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Summary Points

19. China has a level of ability and demand on the commercial side well below its military capabilities and demand. China seeks foreign materials, technology and tooling from foreign sources because these foreign materials, designs, processes, and tooling have already gone through long and arduous testing procedures in order to receive commercial certifications. It is not cost effective for either the Chinese companies or their foreign partner to go through new testing and certification when previously certified materials, processes and tooling already exist.
20. China understands the global division of labor and products in aircraft manufacturing and other sectors. Unlike other sectors, aerospace composite materials from foreign sources are more cost effective and higher quality. The decision to procure these items from foreign sources is a practical decision, not one based on lack of capability. The Chinese, however, will expend funds to create its own composite material industry if it has no other alternative.
21. It is in the interest of the U.S. Government and U.S. industry to increase exports in the aerospace composite material sector to legitimate commercial end-users and end-uses in China. These exports would take place under the supervision of the U.S. export licensing and end-use visit system with cooperating U.S. industry partners, which increases transparency and enhances U.S. national security. Increasing legitimate commercial trade strengthens U.S. companies that are vital to the U.S. military industrial base and thus enhances economic security.
22. The alternative is that companies from Europe and elsewhere will supply equivalent or higher technology, materials and tooling to China without the level of supervision the U.S. Government provides. The U.S. government would then be without a means to monitor directly or cooperatively with U.S. industry the item's end use.

Conclusion

Amchem hopes that this report demonstrates the type of U.S. Government and industry cooperation that is possible in order to develop a more effective and efficient U.S. export control system toward China. Amchem sees the report as a positive step in achieving the joint goal of promoting legitimate commercial trade while prohibiting exports that make a material contribution to Chinese military capabilities.

Recommendation

Amchem requests the U.S. Government to provide feedback on this report, suggest other areas where such information would be helpful, and arrange for licensing

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officers to visit China in order to assess China's aerospace composite materials sector first hand.

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Market Analysis

The following report is based on interviews with individuals familiar with the Chinese commercial aerospace composite material sector and in particular the joint commercial projects in place in China. (Appendix D of this report details the companies and interviews conducted in gathering data for this report. Footnotes provide the open source document from which data was collected.)

II. Overview of Domestic Industry

The Chinese aerospace composite material sector includes a combination of domestic state owned enterprises, joint ventures with foreign companies, and foreign sources. In talking with industry experts, the view was expressed as follows:

a. The Chinese Domestic State Owned Enterprises (See Appendix A)

Based on publicly available information, there exist numerous entities in China currently involved in aerospace composite material research and development, production and/or manufacturing. Many of these are or were State Owned Enterprises. An analysis of this market follows:

1. The following companies comprise the major Chinese domestic enterprises involved in aerospace composite materials: AVIC I; Harbin Aircraft Industry Group; Hafei Aviation Industry (under Harbin Aircraft Industry Group); Shenyang Aircraft Industry Group; Xi'An Aircraft Industry Group; Chengdu Aircraft Industry Group; AVIC II; Beijing International Aeronautical Materials Corporation (BIAM), aka Institute 621; Beijing Aeronautical Manufacturing Technology Research Institute (BAMTRI), aka Institute 625; HONGDU Group; and Shanghai Sxcarbon Technology Co., Ltd.
2. The commercial sector in China is well behind the capabilities of the military side. The commercial side at this point is functioning mainly in the build to print level. For example, Chengdu Aircraft Industry Group is utilizing composites on the Boeing 787 program. The technology involved there is epoxy resin technology that was primarily designed in the 1970s and commercialized in the 1980s. While the processing techniques and skill sets are similar across the composite production, the work on the commercial side in China is considered in the industry to be at a low level.
3. The exception on the commercial side is Hafei Aviation Industry (Hafei) under the Harbin Aircraft Industry Group, which has the highest level of capabilities in aerospace composite materials in China. Hafei has the ability to and is developing, designing and producing composite parts for commercial aircraft. This work is being done for production of Chinese commercial aircraft and for parts and assemblies for foreign aircraft. A site visit was

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conducted at Hafei, during which these capabilities were confirmed. The greatest example of Hafei's abilities was the carbon fiber helicopter cockpit frames. Hafei began by developing and producing these carbon fiber frames jointly with Eurocopter, but now performs the complete process independently.

4. The Chinese have the inherent capability to produce composite parts at the current demand levels and higher for commercial use, but it is not cost effective at this point. The primary reason for this is that the customers on the commercial side are foreign companies such as Boeing, Airbus, Embraer, and Eurocopter. The parts being produced for these customers have been approved in their respective countries through a long and expensive certification process. The cost and time involved to test and certify Chinese production processes, materials, tools, molds, etc. would be cost prohibitive to the customers. (Note: China would, however, pursue that path on the commercial side if it is unable to participate in the commercial aircraft manufacturing industry as a global partner. This has in fact happened in the machine tool industry where the Chinese Government has made the development of the domestic machine tool industry a priority. China now has eight machine tool companies that are in direct competition with foreign companies.)
5. Chinese State Owned Enterprises (SOEs) are the major suppliers to the Chinese military. The Chinese, for reasons of supply chain security, choose to supply their military from internal sources. They do not want to be reliant on foreign sources that could be impacted by any number of logistical problems or other issues. These Chinese aerospace composite material producers have the capability to produce bismaleimide (BMI) resins and provide aerospace grade prepregs for primarily military use but can also supply these materials for commercial use. The major distinction between the U.S. and Chinese capabilities in this area are pure repeatability, quality and efficiency.
6. Chengdu Aircraft Industry Group and Xi'An Aircraft Industry Group make prepregs for military use, but it is older technology. The BMI processing they are using for the F7 and F10 are very simple. The BMI processes and procedures for the materials being used on the F-22 and Joint Strike Fighter (JSF) are at a higher level. The Chinese are not at this level of BMI processing, and no U.S. Company is exporting that level of material to China. (Note: The 621 Institute produces BMI resins for the J17 (formerly the F7) radome. The radar for the export model to Pakistan of the J-17 is the Grifo S-7 fire control radar from Italy. The composite material for the Radome pales in importance to the internal radar being supplied by a foreign source.)

b. Joint Ventures

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Joint ventures are providing much of the aerospace composite materials on the commercial side. Two such ventures are BHA Aero Composite Parts Co., Ltd. (BHA) in Tianjin and Smiths Aerospace in Suzhou. It is of note that joint ventures in China should be included in the analysis of the domestic Chinese market. While both domestic and foreign entities invest in a joint venture, the resulting company is a Chinese company.

1. **BHA Aero Composite Parts Co., Ltd.:** BHA is a joint venture between Boeing, Hexcel and AVIC 1 and has a capacity of 500,000 production hours per year. BHA has a total of 524 employees, with four U.S. citizens on the management team, and an employee retention rate of 95%. BHA's customer acceptance rate is 99.1%, compared to a similar plant in Texas with an acceptance rate of 99.999%. This quality standard is much higher than that of the Chinese SOEs. (Note: As stated previously, quality issues often distinguish the difference between foreign and Chinese domestic capabilities.)
2. BHA makes both structural and internal parts and supplies for the export market and the domestic market in China, with a split of 90% to the export market and 10% to the domestic market in China. The customers in the domestic market in China are Xi'an Aircraft Industry Group and the Shanghai Aircraft Industries Corporation for Boeing projects. The resulting assemblies are then exported to the United States. BHA's other clients are Boeing, Hexcel, Goodrich, FACC, BAE Systems, and KAI.
3. BHA is strictly a build to print shop and is certified in numerous Boeing processes. The advantage in this is that Boeing and Boeing subcontractors can utilize these processes without further testing and certification. (Note: New processes developed in China would require a long and expensive testing and certification process. This is why both Chinese and foreign companies choose to use foreign materials and processes.) BHA gets its material from Hexcel, Cytac and Toray. Currently, no domestic companies are supplying composite materials to the joint ventures and SOEs for the commercial aircraft sector.
4. BHA has two autoclaves from Scholz in Germany that are certified to 400 degrees Fahrenheit and 100 PSI, two cure ovens, one Thermowood 3-axis CNC machine, one Thermowood 5-axis CNC machine and one Cincinnati 5-axis CNC machine. As the commercial demand in China grows, BHA will be looking to the U.S. market for equipment. The U.S. companies, however, will receive competition from other foreign companies, especially from Europe. This would include tape winding machines, trimming machines and molds. (Note: As stated previously, the Chinese machine tool industry is also growing and could be a source for machine tools. There are currently eight Chinese machine tool manufacturers.)

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5. **Smiths Aerospace:** According to Smiths Aerospace's website, they have a 134,000 square foot facility in Suzhou, China. This facility has been producing composite material parts for the civilian aerospace market in China since the summer of 2005. The facility also manufactures sheet metal airframe fabrications and precision machine aircraft engine components.¹ (Note: A site visit was not conducted at the Smiths Aerospace facility in Suzhou but should be scheduled as a follow-up to this report.)
6. Smiths Aerospace is a UK listed company with headquarters in London. Its "head office team" has members located in Cheltenham (UK) as well as Grand Rapids, Michigan and Arlington, Virginia in the US. Their US Legal and Compliance Office is in Gemantown, Maryland.²

c. Foreign Suppliers

The following are foreign companies that supply composite materials in China. Some of this material is aerospace composite material, but a vast majority goes to sporting goods, textiles and other industries requiring low level composite materials. China's primary source for aerospace composite materials appears to be Europe and Japan.

1. **Argosy International:** According to the company website, Argosy International is a California company with Trade Representative Offices in Beijing and Shanghai and manufacturing locations in Guangzhou, Shanghai and Zhongshan. They are the exclusive distributors in China for leading manufacturers including HITCO and Cytec.³ HITCO Carbon Composites Inc., is a Delaware Corporation with offices in California.⁴ The majority of Argosy International's exports to China in the composite sector are 250/350 cured epoxy level, which is EAR99, and they are a supplier to BHA in Tianjin. Argosy does not export any BMI resin materials to China. (A visit to Argosy's facility in Shanghai would be arranged as follow-up to this report.)

¹ "Manufacturing commences at Smiths Facility in China," *from Composites Week News Board*, June 13, 2005(May 2, 2006)

<<http://www.e-composites.com/frontend/newspage.aspx?sno=259>>

² *From Smiths Aerospace online*, (May 13, 2006)

<<http://www.smiths-aerospace.com/about/history>>

<<http://www.smiths-aerospace.com/Contact/default.asp>>

³ *From Argosy International online*, (June 12, 2006)

<<http://www.argosychemical.com/CompanyHistory.asp?area=ABOUT>>

⁴ *From Hitco Carbon Composites Inc. online*, (May 5, 2006)

<<http://www.hitco.com/company/profile/index.html>>

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2. **Hexcel:** As stated in a company press release, "Hexcel is the world's leading manufacturer of advanced composite materials... With headquarters in Stamford, Connecticut, Hexcel is a global company, manufacturing in the US, Europe and the Pacific Region." In addition to their joint venture involvement in BHA Aero Composite Parts Co., Ltd., they also have a Composite Sales Office in Shanghai.⁵
3. According to its website, "Hexcel Corporation is a leading advanced structural materials company. It develops, manufactures and markets lightweight, high-performance reinforcement products, composite materials and composite structures for use in commercial aerospace, space and defense, electronics, and industrial applications."⁶
4. "Hexcel is the largest US producer of carbon fiber, the leading weaver of structural fabrics and a major supplier of composite materials. Hexcel fibers, fabrics, resins, prepregs, honeycombs and adhesives are widely used in the aerospace industry. Regional jets, helicopters, aircraft engines and satellites are also major users of Hexcel materials."⁷
5. Hexcel is the major supplier to BHA but very little of this material is at a controlled level.
6. Hexcel provides composite material to the Chinese SOEs primarily out of its European operation.
7. **Toray:** Toray Japan has an extensive network of offices and plants in China. Toray's offices in Shanghai handle its trading activities in China. None of Toray's plants in China produce aerospace composite materials. Its one composite related plant is in the textile industry. Toray Japan provides aerospace composite materials to the Chinese SOEs.
8. Toray USA sells composite materials to China and has an extensive licensing history with the U.S. Government. The Boeing 787 program at Chengdu

⁵ Rachel Atkinson, "About the Company", *Virtual Pressbox Press Center, Materialica*, (May 4, 2006) <<http://www.materialica-pressinfo.de/html/hexcel1.html>>

⁶ Rachel Woolerton, "Hexcel Exhibits at Asian Aerospace 2006," *from Hexcel press releases online*, February 20, 2006 (May 4, 2006)
<<http://www.hexcel.com/News/Press+Releases/Hexcel+exhibits+at+Asian+Aerospace+2006.htm>>

⁷ Woolerton, "Hexcel Exhibits," Background.

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Aircraft Industry Group will create a demand for increased exports of licensable materials to China.

9. **M.C. Gill:** M.C. Gill, headquartered in California, develops and manufactures composite products to serve the aircraft and aerospace industry. According to its website, they are "one of the largest producers of composite sandwich panels used in aircraft flooring and also produce flat panel composites." M.C. Gill has sales offices worldwide, including Beijing.⁸ (Further research would be required as a follow-up to this report.)
10. **ACM:** Asian Composites Manufacturing Sdn Bhd (ACM) -- a strategic alliance between Sime Darby Berhad and Naluri Berhad of Malaysia and Boeing and Hexcel Corporation of the United States -- is a world leader in supplying composite materials to the global aerospace industry.⁹

ACM currently produces advanced composite structures for the wings on all Boeing jetliners in production. The ACM facility located in Bukit Kayu Hitam, commenced production in June 2001 and employs more than 310 skilled Malaysians, along with an all-Malaysian management team.

III. Distinction Between the Commercial and Military Sectors

Research has provided a definite distinction between the military and commercial capabilities in the aerospace composite material sector in China. This distinction is that while China's military capabilities in aerospace composite materials do not reach the levels of the U.S. in this area, they are significantly higher than the commercial level and demand. This distinction is pertinent in that it appears to greatly reduce the likelihood that increased commercial trade in this area would further China's military capabilities.

- a. On the military side, the Chinese SOEs have the ability to design and manufacture parts using BMI resin materials. Preliminary reports indicate that China may soon be producing its own aerospace composite materials. (This information is very recent and would require further research as a follow-up to this report.)
- b. The main reason the Chinese military relies exclusively on its own domestic suppliers is that it wants a secure supply chain. The risk of becoming reliant on a

⁸ *From M.C. Gill online* (May 12, 2006) <<http://www.mcgillcorp.com/about/index.html>> <<http://www.mcgillcorp.com/sales/index.html>>

⁹ "Asian Composites Mfg. To Produce Boeing 737 Aileron Components," *from IHS Aerospace*, April 1, 2005 (May 2, 2006) <<http://aero.ihc.com/news-05Q2/boeing-737-aileron-components.jsp>>

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foreign source, based on historical relations with the U.S. and others, led China to develop its own inherent abilities. The area where China is behind is in the commercial arena.

- c. The commercial sector is growing based on demand to produce parts for foreign aircraft. The globalized nature of the commercial aerospace industry has led to the production of aircraft parts and assemblies worldwide. Companies such as Boeing, Airbus, Embraer, Eurocopter and others have subcontracted work on various parts, sub-assemblies and assemblies throughout the world. When these subcontractors are manufacturing and producing these items they must meet the specifications laid out by their partner. This necessarily leads to countries such as China requiring the materials and tools to meet its customers' demand and quality. As stated previously, producing components based on the customer's previously approved designs and processes is essential to the partnership, as Chinese development of materials and processing would require an extensive testing and certification procedure. China's requirements in the aerospace composite material sector stem from this base opposed to an inability to reach this level independently, since they are already at a higher level.
- d. This is not dissimilar to the situation in the U.S., where the current aerospace composite material sector is also divided. On the military side, the cutting edge is the supply of composite materials to projects such as the F-22 and the JSF. U.S. companies and approved companies from allied nations are performing this work. The commercial sector is moving more towards composite materials to offset rising fuel costs and increase more efficient and durable aircraft. The composites being employed on the commercial aircraft are older technology that was originally developed in the 1970s and put into production in the 1980s and is well below the current U.S. military standard. It is, as stated above, also below the Chinese military standard.
- e. The Amcham ECWG stresses that it completely supports protecting U.S. military items and technology. Those items that would further China's military capabilities are not and should not be exported to China. In this case, the analysis demonstrates that the commercial level is well below this threshold. Chinese domestic capability is at a higher level and additionally is readily available from other countries. Loss of trade in the commercial aerospace composite sector harms U.S. companies, which in turn diminishes U.S. economic security and impacts the U.S. military industrial base. This does not lead to enhanced national security but actually undermines the long term economic and national security of the U.S. It also pushes the Chinese to develop, with the direct assistance of many U.S. allies, its own industry at a faster pace.

IV. Growing Commercial Demand

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In addition to the current status of the aerospace composite material sector in China, the report also looks ahead to future developments. The worldwide commercial aircraft industry is adopting more composites into their designs. This is going to lead a great increase in demand for commercial aerospace composite materials and associated equipment. The following are a few projects:

- a. Airbus has announced that it will build an A320 assembly plant in China. In published reports, Airbus states that several major technology transfer programs are under way, including one that will involve the composite work on the A350 Family to be manufactured in China.¹⁰ Airbus has stated that it will work jointly with China on development and design on a build to spec basis.
- b. The ARJ21 Regional Jet was originally designed with little or no composite components. Recent reports, however, state that the ARJ21 is too heavy and is being retro designed to include about 20% composite materials.¹¹
- c. Chengdu Aircraft Group Industry received the contract for the Boeing 787 rudder. This is the first joint project between a U.S. Company and a Chinese SOE on composite assembly production. The project is at the build to print level. Subsequent to this program, there are strong indications that Boeing will retro fit the 737 and 767 with composite parts. Since Xi'An Aircraft Group Industry, Shanghai Aircraft Industries Corporation, Shenyang Aircraft Group Industry and Chengdu Aircraft Group Industry produce assemblies for these aircraft; composite materials would most likely become a part of this work.

V. The Technology Line

Determining the level of control in a globalized world where the rate of technical advances is staggering is the greatest challenge.

- a. In general terms, military aircraft specifications require higher performance. The speed and maneuverability of military aircraft is much greater than commercial aircraft and thus need composite materials with a greater Glass Transition Temperature.
- b. As stated previously, the Chinese domestic industry has the ability to produce its own prepregs, as well as design, develop and produce parts and assemblies for commercial and military use at a build to spec level. On the commercial side,

¹⁰ Chris Logan, "Airbus China: Lasting Relationship," *The Airbus Way Corporate Brochure*, (Lavaur, France: SIA, November 2005), p.31

¹¹ "Design changes cause fresh delay for China's ARJ21," *Asian Aviation*, Vol. 2 No. 8, November 2005, (May 16, 2006) <www.asianaviation.com>

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they choose to purchase composites from foreign sources and use foreign processes because they are more inexpensive, higher quality and already certified. It is not based on a lack of capability.

- c. Through cooperation between U.S. Government and U.S. industry, a level of control could be set that distinguishes between military spec and commercial spec composite materials. This would seem practical since the commercial requirements are well below military requirements that were in place at least 20 years ago.
- d. Drawing an accurate technology line based on what is available in China should lead to fewer license requirements, decreased licensing review times for commercial level items, and focus U.S. export controls on those items that could make a material contribution to Chinese military capabilities.

VI. The Compliance Side

- a. While conducting research for this report, opportunities arose and will continue to arise where U.S. Companies can work hand in hand with their Chinese partner on the compliance side. Many Chinese Companies are committed to working with their U.S. partners to increase transparency and ensure compliance with U.S. and Chinese export controls.
- b. The benefits of such cooperation include: greater integration for Chinese companies into the global work force in the commercial aircraft industry; increased exports for U.S. companies; and the furtherance of U.S. Government policy towards China in the areas of export compliance and enforcement.

VII. Next Steps

This report is designed to be a starting point for further cooperation between the U.S. Government and the Amcham ECWG. Following is a list of suggested next steps:

- a. Receive feedback from the U.S. Government on the report, to include suggestions on what further types of material would be beneficial.
- b. Arranging a trip to China for U.S. Government representatives for the various agencies involved in export controls to attend one of the seminars listed below and visit joint commercial projects in China related to aerospace composite materials. Possible seminars are:
 - 1. Second China-Japan International Society for the Advancement of Materials and Process Engineering (SAMPE) Symposium, Co-sponsors, SAMPE Japan, SAMPE Shanghai, June 19-21, 2006

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2. International Conference on Aerospace Materials (ICAM), Chinese Materials Research Society (C-MRS), Beijing, June 25-28, 2006
3. China Composites Expo, Shanghai, September 4-6, 2006
4. Fifth Asian-Australasian Conference on Composite Materials (ACCM-5), Hong Kong, November 27-30, 2006

VIII. Future Reports

The Amcham ECWG believes there are a number of sectors which would also benefit from this type of report and cooperation with the U.S. Government. Some of these include:

- a. Nuclear Power Industry: In the nuclear power sector it is easier to obtain a license for nuclear fuels than the dual-use items controlled for nuclear proliferation reasons. Since China is a member of the Nuclear Suppliers Group, this should be an area where cooperation should be increased.
- b. Machine Tools: The machine tools, as well as the high end molds and dies, are sectors that have been drastically impacted by export controls. With the increased commercial demand for these products in China along with the growing Chinese domestic industry abilities, this area requires a thorough analysis.
- c. Semiconductor: Much work has been done in this area, but it has primarily focused on the silicon based industry. The compound semiconductor industry is a growing sector in China, and it could be added along with a new update on the silicon semiconductor industry.
- d. Computers and Software: This would include high performance computers and encryption among other broader computer areas.

Any suggestions on other industry sectors on which to focus from the U.S. Government would also be appreciated.

IX. Responsible Government and Industry Cooperation

Finally, the Export Control Working Group wants to stress the view that only through true U.S. Government and industry cooperation can an effective export control system be put in place. This concept revolves around the concept of promoting responsible government and responsible industry. The following points illustrate this concept:

- a. It is common knowledge in the worldwide export control and business community that the U.S. has the most strenuous export control system. In addition, the U.S. receives greater cooperation from the Chinese Government on export controls

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than any other country. The U.S. is the only country allowed to conduct end-use visits in China and has the most extensive license review process for the export of dual-use items to China. These facts make it less likely that dual-use items from the US compared to those from other countries will be diverted because:

1. The U.S. licensing review process represents the best available process for ensuring that items exported to China are going to legitimate commercial end-uses. U.S. exporters are providing the greatest level of information and the U.S. Government is providing the greatest level of scrutiny. This is in direct contradiction to others that issue licenses with minimal review and processing.
 2. Follow-up is virtually non-existent outside the U.S. system. Only the U.S. Government has the ability to conduct end-use visits in China. Additionally, U.S. companies provide extensive servicing to items supplied to China. The U.S. company employees are the most well informed about export controls and know that continuing to service or supply parts to items, which are being used in violation of the export license, requires that they stop all support for that item.
- b. Lack of cooperation results in an unfocused export control system that wastes limited U.S. Government resources and overburdens industry. The unforeseen consequences of this are:
1. U.S. Government expends valuable resources on items that do not contribute to Chinese military capabilities, while other items more critical do not receive the required attention.
 2. The movement offshore of critical military infrastructure. Industry moves research and development overseas because of fear that the resulting products would be restricted by U.S. export controls.
 3. A weakening of U.S. companies that make them ripe for purchase from foreign companies.
 4. Refusal of U.S. companies to supply military projects due to fear of export controls restricting the commercial sale of similar items.
 5. Loss of revenue to U.S. industry that helps fuel research and development that is critical the U.S. military industrial base.
 6. An increasing unwillingness of Chinese companies to purchase U.S. products, whether an export control issue exists or not, due to their perceived fear that such products in the future could be controlled, barred or restrained for export to China.

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Due to the intricate nature of the relationships between the SOEs, joint ventures and foreign exports, the following charts are provided to illustrate current and/or potential access within the Chinese economy to aerospace composite technologies:

Chart 1. AVIC I COMMERCIAL AIRCRAFT (ACAC)

Project Name	Nature of Relationship	Foreign Entity	Nationality	Project Description
ARJ21	Consortium led by Chinese government controlled ACAC	Multiple (19 as of 5/2006)	US and European Companies	The 90-seat 700 series and 105-seat 900 series jets to be introduced in 2009 will include up to 20% composite materials ¹²
BHA Aero Composite Parts Co., Ltd.	Joint Venture	Boeing and Hexcel	US	Established in January 1998, the company opened its Tianjin factory for business on September 2002. The 1,184,000 sq. ft. site manufactures composite parts for interiors and secondary structures for commercial aircraft. ¹³

Chart 2. HARBIN AIRCRAFT INDUSTRY GROUP (HAIG)

Project Name	Nature of Relationship	Foreign Entity	Nationality	Project Description
Z9B Multi-role Helicopter ¹⁴	With Hafei Aviation Industry Company	None	Chinese	Licensed Chinese copy of the French Eurocopter Dauphin II with modifications including

¹² Polek, Gregory, "Eastern programs find their stride as Western firms ponder next move," *Aviation International News*, May 2006 (May 16, 2006)
<www.ainonline.com/Issues/05_06/05_06_eastern_72.htm>

¹³ "Boeing, Hexcel and AVIC to Collaborate on Joint Venture Composites Facility in China", *from Boeing Press releases online*, January 21, 1998 (May 4, 2006)
<www.boeing.com/news/releases/1998/news_release_980121a.html>

¹⁴ *From HAFEI AVIATION INDUSTRY CO. LTD online* (May 15, 2006)
www.hafei.com/english/index.htm

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	(HAI)			all composite tail blades instead of 13 metal blades ¹⁵
Harbin Embraer Aircraft Industry Co. Ltd. ¹⁶	Joint Venture	Embraer	Brazil	Jointly develop and produce 50-seat pax family aircraft ERJ145 Regional Jet ¹⁷
EC120 Helicopter ¹⁸	Jointly design and develop with (HAI)	Eurocopter, Singapore Technology Aerospace Industry Co. Ltd.(STAIS) ¹⁹	France, Singapore	Serial production of helicopter
Z15 Helicopter ²⁰	50-50 Joint Venture	Eurocopter	France	Six-ton medium sized helicopter to be used in transportation, security, rescue and other civilian uses

HAFEI AVIATION INDUSTRY COMPANY, LTD

Hafei Aviation Industry Company, Ltd was founded under the Harbin Aircraft Industry Group in 1999 as a scientific research and manufacturing base for helicopters, general

¹⁵ "Z-9 Multirole Helicopter", *Chinese Defence Today*, February 20, 2005 (May 15, 2006) <www.sinodefence.com/airforce/helicopter/z9.asp>

¹⁶ *From HAFEI AVIATION INDUSTRY CO. LTD online* (May 15, 2006) <www.hafei.com/english/index.htm>

¹⁷ Fullbrook, David, "Outsourcing Aircraft Parts to China, airliners later," *Asia Times Online*, September 3, 2004 (May 7, 2006)
 "City Firm Launches Small Jets" *from Eastday.com*, March 4, 2003 (May 7, 2006)
 <<http://www.china.org.cn/english/Life/57319.htm>>

¹⁸ Dubois, Thierry "Harbin EC120s to roll off line by year's end," *Aviation International News, Asian Aerospace*, February 2004 (May 18, 2006)
 <http://www.ainonline.com/Publications/asian/asian_04/d1_harbinp51.html>

¹⁹ "HC120 (EC120) Helicopter," *from Global Security.org*, April 27, 2005 (May 18, 2006)
 <<http://www.globalsecurity.org/military/world/china/hc-120.htm>>

²⁰ "China, Europe jointly develop Z15 helicopter," *China View*, March 15, 2006 (May 15, 2006) <www.xinhuanet.com/english/2006-03/15/content_4306823.htm>

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purpose and regional aircrafts in China. Its four major series of products include: Y12 light general purpose aircraft, Z9 series helicopter, EC120 helicopter, and subcontracted aviation products for foreign companies.²¹

Presently, HAI's composite facilities are the largest in China, according to its homepage published in English. Its general production capability is the most advanced in China and has reached an advanced international level on some specific projects.²²

Chart 3. HAFEI AVIATION INDUSTRY COMPANY, LTD (HAI)

Project Name	Nature of Relationship	Foreign Entity	Nationality	Project Description
Z9 Helicopter ²³	With Harbin Aircraft Industry Group (HAIG)	None	Chinese	Licensed Chinese copy of the French Eurocopter Dauphin II with modifications including all composite tail blades instead of 13 metal blades ²⁴
EC120 Helicopter	Joint design and development with HAIG	Eurocopter, STAIS and CATIC (China Aviation Technology Import-Export Corp.)	France, Singapore	Serial production of helicopter
M430 Helicopter ²⁵	"cooperation contract"	Bell Helicopter Textron Canada Limited	Canada	Sole supplier of helicopter body
Wing-to-Body Fairing Panels	Supplier	Boeing ²⁶	US	

²¹ Thirty Thousand Feet Aviation Directory, (May 16, 2006) <www.thirtythousandfeet.com/aircraft.htm>

²² From HAFEI AVIATION INDUSTRY CO. LTD online (May 15, 2006) <www.hafei.com/english/index.htm>

²³ From HAFEI AVIATION INDUSTRY CO. LTD online

²⁴ "Z-9 Multirole Helicopter", *Chinese Defence Today*, 'Programme'

²⁵ From HAFEI AVIATION INDUSTRY CO. LTD online

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Tail Sections and cargo doors ³²	Joint Venture	Boeing	USA	Production joint venture
Manufacturing sub-assembly ³³	Subcontractor	Bombardier	Canada	Supply components for Q100, Q200 and Q300 aircraft
Manufacturing Parts and maintenance tools ³⁴	Supplier	Airbus	EU	

³¹ "Vistagy reports 300% sales growth: Sales of FiberSIM software to aerospace companies across the Asia Pacific region have increased 318% in a single year reports CAD developer Vistagy," news release from Vistagy, edited by Manufacturing Talk, February 9, 2006 (May 15, 2006) <www.manufacturingtalk.com/news/vis/vis117.html>

³² "Boeing 787 Suppliers"

³³ "Bombardier- Our Presence in China," *from Bombardier online*, (May 17, 2006) <www.bombardier.com/en/6_0/6_7_1.html>

³⁴ The Airbus Way, Corporate Brochure 2005

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Chart 5. XI'AN AIRCRAFT INDUSTRY GROUP

Project Name	Nature of Relationship	Foreign Entity	Nationality	Project Description
Components of CL215 and 415 amphibious aircraft ³⁵	Subcontractor	Bombardier	Canada	
Electric Bay Doors/ Fixed trailing edges on wings and brake blades and air ducts ³⁶		Airbus	EU	For the A320,330 and 340/ A320/A330 and 340

Chart 6. CHENGDU AIRCRAFT INDUSTRY CORPORATION

Project Name	Nature of Relationship	Foreign Entity	Nationality	Project Description
787 Composite Rudder ³⁷	Supplier	Boeing	US	
Rear pax door and parts of nose section for the A320 ³⁸		Airbus	EU	

Chart 7. AVIC II COMMERCIAL AIRCRAFT (ACAC)

Project Name	Nature of Relationship	Foreign Entity	Nationality	Project Description
EC175 utility	Joint Venture	EADS Eurocopter	France	Each of the two companies will invest 300

³⁵ "Bombardier- Our Presence in China," *from Bombardier online*

³⁶ The Airbus Way, Corporate Brochure 2005

³⁷ "Boeing 787 Suppliers"

³⁸ The Airbus Way, Corporate Brochure 2005

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helicopter

million euros to develop the new helicopter. Production will be shared on a 50/50 basis and each country will have its own assembly line.³⁹

A very rough estimate of the percentage of composite materials that will be involved is 30 to 40% of the helicopter will be made of composite parts. Currently there are approximately 50 to 60 Chinese design engineers in France working on this project.⁴⁰

³⁹ "Eurocopter creates a new helicopter in cooperative venture with China", *HeliNews: Helicopter and General Aviation News*, December 5, 2005 (May 16, 2006) <www.helinews.com/janindex.shtml>

⁴⁰ From interview by John Larkin

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Appendix B Chinese Institutes and Researchers

In addition to these specific projects, Appendix B lists a number of Chinese research and development institutes and experts. These institutes and experts often work jointly with foreign composite material researchers both within and outside of China. A review of publicly available material shows that China has unlimited access to composite material research and development.

THE HARBIN INSTITUTE OF TECHNOLOGY

The Harbin Institute of Technology (HIT) is a leading institution of research and development. They have consistently undertaken large-scale and highly sophisticated national projects with multi million yuan investments from the government and industry. It is the key university in the Chinese missile and space industry. Within the School of Astronautics, the Department of Astronautic Engineering and Mechanics has a Composite Materials section.

One of HIT's most prolific researchers is Du Shanyi. He is the author of "Research and Development of Advanced Composite Materials for Aerospace Industry in China." He has been a member of the Editorial Board of the Journal of Composite Materials and a frequent contributor to that bimonthly publication. In 2003, Dr. Du served as Co-chair of the EU-China Workshop on Multifunctional Materials in Bologna, Italy, 2003.

Together with his co-authors, Meng Songhe also of Harbin Institute of Technology and Chen Shaojie of the Shenyang Aircraft Design and Research Institute, Dr. Du examined the applications of advanced composite materials in the aerospace industry in China. They also discussed typical work concerning raw materials, manufacturing and processing, design and analysis, testing and NDI in China. The paper was published by the Society of Manufacturing Engineers.

THE CHINA AVIATION INDUSTRY #621 AND #625 INSTITUTES

The China Aviation Industry #621 and #625 Institutes have been cited in primary source interviews as another leading research center on the study and applications of composite materials. However, a review of the publicly available materials on the #621 Institute yielded few mentions.

The #625 Institute also known as the Beijing Aviation Manufacturing Engineering Institute is the only institution in the country specializing in aviation manufacturing technology and the research and development of integrated technical equipment. According to its Deputy Director Liu An Lu, The Institute was established 40 years ago to support the then new aircraft, engine and aviation factories in the country. Today, it

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provides a large quantity of advanced manufacturing technology processes and equipment in digital and soft manufacturing systems, computer software applications, high-energy Shuliu processing and composite materials components manufacture among others⁴¹.

CHINESE ACADEMICS

Below are just a few of the Chinese academics working abroad in areas of composite material research and development:

1. Li Chongjun, University of New South Wales School of Materials Science and Engineering, Australia

Li Chongjun, currently working at the School of Materials Science and Engineering at the University of New South Wales in Australia, specializes in advanced composite materials, high temperature thermal structural composites and nano-composites research. Dr. Li earned his Bachelor's degree in Material Science at Changsha Institute of Technology and his Master of Science degree in Composite Materials from Xi'an Aerospace Composite Materials Institute. Dr. Li completed his doctoral studies in Material Science and Engineering at the Xi'an Jiaotong University in 2001. His major publications include, "The Effects of Carbon Fiber Surface States on Properties of C/C Composites" published in Chinese in the Aerospace Materials & Technology, China, in 2000.⁴²

2. Li Shuguang, University of Manchester School of Mechanical, Aerospace and Civil Engineering

Born in China in 1960, Li Shuguang received his Bachelor's and Master's degrees in Engineering from the Nanjing Aeronautics Institute, now the Nanjing University of Aeronautics and Astronautics (NUAA). Dr. Li received his PhD from the University of Manchester Institute of Science and Technology in the UK where he was a lecturer in the School of Mechanical, Aerospace and Civil Engineering(MACE) from 1995-2002. His research areas include composite materials/structures.⁴³

3. Lin Ye, University of Sydney School of Aerospace, Mechanical and Mechatronic Engineering

⁴¹ From *Beijing Industrial University- Beijing University of Technology* March 29, 2006, (May 15, 2006) <<http://www.bjpu.edu.cn/news/dynamic.\jsp?articleIID=1237>>

⁴² CV of Li, Chongjun, *from the University of South Wales*, updated May 9, 2005 (May 2, 2006) <<http://www.materials.unsw.edu.au/people/dchongli.html>>

⁴³ CV of Li, Shuguang, *from the University of Manchester*, (May 2, 2006) <<http://www.mace.manchester.ac.uk/aboutus/people/academic/readersseniorlecturers/lis/>>

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Professor Lin Ye received his Master of Engineering and PhD from the Beijing Institute of Aeronautics and Astronautics in 1984 and 1987, respectively. He was awarded the Alexander von Humboldt fellowship for conducting advanced composite research at the Institute for Composite Materials at the University of Kaiserslautern from 1990-92. He joined the University of Sydney as a lecturer in 1992 and became a full professor in 2002. He is a member of the Editorial Boards of Composite Science and Technology, Applied Composite Materials and Aircraft Engineering and Aerospace Technology. His major research interests are in the general areas of composite science and technology, smart materials and structures, nano-materials and nano-composites, structural integrity and durability. He has received over A\$6M for research or collaborative projects from various sources.⁴⁴

⁴⁴ CV of Lin, Ye, from *the University of Sydney*, (May 16, 2006)
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NOTE

The information in this report was collected through interviews with industry experts familiar with the aerospace composite material sector in China, site visits to composite material production facilities and aircraft manufacturing facilities, and open source research.

In conducting the research for this report, John Larkin, President of Larkin International Trade Associates, Ltd. (LTI) conducted interviews with the following companies' representatives in China:

Boeing Commercial Aircraft
United Technologies Corporation
Argosy International, Inc.
BHA Aero Composite Parts Co., Ltd.
Hafei Aviation Industry
Association of Manufacturing Technology
MAG Industrial Automation Systems

John Larkin also completed site visits specific to this report at the following locations:

BHA Aero Composite Parts Co., Ltd.
Hafei Aviation Industry

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Additionally, John Larkin utilized his experience in the aerospace sector in China as a basis for this report. This experience includes previous site visits to the following locations:

Shenyang Aircraft Industry Group
Xi'An Aircraft Industry Group
Chengdu Aircraft Industry Group
Shanghai Aircraft Manufacturing Factory
AVIC 1 Aircraft Group ARJ21 Facilities in Shanghai

Finally, a footnote is supplied for each open source document used in preparing this report.

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HUAWEI Quidway® S8500 Series 10G Multi-service Core Routing Switches Product Specification

Quidway® S8500 Series 10G Multi-service Core Routing Switches Product Specification

Quidway® S8500 Main Control Board Details

Feature/SRPU1	SRP1N3	SRP1N2	SRP1N1	SRP1N0
Compatible chassis	S8505/08/12	S8505	S8505	S8512
SDRAM	1G	512M	512M	512M
Stratum 3 Clock	Yes	No	No	No
Position	<ul style="list-style-type: none"> Carrier class network with WAN Interface Module deployment 	<ul style="list-style-type: none"> Enterprise Carrier class network without WAN Interface Module 	<ul style="list-style-type: none"> Enterprise Carrier class network without WAN Interface Module 	<ul style="list-style-type: none"> Enterprise Carrier class network without WAN Interface Module

Quidway® S8500 Series Software and Hardware Details

Attributes	S8505	S8508	S8512
Switching capacity	300Gbps	480Gbps	720Gbps
Backplane capacity	750Gbps	1.2Tbps	1.8Tbps
Packet forwarding speed	175Mpps	285Mpps	428Mpps
Number of slots	7	10	14
Number of slots for interface modules	5	8	12
L2 features	4K VLAN Super VLAN PVLAN 802.1p priority 802.1Q STP/RSTP/MSTP GARP/GVRP IGMP snooping Port mirroring		

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HUAWEI Quidway® S8500 Series 10G Multi-service Core Routing Switches Product Specification

Attributes	S8505	S8508	S8512
	Flow mirroring Link Aggregation (802.3ad) Cross boards link aggregation LACP 802.1x Guest VLAN Dynamic VLAN Broadcast storm suppression MDI/MDI-X auto negotiation HWTACACS Selected QinQ (Class D interface module supported)		
L3 features	RIPv1, RIPv2, OSPF, IS-IS, BGPv4 Equal Cost Multi Path: 8 Policy routing Routing policy uRPF (NAT Service Module Supported) VRRP DHCP-RELAY DHCP-SERVER NAT		
Multicast	IGMP V2 IGMP snooping PIM-DM PIM-SM MSDP/MBGP Any-RP		

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HUAWEI Quidway® S6500 Series 10G Multi-service Core Routing Switches Product Specification

Attributes	S6505	S6508	S6512
MPLS VPN	Label stack levels: 4 LER/LSR MCE Embedded MPLS VPN HoPE Inter-AS MPLS VPN		
VPLS & VLL	VPLS VSI number: 1K Mac table: 128/VSI, 128K(total) VPLS Martini Method H-VPLS VLL VC number: 4K VLL Martini Method VLL Kompella Method		
QoS	DiffServ Each port supporting 6 priority queues Detailed bandwidth management with the granularity of 8k Congestion prevention algorithm: WRED and tail drop Queue scheduling algorithms: SP, WRR and SP+WRR Traffic shaping		
Reliability	MTEF > 200,000 hours MTTR < 0.5 hours Dual main control boards 1+1 power supplies Modules hot-swappable		
System architecture	Integrated chassis that can be installed in a 19-inch rack		
Outline dimensions (mm) (WxDxH)	436 x 450 x 486	436 x 450 x 619	436 x 450 x 753
Weight (in maximum configuration)	65 kg	80 kg	100 kg

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HUAWEI Quidway® S8500 Series 10G Multi-service Core Routing Switches Product Specification

Attributes	S8505	S8508	S8512
Environmental requirements	Working temperature: 0°C ~45°C Relative humidity: 10%~90%, no condensing		

Quidway® S8500 Series Available Power Supply

Attributes	S8505	S8508	S8512
Input voltage (AC)	100~240 VAC auto-ranging (50~60Hz)	2000W AC power supply module: 100~240VAC auto-ranging (50~60Hz) Output 1200W: 100~120VAC; Output 2000W: 200~240VAC;	
Input voltage (DC)	-48 ~ -60 VDC	2000W DC power supply module: -48 ~ -60VDC	
Max power output of single power module	1200W	2000W	
Max power dissipation	<1000W	<1200W	<1800W
Power redundancy	1+1 redundancy; hot swappable		

The Quidway® S8500 Series can provide PoE functions cooperating with the PoE assembly listed below when the customers intend to deploy PoE applications.

Quidway® S8500 Series PoE Assembly Specifications

Attributes	description
PoE power system deployment (redundant configuration)	2+1 redundancy for PoE power supply modules, hot swappable
PoE power module	2500W AC power supply module: 100~240VAC auto-ranging Output 1200W: 100~120VAC Output 2500W: 200~240VAC
PoE power dissipation	Totally 4500W: 200~240V; Support 298 ports at 15.4W

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Huawei Quidway® NetEngine 5000E Core Router Product Specification

Quidway® NetEngine 5000E Core Router Product Specification

Attribute	Description
Physical Specification	Integrated chassis, installed in standard 19-inch rack
Input Power	DC: -48V AC: 110V/220V
Max. Power Consumption	5000W
Dimension (W × D × H)	442mm × 668mm × 1600mm (36 U high)
Weight	250 kg (fully configured), 120 kg (empty) 4.8 kg (LPU) 3.8 kg (MPU) 3.0 kg (SFU)
Environment	Long-term working temperature: 0 ~ 45°C Short-term working temperature: -5 ~ 55°C Restriction on temperature variation rate: 30°C/Hour Long-term working humidity: 5%RH ~ 85%RH, non-condensing Short-term working humidity: 0%RH ~ 95%RH, non-condensing Long-term working altitude: < 3000m Storage altitude: < 5000m
Capacity	Switching capacity: 2.56 Tbps Port capacity: 1.28 Tbps Forwarding performance: 1600 Mpps
Slots	16 for LPUs, 2 for MPUs, 4 for SFUs
Interface Types	OC-192c/STM-64c PoS OC-48c/STM-16c PoS OC-12c/STM-4c PoS OC-3c/STM-1 PoS 10GE WAN/LAN GE
IPv4	RIP, OSPF, ISIS, BGPv4

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Attribute	Description
IPv6	IPv4 & IPv6 dual stack Manually configured tunnel, automatic tunnel, 6to4 tunnel IPv6 static route, BGP4+, RIPng, OSPFv3, ISISv6 ICMPv6 MIB, UDPv6 MIB, TCPv6 MIB, IPv6 MIB, etc.
MPLS VPN	MPLS/BGP VPN, Inter-AS VPN, Carrier's Carrier, HoPE, MPLS L2 VPN (Martini/Kompella), PWE3, VPLS/H-VPLS
QoS	CAR, GTS, PQ, LLQ, CBQ, WRED, DS-TE
Multicast	IGMPv1/v2/v3, static multicast routing, PIM-DW/SM/SSM, MSDP, MBGP
Security	ACL based packet filtering, uRPF, ARP attack protection, DOS attack protection, SSH
High Availability	1:1 standby for MPU, 3+1 backup for switching fabric, 1+1 backup for power supply and FAN, IP FRR, LDP FRR, TE FRR, IGP Fast Convergence, VPN FRR, Enhanced VRRP, ETH TRUNK, IP TRUNK, BFD, MPLS OAM, Hot Patching, RPR, Non-stop Forwarding, Graceful Restart

ATTACHMENT B

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ViewPoint 8210

Technical Specifications

Standards

Frame: H.323, SIP 2.0
Video: H.261/H.263/H.263+
Audio: G.711, AAC 711/H.263.728
Network: TCP/IP, UDP, RTP, RTCP, DHCP, Telnet, DNS, PPPoE, IPv6/SIP, FTP

Transmission Rates

IP: 64 kbps ~ 512 kbps

Video Features

Format: QCIF (176x144)/CIF (352x288)
Frame rate: 30fps @ 384Kbps
Display: local picture, Remote picture, PIP
Video: brightness, contrast, saturation control

Audio Features

Full duplex audio
Acoustic Echo Cancellation (AEC)
Automatic Noise Suppression (ANS)
Automatic Gain Control (AGC)
Lip Synchronization Mechanism (LSM)
Adjustable gain and volume

Camera

1/4" sensor CCD
520K pixels for BA1 or 270K pixels for NTSC
180° adjustable vertical angle

LCD Display

3.5" TFT color LCD
Resolution: 960x234
90° adjustable vertical angle
90° adjustable horizontal angle
Adjustable brightness and chroma
Automatic sleep mode

Interfaces

Ethernet: 10/100Base-T, 2xRJ-45
Video output: CVBS/PAL/NTSC, iVRCA
Audio output: Line level, 1xRCA

Call Features

Video IP call
Voice IP call

Conferencing Features

SiteCall (conference conferencing)*
H.323 conference control**

QoS

TOS
IP precedence
Auto downspeeding

Phone Features

Phone book of 200 records
Phone book transferring
Call history
Ring tones selection
Privacy protection
Auto answer mode
Hands free mode
Call forwarding
Power saving mode
Time synchronizing with server
LED indicator

Maintenance

Self test
Status monitoring
Auto upgrading via FTP server
Connectivity testing
Telnet access
SNMP management**

Languages

English and Chinese

Electrical

Operating voltage: 100~240 VAC
Frequency: 47~63 Hz
Power consumption: 12watts(MAX.)

Environmental

Operating temperature: 0°C~40°C
Storage temperature: -40°C~70°C
Relative humidity: 10%~90%
Noise: Less than 48 dBA (3m)
Luminance: 7 lux (minimum), 200 lux or more recommended

Reliability

Standard: ETS 300 386(2009), EN50082-2, EMC class: B

Physical

Dimensions: 270mm (h)x210mm (W)x170mm (D)
Weight: 1.5 kg

Warranty

15 months

* H.323 system only
** SIP system only

HUAWEI TECHNOLOGIES CO., LTD
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E-mail: hc_support@huawei.com
hc_sales@huawei.com

www.huawei.com

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ViewPoint 8220

Technical Specifications

Standards

Frame: H.263, SIP 2.0
Video: H.261/H.263/H.263+
Audio: G.711 A/V5.71 IuQ 723
Network: TCP/IP, UDP, RTP, RTCP, DHCP, Telnet, DNS, PPPoE, 802.1P, FTP

Transmission Rates

IP: 16 kbps ~ 512 kbps

Video Features

Format: QCIF (176x144)/CIF (352x288)
Frame rate: 30fps @ 384 kbps
Display: Local picture, Remote picture, PIP
Video: Brightness, contrast, saturation control

Audio Features

Full duplex audio
Acoustic Echo Cancellation (AEC)
Automatic Noise Suppression (ANS)
Automatic Gain Control (AGC)
Up Synchronization Mechanism (USM)
Adjustable gain and volume

Camera

1/4" sensor CCD
20K pixels
45° adjustable vertical angle

LCD Display

5" TFT color LCD
45° adjustable vertical angle
60° adjustable horizontal angle
Adjustable brightness and chroma
Automatic sleep mode

Interfaces

Ethernet: 10/100Base-T, 1xRJ-45
Video input: CVBS PAL/NTSC, 1xRCA
Video output: CVBS PAL/NTSC, 1xRCA
Audio input: Line level, 1xRCA
Audio output: Line level, 1xRCA

Call Features

Video IP call
Voice IP call

Conferencing Features

SiteCall (conference converging)
H.323 conference control*

QoS

RS
IP precedence
Auto downspeeding

Phone Features

Phone book of 200 records
Phone book transferring
Call history
Ring tones selection
Privacy protection
Auto answer mode
Hands free mode
Call forwarding
Power saving mode
Time synchronization with server
LED indicator

Maintenance

Self test
Status monitoring
Auto upgrading via FTP server
Connectivity testing
Telnet access
SNMP management **

Languages

English, Japanese, Korean, and Chinese (S, T)

Electrical

Operating voltage: 100-240 VAC
Frequency: 47-63 Hz
Power consumption: 15 watts

Environmental

Operating temperature: 0°C-40°C
Storage temperature: -40°C-70°C
Relative humidity: 10%-80%
Noise: Less than 45 dBA 1M
Luminance: 7 lux minimum, 300 lux or more recommended

Reliability

Standard: ETS 300 308/2000, EN50082-2, EMC, class B

Physical

Dimensions: 290mm (W)x233mm (L)x133mm (H)
Weight: 1.5 kg

Warranty

15 months

* H.323 system only

** SIP system only

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SmartAX[®] MA5200F-2000 Broadband IP Access Equipment Product Specification

SmartAX[®] MA5200F-2000 Broadband IP Access Equipment Product Specification

Attribute	MA5200F-2000
Architecture	Box Type
Dimension (WxDxH)	462.6mm × 381mm × 88.9mm 2U
Backplane capacity	≥10Gbps
Switching capacity	Shared cache switching network with the switching capacity of 10Gbps
Forwarding capacity	3Mpps (2GE wire-speed forwarding)
Slot number on the interface board	1 GE slot, 4 FE slot
Interface type	GE interface FE interface OC-3/STM-1 POS interface
Routing protocol	Support such routing protocols as RiP, OSPF and BGP-4 etc.
QoS	Provide complete QoS support based on DiffServ. Support bandwidth control for each subscriber and WRED congestion avoidance algorithm.
Multicast	Support IGMP, static multicast configuration, PIM-DM/SM multicast protocols. Support interoperability of multiple multicast protocols. Support multicast policy processing, including multicast routing protocols and multicast forwarding policies. Support QoS control for multicast.
Reliability	All components support hot swap, and power supply 1+1 redundancy.
Number of concurrent users	2K
Number of VLAN termination	8K
Supported protocols	PPPoE, DHCP/DHCP Relay, DHCP Option 60&82, L2TP LAC, RADIUS and SNMP

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SmartAX[®] MA5200F-2000 Broadband IP Access Equipment Product Specification

Attribute	MA5200F-2000
Security	<p>Provide authentication, resource protection, attack shielding and address anti-counterfeit functions.</p> <p>IP+MAC+VLAN ID binding, protect the customers against IP spoofing attack.</p> <p>Starting from 64K, limit user's bandwidth by CAR with the step of 8K.</p>
NM	<p>Adopt Huawei iManager and Quidview NM platforms as the framework. Support SNMP and the Client/Server architecture. Run independently on UNIX (SUN, HP) or ORACLE/SYBASE, or be nested into the existing NM platform such as HP OpenView.</p> <p>Provide dynamic topology management, fault management, performance management, configuration tools, log management, operation monitoring, security and user management.</p> <p>Provide VPN management, QoS policy management and other service management functions.</p> <p>Provide an optional offline flow engineering tool.</p> <p>Support multiple languages.</p> <p>North-bound interface for 3rd-party APP and Service Provisioning system</p>
Input power supply	DC: -36V to -72V / AC (110V/220V): 90V to 264V
Full-load power consumption	Below 60W
Full-configuration weight	Below 10kg
Mean Time Between Failures (MTBF)	≥15 years
Environmental requirement	<p>Long-term working temperature: 0 to 45°C</p> <p>Short-term working temperature: -5 to 55°C</p> <p>Storage temperature: -30 °C to 60 °C</p> <p>Relative humidity: 10% to 90%</p> <p>Altitude: below 4000m</p>

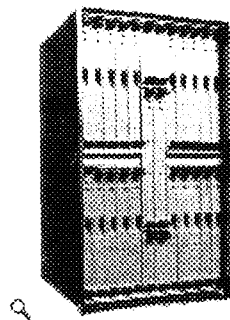
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OptiX Metro5000

Product overview

The OptiX 10G (Metro5000) is the 10G optical transmission equipment. It features such advantages as high capacity, high integration ability, flexible configurations, flexible networking, and large-capacity lower-order convergence and scheduling.



Product characteristics

1. Powerful cross-connection ability

- The cross-connect clock board enables 120G higher-order cross-connection.
- The lower-order cross-connection board enables 10G lower-order cross-connection.
- The mixed cross-connect and clock processing board enables 120G higher-order cross-connection and 5G lower-order cross-connection.
- The enhanced mixed cross-connect and clock processing board enables 120G higher-order cross-connection and 20G lower-order cross-connection.

2. Supporting multiple NE type configurations and MADM

The OptiX 10G (Metro5000) equipment enables flexible configurations. Each NE can be configured as a single REG, TM, ADM or their combination. The equipment can also be configured into the MADM (Multi-ADM) system with STM-1, STM-4, STM-16, STM-64 or combined interfaces. The system enables cross-connection of services among systems.

3. Rich service access types

The OptiX 10G (Metro5000) supports access to the following services.

- SDH signals of STM-64, STM-16, STM-4, STM-1(o), and STM-1(e) rates; OUT-2 signals that are in compliance with the ITU G.709 Recommendation;
- VC-4 services, or VC4-64c/VC4-16c/VC4-8c/VC4-4 concatenation services;

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- GE optical signals, 100M FE optical signals, and 10/100M FE electric signals,
- E1 interface electric signals

4.Hihger board integration

Boards are highly integrated, which results in powerful service access ability of the OptiX 10G (Metro5000) system.

5.Flexible networking ability

The system supports multiple topology modes, including link networking, star networking, two/four-fiber ring networking, ring and link networking, tangent ring, dual ring internetworking, inter-ring service interworking

6.Complete protection mechanism

Protection mechanisms provided by the OptiX 10G (Metro5000) system include equipment-level protection and network-level protection.

- It provides a 1+1 hot backup for cross-connect boards, clock boards and power boards. It also supports the 1+1 protection on two groups of lower-order cross-connect boards (2 groups of 10G, or one group of 20G and one group of 10G, or one group of 10G and one group of 5G); for SLO1, SLH1, SLQ4, SLQ4A, SP16, APQ1, EFS4 and EGS2 boards, it provides board-level power protection;
- For STM-1 or E1 electric signal interface board, it supports two groups of 1:N (Ns5) TPS protection;
- It supports a two-fiber/four-fiber multiplex section ring protection, shared optical fiber virtual path protection, and DNI protection;
- It supports a SNCP protection on higher-order and lower-order services. It supports the mutual switching of SNCP and ordinary services and can dynamically change the SNCP recovery mode;
- It supports 1+1, 1:1 and 1:N linear multiplex section protection as well as the VC-4 multiplex section compression function.

7.Powerful ECC processing ability

The OptiX 10G (Metro5000) equipment enables the 80xECC processing ability. In case the main control board has failed, it can then ensure that the pass-through of ECC information, meeting the requirements for complicated networking.

8.NMS with complete functions

Based on the UNIX and Windows operation system platforms, the network management system (NMS) OptiX iManager can implement centralized operations, maintenance and management (OAM) on complicated networks comprising OptiX 10G(Metro5000) and other OptiX optical transmission systems. It can reasonably configure and schedule bandwidth resources and service resources in the transmission network and ensures safe network operations

9.Power and environment monitoring function

The system adopts the wholly separated power supply mode. Two channels of -48V power are input. It also implements monitoring on power voltage and environment temperature so as to ensure a safer and a more reliable system performance.

Physical characteristics

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Cabinets of the OptiX 10G (Metro5000) optical transmission equipment are made up of three types. They are different in terms of their height, Dimensions and weights. The following are their dimensions

- 2000mm(H)x600mm(W)x600mm(D): 92kg;
- 2200mm (H) x600mm (W) x600mm (D): 101kg;
- 2600mm(H)x600mm(W)x600mm(D): 112.3kg.

The equipment supports the -48V power dual-back working mode. At the same time, it provides 6 external alarm access interfaces and two cabinet alarm output interfaces. Equipment operation management can be conveniently implemented

Dimensions of the OptiX 10G (Metro5000) subrack: 845mm(H)x450mm(W)x490mm(D); weight of each empty subrack: 21kg

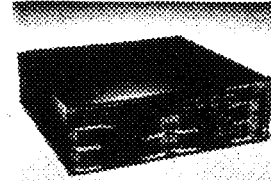
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Eudemon 1000/500/200/100 Series Firewalls

Overview

Quidway Eudemon Series firewall is Huawei's new generation hardware based high speed state firewall, which supports not only state monitor/inspection and NAT but dynamic and static blacklist filtering as well. Besides, Quidway Eudemon has strong anti-attack ability, and can provide rich statistics analysis and detailed classified hierarchical logs. Eudemon supports QOS, VPN and various other features, which are fundamental to a perfect solution to the networking application



Quidway Eudemon consists of 4 models: Eudemon 100, Eudemon 200, Eudemon 500 and Eudemon 1000. All 4 models are based on Huawei's dedicated security hardware platform and VRP routing software platform. All 4 models share a common security feature set, only differs on performance and interface. Networks of any scale can find a security guarantee in Eudemon series.

Features

High-Performance Processing

Eudemon series provides a high-performance security guarantee using NP technology(Eudemon 100 and 200 use software routing technology, not NP). Besides, the Eudemon firewall supports tens of thousands of ACL rules. The Eudemon 500 provides a maximum throughput of 2 Gbit/s and the Eudemon 1000, 3 Gbit/s.

Multiple Security Zones

In addition to the 4 predefined security zones (Local zone, Trust zone, Untrust zone and Demilitarized Zone (DMZ)), Eudemon supports more than 10 user-defined security zones. Besides, the Eudemon can define security zones based on VLANs.

Multiple Functional Modes

Eudemon series provides multiple working modes to facilitate networking application. Routing mode is suitable to initial network construction. Transparent mode meets the general networking requirements, and protects the Eudemon from intrusions. Composite mode combines the benefits of both routing mode and transparent mode. Besides, Eudemon series provides a rich set of routing capabilities

Enhanced Packet Filtering

The black list items of Eudemon can be added manually, automatically by attack defending functions and automatically by ICMP or TCP/UDP filtering

Using application specific packet filter (ASPF) technique, Eudemon series can inspect sessions and states based on TCP/UDP protocol, block Java applets and ActiveX controls, and map port to applications.

Multiple NAT Applications

In addition to One-to-One IP translation, pool based IP translation, policy and IP based translation, PAT, ACL based translation, Eudemon's NAT supports "internal server" services and multiple ALGs like FTP, NBT, ICMP, H.323, SIP, HWCC, DNS, ILS, PPTP, OICQ of tencent and MSN.

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Powerful Attack-Defending Capability

Eudemon series can effectively and efficiently block worm virus and IP spoofing. The DoS attacks that can be blocked by Eudemon include SYN flood, ICMP flood, UDP flood, Land attack, Smurf attack, Fraggle attack, WinNuke attack, ICMP redirection/unreachable, Ping of death, Tear drop, etc. Scanning and snooping attacks can be blocked by Eudemon Series include IP scanning, port scanning, IP source routing option, IP routing record options, network structure snooping via traceroute, etc.

IDS Cooperation

The Eudemon Series can cooperate with Intrusion Detecting Systems. The IDS devices contain complete information about the attacking behaviors and IDS cooperation make it possible to fully unleash the capabilities of both IDS and Eudemon series simultaneously.

Carrier-class Reliability

Eudemon series adopts double power supply modules that support 1+1 backup and hot swap. All the service interface cards and fans of the Eudemon firewall are hot swappable. The Eudemon series supports backup group which can protect communications from the interruptions of firewall failures. Two Eudemon firewalls can work in active/standby or load balancing working modes. The Eudemon series supports Huawei Redundancy Protocol (HRP) which ensures a smooth active/standby switchover when a malfunction occurs.

Traffic Monitoring

Various limitations can be put to connections by Eudemon based on destination/source IP addresses, incoming/outgoing direction of a zone, percentage of various packet types and connection number. The Eudemon series can police traffic through the limitation on committed information rate, committed burst size and excess burst size. The Eudemon series can perform multiple statistics on the input and output IP packets.

Access and Authentication

The authentication schemes provided by Eudemon series include local authentication, standard Remote Access Dial-in User Service (RADIUS) authentication, Huawei RADIUS+ authentication and Huawei Terminal Access Controller Access Control System (HWTACACS). Authentication can be carried out in plain mode or MD5 mode.

The Eudemon series can be used as the PPPoE server. Cooperating with Huawei Portal Server, the Eudemon series can provide secure on-line IP detection and prevent spoof attacks. Cooperating with Huawei Comprehensive Access Management Server (CAMS) accounting system, the Eudemon series can provide various accounting schemes.

Secure VPN Application

The Eudemon series supports IPSec, L2TP, GRE and can provide services of access control, connectionless integrity, data-origin authentication, anti-replay, encryption and data flow classification. Various VPN can be built, such as L2TP VPN, GRE VPN, L2TP over IPSec VPN, GRE over IPSec VPN, IPSec over L2TP and IPSec over GRE. Using the Eudemon firewall, users can build Intranet VPN, Access VPN and Extranet VPN.

QoS Guarantee

QoS functions supported by Eudemon series include Traffic classification, Traffic policing and shaping, Congestion management, and Congestion avoidance. The Eudemon firewall provides special QoS guarantees for the multimedia and Next Generation Network (NGN) services.

Enhanced Log Management

The Eudemon series can provide NAT log, ASPF traffic log, attack-defending log, traffic monitoring log, blacklist log and multiple kinds of statistics. Logs can be output in binary or syslog (text) format. Specially developed log server software can cooperate with Eudemon series to facilitate log browsing, analyzing, querying, exporting, and backing up.

Rich and Flexible Maintenance and Management

The Eudemon firewall supports SNMP (V1/V2c/V3) protocol and can be managed by Network Management

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Station (NMS) The Eudemon firewall provides both command line and (GUI) for configuration and management.

Compliant Test and Verification Standards

The Eudemon 100/200 firewall is designed in compliance with the national standards in China, North America, Europe, Australia and Japan. It meets the requirements of UL, CE, FCC, FCC-part15, Electro Magnetic Compatibility (EMC), VCCI and safety certification and network access requirements.

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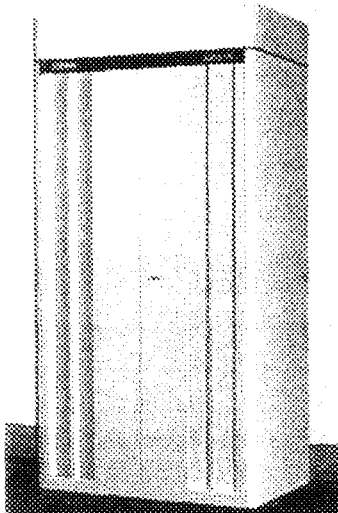
Switching Module (SM)

There are three types of ZXJ10 SMs:

- Standard type: SM8, SM16
- Compact type: SM4C
- Integrated type: SM4I

SM8 and SM16

- **SM8:** The standard switching module SM8 and the small-capacity central module SM8 use the same type of equipment modules that are applied in different occasions.
Application: SM8 is used as a switching module to provide 12,480 lines plus 2,760 trunks or 2,680 trunks. Generally, it is used as the peripheral switching module (PSM) or remote switching module (RSM).
- **SM16:** The standard switching module SM16 and the small-capacity central module SM16 use the same type of equipment modules that are applied in different occasions.
Application: SM16 is used as a switching module to provide 15,360 lines plus 9,600 trunks or 7680 trunks. Generally, it is used as the peripheral switching module (PSM) or remote switching module (RSM).

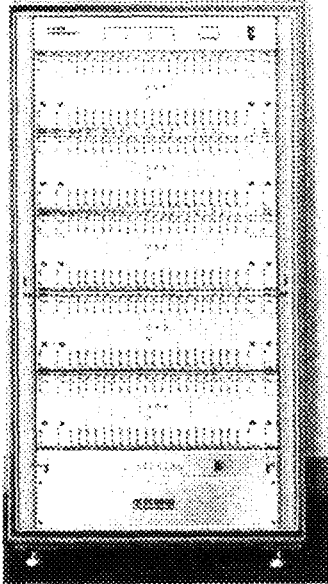


SM8 and SM16

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1.1.1 SM4C



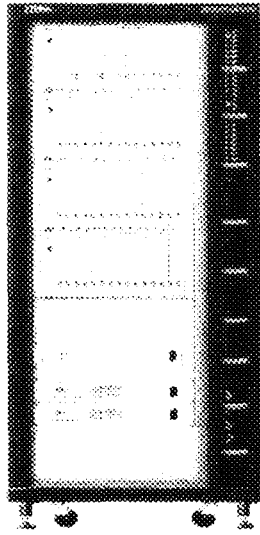
SM4C

- Dimensions: 2000mm×670mm×600mm (H×W×D)
- Weight: 250kg (a single rack with full configuration)
- DC voltage: -48VDC (-40VDC~-57VDC)
- Switching network capacity: Single T 4K/4K
- **Main features:** The transmission, control and switching functions are integrated in the same layer, thus reserving more free space in the rack to connect more subscribers
- **Application:** The typical configuration of SM4C with dual racks has a capacity of 5,280 lines plus 600 trunks. It is generally used as small-capacity end office, remote module (RSM) or Private Automatic Branch eXchange (PABX)

1.1.2 SM4H

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SM4I

- Dimensions: 2000mm×870mm×600mm (H×W×D)
- AC voltage: 220VAC±22VAC
- Switching network capacity: Single T 4K/4K
- **Main features:** The primary power supply, storage battery, and MDF (optional) are integrated inside, and the subscriber concentration ratio is 1:1.
- **Application:** The typical configuration of SM4I with a single rack has a capacity of 720 lines plus 720 trunks. Generally, it is used in occasions requiring high concentration ratio, such as toll centers. It can only be used as an independent exchange, and can neither be used as a Peripheral Switching Module (PSM) of other modules, nor be connected with other switching modules. Remote subscriber line modules (RLMs) can be connected to it.

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W800A

The W800A provides IEEE 802.11a/b/g-based, high-speed wireless access with the maximum speed reaching 54Mbps. In combination with a bridge and repeater, it can be used to fulfill high-speed wireless bridging. It can provide one wireless Ethernet interface, one Ethernet interface and one RS232 configuration port. In terms of system software, it is composed of the Support Subsystem, Basic Service Subsystem, Extended Service Subsystem and Configuration Subsystem. The W800A has all functions necessary for building a public, carrier-level WLAN.

(1) Port types

- Wireless interface: IEEE 802.11a/b/g supported
- Uplink network interface: Autosensing 802.3 10/100BASE-T Ethernet interface
- RS-232 interface: The CLI interface for configuration

(2) Performance features

- User roaming
- Power can be adjusted by software within a range of 10~200mW, and power changing modes can be configured.
- Power self-adaptation is supported.
- Automatic scanning of channel
- Multi-SSID supported
- IAPP supported; load balancing based on user quantity and traffic volume
- Layer-2 isolation, avoiding communication between wireless users via AP. This guarantees high security for WLAN access in public places
- MAC address verifying and filtering supported: Up to 100 MAC addresses can be configured.
- Link integrity detection: High dependability of AP.
- Data encryption methods including WEP, TKIP and AES-OCB
- VLAN is provided: Terminals of an AP can form different VLANs by SSID.
- Based on 802.1x authentication (including port control) and advanced 802.1x authentication (including EAP-SIM, EAP-MD5, EAP-TLS)
- RADIUS
- DHCP Server and DHCP relay
- Remote configuration management: Management via Web-based configuration (HTTP), Telnet, SNMP and GUI
- Secure remote configuration management: Supporting SSH
- Local configuration management: Management via RS-232 serial interface

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- Firmware version upgrade: Upgrading via Serial Interface or TFTP
- Configuration upgrade: Upgrading via Serial Interface or TFTP
- Supports QoS and complies with IEEE 802.11e and 802.1p
- SNMPv2-based network management
- Equipment functions like the Restore button, remote reset, and indicators are available by default.

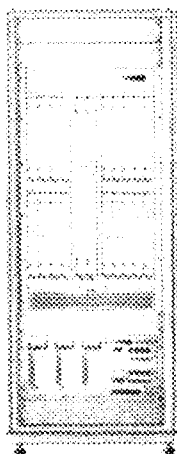
(3) Technical Specifications

Items	Features
Standard	IEEE 802.11a/b/g
Data rate	IEEE 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 & 108Mbps turbo mode; auto sense IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48 & 54Mbps; auto sense IEEE 802.11b: 1, 2, 5.5, 11Mbps; auto sense
Throughput	>=20Mbps
Recommended/Max Number of Subscribers	30/100
Coverage area	Indoor: 30~80 meters; Outdoor: 100~300 meters
Transmitting power	802.11IEEE 802.11b: 100mW 802.11IEEE 802.11g: 100mW 802.11IEEE 802.11a: 40mW
Power supply	48V POE and 12 VDC
Weight	1Kg
Dimension	208mm x 180mm x 47mm (H×W×D)
Temperature	Operating temperature: -5°C ~ 45°C Storage temperature: -40°C ~70°C
Humidity	Operating humidity: 5%~ 95% Storage humidity: 10%~100%

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ZXR10 T1200 Carrier-Class Core Router



1. Overview

The ZXR10 T1200 is a carrier-class, high-end core router developed by ZTE recently to adapt to the rapid growth and expansion of Internet services. With the advanced modular, distributed and expandable design and the large-capacity switching chip & high-performance network processor employed, the ZXR10 T1200 supports up to 16 10G high-speed interfaces and provides hardware-based wire-speed data forwarding and powerful QoS capability. IPv4/IPv6 are supported additionally. The ZXR10 T1200 is the optimal choice for not only carriers and national backbone network nodes of large-scale industry networks, but also provincial backbone nodes and core nodes such as interconnection center between carriers.

2. Product Features

- **Expandable switching capacity and wire-speed forwarding rate**
Leading-industry crossbar switching architecture, centralized control and distributed processing together help guarantee a wire-speed processing capacity for each slot. With a favorable expansibility, the backplane capacity can reach 1.2Tbps. The 640Gbps switching capacity is supported. Advanced network processor technology finally realizes wire-speed IPv4/IPv6 and MPLS data forwarding via high-speed interfaces. The total packet forwarding rate can be as large as 400Mpps.
- **Rich line interface cards with forward compatibility**
Based on the mature ZXR10 T128/T64E series, the ZXR10 T1200 not only provides 10Gbps OC-192c/STM-64c and 10GE WAN/LAN interfaces, but supports line cards of the ZXR10 T128/T64E series as well. Forward compatibility for line interface cards are well guaranteed and customers' early investments are protected.
- **Robust IPv4/v6 routing capability**
IPv4/v6 static routing is supported. ZXR10 T1200 supports diverse dynamic routing protocols such as RIP/RIPng, OSPFv1/v2/v3, IS-ISv4/v6 and BGP4/BGP4+. It can be configurable up to 512K~2M routing entries. Powerful routing capability makes it very suitable for use in Internet backbone networks. In addition, IPv4/IPv6 Dual Stack and fast IPv4/v6 transition mechanism are supported.
- **Strong support various services**
Hardware-based bandwidth restriction is provided, bandwidth control granularity as precise as 1KB. Diversified congestion control and congestion avoidance algorithms such as PQ, CBWFQ, LLQ and WRED are supported so that a perfect QoS mechanism

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is offered for service deployment. MPLS-based traffic engineering, VPN service, hardware-base wire-speed NAT, multicast service, policy routing, load balancing and traffic statistics are support as well.

- **Full support of MPLS**
MPLS technologies are fully supported. MPLS protocols including LDP/RSVP-TE/MP-BGP are supported as well. MPLS-based traffic engineering and DiffServ QoS can be supported. Additionally, good interoperability with MPLS L2/L3 VPN from other mainstream vendors (e.g. Cisco, Juniper and Huawei) is obtained.
- **Carrier-level high reliability**
System's key components including the switching fabric, routing engine, power supply, fan and clock are 1+1 redundant. MPLS Fast Reroute and VRRP are supported. Key components and interface cards support hot swappable, making it very convenient for system maintenance.
- **Superior system management**
Network management protocols of SNMP v2/v3 are supported; both serial interfaces and Ethernet network management interfaces are provided; both in-band and out-band network management are furnished. Each control board has 2 CPUs (route calculation CPU and network management CPU) so that real-time network monitoring is ensured even when there are considerable route interactions. For NMS interface, CLI and GUI are supported; and both Web-based network management and remote network management are available.

3. Technical Specifications

Feature	Description
System Architecture	Crossbar switching fabric+ NP
Input voltage	Double -48 VDC or 220 VAC
Power consumption	1800W(full load)
Dimension (H] W] D)	1111mm] 483mm] 560mm
Weight	<120kg (full load)
Environmental requirement	Long-term operating temperature: 0~40ΣC Operating humidity: 10%~90% (No condensation)
Switching capacity	640Gbps (bi-directional), non-blocking
Forwarding rate	400Mpps
Number of slots	16
Interface type	? 1] OC-192c/STM-64c POS interface ? 4] OC-48c/STM-16c POS interface ? 4] OC-12c/STM-4c POS interface ? 4] OC-3c/STM-1 POS interface

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	<ul style="list-style-type: none"> ○ 2】 channelized OC-3c/STM-1 POS interface ○ 4】 OC-12c/STM-4c ATM interface ○ 16】 100M electronic interface ○ 16】 100M optical interface ○ 4】 GE GBIC interface ○ 10】 GE (SFP) interface ○ 1】 10GE WAN interface ○ 1】 10GE LAN interface
Routing protocols	<ul style="list-style-type: none"> • Routing protocols of RIP, OSPF, IS-IS, BGP-R and static routing are supported; • 2M route entries
IPv6	<ul style="list-style-type: none"> • IPv6 static routing, dynamic routing protocols of RIPv6, OSPFv3, IS-ISv6 and BGPv4+ are supported • Basic transition mechanisms: manual tunnel configuration, automatic tunnel configuration, 6to4 tunneling, 6over4, 4in6 hardware-based NAT-PT • ICMPv6 MIB, UDPS MIB, TCP6 MIB, IPv6 MIB are supported
MPLS	<ul style="list-style-type: none"> • LDP, RSVP-TE and MP-BGP • MPLS-based wire-speed data forwarding rate • Can act as P and PE • MPLS FRR(Fast Reroute) • MPLS CoS(E-LSP) • Traffic engineering: RSVP-TE, OSPF-TE, ISIS-TE • MPLS VPN - L2: VVPS, VPLS - L3: BGP/MPLS VPN (RFC2547bis), supports three subcases for inter-AS VPN defined RFC2547bis • Related standards strictly compliant; good interoperability with devices from other mainstream vendors.
QoS	<ul style="list-style-type: none"> • Supports traffic identification and classification according to 5-tuple(source IP address, destination IP address, source port address, destination port address, application protocol number), physical port, logical port, MAC address, ToS, ACL, 802.1p, and MPLS EXP, etc. • Supports PQ, CBWFQ, LLQ queue management • Supports WRED congestion control algorithm • Support DiffServ CoS • Supports RSVP-TE to establish LSP
Multicast	IGMP, MSDP and PIM-SM are supported.
Network Management	<ul style="list-style-type: none"> • Network management interfaces: Console, RJ-45 • Support in-band, out-band network management information channels • Support CLI, GUI and web management interface

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	<ul style="list-style-type: none"> • Support remote network management and software version upgrade
<p>Other</p>	<ul style="list-style-type: none"> • Policy routing; • Security filtering characteristic; • Wire-speed NAT via high-speed interface; • Link bundling; • Load balancing;
<p>Reliability</p>	<ul style="list-style-type: none"> • Main processor and switching modules are 1:1 redundant, power supply modules are 3+2 redundant, fans are 1+1 redundant • Key components and interface cards support hot swappable. • MPLS FRR • VRRP

From: "Jade West - NAW" <jwest@nawd.org>
To: <publiccomments@bis.doc.gov>
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Please find attached comments in response to Proposed Rulemaking Concerning Revisions and Clarification of Export and Re-export Controls for the People's Republic of China (71 Fed. Reg. at 38,313, July 6, 2006).

Jade C. West

Sr. Vice President - Government Relations

National Association of Wholesaler-Distributors

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www.nawd.org <<http://www.nawd.org>>

CC: "Tim Curran" <tcurran2@tampabay.rr.com>



GLOBAL
TECHNOLOGY
DISTRIBUTION
COUNCIL

a worldwide industry association

November 30, 2006

Sheila Quarterman
Bureau of Industry and Security
United States Department of Commerce
14th Street and Constitution Avenue N.W.
Washington, D.C. 20230

Re: Proposed Rulemaking Concerning Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 FR 38313 of July 6, 2006)

Dear Ms. Quarterman:

The Global Technology Distribution Council (GTDC) appreciates this opportunity to comment on the Proposed Rulemaking Concerning Revisions and Clarification of Export and Re-export Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 FR 38313 of July 6, 2006).

The GTDC is a California nonprofit mutual benefit corporation comprised of the largest technology distributors the world. The 13 members of the GTDC, the majority of which are U.S.-based, represent over \$90 Billion in worldwide technology sales. The US-based members include Access Distribution, Arrow, Avnet, Agilysys, Bell Micro, Ingram Micro, Synnex, Tech Data and Westcon.

GTDC members are committed to doing their part in supporting the national security of the United States, including complying with BIS regulations and cooperating fully with federal authorities. As explained below, however, the proposed regulations with respect to Military End-Use Requirements ("MEUR") applied to the distributors' business in China, will not advance national security but will rather increase the administrative burden on these companies, thus weakening their competitiveness in global markets, with no improvement on export control aims.

Please permit me to describe the business structure of the distribution industry as a way of demonstrating the impracticality of the proposed regulations. The information technology distribution industry is characterized by the following:

- Information Technology distributors purchase products such as printers, monitors, computers, servers, peripherals, software and others directly from technology vendors such as HP, IBM, Microsoft and others. They often maintain these products in inventory and provide them in a "just-in-time" fashion to a variety of different reseller customers (not directly to end users).
- The technology vendors (HP, IBM, etc.) utilize numerous routes to market, including global distribution, in-country sales to local distributors, direct sales to end users or resellers, internet sales and other. The fact that most IT vendors use multiple routes to market makes regulations on US-based global distributors ineffective in controlling the flow of product to a particular country since there are a variety of ways end customers can obtain the products.
- The distribution industry operates in a "two-tier" structure with distributors selling

technology products to "resellers" who in turn sell the products to end user businesses and consumers. The resellers often integrate products into multi-product technology solutions, such as a wireless networks or integrated computer-monitor-printer-copier workstations.

- Resellers range from small businesses, system integrators, corporate resellers and large retailers. These customers depend on the just-in-time, multi-vendor inventory maintained by the distributors as well as technical and sales support and credit financing. One phone call or internet inquiry from a reseller to a distributor can procure countless products from almost any technology vendor, have the products and software integrated and have the products shipped, often on the same day as the order is placed.
- Finally, the industry operates on low gross margins in the 7-8% range and net profit margins after tax in the 1-2% range. Profit margins at this level cannot sustain burdensome cost increases without price increase in the market which in turn will make the US-based companies uncompetitive against other global distributors and against local distributors who will have access to the same products in the Chinese market.

Key issues of technology distribution in China

- It is noted above that distribution is a two-tier industry. In developing countries such as China, the industry is often "multi-tiered" with products moving from vendor to distributors and then to multiple sub-distributors and resellers before they end up in the hands of an end user.
- Moreover, resellers, whether in the U.S. or in developing countries, are very guarded about revealing who their end users are for obvious competitive reasons. When there are multiple tiers of resellers involved as there are in China, it is impossible for the distributors to identify the ultimate end user with certainty at the start of the process when they ship a product.

The GTDC supports the objective of improving the national security of the United States and we support compliance with BIS regulations and cooperation with federal authorities in this effort. However, for the reasons stated above we believe the MEUR Proposed Rulemaking will not be effective at all in controlling the flow of sensitive technology into the PRC. We believe that these regulations will potentially damage the competitiveness of significant American companies operating in an extremely competitive global industry.

The GTDC respectfully recommends that BIS reassess the MEUR proposed rule.

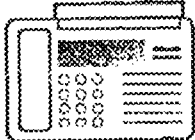
Sincerely,

Tim Curran
CEO

F A X

United Technologies Corporation

1401 I St. NW Suite 600
Washington, DC 20005
202-336-7400



To: Sheila Quarterman

FAX : 202-482-3355

From: Samira Page

Fax: 202-336-7469

Email: Candace.Page@utc.com

Date: 12/4/2006

**Regarding: BIS Comments on China
Catch-All Proposed Rule**

of pages (including cover sheet) : 6

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Lisi Kaufman
Senior Vice President
Government and International Affairs

December 4, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Export Services
14th Street and Constitution Ave., N.W.
Room 2705
Washington, D.C. 20230

Attn: Sheila Quarterman

RIN 0694-AD75

Re: Proposed Rule Concerning Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 Fed. Reg. 38,313 (July 6, 2006))

Dear Ms. Quarterman:

United Technologies Corporation ("UTC") submits these comments in response to the July 6, 2006, request for public comment on the above-referenced proposed rule to amend the Export Administration Regulations ("EAR"). Among other things, the proposed rule would create a new control based on knowledge by an exporter or reexporter of a "military end-use" for certain Commerce Control List ("CCL") items that do not currently require a license for export or reexport to the People's Republic of China ("PRC" or "China").

UTC is a global, diversified corporation based in Hartford, Connecticut. UTC reported revenues of \$42.7 billion in 2005, with well over half generated outside the United States. UTC supplies a broad range of high technology products and support services to the building systems, transportation, security, power generation and aerospace industries. UTC's companies are industry leaders, and its best known products include Carrier heating, ventilation, air conditioning and refrigeration systems, Otis elevators and escalators, Hamilton Sundstrand aerospace and industrial systems, Pratt & Whitney aircraft engines, space propulsion systems and industrial turbines, Sikorsky helicopters, UTC Fire and Security electronic security and fire safety systems, and UTC Power fuel cell and power systems.

It is unclear the proposed rule, in its current form, would benefit U.S. national security, particularly because Wassenaar member countries apparently do not plan to implement similar controls on equivalent dual-use items and because of the widespread

foreign availability of many of the items that would be subject to the new end-use control. The proposal would, however, impose potentially substantial compliance burdens and risks on exporters and reexporters because of ambiguities in the rule's definition of military end-use as well as expanded license documentation requirements.

The business opportunity and compliance costs of the proposed rule are potentially significant. On a macro level, it could erode UTC's competitive position in key aerospace markets as leading Chinese customers opt to forego or reduce reliance on U.S. parts and components out of fear the items may be subject to the rule's requirements. On a micro or transactional level, it would increase UTC's administrative compliance costs to perform due diligence on military end-use determinations on a potentially broad spectrum of transactions involving civil aerospace products.

We request the Commerce Department consider the following comments on the proposed rule and calibrate more precisely the definition of military end-use and its intended application in various export or reexport contexts. A more narrowly-tailored definition would provide greater certainty and predictability in the regulation and help limit the compliance burdens on exporters and reexporters.

I. Definition of Military End-Use

The proposed rule would create a license requirement when an exporter or reexporter has knowledge or is informed that certain CCL items to be listed in Supplement 2 to Part 744 are destined for military end-use in the PRC. The rule proposes to define "military end-use" as: incorporation into, or use for the production, design, development, maintenance, operation, installation, or deployment, repair, overhaul or refurbishment of items (1) described on the U.S. Munitions List ("USML"), (2) described on the Wassenaar International Munitions List ("IML"), or (3) listed under ECCNs ending in "A018" on the Commerce Control List. See proposed §744.21 (f). A note to paragraph (f) provides additional interpretations of the terms used in the definition.

The proposal to define military end-use based on the nature or classification of the foreign product that the CCL items will be used in, for or with creates significant ambiguity for exporters and reexporters who are required to interpret and apply the definition. The ambiguity revolves around the inherent difficulty, in many circumstances, in determining whether a Chinese or other foreign-produced item is of the type described on the USML or IML. The standard for designating USML items under the International Traffic in Arms Regulations ("ITAR") includes items that are specifically designed, developed, configured, adapted, modified or equipped for a military application. In the context of the military end-use definition, this standard implies that exporters and reexporters may be expected to make assessments, for example, of the design intent or configuration status of their Chinese customers' products. Such a result would present exceptional due diligence compliance burdens for exporters and reexporters who are trying to determine whether their customer is producing, servicing or operating a military item.

To help illustrate the compliance challenges with the current expansive definition, we offer the following hypothetical scenarios using civil aerospace as the underlying context.

Scenario A. Exports of civil aircraft parts and components (ECCN 9A991) for use on Chinese aircraft having both civil and military applications. There is an opportunity to supply aircraft parts and components to support a Chinese aircraft development program. Information indicates the aircraft is to be used for commercial cargo and/or passenger operations but also may have variants that will be used or configured for Chinese military transport applications. It is unclear whether supplying dual-use parts, components and technology for the development and production of Chinese multipurpose aircraft would be considered a military end-use under the current definition. Further, once aircraft are fielded and in operation, it is unclear whether supplying dual-use spare and replacement parts for any aircraft ultimately configured for military transport operations in China would fall within the military end-use definition. The potential that dual-use parts and components for multipurpose aircraft could face restrictions at any point in the aircraft life cycle likely would impede U.S. suppliers from competing for such programs.

Scenario B. Export of civil aircraft (ECCN 9A991) for use in transporting Chinese heads-of-state or other senior government officials. There is an opportunity to sell civil aircraft to the Chinese Government for VIP transport of government officials. The aircraft does not include any items or equipment subject to the USML, but the Chinese Government may decide later to add to the aircraft configuration certain items of the type described on the USML or IML, such as aircraft survivability, communications or radar systems manufactured by non-U.S. companies. Pursuant to ITAR principles, the addition of any defense articles to a civil aircraft subjects the entire aircraft to USML control. It is unclear whether the proposal intends to extend such "see through" principles to non-U.S. items or subsystems added to foreign or U.S. civil aircraft in China. As noted above, it is unclear whether supplying dual-use spare and replacement parts to China for incorporation into such VIP aircraft equipped with items described on the USML or IML would constitute a military end-use under the definition. The potential for any interruption in supply of dual-use parts and components for such aircraft likely would exclude U.S. companies from competing for such aircraft sales.

Scenario C. Export of civil helicopters (ECCN 9A991) for various non-military end-uses. There are opportunities to supply civil helicopters to agencies of the Government of China, or regional or municipal government entities, for non-military operations such as civil search and rescue, border patrol, police and law enforcement, humanitarian relief, VIP government transport and support of offshore oil operations. It is unclear if such end-uses, when no items of the type described on the USML or IML are used in or with the aircraft, would be captured under the military end-use definition. In addition, it is unclear if the term "deployment" in the proposed definition would encompass simple transportation of military items in performance of these non-military missions.

We recommend the Commerce Department amend the proposed rule to ensure the foregoing scenarios are unambiguously excluded from the scope of the military end-use definition. Commerce should clarify the note to paragraph (f) to indicate that the meaning of "items described on the USML and IML" does not include U.S. or foreign origin civil aircraft

that may be or have been modified, configured or equipped in China with non-U.S. items of the type described on the USML or IML. In the alternative, the Commerce Department should articulate safe harbors from the military end-use definition in scenarios such as these based on the nature of USML or IML items added to or used with civil or multipurpose aircraft and parts and components. Moreover, the Commerce Department should provide detailed, comprehensive guidance on the degree of due diligence and inquiry exporters are expected to undertake in determining and/or verifying the nature of foreign items throughout their lifecycle.

II. Application to Reexports

The proposed military end-use license requirement applies to reexports to China and to transfers within China. As noted above, the broad and ambiguous military end-use definition will present considerable practical compliance challenges to U.S. exporters. These difficulties will be even more acute when involving third country reexporters. The Commerce Department should provide specific guidance on the obligations of exporters, if any, to ascertain that the ultimate end-use does not involve a military end-use in China. At a minimum, we urge the Commerce Department to clarify that the existing *de minimis* content rules in § 734.4 of the EAR apply fully to reexport transactions and transfers otherwise subject to the proposed rule.

III. Licensing Policy

The proposed license review standards in the rule state that in addition to any other review policies that may apply, applications to export, reexport, or transfer items to a military end-use in China will be reviewed on a case-by-case basis to determine whether the transaction would make a material contribution to the military capabilities of the PRC and would result in advancing the country's military activities contrary to the national security interests of the United States. As explained above, as currently drafted the military end-use definition is expansive in its potential application to CCL items that may be used in, for or with foreign products of the type described on the USML or IML. If left unchanged, the definition could capture a wide array of low-level parts and components with no military significance. If licenses are to be required in such situations, we support maintaining a case-by-case license review policy that would take into account that proposed exports or reexports would not contribute to the qualitative advancement of Chinese military capabilities or military activities.

IV. End-Use Certificates

The proposed rule would expand the requirement for exporters to obtain End-User Certificates from the Ministry of Commerce of the PRC for all exports of controlled goods and technologies over a specific dollar threshold. The language of the proposed revisions to § 748.10 indicates in several places that end-user certification will be required for all items on the CCL that require a license to the PRC. However, the first sentence of proposed § 748.10(b)(4) addresses the requirement for transactions that involve an export of "commodities and software" but does not reference "technology." The Commerce

Ms. Sheila Quarterman
December 4, 2006
Page 5

Department should clarify if end-user certificates are not required for technology export license applications. Such clarification would be consistent with the Commerce Department's current practice of not requiring such certificates in connection with technology exports.

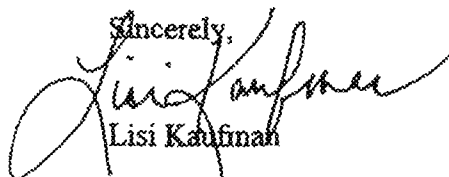
V. Grace Period

If the proposed rule is eventually adopted, we urge the Commerce Department provide an ample grace period to enable exporters and reexporters to transition to the new license and documentation requirements. We also recommend the Commerce Department work with U.S. Customs and Border Protection to ensure officials there are adequately trained in all aspects of the rule to minimize the chances of unnecessary shipment delays due to confusion over its application.

* * *

UTC appreciates the opportunity to present its views to the Department of Commerce on the proposed rule, and urges that the proposed military end-use controls, if adopted, be amended to clarify and narrow the definition of military end-use and to provide guidance on its application in different contexts. For additional information about these comments, please contact the undersigned at (202) 336-7463.

Sincerely,



Lisi Kaufman

Senior Vice President
Government & International Affairs
United Technologies Corporation

From: <mhershey@semi.org>
To: <publiccomments@bis.doc.gov>
Date: Tue, Dec 5, 2006 2:54 PM
Subject: RIN 0694-AD75: Revision to Public Comments from SEMI on China Proposal

This email contained an attached file "SEMI Attachment Two Revised.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?39BB0BC10FEFD8DE6EEAF15F26DF3BB34575CE720007CE04>
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This email contained an attached file "SEMI Comments Final.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?5410E6A86B0B05930EF6F838F90898FE4575CE730004AD57>
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All unclaimed attachments are deleted automatically after fourteen (14) calendar days.

Dear Ms. Quarterman,

Attached is a slight revision to the submission filed yesterday by Semiconductor Equipment and Materials International (SEMI). We apologize for the change, but some of the foreign availability information had not been included in Attachment Two. We would like to make sure that the full range of information is available to officials as they consider policy changes.

The corrected version of Attachment Two is attached. Please disregard the original version of Attachment Two and use this version instead. The correct versions of our comment letter and Attachment One are in the following email.

Thank you for your assistance with this revision. Please let me know if you have any questions.

Best regards,

Maggie Hershey

(See attached file: SEMI Attachment Two Revised.pdf)

Maggie Hershey
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----- Forwarded by Maggie Hershey/SEMI/US on 12/05/2006 02:39 PM -----

Maggie Hershey

To: publiccomments@bis.doc.gov

12/04/2006 12:03 PM cc:

Subject: RIN 0694-AD75: Public Comments from SEMI on China

Proposal

Dear Ms. Quarterman,

Please find attached the comments of Semiconductor Equipment and Materials International (SEMI) in response to the proposed rule on China export licensing that appeared in the Federal Register on July 6, 2006. I have included our comment letter as well as two attachments. Please let me know if you have any trouble accessing these documents.

Thank you and best regards,

Maggie Hershey

(See attached file: SEMI Comments Final.pdf)

(See attached file: SEMI Attachment One.pdf)

[SEMI Attachment Two -- original version deleted]

Maggie Hershey
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December 4, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th St. and Pennsylvania Ave., NW, Room 2705
Washington, DC 20230

Attn: Sheila Quarterman; RIN 0694-AD75

RE: Proposed Rule -- Revisions and Clarifications of Export and Reexport Controls for the People's Republic of China; New Authorization Validated End-User (71 Fed. Reg. 38,313 (July 6, 2006))

Semiconductor Equipment and Materials International ("SEMI") is pleased to submit to the Commerce Department's Bureau of Industry and Security ("BIS") the following comments on the proposed amendments to the Export Administration Regulations ("EAR") identified above.

Introduction and Overview

SEMI is the industry association of companies that provide equipment, materials and services used to manufacture semiconductors, displays, nano-scaled structures, micro-electromechanical systems and related technologies. SEMI represents large and small companies that contribute enormously to the advance of microelectronics technologies and that are central to communities of highly-skilled and educated engineers and technologists in many regions of the United States. United States semiconductor equipment and materials companies are world leaders in many technologies, but they face increasing competition from producers in other countries.

SEMI's comments on the proposed regulatory amendments are informed by facts about SEMI companies, the products that they produce, the market in which they operate, the relevance of export controls to their operations, and the relevance of sales of their products in China to U.S. national security interests. SEMI supports effective export controls as needed to preserve U.S. security interests and wishes to work with BIS to ensure that a final regulation serves those interests while avoiding any unnecessary cost to U.S. industry.

The products made by SEMI companies are overwhelmingly designed and used to manufacture wholly commercial and civilian electronic devices that are mass produced and mass marketed. While SEMI companies operate in a commercial, civilian environment, they contribute greatly to U.S. leadership among many technologies.

The Chinese market for semiconductor manufacturing equipment ("SME") is pivotal to the health of U.S. SME companies and, by extension, U.S. leadership in SME technologies. A recent survey by SEMI experts revealed that Chinese acquisitions of SME in 2006 through 2008 are expected to exceed \$9.8 billion – more than total Chinese SME purchases during the last five years (2001 through 2005).

With China representing by far the fastest growing SME market, U.S. firms cannot remain top SME companies if they do not participate broadly in the Chinese market. While other more established markets may be larger in size, the China market enjoys the fastest growth rates and provides the industry with the most opportunities to establish new business. The estimated growth rate for this year is quite high with the China market projected to increase by 78 percent from \$1.33 billion in 2005 to \$2.37 billion in 2006. After a slight dip in 2007, growth is forecast at 17.84 percent in 2008 and 12.22 percent in 2009 while rates in other regions are expected to be generally more modest. By 2009, the size of the China market is expected to reach three-fourths the size of the Europe market. Attachment One contains the SEMI Mid-Year 2006 Consensus Forecast Market Information by Region.

While the China market provides many opportunities, U.S. suppliers' share of SME sales to China – like their share of total international SME sales – has been falling. The U.S. portion of the Chinese SME market dropped from 50 percent in 2003 to 44.3 percent in 2005. In these circumstances, it is particularly important that export controls not be configured or administered in a way that unnecessarily impedes U.S. SME sales to China.

Another SEMI survey – this one of U.S. SEMI members – establishes that export controls can bear heavily on SME producers' ability to compete in China.¹ Forty-two percent of respondents reported that export controls have contributed to lost sales in China. A few survey respondents' estimated lost sales totaled several millions of dollars each. While the numbers of BIS license denials have been limited, U.S. producers have sometimes found that the delays and other complications involved in seeking a license have led them not to pursue sales opportunities in China.

SME sales to China should be readily amenable to export control streamlining. SME systems are, by and large, high-value and highly visible. Diversion risk is minimal, and sales to China are dominated by a relatively few, large commercial semiconductor manufacturing facilities. Sixty percent of the respondents to the SEMI-member survey indicated that their business in China – critical though it is – is limited to 10 or fewer customers. Working with the industry, the U.S. government should be able to fashion export control policies that permit the overwhelming bulk of SME sales to China without licenses and without creating significant national security risks.

¹ SEMI conducted a survey of U.S. member companies in April-May 2006 regarding the impact of export controls on the industry. The survey was sent to those companies participating in the association's export control activities. We received a high response rate of 43 percent with 12 companies responding out of a pool of 28 survey recipients. Half of the respondents were equipment suppliers and the other half were divided among subassembly and component suppliers and materials companies. Most respondents had over \$500 million in annual revenues and five had over \$1 billion in revenue.

Validated End-User Provision

SEMI applauds the creative thinking that underlies the validated end-user ("VEU") proposal. It is important that the U.S. government find a way to ensure that U.S. companies can, without the need for individual export licenses, supply their full range of commercial SME tools to reliable commercial fabrication facilities in China. We believe that the VEU initiative could provide the basis to do so.

In particular, the VEU proposal could substantially reduce the cost of repetitive licensing. A top concern among respondents to the survey of U.S. SEMI members was the requirement that they obtain successive licenses to ship the same types of equipment to the same Chinese customers. Sixty-four percent of the respondents reported that these follow-on licenses have represented 75-to-100 percent of their licensing volume. Apart from the needless expense to government and industry of obtaining successive licenses for similar products to the same group of customers, the licenses commonly include varying types of conditions for no discernable reason. This complicates company compliance and makes it more expensive. Substantially reducing repetitive licensing and standardizing license conditions for major Chinese customers would go far toward eliminating the unnecessary costs of controls on SME sales to China, and the VEU proposal shows promise for achieving this reform.

In addition, the VEU proposal could lead to a more level competitive environment among SME suppliers in the United States and abroad. While most applications for SME licenses are approved, SEMI members continue to have serious concerns about differences between U.S. licensing practices and those of other Wassenaar Arrangement participants. One particular concern is application-processing times. One-half of respondents to the SEMI member survey reported that their average processing periods range from two-to-four months. One-quarter of the respondents indicated that their average processing times were four-to-six months. We understand that application-processing times among other countries are substantially shorter and tend to be measured in weeks or even days. A VEU approach could go far toward addressing this issue for exports to major Chinese customers.

SEMI offers the following suggestions to help enable the VEU proposal to reach its potential to improve U.S. export control policies vis-à-vis China:

Apply a Wide Scope of License-Free Treatment

First, BIS should ensure that the scope of license-free treatment under the VEU provision is sufficiently broad to make the program useful. BIS should clarify that VEU license-free treatment will ordinarily be accorded all items under Export Control Classification Numbers ("ECCNs") 3B001 and 3B002. Limiting end-user validations to selected categories of products in 3B001 or 3B002 is unnecessary and would severely undermine the utility of the VEU program. If BIS has confirmed that a semiconductor fabricator in China does not present a significant risk of diversion or other security concerns, BIS should permit license-free shipments of all 3B001 and 3B002 tools to that fabricator.

Restrictions on product eligibility under a validation would run counter to the fundamental purpose of the VEU initiative as we understand it. For U.S. SME companies to maintain their

leadership – and for the United States to maintain SME technology leadership – the U.S. companies need a license-free path to supply top-of-the-line civil, commercial SME tools to reliable civil, commercial Chinese fabricators. Supplying second-tier systems to the fastest growing market is incompatible with retention of U.S. leadership.

We urge the government to avoid incremental changes to VEU product scope limitations. Forcing U.S. companies to continually seek scope expansions would be tantamount to current transaction-license practices. United States suppliers would face the same problems of delay, expense and uncertainty.

Furthermore, the term “facility” should be changed to “facilities” in proposed section 748.15(d)(1). The current text could be construed to mean that VEU license-free coverage would extend to only one facility per VEU or that each facility would have to be individually approved. If a Chinese end-user is found to be sufficiently trustworthy to be validated, there should be license-free treatment for exports and reexports to all of its operations (except, perhaps, in unusual circumstances when a particular facility might be expressly omitted).

Avoid Intrusive Auditing Requirements

Second, BIS should clarify that exporters that avail themselves of VEU license-free treatment will not be subject to intrusive auditing policies. Standard BIS auditing policies for exporters should be sufficient, and the scope of VEU audits should be limited to the VEU program itself. A more intrusive policy could lead exporters to conclude that moving from a transaction-licensing practice to reliance on the VEU program is not justified.

Eliminate VEU Certification Requirements

Third, SEMI suggests that BIS eliminate or at least minimize the extent to which VEU candidates are required to provide certifications. Attractive candidates for validation will have understandable objections to making certifications about their behavior, even if they are not provided directly to the U.S. government. They will be concerned, for example, that certifications would make them subject to the jurisdiction of U.S. courts and agencies and otherwise yield legal exposure which they, as foreign entities, would have difficulty understanding, let alone addressing. Consequently, these requirements may result in a universe of applicants for validation that is more limited than it otherwise would have been.

Whether or not certifications are provided, the U.S. government can evaluate whether the candidate Chinese end-user is engaged in military activities or presents a significant risk of diversion. If the end-user is validated and is subsequently found to have become ineligible for validation or it refuses to accommodate U.S. government site visits, its validation can be revoked.

Administer in an Efficient and Expeditious Manner

Fourth, we would like to work with BIS to ensure that the VEU program is administered in a thoughtful and flexible manner. BIS should deploy a sufficient number of trained, experienced staff to process applications for VEU status and to administer the VEU export authorization.

It will be particularly critical for BIS to process applications for validation quickly. In our industry, like many others, the pace of technological and market changes is extremely rapid. If it takes months to implement a validation, the utility of the validation could be greatly undermined. We are encouraged by reports that BIS is seeking to make validation decisions within 30 days of receiving applications. This is the type of timing that could make the VEU program a useful modernization of U.S. export controls.

Continue to Improve Program through Industry-Comment Mechanism

Finally, SEMI urges that BIS continue eliciting industry input on the VEU program after it becomes effective. SEMI recognizes that the proposal is experimental, and adjustments will no doubt be needed to enhance its effectiveness as limitations become apparent through experience. SEMI would be enthusiastic about continuing a vigorous, public discussion about the VEU program in the months and years following its implementation.

Military End-Use Rule

The proposed "military end-use" licensing rule would establish new license requirements for exports, reexports and "transfers" of specified items if the exporter or transferor has "knowledge" that the item is intended for a "military end-use." Military end-use would include use for, among other things, production, design, development, maintenance or operation of an item on the U.S. Munitions List. The rule would also require a license for the knowing "support" of such an export, reexport or "transfer."

SEMI has always supported U.S. export control measures that enhance U.S. national security. However, we believe that this regulation will tend to undermine the U.S. industry's competitiveness without materially affecting whether listed products benefit the Chinese military.

First, the proposal would be, in any meaningful sense, unilateral. There is no current prospect that any other country will apply a policy like the proposed military end-use rule. As such, the proposal would be ineffective and represent little or nothing more than added cost. This is particularly true in the SME industry, where U.S. companies are competing fiercely with suppliers in other countries. In SEMI's view, the BIS should only consider promulgating a new control if it is multilateral.

Second, by encompassing ECCNs 3B991 and 3B992, the proposal would apply broadly to SME systems.² This equipment is intrinsically commercial and civil and is designed and used to produce commercial, civil devices. The covered items are not militarily significant and they are part of the control categories that were generally decontrolled within the Wassenaar Arrangement based on their non-sensitive nature. Also, ECCNs 3B991 and 3B992 are very broad categories that require ten pages of regulations to list approximately 34 types of equipment widely used to produce semiconductors. At minimum, there would seem to be no basis to cover all of this vast, diverse set of products.

² These ECCNs encompass certain "equipment specially designed for the manufacture of semiconductor devices" (3B991.b) and certain "equipment specially designed for the inspection or testing of semiconductor devices" (3B992.b).

Another reason that SME should be omitted from the military end-use proposal is the broad foreign availability of SME products. All major SME systems are supplied by companies in other countries, and we understand those other countries do not view SME exports to China as a security concern. Adding a licensing requirement for these systems will only create confusion and cost. Please see Attachment Two for an overview of foreign availability for the types of products included in ECCNs 3B991 and 3B992.

Some government officials have suggested that foreign availability from Wassenaar partners may not be given as much weight as items available from Chinese sources. We see no basis for this in the underlying statute or regulations on foreign availability, and we see no policy basis for this position. If the item is available to the Chinese buyer, it is available – regardless of the source. Any U.S. government efforts to stop the supply via the military end-use control would therefore be unsuccessful. In these circumstances, the U.S. control would do no good and should not be imposed.

Third, the proposal provides no guidance as to the type of screening that should be applied to address the new license requirement. If anything like the proposal is retained, the regulations should establish a safe-harbor of screening that, if completed, would insulate the exporter from liability.

BIS clarified in guidance published on its internet site in October 2006 that the mere fact that the end-user engages in military activity would not necessarily mean that an export to the end-user is for a military end-use and, hence, covered by the license requirement. We applaud this clarification and urge BIS to include this point in the regulation itself.

Fourth, the proposal should be modified to establish that the license requirement would apply only if the exporter is informed that an export would be for a military end-use. For example, BIS could publish a list of Chinese military programs or restricted foreign purchasers to which the listed items should not be exported. Any catch-all regulation should employ, at most, the "positive knowledge" standard described by U.S. government officials earlier this year rather than the more uncertain standard contemplated by the proposal.

Finally, if the proposal is to be retained it should not extend beyond exports and reexports. The proposed rule would establish license requirements not only for exports and reexports but also for some ill-defined "support" activities and for certain intra-country "transfers." SEMI can find no statutory basis to require a license for non-export activities, including in the now expired Export Administration Act. In any event, there appears to be no policy justification for applying the rule to non-export transactions, and applying the rule to non-export transactions would magnify costs occasioned by the rule. We note that General Prohibition 10 already prohibits U.S. persons from engaging in various activities, such as "transfer," "finance" and "transport", with respect to an item subject to the EAR and exported or to be exported with knowledge that a violation of the Export Administration Regulations has occurred, is about to occur, or is intended to occur in connection with the item.

MOFCOM Certificates

The proposed new Ministry of Commerce ("MOFCOM") certificate requirement would increase exporter costs and could result in delays. SEMI is concerned that the Chinese government is ill-equipped to process the volume of certification requests that would emerge from expanding the scope of the certificate requirement. Reports indicate that Chinese authorities concede that they will be unable to administer the program in a timely manner. Furthermore, exporters seeking a license would be at the mercy of a foreign government agency, which may be inclined to exercise discretion in favor of one competitor over another. Understandings with the Chinese government that it will administer its program of certifications in an effective, reasonable and timely way should be a prerequisite to retaining this requirement.

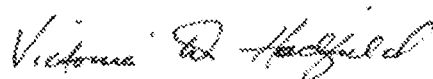
Finally, the rationale for a \$5,000 threshold is unstated and unclear. It would be so low as to cause the certificate requirement to cover the vast bulk of SME exports. SEMI urges that the threshold be reviewed or more narrowly defined so as to focus on items of particular significance to U.S. national security interests, which would be a priority for a potential end-use verification in the future. We understand that the purpose of this proposal is to ensure that the U.S. government is able to conduct end-use checks on an increased number of exported items.

Conclusion

To summarize the SEMI position, we see both potential and areas of concern in this proposal. We support the VEU concept with the reservations and recommendations stated above and seek to work with the government to finalize and implement a workable new policy and process. The military end-use restriction is problematic in that it is unilateral, too broad and too unwieldy from a compliance perspective for all concerned. Most importantly, it does not add significantly to U.S. national security in our sector and could hurt U.S. companies' sales in China and thereby undermine our competitive position there. In the long run, that could hurt U.S. national security by undermining our manufacturing leadership in a critical sector.

Once again, SEMI appreciates the opportunity to address this important matter. Please do not hesitate to contact me if you have questions about our submission.

Sincerely,



Victoria D. Hadfield
President, SEMI North America

SEMI Attachment One: Market Information from July 10, 2006 Press Release

SEMI Announces Mid-Year Consensus Forecast for Chip Equipment Industry

Semiconductor Equipment Companies Expect Sales of \$38.8 Billion in 2006

SAN FRANCISCO, Calif. — July 10, 2006 -- The leading manufacturers of semiconductor equipment expect 2006 to be the second largest year ever for sales of new semiconductor equipment according to the mid-year edition of the SEMI Capital Equipment Consensus Forecast, released here today by SEMI at the annual SEMICON West exposition.

The forecast indicates that, following the anticipated decline of 11.3 percent in 2005, the equipment market will grow 18 percent to \$38.8 billion in 2006. Survey respondents see the market remaining flat in 2007 and resuming double-digit growth over the following year to reach \$44.1 billion in 2008.

"Favorable economic conditions, increased demand for semiconductor devices and stable inventory levels have stimulated capital investment by the world's chip makers in the first half of the year," said SEMI President and CEO Stanley T. Myers. "SEMI members anticipate strong sales of chip manufacturing equipment in 2006. Furthermore, they anticipate less dramatic fluctuations in future cycles consistent with end-market growth and long term diversification trends in consumer electronics."

The SEMI Mid-Year Consensus Forecast indicates that the wafer processing equipment segment will experience the most significant level of growth this year at an estimated 20 percent to \$27.4 billion. Survey respondents anticipate that the market for assembly and packaging equipment will grow 11.6 percent to \$2.4 billion in 2006. The market for equipment to test semiconductors is expected to grow about 14 percent to \$6 billion this year.

The market in China for new equipment leads the growth trend in 2006, with a projected market increase of 78 percent, followed by the Rest-of-World market region (23 percent growth), Taiwan (22 percent growth) and North America (21 percent). Equipment sales in Europe are projected to raise 14 percent, while Korea and Japan will see growth in the high single digits.

The SEMI Mid-Year Consensus Forecast is based on interviews conducted between late May and June 2006 with companies representing a majority of the total sales volume for the global semiconductor equipment industry.

The following survey results are given in terms of market size in billions of U.S. dollars and percentage growth over the prior year:

Forecast by Equipment Segment

	2005	2006	% Chng	2007	% Chng	2008	% Chng	2009	% Chng
Equipment	\$B	\$B		\$B		\$B		\$B	
Type									
Wafer	\$22.86	\$27.42	20.0%	\$27.55	0.5%	\$31.08	12.8%	\$31.12	0.1%
Processing									
Assembly & Packaging	2.13	2.38	11.6%	2.34	-1.7%	2.61	11.7%	2.64	1.3%
Test	5.29	6.02	13.9%	6.51	8.1%	6.94	6.7%	7.33	5.6%
Other	2.61	2.99	14.6%	2.97	-0.6%	3.44	15.7%	3.23	-6.0%
Total	\$32.88	\$38.81	18.0%	\$39.36	1.4%	\$44.07	12.0%	\$44.33	0.6%
Equipment*									

Forecast by Region

	2005	2006	% Chng	2007	% Chng	2008	% Chng	2009	% Chng
Market	\$B	\$B		\$B		\$B		\$B	
Region									
North America	\$5.70	\$6.90	21.07%	\$7.05	2.10%	\$7.89	11.94%	\$7.87	-0.27%
Japan	8.18	8.91	8.92%	9.21	3.41%	9.97	8.23%	9.75	-2.20%
Taiwan	5.72	6.97	21.87%	6.96	-0.14%	7.97	14.46%	7.91	-0.69%
Europe	3.26	3.73	14.47%	3.77	1.06%	4.19	10.98%	4.06	-2.94%

South Korea	5.83	6.40	9.88%	6.60	3.08%	7.55	14.36%	7.64	1.31%
China	1.33	2.37	78.11%	2.34	-1.24%	2.76	17.84%	3.09	12.22%
Rest of World	2.86	3.53	23.27%	3.43	-2.68%	3.76	9.52%	4.00	6.37%
Total Equipment*	\$32.88	\$38.81	18.0%	\$39.36	1.4%	\$44.07	12.0%	\$44.33	0.6%

*Totals and percentages may differ due to rounding of numbers

SEMI is a global industry association serving companies that develop and provide manufacturing technology, materials and services to make semiconductors, flat panel displays (FPDs), micro-electromechanical systems (MEMS) and related microelectronics. SEMI maintains offices in Austin, Beijing, Brussels, Hsinchu, Moscow, San Jose (Calif.), Seoul, Singapore, Tokyo, Shanghai and Washington, D.C. For more information, visit SEMI at www.semi.org.

ASSOCIATION CONTACT:

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E-mail: ssmith@semi.org

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Epitaxial Growth		
Company	Location - Country	Website Address
ASM international	The Netherlands	www.asm.com
		<p>Boilerplate from Company Website</p> <p>ASM offers a complete portfolio of 300mm tools across our product line, with Front-end technologies that provide solutions for device geometries down to 65 nanometers and below, and in both Front-end-of-Line (FEOL) transistor formation , and Back-end-of -Line (BEOL) interconnect technologies.</p>
NuFlare Technology, Inc.	Japan	www.nuflare.co.jp/english
		<p>We have developed as a top semiconductor manufacturing equipment maker with and integrated approach extending from electron beam mask writer development, to production, sales, and servicing. We also supply thin film growth equipment that can support the growing sophistication of semiconductor devices and is based on a new concept that is able to achieve a perfect crystal format.</p>
Hitachi Kokusai	Japan	www.h-kokusai.com
		<p>The operations of Kokusai Denki Logistics Co., Ltd. were divided into two parts. The transport operations concerning semiconductor manufacturing systems were integrated into Kokusai Electric Semiconductor Service Co., Ltd. Meanwhile, operations concerning communications and information systems and other enterprises were integrated into Kokusai Denki Techno Service Inc.</p>
LPE	Italy	www.lpe-epi.com
		<p>LPE's production strategy concentrates on reactors dedicated to severe applications such as Schottky, Power Transistor, PowerMos, Rectifier, very thick epi layers for IGBT devices grown in a single process; NPN, patterned wafers and others on arsenic doped substrates, CMOS, Buried Layers on Sb doped substrates and Mixed Technology. Our reactors are capable of covering the whole range of products mentioned above, including large wafers.</p>

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Sputtering		
Company	Location - Country	Website Address
Canon Anelva	Japan	www.canon-anelva.co.jp/en/
<p>Boilerplate from Company Website</p> <p>Canon ANELVA Corporation manufactures major equipment for the fabrication of semiconductors and LCDs using vacuum technology. ANELVA stands for a ANalysis Electronics Vacuum. The name represents our basic corporate ideal: combining analytical technology and vacuum technology by electronic and developing advanced vacuum and thin-film technologies with an eye toward the future. We provide products achieved by applying vacuum technology, such as manufacturing equipments for storage devices, semiconductors, liquid crystal display (LCD), and plasma display panels (PDP), small-size manufacturing equipments for laboratory use, and those for medium-scale production.</p>		
IPS	Korea	www.ips-tech.com
<p>IPS-Manufacture, retrofit and sales of equipment for manufacturing semiconductors, LCDs or solar cells. Import and sales of parts required to manufacture semiconductors, LCDs or solar cells. Post management and service provision consequent an sales of semiconductors, LCDs or solar cells and research and development services related to the equipment mentioned above.</p>		
Oerlikon (Unaxis)	Switzerland	www.oerlikon.com
<p>Oerlikon is a globally leading company in the field of thin film, vacuum and precision technology. Based on these core competencies, Oerlikon develops production systems, components, and services for high-technology products. The company's commercial activities center on protective coatings for precision tools and components, production equipment and coating processes for solar modules, as well as production systems for data storage devices (Oerlikon Balzers Coating), systems for producing vacuums and conveying process gases (Oerlikon Leybold Vacuum), optical components, aerospace technology and outsourcing (Oerlikon Components). Oerlikon also applies its core competencies as a major provider of semiconductor technology (Oerlikon ESEC Semiconductor).</p>		

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Ion Implant			
Company	Location - Country	Website Address	Boilerplate from Company Website
Sumitomo Eaton Nova - changed its name to SEN Corporation, an SHI and Axcelis Company effective April 1, 2006.	Japan	www.senova.co.jp/english	As the leading manufacturer of ion implantation systems for semiconductor industry in Japan, SEN provides high-current, medium-current, and hi-energy ion implantation systems for the production of the latest semiconductor devices, including those for 300mm wafers. We also provide ion implantation systems most suitable for the production of low-temperature polysilicon TFT-LCDs and organic EL displays, whose high performance is attracting attention for use in the production of high performance flat panel displays.
Nissin Electric	Japan	www.nissin.co.jp	With an original foundation and free use of the state-of-the-art technology, fostered by high voltage technology, Nissin Electric moving forward in expanding these dreams in various directions. Some of our most noteworthy products and achievements include information Telecommunication technology, Photovoltaic System, Electron Beam Processing Equipment and Ion Implanter. Making dreams come true - Nissin Electric continues the challenge and pursuit of progressive ideas and original themes.
Ulvac	Japan	www.ulvac.co.jp/eng	Development, manufacture, sales, customer support and machinery importing/exporting activities related to vacuum equipment, peripheral devices and vacuum components for the display, semiconductor, electronics, electrics, metals, machinery, automotive, chemical, food and pharmaceutical industries, and for universities and research centers. Research guidance and technical consulting on all aspects of vacuum technology.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Etch

Company	Location - Country	Website Address	Boilerplate from Company Website
TEL	Japan	www.tel.com/eng	TEL's largest product line, semiconductor equipment, includes coater/developers, dry etchers, thermal processing systems, single wafer deposition systems, surface preparation systems, test systems, and metrology software. TEL also offers a leading edge line-up of Flat Panel Display (FPD) production equipment. The company's FPD coater/developers and etcher/ashers realize superior cost performance, thereby meeting the demands for large-scale FPD mass production lines. TEL maintains the leading market share positions for both FPD coater/developers and plasma etcher/ashers.
Oerlikon (Unaxis)	Switzerland	www.oerlikon.com	Oerlikon is a globally leading company in the field of thin film, vacuum and precision technology. Based on these core competencies, Oerlikon develops production systems, components, and services for high-technology products. The company's commercial activities center on protective coatings for precision tools and components, production equipment and coating processes for solar modules, as well as production systems for data storage devices (Oerlikon Balzers Coating), systems for producing vacuums and conveying process gases (Oerlikon Leybold Vacuum), optical components, aerospace technology and outsourcing (Oerlikon Components). Oerlikon also applies its core competencies as a major provider of semiconductor technology (Oerlikon ESEC Semiconductor).
IPS	Korea	www.ips-tech.com	IPS-Manufacture, retrofit and sales of equipment for manufacturing semiconductors, LCDs or solar cells. Import and sales of parts required to manufacture semiconductors, LCDs or solar cells. Post management and service provision consequent on sales of semiconductors, LCDs or solar cells and research and development services related to the equipment mentioned above.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Etch			
Company	Location - Country	Website Address	Boilerplate from Company Website
AMEC	China		Designs, manufactures, markets and services semiconductor processing equipment used in the fabrication of ICs. Advanced Micro-Fabrication Equipment Inc. (AMEC) is an emerging Asia-based semiconductor equipment company with a portfolio of wafer fabrication solutions designed to advance technology, increase productivity and reduce manufacturing costs for leading global semiconductor manufacturers. AMEC's solutions combine innovative technology solutions with economic innovations for the 65/45-nm nodes and beyond. AMEC's global infrastructure will include R&D, manufacturing, business and support operations in China, Japan, Korea, Singapore, Taiwan, and the U.S.
Hitachi High Technologies	Japan	www.hitachi-hitec.com	Our specialization, nanotechnology, is slated to be the leading technology of the 21st century, and promises to become the focus of ever increasing interest. In pursuit of our goal of becoming the global leading company in the field of nanotechnology, we are developing our business across a variety of segments, including Electronic Device Systems, Life Science, Information Systems & Electronic Components, and Advanced Industrial Products. We are working to achieve our goal by providing customers with added value based on the most advanced technologies in these fields.
Ulvac	Japan	www.ulvac.co.jp/eng	Development, manufacture, sales, customer support and machinery importing/exporting activities related to vacuum equipment, peripheral devices and vacuum components for the display, semiconductor, electronics, electrics, metals, machinery, automotive, chemical, food and pharmaceutical industries, and for universities and research centers. Research guidance and technical consulting on all aspects of vacuum technology.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Etch		
Company	Location - Country	Website Address
FOI Corporation	Japan	www.foi.co.jp/English
<p>Boilerplate from Company Website FOI Corporation excels in application of oplasma technology. We are aggressive in the development, manufacturing, and sales/service of etching equipment for oxide film for 300mm/200mm silicon wafers, and ashing equipment for 200mm/300mm silicon wafers, and other related equipments.</p>		
Shibaura Mechatronics	Japan	www.shibaura.co.jp/e
<p>As The Provider of Infrastructure for The Digital Age, Shibaura Mechatronics contributes to society by providing manufacturing equipment for electronic components, such as FPDs, semiconductors and optical discs.</p>		
Tokyo Ohka Kogyo	Japan	www.tok.co.jp
<p>Our current businesses are comprised of a materials business with electronic industry materials (such as photoresist, chemical products and specialty chemicals, as our core products), as well as printing materials, and an equipment business (with semiconductor manufacturing equipment and LCD-panel manufacturing equipment as our core products). We have placed special emphasis on the cutting-edge electronics field, relative to semiconductor, flat panel display and package mounting materials, as a crucial direction that will see advancements by leaps and bounds in the 21st century. Therefore, we shall be committing our corporate resources to business developments like these in global markets.</p>		
Samco	Japan	www.samcointl.com
<p>SAMCO, Inc. is a process equipment company that develops and manufactures a wide variety of unique deposition, etching, and surface treatment systems for a worldwide network of major industrial customers and academic facilities. We provide process expertise and turnkey systems to major manufacturers in the compound semiconductor, optoelectronics, MEMS and other industries</p>		

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - Etch</u>		
Company	Location - Country	Website Address
Panasonic Factory Solutions	Japan	panasonic.co.jp/pfsc
		Boilerplate from Company Website Panasonic Factory Solutions Co., Ltd. is dedicated to innovating the manufacturing process around the core of circuit manufacturing technologies and contributing to the growth and prosperity of our customers' business. We aim to further advance the circuit manufacturing technologies we have built up to date, to come up with groundbreaking processes and to put together production systems that will coexist with the
		Asahi provides support for technology leaders in modern society and high-tech industries. We enable our clients' technical innovations through diverse solutions. Through distribution of cutting-edge technologies and OEM manufacturing, ATC's technical expertise extends into fields such as: Development and OEM production of Super vacuum equipment for the semiconductor industry, scientific analyzers, and development of F.A. LA systems and micro-computer applied products.
Asahi Technion Co., Ltd	Japan	www.asahi-technion.co.jp/english/

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - CVD		
Company	Location - Country	Website Address
TEL	Japan	www.tel.com/eng
		<p>TEL's largest product line, semiconductor equipment, includes coater/developers, dry etchers, thermal processing systems, single wafer deposition systems, surface preparation systems, test systems, and metrology software. TEL also offers a leading edge line-up of Flat Panel Display (FPD) production equipment. The company's FPD coater/developers and etcher/ashers realize superior cost performance, thereby meeting the demands for large-scale FPD mass production lines. TEL maintains the leading market share positions for both FPD coater/developers and plasma etcher/ashers.</p>
Oerlikon (Unaxis)	Switzerland	www.oerlikon.com
		<p>Oerlikon is a globally leading company in the field of thin film, vacuum and precision technology. Based on these core competencies, Oerlikon develops production systems, components, and services for high-technology products. The company's commercial activities center on protective coatings for precision tools and components, production equipment and coating processes for solar modules, as well as production systems for data storage devices (Oerlikon Baizers Coating), systems for producing vacuums and conveying process gases (Oerlikon Leybold Vacuum), optical components, aerospace technology and outsourcing (Oerlikon Components). Oerlikon also applies its core competencies as a major provider of semiconductor technology (Oerlikon ESEC Semiconductor).</p>
IPS	Korea	www.ips-tech.com
		<p>IPS-Manufacture, retrofit and sales of equipment for manufacturing semiconductors, LCDs or solar cells. Import and sales of parts required to manufacture semiconductors, LCDs or solar cells. Post management and service provision consequent on sales of semiconductors, LCDs or solar cells and research and development services related to the equipment mentioned above.</p>

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - CVD		
Company	Location - Country	Website Address
AMEC	China	<p>Boilerplate from Company Website</p> <p>Designs, manufactures, markets and services semiconductor processing equipment used in the fabrication of ICs. Advanced Micro-Fabrication Equipment Inc. (AMEC) is an emerging Asia-based semiconductor equipment company with a portfolio of water fabrication solutions designed to advance technology, increase productivity and reduce manufacturing costs for leading global semiconductor manufacturers. AMEC's solutions combine innovative technology solutions with economic innovations for the 65/45-nm nodes and beyond. AMEC's global infrastructure will include R&D, manufacturing, business and support operations in China, Japan, Korea, Singapore, Taiwan, and the U.S.</p>
Hitachi Kokusai	Japan	<p>The operations of Kokusai Denki Logistics Co., Ltd. were divided into two parts. The transport operations concerning semiconductor manufacturing systems were integrated into Kokusai Electric Semiconductor Service Co., Ltd. Meanwhile, operations concerning communications and information systems and other enterprises were integrated into Kokusai Denki Techno Service Inc.</p> <p>www.h-kokusai.com</p>
Aixtron	Germany	<p>AIXTRON AG is a leading provider of deposition equipment to the semiconductor industry. The Company's technology solutions are used by a diverse range of customers worldwide to build advanced components for electronic and opto-electronic applications based on compound, silicon, or organic semiconductor materials. Such components are used in fiber optic communication systems, wireless and mobile telephony applications, optical and electronic storage devices, computing, signaling and lighting, as well as a range of other leading-edge technologies.</p> <p>www.aixtron.com</p>

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - CVD		
Company	Location - Country	Website Address
Jusung	Korea	www.jusung.com
		Boilerplate from Company Website As a professional front-end semiconductor equipment manufacturing company, JUSUNG developed EUREKA, a Low Pressure Chemical Vapor Deposition (LP CVD) procedure. JUSUNG has earned high recognition for its technologies and product quality from the world's premier semiconductor makers. Full-scale exports began in 1997 and JUSUNG now supplies products for the mass production lines of domestic and foreign semiconductor makers. JUSUNG has also developed and started marketing ALD, LP CVD, MO CVD, PE CVD, UHV CVD and ETCH system, which are used during the front-end semiconductor manufacturing process. JUSUNG's products are responsible for up to 20% of the semiconductor's front-end manufacturing processes.
Koyo Thermo Systems	Japan	www.koyo-thermos.com/global
		Koyo Thermo Systems wants to contribute to the development of many fields--steel, machinery, automobiles, aircraft, electronics, new materials and the telecommunications industry--through the application of highly controlled heat technology. Heat technology, the main field of Koyo Thermo Systems, is essential for the production of the semiconductors and display devices that make our telecommunications-based society possible.
Samco	Japan	www.samcointl.com
		SAMCO, Inc. is a process equipment company that develops and manufactures a wide variety of unique deposition, etching, and surface treatment systems for a worldwide network of major industrial customers and academic facilities. We provide process expertise and turnkey systems to major manufacturers in the compound semiconductor, optoelectronics, MEMS and other industries

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - E-beam for mask making		
Company	Location - Country	Website Address
Micronic	Sweden	www.micronic.se/site_eng
<p>Boilerplate from Company Website Micronic manufactures systems that are used in the production of advanced photomasks for flat panel displays (the LRS product series), semiconductor applications (the Sigma and Omega product series), and electronic packaging (the MP and FPS product series). The product offering also includes metrology systems for display photomasks (the MMS product series). Micronic has secured its forefront position by offering products that combine high resolution, or the ability to write the smallest photomask features, and high throughput thanks to short write times</p>		
Advantest	Japan	www.advantest.co.jp
<p>As the miniaturization of IC devices continues, electron beam exposure technology is gaining prominence as a useful technology for next-generation design rules. Advantest is offering the F3000 EB lithography system that uses E-Beam direct-write technology not only as a design tool for research and development, but also as a tool suitable for system LSIs production lines where mostly small-lot-multiple-type products are produced. To help reduce your development costs and shorten development periods, please give serious consideration to Advantest's E-Beam Solution.</p>		
Leica	Germany	www.leica-microsystems.com
<p>Leica Microsystems is a leading global designer and producer of innovative high-tech precision optics systems for the analysis of microstructures. It is one of the market leaders in each of the fields Microscopy, Confocal Laser Scanning Microscopy, Imaging Systems, Specimen Preparation and Medical Equipment. The company manufactures a broad range of products for numerous applications requiring microscopic imaging, measurement and analysis. It also offers system solutions in the areas of Life Science including biotechnology and medicine, as well as the science of raw materials and industrial quality assurance.</p>		

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - E-beam for mask making		
Company	Location - Country	Website Address
Vistec	Germany	www.vistec-semi.com
<p>Vistec provides two kinds of mask CD measurement systems to the industry, an optical based tool and a CD SEM. The optical measurement system Vistec LWM500 WI provides transmitted light measurement capability at DUV wavelength (248nm), using water immersion for further resolution enhancement. The system is suitable to meet the requirements of reticles for the 65nm technology node.</p> <p>The Vistec LWM270 DUV is the solution for reticle CD measurements for the 90nm node in transmitted light as the reticles are used in wafer scanners. The Vistec LWM9000 SEM is the market leader world wide for CD measurement systems for the latest 65nm node masks and reticles. It is electron microscope (SEM) based in order to achieve sufficient resolution to even measure on the smallest OPC features. The LWM9000 SEM can achieve a sub-1nm dynamic measurement repeatability.</p>		
Hitachi High Technologies	Japan	www.hitachi-hitec.com
<p>Our specialization, nanotechnology, is slated to be the leading technology of the 21st century, and promises to become the focus of ever increasing interest. In pursuit of our goal of becoming the global leading company in the field of nanotechnology, we are developing our business across a variety of segments, including Electronic Device Systems, Life Science, Information Systems & Electronic Components, and Advanced Industrial Products. We are working to achieve our goal by providing customers with added value based on the most advanced technologies in these fields.</p>		
JEOL	Japan	www.jeol.com
<p>JEOL is a leading global supplier of scientific instruments used for research and development in the fields of nanotechnology, life sciences, optical communication, forensics, and biotechnology. Utilizing its unique technologies, products, services, and knowledge, JEOL helps its customers make significant breakthroughs in product development and scientific research. JEOL products include scientific instrumentation and industrial equipment, based on five major product groups.</p>		

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - Surface finishing/wafer thinning (backside)</u>		
Company	Location - Country	Boilerplate from Company Website
SEZ	Switzerland	SEZ's products are used for the wet chemical surface preparation of wafers (silicon or gallium arsenide) within the scope of microchip production. SEZ develops and markets Spin-Process equipment as well as a complete portfolio of wafer surface preparation applications. SEZ works with its customers to develop the optimal processes individually tailored to their specific production requirements.
Trio Tech		
DNS Korea	Korea	We are now developing and producing equipment that advances the digitalization of printing processes in the printing field and world-leading high-tech industrial equipment such as manufacturing equipment for semiconductors, FPDs (flat panel displays), and printed circuit boards in the electronics field. It is our desire to contribute to the development of society with a view to the coming era of ubiquitous connectivity.
<u>Equipment Segment - Laser mask repair</u>		
Company	Location - Country	Boilerplate from Company Website
Carl Zeiss	Germany	Carl Zeiss SMT AG provides a broad range of products and solutions that support the global chip industry. Key products are lithography optics for wafer steppers/scanners from ASML. Our product range additionally comprises optical components and subsystems for lithography lasers from Cymer as well as Synchrotron Optics. Furthermore, SMT offers unique mask review and e-beam based mask repair systems.
Sil Nano Technology Inc.	Japan	As a specialist in precision measurement technology that originated in watch making, we have focused on the potential of nanotechnology since its infancy. By refining our unique high-precision technologies that were nurtured through the development of watches, we have created many analysis and measurement instruments that were the world's first when they appeared. Our craftsmanship DNA allows us to keep pace with the flow of the constantly changing times.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

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SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - Laser mask repair</u>		
Company	Location - Country	Website Address
Leica	Germany	www.leica-microsystems.com
<p>Boilerplate from Company Website Leica Microsystems is a leading global designer and producer of innovative high-tech precision optics systems for the analysis of microstructures. It is one of the market leaders in each of the fields Microscopy, Confocal Laser Scanning Microscopy, Imaging Systems, Specimen Preparation and Medical Equipment. The company manufactures a broad range of products for numerous applications requiring microscopic imaging, measurement and analysis. It also offers system solutions in the areas of Life Science including biotechnology and medicine, as well as the science of raw materials and industrial quality assurance.</p>		
Vistec	Germany	www.vistec-semi.com
<p>Vistec provides two kinds of mask CD measurement systems to the industry, an optical based tool and a CD SEM. The optical measurement system Vistec LWM500 WI provides transmitted light measurement capability at DUV wavelength (248nm), using water immersion for further resolution enhancement. The system is suitable to meet the requirements of reticles for the 65nm technology node. The Vistec LWM270 DUV is the solution for reticle CD measurements for the 90nm node in transmitted light as the reticles are used in wafer scanners. The Vistec LWM9000 SEM is the market leader world wide for CD measurement systems for the latest 65nm node masks and reticles. It is electron microscope (SEM) based in order to achieve sufficient resolution to even measure on the smallest OPC features. The LWM9000 SEM can achieve a sub-1nm dynamic measurement repeatability.</p>		

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - Mask substrates (not equipment)</u>		
Company	Location - Country	Website Address
Toshiba		Boilerplate from Company Website www.photomask.com
Dai Nippon	Korea	www.screen.co.jp We are now developing and producing equipment that advances the digitalization of printing processes in the printing field and world-leading high-tech industrial equipment such as manufacturing equipment for semiconductors, FPDs (flat panel displays), and printed circuit boards in the electronics field. It is our desire to contribute to the development of society with a view to the coming era of ubiquitous connectivity.
Hoya	Japan	www.hoya.co.jp/english The information technology field is Hoya's core business. Products in this category include mask blanks and photomasks, which are essential to the fabrication of semiconductor devices; optical glass for use in devices such as liquid crystal displays and digital cameras; and glass disks for hard disk drives.
Taiwan Mask Company	Taiwan	www.corporateinformation.com Taiwan Mask Corporation. The Company's principal activities are the design, development, manufacture and distribution of mask and optical lens for the semiconductor industry. Other activities are the provision of technical support, consultation, testing and repair services.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - PVD</u>		
Company	Location - Country	Website Address
Oerlikon (Unaxis)	Switzerland	www.oerlikon.com
		Boilerplate from Company Website
<p>Oerlikon is a globally leading company in the field of thin film, vacuum and precision technology. Based on these core competencies, Oerlikon develops production systems, components, and services for high-technology products. The company's commercial activities center on protective coatings for precision tools and components, production equipment and coating processes for solar modules, as well as production systems for data storage devices (Oerlikon Balzers Coating), Leybold Vacuum, optical components, aerospace technology and outsourcing (Oerlikon Components). Oerlikon also applies its core competencies as a major provider of semiconductor technology (Oerlikon ESEC Semiconductor).</p>		

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - Lithography</u>		
Company	Location - Country	Website Address
ASML	The Netherlands	www.asml.com
		Boilerplate from Company Website ASML researches, develops, designs, manufactures, markets and services lithography systems used by the semiconductor industry to fabricate state-of-the-art chips. Most of the major global semiconductor manufacturers are ASML customers. For chipmakers, technological advancement in imaging means increased manufacturing productivity and improved profitability.
Nikon	Japan	www.nikon.com
		Nikon is involved in a broad spectrum of businesses centering on the core business segments of precision equipment, imaging products and instruments. We focus our energies on developing proposal-based products that build on Nikon's unique strengths and capitalize on our proprietary technologies. These technologies, maximized through Nikon's singular vision, have already resulted in a long list of innovations ranging from IC scanners that utilize immersion lithography technology to LCD steppers and scanners which feature our
Canon	Japan	www.canon.com
		Canon is pursuing development near-field mask lithography technology, with the aim of applying it to next-generation exposure equipment for processing to resolutions of several dozen nanometers without the need for large-scale equipment. Canon also foresees that the development of near-field optical technologies will lead to new applications in optical memory and micro-optical devices.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Resist Track		
Company	Location - Country	Website Address
TEL	Japan	www.tel.com/eng
		Boilerplate from Company Website
		TEL's largest product line, semiconductor equipment, includes coater/developers, dry etchers, thermal processing systems, single wafer deposition systems, surface preparation systems, test systems, and metrology software. TEL also offers a leading edge line-up of Flat Panel Display (FPD) production equipment. The company's FPD coater/developers and etcher/ashers realize superior cost performance, thereby meeting the demands for large-scale FPD mass production lines. TEL maintains the leading market share positions for both FPD coater/developers and plasma etcher/ashers.
Suss Micro	Germany	www.suss.com
		SUSS MicroTec is a world leading supplier of precision technology providing innovative solutions for markets including Advanced Packaging, MEMS, Nanotechnology, Compound Semiconductor, Silicon On-Insulator, and 3D interconnect. SUSS MicroTec manufactures a complete line of photoresist and dielectric coat/bake/develop systems, microlithography exposure systems, wafer and device bonders, probers, photomasks, cleaners and etchers.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Mask Making		
Company	Location - Country	Website Address
Micronic	Sweden	www.micronic.se/site_eng
		<p>Boilerplate from Company Website</p> <p>Micronic manufactures systems that are used in the production of advanced photomasks for flat panel displays (the LRS product series), semiconductor applications (the Sigma and Omega product series), and electronic packaging (the MP and FPS product series). The product offering also includes metrology systems for display photomasks (the MMS product series). Micronic has secured its forefront position by offering products that combine high resolution, or the ability to write the smallest photomask features, and high throughput thanks to short write times</p>
NuFlare Technology, Inc.	Japan	www.nuflare.co.jp/english
		<p>We have developed as a top semiconductor manufacturing equipment maker with an integrated approach extending from electron beam mask writer development, to production, sales, and servicing. We also supply thin film growth equipment that can support the growing sophistication of semiconductor devices and is based on a new concept that is able to achieve a perfect crystal format.</p>
Leica	Germany	www.leica-microsystems.com
		<p>Leica Microsystems is a leading global designer and producer of innovative high-tech precision optics systems for the analysis of microstructures. It is one of the market leaders in each of the fields Microscopy, Confocal Laser Scanning Microscopy, Imaging Systems, Specimen Preparation and Medical Equipment. The company manufactures a broad range of products for numerous applications requiring microscopic imaging, measurement and analysis. It also offers system solutions in the areas of Life Science including biotechnology and medicine, as well as the science of raw materials and industrial quality assurance.</p>

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Mask Making			
Company	Location - Country	Website Address	Boilerplate from Company Website
Vistec	Germany	www.vistec-semi.com	Vistec provides two kinds of mask CD measurement systems to the industry, an optical based tool and a CD SEM. The optical measurement system Vistec LWM500 Wl provides transmitted light measurement capability at DUV wavelength (248nm), using water immersion for further resolution enhancement. The system is suitable to meet the requirements of reticles for the 65nm technology node. The Vistec LWM270 DUV is the solution for reticle CD measurements for the 90nm node in transmitted light as the reticles are used in wafer scanners. The Vistec LWM9000 SEM is the market leader world wide for CD measurement systems for the latest 65nm node masks and reticles. It is electron microscope (SEM) based in order to achieve sufficient resolution to even measure on the smallest OPC features. The LWM9000 SEM can achieve a sub-1nm dynamic measurement repeatability.
Hitachi High Technologies	Japan	www.hitachi-hitec.com	Our specialization, nanotechnology, is slated to be the leading technology of the 21st century, and promises to become the focus of ever increasing interest. In pursuit of our goal of becoming the global leading company in the field of nanotechnology, we are developing our business across a variety of segments, including Electronic Device Systems, Life Science, Information Systems & Electronic Components, and Advanced Industrial Products. We are working to achieve our goal by providing customers with added value based on the most advanced technologies in these fields.
JEOL	Japan	www.jeol.com	JEOL is a leading global supplier of scientific instruments used for research and development in the fields of nanotechnology, life sciences, optical communication, forensics, and biotechnology. Utilizing its unique technologies, products, services, and knowledge, JEOL helps its customers make significant breakthroughs in product development and scientific research. JEOL products include scientific instrumentation and industrial equipment, based on five major product groups.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - CMP</u>			
Company	Location - Country	Website Address	Boilerplate from Company Website
Ebara	Japan	www.ebara.co.jp	<p>Ebara Corporation is one of the world's principal manufacturers of fluid transfer machinery, with particularly strong positions in pumps, compressors, fans, and chillers. The Company is also a prominent contractor of environmental engineering systems, focusing on the realization of the "sustainable society." Ebara is a leading supplier of precision machinery to the semiconductor device manufacturing industry. Key products in this sector include chemical mechanical polishing systems, dry vacuum pumps, and other equipment, such as wafer plating systems, that assist the industry in meeting the demands of manufacturing the next generation of semiconductor devices. Ebara is actively engaged in developing and commercializing new energy technologies, including wind power generators, fuel cell cogeneration systems, and photovoltaic power generators.</p>
Accretech	Japan	www.accretech.jp	<p>ACCRETECH-TOKYO SEIMITSU's next-generation semiconductor manufacturing equipment supports the device production. We go through even the fields of CMP equipment and wafer inspection equipment, as well as the conventional fields of wafer manufacturing, test area and assembly, helping you to build the optimum manufacturing system. Production and measurement: two inextricably linked elements. Accurate measurement is a prerequisite for creation. The field of measuring is expanding rapidly in terms of precision, accuracy, speed and stability. Beginning with industrial, optical parts and production line measuring instruments, ACCRETECH-TOKYO SEIMITSU provides a wide range of equipment to meet the needs of the modern world.</p>

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Process Control			
Company	Location - Country	Website Address	Boilerplate from Company Website
Leica	Germany	www.leica-microsystems.com	Leica Microsystems is a leading global designer and producer of innovative high-tech precision optics systems for the analysis of microstructures. It is one of the market leaders in each of the fields Microscopy, Confocal Laser Scanning Microscopy, Imaging Systems, Specimen Preparation and Medical Equipment. The company manufactures a broad range of products for numerous applications requiring microscopic imaging, measurement and analysis. It also offers system solutions in the areas of Life Science including biotechnology and medicine, as well as the science of raw materials and industrial quality assurance.
Hitachi Kokusai	Japan	www.h-kokusai.com	The operations of Kokusai Denki Logistics Co., Ltd. were divided into two parts. The transport operations concerning semiconductor manufacturing systems were integrated into Kokusai Electric Semiconductor Service Co., Ltd. Meanwhile, operations concerning communications and information systems and other enterprises were integrated into Kokusai Denki Techno Service Inc.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Die Bonders

Company	Location - Country	Website Address	Boilerplate from Company Website
BE Semiconductor/Datagon	The Netherlands	www.besi.nl	BE Semiconductor Industries N.V. is a leading manufacturer of semiconductor die sorting, flip chip and multi-chip die bonding, packaging and plating equipment for both array connect and leadframe assembly applications. Our technologically advanced equipment and integrated systems are used principally to produce semiconductor assemblies or "packages", which provide the electronic interface and physical connection between the chip and other electronic components and protect the chip from the external environment.
ASM Pacific	Hong Kong	www.asmpacific.com	ASM Pacific Technology Ltd. was founded in 1975. We are the world's largest assembly and packaging equipment supplier for the semiconductor industry. We manufacture semiconductor assembly equipment and materials (etched and stamped leadframes) used by multinational chip manufacturers; independent IC assembly houses and consumer electronics manufacturers.
Renesas Easter Japan Semiconductor	Japan	www.tosemi.renesas.com	Semiconductor development, design, manufacture, and sale, as well as the manufacture and sale of semiconductor manufacturing equipment. Development, manufacture, and sale of applied electronics for purposes such as image recognition, and environment analysis.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Oerlikon (Unaxis)	Switzerland	www.oerlikon.com	<p>Oerlikon is a globally leading company in the field of thin film, vacuum and precision technology. Based on these core competencies, Oerlikon develops production systems, components, and services for high-technology products. The company's commercial activities center on protective coatings for precision tools and components, production equipment and coating processes for solar modules, as well as production systems for data storage devices (Oerlikon Balzers Coating), systems for producing vacuums and conveying process gases (Oerlikon Leybold Vacuum), optical components, aerospace technology and outsourcing (Oerlikon Components). Oerlikon also applies its core competencies as a major provider of semiconductor technology (Oerlikon ESEC Semiconductor).</p>
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SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Die Bonders		
Company	Location - Country	Website Address
NEC Machinery name changed to Canon Machinery	Japan	www.canon-machinery.co.jp
<p>Boilerplate from Company Website</p> <p>Since the foundation of our company in 1972, we have been making every possible effort to improve our technologies and thus create sophisticated production systems with the management philosophy, "Originality, Sincerity & Challenge." The philosophy reflects our willingness to create optimum solutions satisfying the customer needs based on the customer's viewpoints as well as our enthusiasm to tackle with any challenging assignments without hesitation.</p>		
Alphasem	Switzerland	www.alphasem.com
<p>Alphasem is a worldwide active company working in the semiconductor backend equipment market and Microsystem technology. Alphasem is heavily investing in research and product development to achieve technology leadership and has therefore gained a lot of experience in the most challenging technologies such as air bearings, volumetric dispense systems, epoxy writing, etc</p>		
Shinkawa	Japan	shinkawa.com/english
<p>Shinkawa has specialized in the production of semiconductor manufacturing equipment, specifically bonding equipment commonly called a bonder, as its core product for the semiconductor industry for nearly fifty years.</p>		
Shibaura Mechatronics	Japan	www.shibaura.co.jp/e
<p>As The Provider of Infrastructure for The Digital Age, Shibaura Mechatronics contributes to society by providing manufacturing equipment for electronic components, such as FPDs, semiconductors and optical discs.</p>		
Towa	Japan	www.towajapan.co.jp
<p>As the industry leader in the field of semiconductor packaging technology, TOWA has developed numerous technology de facto standards. At the same time, we have continued our research and development efforts in order to meet customer requirements for new technologies.</p>		

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - Semiconductor Test Equipment</u>		
Company	Location - Country	Website Address
Advantest	Japan	www.advantest.com
<p>Boilerplate from Company Website</p> <p>Advantest has established an impressive track record of helping customers turn technological innovations into practical, market-ready products by providing user-focused test and measurement solutions. Manufacturing and sale of electronic measuring instruments, automatic test equipment, and electron beam lithography systems</p>		
Vengy	Germany & Singapore	www.vengy.com
<p>Boilerplate from Company Website</p> <p>Vengy designs, develops, manufactures and sells advanced test systems and solutions for the semiconductor industry. Building upon 65+ years of testing technology innovation, Vengy's advanced solutions help semiconductor designers and manufacturers lower their costs of test and improve their competitiveness.</p>		

<u>Equipment Segment - Board Test Products</u>		
Company	Location - Country	Website Address
EADS (Airbus)	France	www.eads.com
<p>Boilerplate from Company Website</p> <p>In the short time since its formation EADS has established itself as a leading player in the global aerospace and defence market underpinning the capability and expertise of EADS' 17,000 UK employees. The success stories of Airbus, Ariane and Eurocopter show what EADS can achieve. Our products have earned us international acclaim. We are also shaping the future, by researching, developing and implementing projects that push current technological boundaries.</p>		
Diagnosys	France	www.diagnosys.com
<p>Boilerplate from Company Website</p> <p>DiagnoSYS is an established Global Company with the sole aim of providing Electronic Test Solutions and Services Worldwide. We offer Test Solutions to our Customers through offices in the UK, USA, India, France, Germany & Sweden and another 39 countries around the globe through a comprehensive distributor network.</p>		

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - Board Test Products</u>		
Company	Location - Country	Website Address
Seica	Italy	www.seicatesolutions.com
		Boilerplate from Company Website Seica's innovative test solutions are being used across the globe to improve quality, increase productivity and save money in automobile, military and consumer markets.
Marconi	UK	www.marconi.com
		Boilerplate from Company Website Marconi is a multi-regional designer, manufacturer and supplier of telecommunications and information technology equipment and services. Our network technology and services enable our customers to evolve narrowband networks to next-generation broadband networks. Our customer base includes public network operators, internet service providers, large corporations, government departments and agencies, utilities and educational institutions. Our core activities can be divided into two main business types, Network Equipment and Network Services.

From: <mhershey@semi.org>
To: <publiccomments@bis.doc.gov>
Date: Tue, Dec 5, 2006 2:54 PM
Subject: RIN 0694-AD75: Revision to Public Comments from SEMI on China Proposal

This email contained an attached file "SEMI Attachment Two Revised.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?39BB0BC10FEFD8DE6EEAF15F26DF3BB34575CE720007CE04>
Per BIS policy, the file(s) attached to this message have been held in quarantine. If you are certain the file is a legitimate business document, forward this message to the BIS Help Desk (ITHELP) and ask to have the attachment(s) released.

All unclaimed attachments are deleted automatically after fourteen (14) calendar days.

This email contained an attached file "SEMI Comments Final.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?5410E6A86B0B05930EF6F838F90898FE4575CE730004AD57>
Per BIS policy, the file(s) attached to this message have been held in quarantine. If you are certain the file is a legitimate business document, forward this message to the BIS Help Desk (ITHELP) and ask to have the attachment(s) released.

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This email contained an attached file "SEMI Attachment One.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?C2CF0E9770914310C28AC2CD435D56A54575CE73000C7475>
Per BIS policy, the file(s) attached to this message have been held in quarantine. If you are certain the file is a legitimate business document, forward this message to the BIS Help Desk (ITHELP) and ask to have the attachment(s) released.

All unclaimed attachments are deleted automatically after fourteen (14) calendar days.

Dear Ms. Quarterman,

Attached is a slight revision to the submission filed yesterday by Semiconductor Equipment and Materials International (SEMI). We apologize for the change, but some of the foreign availability information had not been included in Attachment Two. We would like to make sure that the full range of information is available to officials as they consider policy changes.

The corrected version of Attachment Two is attached. Please disregard the original version of Attachment Two and use this version instead. The correct versions of our comment letter and Attachment One are in the following email.

Thank you for your assistance with this revision. Please let me know if you have any questions.

Best regards,

Maggie Hershey

(See attached file: SEMI Attachment Two Revised.pdf)

Maggie Hershey
Director, Public Policy
Semiconductor Equipment and Materials International (SEMI)
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----- Forwarded by Maggie Hershey/SEMI/US on 12/05/2006 02:39 PM -----

Maggie Hershey

To: publiccomments@bis.doc.gov

12/04/2006 12:03 PM cc:

Subject: RIN 0694-AD75: Public Comments from SEMI on China

Proposal

Dear Ms. Quarterman,

Please find attached the comments of Semiconductor Equipment and Materials International (SEMI) in response to the proposed rule on China export licensing that appeared in the Federal Register on July 6, 2006. I have included our comment letter as well as two attachments. Please let me know if you have any trouble accessing these documents.

Thank you and best regards,

Maggie Hershey

(See attached file: SEMI Comments Final.pdf)

(See attached file: SEMI Attachment One.pdf)

[SEMI Attachment Two -- original version deleted]

Maggie Hershey
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December 4, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th St. and Pennsylvania Ave., NW, Room 2705
Washington, DC 20230

Attn: Sheila Quarterman; RIN 0694-AD75

RE: Proposed Rule -- Revisions and Clarifications of Export and Reexport Controls for the People's Republic of China; New Authorization Validated End-User (71 Fed. Reg. 38,313 (July 6, 2006))

Semiconductor Equipment and Materials International ("SEMI") is pleased to submit to the Commerce Department's Bureau of Industry and Security ("BIS") the following comments on the proposed amendments to the Export Administration Regulations ("EAR") identified above.

Introduction and Overview

SEMI is the industry association of companies that provide equipment, materials and services used to manufacture semiconductors, displays, nano-scaled structures, micro-electromechanical systems and related technologies. SEMI represents large and small companies that contribute enormously to the advance of microelectronics technologies and that are central to communities of highly-skilled and educated engineers and technologists in many regions of the United States. United States semiconductor equipment and materials companies are world leaders in many technologies, but they face increasing competition from producers in other countries.

SEMI's comments on the proposed regulatory amendments are informed by facts about SEMI companies, the products that they produce, the market in which they operate, the relevance of export controls to their operations, and the relevance of sales of their products in China to U.S. national security interests. SEMI supports effective export controls as needed to preserve U.S. security interests and wishes to work with BIS to ensure that a final regulation serves those interests while avoiding any unnecessary cost to U.S. industry.

The products made by SEMI companies are overwhelmingly designed and used to manufacture wholly commercial and civilian electronic devices that are mass produced and mass marketed. While SEMI companies operate in a commercial, civilian environment, they contribute greatly to U.S. leadership among many technologies.

The Chinese market for semiconductor manufacturing equipment ("SME") is pivotal to the health of U.S. SME companies and, by extension, U.S. leadership in SME technologies. A recent survey by SEMI experts revealed that Chinese acquisitions of SME in 2006 through 2008 are expected to exceed \$9.8 billion – more than total Chinese SME purchases during the last five years (2001 through 2005).

With China representing by far the fastest growing SME market, U.S. firms cannot remain top SME companies if they do not participate broadly in the Chinese market. While other more established markets may be larger in size, the China market enjoys the fastest growth rates and provides the industry with the most opportunities to establish new business. The estimated growth rate for this year is quite high with the China market projected to increase by 78 percent from \$1.33 billion in 2005 to \$2.37 billion in 2006. After a slight dip in 2007, growth is forecast at 17.84 percent in 2008 and 12.22 percent in 2009 while rates in other regions are expected to be generally more modest. By 2009, the size of the China market is expected to reach three-fourths the size of the Europe market. Attachment One contains the SEMI Mid-Year 2006 Consensus Forecast Market Information by Region.

While the China market provides many opportunities, U.S. suppliers' share of SME sales to China – like their share of total international SME sales – has been falling. The U.S. portion of the Chinese SME market dropped from 50 percent in 2003 to 44.3 percent in 2005. In these circumstances, it is particularly important that export controls not be configured or administered in a way that unnecessarily impedes U.S. SME sales to China.

Another SEMI survey – this one of U.S. SEMI members – establishes that export controls can bear heavily on SME producers' ability to compete in China.¹ Forty-two percent of respondents reported that export controls have contributed to lost sales in China. A few survey respondents' estimated lost sales totaled several millions of dollars each. While the numbers of BIS license denials have been limited, U.S. producers have sometimes found that the delays and other complications involved in seeking a license have led them not to pursue sales opportunities in China.

SME sales to China should be readily amenable to export control streamlining. SME systems are, by and large, high-value and highly visible. Diversion risk is minimal, and sales to China are dominated by a relatively few, large commercial semiconductor manufacturing facilities. Sixty percent of the respondents to the SEMI-member survey indicated that their business in China – critical though it is – is limited to 10 or fewer customers. Working with the industry, the U.S. government should be able to fashion export control policies that permit the overwhelming bulk of SME sales to China without licenses and without creating significant national security risks.

¹ SEMI conducted a survey of U.S. member companies in April-May 2006 regarding the impact of export controls on the industry. The survey was sent to those companies participating in the association's export control activities. We received a high response rate of 43 percent with 12 companies responding out of a pool of 28 survey recipients. Half of the respondents were equipment suppliers and the other half were divided among subassembly and component suppliers and materials companies. Most respondents had over \$500 million in annual revenues and five had over \$1 billion in revenue.

Validated End-User Provision

SEMI applauds the creative thinking that underlies the validated end-user ("VEU") proposal. It is important that the U.S. government find a way to ensure that U.S. companies can, without the need for individual export licenses, supply their full range of commercial SME tools to reliable commercial fabrication facilities in China. We believe that the VEU initiative could provide the basis to do so.

In particular, the VEU proposal could substantially reduce the cost of repetitive licensing. A top concern among respondents to the survey of U.S. SEMI members was the requirement that they obtain successive licenses to ship the same types of equipment to the same Chinese customers. Sixty-four percent of the respondents reported that these follow-on licenses have represented 75-to-100 percent of their licensing volume. Apart from the needless expense to government and industry of obtaining successive licenses for similar products to the same group of customers, the licenses commonly include varying types of conditions for no discernable reason. This complicates company compliance and makes it more expensive. Substantially reducing repetitive licensing and standardizing license conditions for major Chinese customers would go far toward eliminating the unnecessary costs of controls on SME sales to China, and the VEU proposal shows promise for achieving this reform.

In addition, the VEU proposal could lead to a more level competitive environment among SME suppliers in the United States and abroad. While most applications for SME licenses are approved, SEMI members continue to have serious concerns about differences between U.S. licensing practices and those of other Wassenaar Arrangement participants. One particular concern is application-processing times. One-half of respondents to the SEMI member survey reported that their average processing periods range from two-to-four months. One-quarter of the respondents indicated that their average processing times were four-to-six months. We understand that application-processing times among other countries are substantially shorter and tend to be measured in weeks or even days. A VEU approach could go far toward addressing this issue for exports to major Chinese customers.

SEMI offers the following suggestions to help enable the VEU proposal to reach its potential to improve U.S. export control policies vis-à-vis China:

Apply a Wide Scope of License-Free Treatment

First, BIS should ensure that the scope of license-free treatment under the VEU provision is sufficiently broad to make the program useful. BIS should clarify that VEU license-free treatment will ordinarily be accorded all items under Export Control Classification Numbers ("ECCNs") 3B001 and 3B002. Limiting end-user validations to selected categories of products in 3B001 or 3B002 is unnecessary and would severely undermine the utility of the VEU program. If BIS has confirmed that a semiconductor fabricator in China does not present a significant risk of diversion or other security concerns, BIS should permit license-free shipments of all 3B001 and 3B002 tools to that fabricator.

Restrictions on product eligibility under a validation would run counter to the fundamental purpose of the VEU initiative as we understand it. For U.S. SME companies to maintain their

leadership – and for the United States to maintain SME technology leadership – the U.S. companies need a license-free path to supply top-of-the-line civil, commercial SME tools to reliable civil, commercial Chinese fabricators. Supplying second-tier systems to the fastest growing market is incompatible with retention of U.S. leadership.

We urge the government to avoid incremental changes to VEU product scope limitations. Forcing U.S. companies to continually seek scope expansions would be tantamount to current transaction-license practices. United States suppliers would face the same problems of delay, expense and uncertainty.

Furthermore, the term “facility” should be changed to “facilities” in proposed section 748.15(d)(1). The current text could be construed to mean that VEU license-free coverage would extend to only one facility per VEU or that each facility would have to be individually approved. If a Chinese end-user is found to be sufficiently trustworthy to be validated, there should be license-free treatment for exports and reexports to all of its operations (except, perhaps, in unusual circumstances when a particular facility might be expressly omitted).

Avoid Intrusive Auditing Requirements

Second, BIS should clarify that exporters that avail themselves of VEU license-free treatment will not be subject to intrusive auditing policies. Standard BIS auditing policies for exporters should be sufficient, and the scope of VEU audits should be limited to the VEU program itself. A more intrusive policy could lead exporters to conclude that moving from a transaction-licensing practice to reliance on the VEU program is not justified.

Eliminate VEU Certification Requirements

Third, SEMI suggests that BIS eliminate or at least minimize the extent to which VEU candidates are required to provide certifications. Attractive candidates for validation will have understandable objections to making certifications about their behavior, even if they are not provided directly to the U.S. government. They will be concerned, for example, that certifications would make them subject to the jurisdiction of U.S. courts and agencies and otherwise yield legal exposure which they, as foreign entities, would have difficulty understanding, let alone addressing. Consequently, these requirements may result in a universe of applicants for validation that is more limited than it otherwise would have been.

Whether or not certifications are provided, the U.S. government can evaluate whether the candidate Chinese end-user is engaged in military activities or presents a significant risk of diversion. If the end-user is validated and is subsequently found to have become ineligible for validation or it refuses to accommodate U.S. government site visits, its validation can be revoked.

Administer in an Efficient and Expeditious Manner

Fourth, we would like to work with BIS to ensure that the VEU program is administered in a thoughtful and flexible manner. BIS should deploy a sufficient number of trained, experienced staff to process applications for VEU status and to administer the VEU export authorization.

It will be particularly critical for BIS to process applications for validation quickly. In our industry, like many others, the pace of technological and market changes is extremely rapid. If it takes months to implement a validation, the utility of the validation could be greatly undermined. We are encouraged by reports that BIS is seeking to make validation decisions within 30 days of receiving applications. This is the type of timing that could make the VEU program a useful modernization of U.S. export controls.

Continue to Improve Program through Industry-Comment Mechanism

Finally, SEMI urges that BIS continue eliciting industry input on the VEU program after it becomes effective. SEMI recognizes that the proposal is experimental, and adjustments will no doubt be needed to enhance its effectiveness as limitations become apparent through experience. SEMI would be enthusiastic about continuing a vigorous, public discussion about the VEU program in the months and years following its implementation.

Military End-Use Rule

The proposed "military end-use" licensing rule would establish new license requirements for exports, reexports and "transfers" of specified items if the exporter or transferor has "knowledge" that the item is intended for a "military end-use." Military end-use would include use for, among other things, production, design, development, maintenance or operation of an item on the U.S. Munitions List. The rule would also require a license for the knowing "support" of such an export, reexport or "transfer."

SEMI has always supported U.S. export control measures that enhance U.S. national security. However, we believe that this regulation will tend to undermine the U.S. industry's competitiveness without materially affecting whether listed products benefit the Chinese military.

First, the proposal would be, in any meaningful sense, unilateral. There is no current prospect that any other country will apply a policy like the proposed military end-use rule. As such, the proposal would be ineffective and represent little or nothing more than added cost. This is particularly true in the SME industry, where U.S. companies are competing fiercely with suppliers in other countries. In SEMI's view, the BIS should only consider promulgating a new control if it is multilateral.

Second, by encompassing ECCNs 3B991 and 3B992, the proposal would apply broadly to SME systems.² This equipment is intrinsically commercial and civil and is designed and used to produce commercial, civil devices. The covered items are not militarily significant and they are part of the control categories that were generally decontrolled within the Wassenaar Arrangement based on their non-sensitive nature. Also, ECCNs 3B991 and 3B992 are very broad categories that require ten pages of regulations to list approximately 34 types of equipment widely used to produce semiconductors. At minimum, there would seem to be no basis to cover all of this vast, diverse set of products.

² These ECCNs encompass certain "equipment specially designed for the manufacture of semiconductor devices" (3B991.b) and certain "equipment specially designed for the inspection or testing of semiconductor devices" (3B992.b).

Another reason that SME should be omitted from the military end-use proposal is the broad foreign availability of SME products. All major SME systems are supplied by companies in other countries, and we understand those other countries do not view SME exports to China as a security concern. Adding a licensing requirement for these systems will only create confusion and cost. Please see Attachment Two for an overview of foreign availability for the types of products included in ECCNs 3B991 and 3B992.

Some government officials have suggested that foreign availability from Wassenaar partners may not be given as much weight as items available from Chinese sources. We see no basis for this in the underlying statute or regulations on foreign availability, and we see no policy basis for this position. If the item is available to the Chinese buyer, it is available – regardless of the source. Any U.S. government efforts to stop the supply via the military end-use control would therefore be unsuccessful. In these circumstances, the U.S. control would do no good and should not be imposed.

Third, the proposal provides no guidance as to the type of screening that should be applied to address the new license requirement. If anything like the proposal is retained, the regulations should establish a safe-harbor of screening that, if completed, would insulate the exporter from liability.

BIS clarified in guidance published on its internet site in October 2006 that the mere fact that the end-user engages in military activity would not necessarily mean that an export to the end-user is for a military end-use and, hence, covered by the license requirement. We applaud this clarification and urge BIS to include this point in the regulation itself.

Fourth, the proposal should be modified to establish that the license requirement would apply only if the exporter is informed that an export would be for a military end-use. For example, BIS could publish a list of Chinese military programs or restricted foreign purchasers to which the listed items should not be exported. Any catch-all regulation should employ, at most, the "positive knowledge" standard described by U.S. government officials earlier this year rather than the more uncertain standard contemplated by the proposal.

Finally, if the proposal is to be retained it should not extend beyond exports and reexports. The proposed rule would establish license requirements not only for exports and reexports but also for some ill-defined "support" activities and for certain intra-country "transfers." SEMI can find no statutory basis to require a license for non-export activities, including in the now expired Export Administration Act. In any event, there appears to be no policy justification for applying the rule to non-export transactions, and applying the rule to non-export transactions would magnify costs occasioned by the rule. We note that General Prohibition 10 already prohibits U.S. persons from engaging in various activities, such as "transfer," "finance" and "transport", with respect to an item subject to the EAR and exported or to be exported with knowledge that a violation of the Export Administration Regulations has occurred, is about to occur, or is intended to occur in connection with the item.

MOFCOM Certificates

The proposed new Ministry of Commerce ("MOFCOM") certificate requirement would increase exporter costs and could result in delays. SEMI is concerned that the Chinese government is ill-equipped to process the volume of certification requests that would emerge from expanding the scope of the certificate requirement. Reports indicate that Chinese authorities concede that they will be unable to administer the program in a timely manner. Furthermore, exporters seeking a license would be at the mercy of a foreign government agency, which may be inclined to exercise discretion in favor of one competitor over another. Understandings with the Chinese government that it will administer its program of certifications in an effective, reasonable and timely way should be a prerequisite to retaining this requirement.

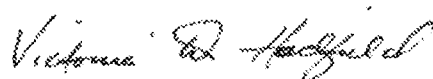
Finally, the rationale for a \$5,000 threshold is unstated and unclear. It would be so low as to cause the certificate requirement to cover the vast bulk of SME exports. SEMI urges that the threshold be reviewed or more narrowly defined so as to focus on items of particular significance to U.S. national security interests, which would be a priority for a potential end-use verification in the future. We understand that the purpose of this proposal is to ensure that the U.S. government is able to conduct end-use checks on an increased number of exported items.

Conclusion

To summarize the SEMI position, we see both potential and areas of concern in this proposal. We support the VEU concept with the reservations and recommendations stated above and seek to work with the government to finalize and implement a workable new policy and process. The military end-use restriction is problematic in that it is unilateral, too broad and too unwieldy from a compliance perspective for all concerned. Most importantly, it does not add significantly to U.S. national security in our sector and could hurt U.S. companies' sales in China and thereby undermine our competitive position there. In the long run, that could hurt U.S. national security by undermining our manufacturing leadership in a critical sector.

Once again, SEMI appreciates the opportunity to address this important matter. Please do not hesitate to contact me if you have questions about our submission.

Sincerely,



Victoria D. Hadfield
President, SEMI North America

SEMI Attachment One: Market Information from July 10, 2006 Press Release

SEMI Announces Mid-Year Consensus Forecast for Chip Equipment Industry

Semiconductor Equipment Companies Expect Sales of \$38.8 Billion in 2006

SAN FRANCISCO, Calif. – July 10, 2006 -- The leading manufacturers of semiconductor equipment expect 2006 to be the second largest year ever for sales of new semiconductor equipment according to the mid-year edition of the SEMI Capital Equipment Consensus Forecast, released here today by SEMI at the annual SEMICON West exposition.

The forecast indicates that, following the anticipated decline of 11.3 percent in 2005, the equipment market will grow 18 percent to \$38.8 billion in 2006. Survey respondents see the market remaining flat in 2007 and resuming double-digit growth over the following year to reach \$44.1 billion in 2008.

"Favorable economic conditions, increased demand for semiconductor devices and stable inventory levels have stimulated capital investment by the world's chip makers in the first half of the year," said SEMI President and CEO Stanley T. Myers. "SEMI members anticipate strong sales of chip manufacturing equipment in 2006. Furthermore, they anticipate less dramatic fluctuations in future cycles consistent with end-market growth and long term diversification trends in consumer electronics."

The SEMI Mid-Year Consensus Forecast indicates that the wafer processing equipment segment will experience the most significant level of growth this year at an estimated 20 percent to \$27.4 billion. Survey respondents anticipate that the market for assembly and packaging equipment will grow 11.6 percent to \$2.4 billion in 2006. The market for equipment to test semiconductors is expected to grow about 14 percent to \$6 billion this year.

The market in China for new equipment leads the growth trend in 2006, with a projected market increase of 78 percent, followed by the Rest-of-World market region (23 percent growth), Taiwan (22 percent growth) and North America (21 percent). Equipment sales in Europe are projected to raise 14 percent, while Korea and Japan will see growth in the high single digits.

The SEMI Mid-Year Consensus Forecast is based on interviews conducted between late May and June 2006 with companies representing a majority of the total sales volume for the global semiconductor equipment industry.

The following survey results are given in terms of market size in billions of U.S. dollars and percentage growth over the prior year:

Forecast by Equipment Segment

	2005 Actual	2006	% Chng	2007	% Chng	2008	% Chng	2009	% Chng
Equipment Type	\$B	\$B		\$B		\$B		\$B	
Wafer Processing	\$22.86	\$27.42	20.0%	\$27.55	0.5%	\$31.08	12.8%	\$31.12	0.1%
Assembly & Packaging	2.13	2.38	11.6%	2.34	-1.7%	2.61	11.7%	2.64	1.3%
Test	5.29	6.02	13.9%	6.51	8.1%	6.94	6.7%	7.33	5.6%
Other	2.61	2.99	14.6%	2.97	-0.6%	3.44	15.7%	3.23	-6.0%
Total Equipment*	\$32.88	\$38.81	18.0%	\$39.36	1.4%	\$44.07	12.0%	\$44.33	0.6%

Forecast by Region

	2005 Actual	2006	% Chng	2007	% Chng	2008	% Chng	2009	% Chng
Market Region	\$B	\$B		\$B		\$B		\$B	
North America	\$5.70	\$6.90	21.07%	\$7.05	2.10%	\$7.89	11.94%	\$7.87	-0.27%
Japan	8.18	8.91	8.92%	9.21	3.41%	9.97	8.23%	9.75	-2.20%
Taiwan	5.72	6.97	21.87%	6.96	-0.14%	7.97	14.46%	7.91	-0.69%
Europe	3.26	3.73	14.47%	3.77	1.06%	4.19	10.98%	4.06	-2.94%

South Korea	5.83	6.40	9.88%	6.60	3.08%	7.55	14.36%	7.64	1.31%
China	1.33	2.37	78.11%	2.34	-1.24%	2.76	17.84%	3.09	12.22%
Rest of World	2.86	3.53	23.27%	3.43	-2.68%	3.76	9.52%	4.00	6.37%
Total Equipment*	\$32.88	\$38.81	18.0%	\$39.36	1.4%	\$44.07	12.0%	\$44.33	0.6%

*Totals and percentages may differ due to rounding of numbers

SEMI is a global industry association serving companies that develop and provide manufacturing technology, materials and services to make semiconductors, flat panel displays (FPDs), micro-electromechanical systems (MEMS) and related microelectronics. SEMI maintains offices in Austin, Beijing, Brussels, Hsinchu, Moscow, San Jose (Calif.), Seoul, Singapore, Tokyo, Shanghai and Washington, D.C. For more information, visit SEMI at www.semi.org.

ASSOCIATION CONTACT:

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SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Epitaxial Growth			
Company	Location - Country	Website Address	Boilerplate from Company Website
ASM International	The Netherlands	www.asm.com	ASM offers a complete portfolio of 300mm tools across our product line, with Front-end technologies that provide solutions for device geometries down to 65 nanometers and below, and in both Front-end-of-Line (FEOL) transistor formation, and Back-end-of-Line (BEOL) interconnect technologies.
NuFlare Technology, Inc.	Japan	www.nuflare.co.jp/english	We have developed as a top semiconductor manufacturing equipment maker with and integrated approached extending from electron beam mask writer development, to production, sales, and servicing. We also supply thin film growth equipment that can support the growing sophistication of semiconductor devices and is based on a new concept that is able to achieve a perfect crystal format.
Hitachi Kokusai	Japan	www.h-kokusai.com	The operations of Kokusai Denki Logistics Co., Ltd. were divided into two parts. The transport operations concerning semiconductor manufacturing systems were integrated into Kokusai Electric Semiconductor Service Co., Ltd. Meanwhile, operations concerning communications and information systems and other enterprises were integrated into Kokusai Denki Techno Service Inc.
LPE	Italy	www.lpe-epi.com	LPE's production strategy concentrates on reactors dedicated to severe applications such as Schottky, Power Transistor, PowerMos, Rectifier, very thick epi layers for IGBT devices grown in a single process; NPN, patterned wafers and others on arsenic doped substrates, CMOS, Buried Layers on Sb doped substrates and Mixed Technology. Our reactors are capable of covering the whole range of products mentioned above, including large wafers.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Sputtering			
Company	Location - Country	Website Address	Boilerplate from Company Website
Canon Anelva	Japan	www.canon-anelva.co.jp/en	Canon ANELVA Corporation manufactures major equipment for the fabrication of semiconductors and LCDs using vacuum technology. ANELVA stands for a <u>A</u> nalysis <u>E</u> lectronics <u>V</u> acuum. The name represents our basic corporate ideal: combining analytical technology and vacuum technology by electronic and developing advanced vacuum and thin-film technologies with an eye toward the future. We provide products achieved by applying vacuum technology, such as manufacturing equipments for storage devices, semiconductors, liquid crystal display (LCD), and plasma display panels (PDP), small-size manufacturing equipmes for laboratory use, and those for medium-scale production.
IPS	Korea	www.ips-tech.com	IPS-Manufacture, retrofit and sales of equipment for manufacturing semiconductors, LCDs or solar cells. Import and sales of parts required to manufacture semiconductors, LCDs or solar cells. Post management and service provision consequent on sales of semiconductors, LCDs or solar cells and research and development services related to the equipment mentioned above.
Oerlikon (Unaxis)	Switzerland	www.oerlikon.com	Oerlikon is a globally leading company in the field of thin film, vacuum and precision technology. Based on these core competencies, Oerlikon develops production systems, components, and services for high-technology products. The company's commercial activities center on protective coatings for precision tools and components, production equipment and coating processes for solar modules, as well as production systems for data storage devices (Oerlikon Balzers Coating), systems for producing vacuums and conveying process gases (Oerlikon Leybold Vacuum), optical components, aerospace technology and outsourcing (Oerlikon Components). Oerlikon also applies its core competencies as a major provider of semiconductor technology (Oerlikon ESEC Semiconductor).

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Ion Implant			
Company	Location - Country	Website Address	Boilerplate from Company Website
Sumitomo Eaton Nova - changed its name to SEN Corporation, an SHI and Axcelis Company effective April 1, 2006.	Japan	www.senova.co.jp/english	As the leading manufacture of ion implantation systems for semiconductor industry in Japan, SEN provides high-current, medium-current, and hi-energy ion implantation systems for the production of the latest semiconductor devices, including those for 300mm wafers. We also provide ion implantation systems most suitable for the production of low-temperature polysilicon TFT-LCDs and organic EL displays, whose high performance is attracting attention for use in the production of high performance flat panel displays.
Nissin Electric	Japan	www.nissin.co.jp	With an original foundation and free use of the state-of-the-art technology, fostered by high voltage technology. Nissin Electric moving forward in expanding these dreams in various directions. Some our most noteworthy products and achievements include information Telecommunication technology, Photovoltaic System, Electron Beam Processing Equipment and Ion Implanter. Making dreams come true - Nissin Electric continues the challenge and pursuit of progressive ideas and original themes.
Ulvac	Japan	www.ulvac.co.jp/eng	Development, manufacture, sales, customer support and machinery importing/exporting activities related to vacuum equipment, peripheral devices and vacuum components for the display, semiconductor, electronics, electrics, metals, machinery, automotive, chemical, food and pharmaceutical industries, and for universities and research centers. Research guidance and technical consulting on all aspects of vacuum technology.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Etch			
Company	Location - Country	Website Address	Boilerplate from Company Website
TEL	Japan	www.tel.com/eng	TEL's largest product line, semiconductor equipment, includes coater/developers, dry etchers, thermal processing systems, single wafer deposition systems, surface preparation systems, test systems, and metrology software. TEL also offers a leading edge line-up of Flat Panel Display (FPD) production equipment. The company's FPD coater/developers and etcher/ashers realize superior cost performance, thereby meeting the demands for large-scale FPD mass production lines. TEL maintains the leading market share positions for both FPD coater/developers and plasma etcher/ashers.
Oerlikon (Unaxis)	Switzerland	www.oerlikon.com	Oerlikon is a globally leading company in the field of thin film, vacuum and precision technology. Based on these core competencies, Oerlikon develops production systems, components, and services for high-technology products. The company's commercial activities center on protective coatings for precision tools and components, production equipment and coating processes for solar modules, as well as production systems for data storage devices (Oerlikon Balzers Coating), systems for producing vacuums and conveying process gases (Oerlikon Leybold Vacuum), optical components, aerospace technology and outsourcing (Oerlikon Components). Oerlikon also applies its core competencies as a major provider of semiconductor technology (Oerlikon ESEC Semiconductor).
IPS	Korea	www.ips-tech.com	IPS-Manufacture, retrofit and sales of equipment for manufacturing semiconductors, LCDs or solar cells. Import and sales of parts required to manufacture semiconductors, LCDs or solar cells. Post management and service provision consequent on sales of semiconductors, LCDs or solar cells and research and development services related to the equipment mentioned above.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Etch			
Company	Location - Country	Website Address	Bollierplate from Company Website
AMEC	China		Designs, manufactures, markets and services semiconductor processing equipment used in the fabrication of ICs. Advanced Micro-Fabrication Equipment Inc. (AMEC) is an emerging Asia-based semiconductor equipment company with a portfolio of wafer fabrication solutions designed to advance technology, increase productivity and reduce manufacturing costs for leading global semiconductor manufacturers. AMEC's solutions combine innovative technology solutions with economic innovations for the 65/45-nm nodes and beyond. AMEC's global infrastructure will include R&D, manufacturing, business and support operations in China, Japan, Korea, Singapore, Taiwan, and the U.S.
Hitachi High Technologies	Japan	www.hitachi-hitec.com	Our specialization, nanotechnology, is slated to be the leading technology of the 21st century, and promises to become the focus of ever increasing interest. In pursuit of our goal of becoming the global leading company in the field of nanotechnology, we are developing our business across a variety of segments, including Electronic Device Systems, Life Science, Information Systems & Electronic Components, and Advanced Industrial Products. We are working to achieve our goal by providing customers with added value based on the most advanced technologies in these fields.
Ulvac	Japan	www.ulvac.co.jp/eng	Development, manufacture, sales, customer support and machinery importing/exporting activities related to vacuum equipment, peripheral devices and vacuum components for the display, semiconductor, electronics, electrics, metals, machinery, automotive, chemical, food and pharmaceutical industries, and for universities and research centers. Research guidance and technical consulting on all aspects of vacuum technology.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Etch			
Company	Location - Country	Website Address	Boilerplate from Company Website
FOI Corporation	Japan	www.foi.co.jp/English	FOI Corporation excels in application of oplasma technology. We are aggressive in the development, manufacturing, and sales/service of etching equipment for oxide film for 300mm/200mm silicon wafers, and ashing equipment for 200mm/300mm silicon wafers, and other related equipments.
Shibaura Mechatronics	Japan	www.shibaura.co.jp/e	As The Provider of Infrastructure for The Digital Age, Shibaura Mechatronics contributes to society by providing manufacturing equipment for electronic components, such as FPDs, semiconductors and optical discs.
Tokyo Ohka Kogyo	Japan	www.tok.co.jp	Our current businesses are comprised of a materials business with electronic industry materials (such as photoresist, chemical products and specialty chemicals, as our core products), as well as printing materials, and an equipment business (with semiconductor manufacturing equipment and LCD-panel manufacturing equipment as our core products). We have placed special emphasis on the cutting-edge electronics field, relative to semiconductor, flat panel display and package mounting materials, as a crucial direction that will see advancements by leaps and bounds in the 21st century. Therefore, we shall be committing our corporate resources to business developments like these in global markets.
Samco	Japan	www.samcointl.com	SAMCO, Inc. is a process equipment company that develops and manufactures a wide variety of unique deposition, etching, and surface treatment systems for a worldwide network of major industrial customers and academic facilities. We provide process expertise and turnkey systems to major manufacturers in the compound semiconductor, optoelectronics, MEMS and other industries

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Etch			
Company	Location - Country	Website Address	Boilerplate from Company Website
Panasonic Factory Solutions	Japan	panasonic.co.jp/pfsc	Panasonic Factory Solutions Co., Ltd. is dedicated to innovating the manufacturing process around the core of circuit manufacturing technologies and contributing to the growth and prosperity of our customers' business. We aim to further advance the circuit manufacturing technologies we have built up to date, to come up with groundbreaking processes and to put together production systems that will coexist with the
Asahi Technion Co., Ltd	Japan	www.asahi- technion.co.jp/english/	Asahi provides support for technology leaders in modern society and high-tech industries. We enable our clients' technical innovations through diverse solutions. Through distribution of cutting-edge technologies and OEM manufacturing, ATC's technical expertise extends into fields such as: Development and OEM production of Super vacuum equipment for the semiconductor industry, scientific analyzers, and development of FA, LA systems and micro-computer applied products.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - CVD			
Company	Location - Country	Website Address	Boilerplate from Company Website
TEL	Japan	www.tel.com/eng	TEL's largest product line, semiconductor equipment, includes coater/developers, dry etchers, thermal processing systems, single wafer deposition systems, surface preparation systems, test systems, and metrology software. TEL also offers a leading edge line-up of Flat Panel Display (FPD) production equipment. The company's FPD coater/developers and etcher/ashers realize superior cost performance, thereby meeting the demands for large-scale FPD mass production lines. TEL maintains the leading market share positions for both FPD coater/developers and plasma etcher/ashers.
Oerlikon (Unaxis)	Switzerland	www.oerlikon.com	Oerlikon is a globally leading company in the field of thin film, vacuum and precision technology. Based on these core competencies, Oerlikon develops production systems, components, and services for high-technology products. The company's commercial activities center on protective coatings for precision tools and components, production equipment and coating processes for solar modules, as well as production systems for data storage devices (Oerlikon Baizers Coating), systems for producing vacuums and conveying process gases (Oerlikon Leybold Vacuum), optical components, aerospace technology and outsourcing (Oerlikon Components). Oerlikon also applies its core competencies as a major provider of semiconductor technology (Oerlikon ESEC Semiconductor).
IPS	Korea	www.ips-tech.com	IPS-Manufacture, retrofit and sales of equipment for manufacturing semiconductors, LCDs or solar cells. Import and sales of parts required to manufacture semiconductors, LCDs or solar cells. Post management and service provision consequent on sales of semiconductors, LCDs or solar cells and research and development services related to the equipment mentioned above.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - CVD</u>			
Company	Location - Country	Website Address	Boilerplate from Company Website
AMEC	China		Designs, manufactures, markets and services semiconductor processing equipment used in the fabrication of ICs. Advanced Micro-Fabrication Equipment Inc. (AMEC) is an emerging Asia-based semiconductor equipment company with a portfolio of wafer fabrication solutions designed to advance technology, increase productivity and reduce manufacturing costs for leading global semiconductor manufacturers. AMEC's solutions combine innovative technology solutions with economic innovations for the 65/45-nm nodes and beyond. AMEC's global infrastructure will include R&D, manufacturing, business and support operations in China, Japan, Korea, Singapore, Taiwan, and the U.S.
Hitachi Kokusai	Japan	www.h-kokusai.com	The operations of Kokusai Denki Logistics Co., Ltd. were divided into two parts. The transport operations concerning semiconductor manufacturing systems were integrated into Kokusai Electric Semiconductor Service Co., Ltd. Meanwhile, operations concerning communications and information systems and other enterprises were integrated into Kokusai Denki Techno Service Inc.
Aixtron	Germany	www.aixtron.com	AIXTRON AG is a leading provider of deposition equipment to the semiconductor industry. The Company's technology solutions are used by a diverse range of customers worldwide to build advanced components for electronic and opto-electronic applications based on compound, silicon, or organic semiconductor materials. Such components are used in fiber optic communication systems, wireless and mobile telephony applications, optical and electronic storage devices, computing, signaling and lighting, as well as a range of other leading-edge technologies.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - CVD</u>			
Company	Location - Country	Website Address	Boilerplate from Company Website
Jusung	Korea	www.iseng.com	As a professional front-end semiconductor equipment manufacturing company, JUSUNG developed EUREKA, a Low Pressure Chemical Vapor Deposition (LP CVD) procedure. JUSUNG has earned high recognition for its technologies and product quality from the world's premier semiconductor makers. Full-scale exports began in 1997 and JUSUNG now supplies products for the mass production lines of domestic and foreign semiconductor makers. JUSUNG has also developed and started marketing ALD, LP CVD, MO CVD, PE CVD, UHV CVD and ETCH system, which are used during the front-end semiconductor manufacturing process. JUSUNG's products are responsible for up to 20% of the semiconductor's front-end manufacturing processes.
Koyo Thermo Systems	Japan	www.koyo-thermos.com/global	Koyo Thermo Systems wants to contribute to the development of many fields--steel, machinery, automobiles, aircraft, electronics, new materials and the telecommunications industry--through the application of highly controlled heat technology. Heat technology, the main field of Koyo Thermo Systems, is essential for the production of the semiconductors and display devices that make our telecommunications-based society possible.
Samco	Japan	www.samcointl.com	SAMCO, Inc. is a process equipment company that develops and manufactures a wide variety of unique deposition, etching, and surface treatment systems for a worldwide network of major industrial customers and academic facilities. We provide process expertise and turnkey systems to major manufacturers in the compound semiconductor, optoelectronics, MEMS and other industries

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - E-beam for mask making			
Company	Location - Country	Website Address	Boilerplate from Company Website
Micronic	Sweden	www.micronic.se/site_eng	Micronic manufactures systems that are used in the production of advanced photomasks for flat panel displays (the LRS product series), semiconductor applications (the Sigma and Omega product series), and electronic packaging (the MP and FPS product series). The product offering also includes metrology systems for display photomasks (the MMS product series). Micronic has secured its forefront position by offering products that combine high resolution, or the ability to write the smallest photomask features, and high throughput thanks to short write times
Advantest	Japan	www.advantest.co.jp	As the miniaturization of IC devices continues, electron beam exposure technology is gaining prominence as a useful technology for next-generation design rules. Advantest is offering the F3000 EB lithography system that uses E-Beam direct-write technology not only as a design tool for research and development, but also as a tool suitable for system LSIs production lines where mostly small-lot-multiple-type products are produced. To help reduce your development costs and shorten development periods, please give serious consideration to Advantest's E-Beam Solution.
Leica	Germany	www.leica-microsystems.com	Leica Microsystems is a leading global designer and producer of innovative high-tech precision optics systems for the analysis of microstructures. It is one of the market leaders in each of the fields Microscopy, Confocal Laser Scanning Microscopy, Imaging Systems, Specimen Preparation and Medical Equipment. The company manufactures a broad range of products for numerous applications requiring microscopic imaging, measurement and analysis. It also offers system solutions in the areas of Life Science including biotechnology and medicine, as well as the science of raw materials and industrial quality assurance.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - E-beam for mask making			
Company	Location - Country	Website Address	Boilerplate from Company Website
Vistec	Germany	www.vistec-semi.com	<p>Vistec provides two kinds of mask CD measurement systems to the industry, an optical based tool and a CD SEM. The optical measurement system Vistec LWM500 WI provides transmitted light measurement capability at DUV wavelength (248nm), using water immersion for further resolution enhancement. The system is suitable to meet the requirements of reticles for the 65nm technology node.</p> <p>The Vistec LWM270 DUV is the solution for reticle CD measurements for the 90nm node in transmitted light as the reticles are used in wafer scanners. The Vistec LWM9000 SEM is the market leader world wide for CD measurement systems for the latest 65nm node masks and reticles. It is electron microscope (SEM) based in order to achieve sufficient resolution to even measure on the smallest OPC features. The LWM9000 SEM can achieve a sub-1nm dynamic measurement repeatability.</p>
Hitachi High Technologies	Japan	www.hitachi-hitec.com	<p>Our specialization, nanotechnology, is stated to be the leading technology of the 21st century, and promises to become the focus of ever increasing interest. In pursuit of our goal of becoming the global leading company in the field of nanotechnology, we are developing our business across a variety of segments, including Electronic Device Systems, Life Science, Information Systems & Electronic Components, and Advanced Industrial Products. We are working to achieve our goal by providing customers with added value based on the most advanced technologies in these fields.</p>
JEOL	Japan	www.joel.com	<p>JEOL is a leading global supplier of scientific instruments used for research and development in the fields of nanotechnology, life sciences, optical communication, forensics, and biotechnology. Utilizing its unique technologies, products, services, and knowledge, JEOL helps its customers make significant breakthroughs in product development and scientific research. JEOL products include scientific instrumentation and industrial equipment, based on five major product groups.</p>

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Surface finishing/wafer thinning (backside)			
Company	Location - Country	Website Address	Boilerplate from Company Website
SEZ	Switzerland	www.sez.com	SEZ's products are used for the wet chemical surface preparation of wafers (silicon or gallium arsenide) within the scope of microchip production. SEZ develops and markets Spin-Process equipment as well a complete portfolio of wafer surface preparation applications. SEZ works with its customers to develop the optimal processes individually tailored to their specific production requirements.
Trio Tech			
DNS Korea	Korea	www.screen.co.jp	We are now developing and producing equipment that advances the digitalization of printing processes in the printing field and world-leading high-tech industrial equipment such as manufacturing equipment for semiconductors, FPDs (flat panel displays), and printed circuit boards in the electronics field. It is our desire to contribute to the development of society with a view to the coming era of ubiquitous connectivity.
Equipment Segment - Laser mask repair			
Company	Location - Country	Website Address	Boilerplate from Company Website
Carl Zeiss	Germany	www.smt.zeiss.com	Carl Zeiss SMT AG provides a broad range of products and solutions that support the global chip industry. Key products are lithography optics for wafer steppers/scanners from ASML. Our product range additionally comprises optical components and subsystems for lithography lasers from Cymer as well as Synchrotron Optics. Furthermore, SMT offers unique mask review and e-beam based mask repair systems.
SII Nano Technology Inc.	Japan	www.sii.co.jp	As a specialist in precision measurement technology that originated in watch making, we have focused on the potential of nanotechnology since its infancy. By refining our unique high-precision technologies that were nurtured through the development of watches, we have created many analysis and measurement instruments that were the world's first when they appeared. Our craftsmanship DNA allows us to keep pace with the flow of the constantly changing times.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - Laser mask repair</u>			
Company	Location - Country	Website Address	Boilerplate from Company Website
Leica	Germany	www.leica-microsystems.com	Leica Microsystems is a leading global designer and producer of innovative high-tech precision optics systems for the analysis of microstructures. It is one of the market leaders in each of the fields Microscopy, Confocal Laser Scanning Microscopy, Imaging Systems, Specimen Preparation and Medical Equipment. The company manufactures a broad range of products for numerous applications requiring microscopic imaging, measurement and analysis. It also offers system solutions in the areas of Life Science including biotechnology and medicine, as well as the science of raw materials and industrial quality assurance.
Vistec	Germany	www.vistec-semi.com	Vistec provides two kinds of mask CD measurement systems to the industry, an optical based tool and a CD SEM. The optical measurement system Vistec LWM500 WI provides transmitted light measurement capability at DUV wavelength (248nm), using water immersion for further resolution enhancement. The system is suitable to meet the requirements of reticles for the 65nm technology node. The Vistec LWM270 DUV is the solution for reticle CD measurements for the 90nm node in transmitted light as the reticles are used in wafer scanners. The Vistec LWM9000 SEM is the market leader world wide for CD measurement systems for the latest 65nm node masks and reticles. It is electron microscope (SEM) based in order to achieve sufficient resolution to even measure on the smallest OPC features. The LWM9000 SEM can achieve a sub-1nm dynamic measurement repeatability.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Mask substrates (not equipment)			
Company	Location - Country	Website Address	Boilerplate from Company Website
Toppan		www.photomask.com	
Dai Nippon	Korea	www.screen.co.jp	We are now developing and producing equipment that advances the digitalization of printing processes in the printing field and world-leading high-tech industrial equipment such as manufacturing equipment for semiconductors, FPDs (flat panel displays), and printed circuit boards in the electronics field. It is our desire to contribute to the development of society with a view to the coming era of ubiquitous connectivity.
Hoya	Japan	www.hoya.co.jp/english	The information technology field is Hoya's core business. Products in this category include mask blanks and photomasks, which are essential to the fabrication of semiconductor devices; optical glass for use in devices such as liquid crystal displays and digital cameras; and glass disks for hard disk drives.
Taiwan Mask Company	Taiwan	www.corporateinformation.com	Taiwan Mask Corporation. The Company's principal activities are the design, development, manufacture and distribution of mask and optical lens for the semiconductor industry. Other activities are the provision of technical support, consultation, testing and repair services.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - PVD</u>			
Company	Location - Country	Website Address	Boilerplate from Company Website
Oerlikon (Unaxis)	Switzerland	www.oerlikon.com	Oerlikon is a globally leading company in the field of thin film, vacuum and precision technology. Based on these core competencies, Oerlikon develops production systems, components, and services for high-technology products. The company's commercial activities center on protective coatings for precision tools and components, production equipment and coating processes for solar modules, as well as production systems for data storage devices (Oerlikon Balzers Coating), systems for producing vacuums and conveying process gases (Oerlikon Leybold Vacuum), optical components, aerospace technology and outsourcing (Oerlikon Components). Oerlikon also applies its core competencies as a major provider of semiconductor technology (Oerlikon ESEC Semiconductor).

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - Lithography</u>			
Company	Location - Country	Website Address	Boilerplate from Company Website
ASML	The Netherlands	www.asml.com	ASML researches, develops, designs, manufactures, markets and services lithography systems used by the semiconductor industry to fabricate state-of-the-art chips. Most of the major global semiconductor manufactures are ASML customers. For chipmakers, technological advancement in imaging means increased manufacturing productivity and improved profitability.
Nikon	Japan	www.nikon.com	Nikon is involved in a broad spectrum of businesses centering on the core business segments of precision equipment, imaging products and instruments. We focus our energies on developing proposal-based products that build on Nikon's unique strengths and capitalize on our proprietary technologies. These technologies, maximized through Nikon's singular vision, have already resulted in a long list of innovations, ranging from IC scanners that utilize immersion lithography technology to LCD steppers and scanners which feature our
Canon	Japan	www.canon.com	Canon is pursuing development near-field mask lithography technology, with the aim of applying it to next-generation exposure equipment for processing to resolutions of several dozen nanometers without the need for large-scale equipment. Canon also foresees that the development of near-field optical technologies will lead to new applications in optical memory and micro-optical devices.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Resist Track			
Company	Location - Country	Website Address	Boilerplate from Company Website
TEL	Japan	www.tel.com/eng	TEL's largest product line, semiconductor equipment, includes coater/developers, dry etchers, thermal processing systems, single wafer deposition systems, surface preparation systems, test systems, and metrology software. TEL also offers a leading edge line-up of Flat Panel Display (FPD) production equipment. The company's FPD coater/developers and etcher/ashers realize superior cost performance, thereby meeting the demands for large-scale FPD mass production lines. TEL maintains the leading market share positions for both FPD coater/developers and plasma etcher/ashers.
Suss Micro	Germany	www.suss.com	SUSS MicroTec is a world leading supplier of precision technology providing innovative solutions for markets including Advanced Packaging, MEMS, Nanotechnology, Compound Semiconductor, Silicon-On-Insulator, and 3D Interconnect. SUSS MicroTec manufactures a complete line of photoresist and dielectric coat/bake/develop systems, microlithography exposure systems, wafer and device bonders, probers, photomasks, cleaners and etchers.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Mask Making			
Company	Location - Country	Website Address	Boilerplate from Company Website
Micronic	Sweden	www.micronic.se/site_eng	Micronic manufactures systems that are used in the production of advanced photomasks for flat panel displays (the LRS product series), semiconductor applications (the Sigma and Omega product series), and electronic packaging (the MP and FPS product series). The product offering also includes metrology systems for display photomasks (the MMS product series). Micronic has secured its forefront position by offering products that combine high resolution, or the ability to write the smallest photomask features, and high throughput thanks to short write times
NuFlare Technology, Inc.	Japan	www.nuflare.co.jp/english	We have developed as a top semiconductor manufacturing equipment maker with an integrated approach extending from electron beam mask writer development, to production, sales, and servicing. We also supply thin film growth equipment that can support the growing sophistication of semiconductor devices and is based on a new concept that is able to achieve a perfect crystal format.
Leica	Germany	www.leica-microsystems.com	Leica Microsystems is a leading global designer and producer of innovative high-tech precision optics systems for the analysis of microstructures. It is one of the market leaders in each of the fields Microscopy, Confocal Laser Scanning Microscopy, Imaging Systems, Specimen Preparation and Medical Equipment. The company manufactures a broad range of products for numerous applications requiring microscopic imaging, measurement and analysis. It also offers system solutions in the areas of Life Science including biotechnology and medicine, as well as the science of raw materials and industrial quality assurance.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Mask Making			
Company	Location - Country	Website Address	Boilerplate from Company Website
Vistec	Germany	www.vistec-semi.com	<p>Vistec provides two kinds of mask CD measurement systems to the industry, an optical based tool and a CD SEM. The optical measurement system Vistec LWM500 WI provides transmitted light measurement capability at DUV wavelength (248nm), using water immersion for further resolution enhancement. The system is suitable to meet the requirements of reticles for the 65nm technology node.</p> <p>The Vistec LWM270 DUV is the solution for reticle CD measurements for the 90nm node in transmitted light as the reticles are used in wafer scanners. The Vistec LWM9000 SEM is the market leader world wide for CD measurement systems for the latest 65nm node masks and reticles. It is electron microscope (SEM) based in order to achieve sufficient resolution to even measure on the smallest OPC features. The LWM9000 SEM can achieve a sub-1nm dynamic measurement repeatability.</p>
Hitachi High Technologies	Japan	www.hitachi-hitec.com	<p>Our specialization, nanotechnology, is slated to be the leading technology of the 21st century, and promises to become the focus of ever increasing interest. In pursuit of our goal of becoming the global leading company in the field of nanotechnology, we are developing our business across a variety of segments, including Electronic Device Systems, Life Science, Information Systems & Electronic Components, and Advanced Industrial Products. We are working to achieve our goal by providing customers with added value based on the most advanced technologies in these fields.</p>
JEOL	Japan	www.joel.com	<p>JEOL is a leading global supplier of scientific instruments used for research and development in the fields of nanotechnology, life sciences, optical communication, forensics, and biotechnology. Utilizing its unique technologies, products, services, and knowledge, JEOL helps its customers make significant breakthroughs in product development and scientific research. JEOL products include scientific instrumentation and industrial equipment, based on five major product groups.</p>

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - CMP</u>			
Company	Location - Country	Website Address	Boilerplate from Company Website
Embara	Japan	www.ebara.co.jp	Ebara Corporation is one of the world's principal manufacturers of fluid transfer machinery, with particularly strong positions in pumps, compressors, fans, and chillers. The Company is also a prominent contractor of environmental engineering systems, focusing on the realization of the "sustainable society." Ebara is a leading supplier of precision machinery to the semiconductor device manufacturing industry. Key products in this sector include chemical mechanical polishing systems, dry vacuum pumps, and other equipment, such as wafer plating systems, that assist the industry in meeting the demands of manufacturing the next generation of semiconductor devices. Ebara is actively engaged in developing and commercializing new energy technologies, including wind power generators, fuel cell cogeneration systems, and photovoltaic power generators.
Accrettech	Japan	www.accrettech.jp	ACCRETECH-TOKYO SEIMITSU's next-generation semiconductor manufacturing equipment supports the device production. We go through even the fields of CMP equipment and wafer inspection equipment, as well as the conventional fields of wafer manufacturing, test area and assembly, helping you to build the optimum manufacturing system. Production and measurement: two inextricably linked elements. Accurate measurement is a prerequisite for creation. The field of measuring is expanding rapidly in terms of precision, accuracy, speed and stability. Beginning with industrial, optical parts and production line measuring instruments, ACCRETECH-TOKYO SEIMITSU provides a wide range of equipment to meet the needs of the modern world.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Process Control			
Company	Location - Country	Website Address	Boilerplate from Company Website
Leica	Germany	www.leica-microsystems.com	Leica Microsystems is a leading global designer and producer of innovative high-tech precision optics systems for the analysis of microstructures. It is one of the market leaders in each of the fields Microscopy, Confocal Laser Scanning Microscopy, Imaging Systems, Specimen Preparation and Medical Equipment. The company manufactures a broad range of products for numerous applications requiring microscopic imaging, measurement and analysis. It also offers system solutions in the areas of Life Science including biotechnology and medicine, as well as the science of raw materials and industrial quality assurance.
Hitachi Kokusai	Japan	www.h-kokusai.com	The operations of Kokusai Denki Logistics Co., Ltd. were divided into two parts. The transport operations concerning semiconductor manufacturing systems were integrated into Kokusai Electric Semiconductor Service Co., Ltd. Meanwhile, operations concerning communications and information systems and other enterprises were integrated into Kokusai Denki Techno Service Inc.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - Die Bonders</u>			
Company	Location - Country	Website Address	Boilerplate from Company Website
BE Semiconductor/Datacon	The Netherlands	www.besi.nl	BE Semiconductor Industries N.V. is a leading manufacturer of semiconductor die sorting, flip chip and multi-chip die bonding, packaging and plating equipment for both array connect and leadframe assembly applications. Our technologically advanced equipment and integrated systems are used principally to produce semiconductor assemblies or "packages", which provide the electronic interface and physical connection between the chip and other electronic components and protect the chip from the external environment.
ASM Pacific	Hong Kong	www.asmpacific.com	ASM Pacific Technology Ltd. was founded in 1975. We are the world's largest assembly and packaging equipment supplier for the semiconductor industry. We manufacture semiconductor assembly equipment and materials (etched and stamped leadframes) used by multinational chip manufacturers, independent IC assembly houses and consumer electronics manufacturers.
Renesas Easter Japan Semiconductor	Japan	www.tosemi.renesas.com	Semiconductor development, design, manufacture, and sale, as well as the manufacture and sale of semiconductor manufacturing equipment. Development, manufacture, and sale of applied electronics for purposes such as image recognition, and environment analysis.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Oerlikon (Unaxis	Switzerland	www.oerlikon.com	<p>Oerlikon is a globally leading company in the field of thin film, vacuum and precision technology. Based on these core competencies, Oerlikon develops production systems, components, and services for high-technology products. The company's commercial activities center on protective coatings for precision tools and components, production equipment and coating processes for solar modules, as well as production systems for data storage devices (Oerlikon Balzers Coating), systems for producing vacuums and conveying process gases (Oerlikon Leybold Vacuum), optical components, aerospace technology and outsourcing (Oerlikon Components). Oerlikon also applies its core competencies as a major provider of semiconductor technology (Oerlikon ESEC Semiconductor).</p>
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SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - Die Bonders</u>			
Company	Location - Country	Website Address	Boilerplate from Company Website
NEC Machinery name changed to Canon Machinery	Japan	www.canon-machinery.co.jp	Since the foundation of our company in 1972, we have been making every possible effort to improve our technologies and thus create sophisticated production systems with the management philosophy, "Originality, Sincerity & Challenge." The philosophy reflects our willingness to create optimum solutions satisfying the customer needs based on the customer's viewpoints as well as our enthusiasm to tackle with any challenging assignments without hesitation.
Alphasem	Switzerland	www.alphasem.com	Alphasem is a worldwide active company working in the semiconductor backend equipment market and Microsystem technology. Alphasem is heavily investing in research and product development to achieve technology leadership and has therefore gained a lot of experience in the most challenging technologies such as air bearings, volumetric dispense systems, epoxy writing, etc
Shinkawa	Japan	shinkawa.com/english	Shinkawa has specialized in the production of semiconductor manufacturing equipment, specifically bonding equipment commonly called a bonder, as its core product for the semiconductor industry for nearly fifty years.
Shibaura Mechatronics	Japan	www.shibaura.co.jp/e	As The Provider of Infrastructure for The Digital Age, Shibaura Mechatronics contributes to society by providing manufacturing equipment for electronic components, such as FPDs, semiconductors and optical discs.
Towa	Japan	www.towajapan.co.jp	As the industry leader in the field of semiconductor packaging technology, TOWA has developed numerous technology de facto standards. At the same time, we have continued our research and development efforts in order to meet customer requirements for new technologies.

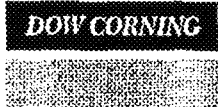
SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

<u>Equipment Segment - Semiconductor Test Equipment</u>			
Company	Location - Country	Website Address	Boilerplate from Company Website
Advantest	Japan	www.advantest.com	Advantest has established an impressive track record of helping customers turn technological innovations into practical, market-ready products by providing user-focused test and measurement solutions. Manufacturing and sale of electronic measuring instruments, automatic test equipment, and electron beam lithography systems
Verigy	Germany & Singapore	www.verigy.com	Verigy designs, develops, manufactures and sells advanced test systems and solutions for the semiconductor industry. Building upon 65+ years of testing technology innovation, Verigy's advanced solutions help semiconductor designers and manufacturers lower their costs of test and improve their competitiveness.

<u>Equipment Segment - Board Test Products</u>			
Company	Location - Country	Website Address	Boilerplate from Company Website
EADS (Airbus)	France	www.eads.com	In the short time since its formation EADS has established itself as a leading player in the global aerospace and defence market underpinning the capability and expertise of EADS' 17,000 UK employees. The success stories of Airbus, Ariane and Eurocopter show what EADS can achieve. Our products have earned us international acclaim. We are also shaping the future, by researching, developing and implementing projects that push current technological boundaries.
Diagnosys	France	www.diagnosys.com	DiagnoSYS is an established Global Company with the sole aim of providing Electronic Test Solutions and Services Worldwide. We offer Test Solutions to our Customers through offices in the UK, USA, India, France, Germany & Sweden and another 39 countries around the globe through a comprehensive distributor network.

SEMI Attachment Two: Foreign Availability for 3B991 and 3B992

Equipment Segment - Board Test Products			
Company	Location - Country	Website Address	Boilerplate from Company Website
Seica	Italy	www.seicatestsolutions.com	Seica's innovative test solutions are being used across the globe to improve quality, increase productivity and save money in automobile, military and consumer markets.
Marconi	UK	www.marconi.com	Marconi is a multi-regional designer, manufacturer and supplier of telecommunications and information technology equipment and services. Our network technology and services enable our customers to evolve narrowband networks to next-generation broadband networks. Our customer base includes public network operators, Internet service providers, large corporations, government departments and agencies, utilities and educational institutions. Our core activities can be divided into two main business types, Network Equipment and Network Services



Dow Corning Corporation
P.O. Box 994
Midland, MI 48686-0994

Fax Cover Sheet

DATE: December 4, 2006 TIME: 1:00 p.m.

TO: Ms. Sheila Quarterman FAX: 202-482-3355

FROM: J. D. Dodd PHONE: 989-496-4980
Dow Corning Corporation

RE: FAX - RIN 0694-AD75

Number of pages including cover sheet: 2

Message: RIN 0694-AD75 -- please see the attached.

NOTE: The information contained in this facsimile message is intended only for the personal and confidential use of the designated recipient(s) named above. If the reader of this message is not the intended recipient(s) or an agent responsible for delivering it to the intended recipient(s), you are hereby notified that you have received this document in error, and that any review, dissemination, distribution, or copying of this message is strictly prohibited. If you have received this communication in error, please notify the sender or this office immediately by telephone and return the original message to us by mail.

If you fail to receive any part of this transmission, please contact Denise Allen (989-496-8054) immediately. Thank you.

DOW CORNING

December 4, 2006

Ms. Sheila Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry and Security
U.S. Department of Commerce
14th Street and Pennsylvania Avenue, NW
Room 2705
Washington, DC 20230

ATTN: RIN 0694-AD75

Re: Revisions and Clarification of Export and Re-Export Controls for the People's Republic of China (PRC): New Authorization Validated End-User, 71 FR 38313-21, July 6, 2006

To Whom It May Concern:

Dow Corning Corporation ("DCC"), headquartered in Midland, Michigan, was established in 1943 specifically to explore the potential of silicones. Today we produce more than 8,000 silicon-based products that are utilized as a material in a variety of items such as airplanes, airbags, automobiles, cookware, cosmetics, textile treatments, lotions, lubricants, and shampoos.

DCC is a member of the American Chemistry Council (ACC) and contributed input to the ACC's comments on the proposed China regulations. As a concerned U.S. manufacturer and exporter, we fully endorse and support the position expressed in the ACC comment letter.

Sincerely,

Dow Corning Corporation

Jeanne D. Dodd / JDD with permission
Jeanne D. Dodd
Executive Director
Regulatory Compliance

Dow Corning Corporation
Midland, Michigan 48686-0994
Phone: (989) 496-4000
www.dowcorning.com



December 1, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th St. and Constitution Ave. N.W.
Room 2705
Washington, DC 20230
Attention: Sheila Quarterman

RIN 0694-AD75

RE: Proposed Rulemaking Concerning Revisions and Clarifications of Export and Reexport Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 Fed. Reg. at 38,313, July 6, 2006)

Dear Ms. Quarterman:

On behalf of Tektronix, Inc. (Company), we appreciate the opportunity to comment on this proposed regulation. Exports to China are important to the Company, and it is clear that the proposed changes will have a substantial impact on our business and export compliance risk.

We agree with the premise that items subject to national security controls should not be used by potential adversaries for their military applications. We also agree that lists of such items should be reviewed periodically and expect that there will be circumstances that require a previously decontrolled item to be brought back under control for legitimate national security reasons.

However, dual-use items are placed on the Wassenaar control lists because of their strategic utility, and because the control has a reasonable chance of being effective. It has long been established that unilateral or symbolic controls are competitively harmful and serve little or no real national security objective. The proposed military end-use rule is just such a symbolic control; its major effect is re-imposition of controls on items already removed from the multilateral control lists. Moreover, as shown by the variety of public comments, including the AeA letter December 1, 2006 it has little hope of effectively controlling those items. Specifics on the additional screening burdens and export compliance risk this proposal will cause only add to reasons why it should not be implemented.

As members of AeA, we fully endorse AeA's final letter to you, dated December 1, 2006 regarding this rule. We also provide you with the some additional comments:

Additional Screening Burden and Compliance Risk

Unlike existing EPCI end-user and end-use screening requirements, the term "military" activities is extremely broad and virtually unidentifiable under the current language; end-user/use screening will need to encompass a very large number of transactions in a very large and complex market. Indeed, given the penalty for even inadvertent mistakes under current rules is severe, unless companies decide to screen every transaction they run a risk of failure under this rule. Even screening all transactions does not guarantee compliance when the rule and standards are so ambiguous.

Validated End-Use Authorization

As expressed in the AeA letter, this as an innovative idea, but if adopted will be ineffective because it simply will not be used by the end-users, our customers or U.S. exporters. As it is drafted, the VEU proposal is similar to an export license application: application is complex and has myriad technical limitations. In fact, it bears resemblance to validated license applications available in principle today. Administration and use of this rule (along with the cost) will be borne by U.S. exporters (rather than Chinese customers). That fact means that approval can be exploited by competitors and makes this supposed boon to industry unattractive and unusable.

Military End-Use and the Knowledge Standard

The expansive definition of "knowledge" used in the proposal, while consistent with that currently found in Part 772 of the EAR, ensures that extensive additional screening will have to be implemented to detect potential military end-uses. The similarly broad definition of "military end-use" drawn from the ITAR not only covers a very wide range of activity, but will require substantial analytical effort to resolve ambiguous real-world situations. This will in turn cause useless delay and cost for substantial numbers of customer transactions that will not help the US reach its national security goals, but will substantially impact our competitiveness.

Of specific concern to Tektronix are provisions of Category XI of the US Munitions list such as the following:

(a) Electronic equipment not included in Category XII of the U.S. Munitions List which is specifically designed, modified or configured for military application.

(b) Electronic systems or equipment specifically designed, modified, or configured for intelligence, security, or military purposes for use in search, reconnaissance, collection, monitoring, direction-finding, display, analysis and production of information from the electromagnetic spectrum and electronic systems or equipment designed or modified to counteract electronic surveillance or monitoring.

Those provisions require determination that common civilian electronic equipment has been specifically designed, modified or configured for a military application. As noted

above, military end use will be virtually impossible to determine; moreover, in a real time situation it will be equally hard to determine if any specific design, modification or configuration has occurred. That is, in most circumstances, Tektronix has no valid way to determine specific design modification or configuration without asking any customer who might ever have had a supply relationship with a military organization or a military contractor whether or not instruments or systems they will use Tektronix products to test, maintain, repair (etc) have been specifically designed modified or configured for a military application. This is not administratively possible to manage, nor is it a reliable way to determine whether Tektronix is in compliance with the criteria set forth in the rule. As such, the requirement results in significant additional compliance steps but does not yield dependable or reliable results. Yet, the rule will make Tektronix liable for information we can only obtain from the end user.

Revision of End User Certificate Requirements

The proposed change expanding the requirements for PRC Ministry of Commerce end-user certificates will result in a number of identifiable disadvantages for U.S. exporters. In addition to extending processing time, it makes shipments completely dependent on MOFCOM's ability and willingness to issue the appropriate certificate. As those certificates are not required from non-US suppliers, this will provide yet another incentive for customers to seek suppliers outside of the US—again putting US industry at a competitive disadvantage.

Tektronix Products falling into 3A292

Because the threshold of control for oscilloscopes has remained unchanged since 1994, ECCN 3A292 no longer captures only state of the art oscilloscopes. As technology has continued to advance, many oscilloscopes at the controlled thresholds under 3A292 have become high volume commodities sold through regional distributors. Oscilloscopes made by foreign competitors are well beyond the 1 GS/s level using "off the shelf" components. (Yokagawa in Japan and Fluke in the Netherlands). Even competitive products made in China are already at the threshold of the controlled sample rate and are expected to exceed it (possibly to 2 GS/s) within the next 18 months. (Rigol and Xiamen Lilliput Technology Co. Ltd).

Tektronix Products falling into 5B991

ECCN 5B991 is a "not elsewhere specified" bucket classification of equipment at a de-controlled level; due to its breadth, the category sweeps in many types of commercial telecom test equipment with little risk of application in military end uses. Using a bucket classification category to enforce broad, sweeping controls under ambiguous criteria will not achieve effective control for national security purposes. BIS should either exclude 5B991 altogether or otherwise identify the specific test instruments or test application that is of concern for military end uses. References to 5B991 in 5D991 and 5E991 should be updated accordingly.

Specifically, there are several categories of Tektronix products which fall into 5B991. These can be roughly grouped into Communications products and Video products. The

following provides you with a general description of the products and thereafter, information to support our position that they should not be controlled under the "bucket" approached proposed for ECCN 5B991:

General Description of Tektronix products classified under 5B991:

Tektronix Communications products serve network equipment manufacturers and carriers for mobile and fixed line multi-service communications networks. Equipment manufacturers use Tektronix test tools to verify design and integrate into the network. Carriers use Tektronix test tools to operate, monitor and manage networks. Our "network diagnostics" equipment includes mobile and fixed protocol test tools and wireless field test tools. This equipment performs functional test, load tests, portable monitoring as well as tests of transmitters, antennae, backhaul transmission and interference. Our "network management" equipment includes integrated, end to end performance monitoring solutions. Please see <http://www.tek.com/products/communications/index.html> for more information on product applications and specifications.

Tektronix Video products serve industries that create and deliver video content as well as the manufacturers of consumer and professional video products. Test equipment includes baseband waveform monitors and rasterizers, Video signal measurement and picture quality and video signal generators and MPEG (video compression protocol) signal generators, signal monitors, and signal analyzers. Please see http://www.tek.com/products/video_test/index.html for more information on product applications and specifications

Applicability of Tektronix test products controlled under 5B991 to those 5A991 applications controlled under the proposed rule:

5A991.a – Tektronix equipment does not operate outside the range of 219K to 397K (or even across that temperature range)

5A991.b.5 – Tektronix equipment does not test telecom equipment employing lasers and having the listed criteria.

5A991.b.7 – Tektronix communication products do not test QAM modulation. Tektronix Video (MPEG) products do test digital civil terrestrial television (DTTV) and cable TV which employs a combination of QAM and other technologies. However Tektronix MPEG products are not designed for the extensive detailed steps associated with designing, operating and maintaining RF/QAM signal processing components and systems. Tektronix MPEG products are only useful for test, design and repair of receivers designed to demodulate and decode the standardized public digital video transmission. They would not be useful for 2-way radio transceiver design, test and repair or other more general, digital radio transmission design, test and repair.

5A991.f – Tektronix equipment does not test phased array antennae

Applicability of Tektronix test products to military applications as defined by the US Munitions List.

Section 744.21(f) of proposed rule defines military purpose as including design, development, maintenance, repair, refurbishing etc of anything on the US munitions list. In general, Tektronix equipment could only be useful for Category XI – Military Electronics.

Communications Equipment

Tektronix' Communications Business make tools to monitor and diagnose telecommunications networks. In that role they are built to accept telecommunication standards set by both by ETSI and ITU telecommunication standards bodies. Hardware interfaces and software modules are built to specifically interpret the electrical or optical signals transported by modern telecom networks. These signals in digital sequences of 1's and 0's describe both the protocol interactions and user content. The tools passively monitor these signals and rebuild the information sequences so that problem messages are isolated and network problems resolved.

In the design of telecommunications infrastructure, some of these tools can be used to simulate or emulate the same protocol signaling function so that design work by the manufacturer can proceed without delay and to be a valid 3rd party of interpreting the telecommunication standards. In this role they are designed to only work to modern telecom standards and have no ability to work in weapons research.

Modern telecom networks are distinct from C2 (Command and Control) Military networks in that the C2 networks will use proprietary protocols or completely encrypted transactions for security measures. Tektronix communication tools could not be used in the monitoring or diagnosis of those networks without extensive modification at a minimum to their software code base. Non compiled code base is the company's intellectual property and is not made available to any companies, governments or individuals.

Video Equipment

Tektronix Video products are primarily marketed to for broadcasters, content producers, and post-production facilities. Another market is designers and manufacturers of video equipment.

Using sales of video equipment to the US Military and US defense contractors as a basis for analysis, there are two potential areas of usage by a military organization. The first is for broadcasts, creation of training videos etc. For example, Tektronix equipment has been sold for usage in broadcast studios on US aircraft carriers. For the reasons noted above regarding usage of Tektronix communication equipment, it is extremely unlikely that a command and control network would use commercial broadcast standards. Modern C2 (Command and Control) military systems, where video is used, are expected to carry

encrypted content, or the content is expected to be contained within encrypted signaling systems that are appropriate for the communications security (comsec) needs of those organizations. While some commercial video/audio content distribution companies may opt to encrypt (scramble) video content for business reasons, Tektronix does not design, manufacture or sell equipment for encrypting or decrypting video/audio content, or test and measurement devices that would be used specifically for encryption system design

Non-command and control broadcast applications such as training, news and entertainment can not be considered to provide a material contribution to a military purpose as defined under the proposed Part 744. Training broadcasts are not enumerated in 121.1 – Category IX Military Training Equipment which includes such equipment as radar target generators and anti-submarine warfare trainers. Webster's Dictionary defines "material" as *having real importance or great consequences*. "To contribute" is defined as *to play a significant part in bringing about an end or result*. As BIS has chosen not to define "material contribution" a standard lay interpretation should be used. Clearly, other civilian type broadcast applications do not make a material contribution to a military application

The second application is research and development on sensors potentially used in missiles and unmanned aerial vehicles. Sales to any non-US customer for second application, while undoubtedly a military purpose, are already prohibited under the EPCI regulations.

Because 5B991 is a "not elsewhere specified" classification, many products which do not make any material contribution to a military application are subject restrictions under the proposed rule. Tektronix video and communications products do not test proposed controlled telecommunications systems in 5A991; Tektronix video and communications test products are not designed to test, repair, maintain (etc) military electronics (USML Category XI) or any other item on the USML not already subject to EPCI restrictions. 5B991 should be removed from the proposed rule.

National Competitiveness and Foreign Availability

In addition to the technical arguments provided above, we have significant concerns regarding national competitiveness and the effectiveness of this rule. There are many foreign direct competitors to Tektronix in the video and communications markets. These competitors will not be subject to the proposed rules, greatly diminishing the success and effectiveness of this rule. Indeed, several direct competitors of our communications products are in China. From the following data, it is clear that the primary impact of restricting sales of 5B991 products under the proposed rule will be competitive harm to US companies with no real benefit to national security goals.

Communications Test Equipment – Tektronix Non-US Competitors

Rohde and Schwarz	Germany
Bitgate	Germany

Solinet	Germany
Anritsu	Japan
Spirent	UK
Actix	UK
NetHawk	Finland
Astelia	France
Gencom	New Zealand
Starpoint	China
Zhang Chuang Telecom Test (ZCTT)	China

Video Test Equipment -- Tektronix Non-US Competitors

Leader Electronic Corp	Japan
Astro Systems	Japan
Shibasoku	Japan
KDDI Media Will Corporation	Japan
KDDI R & D	Japan
Evertz	Canada
DK Audio	Denmark
Rohde and Schwarz	Germany
LG Electronics	Korea
Pixelmetrix	Singapore
Hamlet	UK
Electronic Visuals	UK
Omnitek Ltd	UK
Trilogy Broadcast Ltd	UK

Conclusion


In conclusion, we believe that the proposed military end-use restriction is extensive, complex and unlikely to have any significant impact on China's military capabilities; it follows that the proposed rule will have no real impact on increasing national security and a significant impact of diminishing national competitiveness. While we recognize the need to reevaluate controls as geo-political and technology circumstances change, this should be done on a very selective basis with clear multilateral support and well researched data to understand the consequences to both national security and national competitiveness; without a thorough understanding of all factors, unintended consequences are likely to occur. Again, the current proposal represents a de facto roll-back that will introduce substantial administrative burdens and compliance risk with little potential benefit to national security. Therefore, we respectfully ask that you:

- exclude the "not elsewhere specified" bucket classifications such as 5B991 and restrict the rule to specific instruments or applications of concern
- redefine "knowledge" to include only actual knowledge for the purposes of this rule
- redefine "military purpose" to narrowly target specific military applications— additionally, provide specific guidance on "military" vs non-military applications

- provide a clear and detailed standard for screening to ensure consistency and a level playing field; include a safe-harbor provision if proscribed screening standards are followed in good faith

We again thank BIS for this opportunity to comment on the proposed rule.

Sincerely,


Courtney Seelinger
Sr. Manager, Trade Compliance
Tektronix, Inc.

cc: MardiLyn Saathoff, Chief Compliance Officer



*Norma Rein
Senior Manager Export Policy & Strategy
1200 Wilson Blvd.
Arlington, VA 22209*

Date: DEC 4, 2006

To: RIN 0694-AD75

Fax: 202-482-3355

From:

Tel: 703-465-3655

Fax: 703-465-3031

L+6

Memo:

Submission of Comments:

*Re: New Proposed Rule Regarding Exports
and Re-Exports to China.*

Thank you

Kathy T. Hunsarik
V.P., Global Trade Controls
Office of Internal Governance
Corporate Offices

The Boeing Company
P.O. Box 3707 MC IT-00
Seattle, WA 98124-2207

December 4, 2006

Ms. Sheila Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry and Security
Room 2705
Department of Commerce
14th Street & Pennsylvania Avenue, NW
Washington, D.C. 20230

Attn: RIN 0694-AD75

Dear Ms. Quarterman:

We appreciate the opportunity to provide comments to the Department on its proposed rule regarding export and re-export controls for the People's Republic to China and the establishment of a new Validated End User (VEU) for eligible end users in the PRC and other to-be-determined destinations.

Our most important concern about the new regulation is the new military end-use controls because we believe they are a unilateral action in the presence of foreign availability and, particularly for us, because unintended consequences could arise that would adversely impact our commercial business activities in China, given that several of the companies with which we collaborate on important commercial aircraft programs are engaged both in military and commercial manufacturing.

For that reason, The Boeing Company does not support this portion of the proposed rule and believes it should be withdrawn for reconsideration for the reasons elaborated in this letter, as well as those expressed in the November 30, 2006 letter to the Department signed by 24 major associations representing a broad cross-range of U.S. manufacturing and export interests. We are particularly concerned with the precedent that may be set in not considering this proposed rule as a "Major Rule."

We do want to applaud the Department's Validated End User (VEU) concept. While we have some concerns on the implementation of the VEU concept, we believe that it could be extracted from the rule and implemented separately.



Our concerns with the new controls and VEU implementation are presented below.

New Military End-Use Controls

The regulation states that the new controls for China on military end use are being proposed pursuant to U.S. multilateral export control commitments as a Participant State in the Wassenaar Arrangement, a commitment to which all Participant Members would have to adhere. However, it is our understanding that the language of the new regulations was not coordinated with, for example, EU members, and that the U.S. Government does not have a commitment from those members that they will institute similar controls.

According to a published statement by the Arrangement (please click on: http://www.wassenaar.org/publicdocuments/2003_statementofunderstanding.html to review), licenses may not necessarily be required for items captured under the military end-use controls. In fact, the language in the Statement is that upon being informed by the exporter that a particular export may be intended for military use, the authorities in the Participant State "will decide whether or not it is expedient to make the export concerned subject to authorization." Without any additional analysis, that statement is cause for concern that other Wassenaar member states may not be prepared to implement the Statement of Understanding in the same manner and to the same extent. Furthermore, it is our understanding that several European Members have said that implementation of the Statement of Understanding will not apply to China.

A large number of the ECCN's subject to the new military end-use controls are relevant to Boeing. In fact, Boeing and other U.S. manufacturers that support aircraft part manufacturing export to China about twenty of the forty-seven ECCN's listed in the new regulation. The most significant is commercial aircraft and commercial aircraft parts and components (9A991), software for the development or production of commercial aircraft (9D991), and technology for development, production or use of commercial aircraft (9E991). Other ECCN's exported by Boeing and other U.S. companies are those related to composites and materials processing and associated technology and software (1B999, 1C990, 1D999); machine tools (2B992) dimensional inspection and measuring equipment (2B996); technology for navigation and avionics systems and equipment (7A994, 7B994, 7D994 and 7E994); and equipment for inspection or testing of electronic components and materials (3B992). Other ECCNs are relevant to a lesser degree, such as those relating to electronics, computers and information security.

Items and technology that we export to China are used for commercial purposes, and therefore we have no reason to believe that they will be used for military purposes. As a result, we do not anticipate immediate impact on our activities in China. However, the high value of our products, the significant

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number of ECCN's involved, the possibility that some of our U.S. suppliers may face a different environment for their own products under the new regulation, and the fact that we work with companies that have both civilian and military production are cause for a heightened level of uncertainty and therefore concerns on our part.

One specific area of concerns is the continuous stream of exports from the U.S. and the potential re-export from a multitude of distribution centers around the world of commercial airplane parts and components with no license required. We have more than 2.6 million active parts for commercial aircraft that are only controlled for Anti Terrorism (AT) purposes. These parts are ready to be exported, or re-exported from distribution centers to our customers around the world, with a goal of shipment within 4 hours. These commercial aircraft parts are controlled only for E-1 countries. It would be almost impossible to apply a military end-use due diligence check for China for these millions of parts.

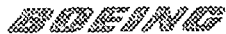
The regulation must provide precise and clear definitions, particularly with respect to "military end use" and "material contribution" in order for industry to have a common understanding, and scenarios such as the one described above should be carefully considered within that context.

Validated End User (VEU) Concept

We believe that creation of a Validated End User (VEU) authorization for China, with other destinations to follow, could be an important development in the area of dual use exports. We support the concept of certifying companies for a license-free environment for a large number of items on the Commerce Control List because, if successfully implemented, it could lead to the creation of a system in which companies in the major trading partner countries would be able to collaborate more competitively.

The key to making this initiative attractive to exporters, however, is to make implementation manageable and to find the right balance between benefits and obligations. Our concern at this point is that difficulties in achieving this balance could result in reluctance on the part of the U.S. exporter or the end user to apply for VEU status or, worse, in stiff resistance from our foreign partners, which would mean that a worthwhile endeavor could fail to achieve its objectives. In this respect, we respectfully ask the Department to consider the following concerns and suggestions:

- Considerations Regarding Removal of VEU Status – First and foremost, careful consideration should be given to what the consequences of removing the VEU status of a foreign partner would be for the affected U.S. company. How will the U.S. Government make these determinations? Will there be an appeal process? If removal from VEU status results in the denial of licenses for an activity that may have



been ongoing for many years and on which a U.S. company depends for on-schedule production and deliveries, losses could be enormous.

- Reasonable Eligibility Criteria – The criterion for eligibility that relates to how well the country in which the end user is located administers export controls, and to whether the government of that country supports and adheres to multilateral export control regimes may be beyond the candidate's ability to comply. Therefore, it should not be considered as a requirement for eligibility, even though we realize that it would have to be considered when determining whether or not to make VEU available in a particular country.
- Inability to Obtain VEU Certification – Inability to obtain VEU status should not be considered a "red flag" because it could be due to legitimate reasons, such as not engaging exclusively in civil activities, a lack of desire to request VEU certification, lack of resources to implement requirements, etc. It is important that the new regulation reflect this, so that the creation of a "white list" does not lead to the establishment of a "black list" from the outset.
- Identification of Commodities – It is not clear in the regulations whether it would be possible for a U.S. company applying for VEU status on behalf of the Chinese company to list in the application all the items that the foreign company imports or will be importing from the U.S. (if that list were made available to the U.S. company), or whether the U.S. company would only be able to list in the application those items that it intends to export to the VEU candidate.
- Reasonable Implementation Requirements - Requirements should not be burdensome, both from a cost and an implementation perspective, to the point that they would undermine the benefits derived from certification. In addition, requirements should be clearly spelled out and user friendly, since the companies that will become subject to those requirements will most likely be unfamiliar with U.S. regulations.
- Adequate Resources - We question whether the Department and other agencies involved will have the resources in the U.S., in China, and in the countries for which VEU will also be made available, to implement certification requirements, audit compliance, provide training, etc., and we are concerned that the normal licensing review process for controlled items could be adversely impacted.
- Audits and Verifications – The Department should spell out how audits would be conducted, how frequently and under which circumstances, as well as who, specifically, will be charged with monitoring on-going compliance of the potentially high number of entities that may apply for

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VEU status. Before any final rule is issued, this should be fully addressed.

- Consequences of Failure to Comply with VEU Requirements - We are concerned with the statement made in the regulation that validated end users found not to be in compliance with the requirements of VEU status will be subject to removal from the list of validated end users "and other action, as appropriate." Non-compliance with the requirements of VEU certification should result only in removal from VEU status. Other actions that might be taken pursuant to other sections of the EAR, or due to statutory requirements, should not be directly connected to this regulation. We believe that this is an important point to make clear, otherwise potential candidates will be reluctant to request VEU status.
- Offer Renewable and Amendable Certification and Provide Timelines - it would be useful to make VEU certification renewable, so that actual removal from the list could become a rarely used tool. Additionally, timelines for certification should be provided for planning purposes. A fast and simple amendment option for reporting changes might be useful, as well.
- Clear Re-Export and Re-Transfer Requirements - The language related to re-exports or re-transfers may need some clarification. For example, the regulations state that requests for VEU certification would have to include a list of items identified by ECCN that would be exported, re-exported or transferred to an eligible end user. We are not sure if that would apply only to items that are re-exported or transferred by the U.S. company's foreign offices or subsidiaries to the certified company in China, or also to items that are re-exported or re-transferred by other foreign companies. In other words, if we export controlled technology that is controlled for China to a foreign company in an ASEAN country, for example, can that company re-export the technology without a license to the VEU in China if the technology is approved for export without a license pursuant to VEU status?

We look forward to the opportunity of working closely with the Department to define VEU implementation procedures and requirements.

New End-User Certificate Requirement

This requirement is more stringent than that which is in place for items on the U.S. Munitions List (USML). Specifically, while under the International Traffic in Arms Regulations (ITAR) end-user certificates may be requested by the State Department at its discretion for any license application, they are normally required only for requests to export Significant Military Equipment

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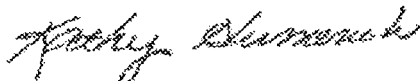
(SME). Classified items and those items that have capacity for substantial military utility or capability on the U.S. Munitions List are identified as SME. In our opinion, requirements related to dual use exports should not be more restrictive than for defense exports.

Summary

In closing, we recommend that the Department reconsider the proposed regulation as a "Major Rule" and extract the VEU concept as the subject of a separate rule.

We also want to reiterate our concerns regarding the possibility that the U.S. Government will go forward with military end use controls for China without a firm commitment from the other members of the Wassenaar Arrangement that they will apply them in the same manner and to the same degree as the United States. Such an approach would not achieve the objectives of the new regulation, and could put U.S. companies at a competitive disadvantage by giving foreign suppliers the opportunity to expand commonality of their products throughout China--at the expense of U.S. industry.

Sincerely,



Kathy Humenik
Vice President - Global Trade Controls
Office of Internal Governance
The Boeing Company

From: <jonathan_wise@agilent.com>
To: <publiccomments@bis.doc.gov>
Date: Mon, Dec 4, 2006 2:15 PM
Subject: Comments for RIN 0694-AD75

This email contained an attached file "ISTAC Comments RIN 0694-AD75.DOC" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?6C60AD4940E407BF815CF3D04EB3D5BB457473D0000B0C6A>
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All unclaimed attachments are deleted automatically after fourteen (14) calendar days.

Greetings,

Attached please find comments from the Information Systems Technical Advisory Committee ("ISTAC") regarding the subject rule.

rgds,
Jonathan Wise
ISTAC Chair

Jonathan Wise
Export Classification Manager
Global Trade

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December 4, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th Street and Pennsylvania Ave., NW
Room 2705
Washington, DC 20230

Attn: Sheila Quarterman, RIN 0694-AD75

RE: RIN 0694-AD75, Proposed Rule – Revisions and Clarifications of Export and Reexport Controls for the People's Republic of China; New Authorization Validated End-User (71FR38313 (July 6, 2006))

The Information Systems Technical Advisory Committee ("ISTAC") is pleased to submit to the Commerce Department's Bureau of Industry and Security ("BIS") the following comments on the proposed amendments to the Export Administration Regulations ("EAR") identified above.

The industry members of the ISTAC are generally opposed to this proposed regulation. However, that opposition will be elaborated and communicated through other responses. In keeping with the ISTAC charter, our comments are limited to technical suggestions. Thus, these comments are for proposed changes to the list of ECCNs that would be affected by this regulation.

Please do not hesitate to contact me if you have questions regarding these comments.

Sincerely yours,

/s/ Jonathan Wise

Jonathan Wise
Chair, ISTAC

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MS C2030
Colorado Springs, CO 80907
jonathan_wise@agilent.com

Category 3--Electronics Design, Development and Production

3A292

ISTAC Recommendation: No change.

~~3A999~~ Limited to items controlled by 3A999.c.

ISTAC Recommendation: No change.

3B991

ISTAC Recommendation: No comment. The ISTAC did not explicitly consider this ECCN, but notes that there is a significant US industry segment that would support deletion of this ECCN from the proposed rule.

3B992

ISTAC Recommendation: No comment. The ISTAC did not explicitly consider this ECCN, but notes that there is a significant US industry segment that would support deletion of this ECCN from the proposed rule.

3D991

ISTAC Recommendation: 3D991 "Software" specially designed for the "development"; or "production" ~~or "use" of electronic devices or components controlled by 3A991, general purpose electronic equipment controlled by 3A992, or~~ of manufacturing and test equipment controlled by 3B991 and 3B992.

ISTAC Rationale: The ISTAC notes that it is illogical to add controls on software for "use" of items controlled by 3A991 or 3A992 when no additional controls are proposed for the subject items (and, hence, for "use" of the subject items themselves). The ISTAC further recommends that any additional controls on software should be limited to those items that are further controlled by this proposed regulation. As neither 3A991 nor 3A992 are controlled by this regulation, it follows that the corresponding software need not be controlled. Finally, although we did not explicitly consider 3B991 and 3B992, if those ECCNs were to be deleted from this proposed regulation, it would follow that the corresponding software should also be deleted.

3E292

ISTAC Recommendation: No changes.

3E991

ISTAC Recommendation: 3E991 "Technology" according to the General Technology Note for the "development"; or "production"; ~~or "use" of electronic devices or components controlled by 3A991, general purpose electronic equipment controlled by 3A992, or~~ of manufacturing and test equipment controlled by 3B991 or 3B992.

ISTAC Rationale: We recommend limited this technology according to the General Technology Note to more precisely capture what is of concern. As for 3D991, we recommend that any further controls on technology should be limited to those items that are further controlled by this proposed regulation. As neither 3A991 nor 3A992 are controlled by this regulation, it follows that the corresponding technology need not be controlled. Finally, although we did not explicitly

consider 3B991 and 3B992, if those ECCNs were to be deleted from this rule, it would follow that the corresponding technology should also be deleted.

Category 4--Computers

4A994

ISTAC Recommendation: The ISTAC questions whether 0.1 WT would be the correct threshold for this control, but was unable to find a basis for suggesting an alternate value.

4D993

ISTAC Recommendation: No change.

4D994

ISTAC Recommendation: 4D994 "Software" specially designed or modified for the "development"; ~~or "production"; or "use"~~ of equipment controlled by 4A101, 4A994 with an Adjusted Peak Performance ("APP") exceeding 0.1 Weighted TeraFLOPS (WT), ~~4B994 and materials controlled by 4C994.~~

ISTAC Rationale: The ISTAC notes that it is illogical to add controls on software for "use" of items controlled by 4B994 or 4C994 when no additional controls are proposed for the subject items (and, hence, for "use" of the subject items themselves). The ISTAC further recommends that any additional controls on software should be limited to those items that are further controlled by this proposed regulation. As neither 4B994 nor 4C994 are controlled by this regulation, it follows that the corresponding software need not be controlled. Finally, as for 4A994, the ISTAC questions whether 0.1 WT would be the correct threshold for this control, but was unable to find a basis for suggesting an alternate value.

4E992

ISTAC Recommendation: 4E992 "Technology" for the "development"; ~~or "production"; or "use"~~ of equipment controlled by 4A994, as described in this Supplement No. 2 to Part 744, ~~and 4B994, materials controlled by 4C994,~~ or "software" controlled by 4D993 or 4D994.

ISTAC Rationale: The ISTAC notes that it is illogical to add controls on technology for "use" of items controlled by 4B994 or 4C994 when no additional controls are proposed for the subject items (and, hence, for "use" of the subject items themselves). The ISTAC further recommends that any additional controls on technology should be limited to those items that are further controlled by this proposed regulation. As neither 4B994 nor 4C994 are controlled by this regulation, it follows that the corresponding technology need not be controlled.

Category 5--(Part 1) Telecommunications

5A991 Limited to items controlled by 5A991.a., 5A991.b.5., 5A991.b.7. and 5A991.f.
ISTAC Recommendation: No changes.

5B991 Telecommunications test equipment, n.e.s.

ISTAC Recommendation: ~~5B991 Telecommunications test equipment, n.e.s.~~

ISTAC Rationale: Delete this ECCN from the regulation. This ECCN is analogous to 3A992 and should be excluded for the same reasons that BIS excluded that ECCN from this proposed regulation.

5C991

ISTAC Recommendation: No changes.

5D991

ISTAC Recommendation: 5D991 "Software" specially designed or modified for the "development"; or "production" or "use" of equipment controlled by ~~5A991 and 5B991~~; 5A991.a, 5A991.b.5, 5A991.b.7 and 5A991.f.

ISTAC Rationale: The limited set of subparagraphs cited in 5A991, above, specify the items of concern. Any additional controls on software should be equivalently limited. Consistent with the ISTAC recommendation to deleted 5B991, we also recommend deletion of the corresponding software.

5E991

ISTAC Recommendation: 5E991 "Technology" according to the General Technology Note for the "development"; or "production" or "use" of equipment controlled by ~~5A991 or 5B991~~; 5A991.a, 5A991.b.5, 5A991.b.7, and 5A991.f, or "software" controlled by 5D991 in this Supplement, and other technologies as follows (see List of Items Controlled).

ISTAC Rationale: The limited set of subparagraphs cited in 5A991, above, specify the items of concern. Any additional controls on technology should be equivalently limited. Consistent with the ISTAC recommendation to deleted 5B991, we also recommend deletion of the corresponding technology.

Category 5--(Part 2) Information Security

5A992/5D992/5E992

ISTAC Recommendation: An argument was presented to the ISTAC that the proposed regulation, as written, creates the possibility that software that might otherwise be subject to this regulation could be released from this regulation by addition of non-essential encryption functionality and subsequent treatment by BIS as mass-market software. The ISTAC believes that this possibility was not intended and that the regulation should be revised so that this possibility is removed. However, the ISTAC defers to the Encryption Subgroup of the RAPTAC to provide specific suggestions as to how this revision might be accomplished.

From: Kara Calvert <kcalvert@itic.org>
To: <publiccomments@bis.doc.gov>
Date: Mon, Dec 4, 2006 3:49 PM
Subject: ATTN: RIN 0694-AD75, Sheila Quarterman

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Attached are formal comments submitted by the Computer Coalition for Responsible Exports in response to the proposed rule published by the Bureau of Industry and Security concerning Revisions and Clarifications of Export and Reexport Control for the People's Republic of China, 71 Fed. Reg. 38,313 (July 6, 2006). Please contact me with any questions or concerns. Thank you.

Kara Calvert
Director, Government Relations
Information Technology Industry Council
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December 4, 2006

VIA ELECTRONIC MAIL

U.S. Department of Commerce
Bureau of Industry and Security
Office of Exporter Services
Regulatory Policy Division
14th Street and Pennsylvania Avenue, NW
Washington, DC 20230

Attention: **RIN 0694-AD75**
 Sheila Quarterman, Room 2705

Dear Ms. Quarterman:

On behalf of the Computer Coalition for Responsible Exports (“CCRE”), we are submitting these comments in response to the proposed rule published by the Bureau of Industry and Security (“BIS”) concerning *Revisions and Clarifications of Export and Reexport Control for the People’s Republic of China*, 71 Fed. Reg. 38,313 (July 6, 2006) (“Draft Rule”).

CCRE is an alliance of American computer companies and allied associations established to inform policymakers and the public about the nature of the computer industry—its products, technological advances, and global business realities. Our members include Dell Inc., Hewlett Packard Company, IBM Corporation, Intel Corporation, Sun Microsystems, Inc., Unisys Corporation, AeA, and the Information Technology Industry Council. Our industry has a long history of cooperation with the U.S. government on national security-related technology issues, and we are committed to providing BIS with the information it needs to develop effective export control policies.

CCRE supports the Administration’s strategy of engagement with China while maintaining effective national security export controls. However, in reviewing the Draft Rule, we are concerned that the proposed approach represents a step in the wrong direction. In our view, the Draft Rule would undermine the Administration’s China policy, misdirect the U.S. Government’s limited export control resources, and impose unnecessary compliance burdens on U.S. companies.

In particular, in addition to the views and recommendations expressed in the business community’s overall comments, we are also concerned that:

- The proposed scope of the regulation is so broad that it captures computer systems that the President already exempted from export licensing requirements because they no longer pose a meaningful national security risk.

- The coverage of the validated end-user (“VEU”) proposal does not go far enough to constitute an effective compliance tool for the U.S. IT industry.
- The definition of “military end-use” is overly broad and ambiguous, imposing heavy compliance burdens for companies.

As discussed in detail below, we recommend that the Administration:

- Ensure that the scope of any final regulation is properly focused on items that would make a material contribution to China’s military capability. In developing its final rule, the Administration should:
 - Release computers with an Adjusted Peak Performance (“APP”) below 0.50 Weighted TeraFLOPS (“WT”) in order to accommodate the sale of mid-range 32-socket enterprise servers during the next 18 months.
 - Maintain the APP threshold for computer technology and software at the proposed 0.1 WT level and bring the current China licensing threshold into conformity.
 - Provide for annual review of prevailing control thresholds so that adjustments can be made to account for fast-moving changes in technology and international market conditions.
 - Exclude weak encryption items that are currently eligible for export to China as No License Required (NLR), as well as certain low-level chips and cards that are incorporated into ethernet cards and other mainstream commodity products.
- Expand the proposed VEU-based system to include broader categories of technologies without performance limits or, at the very least, develop a License Exception VEU for the transfer of knowledge to controlled foreign subsidiaries and joint ventures of U.S. companies for a wide range of products, technologies, and end-uses.
- Apply a more focused definition of “military end-use” in order to make exporter compliance more workable.

REFOCUSING THE SCOPE OF THE PROPOSED REGULATION

The Administration’s stated policy is to focus export control resources on “exports that would make a *material* contribution to the PRC’s military capability,” but the proposed regulation is overly broad and fails to meet this standard. Bearing in mind that the Administration already maintains effective controls on all items specially-designed for military applications and other munitions, as well as all items used in proliferation-related activities, below are some

suggestions on how the Administration can more narrowly tailor the proposed regulation to better achieve its national security objectives.

Computers

The President has twice adjusted the prevailing computer export control threshold to release 32-socket commercial servers from licensing requirements for exports to China. First, in 2002, President Bush raised the computer export control threshold to 190,000 MTOPS, thereby releasing 32-socket commercial servers from China licensing requirements.

More recently, in April 2006, the President again raised the licensing threshold for commercial computer exports to China to 0.75 Weighted Teraflops ("WT"), which released the latest generation of 32-socket commercial servers (and even larger systems) from control. The President's April 2006 decision -- which was ratified by our Wassenaar allies -- reflected the Administration's national security assessment that China already has supercomputers ranked in the "Top 50" and that commercial servers below the 0.75 WT level are not material to America's export control strategy.

These U.S.-led decisions permitted U.S. companies -- and foreign competitors like Bull, NEC, and Fujitsu -- to freely market 32-socket commercial systems in China during the past four years without the need to screen for military end-use. The Draft Rule threatens to set a unilateral control threshold of 0.1 WT¹ and thereby subject to license screening a broad range of commercial computer systems, including 32-socket servers, that are designed primarily for commercial transaction processing and are not particularly well-suited for national security applications.

The proposed reduction of the screening threshold from 0.75 WT to 0.10 WT for computer exports to China makes no national security sense given the Defense Department's assessment that "{e}xport controls on computers cannot prevent a potential adversary from pursuing national security related work; controls can only limit access to the most efficient and reliable computers being used by the USG for computationally intensive military and intelligence work." For this reason, if the Administration decides to capture additional commercial computer systems under this regulation, it should narrowly focus such controls on vector systems, which are the most efficient machines for running sensitive national security applications.

From a commercial standpoint, the proposed 0.1 WT control threshold would be needlessly overbroad and raise the concern that Chinese companies will refuse to do business with U.S. companies for fear that the new regulation would render them "unreliable suppliers" in relation to foreign sources. We note, for example, that:

¹ The proposed 0.1 WT threshold (4A994) does not cover "electronic assemblies" such as replacement boards specifically designed to be aggregated into larger computer systems. We agree with BIS that electronic assemblies should not be covered under the rule. We suggest, however, that this exclusion be specifically noted in the rule in order to clarify the scope of companies' compliance obligations.

- Some U.S. companies already produce 32-socket commercial servers above the 0.1 WT level. Application of the proposed rule would force companies to re-implement compliance screening on a wide range of systems that were just released from licensing controls only seven months ago.
- Based on Intel's microprocessor technology projections, the performance of nearly all 32-socket servers will likely be rated between 0.45 and 0.5 WT within the next 12-18 months."
- If the 0.1 WT level were implemented, then within 18 months, it would cover 8-socket servers, which are sold in the tens of thousands. In the next three years, 0.1 WT would also cover four-socket servers, which are commodity items sold in the hundreds of thousands from a variety of foreign sources, including Chinese producers like Dawning.

We therefore recommend that:

- If a WT threshold below 0.75 must be set, then the level should be set at 0.50 WT to continue to release mid-range 32-socket servers using the latest commercial processors, and include an 18-month lead time to permit U.S. companies to be first to market with commercial servers containing the next generation of civilian microprocessors.
- In addition, the final rule needs to provide for an annual review of the prevailing APP level for computers so that adjustments can regularly be made to account for fast-moving changes in technology and international market conditions. Specifically, the WT threshold should be continuously updated to reflect the 18-month projection for the highest performing 32-socket server incorporating commodity processors. A 0.5 WT threshold is needed to satisfy this criterion based upon today's technology and market conditions.

Computer Technology & Software

The proposed regulation reflects the Administration's preliminary assessment that computer technology (4E992) and software (4D994) need only be controlled for Chinese military end-use purposes above the 0.1 WT level. Although the U.S. industry has consistently taken the position that technology/software control levels should conform with the prevailing hardware control level (i.e., 0.75 WT), we appreciate the Administration's recognition that computer technology and software below the 0.1 WT level no longer warrants controls to China (except, of course, for EPCI controls and exports to prohibited end-users). The final rule should, therefore, set the technology/software "catch-all" limits no lower than 0.1 WT, and the current licensing threshold for technology/software exports to destinations like China should also be updated to 0.1 WT in order to reflect the latest technological realities.

Encryption

BIS has made a determination that a broad array of software products with strong encryption will not be covered by this rule. As written, the proposed rule would rightly exclude mass market strong encryption items but include weak encryption items (5A/D992) that are currently

available in China. This inconsistency would seemingly encourage exporters to include stronger encryption in their products in an attempt to escape this new end use screening requirement. We believe that the Commerce Department's Bureau of Industry and Security ("BIS") is already aware of this problem, but failure to correct it would pose a significant screening problem for companies because it would capture a broad range of commercial products, e.g., low-level commercial systems with anti-virus functionality.

The CCRE believes that 5D002 Software, which is typically exported under license exception ENC, will not be controlled under this Draft Rule. We strongly agree with this perspective and think BIS should make this clear in the rule.

Integrated Circuits

Some low-level category 5A991 items (chips and cards) are sold to mainstream Chinese civilian manufacturers who then manufacture other electronic products used by all sectors of the economy. Similarly, low-level Category 3 technology (SRAMS under 3A991b.2 and chips under 3A991) which go into Ethernet cards may also be covered. In either of these situations, the strategic value of the hardware is insignificant and the resulting products are widely available commodities. Accordingly, the Administration should remove these items from the scope of any final regulation.

IMPROVING UPON THE VEU CONCEPT

As currently drafted, the proposed validated end-user ("VEU") process is not a particularly valuable tool for U.S. IT industry because it is narrowly limited to only a few ECCNs and end-uses. The Administration should therefore improve upon its VEU proposal and develop new rules to facilitate the intracompany sharing of knowledge in the computer and microprocessor industries and promote U.S. technological leadership, global competitiveness, and national security.

Specifically, the Administration should extend the VEU system to broader categories of technologies without performance limits. At the very least, the Administration can develop a License Exception VEU for the transfer of knowledge to controlled foreign subsidiaries and joint ventures of U.S. companies for a wide range of products, technologies, and end-uses. We believe that such an approach can effectively address U.S. national security concerns through a set of commonsense conditions based on company-administered security procedures that effectively limit the possibility of diversion for unauthorized end-uses.

FIXING THE DEFINITION OF "MILITARY END-USE"

The proposed definition of "military end-use" would seek to impose liability whenever an exporter has reason to know that an export was at least partly intended for "incorporation into, or use for the production, design, development, maintenance, operation, installation, or deployment, repair or refurbishing" of munitions items. This proposed definition is unworkably broad and difficult for companies to administer, for example:

- If an enterprise computer server is sold to a commercial airport to manage air traffic control, and the exporter has reason to know that a military aircraft may potentially be among the thousands of aircraft to land there, would the rule apply?
- In a joint development project with a Chinese university, how can a U.S. IT company reasonably identify all of the projects ongoing across the institution and reliably assess whether the Chinese military has some attenuated connection?

We recommend that the definition of "military end-use" be limited to "incorporation or embedding" of items into munitions controlled under the International Trade in Arms Regulations ("ITAR"). At a minimum, the "deployment" language should be removed from the proposed definition, as it has the potential to cover a unreasonably wide variety of civilian activities, e.g., shipment of items by rail, truck, aircraft, or ship.

* * * * *

To summarize, our industry supports the Administration's China policy, but we believe that the proposed unilateral control initiative fails to effectively advance that policy. At a minimum, the Administration needs to refocus the scope of the regulation -- and adjust the technology control thresholds -- to address only those items that can make a material contribution to the Chinese military. In addition, the Administration should take this opportunity to improve upon the VEU concept by covering broader categories of technologies without performance limits or, at the very least, develop a license exception for the transfer of knowledge to controlled foreign subsidiaries and joint ventures for a wide range of products, technologies, and end-uses.

Please do not hesitate to contact us if we can be of further assistance.

Sincerely,



Dan Hoydysch
Chairman, CCRE

From: "Bougopoulos, Nick" <Nick.Bougopoulos@lamrc.com>
To: <publiccomments@bis.doc.gov>
Date: Mon, Dec 4, 2006 3:58 PM
Subject: RIN 0694-AD75

This email contained an attached file "Lam Research Comments 120406.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?D454DD281BBC76A2426708F95E38A91C45748BD300089A46>
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Attached please find the comments from Lam Research on the proposed rule.

Please contact me should you have any questions.

Thank you

Nick Bougopoulos

Director of Foreign Trade

(510) 572-4957

CC: "Roland, Kathy" <kathy.roland@lamrc.com>, "Haugen, Marc" <marc.haugen@lamrc.com>, "Izor, Michele" <michele.izor@lamrc.com>, "Schisler, George" <george.schisler@lamrc.com>, "Ling, Angela" <angela.ling@lamrc.com>



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December 4, 2006

Ms. Sheila Quarterman
Office of Exporter Services, Regulatory Policy Division
Bureau of Industry & Security
U.S. Department of Commerce
14th Street & Pennsylvania Avenue NW, Room 2705
Washington, DC 20230

ATTN: RIN 0694-AD75

RE: Proposed Rule: Revisions and Clarification of Export and Reexport Controls for the
People's Republic of China (PRC)

Dear Ms. Quarterman:

This letter is in response to your request for public comment on the proposed rule regarding revisions of export and reexport controls for the People's Republic of China (PRC).

Lam Research Corporation ("Lam") is recognized as a leading supplier of wafer fabrication equipment to the worldwide semiconductor industry. While Lam maintains a wide customer base globally, the emerging business in China is becoming an increasingly important market to us. To support that business, Lam maintains a Special Comprehensive License (SCL) to support its consignees and end-users in the following manner: 1) to support the sale of equipment used as capital equipment; and 2) to support the sale of spare parts for service, repair and maintenance services to the consignee as an end-user. Lam continues to use the services of its wholly owned subsidiaries, Lam Research (Shanghai) Corporation Limited ("Lam Shanghai Corporation") and Lam Research (Shanghai) Service Corporation Limited ("Lam Shanghai Service") both of whom are also consignees on this license. Lam also maintains individual validated licenses.

We have reviewed the proposed rule and would like to comment on three particular areas of the current version.

Proposed Section 748.15: Authorization Validated End-User (VEU)

Automatic Validated End User Status for Approved End Users of the SCL

Whenever Lam requests BIS approval to add a customer to its SCL as an approved end user, the process is often complicated and requires multiple levels of authorization. The process frequently involves bringing representatives from the end-user company to Washington, D.C. for meetings and presentations to Commerce, Defense, State, and Energy. In addition, the company must demonstrate that it has a history of complying with US export regulations and support this claim with proof of a strong compliance program. The company must also show transparency of its relationships with business partners and investors. Under the proposed China rule, BIS proposes to evaluate potential Validated End Users (VEUs) under a set of conditions similar to what is used to approve end-users on the SCL. This includes the party's record of compliance with US export and reexport regulations; the party's relationship with US and foreign companies; and the party's exclusive civil end use activities.

Lam takes the position that due to the level of scrutiny placed upon end-users under the SCL program, additional consideration should be given to them as they attempt to obtain VEU status. The rigorous SCL approval process for end-users should warrant *de facto* authorization for VEU status. Thus, a company's burden to meet U.S. Government requirements for VEU status is nominal or nonexistent if SCL end-users are given special consideration. Furthermore, the Government also benefits from granting "automatic" VEU status for SCL end-users, by means of shorter processing times and paperwork reduction.

The proposed rule discusses additional record keeping and reporting requirements for approved VEUs. What is not clear, however, is the scope of these additional requirements. Lam takes the position that in order to encourage companies to apply for VEU status, the criteria to do so should not be so burdensome that the U.S. Government alienates these companies from applying. For example, to further promote cooperation and participation by companies, should the U.S. Government propose an audit requirement, then the Government should be responsible for performing this function. Also, to encourage participation, the Government should consider eliminating the PRC End-User Certificate for companies with VEU status. The final rule must balance the Government's need to obtain critical information on the potential end-users with any resulting unwillingness for these companies to participate. To accomplish this goal, the requirements must serve a valid purpose and not become prohibitive for the intended party.

Clarification of Impact on Related Technology to Controlled ECCNs

The proposed rule details additional changes to the list of ECCNs requiring authorization from the U.S. Government. What is not clear is how related controlled technology will be impacted by the changes. Specifically, Lam is concerned with the related technology to equipment controlled under 3B001. In order to transfer 3E001 technology to our subsidiaries in China, we maintain a separate Technology Transfer License, even though our subsidiary is an approved consignee on our SCL. This requires a tremendous amount of vigilance and access controls, and further limits our employment possibilities. Our engineers in China, as well as our controlled foreign national engineers currently employed in the US under Deemed Export Licenses, are unable to move freely from project to project, creating a greater burden for Lam. Lam proposes the inclusion of technology classifications to the list of ECCNs requiring U.S. Government authorization.

December 4, 2006
Ms. Quarterman
Page 3

Lam takes the position that technology related to permitted ECCN 3B001, exported to approved VEUs, should also be authorized under the proposed China rule. We also believe that the technology node to 3B001 equipment authorized under the rule should be aligned with current technology nodes being exported under either individual validated licenses or SCL's. This would grant Lam, and other US companies exporting tools classified under 3B001, to concentrate its technology transfer licensing activities to critical sub levels of technology. By authorizing a technology node higher than what is currently authorized under export licenses, there would be no motivation for companies to discontinue the issue of their current licensing schemes. Additionally, U.S. companies would further benefit by this change by having a wider range of employee resources and greater mobility for personnel on a global level. We encourage BIS to provide clear language and guidance regarding authorized technology nodes and the process that needs to be taken when an exporter wants to ship technology below stated nodes when the final rule is published. We further suggest BIS to consider approving technology nodes based on a VEU's technology roadmap. BIS could approve various nodes at one-time without requiring additional authorization for each technology phase. This would ease the administrative burden on BIS, U.S. companies, and VEUs since the Government would not be required to authorize every new technology milestone identified on the roadmap.

Revised Section 748.10: Import and End-User Certificates

The proposed China rule states that a PRC End-User Certificate is required for exports of items requiring licenses with a value exceeding \$5,000. It is Lam's experience that it usually takes a full 20 business days to obtain these certificates. The process is also arduous and burdensome for our customers. Our concern is that by adding this additional requirement, the PRC Government will be unable to meet the increased demand in a manner consistent with shipping needs. We urge BIS to align itself completely with the PRC Government before implementing the end-user certificate requirement and focus on streamlining the process.

Finally, BIS should consider fewer administrative requirements for US companies (i.e., license holders) than what is currently required. The proposed China rule should minimize or altogether eliminate license requirements such as, notice to consignees or technology recipients, annual reporting requirements, and audits.

On behalf of Lam Research, I thank you for the opportunity to comment on the proposed China rule. We understand that this rule has been designed to meet national security concerns of the U.S. Government, while easing the licensing burden placed on U.S. companies. It is our belief that further consideration needs to be taken with respect to the current version of the rule. By granting current SCL-approved end users automatic VEU status, focusing on improving the current PRC end-user certificate requirement, and increasing the scope of permissible ECCN's to include technology-related controls, both goals of the proposed rule can be accomplished.

Sincerely,



Stephen G. Newberry
President & Chief Executive Officer

Fax From IBM Export Regulation Office
Fax # T/L 622-5551 or 202/515-5551

Date: 12/4/06
Pages to follow: 15

To: Ms. Sheila Quarterman

Telephone #: _____

Fax #: 202 - 482 - 3355

From: IBM Corp.

Telephone #: 202 - 515 - 5510

COMMENTS:

RIN 0694-AD75

VIA EMAIL AND FACSIMILE

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
14th Street & Pennsylvania Avenue, NW
Room 2705
Washington, DC 20230

December 4, 2006

Attention: Sheila Quarterman

RIN 0694-AD75

Re: Comments on Proposed Rulemaking Concerning Revision and Clarification of Export and Re-export Controls for the People's Republic of China (PRC) and New Authorization Validated End-User

Dear Ms. Quarterman:

On behalf of International Business Machines Corporation (IBM), we are submitting these comments in response to the July 6, 2006, request regarding Revision and Clarification of Export and Re-export Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 Fed. Reg. 38313 (July 6, 2006)) ("Proposed Rule").

IBM provides information technology products and services to customers in more than 175 countries and employs more than 320,000 persons based in 75 countries. Revenues for 2005 were \$91 billion, of which more than 60% was generated outside of the US. In China, IBM had sales of more than \$1.3 billion in 2005 and currently employs approximately 5000 employees. IBM has a growing, dynamic business in China, which includes sales of both finished products and components to external customers as well as internal IBM business units. IBM currently screens customers worldwide, including in China, for export control compliance purposes; however, IBM believes that the Proposed Rule, which is overly broad and seeks to control categories that have long been decontrolled, will have a substantial impact on IBM by requiring extensive, burdensome, and expensive changes across our company and business channels.

1

Notwithstanding the potential impact to IBM, we believe that the Proposed Rule will ill serve the U.S. exporting community without having a measurable impact on the stated goal of improving national security. As discussed below, IBM believes that the Proposed Rule is overreaching, vague, and costly, severely complicating compliance programs for corporations. In addition, the imposition of additional controls and complexity in exporting U.S. goods will further undercut the role of US suppliers in both China and other countries. These additional controls are unlikely to increase national security, given the availability of competing products and/or technology through non-U.S. sources. IBM suggests that the Proposed Rule be targeted more narrowly by tightening the definitions of "military end-use" and "knowledge" and adopting our specific comments below on items in Categories 3, 4 and 5.

I. Background

IBM is committed to supporting U.S. national security goals and supports reasonable and effective export controls. To that end, we consider the following principles to be critical in establishing export controls:

- Export controls should remain multilateral to the greatest extent possible;
- Truly sensitive "choke point" technologies should be restricted through international negotiations and input from business;
- The use of unilateral export controls should be strictly limited.

IBM has suggested for years that the reform of export controls or adoption of new controls should be based on these principles, because, in a global economy, a multilateral control regime is most effective. Controls should address policy goals but also must be practical and workable in a global economy. For example, where comparable items are available from non-

U.S. sources, it is simply not a productive use of resources to attempt to control unilaterally these types of U.S. exports. Indeed, experience has shown that unilateral controls create a burden on business, decrease competitiveness, waste government resources that could be used in more effective manner, and fail to achieve stated policy objectives.

IBM recommends that the Bureau of Industry and Security (BIS) carefully review the categories and items selected to determine if there is foreign or domestic availability in China of the products or technologies. Specifically, as discussed below, where products have previously been established as mass market, we question the practicality of attempting to re-regulate items that have been deemed not to need controls and are widely available.

IBM also recommends that, as the regulatory process goes forward, BIS not finalize this Proposed Rule until and unless there is agreement from a strong majority of Wassenaar countries to implement similar rules. If other supplier countries do not agree to the same or very similar measures, this rule will disadvantage U.S. exporters without achieving the sought after result. During the Cold War period, COCOM was highly effective because it was multilateral and was respected by all suppliers. The U.S. Government should be seeking the same level of multilateral support for this rule to ensure that it is effective.

II. The Department's Definitions of "Military End-Use" and "Knowledge" Are Overly Broad and Should Be Narrowed

IBM has created a highly developed worldwide export control network of more than 260 people, worldwide, to implement far reaching internal control programs for compliance with U.S. export laws and regulations. This network has been in place for more than 23 years. Despite having this level of resource and significant expertise, IBM is concerned that the broad terminology in the Proposed Rule will create open ended compliance exposures for sales of

commercial items, such as hardware, software and components, to hybrid civilian/government supported entities or into distribution channels that do not lend themselves to be readily monitored for ultimate end users. Specifically, we have strong concerns that overly broad interpretations of "military end-use" and "knowledge" could lead to unjustified enforcement actions, creating a chilling effect in selecting customers with which to do business. Given the complexity of the Chinese market and long history of the Peoples Liberation Army (PLA) in many purely civilian enterprises, this is not an abstract concern.

Likewise, the exporting community will struggle with these broad definitions, which would require investigations of sales transactions to an absurd level -- especially for parts or components. For IBM, we estimate that it will take an additional 2-4 full time headcount to reformulate and expand screening practices along with updated education to prepare for this regulation as proposed. This does not include any estimate for additional customer inquiries or internal evaluations that would undoubtedly occur given the current draft.

As discussed below, these definitions developed by BIS should be narrowed substantially to provide industry with clear and practical guidance to ensure compliance.

A. Military End-Use

Per the Proposed Rule, the definition of "military end-use" means: "incorporation into, or use for the production, design, development, maintenance, operation, installation, or deployment, repairs, overhaul or refurbishing of items. . . ." Proposed Rule, 71 Fed. Reg. at 38318. This is simply too broad a definition to be practical. Terms like "deployment" and "maintenance" are not defined and could capture a variety of activities, leaving it extremely difficult for companies to screen against such end-use. For example, some IBM customers, such as Chinese electronics manufacturers, have large and complex lines of business and our

capability to understand all possible uses of IBM products and components is not possible. Moreover, under the Proposed Rule, a customer could be using IBM products 99.9 % of the time in an acceptable end-use but still run afoul of the regulation if a peripheral use of the item is interpreted to be part of a military end-use. In short, we believe that the breadth of the concept of "military end-use" and inability to discern its meaning and screen for it could have a substantial effect on the day-to-day transactions of large companies with their large customers. To illustrate this point consider the following hypothetical:

A Chinese telecommunication equipment manufacturer requests custom designed semiconductor chips for their main communications product and some mid-range servers to incorporate into network monitoring. The company generally appears to be a civilian company supplying both the domestic and export markets for communications equipment. However, it is obvious that any large institutional customer could use their products, including military units. The company participates at industry trade shows where the military attends for product evaluations. If the U.S. vendor estimates that an extremely high percentage of their products are going to the civilian market but a small percentage may be going to the military market, military bases, etc., do they have knowledge of a potential "military end-use?" Should they avoid a customer of this type?

Further, one of the ultimate end uses for the Chinese telecommunications company is to install communications at a local airport that allows both civilian and military aircraft to land. Do the expansive terms in the definitions of military end-use create liability here despite the vendor's inability to predict a downstream use of their components? One could argue that serving the airport is a form of "deployment" for the air force. The communications amount to an "operational" aspect and "service level monitoring" by the servers at company headquarters are maintenance in support of a military end-use.

Businesses will be faced with these complex questions more often than expected when dealing with hybrid entities that have some government ownership, control or connection. As an alternative to the current Proposed Rule, IBM requests that the definition be revised to address more practical concerns and thus be more enforceable. For example, military end-use could be limited to an item "incorporated into" or "embedded" within a specific munitions list item or other military weapon. This would significantly clarify the definition for both industry and government. American business will be able to identify specific situations that may constitute a military end-use, rather than an open-ended list of possibilities. Likewise, BIS will be able to more clearly discern what are permissible and prohibited actions under the regulations. At the same time, this more concrete definition preserves the intent of the Proposed Rule, i.e., to prevent a "material contribution" to the Chinese military.

B. Knowledge Standard

The "knowledge" definition is also highly problematical due to the unique attributes of the Chinese market and historical involvement of the PLA in so many industries. From a compliance standpoint, an American business will have difficulty discerning what constitutes "knowledge," because they will seldom have a complete picture of their customer's business, as discussed above.

Again, our concerns emanate from a practical perspective. It is well known that the Chinese government, and more specifically the military, has been or is currently involved with many commercial industries and universities. Many of the contacts may be unrelated to a military end-use but as a vendor in China, IBM believes that industries will be struggling with customer evaluations for even innocuous situations, such as a software sale to a State Owned Enterprise with military management connections. Consequently, companies will be forever attempting to determine how diligent they must be in assessing a relationship. Even for the most

diligent of companies, cultural differences and business practices may likewise preclude them from assessing how close the military relationship might be with their customer. In the competitive world of information technology, IBM's customers are not necessarily open to providing information on their own downstream customers. This reticence, which is based on competitive reasons and not unique to China, underscores the difficulty of obtaining such information about downstream parties. We also have concerns that if our employees in China are repeatedly requesting detailed information about their customers' business, including the use of IBM products, they may be accused by the Chinese authorities of unauthorized activities.

With this definition, IBM foresees extensive debates on what constitutes "knowledge" and when a fact was known. While BIS policymakers have given assurances that the proposed interpretation will be applied fairly and judiciously, we are concerned that the Office of Export Enforcement may see cases differently, depending on the policy conditions of the moment, headlines of the day, and future personnel changes in the Department.

IBM recommends that BIS redraft the definition of "knowledge" to be "actual knowledge" or "is informed," which was verbally suggested by BIS officials in early discussions on this proposal. Furthermore, IBM notes that the United Kingdom employs an "as informed" approach in the Wassenaar context (as mentioned in comments submitted by ICOTT – the Industry Coalition on Technology Transfer), so a change to that effect would establish a consistent approach.

This recommended change in "knowledge" and a narrowing of the "military end-use" definition would be an immense improvement, enabling exporters to screen customers based on clear criteria and standards and providing government officials with clarity in enforcing the regulation. Even if BIS does not adopt our suggested definitions, we urge the Department to supply industry with additional guidance. The exporting community will need direction when

evaluating supply chain relationships and determining when a transaction can be so remote as to ensure a lack of "knowledge." In that regard, BIS might consider how the contracting process could be used to provide a level of confidence to vendors, where a customer affirms he is not selling to military customers. IBM also suggests that BIS set parameters to ensure timely responses to exporter requests for guidance about a customer, transaction, or end use. Exporters need to be able to react to market situations and cannot wait weeks for answers to questions. We believe BIS should establish a deadline of 48 hours, absent extraordinary circumstances.

III. BIS Should Remedy Specific Category Concerns Prior to Adopting a Final Rule

The Proposed Rule states that it seeks to limit exports "that would make a material contribution to the PRC's military capability" and applies to 47 categories of products. Proposed Rule, 71 Fed. Reg. at 38313. IBM is interested in this application to products and technology in categories 3, 4 and 5. IBM believes that BIS has drafted these categories too broadly and should revise these to reflect current market realities, including the foreign and domestic availability of such products and technology in China and the public availability or ready accessibility of other products and technology throughout the world.

A. Category 4: Computers and Associated Software and Technology

In April 2006, BIS issued a new regulation changing the current control level for high performance computers to Tier 3 Countries after the agencies concluded that technology had eclipsed the previous level set more than 3 years ago. Despite this conclusion, the Proposed Rule seeks to effectively roll back 0.75 to 0.10 Weighted Teraflops (WT) for computers destined to customers with military end-uses.

IBM believes this roll back does not serve national security objectives, due to the availability of such systems being produced domestically in China, foreign availability of similar machines in China, and the ability to cluster low power computers to exceed these performance levels. Given these sources, re-regulating this category will consume both public and private resources for little discernible national security benefit. Furthermore there is the potential for other countries' suppliers to screen out U.S. products and components in final products being exported to China if they foresee these items creating supply chain difficulties and re-export issues.

Currently, server manufacturing is being performed in China by Dawning Information Industry Company, LangChao (recently renamed InSpur), Lenovo, Founder Group and Powerleader. Of particular note, Dawning not only supplies high-end servers but also has delivered a Supercomputer ranked in the top 100 (on the top 500 most powerful list as of November 2006) at the Shanghai Supercomputer Center. Lenovo has delivered a system in the top 150 to the Chinese Academy of Sciences. Bull, a French corporation, is distributing their servers with Lenovo after they signed a 5-year distribution agreement in 2004. With this type of both domestic and foreign availability, we respectfully request that the limits for computers and associated software and technology for their development, production, or use be set uniformly either at 0.75 WT or at a level reflecting current capability or availability in China.

In the event that BIS establishes a level less than 0.75 WT, IBM requests that it be established as a fraction of the 0.75 WT level so that, over time, if the 0.75 WT control level

increases, the control level in the Proposed Rule will rise accordingly without the need to revise this regulation. For example, if the level was established at 0.50 WT, it should be expressed as two-thirds of the current control level.

In addition to the impact on finished computer systems, the Proposed Rule also has a significant impact on U.S. companies seeking to partner with the burgeoning Chinese computer industry - even low-level products such as PCs - because the technology control level is set so low. The reference to 4E992 (Proposed Rule, 71 Fed. Reg. at 38318) will only allow technology to be shared with a WT value of 0.00001, effectively zero. IBM recommends this issue also be reexamined because BIS has neither brought forth a specific justification for these changes nor established how these new control thresholds will resolve a particular problem. For low-level commodity products that are ubiquitous worldwide, IBM does not see the justification for development controls that will effectively block U.S. company participation.

B. Encryption products in Category S

Some software products that IBM develops and manufactures would be subject to the Proposed Rule in Category S, principally due to the use of encryption. These products are generally middleware for businesses along with some operating systems software. We commend BIS for recognizing that mass-market 5D992 software, which has been widely available for years, should fall outside the purview of the proposal. However, IBM questions why weaker encryption in some products is covered (64 bit encryption). If the control reason is for

encryption, such control is unnecessary and inconsistent, given the determination that mass market need not be covered.

Given the public availability on the internet of strong open source code with cryptographic libraries (frequently used in many U.S. software applications), we believe that it is not realistic to control products in this area based on their encryption content. Unlike some other countries, China's IT sector and university population has adequate expertise in working with computer systems and software code. Limiting the sale of U.S. commercial products containing cryptography will not limit the availability of cryptographic software in China. A government entity will use available resources to formulate their own security features. A recent request to IBM illustrates this point. A civilian government entity sought a broad based license for one of our middleware products to be deployed in many facilities around China. As part of the bid, they requested the software have the IBM cryptography removed so the customer could deploy its own cryptographic solution. While this is not typical, it is not surprising either. Customers can resort to opting out of the use of American cryptographic solutions, because China has a domestic industry experienced in developing their own cryptographic products. For example, Beijing TOPSEC is a leader in the Chinese network security industry and has produced a variety of security products, including firewall products. The company has more than 1000 employees, over 10,000 customers, and between 7 and 15% market share, depending on the product. There is also additional evidence of the indigenous capability in China, as demonstrated by the 2004 effort to develop the country's own Wi-Fi area (WAPI) standards to be more competitive nationally and globally. Taken together - a domestic industry that is expanding, open source availability and educated population - these factors lead IBM to question why BIS is seeking to regulate products in this category.

While the Proposed Rule did not mention 5D002 software eligible for export to China under License Exception ENC-Unrestricted, IBM understands that BIS may be considering the

addition of it to the existing list of items. We are opposed to such a revision, based on the foregoing comments. In addition, cryptography in many 5D002 "Unrestricted" products in IBM's portfolio is the same as that contained in 5D992 Mass Market products. The differentiating factor in the classifications is principally the volume of the products sold. Therefore, adding 5D002 "Unrestricted" products to the covered categories would not be based on some unique factor associated with stronger cryptography (the dominant reason for control) but with anomalies in the regulatory framework. We strongly urge BIS not to expand coverage to this class of product because these products, like the mass-market products, have been widely available for years and are distributed broadly. Any attempt to restrict these products would, therefore, represent another compliance challenge to industry.

C. Category 3 Semiconductor Technology

The broad technology controls in Category 3 could potentially cover absurdly low levels of electronic test equipment technology. The result of this control is that BIS would be regulating technology for the development, production and use of such common equipment as voltmeters and ohmmeters (typically used by electricians) under the 3A992.a category covering "electronic test equipment." We doubt this type of control was the goal of this proposal but it represents one of the unintended consequences of drafting a control on a broad category of items. We strongly suggest that any restrictions on this category be eliminated or drafted more narrowly.

IV. The Department Should Widen the Scope of the Proposed Verified End-User

BIS has introduced the concept of the "Verified End-User" (VEU) as a key element of the Proposed Rule, ostensibly to streamline and enhance the export approval process. IBM believes that this proposal is potentially somewhat positive, heavily subject to widening of its

scope. While it is insufficient in its current form, IBM believes there may be potential to develop it into a successful policy tool, especially if subsidiaries of U.S. corporations are given more favorable treatment.

As proposed, the VEU contains elements similar to an individual license and bulk license. While the VEU could potentially have advantages over these, the Proposed Rule fails to provide sufficient incentives via the VEU to outweigh the burdens that come with the program (e.g., on site reviews, record keeping, etc.). Under the VEU, a business would be subject to administrative oversight on a broader scale than in an individual license. In the current draft, IBM does not see much of an advantage to obtaining a VEU if the scope of the approval is for a single type of transaction, if lists of ECCNs have to be updated regularly as customer orders change, or if it does not include technology for manufacturing or development. A more innovative approach would be to allow the VEU to receive products and technology associated with an entire range of eligible ECCNs, not just a particular set of items.

In addition to the above suggestions, there would be significant U.S. industry interest in a "Two Tier" system for the VEU, with a separate status available for the subsidiaries of U.S. corporations that would permit a broad number and type of transactions under one approval. For subsidiaries of U.S. companies, we could foresee the need to apply in a single instance for multiple types of items with different technologies. For instance, under such a system, IBM could apply for a range of Application Specific Integrated Circuits (ASIC) internal design approvals for semiconductor chips or manufacturing and development technology above that which currently requires export license (3E00x technology). This would provide a significant benefit over having to obtain multiple individual licenses that might be needed over a period of years. As a U.S. company with subsidiaries worldwide, IBM believes that the established

connection between a subsidiary and a U.S. company with a compliance program in place ameliorates traditional concerns, such as a lack of familiarity with the business or a fear that the foreign company is not familiar with U.S. export laws and regulations. Thus, the connection between U.S. companies and their foreign subsidiaries justifies more beneficial conditions to these entities, such as expanding the VEU to cover higher-level licensable technology to them.

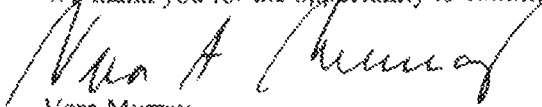
Notwithstanding the suggestions above, IBM has concerns regarding the budget and resources for BIS and other agencies to execute the program as proposed. It is clear that BIS will take on new requirements and activities, not only with the administration of the VEU program but also in advising exporters who request advice. It is imperative that management of this program be adequately staffed and funded, so exporters can obtain quick responses. If interagency responses are contemplated, the U.S. Government must be ready to commit new funding to the other agencies so they can provide useful and timely assistance to avoid assessment delays. BIS's attempt to establish a new regulatory framework for China (and other countries in the future) will be ineffective without building the requisite internal management framework and providing the necessary funding to execute. Investigating and approving VEU candidates in China may be a substantial undertaking, depending on the responses from Chinese companies. It is critical that the agencies be ready for these possibilities and an immediate backlog not develop.

V. Conclusion

In summary, IBM supports the Administration's efforts to establish an effective national security policy, but we believe that regulation must be closely linked to multilateral efforts that are practical, enforceable and represent meaningful controls to address a particular problem. The Proposed Rule is overly broad, unilateral in nature, and seeks to control some products and technologies that are widely available. IBM does not believe this particular Proposed Rule will

achieve its objective as currently drafted and recommends that it be substantially altered in line with the above comments.

We thank you for the opportunity to comment.



Vera Murray

Director Export Regulations

IBM Corporation

1301 K St. N.W. Suite 1100

Washington, DC 20005

From: "Cannon, Jr., James" <jcannon@williamsmullen.com>
To: <publiccomments@bis.doc.gov>
Date: Mon, Dec 4, 2006 4:52 PM
Subject: RIN 0694-AD75

This email contained an attached file "CEUcmmtsCogent.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?91281161673FFFF96905AECB7BCB4AB64574986100092542> Per BIS policy, the file(s) attached to this message have been held in quarantine. If you are certain the file is a legitimate business document, forward this message to the BIS Help Desk (ITHELP) and ask to have the attachment(s) released.

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Attached please find comments of Cogent Systems, Inc., with respect to the Revisions and Clarification of Export and Reexport Controls for the PRC. Thank you.
<<CEUcmmtsCogent.pdf>>

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December 4, 2006

Sheila Quarterman
Regulatory Policy Division
Bureau of Industry and Security
U.S. Department of Commerce
14th Street & Pennsylvania Avenue, N.W.
Room 2705
Washington, DC 20230

Attention: RIN 0694-AD75

Re: Revisions and Clarification of Export and Re-export Controls for
the People's Republic of China (PRC); New Authorization
Validated End-User

Dear Ms. Quarterman:

On behalf of Cogent Systems, Inc., a leading U.S. producer of fingerprint retrieval systems, we submit these comments regarding the proposed revisions set forth in the July 6, 2006, *Federal Register*, 71 Fed. Reg. 38,313 (July 6, 2006). As explained below, these comments are made in connection with the comments filed by Cogent on November 22, 2006, in the proceeding concerning Foreign-Policy Based Export Controls. Therein, we explain that the national interest would be served by lifting the suspension on export licenses with respect to fingerprint retrieval systems. If the proposed revisions and clarification of export controls for the People's Republic of China (PRC) are not adopted by next August, the case for licensing exports of fingerprint retrieval systems is a strong one. Yet, if the proposed revisions become final regulations, there is an even stronger case for lifting the suspension on export licenses for fingerprint retrieval systems.

Under current regulations many of the fingerprint retrieval systems manufactured in the United States by Cogent Systems cannot be exported to China. So-called "one-to-many" fingerprint matching systems are covered by the "Crime Control" provision, and export licenses are suspended by the Tiananmen Square Sanctions Act. Cogent has separately requested that the Bureau of Industry and Security (BIS) remove certain

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fingerprint control systems from the ambit of this provision.¹ The establishment of additional safeguards, particularly the proposed rules expanding the use of End-User Certificates and visits and the new authorization for "Validated End-Users" (VEUs), lends further support to Cogent's November 22 request.

Any strengthening of the export control regulations will allow for exports of fingerprint retrieval systems while ensuring that such systems are not misused. For example, the requirement that exporters must obtain an End-User Certificate from the PRC Ministry of Commerce will help to ensure that exported fingerprint retrieval systems are properly used for security and law enforcement purposes. Expanded ability to conduct end-use checks and visits will further ensure that exports of such technology are not applied to the uses proscribed by the Tiananmen Square Sanctions Act.

That is, the enhancements offered by the proposed revisions have the potential to expand trade—at least so long as the revisions do not create administrative problems that impede U.S. competitiveness. The proposed revisions thus offer the opportunity both to strengthen the export control regulations and to relax the existing suspension of licensing authority for fingerprint retrieval systems.² Indeed, to the extent that Chinese end users of fingerprint retrieval systems are VEUs, the logic for including fingerprint retrieval systems under the "Crime Control" provision is even weaker. As noted in the proposed regulation, VEUs would be those end users with a "demonstrated record" of avoiding activity contrary to U.S. foreign policy interests. 71 Fed. Reg. at 38,315.

The upcoming Olympics offers a major export opportunity for the U.S. fingerprint retrieval industry to advance several vital U.S. interests.³ Security procedures at the Olympics are likely to require that all workers be fingerprinted to ensure that terrorists do

¹ Cogent's comments were filed on November 22, 2006, in response to BIS's request concerning Foreign Policy-Based Export Controls and are expected to appear on the BIS website at <<http://efoia.bis.doc.gov/>>.

² To achieve this result, the President must make a finding called for by section 902(b) of the Tiananmen Square Sanctions. The basis for such a finding is discussed in detail in Cogent's November 22, 2006 submission.


³ The Congressional Research Service recently reported that consideration has been given to lifting temporarily all or portions of the Tiananmen Square Sanctions in connection with the 2008 Olympics. CRS, Rep. No. RL33001, "U.S.-China Counterterrorism Cooperation: Issues for U.S. Policy" at 7 (June 27, 2006), <http://fpc.state.gov/documents/organization/71784.pdf> (accessed Dec. 1, 2006).

not gain access to the events. Under current export control procedures, U.S. manufacturers cannot participate even in the bidding to supply fingerprint retrieval systems—despite that leading producers such as NEC Corporation have already installed fingerprint retrieval systems in China. Cogent's November 22 comments ask BIS to balance the security and commercial interests favoring U.S. exports against the concerns reflected in the Tiananmen Square sanctions. If the proposed BIS regulations are added to that balance, the case for lifting the license suspension is even stronger.

That is not to say that the existing restrictions on exports of fingerprint retrieval systems are appropriate or warranted unless the proposed regulations become final. To the contrary, existing license requirements will be perfectly adequate to protect against misuse of such systems. Hence, lifting the suspension on export licenses for fingerprint retrieval systems need not await the adoption of the proposed regulations.

As noted in the proposed regulations, modification of existing Foreign Policy-Based controls occurs only after Congress is advised pursuant to section 6 of the Export Administration Act. 71 Fed. Reg. at 38,316. Likewise, Cogent's pending request to lift the license suspension on fingerprint retrieval systems requires a report to Congress. Therefore, in assessing whether the license suspension is in the national interest, it is appropriate also to consider any proposed revisions or VEU authorization and the likely impact of such measures on exports of fingerprint retrieval systems. If the proposed regulations are adopted by August of next year, any report to Congress should reflect the even stronger case for lifting the suspension on export licenses for fingerprint retrieval systems.

Respectfully submitted,



James R. Cannon, Jr.
Williams Mullen

Special Counsel for Cogent Systems, Inc.

From: <slita@deweyballantine.com>
To: <publiccomments@bis.doc.gov>
Date: Mon, Dec 4, 2006 4:57 PM
Subject: RIN 0694 --AD75 - EMS Coalition's Comments on Proposed Rulemaking

This email contained an attached file "EMS_Coalition_Comments.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?782BFD3628ED3791758C62F5E97026E1457499B10005321F>
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Attached please find the EMS Coalition's comments in response to the July 6, 2006, proposed rulemaking (RIN 0694--AD75) to revise and clarify the United States' policy for exports and reexports of dual-use items to the People's Republic of China.

-Steve Lita

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CC: <CMcFadden@deweyballantine.com>

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December 3, 2006

Office of Exporter Services
Regulatory Policy Division
Bureau of Industry and Security
U.S. Department of Commerce
14th Street & Pennsylvania Avenue, N.W.
Room 2705
Washington, D.C. 20230

ATTENTION: Sheila Quarterman

Re: RIN 0694-AD75. Request for Comments on Revisions and Clarification of Export and Reexport Controls for the People's Republic of China; New Authorization Validated End-User (71 Fed. Reg. 38313)

Dear Ms. Quarterman:

The Electronic Manufacturing Services Coalition ("EMS Coalition") is pleased to submit comments on the Commerce Department's proposed rulemaking to (i) impose licensing requirements for export and reexport to the People's Republic of China ("PRC") relating to military end-use, (ii) expand the end-user certificate requirement and (iii) create a validated end-users ("VEUs") authorization.

The EMS Coalition is comprised of leading companies that offer design, engineering, logistics and manufacturing services worldwide in the aerospace, automotive, computing, consumer goods, industrial, infrastructure, medical and telecommunication industries.

The EMS Coalition does not believe the revisions regarding China military end-users are justified or will be effective. Commercial-off-the-shelf ("COTS") items that are widely available throughout the world are simply not capable of making a material contribution to the PRC military. The expansion of the end-user certificate requirement is likely to create many difficulties for Chinese customers and be unevenly applied by Chinese officials to the detriment of U.S. exporters. And while the EMS Coalition

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endorses the concept of a VEU, many concerns arise with respect to Commerce Department implementation.

Military End-Uses

The Commerce Department has not explained how the 47 Export Control Classification Numbers ("ECCNs") identified in the proposed rule, which are currently not subject to national security controls, can make a material contribution to the advancement of the PRC military.

Further, the license requirement for military end-use of these 47 anti-terrorism-controlled ECCN's will be inconsistent with other national security-controlled items that can be legitimately exported to China despite military or government end-use; e.g. 5A002 with license exception ENC Unrestricted treatment.

In addition, the unilateral nature of the proposed revisions will adversely impact the competitiveness of U.S. electronic manufacturing suppliers without any benefit to U.S. security interests. Unnecessarily increasing export controls on U.S. companies will merely result in customers in China contracting with suppliers in countries with less restrictive export policies. The Commerce Department should ensure that the proposed rule has the full participation of other Wassenaar Arrangement member countries prior to its promulgation.

Finally, the EMS Coalition objects to the Commerce Department's desire to expand the list of parties who are liable for an export transaction to include entities that merely support the exportation. Suppliers, freight forwarders and other intermediaries should not be required to accept responsibility or liability for the end-use of an export. Maintaining an efficient supply chain is crucial to EMS companies and increasing the obligations of supply chain participants who have little or no responsibility or control over the final end-user is sure to be costly and unproductive. End-use responsibility should not extend beyond the exporter and the end-user.

Changes to End-User Certificate Requirements

The proposed rule does not provide a justification for revising the end-user certificate requirements or explain how end-user certificates will facilitate the Commerce Department's ability to conduct end-use checks.

The proposed rule would create a significant change to the issuance of end-user certificates. The EMS Coalition is concerned about the willingness of the Chinese government to comply with these proposed changes as well as the Chinese government's ability to expeditiously process end-user certificates. Unless the Chinese government dedicates a significant amount of resources and manpower to the implementation of this proposed change, U.S. companies would see substantial delays in export approval.

Proposed Validated End-User Authorization

The EMS Coalition commends the Commerce Department's efforts to streamline the export licensing system, increase efficiency and reduce the need for duplicative licenses. However, while the proposed rule could potentially provide benefits to some U.S. exporters, the EMS Coalition remains concerned about some of the details of the proposed VEU authorization's implementation.

First, the EMS Coalition is concerned that its Chinese customers will find the proposed VEU authorization process intrusive and burdensome and will therefore decline to participate in the system. The Commerce Department should strive to simplify the VEU authorization process and limit U.S. Government interventions imposed on Chinese companies.

Second, the EMS Coalition is concerned that Chinese companies may be reluctant to submit themselves to U.S. legal jurisdiction and expanded U.S. requirements such as on-site visits, audits and record-keeping. Therefore, the Commerce Department should strive to simplify the VEU authorization process so that its requirements are not disproportional to its alleged benefits.

Third, the Commerce Department should ensure that VEU authorization process can accommodate the needs of EMS companies and provide a benefit over individual export licenses. To this end, export licenses to VEUs must be flexible, able to expand to cover additional products and technology and amenable to routine updates.

Qualifying subsidiaries of EMS companies that operate in China under the VEU offers a genuine opportunity to eliminate extensive and repetitious export license activity to the benefit of industry and government. To achieve its potential, the proposed VEU authorization should proceed as a measured expansion of the current licensing process rather than as a set of unique undertakings and conditions. If the proposed changes result in companies bearing substantial new costs and restrictions, the VEU system will not be worth the effort, nor will it be an attractive alternative to individual licenses.

Fourth, the Commerce Department should likewise ensure that the initial VEU application process does not impose hurdles so great that Chinese companies will be reluctant to participate in the process and instead opt to continue importing under individual export licenses. Ongoing obligations, restrictive license conditions and intrusive on-site inspections could lead the VEU system to be viewed by Chinese importers as an excessive burden and not a benefit. If the VEU system starts on a small scale and gradually expands, it may be more palatable to companies.

Finally, because VEU authorization requires the consent of an U.S. interagency working group, the EMS Coalition is concerned that long delays and uncertainty will be introduced to the authorization process. A protracted VEU authorization process could lead Chinese companies to seek exporters in countries with a simpler and more expedient

Office of Exporter Services
December 3, 2006
Page 4

export licensing system, thus defeating the purpose of the proposed rule. The Commerce Department should therefore work to ensure that the VEU authorization process does not take longer than the existing export licensing process.

The EMS Coalition appreciates the opportunity to comment on the proposed rule. Please feel free to contact the undersigned if you have questions regarding these comments.

Sincerely,

A handwritten signature in black ink, appearing to read "W. Clark McFadden II". The signature is fluid and cursive, with a long horizontal stroke at the end.

W. Clark McFadden II
Counsel to EMS Coalition

From: <mjenkins@newarkinone.com>
To: <publiccomments@bis.doc.gov>
Date: Mon, Dec 4, 2006 6:18 PM
Subject: Comments on Proposed China Export Control Rule - Newark InOne

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Dear Ms. Sheila Quarterman,

Please find attached Newark InOne's comments on the proposed rule for export, reexport, and in-country transfer controls to the People's Republic of China (PRC) and the new authorization for Validated End User (VEU).

<<China Rule - Newark InOne comments.doc>>

A signed original will be following via overnight mail.

Regards,

Matt Jenkins
International Trade Manager
Newark InOne
Ph: 773-907-5719
Email: mjenkins@newarkinone.com

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November 30, 2006

Ms. Sheila Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry & Security
Department of Commerce
14 St. & Pennsylvania Ave. NW, Room 2705
Washington, DC 20230

Attn: RIN 0694-AD75

Re: Comments on Revisions and Clarification of Export and Re-export
Controls for the People's Republic of China (PRC); New Authorization
Validated End-User
Docket No. 060622180-6180-01

Dear Ms. Quarterman,

We would like to express our thanks for the opportunity to comment on the proposed rule for export, reexport, and in-country transfer controls to the People's Republic of China (PRC) and the new authorization for Validated End User (VEU). The proposed rule creates serious concerns within the companies and trade associations in our industry.

We are sincerely committed to strict compliance with U.S. export control laws. However, phrases like "trade barrier for U.S. companies" and "heavy administrative burden" have companies concerned about the cost/benefit of doing business with the PRC. We would like to outline some of the detrimental affects of the proposed rule both in terms of complicating trade between the U.S. and PRC while at the same time creating trade barriers for U.S. companies in the global market. We believe the proposed rule would not enhance the protection of the national security.

Our company, Newark InOne, is a market-leading, knowledge-based distributor of electronic components, stockroom management services and eProcurement solutions. Newark InOne provides customers with exceptional one-to-one services, the most appropriate selection of electronic products and unique value-added services through an

understanding of individual customer needs. Customers include professionals working in design, maintenance and purchasing.

Newark InOne is part of the global Premier Farnell group in the United Kingdom. We supply electronic components to over 100 countries and we have a physical presence in more than 20. In the coming year our company expects significant expansion the Asia market, especially China where we will be opening two third party warehouses. In these warehouses, we will be stocking over 35,000 different electronic components and parts. These parts include semiconductors, passives, interconnect products, wire, cable, optoelectronics, power supplies, electrical and circuit protection products, test / measurement equipment, as well as many other electronic components and parts.

New Authorization Validated End-User (VEU) (Proposed Section 748.15 of the EAR)

After careful scrutiny of the VEU requirements, the following areas of concern have become evident.

- **BIS would accept requests to be listed as a validated end-user in the form of an advisory opinion request, as set forth in the proposed new section 748.15(a)(2) of the EAR.**

Comment: The process and requirements look and feel like a license application process which validates the end user as a civil rather than a military entity. There does not seem to be a big difference in the VEU process from applying for an export license for a particular product and end-use. This is especially the case if the PRC customer does not purchase many licensable products on a regular basis. Moreover, to the extent this proposed procedure creates difficulties for the PRC customer, the customer will simply turn to other foreign or domestic sources of supply for these products. Most of these products that would be subject to control under the proposed rule are quite readily available from non-U.S. sources.

- **The U.S. exporter or the Chinese end-user may apply for the Chinese company to be listed as the VEU.**

Comment: We do not think BIS has provided a meaningful incentive for applying for VEU status. Companies are asking, "Why would a U.S. company "A" want to go through the administratively burdensome and costly process of preparing and submitting a VEU application for PRC customer "B," only to have B listed on the BIS website, which then would allow all competitors shipping goods subject to the EAR to "piggy back" on company A's efforts?"

Under this scenario, company A would definitely lose a competitive advantage under this process, while applying for an export license, which is a similar and perhaps less cumbersome and costly process, would protect A's competitive advantage.

The U.S. Government has told us in public meetings that the Chinese companies will

be coming forward to apply for VEU status. But it is our experience in the PRC market that no Chinese customer willingly comes forward with information about their business or willingly sign any documents required by the U.S. companies to meet due diligences standards, e.g., Civil end-use statements for CIV license exceptions; End-Use Certificates; End Consignee Statements; and so on.

- **The VEU authorization would be for an “indefinite period”, subject to periodic U.S. Government reviews of the records of the VEU and the records of the exporters/re-exporters who use authorization VEU.**

Comment: One requirement of VEU authorization would be to permit periodic on-site audits. We do not believe the Chinese government or the Chinese company will allow such audits. We have heard no positive comments from the Chinese government or our PRC customers about the VEU authorization. Moreover, since the U.S. Government has not clearly defined the duration of an “indefinite period,” it remains unclear what events might trigger a withdrawal of a person’s VEU status, or what would be the expectations for conducting a “review of records.”

- **Exporters, re-exporters and validated end-users using the VEU authorization would be required to comply with certification, recordkeeping and reporting requirements and would be subject to routine audits as described in proposed sections 748.15(e) and (f).**

Comment: The additional administrative burden for managing the VEU certification, recordkeeping and reporting requirements can be likened to an application for a Special Comprehensive License and follow up management of the license to fulfillment. Systems would need to be updated to flag, monitor and report the quoting, sale and shipping of the 47 ECCNs as well as the VEU status of the PRC customer. People would need to be trained on the process, including but not limited to: salespersons, marketing, export administration and warehouse operations. A significant financial and labor cost would exist for each VEU application and shipment tracking.

- **Foreign availability will be taken into account in determining whether all 47 ECCNS should be covered by the proposed military end-use controls.**

Comment: The proposed rule casts a wide net over the 47 Export Control Classification Numbers (“ECCNs”) that would be affected. However, it fails to take into consideration the fact that many products in these categories (e.g., 3A292, 3B991, 4A994, 4D994, 5A991, 5A992 and 5D992) are readily available in PRC, other parts of Asia, as well as Europe. Some of these products are manufactured by non-U.S. companies, such as Pintek Electronic Co. (Taiwan), Spectrum GmbH (Germany), GW Instek (Taiwan), Acer (PRC), Lenovo (PRC), Meilhaus Electronic (Germany), Huawei (PRC), and a host of other manufacturers. These products, therefore, will escape the strict controls contemplated by the proposed rule. The result will be a significant increase in purchases of these non-controlled products, to

the detriment of U.S. companies, such as Newark InOne, that try so hard to operate within stringent U.S. export controls. More importantly, there will be minimal, if any, counterbalancing advancement of U.S. national security interest.

- **The current PRC End-User Certificate (from the PRC Ministry of Commerce) requirement applies only to items controlled for National security reasons. The new requirement would also extend to those items that would require an export license under the proposed military end-use restriction described in proposed new section 744.21 of the EAR.**

Comment: We have received no assurance from the PRC's Ministry of Commerce that they would be able to handle the additional requests for the End-User Certificates. We are not aware of any other U.S. exporters receiving such assurances, either. We believe Chinese companies would quickly conclude no incentive exists for them to accept this administrative burden, because they can quite easily source the products described in the 47 ECCNs elsewhere.

In conclusion, the following summarize trade barriers and administrative burdens that the proposed rule will place on U.S. industry, without producing any protection for the U.S. national security:

Administrative Burden & Additional Costs of Doing Business

1. The VEU application process is complicated, onerous and burdensome to the PRC customer and the U.S. exporter/re-exporter.
2. Systems and processes would have to be modified to manage the new requirements.
3. Employees will have to be trained and possibly, staff increased.
4. PRC customers will have to be persuaded to participate in the VEU application process and to maintain their VEU status.

Trade Barrier

1. We are convinced from our experience doing business in the PRC that Chinese customers will go elsewhere for the product rather than submit to the requirements of the VEU.
2. U.S. competitors would be able to take advantage of the VEU status that was hard won by another U.S. company.
3. Foreign companies not burdened by the restrictions of the proposed rule for the 47 ECCNs will have an open field with the PRC companies.

No Gain for National Security

1. The ability of the VEU to enhance national security depends entirely on how many PRC companies choose to use it.
2. Because of extensive foreign and local availability in the PRC for the products

described in the 47 ECCNs, which are currently not controlled to the PRC, our customers will be able to turn elsewhere for supplies – immediately and at comparable prices and quality – due to the competitive nature of our industry.

3. Given the current availability of these items, the PRC military will not be affected by the proposed rule in the slightest.

We urge BIS to withdraw this proposed rule. The national security interests of the U.S. will be better protected if BIS were to work with industry to develop a more rational and fact-based policy of controls on exports to the PRC that may actually make material contributions to clearly identified military capabilities of the PRC.

We would be pleased to join with the many industry associations and individual companies that are willing to assist BIS and other government agencies in developing a policy which would ensure that all companies, regardless of their size, will be able to meet the national security concerns of the U.S. Government in full compliance with existing export control laws and regulations.

Respectfully submitted,

Matt Jenkins
International Trade Manager
Newark InOne
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Chicago, IL 60640
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Email: mjenkins@newarkinone.com

❖ AAEL AMERICAN ASSOCIATION OF EXPORTERS AND IMPORTERS
The Voice of the International Trade Community Since 1921

F A X

TO: PLEASE DELIVER IMMEDIATELY to Sheila Quarterman
Tel No.: (202)
Fax No.: (202) 482-3355

FROM: Marianne Rowden, General Counsel DATE: December 4, 2006

RE: RIN 0694-AD75 PAGES: 7

Dear Ms. Quarterman:

We have been trying to electronically file AAEL's comments on the on Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC); New Authorization Validated End-User Docket No. 060622180-6180-01, RIN 0694-AD75. Unfortunately, as the enclosed e-mails indicate, we sent our comments twice, but we have not received a "return receipt" from our e-mail message.

Please accept these comments as timely filed as evidenced by the date and time stamp of our original e-mail to "publiccomments@bis.doc.gov". We will send a hard copy by mail.

Marianne Rowden

From: Marianne Rowden [mrowden@aaei.org]
Sent: Monday, December 04, 2006 5:09 PM
To: 'SHEILA QUARTERMAN'
Subject: FW: RIN 0694-AD75: AAEI Comments on Revisions/Clarifications of Export Controls for PRC Docket No. 06022180-6266-02

Importance: High

Dear Sheila:

Please forgive me for sending these comments to your e-mail as I want to make sure they are filed as I did not receive a return receipt by sending it to the "public comments" e-mail address. Thank you for your understanding.

Marianne Rowden

From: Marianne Rowden [mailto:mrowden@aaei.org]
Sent: Monday, December 04, 2006 4:59 PM
To: 'publiccomments@bis.doc.gov'
Cc: 'hnorthcott@aaei.org'
Subject: RIN 0694-AD75: AAEI Comments on Revisions/Clarifications of Export Controls for PRC Docket No. 06022180-6266-02
Importance: High

Dear Sir or Madame:

We are submitted the attached comments on behalf of the American Association of Exporters and Importers in response to the proposed rule on the Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC); New Authorization Validated End-User Docket No. 06022180-6180-01, RIN 0694-AD75. Please ensure that the attached comments are submitted to Sheila Quarterman.

If you have any questions or cannot open the attached document, please contact me immediately.

Marianne Rowden
General Counsel
American Association of Exporters & Importers
1050 17th Street, NW, Suite 810
Washington, DC 20036
Tel: (202) 857-8009
Fax: (202) 857-7843
E-Mail: mrowden@aaei.org

12/4/2006

Marianne Rowden

From: Marianne Rowden [mrowden@aaei.org]
Sent: Monday, December 04, 2006 4:59 PM
To: 'publiccomments@bis.doc.gov'
Cc: 'hnorthcott@aaei.org'
Subject: RIN 0694-AD75: AAEI Comments on Revisions/Clarifications of Export Controls for PRC
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Dear Sir or Madame:

We are submitted the attached comments on behalf of the American Association of Exporters and Importers in response to the proposed rule on the Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC); New Authorization Validated End-User Docket No. 060622180-6180-01, RIN 0694-AD75. Please ensure that the attached comments are submitted to Sheila Quarterman.

If you have any questions or cannot open the attached document, please contact me immediately.

Marianne Rowden
General Counsel
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12/4/2006

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PAGE. 03

AAEI American Association of Exporters and Importers

The Voice of the International Trade Community Since 1921

December 4, 2006

Via E-Mail: publiccomments@bis.doc.gov

Ms. Shelia Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry and Security
Department of Commerce
14th Street & Pennsylvania Avenue, NW
Room 2705
Washington, DC 20230

Re: Comments on Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC); New Authorization Validated End-User
Docket No. 060622180-6180-01
RIN 0694-AD75

Dear Ms. Quarterman:

On behalf of the American Association of Exporters and Importers (AAEI), we respectfully submit the comments below on the Bureau of Industry and Security's (BIS) proposed rule on the revision of export controls and new authorization validated end-user requirements for the People's Republic of China (PRC) amending 15 C.F.R. Parts 740, 742, 744, and 748, published on July 6, 2006, by the Department of Commerce. See, 71 Fed. Reg. 38313. We appreciate the opportunity to comment upon the instant proposal and the agency's extension of the comment period. See, 71 Fed. Reg. 61692.

AAEI has been the national voice of the international trade community since 1921. Its unique role, speaking for both Importers and exporters, is driven by its broad economic base of manufacturers, distributors, retailers and service providers, many of which are small businesses with important capabilities and technology to offer the many agencies of the U.S. Government. With promotion of fair and open trade policy and practice at its core, AAEI speaks to international trade, supply chain, export controls, and customs and border protection issues covering the expanse of legal, technical and policy-driven concerns.

As a representative of private sector participants engaged in and impacted by developments pertaining to international trade, national security and supply chain security, AAEI is deeply interested in the proposed Rule under consideration.

1. The Proposed Rule Should Be Withdrawn and Reconsidered

Consonant with the bulk of comments upon this proposed rule, notably those of the NAFTA which we support and others, we suggest, with regret, that the numerous negative aspects of the proposal are so significant and in turn the enhancement of U.S. national security likely to achieve so minimal as to warrant the withdrawal of the proposed rule and its reconsideration with BIS Technical Advisory Committees and the trade industry, a process in which we would be pleased to participate.

Without all our major trading partners, the proposed rule will negatively affect not only our members' trade with China, but also their trade with our allied trading partners who enjoy robust trade with China.

In particular, we note that the proposed regulation encompasses 47 ECCN Categories, which in turn cover hundreds of different products that are currently only controlled for AT purposes and do not require a license to the PRC. It is well understood that many of those targeted products are already adequately controlled in other ECCN's and moreover, are readily available in or to the PRC. Frankly, it appears that while providing limited enhancement of U.S. national security, this clearly hurts the global competitive position of U.S. exporters, and ignores the statutory framework for "foreign availability."

The breathtaking expansion of liability and scope without workable definitions of "military end use" or "material contribution to the capabilities of the PRC" is unwarranted, especially since BIS fails, to our knowledge, to provide the American business community with a clear road map for due diligence to comply with the proposed rule.

Also the Authorization VEU mechanism is ill-defined, non-AES conforming, and requires the supply of information contrary to Chinese national security legislation. In short, we believe that it will not work as proposed. Were it "flight tested" with our close trading allies, it might have the bugs worked out and be better suited for use in our most complex, but most important, trading relationship - China. We are also concerned about MOFCOM's and BIS' ability to expeditiously process either the EUCs or the license applications.

2. A Concrete Example Among Many

In many instances, it is clear that compliance with this proposed regulation would be difficult, lead to further competitiveness and trade balance issues. As a result, it is difficult to obtain concrete examples concerning the impact of the proposed rule on U.S. exporters. Nonetheless, among the many comments of our members, the following concrete example is instructive:

ECCN 3B991 encompasses "Equipment not controlled by 3B001 for the manufacture of electronic components and materials, and specially designed components and accessories therefor." In practical terms, 3B991 covers no less than 37 different subcategories. One of those subcategories, 3B991.b.2.a, includes photomasks (also known simply as "masks"). Masks are high precision plates containing microscopic images of electronic circuits. They typically consist of a transparent fused quartz blank with a layer of chrome on one side. Etched in the chrome is a portion of an electronic circuit design. They are used in wafer fabrication, mostly to make integrated circuits (ICs).

The proposed regulation would capture this very large category of photomasks, placing a difficult constraint on U.S. photomask exporters in an already extremely competitive environment. A thoughtful review of the proposed targeting of these photomasks demonstrates that such controls are: (a) unnecessary because there are already adequate controls in place for photomasks posing a National Security (NS) concern; (b) inconsistent because the resultant ICs made from ECCN 3B991

photomasks are classifiable in 3A991 - a category that is NOT targeted by the proposed regulation; and (c) Ineffective in accomplishing U.S. policy goals and harmful to U.S. exporters because photomasks are readily available in the PRC from both PRC and third country entities. Each of these points is further detailed below.

A. Photomasks are Already Subject to Stringent CCL Controls

In addition to 3B991 AT controls, certain photomasks are subject to stringent NS (as well as AT) controls in two other ECCN's:

3B001.g "Masks and reticles designed for integrated circuits controlled by 3A001";
3B001.h "Multi-layer masks with a phase shift layer [excluding certain masks designed for the fabrication of memory devices not controlled by 3A001]."

Exports of such photomasks require a license to China. To capture 3B991 photomasks in the proposed regulation simply serves to add to the compliance burden of U.S. photomask exporters without any justification that it is adequately serving a governmental interest, as detailed in Paragraph C below.

B. The Inclusion of 3B991 Photomasks is Inconsistent Because the Resultant ICs are Not Targeted in the Proposed Regulation

As noted above, the CCL controls 3B001.g photomasks and the ICs they are used to make, which are classifiable in 3A001. Various other ICs (*i.e.*, NOT controlled by 3A001) are classifiable in different subheadings of 3A991. However, the proposed rule does not target 3A991. It is reasonable to conclude that if 3A991 ICs are not targeted by the proposed rule, then the photomasks used to make those ICs should likewise be excluded from the rule. This type of inconsistency only serves to add to the burden of U.S. exporters.

C. The Inclusion of 3B991 Photomasks in the Proposed Regulation is Ineffective in Accomplishing U.S. Policy Goals and Harmful to U.S. Exporters Because Photomasks are Readily Available in the PRC from Both PRC and Third Country Entities

Photomasks are readily available in the PRC. The PRC's semiconductor industry has been growing quite rapidly and could not do so without photomasks. There are several "merchant mask shops" located in the PRC. These shops fabricate masks for use by IC companies. Specific examples include:

Supermask Co., Ltd.: www.supermask.com/doce/introduce.htm. According to its website, this company was established almost 10 years ago (in 1997) and boasts that it was the: "First specialized manufacturer of high precision large area chrome photomasks by direct laser writer in China." It is located in Shenzhen.

Toppan: www.toppan.co.jp. This summer, Toppan announced plans to expand its Shanghai facility. This will be the fourth expansion since it opened in 1996. It manufactures photomasks to manufacture semiconductor devices with 180nm design rules and additional lithography and inspection capacity for 250nm and above products. See

<http://www.eetimes.com/news/design/showArticle.html?articleID=19030150>

3

SMIC: www.smics.com/website/enVersion/Manufacture/maskServices.htm. According to its website, "SMIC's mask shop provides mask manufacturing services for SMIC's foundry customers and other fabs and institutions. Currently we have China's largest and most advanced mask making facility with 0.5 um to 90 nm capabilities. Equipped with state-of-the-art tools, the facility offers binary masks and phase shift masks complete with optical proximity correction. Both 5"x5" and 6"x6" reticles for I-line, G-line or deep UV KrF and ArF steppers and scanners are available." According to EETIMES, SMIC alone is expected to account for half of semiconductor equipment spending in China 2006 and 2007.
<http://www.eetimes.com/news/semi/showArticle.ihtml?articleID=192701187>

In addition to these photomask shops in the PRC, there are IC manufacturers with their own in-house or "captive" mask shops as well as many photomask manufacturers located in Asia and Europe that sell photomasks to China IC fabs. Those foreign mask manufacturers will certainly benefit from restrictions or additional compliance burdens that U.S. exporters would face for 38991 photomasks under the proposed regulation.

The above example highlights how hundreds of products would be captured by the proposed regulation and could cause unnecessary harm to the competitive position of U.S. exporters while not adequately serving a U.S. national security interest. While such results may be unintentional, AAEI urges BIS to carefully balance its desire to enhance national security with unnecessary burdens placed on U.S. exporters whose resources are already strained.

Conclusion

AAEI therefore urges BIS to abandon this proposed rule and instead work with U.S. exporters and our allies to develop a rational policy concerning exports to China.

AAEI and its members are available to discuss our comments with you and to assist in crafting a policy to ensure that all companies, regardless of their size, will be able to enhance U.S. national security in full compliance with existing export control laws and regulations.

Respectfully submitted,


Hall Northcott
President & CEO

cc: Melvin Schwechter, Co-Chair, AAEI Export Compliance & Facilitation Committee
Phyllis Wigginton, Co-Chair, AAEI Export Compliance & Facilitation Committee

From: "Jo-Anne Daniels" <Jo-Anne.Daniels@avizatechnology.com>
To: <publiccomments@bis.doc.gov>
Date: Mon, Dec 4, 2006 5:22 PM
Subject: Re: Proposed rule- Revisions and Clarification of export and Reexport Control for the People's Republic of China

This email contained an attached file "DOC010.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?97826822C5CE12F089D39319857D0C9945749F950003CD97>
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Attn: Sheila Quarterman

RE: Proposed Rule- Revisions and Clarification of Export and Reexport Controls for the People's Republic of China; New Authorization Validate End-User (71 Fed. Reg.38.313 (July 6, 2006)

RIN0694-AD75

Attached is Aviza Technology's letter containing comments to the above proposed rule.

Thank you very much for the opportunity to comment on this important rule.

Sincerely,

William J. O'Connor
Director of Worldwide Spares

Jo-Anne Daniels
Export Compliance Consultant

Aviza Technology, Inc

<<DOC010.pdf>>



440 Kings Village Road
Scotts Valley, CA 95066

December 4, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th Street and Pennsylvania Ave., NW, Room 2705

Attn: Sheila Quarterman

RIN0694-AD75

RE: Proposed rule- Revisions and Clarification of Export and Reexport Controls for the People's Republic of China; New Authorization Validate End-User (71 Fed. Reg. 38.313 (July 6, 2006))

Dear Ms. Quarterman

Aviza Technology, Inc. thanks you for the opportunity to comment on this important proposed rule. This rule may have serious impact on both export compliance costs and risk in a critical export market. Aviza supports effective export controls as needed to preserve the U.S. interests, and is pleased to offer comments to BIS to ensure that a final regulation serves those interests while avoiding unnecessary costs to U.S. industry.

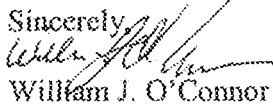
Aviza manufactures semiconductor manufacturing equipment (SME) that is designed and used for the commercial and civilian markets. ECCNS's 3B991 and 3B992 are not militarily significant and they are part of the control categories that were generally decontrolled within the Wassenaar Arrangement based on their non-sensitive nature. The addition of military end-user requirements adds an additional layer of analytical complexity to the export screening system. The definition of military end-use is complex and would require additional development of due diligence procedures to screen transactions. The effort needed to implement these requirements in existing order management will be burdensome. At this time the proposed regulation is unilateral and there is no current prospect that any other country will apply a policy like the proposed military end-use rule. US SME companies already are competing fiercely with suppliers in other countries; therefore, we do not recommend the new controls unless they are multilateral.

The VEU program, which is the proposed new form of authorization for certain exports, reexports or transfer to a Validated End-User, would not be valuable to companies like ours because all the products are license-free. The proposed program contains a complex internal control commitment on the part of the VEU. Also it is likely that China customers will require assistance to undertake the application process of VEU status, which means the U.S. companies will be additionally burdened. We respectfully suggest that BIS eliminate or minimize VEU certificates and suggest that BIS deploy a sufficient number of trained, experienced staff to process applications for VEU status and to administer the VEU export authorization.

In conclusion, the military end-use restriction is problematic in that it is unilateral, too broad and too unwieldy for effective compliance management. Most importantly, it does not add significantly to U.S. national security in our industry and could hurt U.S. Companies' sales in China, thereby undermining our competitive position there. Simultaneously it could hurt U.S. national security by damaging U.S. manufacturing leadership in a critical industry.

Thank you again for the opportunity to address this important matter.

Sincerely,



William J. O'Connor
Director of Worldwide Logistics
Aviza Technology, Inc.

From: <NOHRA_BALILO@cranevalve.com>
To: <publiccomments@bis.doc.gov>
Date: Mon, Dec 4, 2006 5:11 PM
Subject: RIN 0694-AD75

This email contained an attached file "DOC Document.doc" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?51322B669295F3F9E8069330FC09E81C45749CFE0005482D>
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(See attached file: DOC Document.doc)

Nohra Balilo
Export Traffic Manager
Pacific Valves

562-304-1621



Pacific Valves

Telephone: (562) 426-2531
FAX: (562) 424-5043

December 4, 2006

Sheila Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry & Security
Department of Commerce
14th Street & Pennsylvania Ave., NW
Room 2705
Washington, DC 20230

Attention: RIN 0694-AD75

Re: July 6, 2006 Federal Register Notice Proposing Amendments to
Export Controls Relating to China

Dear Ms. Quarterman:

Please accept this letter as the comment of Pacific Valves on the Federal Register Notice published July 6th proposing to amend the Export Administration Regulations with specific reference to China. Pacific Valves ("Pacific") is a member of the Crane Co. group of companies. It manufactures valves at its facilities in Signal Hill, CA and employs over 100 individuals in the United States.

On May 31, 2002, the definition of valves controlled under ECCN 2B350.g was expanded dramatically and, for the first time, covered some of the valves manufactured by Pacific. We began applying for export licenses shortly thereafter. On April 14, 2005, the list of countries requiring an export license as a condition of receiving valves governed by ECCN 2B350.g was expanded to include all countries other than those that are members of the Australia Group. The number of export license applications submitted by Pacific Valves increased correspondingly. We understand that these valves are subject to export controls because of their potential use in the manufacture or development of chemical and biological weapons. In reality, however, we sell these valves to customers who use them in a variety of perfectly legitimate civilian applications, including chemical, pulp and paper, oil refinery and related process industries.

We note that, in our international sales, we compete against manufacturers of comparable products that are located in countries outside the Australia Group. We therefore question the effectiveness of these export controls in denying access to these controlled valves to customers located in countries that are not Australia Group members.

The proposed rule published on July 6th would require that, for virtually every export license for China, an application could not even be submitted until the applicant had received a copy of the Import or End User Certificate issued by the Department of Scientific and Technological Development and Trade in Technology of the PRC Ministry of Commerce ("MOFCOM"). The preamble to the proposed rule states that an actual copy of the certificate need not be submitted with the license application "to minimize the impact that this expanded support documentation requirement will have on exporters." This makes no sense. If an application cannot be submitted until the applicant has received a copy of the certificate, what additional burden is there in requiring that a copy accompany the application? The real burden comes with the delay in involved in obtaining a certificate from MOFCOM.

The most recent annual report issued by BIS states that "China is the largest single export market among the controlled country group, with eighty percent of the total."¹ The preamble to the

proposed rule notes that "approximately \$2.4 billion worth of exports were licensed for export to the PRC, while \$12.5 million worth of exports were denied." Thus, while many export licenses for China are submitted, almost all are granted.² Under the existing EAR, end-use certificates are required for only a limited set of products exported to China. Even under these more limited regulations, however, U.S. exporters have experienced lengthy delays in obtaining certificates from MOFCOM. If the proposed rule is adopted, MOFCOM will presumably be flooded with requests for certificates and delays can only be expected to grow.

Insofar as other exporting countries are not adopting a requirement that license applications be submitted only after receiving a MOFCOM certificate, our foreign competitors will experience an immediate and profound competitive advantage in supplying controlled products to Chinese customers. The preamble to the proposed rule indicates that the expanded end-use certificate requirement will facilitate BIS's ability to conduct end use checks on exports and that "facilitation of end-use checks should facilitate increased U.S. exports to the PRC." Nothing could be further from the truth. If a MOFCOM certificate is required before submitting export license applications for China, Chinese customers will look to non-U.S. suppliers and the volume of controlled exports to China will plummet.

We question the need to involve the Chinese government in obtaining assurance that BIS will be able to conduct end-use checks. Under the proposed new authorization Validated End-User ("VEU"), it is the Chinese End-User that is required to submit to the U.S. exporter a certification that, *inter alia*, it agrees to allow on-site visits by U.S. government officials to verify end-use. If the End-User's certification is sufficient for purpose of VEU, why is it not also sufficient for purposes of submitting routine export license applications? The Department of Commerce already has an understanding with its counterpart in China relating to end-use visits. Requiring MOFCOM certificates would seem to do little to strengthen this pre-existing agreement. If anything, requiring a similar certificate from the actual Chinese End-User would seem to be of greater benefit to BIS in assuring that individual Chinese companies in fact cooperate with end-use visits.

In short, if the proposed rule is adopted, we recommend that, rather than requiring MOFCOM certificates before the submission of export license applications for China, U.S. exporters instead be required to obtain certificates from their Chinese customers acknowledging their agreement to allow end-use visits.

Thank you for your consideration of this comment.

¹ Bureau of Industry and Security Annual Report, Fiscal Year 2005 at 90 (hereinafter "FY 2005 Report").

² For products governed by ECCN 2B350 there were over 200 individual export license applications submitted in FY 2005 alone. FY 2005 Report at 77.

From: "Palma, Kathleen L (GE, Corporate)" <kathleen.palma@ge.com>
To: <publiccomments@bis.doc.gov>
Date: Mon, Dec 4, 2006 5:48 PM
Subject: GE submission: RIN 0694-AD75

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<<GE Comments China End Use.pdf>>

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December 4, 2006

Ms. Sheila Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry and Security
U.S. Department of Commerce
14th Street & Pennsylvania Avenue, NW
Room 2705
Washington, D.C. 20230

By electronic submission: publiccomments@bis.doc.gov

Re: RIN 0694-AD75/Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC); New Authorization Validated End-User

Dear Ms. Quarterman:

The General Electric Company ("GE") appreciates the opportunity to submit written comments regarding revisions and clarification of export and reexport controls for the People's Republic of China (the "PRC") and new authorization validated end-user (the "Proposed Rule"), as published in the Federal Register (71 Fed. Reg. 38,313, July 6, 2006).

GE is a diversified technology, manufacturing, media, and financial services company that ranks among the oldest and largest in the United States. Today, GE operates through six business verticals that produce goods and services ranging from aircraft engines, power generation, water processing, and security technology to medical imaging, business and consumer financing, television, film and internet-based content. GE has operations in over 100 countries (manufacturing in over 40 countries) and employs more than 300,000 people worldwide. 2005 consolidated revenues reached \$150 billion. The PRC is an important market for GE, where we have grown significantly in the past five years. In 2005 GE had \$5 billion in revenue and 12,000 employees in the PRC.

GE has a strong and unyielding commitment to compliance. GE's commitment to compliance is set forth in its integrity policy, the Spirit & the Letter. The Spirit & Letter includes a policy on international trade controls compliance, which applies to all GE operations and employees worldwide.

As a global company with diverse operations and a strong commitment to international trade controls ("ITC") compliance, GE is an interested stakeholder in the Proposed Rule. GE supports BIS's efforts to develop regulations that help protect US national security interests, prevent terrorism and the proliferation of weapons of mass

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destruction through a sound system of effective export controls. Without question, the US Government has a strong interest in protecting valuable US technologies that are subject to export controls. GE supports US national security interests. We offer these comments in the hope that any final rule will more effectively promote US national security interests, more thoroughly consider the compliance perspective of US exporters, and more clearly explain BIS's expectations as to industry compliance.

Comments on Proposed Rule

Our comments will focus on the following key areas of the Proposed Rule: (1) Purpose and Unilateral Nature; (2) Definition of military end use; (3) due diligence; (4) Compliance Costs; (5) Validated End-User Authorization.

Purpose & Unilateral Nature of Proposed Military End Use Control

GE appreciates that export controls may sometimes be implemented in circumstances where US exporters may not fully appreciate the threat to US national security. However, when US companies understand the policy goals that rules protect, they do a better job interpreting the rules and implementing controls designed to ensure compliance with the laws. To date we have not heard a compelling articulation of how the specific measures contemplated by the Proposed Rule will further US security and foreign policy interests. We urge the US Government to reexamine how this proposal fits with the larger foreign and trade policy issues between the United States and the PRC.

The purpose of this Proposed Rule is to ensure that US dual use exports do not make a material contribution to the PRC's military capability (Proposed Rule at 38.314). We respectfully submit that the specific measures proposed are unlikely to achieve real gains in terms of limiting trade that could materially enhance the PRC's military capability. In our experience, the items that would be subject to this new end-use screening and licensing requirement are available from many countries, including PRC domestic suppliers. Moreover, BIS has already established strict licensing requirements for many items controlled for National Security, Nuclear Nonproliferation, Missile Technology and Regional Stability reasons and the US Government does not allow exports of any military items to the PRC. Accordingly, it is unclear what security gap the Proposed Rule is addressing and whether the Proposed Rule is in fact an effective approach in addressing any such gap. We urge that the US Government articulate what the gap is and how this rule fixes that gap before asking the US business community to undertake this significant burden with one of our largest trading partners.

While we understand that one stated purpose of this Proposed Rule is to bring US export control system into compliance with Wassenaar commitments, the impact will still be unilateral in nature, since the Wassenaar commitment focuses on multilateral arms embargoes.¹ We understand that few, if any, Wassenaar members are implementing the

¹ The Wassenaar Statement of Understanding on Control of Non-Listed Dual-Use Items provides (http://www.wassenaar.org/publicdocuments/2003_statementofunderstanding.html):

Participating States will take appropriate measures to ensure that their regulations require authorisation for the transfer of non-listed dual-use items to destinations subject to a binding United Nations Security Council arms embargo, any relevant regional arms embargo either binding on a Participating State or to which a Participating State has voluntarily consented to adhere, when the

military catch all control with respect to the PRC, including European countries such as the United Kingdom, which have a significant trading relationship with the PRC. Thus, in practice, US exporters will stand alone, and Chinese companies will have ready access to alternative sources for the dual use items covered by the Proposed Rule from our competitors to the detriment of US firms, investors, and workers. Moreover, if the Wassenaar objective is the primary purpose of the Proposed Rule, why hasn't BIS issued even a proposed rule that would impose similar controls for countries that are the subject of multilateral or UN arms embargoes? We urge the US Government to discuss this Proposed Rule with other Wassenaar members and to delay promulgation of any final rule until a consistent, multilateral approach on exports to the PRC is developed with our allies.

Finally, GE submits that this Proposed Rule really asks US exporters to make a national security judgment about the nature of a commercial transaction, i.e., whether it would make a material contribution to the military capabilities of the PRC because of "military end use." Private companies are not well suited to make these types of judgments. We urge BIS to limit the application of the military end use control set forth in the Proposed Rule to an "is informed" basis. GE would welcome a rule that limited its duty to the clearly defined circumstance in which the US Government informs an exporter that a specific sale is inappropriate given that it could make a material contribution to the military capabilities of the PRC. We believe this approach is more appropriate because it leaves the national security judgment in the hands of the government.

When viewing the judgment in a reexport context, the need for an "is informed" standard is even more critical. It is not a wise policy to delegate this kind of judgment to a non-US party and BIS should strongly consider limiting the reach of the rule in a reexport context to the "is informed" standard.

GE urges BIS not to promulgate a military end use control applicable to dual use goods and technology in final form, except for in an "is informed" situation. However, should BIS determine that a rule of this nature must be finalized, there are several ways in which the Proposed Rule could be clarified. We urge BIS to address the following issues, if it ultimately determines to finalize some form of the military end-use rule that will require companies to make judgments about how their exports may further military capabilities in the PRC.

Definition of Military End Use

The Proposed Rule proposes to define "military end use" as:

incorporation into, or use for the production, design, development, maintenance, operation, installation, or deployment, repair, overhaul, or refurbishing of items (1) described on the U.S Munitions List (USML) (22 CFR Part 121, International Traffic in Arms Regulations); (2) described on the Munitions List (IML) (as set out on the

authorities of the exporting country inform the exporter that the items in question are or may be intended, entirely or in part, for a military end-use.

If the exporter is aware that items in question are intended, entirely or in part, for a military end-use, the exporter must notify the authorities referred to above, which will decide whether or not it is expedient to make the export concerned subject to authorization.

Wassenaar Arrangement Web site at <http://www.wassenaar.org>); or 3) listed under Export Control Classification Numbers (ECCNs) ending in "A018" on the CCL in Supplement No. 1 to Part 774 of the EAR (Proposed Rule at 38,318).

The Proposed Rule notes that for purposes of this section:

"production" means integration, assembling, inspection, or testing; "development" means design, and includes testing and building of prototypes; "maintenance" means performing work to bring an item to its original or designed capacity and efficiency for its intended purpose, and includes testing, measuring, adjusting, inspecting, replacing parts, restoring, calibrating, overhauling; "operation" would mean to cause to function as intended; "installation" would mean to make ready for use, and would include connecting, integrating, incorporating, loading software, and testing; "deployment" would mean placing in battle formation or appropriate strategic position" (id.).

This definition of military end use is potentially overly broad in its application, given that the rule includes items that are "described on" the USML. As BIS is aware, many articles that do not clearly "appear" on the USML but were designed, developed, adapted, configured or modified for military end use, may be considered subject to ITAR controls and, therefore, in a technical sense are considered USML. This type of analysis is difficult even within a company where there is complete access to design information. In a component context, it is sometimes difficult to identify that the ITAR may apply as a sub-tier supplier may not know the end use and, therefore, may not recognize that an item was specially designed for military end use. However, in a cross-border, arm's-length transaction, US exporters will not be able to obtain and should not be required to delve into the design intent of a Chinese customer absent some kind of significant red flag indicating significant military capability. We do not believe BIS expected such exhaustive and likely unattainable investigation. In a reexport context, the complexity is even more difficult, given that foreign reexporters may be even less familiar with the USML and when it might apply. By incorporating the USML into the definition the rule again takes on a unilateral nature. For these reasons, we urge BIS to limit the definition to those items described on the International Munitions List ("IML"). We believe the IML is relatively more clear in its application and will be much easier for reexporters to interpret and apply as it stands behind many countries' control lists. This limitation would introduce welcomed clarity but still preserve the apparent objective of the Proposed Rule.

BIS should clarify that if an exporter has knowledge that the current end use is civilian but that in the future the customer *could* apply the same item to a military end use, the exporter does not have knowledge of a military end use.

BIS should also clarify its expectation in the circumstance where an exporter has information that a product could be used for the design of both military and civilian products.

BIS should clarify that exports of commercial transportation equipment or parts to the Chinese government that may be used for routine transportation of military equipment or government/military personnel do not fall within the definition of "deployment" nor are otherwise within the definition of "military end use."

In addition, GE seeks clarity that the particular scenarios below do not fall within the meaning of "military end use" as articulated in the Proposed Rule:

- A US exporter receives an order for a commercial spare part (ECCN 9A991.c or 9A991.d). The spare part is intended for use on a civilly-certified, commercial engine installed on a civilly-certified, commercial aircraft. As far as the exporter is aware, the aircraft has not been modified for a military purpose. The aircraft is part of a fleet used by the Chinese government to transport Chinese government officials and military personnel. GE submits that in this example the exporter does not have knowledge of a "military end use" as defined in the Proposed Rule.
- A US exporter receives an order for a commercial spare part (ECCN 9A991.c or 9A991.d). The spare part is intended for use on a civilly-certified, commercial engine installed on a civilly-certified, commercial aircraft. The particular aircraft has been modified by installing equipment that by its nature is usable for safety and defensive measures only, for example, a counter Man Portable Air Defense (MANPAD) device. The aircraft is part of a fleet used by the Chinese government to transport Chinese government officials and military personnel. GE submits that in this example the better interpretation is that the exporter does not have knowledge of a "military end use." The modification was made solely for safety/defensive purposes and the modified aircraft should not be considered to fall within the IML.
- A US exporter receives an order for a commercial single board computer (ECCN 4A994) for automation assembly testing and production lines in a car manufacturing plant. The stated end use is for a civil purpose. The manufacturing facility, however, is known to be partially government-owned and the end product enables transportation of Chinese government officials. GE submits that in this example the exporter does not have knowledge of a "military end use" as defined in the Proposed Rule.

Due Diligence

The Proposed Rule provides that:

You may not export, reexport, or transfer any items listed in Supplement No. 2 to Part 744 to the PRC without a license . . . if, at the time of the export, reexport, or transfer, you know, meaning either: (1) You have knowledge that the item is intended, entirely or in part, for a "military end use" . . . or (2) You have been informed by BIS that the item is or may be intended, entirely or in part, for a "military end use" in the PRC (Proposed Rule at 38,317).

While the requirements proposed in sections 744.21 and 744.6 are basically parallel to those under the Enhanced Proliferation Control Initiative ("EPCI") regarding weapons of mass destruction ("WMD") end uses, US exporters would welcome clarification as to how BIS would interpret these requirements in the "military end use" context. WMD end uses are more clearly defined, unique and rare. US exporters are more likely to see "military end uses" than WMD end uses, making clear guidance regarding military end use critically

important. The application of the knowledge standard as defined in part 772 of the EAR, which includes "an awareness of a high probability of its existence or future occurrence" may be difficult to apply in this context. GE requests that BIS provide additional guidance as follows.

BIS should clarify that exporters will necessarily use a risk-based Know Your Customer approach in vetting their customers and potential sales. In a very large scale transaction where the US exporter or an affiliate will do significant installation work, a company will necessarily have information as to the end user and end use that will allow the exporter to evaluate the transaction for military end use. In such a transaction, the exporter simply has more information about the customer and end use of equipment due to the quality of information collected in the normal course of business.

However, BIS should clarify that in a "flow goods" situation, where the US exporter is selling to a distributor in the PRC or a third country, where the exporter does not, in the normal course of business, learn the identity of the end-users, then absent red flags or other special facts, the exporter would not have a duty to inquire further. While the exporter cannot "self-blind," absent additional red flags such an exporter would not have "knowledge" of a military end use.

BIS should clarify that a parallel approach is reasonable when dealing with distributors, resellers and other potential reexporters. When dealing with "flow goods," where the US exporter would not normally have line of sight to the ultimate customers, the US exporter would not have any obligation to collect additional information. US exporters would have no duty beyond clearly identifying goods as subject to the EAR by use of the Destination Control Statement. If US exporters normally obtain information about the end users and end uses because of warranty commitments, product registration requirements or by other means, then it may be possible and reasonable for the US exporter to take additional steps.

Similarly, in the instance where a US person is providing "support" as defined in proposed 744.6(a)(1)(ii) but does not obtain detailed information about the end-use or end-user in the normal course of business, there would be no additional duty of inquiry.

BIS should reconfirm that this rule does not change its long-standing position that exporters are not required to determine or verify the end use of particular exports absent some red flag indicating an impermissible purpose or risk of diversion.

Compliance Costs

GE businesses will face additional costs associated in the following categories if the Proposed Rule were finalized:

- **Customers.** Additional uncertainty and the potential for delays will increase the effective costs of sale for PRC transactions. We anticipate that in certain instances ensuring compliance with the Proposed Rule would delay our ability to conclude a transaction with bona fide commercial customers in the PRC (when appropriate/feasible, identifying the end use and clearing that information with appropriate Compliance personnel, which would realistically take at least a few

days). This would result in less customer satisfaction with the sales process and could result in the loss of sales to our non-US competition.

- Distributors. The Proposed Rule will add cost and risks in our dealings with distributors, which may bear responsibility for addressing the requirements of the rule in individual sales. While GE businesses work with distributors that deal in US products to ensure that they understand that the EAR apply to those sales, this will add another level of complexity and effort. GE businesses will need to determine in multiple circumstances if they need to validate responses that distributors are supplying. This will either introduce additional cost or additional risk into individual transactions.
- Training GE Personnel. GE businesses impacted by the Proposed Rule would implement additional training to ensure that personnel in the PRC and global sales teams were aware of the requirements. Compliance personnel would have to develop and deliver the training. One of our businesses (the products of which are included among the 47 items), estimates that significant training would be necessary for at least 100 personnel located in the PRC and as many as 3,000 individuals globally involved in different functions including engineering, marketing, sales and sourcing. Additional training would also be required for our financial services businesses due to the U.S. person restrictions set forth in the proposed § 744.6. GE estimates training costs alone would be substantial.
- Vetting Compliance Concerns. The Proposed Rule would likely put additional pressure on sales, engineering and other internal organizations to ensure their activities remain in compliance with the requirements of the EAR, including technology exports. It is likely that our businesses will feel it prudent to take certain steps to ensure compliance that are not required by the rule, per se, but to maintain an appropriate level of risk management. It is also likely that many of our ITC Compliance personnel will have to spend time answering questions and vetting potential sales. We conservatively estimate that at least 1,000 hours of ITC Compliance time would be dedicated to addressing concerns related to the requirements of the rule and doing additional vetting of potential PRC transactions in the first year after implementation.

The combined impact will be substantial, though difficult for us to quantify with precision. China is a significant and important market for GE: \$5 billion in revenues and 12,000 employees. These additional costs will impact us even though our customers in the PRC are private companies and civilian government end users.

Enhancing the Proposed VEU Authorization

GE welcomes the Validated End-User Authorization proposal that was also set forth in the Proposed Rule. We agree with BIS that alternative and creative authorizations are necessary to ensure that both US industry and government prioritize their compliance and licensing resources on the exports and end users that create the most risk. However, we have a few specific concerns about the VEU Authorization and request clarification from BIS on the following points.

First, as a matter of principle, US subsidiaries in the PRC (and worldwide) should automatically qualify for use of the VEU authorization for any eligible ECCN as long as the exports were for their internal uses. Of course, license, license exception or other authorization would be required if the item were retransferred or reexported. To submit US subsidiaries to the VEU vetting process will add needless review time and expend considerable BIS and other US Government resources on low-risk end-users. While we submit that US subsidiaries in the PRC should automatically be eligible to use VEU, if BIS needed some tracking mechanism, it would be reasonable to ask exporters to send a notification letter to BIS simultaneous with the first use of the authorization.

In addition, the mechanisms proposed for a non-related company to qualify for VEU Authorization are cumbersome and will quickly overwhelm current BIS resources under the advisory opinion format as presented in this rule. Rather than have the exporter or the foreign party submit a request for advisory opinion and have the qualified entities published in a Supplement to the EAR, it would be more effective to permit VEU requests within the licensing procedures: e.g., the exporter can submit a letter accompanying a license request for VEU status. Another possibility would be to submit VEU applications with a set review period, similar to what is done in the encryption area. Without predictability in the amount of time it will take to become eligible for the VEU authorization, exporters may not find the authorization useful given that if a party does not qualify for VEU, the exporter would have to start over with a license application. An aspirational statement about the amount of time reviews should take will not be adequate, particularly in the context of the PRC. We note that current PRC export application review timeframes are the longest of any other country and exceed the interagency 39-day decision period and BIS average processing time.

The VEU Authorization should be made available for all eligible ECCNs and not be dependent upon specific clearance for individual ECCNs. As proposed, reviewing a published list of VEU-eligible entities with various ranges of applicable ECCNs will be a serious implementation burden. In addition, this would eliminate the need for exporters/authorized parties to stop and obtain additional permissions if their areas of collaboration expand. Further, the idea of the VEU is to liberalize trade for parties who have demonstrated that they are involved with acceptable end-uses and are not "otherwise engaged in activity contrary to U.S. national security or foreign policy interests" (Proposed Rule at 38.315). The US Government should be willing to authorize such parties for a full range of technologies.

With respect to section 748.15(f)(2), BIS should clarify that exporters, reexporters and validated end-users will be subject to audit as to their use of authorization VEU and not generally as to their general compliance with the EAR in other areas. If using VEU opens exporters and end-users up to a complete audit of their activities and compliance programs, parties may be more reluctant to use the mechanism.

Finally, we are compelled to mention there is a significant disconnect between this proposed VEU authorization, which would authorize a range of exports to companies that have a demonstrated record of appropriate end-uses and the current licensing policy as applied to deemed exports. We understand that in the deemed export context, individual licenses would still be required, based on very detailed information concerning the individual's background and experiences. This disconnect highlights the incongruity of the

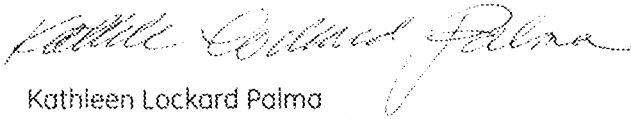
current deemed export policy. BIS should make available an authorization or license exception that would permit broad sharing of technology within a company's borders, regardless of the national borders or nationalities involved. We urge BIS to allow authorization VEU for exports of technology to foreign national employees of authorized companies normally employed inside the United States, if the employees are nationals of a country eligible for VEU status.

With certain enhancements, the VEU concept could be an effective means of facilitating low-risk trade with the PRC. We urge BIS to broaden and enhance the VEU concept to ensure that it is usable by industry. Finally, we encourage BIS to expand eligibility for VEU to other countries that are important strategic US trading partners, such as India.

Conclusion

GE strongly urges BIS to modify the Proposed Rule as addressed in these comments. GE thanks BIS and the Department of Commerce for the opportunity to provide these comments.

Best regards,



Kathleen Lockard Palma
Counsel, International Trade Regulation

From: Robert Boege <vonbob@mac.com>
To: <publiccomments@bis.doc.gov>
Date: Mon, Dec 4, 2006 6:03 PM
Subject: RIN 0694-AD75 Comments from SPIE-The International Society for Optical Engineering

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>
>> From: Robert Boege <vonbob@mac.com>
>> Date: December 4, 2006 2:59:47 PM EST
>> To: publiccomments@bis.doc.gov
>> Cc: bkritzer@bis.doc.gov, david_rostker@omb.eop.gov
>> Subject: RIN 0694-AD75 - SPIE Comments
>>
>> Dear Ms. Quarterman:
>>
>> Attached in PDF format you will find comments on the so-called
>> "China Rule" prepared by the Engineering, Science and Technology
>> Policy (ESTeP) Committee of SPIE — The International Society for
>> Optical Engineering.
>>
>> If you have any questions about these comments or need additional
>> information, please contact me at the coordinates below.
>>
>> Thank you for this opportunity to comment of this proposed
>> regulation.
>>
>> Cordially,
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>> Robert S. Boege
>>
>>

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>>
>>
>>
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The International Society
for Optical Engineering

November 30, 2006

Ms. Sheila Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry and Security
U.S. Department of Commerce
Room 2705
14th & Pennsylvania Avenue, N.W.
Washington, D.C. 20230

ATTN: RIN 0694-AD75

Dear Ms. Quarterman;

SPIE - The International Society for Optical Engineering, has reservations about proposed changes in *Export Administration Act* (EAR) rules affecting U.S. exports, re-exports and transfers of goods and technology to the People's Republic of China (PRC) contained at 15 CFR Parts 740, 742, 744 and 748. Our organization is comprised of 17,000 engineers, scientists, researchers and companies across the globe who are involved in activities which relate to such diverse market sectors as telecommunications, lasers, remote sensing, biophotonics, imaging, instrumentation, sensors, semiconductors, and nanotechnology.

SPIE has long supported the concept of restricting militarily critical exports in order to enhance national and international security interests. Unfortunately, it believes the proposed "China Rule" will also impede civilian products and services.

Optics and photonics industries are a key building block to the 21st Century global economy. Members of SPIE currently export a variety of goods and services to the PRC. In general, we find the PRC market to be competitive and challenging. After years of effort, many SPIE members have found the outsourcing of final assembly of products to the PRC, and then re-export of such goods back to the U.S. (or other countries) an effective way for U.S.-based manufacturers to compete. This can be especially true in the PRC where a well-trained talent pool and lower costs often apply. Creating nimble distribution and supply chains has enabled our industry and profession to keep jobs in the United States.

SPIE's specific objections to the proposed China Rule:

1. The changes would place U.S.-based manufacturers and professionals at a disadvantage with their overseas competitors, without accomplishing any significant policy objective.
2. In effect, the proposed rule presents an added "barrier to entry" in a growing and essential market by creating complex administrative burdens, bureaucratic delay and

uncertainty. It would also complicate the business operations of smaller manufacturers disproportionately.

3. Imposing easier compliance procedures for existing exporters and more difficult procedures for newer market entrants could create an end-user certification system that results in a "grandfathering" of existing exporters.

4. BIS should consider the impact to the U.S. economy and defense structure should the proposed rule result in locking out new competition, new companies, and innovation *in the United States* itself. The proposed rule comes at a time when competitive capacities in global markets are the focus of grave concern within the Administration and Congress (*viz. Gathering Storm Report*, the Bush Administration's American Competitiveness Initiative legislative proposal, and the U.S. Senate's *National Innovation and Competitiveness Act of 2006*, etc). A review of the recently released National Science Foundation (NSF) biennial compendium *Science & Engineering Indicators 2006* clearly demonstrates an erosion of U.S. scientific (and economic) capacity across a wide array of disciplines. Disturbing indicia are presented to show this decline, including the production of scientific papers, degrees conferred, patents produced, and export market share.

5. The proposed rule does not account for the fact that much of our global scientific talent and resources reside outside the purview of the U.S. legal system; thus, its implementation risks shutting off the flow of innovation, new talent and essential knowledge needed by our own economy.

The end-use compliance provisions would be burdensome, since they would require tracking and other monitoring of products and services long after sale to entities within the PRC. BIS states that it is not subject to the *Paperwork Reduction Act* (PRA) provisions which should apply to these proposed changes, but offers no proof that the PRA does not cover the complicated reporting mechanism.

The BIS proposed compliance scheme would subject individuals and companies to the following regime (I quote only from part of the explanation given to illustrate the potential for burdensome compliance procedures in a marketplace that has little tolerance for delay and ambiguity):

... under new section 748.15, exporters, reexporters and end-users who use authorization VEU would be required to comply with recordkeeping and reporting requirements, as described in sections 748.15(e) (Certification and recordkeeping) and (f) (Reporting and auditing requirements) of the EAR. As required in proposed section 748.15(e), prior to the initial export or reexport under authorization VEU, exporters or reexporters would be required to receive and retain certifications from eligible end-users that state that they are informed of and will abide by all VEU end-use restrictions; they have procedures in place to ensure compliance with the terms and conditions of VEU; they will not use items obtained under VEU in any of the prohibited activities described in part 744 of the EAR; and they agree to allow on-site visits by U.S. Government officials to verify their compliance with the conditions of VEU. Validated end-users found to be not in compliance with the requirements of VEU as set forth in section 748.15 will be subject to removal from the list of validated end-users and other action, as appropriate.

In addition, as described in proposed section 748.15(f)(1), exporters and reexporters who use authorization VEU would be required to submit annual reports to BIS. These reports must include specific information regarding the export or reexport of eligible items to each validated end-user. Exporters, reexporters, and end-users who avail themselves of VEU also would be audited on a routine basis, as described in proposed section 748.15(f)(2) (Audits). Upon request by BIS, exporters, reexporters, and validated end-users would be required inspection of records or on-site compliance review. For audit purposes, this rule would require records and information identified in proposed section 748.15 to be retained in accordance with the recordkeeping requirements set forth in part 762 of the EAR.

While BIS claims exemption from the PRA due to the military and dual-use nature of the products and services covered, it ignores the civilian component of what is being regulated, which is the vast bulk of the export trade involved. SPIE believes that the Office of Management & Budget (OMB) should review this proposed rule and its potential impacts upon the private sector for which no government compensation is proffered.

Other comments:

1. The *Export Administration Act* itself expired in 2001 yet BIS claims authority to act under the *International Emergency Economic Powers Act*, Executive Order 13222 of August 17, 2001, and a CFR Notice dated August 2, 2005 which purports to continue the authority of the EAR although Congress has not formally reviewed this authority.

2. SPIE thinks there are better ways to accomplish the objective of restricting militarily critical technologies without harming the legitimate commercial interests of U.S.-based exporters. Specifically, SPIE urges BIS to consider further action through the Wassenaar Arrangement, which is referenced several times in the proposed rule. In this way, multilateral action might prevent unilateral damage to U.S.-based optical engineering professionals and our related manufacturing entities and disciplines.

Thank you for this opportunity to comment on the proposed "China Rule." We are happy to provide any additional information you may require.

Sincerely,

Dr. Eugene Arthurs
Executive Director
SPIE — The International Society for Optical Engineering

From: "Storme Street" <stormes@eia.org>
To: <publiccomments@bis.doc.gov>
Date: Mon, Dec 4, 2006 6:36 PM
Subject: RIN 0694-AD75

This email contained an attached file "EIA_China BIS_letter_11-06.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?3E7D41908B169F2BF0D402350950DFC14574B0D700058386>
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All unclaimed attachments are deleted automatically after fourteen (14) calendar days.

Please find attached comments from the Electronic Industries Alliance on the proposed EAR amendment to revise and clarify export and reexport controls for the People's Republic of China. Thank you.

Storme Street
Vice President of Government Relations
Electronic Industries Alliance (EIA)
2500 Wilson Blvd.
Arlington, VA 22201
703-907-7759 direct
sstreet@eia.org <mailto:sstreet@eia.org>



December 4, 2006

Ms. Sheila Quarterman
U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th St. and Constitution Avenue, NW
Room 2705
Washington, DC 20230

RIN 0694-AD75

RE: Proposed Rulemaking Concerning Revisions and Clarification of Export and Re-export Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 Fed. Reg. at 38,313, July 6, 2006)

Dear Ms. Quarterman,

Thank you for the opportunity to comment on the above referenced notice of proposed rulemaking by BIS to revise and clarify Export and Re-export Controls for the People's Republic of China.

The member companies of the Electronic Industries Alliance, which includes manufacturers from across the spectrum of the high-tech industry, have significant concerns with this proposed rule. Specifically, our members:

- question the practicality and value of the 'Validated End User' proposal;
- believe that the rule imposes a competitiveness burden on U.S. firms; and
- believe that the 47 listed items represent too broad a swath of goods.

We believe that efforts to control critical and sensitive technologies will founder if they are not properly coordinated with other nations to ensure the application of similar policies on companies that export or re-export comparable goods. Notwithstanding the efforts of the U.S. government to promote the adoption of rules comparable to this one by U.S. trading partners, we question whether that is the case in this instance. Other signatories to the Wassenaar accord are unlikely to implement controls comparable to those proposed in this rule. Until and unless non-U.S. producers of covered products are required to adhere to the same rules, efforts to promote security will prove fruitless, and U.S. firms will find their competitiveness undercut. We

Electronic Industries Alliance
2500 Wilson Boulevard, Arlington, VA 22201 · 703-907-7500

question the benefit of adopting a measure such as that proposed, which will hamper U.S. competitiveness at a time when important allies are not contemplating similar reforms.

We appreciate the opportunity to provide comment on the foreign availability of relevant products. In one specific example, we would like to note that Mobile Cellular Phones (ECCN 5A992) are manufactured globally in many different companies and are available as mass market products. Currently, the U.S. does not require any license to export/re-export 5A992 products to China, and the imposition of this rule may impose substantial additional burdens on U.S. companies. The availability of mobile terminals throughout the world and the lack of multilateral restrictions create a burdensome and costly control requirement not only for U.S. companies but also for foreign-based companies utilizing U.S. technologies (de minimis). The availability of such items by multiple non-U.S. companies and the lack of appropriate export controls by many countries means that U.S. businesses are placed in an unfair competitive arena, yet have the resulting additional costs in maintaining effective export control programs to ensure compliance. The deterrent works neither as an economic sanction nor as an anti-terrorist control when such items are supplied by other countries.

Again, thank you for the opportunity to comment. We look forward to working with you as this proposed rule is considered further.

Sincerely,

A handwritten signature in black ink that reads "Dave McCurdy". The signature is written in a cursive, flowing style.

Dave McCurdy
President
Electronic Industries Alliance

From: "Pete Schreiber" <pschreiber@esri.com>
To: <publiccomments@bis.doc.gov>
Date: Mon, Dec 4, 2006 9:58 PM
Subject: Proposed Rule for PRC (RIN 0694-AD75)

This email contained an attached file "Proposed China Rule.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?BAE811E1A050C65769CE2B8BAAB627274574E0240002A230>
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ATTN: Shelia Quarterman

Office of Exporter Services, Regulatory Policy Division

Bureau of Industry and Security (BIS)

Department of Commerce

14th Street & Pennsylvania Avenue NW, Room 2701

Washington, DC 20230

Time: 9:55PM EST/6:55PM PST



December 4, 2006

Attn: Sheila Quarterman
Office of Exporter Services, Regulatory Policy Division
Bureau of Industry and Security (BIS)
Department of Commerce
14th St. & Pennsylvania Avenue NW, Room 2705
Washington, DC 20230

By Electronic Mail to publiccomments@bis.doc.gov

RE: Proposed Rule Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC); New Authorization Validated End-User (RIN 0694-AD75)

Dear Ms. Quarterman:

Environmental Systems Research Institute, Inc. (ESRI), is a California corporation located in Redlands, California, with regional offices located throughout the United States and 80 international distributors covering some 200 countries around the world, including the PRC. ESRI is a leader in the field of geographic information systems (GIS) software, data, and services. ESRI's GIS software and related mapping services support diverse applications for private sector businesses, education, science, federal, state, and local government users on a worldwide basis.

On behalf of ESRI, I am writing to you in response to the Department of Commerce's Bureau of Industry and Security (BIS) request for public comment as set forth in the Federal Register on July 6, 2006, (Volume 71, Number 129), Pages 38313-38321, regarding the proposed changes to the Export Administration Regulations (EAR) entitled *Proposed Rule Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC); New Authorization Validated End-User (RIN 0694-AD75)*. ESRI is pleased to have this opportunity to submit these comments on the issue presented.

1. COMPETITION

- a. Foreign counterparts. The geospatial technology sector comprised of software, data, and services has been estimated to be between US\$3-5 billion and growing. The GIS software portion, the primary driver of this technology sector, is estimated to be worth US\$1.5 billion and growing. ESRI has identified a multitude of GIS competitors, both domestic and international, all vying for market share in China. More than 50% of ESRI's top 100 competitors are located outside the U.S. Many of those foreign competitors will not be constrained by the laws of their country concerning selling into the Chinese marketplace, thus placing U.S. firms like ESRI at a competitive disadvantage in that marketplace.
- b. Global Availability of GIS Software. The U.S. does not possess a monopoly on GIS software technology.
 - i. ESRI and its domestic competitors maintain market leadership and competitive advantage by developing better GIS software than their global competition. If the U.S. government unilaterally implements this proposed rule and U.S. software vendors are blocked or participation is

1

encumbered, then end users in China will seek out suitable substitute technology from foreign GIS software vendors to accomplish their geospatial objectives. The policy effect will be to embolden foreign competitors and provide these foreign competitors with increased market share, profits, and resources that may enable them to further develop their technology to the economic detriment of U.S. software vendors.

- ii. If the U.S. government makes this unilateral decision to go it alone under the proposed rule, then the U.S. software industry will be placed at a competitive disadvantage.
 1. Wassenaar Arrangement. It has been expressed that the U.S. is setting out its position as a "matter of leadership" and will try to convince our Wassenaar partners to adopt appropriate military end-use controls. Unfortunately, there have been no details about how or when the U.S.'s Wassenaar partners would actually implement parallel controls.
 2. Market share of U.S. software vendors will decrease in China relative to foreign competitors who have no interest in promoting U.S. export control policies or protecting U.S. interests. The U.S. government is in a stronger position to influence China if U.S. software vendors are perceived as indispensable to the technologic advancement of China.
- c. Open Source Code. Open Source Code is defined as software whose source code is published and made available to the public, enabling anyone to copy, modify, and redistribute the source code without paying royalties or fees. Open Source Code evolves through user community cooperation. These user communities are composed of individual programmers as well as very large companies. For example, the Linux operating system, the first major Open Source Code project, is believed to have somewhere between 4 and 27 million users, with best estimates towards the upper end of that range. (According to IDG, business Linux usage increased 212% in 1998. Other figures indicate it is roughly doubling yearly.) 750,000 developers worldwide. At current count, there are some 240 GIS Open Source Code initiatives and even an Open Source conference dedicated to GIS software. Source: <http://opensourcegis.org/>.

Additionally, there is a growing open source union in China that should be acknowledged.

http://www.oss.org.cn/index.php?option=com_content&task=view&id=27&Itemid=54

The proposed rule will not constrain use of Open Source Code in military end-use applications since its distribution is not controlled through traditional sales and distribution channels. This factor undercuts the usefulness of the proposed rule with respect to the objective of limiting access to such GIS code by the Chinese military end users for use in Chinese military applications.

- d. Piracy of Intellectual Property. Business Software Alliance (BSA) and IDC Global *Software Piracy Study* (May 2006) estimates worldwide revenue losses due to software piracy at US\$34.2 billion in 2005. China's piracy rate of 86% and piracy losses of US\$3.88 billion for 2005 contributes to that overall revenue loss figure. High piracy regions are also indicators of high market growth regions. The BSA/IDC study estimates IT spending in the next 5 years in China to grow to between 15-20%. The study goes on to estimate that Business and Consumers will spend US\$300 billion globally on PC software over the next 4 years. Factoring both growth rates and piracy rates that translates into nearly US\$200 billion of lost revenue due to piracy.

Additionally, the BSA/IDC study indicates that in the 2005-2009 time periods, 100 million new Internet users will come from the emerging markets of China, India, and Russia alone. Greater Internet access in these countries will only further aid the use and dissemination of pirated software.

Like many software vendors, ESRI uses license management/DRM technology that utilizes low level cryptographic properties in order to protect its intellectual property assets from piracy and theft. ESRI's software falls within the scope of the proposed rule and within the 47 ECCN categories largely because of the use of this license management/DRM technology. Thus, the proposed rule forces U.S. software vendors like ESRI to decide between 2 options: 1) to remove the license management/DRM technology in order to not be brought within the scope of the proposed rule, thus facing the piracy consequences, or 2) to maintain the license management/DRM technology in order to lessen piracy but to fail within the proposed rule, and consequently being blocked out of the Chinese marketplace. That sets up a Lose-Lose scenario for the U.S. software industry.

- e. Indigenous Chinese Software Products. The Chinese software industry is currently small but is expanding at a rapid pace. According to a recently published report by China Economic Net (the article can be located at http://en.ce.cn/Industries/IT/200611/30/20061130_9631125.shtml), Guangzhou has been awarded the right to be a national export-oriented software innovation base in China. The city spent a total of 233 million Yuan (US\$29.5 million) to support the development of the software industry between 2001 and 2005. The municipal government of Guangzhou has budgeted 150 million Yuan (US\$19 million) annually through 2010 to support software industrial parks, train software professionals, and subsidize software exports and software outsourcing businesses. The city's goal is to draw 10 globally renowned multinational software companies to its software innovation base by 2010 in order to develop its software outsourcing businesses.

The article goes on to indicate that "the city's goal is to realize an annual software industrial output of 110 billion Yuan (\$13.9 billion U.S. Dollars) by 2010." That translates into a projected increase of 35% per annum. China's stated goal is to increase annual software exports to 1.2 billion Yuan which is an increase of 30% per annum. Finally, the article indicates that "Official statistics indicate the city's over 1,100 software enterprises realized total revenue of 24.2 billion Yuan (\$3.1 billion U.S. Dollars) in 2005, with exports reaching 336 million dollars."

As such, ESRI faces increasing competition from several GIS software vendors inside China. In particular, ESRI has one full service Chinese GIS software competitor named SuperMap GIS Technologies, Inc. whose staff in China outnumbers ESRI's staff by 3:1. This Chinese GIS software competitor is a university-technology spin-off entity that continues to have close ties with the Chinese Academy of Sciences. This same Chinese GIS software competitor has essentially attempted to imitate ESRI's technology offerings, business, and technical support models, and its Web site is even patterned after ESRI's Web site in "look and feel." For now, ESRI maintains a competitive advantage in the Chinese marketplace, because ESRI's GIS software is still better than any Chinese-developed GIS software being offered by Chinese GIS software vendors.

That competitive advantage is being eroded by the following factors. Recently, the Chinese government announced its latest 5 year economic plan, which includes a planned investment in GIS and related geospatial fields and is projected to be ten times greater than the previous 5 year plan. Additionally, ESRI understands that the Chinese government is promoting a "Buy Chinese"

procurement policy for all of its governmental ministries which will favor local Chinese software vendors over foreign software vendors. At stake is the potential loss of establishing the de facto standard software platform at the government level, which in turn has immense trickle-down implications at the business and consumer user levels. Again, a unilateral decision to block or encumber U.S. software industry exports into China will drive business to Chinese GIS software vendors or other foreign competitors to the detriment of the U.S. software industry. Finally, the artificially low currency valuation of the Chinese Yuan relative to the U.S. Dollar will continue to reduce the U.S. industry's competitiveness in the Chinese marketplace, only further pushing prospective Chinese customers to acquire and license technology from Chinese software vendors.

There are numerous non-military end use opportunities and projects, including the upcoming 2008 Olympics in Beijing, which the U.S. geospatial technology sector, including the GIS software industry, needs to compete for.

- f. Case Studies. In the 1980s, Brazil was in the midst of a debt crisis carrying a debt load of between US\$80-100 billion and was threatening to default on these bank loans. An IMF austerity program was instituted in order to reduce debt load and prevent default on the bank loans. The IMF austerity program essentially mandated accelerating exports and blocking imports into Brazil, including high technology imports. The end result was that Brazil, with an educated and trained workforce of engineers, successfully reverse engineered the IBM PC BIOS and pirated copies of the Microsoft Windows OS and other software programs in order to create its own computer industry and sustain its own internal computing requirements.

In October 2006, the BIS released a study entitled *Defense Industrial Base Assessment: U.S. Imaging and Sensors Industry*. The study revealed a strong and growing U.S. imaging and sensors industry for both commercial- and defense-related applications. All economic indicators were on the upswing, and a positive trade balance was posted during the 2001 to 2005 time period. U.S. export control policies were then changed with regards to uncooled infrared (thermal) imaging system devices, and gross sales revenues in this product category declined by 63.9% for U.S. manufacturers. The U.S. manufacturers indicated that their EU and Asian competitors of uncooled infrared (thermal) imaging devices faced fewer export restrictions by their licensing authorities and therefore captured significant market share of an important technology sector.

The lessons learned from both the Brazilian and U.S. Imaging and Sensor Industry case studies and applied to this Chinese scenario is this: if the U.S. export policies attempt to block technology transfer to Chinese end users, the U.S. export control policy will most like fail to achieve its objective because the Chinese will turn to a combination of foreign competitors, open source code, piracy, or the development of indigenous Chinese software products to fill the void. The negative impact on the U.S. software industry will be immense.

2. ECONOMICS

- a. Balance of Trade. A study released by the U.S.-China Economic and Security Review Commission (USCC) by Robert Scott, Director of International Programs at the Washington-based Economic Policy Institute (EPI), entitled "*U.S.-China Trade, 1989-2003*" found that the U.S.'s growing trade deficit with China has had an increasingly negative impact on the U.S. economy, causing job losses that have reached into the most technologically advanced industries in the manufacturing sector and have affected every state. Since this study was completed, the negative trade balance has significantly increased. The large majority of imports from China include inexpensive consumer products such as

low-cost textiles, footwear, toys, sporting goods, and consumer electronics. On the other hand, the majority of Chinese imports from the U.S. are expensive, high-technology goods, such as semiconductors, computer software, transportation equipment, pharmaceuticals, medical devices, and services.

Currently, the U.S. and China share the most imbalanced bilateral trade relationship in the world. China alone accounted for nearly 26% of the U.S.'s \$725.8 billion trade deficit in 2005. The following trade figures, provided by the U.S. Commerce Department, demonstrate the current inequities in trade between the U.S. and China in a year by year basis as set forth in Table 1 below. Table 2 represents the current trade figures for 2006. Limiting exports, by adding additional controls into China, expand the trade gap to the U.S.'s economic detriment.

Table 1: Year by Year China Trade Balance
(Source: U.S. Census Bureau, Foreign Trade Statistics)

NOTE: All figures are in millions of U.S. dollars.

YEAR	Imports	Exports	Balance
1997	12,862.20	62,557.70	<-49,695.50>
1998	14,241.20	71,168.60	<-56,927.40>
1999	13,111.10	81,788.20	<-68,677.10>
2000	16,185.20	100,018.20	<-83,833.00>
2001	19,182.30	102,278.40	<-83,096.10>
2002	22,127.70	125,192.60	<-103,064.90>
2003	28,367.90	152,436.10	<-124,068.20>
2004	34,744.10	196,682.00	<-161,938.00>
2005	41,925.30	243,470.10	<-201,544.80>
2006*	40,235.70	206,500.50	<- 166,264.8>

*as of the month ending in Sept.

Table 2: Trade with China : 2006
 (Source: U.S. Census Bureau, Foreign Trade Statistics)

NOTE: All figures are in millions of U.S. dollars.

Month	Exports	Imports	Balance
January 2006	3,494.1	21,404.9	-17,910.9
February 2006	4,087.0	17,926.5	-13,839.5
March 2006	4,955.4	20,526.1	-15,570.7
April 2006	4,343.7	21,377.2	-17,033.5
May 2006	4,542.0	22,253.6	-17,711.6
June 2006	4,347.0	24,052.4	-19,705.4
July 2006	5,064.6	24,639.6	-19,574.9
August 2006	4,764.3	26,723.4	-21,959.0
September 2006	4,637.5	27,596.8	-22,959.3
TOTAL	40,235.7	206,500.5	-166,264.8

- b. U.S. Technology Leadership is Lost. Technology leads the way in creating a positive balance of trade. Maintaining the technological and competitive advantage requires continuous innovation, profits, R&D, customer feedback, and ideas from the field. Delays in processing orders due to screening, delays in licensing, lost orders because of anti-U.S. sentiment, and a "Buy Chinese" environment will hurt the U.S. in sectors with products covered under this rule, and ultimately in every other U.S. business sector that trades with China. If the United States loses the benefit of having a competitive advantage, it not only loses the one sale to the China government, but it loses many more sales to other entities. As a result, a competitor in China will have the advantage of more profits, more R&D, feedback, and ideas from customers.

- i. Increased cost of production. The additional administrative burden imposed on industry because of the rule will result in higher product costs that must be passed on to the end user, thus decreasing the U.S. manufacturer's ability to compete in the world-wide marketplace.

3. IMPLEMENTATION OF THE PROPOSED RULE

- a. Identification Process of "Military End Use". The proposed rule requires an export license for items intended for "military end use" in China defined as the "incorporation into, or use for the production, design, development, maintenance, operation, installation, or deployment, repair, overhaul, or refurbishing of" items that would be covered by the USML of the ITAR. Commercial companies will be required to comply with a new standard of "knowing" when their technology is or will possibly be used for a "military end use" either now or in the future.

Through these regulations, the U.S. government places strict liability, with no "Safe Harbor" provision, on U.S. commercial vendors to understand and comply with two different and very problematic concepts: (1) requiring commercial entities to educate Chinese end users on the content and scope of the U.S. ITAR Categories in order to obtain an educated response on whether or not the Chinese end user will subject the technology to "military end use," and (2) requiring U.S. commercial vendors to predict the future.

Knowing what the ITAR Categories encompass is a difficult process. Commercial entities must invest a great deal of dedicated time and effort in educational seminars and trade information to acquire the requisite ITAR knowledge. Even then, the use of undefined terms within the regulations (i.e., technology "directly related" to the items in a Category) often complicates matters. Defense contractors, with ITAR experts whose sole business it is to help them comply with the ITAR regulations, are routinely fined because they did not fully comply with the ITAR regulations despite efforts to do so. It will be very difficult for a U.S. commercial vendor, who is not an expert in all industries that might use the vendor's technology, to adequately explain these concepts and potential problem areas to a Chinese commercial entity. ESRI is not aware of any Chinese language educational materials or seminars that will be available to the Chinese end user. The U.S. commercial vendor can ask the question, but because of the complexity of the USML, its related regulations, and various interpretations of numerous entities in government, industry, and others, the accuracy of the answers will be contingent on the knowledge and understanding of the USML by the Chinese end user.

The regulations require the U.S. commercial vendor to know whenever there is a high probability that the technology will be used for "military end use" in the future. The U.S. commercial vendor will not be party to the long term goals and business plans of their clients. The U.S. commercial vendor can ask the question, but the answer will be valid for only a brief period of time, subject to change at any moment by the Chinese end user. As currently worded, the proposed rule can be interpreted to mean the U.S. commercial vendor has an obligation to follow up and update the use information provided by the Chinese end user in order to meet the "now or in the future" requirement. These obligations are chilling to a U.S. commercial vendor and leads the U.S. commercial vendor down a path of very high administrative costs for their product, essentially pricing them out of the commercial marketplace.

- i. The ITAR USML is difficult even for a U.S. origin company to understand; it will be impossible for a U.S. commercial vendor to educate all their Chinese customers on the meaning and scope of the USML as it applies to the Chinese customers' use of U.S. origin technology. The magnitude of this problem is evidenced by the fact that under the proposed rule, the U.S. commercial vendor is charged with determining whether or not a "Military End Use" will occur; however, BIS is even reluctant to provide published lists of Chinese military end-users. Because of the broad influence of the People's Liberation Army over commercial business in China, determining military end-use, or the absence thereof, becomes much more difficult than determining if there will be WMD end-use. If BIS will not step up to identify WMD proliferators and publish the lists of known proliferators, then how does BIS expect the U.S. software industry to make those determinations?
- b. Levels of Administrative Burdens on Implementing the Proposed Rule
 - i. The administrative burden imposed by the proposed rule does not solely apply to U.S. commercial vendors but will encompass
 1. The U.S. Department of Commerce,
 2. The Chinese Distribution and Reseller Channel,
 3. The Chinese Ministry of Commerce, and
 4. The Chinese end user.
 - ii. Mr. Borman indicated that BIS would take up this issue with the Chinese under a bilateral mechanism for consultations that has been established by the U.S. and China to handle these types of issues. Chinese Government officials have recently told BIS that they do not expect to be

able to handle the increased volume. Finally, the Chinese end user could simply change its stated use of the U.S. vendor's technology without notice. Of these five required participants, three have no incentive to comply with the requirements of the proposed rule and will readily look for suitable, substitute technology elsewhere.

4. PROBLEMS WITH THE PROPOSED RULE

- a. Increase of Licensing Obligation. ESRI is only addressing the provisions of the proposed rule as it pertains to the referenced ECCN numbers under Supplement No 2 to part 744. Exclusions in the use of license exception ENC and further controls on other ECCNs not mentioned in the rule are not covered in ESRI's comment.

First, ESRI wishes to address the statement within the rule, "This proposed rule is not expected to result in a significant increase in license applications or other documentation submitted to BIS." ESRI does not believe this to be an accurate statement. The logical conclusion is of the 47 categories of ECCN covered under this rule, not only will there be a significant increase in the cost of compliance for these companies, but the BIS will also receive an influx of license applications for products that otherwise do not require a license. China is a significant and important market for ESRI products and services. ESRI anticipates the new order process will require enhanced screening, obtaining VEU's (if applicable), additional record keeping, required reporting, and export license applications, resulting in a significant administrative burden to ESRI. The prospect of hiring and training staff just to handle this additional burden will certainly increase the costs of doing business, delay orders, and ultimately result in lost business opportunities.

- i. VEU's. The process of becoming an Authorized Validated End-User (VEU) under the new sections of 748 is very time consuming, costly, and presumptuous from a client's perspective, and it simply will not work. These VEU requirements could lead legitimate commercial and civilian businesses to avoid dealing with U.S. commercial vendors for fear of U.S. government requirements and audit privileges, thus opening the door to wider piracy than already prevails in China.

In a reverse situation, no U.S. company would voluntarily open up their books and records for foreign government compliance reviews and audits or volunteer to meet the additional recordkeeping and reporting requirements. Exporters and re-exporters, for their part, would have to submit annual reports to the Commerce Department detailing the eligible items exported or re-exported to each validated end-user. All parties making use of the VEU regime would also be audited on a routine basis.

Additionally, a foreign entity in China with limited English proficiency may not understand or be familiar with the EAR. This proposed rule is overbroad and requires an unreasonable amount of knowledge and effort. Many U.S. commercial vendors would have problems understanding and complying with these VEU requirements and certainly would have great difficulty explaining the requirements to their Chinese distribution channel.

- ii. End-User Certificates. The proposed rule changes the current end-user certificate requirements. One of the major problems seen in this requirement is that of the four entities that will have a role in obtaining these requirements, three of them are in China. In an export transaction one will have the U.S. exporter, the Chinese distributor or intermediate consignee, the Chinese end user, and the China Ministry of Commerce.

ESRI would make the argument that the process is already difficult enough without adding another layer of bureaucracy within China.

- b. Intellectual Property. Items controlled for AT purposes in Category 5 Part II. will be subject to this proposed rule. Many of the ESRI products would not be controlled under this section of the EAR, except for the inclusion of certain cryptographic properties that serve to provide protection from intellectual property theft and piracy. One possible way to avoid the requirements and additional restrictions of the proposed rule would be to take out this cryptographic protection mechanism. An additional detrimental effect of removing the encryption would be the elimination of the item's functionality. ESRI believes this would leave an opening for non-U.S. competitors, who would be able to market their products with all the necessary security measures (as well as all the bells and whistles) that are basic to many software products in the market today. Piracy and the protection of intellectual property are very large concerns for many U.S. companies, including ESRI. It seems that we are being penalized by the BIS for adding features that ultimately protect our property from being stolen.
- c. Applicability of the Proposed Rule to 5D002 ENC and 5D992. Over the past 10 years, encryption has been continually reviewed by the BIS. The BIS has carefully identified the type of encryption requiring a high level of export control, while at the same time recognizing the changing technological climate and identifying encryption that no longer poses a threat to the U.S. and can be de-controlled. The BIS currently recognizes the widespread use of the easily "cracked" lower strength encryption and its subsequent use for copy and password protection. The copyright owner understands the use of these techniques does not protect the intellectual property from a serious and sophisticated pirate of intellectual property and only serves to keep the honest user honest. The BIS recognizes the lower encryption strength does not create text that cannot be "cracked" or read by governmental entities. Both parties have been willing to assume these risks as a compromise position in order to allow some form of IP protection to a commercial vendor of software, while at the same time allowing the free distribution and commercialization of these software programs to most of the world. The BIS has identified the specific parameters for the lower-controlled encryption through the "ENC" exception and 5D992 classification.

ESRI is of the opinion that software qualifying for the "ENC" exception and 5D992 classification should not be included within the 47 classifications under the proposed rule, because the BIS has already recognized the low risk to the U.S. through use of this technology, and, in the case of the "ENC" qualification, has specifically reviewed the encryption component prior to issuance of the "ENC" designation.

5. CONCLUSION

While ESRI appreciates that the BIS is attempting to protect the national security and foreign policy interests of the U.S., ESRI is not supportive of the proposed rule (RIN 0694-AD75) as currently drafted on multiple levels. Specifically, the proposed rule will place the U.S. software industry at a competitive disadvantage amongst its foreign counterparts. In practice, the proposed rule will not achieve its objective of limiting the availability of GIS software and technology transfer into China. Rather, the resulting policy will push Chinese government, military, business, higher education, and consumer users into seeking the same or similar technology from unencumbered vendors from other countries, increase piracy, trigger the adoption of Open Source Code initiatives, or cause users to turn to indigenous Chinese developed software products. The proposed rule hurts the U.S. balance of trade position with China and handcuffs the U.S. software industry, which is one industry sector that is delivering a positive balance of trade. Finally, the proposed rule would be both costly and administratively burdensome to

implement, and interpretation of the proposed rule by U.S. firms, let alone Chinese end users, would be highly problematic without the benefit of a "Safe Harbor" provision.

Essentially, the proposed rule sets up a Lose-Lose scenario for the U.S. and the U.S. software industry.

6. SUGGESTED ALTERNATIVES

- a. ESRI believes the Bureau of Industry and Security should reconsider adoption of this proposed rule. There exists areas within the EAR where regulation modifications could achieve the desired policy objectives. Suggested alternatives to this proposed rule would include:
 - i. Expansion of the 'Entity List' in Supplemental 4 to part 744 to include known Chinese military end-users.
 - ii. Consideration of additional conditions on license exceptions requiring enhanced screening in order to apply the exception for a defined set of users.
 - iii. At the very least, the BIS should step back and work with industry in order to discuss and understand what workable solutions can be implemented that will have sustainable results in-line with U.S. regional and worldwide objectives.
 - iv. Creation of a cross-functional team or panel to address political, industry, technology, and military concerns in order to determine a way forward to address the most significant concerns.

ESRI appreciates this opportunity to provide its comments to the BIS on this subject. If you have any questions regarding ESRI's comments, please do not hesitate to contact me. ESRI would welcome the opportunity to discuss this issue with the BIS at greater length.

Sincerely,



Donald J. Berry, Director of Operations
Environmental Systems Research Institute, Inc.

LEOMA

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November 21, 2006

Cohherent Inc
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Cutting Edge Optonics
St Charles MO

JDSU Corp.
Santa Rosa CA

Laser Mechanism
Farmington Hills MI

Newport Corp
Irvine CA

nLight Photonics
Vancouver WA

Novalux
Sunnyvale CA

NP Photonics
Tucson AZ

Nufem
East Granby CT

Optics for Research
Caldwell NJ

Quintessence Photonics
Sylmar CA

Spectra-Physics
Mountain View CA

Sheila Quarterman
Office of Exporter Services, Regulatory Policy Division
Bureau of Industry and Security
Department of Commerce
14th St. & Pennsylvania Avenue, NW., Room 2705,
Washington, D.C. 20230
ATTN: RIN 0694-AD75

Ladies and Gentlemen:

We would like to express our grave concern over the proposed Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC) published July 6, 2006 in Vol. 71, No. 129 of the Federal Register. While this proposal has the admirable objective of protecting U.S. national security, we believe that it would fail to meet this objective due to its unilateral nature, while its onerous restrictions and overly broad prohibitions would inflict substantial financial harm on American companies, while benefiting our foreign competitors.

Although the proposal is characterized as a multilateral initiative under the ambit of the Wassenaar Arrangement, we are not aware of any other Participating States that have proposed to implement controls of similar scope on their trade with the PRC. The proposal appears to us as a unilateral control mechanism.

As such, the proposed rule would not prevent or even discourage the PRC military from modernizing, nor would it protect American national security interests. It would instead have the opposite effect, as the PRC would merely procure products with comparable or identical technology currently available from our competitors in Europe, Asia and Israel, resulting in lost revenue to American companies.

Further, the proposal would encourage our competitors within the PRC to develop their own competitive products, thereby eliminating the need for American technology. We have seen this happen in the past in reaction to restrictive U.S. trade policy. We note specifically that of the four general types of lasers controlled under 6A995 of the Commerce Control List and proposed to be subject to the military end-use control under Supplement No. 2 to Part 744, three are currently available from our PRC competitors. In all, this proposal would further denigrate the ability of our member companies to maintain leadership in the electro-optics technology arena.

The proposal's expanded export controls and the cost of fulfilling the proposal's increased administrative requirements also promise to virtually eliminate the export of a wide range of American products to legitimate civilian end-users in

the PRC. Even under the requirements of the current regulatory regime, it is extremely difficult to obtain a validated export license to China for controlled products. With the proposed rule in place with a dramatically expanded list of controlled products, we anticipate this situation to deteriorate to the point of strangling the ability of our member companies to export to China. We do not believe that BIS is adequately staffed to address the dramatic increase in license applications that would result from implementation of the proposal, or to undertake the evaluation and audit the recordkeeping and reporting proposed in connection with the VEU program. We also do not believe that MOFCOM has the resources necessary to issue the number of additional PRC End-Use Certificates that would be requested in connection with the proposal.

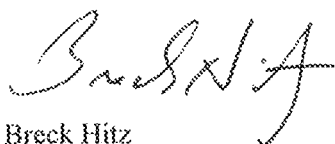
Additionally, the requirements placed on our Chinese customers in connection with supporting increased license applications or submitting to VEU evaluation would be burdensome and intrusive, to the point that these customers would simply avoid them by purchasing comparable products from our overseas and Chinese National competitors, again resulting in lost revenue to American companies.

Finally, the broad scope of the proposal's prohibition on "support" by U.S. persons of exports, reexports or transfers without a license, when combined with the subjective nature of the definition of "knowledge" applied to the proposed military end-use control, would result in substantially increased risk of criminal and civil liability associated with exports to the PRC. This risk would be punctuated by the lack of a clear due diligence standard to help insulate from this risk, and would accrue not only to the actual exporters of the products, but also to export partners (e.g., freight forwarders, shippers, financial institutions, attorneys and consultants). This would lead to increased costs and administrative burdens, as all parties attempt to compensate themselves for and protect against potential liability. Consequently, this increased cost would further discourage American companies from exporting to China.

While we fully support a thoughtful, comprehensive export control regime that protects U.S. national security, this proposal is not the proper means to this end. If this proposal is implemented, the result will be a PRC military that has modernized either by purchasing comparable products and technology from foreign competitors, or by developing the technology with our PRC competitors. In either case, the victims of this proposal will be American companies, who will suffer from lower sales, fewer jobs and erosion of industry leadership.

We therefore urge you to find an alternative to this well-meaning but ill-conceived proposal that gives American companies a fighting chance to compete for business in China on a level playing field with our international competitors.

Sincerely,
The Laser and Electro-Optics Manufacturers' Association



Breck Hitz
Executive Director



Mentor Graphics Corporation
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November 10, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th St. and Constitution Ave. NW
Room 2705
Washington, DC 20230

Attention: Sheila Quarterman

RIN 0694-AD75

RE: Proposed Rulemaking Concerning Revisions and Clarifications of Export and Re-export Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 Fed. Reg. at 38.313, July 6, 2006)

Dear Ms. Quarterman:

At Mentor Graphics, we have always taken our responsibilities under United States and international export laws seriously, and we appreciate the opportunity to comment on this important proposed rule.

For your information, Mentor Graphics Corporation (Nasdaq:[MENT](http://www.mentor.com) - [News](http://www.mentor.com)) is a world leader in electronic hardware and software design solutions, providing products, consulting services and award-winning support for the world's most successful electronics and semiconductor companies. Established in 1981, the company reported revenues over the last 12 months of over \$750 million and employs approximately 4,100 people worldwide. Corporate headquarters are located at 8005 S.W. Boeckman Road, Wilsonville, Oregon 97070-7777. World Wide Web site: <http://www.mentor.com/>.

We appreciate that you are trying to develop an export control policy that fosters civilian trade with China while at the same time recognizing that exports to certain end-uses may impede the national security and foreign policy interests of the United States. However, as currently proposed, we feel that the proposed Military End-Use Rule (MEUR) is too broad, is not well focused on the truly important technologies that could make a material contribution to China's military, and that since it is a unilateral control, it will not be successful in its export control aims. As such, the current proposed rule has a potentially serious impact on both export compliance costs and risk in a country which is a critical export market for all United States industry, and is an important and growing export market for our company, in many cases

without a significant increase in security. As you continue to discuss this matter inter-agency, we hope that you will consider the following points.

For any Military End-Use control to be successful, it must be multilateral. The current proposed MEUR cannot be multilateral because it includes ECCNs which are not part of the Wassenaar Dual-Use List.

BIS has said that they hope that the proposed MEUR will be adopted by other countries, and will become a multilateral control. However, the current proposed MEUR includes many ECCNs that the United States controls unilaterally for anti-terrorism (AT) concerns; these are the ECCNs ending in 99x. Like the United States, member countries within the European Union have stated that they will not implement MEUR for China as a blanket "catch-all". Since the AT-controlled ECCNs are not on the Wassenaar Dual-Use List, and are not controlled by any of our trading partners, unless other countries adopt a "catch-all" rule, the United States controls on these items will be unilateral.

The AT-controlled ECCNs would not provide a material contribution to China's military.

Clearly, since the international community has chosen not to control the technologies the United States controls at the AT level, they are not considered critical technologies in developing weapons.

For example, our company's product, Electronic Design Automation (EDA) software, is classified as 3D991. It has been specifically excluded from the Wassenaar Dual-Use List for fifteen years, and this has been re-affirmed in the Dual Use List Reviews for 2003 and 2005. Our products can be viewed like word processors for electronic design; they can help make the process easier, but if users do not have the know-how to design electronics, our tools will not help them. EDA software has no inherent military value. Like our products, other items classified at the AT level would not provide a material contribution to China's military.

Unilateral controls should be eliminated in order to maintain a level playing field.

In addition to being ineffective, unilateral controls penalize U.S. suppliers. If the U.S. controls ECCNs at the AT level, competitors based in the EU and elsewhere will not face the same increased level of export compliance costs and uncertainty with respect to sales in China that U.S. companies will face. This may result in causing Chinese customers to avoid U.S. suppliers because of this increased bureaucratic overhead and uncertainty, which could then lead to a shift of technological leadership out of the United States.

For example, the EDA industry's competitors include MunEDA, ChipVision and Concept Engineering in Germany; TransEDA, Spiratech and Pulsec in the UK; and Kimotion in Belgium. Further to this, large consumers of EDA in Europe, such as Infineon, STMicroelectronics and Philips actively collaborate on EDA R&D, and large research institutes like Leti in France or IMEC in Belgium also have active EDA programs, with the intent of shifting this technology from its core U.S. roots to the EU. If MEUR, as it is currently proposed, is implemented, it could help to shift this originally U.S. industry to foreign competitors.

Conclusion

Since AT level ECCNs would not make a significant contribution to China's military development, and since controls on these ECCNs could not be made multilateral, leading to an ineffective control and a disadvantage for U.S. suppliers, we respectfully submit that ECCNs classified at the 99x level should be removed from the scope of the MEUR for China. In particular, we feel that EDA software classified under 3D991 should be removed. We remain optimistic that a reasonable scope of a MEUR for China can be devised that not only protects the national security and foreign policy interests of the United States. We would be pleased to respond to any additional questions and concerns that may not have been addressed in this letter, in a manner and time that would be mutually convenient.

Sincerely,

A handwritten signature in black ink, appearing to read "Walden C. Rhines". The signature is stylized and includes a horizontal line at the end.

Walden C. Rhines
Chairman of the Board and Chief Executive Officer
Mentor Graphics Corporation



December 1, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th Street and Pennsylvania Ave., NW
Room 2705
Washington, DC 20230

Attn: Sheila Quarterman

RIN 0694-AD75

RE: Proposed Rule – Revisions and Clarifications of Export and Reexport Controls for the People's Republic of China; New Authorization Validated End-User (71 Fed. Reg. 38,313 (July 6, 2006))

Dear Ms. Quarterman:

Applied Materials, Inc., ("Applied") is pleased to submit to the Commerce Department's Bureau of Industry and Security ("BIS") the following comments on the proposed amendments to the Export Administration Regulations ("EAR") identified above.

Background

Applied is the global leader in nanomanufacturing technology solutions with a broad portfolio of innovative equipment, service and software products for the fabrication of semiconductor chips, flat panels, solar photovoltaic cells, flexible electronics and energy efficient glass. Founded in 1967, Applied Materials creates and commercializes the nanomanufacturing technology that helps produce virtually every semiconductor chip and flat panel display in the world. The company employs approximately 14,000 people throughout the world. In fiscal year 2006, Applied Materials recorded net sales of \$9.17 billion.

With exports accounting for approximately 80 percent of its worldwide sales, Applied Materials is keenly aware of the importance of trade compliance. Accordingly, Applied strictly complies with all U.S. export control laws and regulations while seeking the leading position in every market in which we operate. Concomitant with a strict adherence to US export control rules, Applied also advocates a US export control policy that is premised on several key principles, including --

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- Export controls, both policy and administration, must be cognizant of economic realities and globalization and can no longer view national security from a Cold War-era perspective in which the United States is *the* sole global technology and market leader.
- Export controls must be multilateral and standards of worldwide effectiveness must be established. The ability to institute effective multilateral controls should be an important determinant in any consideration of applying controls.
- Once established on a multilateral basis, implementation should be applied evenly across the export control regime. Control requirements and conditions must be applied consistently, with regard to precedent, and applied equally among exporters of equivalent products.
- Licensing decisions — or the licensing process — should not permit US companies to lose sales to non-US firms offering equivalent technologies.

Military End-Use Licensing

We view the proposed revisions of US licensing review policy and license requirements for items exported to China destined for military end use as largely contradictory to these principles. Accordingly, we believe they will prove ineffective in their intended purpose to prevent US exports from making a material contribution to China's military capabilities. We also believe the proposed revision would lead to US suppliers being viewed as less reliable than their foreign counterparts, which — because of widespread foreign availability — could lead to lost sales (and ultimately jobs) by US suppliers.

As a supplier of equipment used in the commercial production of integrated circuits, Applied is concerned over the inclusion of items in categories 3B991 and 3B992 in the list of items subject to new military end-use requirements. Applied and other US semiconductor equipment suppliers face determined competitors from around the world:

Process Step	Non-US Suppliers
Etch	TEL (Japan), AMEC (China), Asahi Techneion Co., Ltd (Japan)
CVD	Jusung (Korea), ASMI (Netherlands), Aixtron (Germany), TEL
PVD	Trikon (UK), Unaxis (Switzerland)
Ion Implant	SEN (Japan), Nissin (Japan)
Lithography	ASML (Netherlands), Nikon (Japan), Canon (Japan)
Resist Track	TEL, Suss Micro (Germany)
Mask Making	Micronic (Sweden), NuFlare (Japan)
CMP	Ebara (Japan), Accretech (Japan)
Process Control/ Metrology	Leica (Germany), Hitachi (Japan), Thermawave (Israel), Nova Measurement (Israel)
ALD	Aixtron
CVD = chemical vapor deposition; PVD = physical vapor deposition; CMP = chemical-mechanical planarization, ALD = atomic layer deposition	

Typically, our customers qualify at least two suppliers for any process step and generally outfit their production facilities in a “copy exact” fashion. The widespread foreign availability of equivalent and qualified tools raises the potential for US-made tools being “designed-out” of our customers’ productions facilities not only in China but *everywhere*.

End-User Certificate Requirements

Requiring end-user certificates for all items (not just dual use) exceeding a \$5,000 threshold is unrealistically low and would capture nearly every export of US-made semiconductor manufacturing equipment, related spare parts and materials. Moreover, placing this burden on a Chinese bureaucracy ill-equipped to handle it will place US suppliers at a clear disadvantage in dealing with customers in China. It is not at all difficult to see customers being "guided" by the Chinese government to buy tools from suppliers whose governments do not impose these certificate requirements.

Validated End-User

We welcome the proposed new validated end-user (VEU) designation. The VEU proposal would benefit Applied Materials and other US semiconductor equipment providers because much of our licensing activity involves shipping the same equipment/spare parts to the same customer. The VEU program, if properly implemented, would help to eliminate what has become a competitive advantage for our non-US competitors (i.e., a relatively simple, straightforward, quick and predictable licensing process).

We believe the VEU proposal is an excellent starting point and offer the following suggestions to make it even better –

1) Extend the VEU program to countries other than China, such as India and Taiwan. Establishing "trusted partners" has the potential to reduce licensing burdens overall and need not be limited to just one country.

2) Broaden the VEU program to include subsidiaries and subcontractors, as well as multiple facilities of the same end-user.

3) Devote adequate resources to making the VEU program successful. We would not like to see resource constraints within BIS hamper effective implementation of the VEU. Processing time should be less than the existing validated license process.

4) Ensure that no company confidential information is published in the EAR. This includes any specific sub-ECCNs which could compromise the VEU.

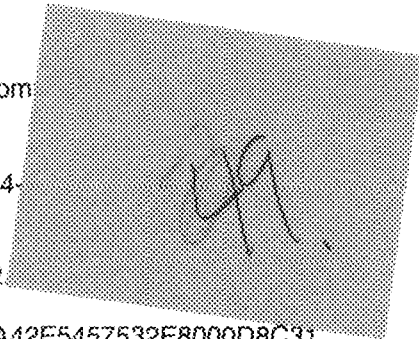
In summary, Applied Materials believes the VEU proposal has considerable merit and represents a fresh approach to an old problem. The military end-use and certification proposals, however, appear to be the same old approaches to an ill-defined problem and should be withdrawn and reconsidered before issuing as final rules.

Applied Materials appreciates the opportunity to submit comments on this important issue and we will be happy to work with BIS on these proposals.

Sincerely,


Karen Murphy
Sr. Director, Trade

From: "Jacobson, Douglas" <Douglas.Jacobson@strasburger.com>
To: <publiccomments@bis.doc.gov>
Date: Tue, Dec 5, 2006 3:51 AM
Subject: NCITD Comments on China Rule (12.4.06).pdf - RIN 0694-



This email contained an attached file "NCITD Comments on China Rule (12.4.06).pdf". MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?2401DA7F6BD3CAC4DBFF69DEB6FA42E5457532E8000D8C31>. Per BIS policy, the file(s) attached to this message have been held in quarantine. If you are certain the file is a legitimate business document, forward this message to the BIS Help Desk (ITHELP) and ask to have the attachment(s) released.

All unclaimed attachments are deleted automatically after fourteen (14) calendar days.

Please see the attached comments of the NCITD on the proposed China Rule (RIN 0694-AD75).

.....
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.....

CC: "NCITD" <ezra@ncitd.org>, <mford@bdpnet.com>



The National Council on International Trade Development
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December 4, 2006

VIA E-MAIL (PUBLICCOMMENTS@BIS.DOC.GOV)
AND FAX (202-482-3355)

Ms. Sheila Quarterman
U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th Street and Pennsylvania Ave., NW
Room 2705
Washington, DC 20230

REF: RIN 0694-AD29

RE: NCITD Comments on Advance Notice of Proposed Rulemaking Regarding
Revisions and Clarification of Export and Reexport Controls for the People's
Republic of China and New Authorization Validated End-User

Dear Ms. Quarterman:

The National Council on International Trade Development (NCITD) is pleased to respond to the Bureau of Industry and Security's (BIS) request for comments on proposed changes to the Export Administration Regulations ("EAR") that would impact existing regulatory requirements and policies with respect to the export and reexport of certain products to the People's Republic of China ("PRC").¹

I. NCITD Background

NCITD, founded in 1967, is a nonprofit trade association of large and small U.S. exporters and importers who are advocates of policies that are consistent with national security, foreign policy, and a flexible export transaction process that promotes export trade. Our membership includes large, mid-size, and small firms, exporters and importers, freight forwarders and brokers, banks, attorneys, trade groups, and consulting firms. Many of our members export products to and have significant

¹ 71 Fed. Reg.38,213 (July 6, 2006). These comments are timely filed since the comment period was extended to December 4, 2006. See 71 Fed. Reg. 61,692 (Oct. 19, 2006).

manufacturing operations in the PRC. Our members clearly understand the importance of their role in preventing exports and reexports of U.S. origin products and technology that might be contrary to the national security and foreign policy interests of the United States.

II. Comments and Analysis of Proposed Rule

As set forth below, the members of the NCITD believe that the proposed rule modifying export and reexport controls for the PRC has many flaws. Despite its good intentions, the proposed rule would significantly raise compliance costs and would unfairly restrict trade in highly competitive markets without enhancing the national security of the United States. Therefore, as discussed below, the NCITD encourages BIS to reevaluate the utility of the proposed rule and urges BIS to make the changes described below before issuing any final rule.

A. Revision of Licensing Review Policy and Additional Licensing Requirements on Certain Exports to the PRC

The proposed rule published on July 6, 2006 states that it is intended to "strengthen U.S. efforts to prevent U.S. exports to the PRC that would make a material contribution to the PRC's military capabilities." In order to do so, BIS proposes to impose licensing requirements (with a policy of denial) on a wide range of products that the U.S. has determined "will contribute to the advancement of Chinese military capabilities." Specifically, the proposed rule will implement a new control on exports to the PRC of certain items listed on the Commerce Control List ("CCL") when the exporter has "knowledge" that such items are "destined for military end-use in the PRC."

1. Definition of Military End-Use and "Material Contribution"

NCITD and its members have a number of concerns with these proposed changes to the EAR. First, there is a lack of clarity on what constitutes a "military end-use". While the proposed rule defines "military end-use" as "incorporation into, or use for the production, design, development, maintenance, operation, installation, or deployment, repair, overhaul, or refurbishing" of certain specified "defense articles" and certain ECCNs on the CCL, exporters do not always have accurate information on the specific end-use of their products. As a result, an undue burden will be placed on U.S. industry to determine the licensing requirements on transaction-by-transaction basis. This is particularly problematic in China, where it is often difficult to determine whether a company is affiliated with the People's Liberation Army or not.

In addition, it is not clear how far a U.S. company will have to go, in terms of due diligence, to determine whether a product will have a military end-use. For example, it is often very difficult for U.S. exporters to obtain accurate information or intelligence from third-country or Chinese distributors regarding the names of the end-users or the intended end-use of a product. As a result, the proposed rule may actually encourage

certain customers to provide inaccurate or misleading information to their supplier regarding the end-use of a product in China because they are aware that such information may delay or prohibit the export of a product from the United States.

Second, NCITD's members are concerned that all licensed exports will be reviewed through the murky lens of whether the item will make a "material contribution to the military capabilities of the People's Republic of China." The net outcome of this review may not be an increase in U.S. national security. Rather, it is more likely to lead to a further erosion of the U.S. industrial base as China turns more and more to non-U.S. suppliers.

A better approach would be to shift the burden away from exporters by having BIS publish a list, similar to the Unverified List or Entity List, which would name specific prohibited military end-users in China. A list of prohibited military end-users that is established and maintained by BIS is a much more transparent, practical and objective way for U.S. exporters to ascertain the likelihood that a product being exported to the PRC will be for a military end-use or not.

2. Foreign Availability

China represents a key long-term and large-scale growth market opportunity for many companies. Thus, NCITD's members are very concerned that the proposed rule is overbroad and will be unusually burdensome to administer. The proposed rule imposes new controls on a number of products, many of which are of limited strategic value. Many of the 47 ECCNS that would be prohibited from being sold to military end-users in China are readily available in the global marketplace. In fact, many of the products falling within the 47 ECCNs are actually produced in China. These broad restrictions will not achieve the desired effect to limit China's access to sensitive items. We believe that if these restrictions are enacted that it will hinder many U.S. companies from competing globally. This is particularly true since many other countries that produce these products, including those produced in countries that are members of the Wassenaar Arrangement, do not have similar export controls.

C. Authorized Validated End-Users

The proposed rule contemplates the establishment of a new authorization for "validated" end-users, known as Authorization VEU. The proposed authorization, would allow the export, reexport, and transfer of eligible items to validate end-users in the PRC. To become an eligible VEU, the end-user in China would have to meet a number of criteria, including a "demonstrated record of engaging only in civil end-use activities and not contributing to the proliferation of weapons of mass destruction or otherwise engaged in activity contrary to U.S. national security or foreign policy interests."

At first glance the Authorized VEU proposal seems like a reasonable way to "facilitate legitimate exports to civilian end-users" in China. However, upon closer scrutiny, the

Authorized VEU program is unlikely to facilitate trade in the manner that BIS officials expect. First, it is unlikely that many Chinese companies will agree to the terms of the Validated End User designation. Based upon the experience of our members, non-U.S. companies are usually unwilling to submit to audits conducted by foreign governments. In addition, VEU's will be required to comply with recordkeeping requirements, have procedures in place to ensure compliance with the terms and conditions of Authorization VEU and submit annual reports to BIS. While affiliates of U.S. companies may be willing to implement these enhance requirements in order to become a VEU, it is unclear as to how many companies will actually want to undergo the enhance scrutiny to become a VEU, particularly if becoming a VEU will impose additional costs and requirements on the importer.

Second, the proposed rule states that a list of VEU's will be published in a supplement to the EAR. However, because of company there exists a strong potential for some Chinese importers, particularly those affiliated with U.S. companies, to be encouraged not to participate in the VEU program for fear that they will lose sales to competitors.

Third, the proposed rule fails to address whether the proposal to publish the names of VEU's in the EAR is permissible under the confidentiality provisions of the Export Administration Act ("EAA"). Section 12(c) of the EAA provides for the confidentiality of export-related information obtained by the government under the EAA. See 50 U.S.C. App. § 2411(c). Specifically, section 12(c) of the EAA states that certain information submitted to BIS "shall be withheld from public disclosure unless the release of such information is determined by the Secretary to be in the national interest." 50 U.S.C. App. § 2411(c). Many Chinese companies that choose to apply to become a VEU may not want their names to be made publicly available. At a minimum, assuming the VEU program is adopted, applicants should be given the opportunity to determine whether they want their names to be made publicly available.

Finally, before BIS chooses to proceed with the VEU program, we strongly encourage the agency to ensure that it has adequate resources to operate such a program in an effective manner. The proposed rule would require VEU's to submit a great deal of information to BIS. The proposal also contemplates having BIS staff conduct "on-site visits by U.S. Government officials to verify their compliance with the conditions of VEU." As noted above, it is not certain how many Chinese companies would choose to participate in this process. Nevertheless, it appears that conducting even a small number of VEU verifications would require significant resources. Therefore, if BIS chooses to proceed with the VEU program it must ensure that it has the adequate resources in the U.S. and in China to vet and issue VEU authorizations in an efficient and timely manner.

D. End-User Certificates

The proposed rule would modify section 748.10 of the EAR by requiring exporters to obtain an End-User Certificate, issued by the PRC Ministry of Commerce, for all items that both require a license to the PRC for any reason and exceed a total value of \$5,000 per ECCN entry. Presently, a PRC End-Use Certificate is only required for items controlled for national security reasons. The proposed rule also proposes to amend several sections of the EAR to eliminate the current requirement that exporters submit PRC End-User Certificates to BIS with their license applications, while requiring exporters to retain such certificates for five years.

While we concur with the proposed change to the EAR that would eliminate the requirement for exporters to submit PRC End-User Certificates to BIS with their license applications, we strongly disagree with the proposal to greatly expand the PRC End-User Certificate requirements for the following reasons.

First, requiring PRC End-User Certificates for all items that require an export license to the PRC and exceed a total value of \$5,000 would dramatically increase the number of export transactions that would require such a certificate. Based upon public data contained in Appendix F of BIS's 2005 Annual Report, BIS received 1303 applications to export controlled products to the PRC in fiscal year 2005. Due to the increasing volume trade between the U.S. and China, it is likely that the number of applications to export controlled products to the PRC in 2006 increased from 2005. While it is not possible for us to predict with certainty how many additional PRC End-User Certificates would be required if the propose change in policy is implemented, based upon information obtained from our members we believe that U.S. companies would be required to obtain a significant number of additional PRC End-User Certificates than are currently required. This is particularly true if BIS chooses to proceed with the proposal outlined above that would impose export licensing requirements on certain categories of products destined for military end-use, assuming that exporters chose to submit license applications for those types of products.

Second, obtaining PRC End-User Certificates from China's Ministry of Commerce (MOFCOM) is a non-transparent, challenging, time-consuming and costly endeavor. While the proposed states that MOFCOM's "Export Control Division 1" is responsible for issuing PRC End-User Certificates, obtaining any information from MOFCOM on the specific requirements needed to apply for an end-user certificate is very difficult, unless a company employs a Chinese law firm or consultant. Moreover, we have been advised by BIS officials that the actual procedure for obtaining a PRC End-User Certificate should commence at the provincial level in China. In addition, U.S. exporters that have navigated the PRC-End User Certificate process, report that MOFCOM's Export Control Division is understaffed and only works specified hours during the week, leading to significant delays in the issuance of certificates. Our members report that it can take nearly one year to obtain an end-user certificate from MOFCOM. Thus, it is likely that increasing the number of transactions requiring MOFCOM end-user certificates will lead

to lost sales by U.S. companies, since their overseas competitors will not require such certificates.

Third, there is conflicting information on the fees imposed by MOFCOM for applying for and obtaining a PRC End-User Certificate. Based upon the experience of our members, the reported MOFCOM fee for obtaining a PRC-End User Certificate can range from hundreds to thousands of U.S. dollars. The inconsistent information and transparency associated with end-user certificate application fees required by MOFCOM to process and issue end-user certificates may require U.S. exporters to increase their FCPA-compliance costs to ensure that no prohibited payments are made.

Fourth, it is unclear whether the increased costs of requiring an expanded universe of PRC End-User Certificates will actually lead to any benefit of enhancing compliance with U.S. export controls. The proposed rule states that "facilitation of end-use checks should facilitate increased U.S. exports to the PRC." We respectfully disagree. Since the Government of the PRC will be the ones conducting the end-use checks and issuing the certificates, the PRC Government may have incentive to issue end-user certificates for products that they want to purchase and to delay end-user certificates associated with products that may compete with PRC Government industries. This is akin to having the "fox watching the hen house." Moreover, while BIS has a representative in China to work with MOFCOM on conducting end-user checks, a lone (or even multiple) BIS representative will be unable to perform the necessary oversight to ensure that the end-user certificates that are issued are accurate and issued in a timely manner.

For these reasons, we recommend that BIS refrain from enacting the proposed changes to the EAR with respect to PRC End-User Certificates. If BIS chooses to proceed with this proposal, we recommend that the threshold for issuing a PRC End-User Certificate be increased to a much higher dollar, such as sales exceeding \$250,000

III. Conclusion

The members of NCITD welcome the opportunity to submit these comments on the proposed changes to the EAR. We trust that BIS will find consider these comments in determining whether to issue a final rule containing the specific changes to the EAR that are contemplated.

Respectfully submitted,



Michael J. Ford
Chairman

National Council on International Trade Development



Alliance for
Network
Security

December 1, 2006

Sheila Quarterman
Bureau of Industry and Security
United States Department of Commerce
14th Street and Constitution Avenue N.W.
Washington, D.C. 20230

Re: **Proposed Rulemaking Concerning Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 FR 38313 of July 6, 2006)**

Dear Ms. Quarterman:

The members of the Alliance for Network Security ("ANS") appreciate this opportunity to comment on the Proposed Rulemaking Concerning Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC) and New Authorization Validated End-User (71 FR 38313 of July 6, 2006). ANS member companies include 3Com Corp., Cisco Systems, Inc., Hewlett-Packard Company, Hitachi Data Systems, Inc., Juniper Networks, Inc., Lucent Technologies, Inc., McAfee, Inc., Microsoft Corporation, Novell, Inc., PGP Corporation and Sun Microsystems, Inc.

ANS and its member companies support the overall objective of facilitating commercial trade with the PRC while at the same time protecting legitimate national security interests of the United States. Nevertheless, we have concerns with respect to the proposed rulemaking which need to be addressed prior to publication of an interim or final rule by the Bureau of Industry and Security ("BIS"). Our concerns may be summarized in three parts.

Cross-Industry Concerns

First, ANS member companies, like companies in many other industries, are profoundly concerned with respect to the unilateral nature of the Military End Use Requirements ("MEUR"). Unless and until other members of the Wassenaar Arrangement implement controls similar to MEUR, the United States should forebear. In addition, ANS member companies believe that the Validated End User provisions would provide little, if any, benefit to Information Technology companies that sell large numbers of low value products through indirect channels. The End User Certificate requirements also are problematic, because they impose (yet another) non-tariff barrier to trade with China. Finally, the "knowledge" standard is vague. These aspects of the proposed rule are discussed further, in Attachment A.

Concerns Specific to the Network Security Industry

Second, ANS member companies are very concerned that the scope of items subject to MEUR is overly broad. We believe that only items specifically listed in Supplement No. 2 to Part 744 of the Export Administration Regulations ("EAR" 15 CFR Part 730 et seq.), and not other items on the Commerce Control List ("CCL") of the EAR, should be subject to MEUR. Perhaps, this is the intent of the proposed rule. If so, then that intent should be more explicit. In addition, we believe that items classified under Export Control Classification Number ("ECCN") 3D991, 4D994, 5A/B/D/E991, 5A/B/D/E992 and 3D991 should be exempted from MEUR, because existing controls on items controlled for national security purposes already reflect the fact that most items controlled for national security reasons do not require licenses for export to government end-users, for example under ECCNs 5A/D002. The reasons for these recommendations are set forth in Attachment B.



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Competitiveness Concerns

Third, we are concerned that the requirements of MEUR will have a negative effect on sales of American companies and/or local companies operating under US export laws that compete with domestic Chinese and other foreign competitors, without achieving the intended results of this policy. As an example, the current competitive landscape of networking equipment is highlighted in Attachment C.

Conclusion

As previously stated, ANS and its member companies support the overall objective of facilitating commercial trade with the PRC while at the same time protecting legitimate national security interests of the United States. Nevertheless, we have concerns with respect to the proposed rulemaking which need to be addressed prior to publication of an interim or final rule by the BIS, as outlined above. Addressing these concerns, particularly our concern with respect to the unilateral nature of MEUR, requiring close consultation with our allies, undoubtedly will take time.

While the United States seeks to make MEUR truly multilateral, and addresses the other issues raised in this letter, we respectfully suggest that industry and the Bureau of Industry and Security should continue the dialogue begun in August, to review the scope of items affected and other issues of interest. We stand ready and willing to continue this discussion, in order to ensure that national security and foreign policy interests are protected without unnecessarily hindering legitimate access to important markets in China.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Roszel C. Thomsen II', is written over a light blue horizontal line.

Roszel C. Thomsen II
Counsel
Alliance for Network Security

Index of Attachments

- A. Cross-Industry Concerns
- B. Concerns Specific to the Network Security Industry
- C. Competitiveness Concerns



Attachment A

Cross-Industry Concerns

1. The Proposed Regulation Would be Unilateral

ANS members understand that the Wassenaar Arrangement agreed to implement military end-use restrictions on countries subject to conventional arms embargoes. However, as far as we can determine, only the United States has implemented a conventional arms embargo with respect to China. The net effect is that American companies will be subject to more stringent regulations than their foreign competitors, undermining the effectiveness of the MEUR and negatively impacting American companies in their efforts to compete on a level playing field.

2. The Validated End User Rule Would Have Limited Utility for ANS Member Companies

ANS members believe that the Validated End User Rule would have limited utility for their activities in China. The Validated End-User rule may have some utility for companies that sell relatively high dollar value products directly to a small number of companies. By comparison, ANS members sell relatively small dollar value products indirectly (i.e., through distributors, resellers and other channel partners) to a large number of companies. Hence, the intended benefits of the Validated End User Rule are likely to be illusory for ANS member companies.

3. The End User Certificate Requirement Will Hinder ANS Members' Ability to Compete

ANS members believe that the End User Certificate requirement will hinder their ability to compete in China. ANS members have experienced delays in obtaining such certificates, when they were required for a much more limited volume of trade than would be effected under the MEUR. Additional delays would likely ensue if the proposed rule were adopted as written, because of the large volume of trade affected, harming American companies vis-à-vis their foreign competitors.

4. The Knowledge Element Should Be an "Actual" Rather Than "Constructive" Standard

ANS members believe that the knowledge element of the MEUR should be based on an actual knowledge standard, rather than a constructive knowledge standard. Without belaboring this technical point, it is deeply concerning to ANS member companies that knowledge of business partners and others might be imputed to the parent corporation, notwithstanding codes of conduct and other forms of due diligence. In a complicated country where the government plays such a significant role in society, like China, an actual knowledge standard is more appropriate than a constructive knowledge standard.



Attachment B

Concerns Specific to the Network Security Industry

1. MEUR Should Be Limited to Items Listed in Supplement No. 2 to Part 744

Because of the wording of Sections 744.21(a) and (c), there is some confusion concerning the scope of the MEUR. For example, Section 744.21(a) references items that are specifically listed on the Commerce Control List (“CCL”) of the Export Administration Regulations (“EAR”, 15 CFR Part 730 *et seq.*), and Section 744.21(c) states that license exceptions other than GOV are not available. However, Supplement No. 2 to Part 744 purports to provide an exclusive list of items subject to MEUR.

Consistent with the Wassenaar Arrangement mandate, we believe that the MEUR should apply only to items that are listed in Supplement No. 2 to Part 744 of the EAR. Therefore, we respectfully recommend that Sections 744.21(a) and (c) be amended to clarify that other ECCNs on the CCL of the EAR are *not* subject to MEUR.

2. ECCNs 5A/B/D/E992 Should Be Excluded from MEUR

We respectfully suggest that ECCNs 5A/B/D/E992 should not be subject to MEUR for the following reasons, among others.

We note that information security items classified under ECCNs 5A/B/D/E002 are not subject to MEUR, but for the most part are eligible for export to civilian and military end-use under License Exception ENC. Therefore, it is incongruous to subject information security that are controlled only for Anti-Terrorism reasons to MEUR, when items that are controlled for National Security reasons are not subject to MEUR.

It might be argued that information security items classified under ECCNs 5A/B/D/E002 should likewise be subject to MEUR, but such an outcome would exceed the Wassenaar mandate of controlling items that are not listed on the CCL, and would greatly expand the scope of MEUR, and of our concerns.

3. ECCNs 5A/D/E991 Should Be Excluded from MEUR

We respectfully suggest that ECCNs 5A/B/D/E991 should not be subject to MEUR for the following reasons, among others.

We note that items classified under ECCNs 5A/B/D/E991 are subject to MEUR, including for example networking equipment such as routers and switches and their software. However, if a “limited use” information security feature, such as access control or authentication is added, such items become classified under 5A/B/D/E992 and hence are exempt from MEUR. It does not appear to support the rationale of this rule for items to be subject to MEUR when they do not have a limited use information security feature, but remain subject to MEUR when they do not.

It is our belief that the vast majority of such items currently in the marketplace would be exempt from MEUR because they currently have a “limited use” information security feature. The impact of the rule, as proposed, would hasten the introduction of similar features in order to exempt them from MEUR.

It might be argued that items containing a limited use information security feature should remain classified under ECCN 5A/B/D/E991. Admittedly, the practice of the BIS in this regard has been inconsistent. However, our members’ experience indicates that where there is a choice between 5A/B/D/E991 and 5A/B/D/E992, BIS generally issues the latter classification. Changing this practice would subject to doubt numerous classifications by BIS issued over many years, which is not sound administrative practice and would greatly expand the scope of MEUR, and our concerns.



4. ECCN 4D994 Should be Excluded from MEUR

We respectfully suggest that ECCN 4D994 should not be subject to MEUR for the following reasons, among others.

We note that items classified under ECCN 4D994 include software that is “specially designed” for computers having an Adjusted Peak Performance (“APP”) exceeding 0.1 Weighted Teraflops. We are doubtful whether there is, in fact, any software that is specially designed for computers with an APP exceeding this threshold, since all of the software we have been able to identify also runs on computers that do not exceed this threshold.

Assuming for the moment that software exceeding this threshold may exist, then the overlap with ECCN 5D992 is problematic, because the simple introduction of a limited use information security feature would exempt such software from MEUR. For the same reasons expressed in Section A.3 above, items classified under ECCN 4D994 should not be subject to MEUR.

5. ECCN 3D991 Should Be Excluded from MEUR

We respectfully suggest that ECCN 3D991 should not be subject to MEUR for the following reasons, among others.

We note that items classified under ECCN 3D991 include Electronic Design Automation (“EDA”) software which sometimes has been referred to as the “word processor for integrated circuits”. Some such software includes information security features for protection of intellectual property. Today, such software is classified under ECCN 5D002, and is exempt from MEUR. In the 2005 list review, the Wassenaar Arrangement specifically exempted such software from controls. Again, it does not make sense to subject such software to MEUR, when it does not include information security, but to subject it to MEUR when it does include information security.

5. Proprietary Source Code Should Not Be Subject to MEUR

We respectfully suggest that proprietary source code that does not include encryption should not be subject to MEUR for the following reasons, among others.

A careful review of the export controls on proprietary source code with, and without, encryption highlights the arbitrary nature of the MEUR and the disadvantage afforded to proprietary source code, as illustrated in the following chart:

Type	EAR	MEUR applies?
Open without crypto	TSPA	No
Open with crypto	5D002/TSU	No
Proprietary without crypto	4D994	Yes
Proprietary with limited use crypto	5D992	No
Proprietary with strong crypto	5D002/ENC	No



Attachment C

Networking Items Should Be Excluded from MEUR Because of Availability in China

Because of widespread availability of networking hardware, software and technology in China, from Chinese sources and from other sources, we respectfully submit that such items should not be subject to MEUR. We have selected four representative vendors of networking equipment. Two of them are American companies (Cisco and Juniper), one is a Chinese company (Huawei) and the final one is a French company (Alcatel), illustrating the global competitiveness of this dynamic industry. Items described below are classified under ECCNs 5A/D002 and 5A/D992. (Hardware otherwise classified under 5A991 is controlled under 5A002 or 5A992, as appropriate, after software with encryption has been added. All encryption is based on industry standards, in order to facilitate interoperability, and have similar performance.)

1. Marketplace for Routers

	Cisco	Huawei	Alcatel	Juniper
Core	Carrier Routing System (CRS-1)	Net Engine 5000E		T-640 TX
Edge	XR-12000 Series 7600 Series 10000 Series	Net Engine 80E Net Engine 40 E / 20 MA 5200G	7750 Service Router 7450 Service Switch	M320 M120 E320
Midrange	7200 Series	Net Engine 16E/8E/5	7710 Service Router	M10i M7i
Access	3800 Series 2800 Series 1800 Series	AR 46 AR 28 AR 18		J6300 J4300 J2300

2. Marketplace for Switches

	Cisco	Huawei	Alcatel	Juniper
Core Distribution	Catalyst 6500	Quidway S8500	OmniSwitch 9800 OmniSwitch 9700	
Aggregation Wiring Closet	Catalyst 4500	Quidway S6500	OmniSwitch 7800 OmniSwitch 7700	



Metro Medium	Catalyst 3750 Catalyst 3560	Quidway S5600 Quidway S3900 Quidway S3500	OmniSwitch 6850 OmniSwitch 6800 OmniSwitch 6600	
Small Office	Catalyst 2960 Catalyst Express 500	Quidway S3000	OmniStack LS6200	

3. Marketplace for Voice and IP Communications

	Cisco	Huawei	Alcatel	Juniper
IP Phones	7900 Series Unified IP Phones IP Communicator	ViewPoint 8210 Videophone ViewPoint 8220 Videophone	IP Touch 8 Series Phones	
Call Control	Unified Call Manager BTS 10200 Softswitch	USYS- MediaX3600 Soft.X3000- Softswitch	OmniPCX Enterprise 5020 Media Gateway Controller	
Customer Contact	Unified Contact Center		OmniGensis	
Applications	Unified CRM Connector Fax Server		OmniTouch Unified Communications	

4. Marketplace for Wireless Networking

	Cisco	Huawei	Alcatel	Juniper
Access Points	Aironet Access Points	Quidway Wireless Access Points	OmniAccess Wireless Access Points	
Controllers	4400 Series Wireless LAN Controllers 2000 Series Wireless LAN Controllers	MA5200F	OmniAccess 6000 OmniAccess 4324 OmniAccess 4308	



Integrated WLAN	Wireless Services for ISRs Catalyst 6500 WLSM	Aolynk BR Series Aolynk DR Series		NetScreen-5GT Wireless Odyssey
Mobile Solutions	Mobile Solutions	UMTS/WCDMA CDMA 2000 GSM Mobile Core Network	Mobile Network Solutions	

5. Marketplace for Network Security Products

	Cisco	Huawei	Alcatel	Juniper
Firewalls	PIX 500 Series Security Appliances ASA 5500 Series	Eudemon 1000/500/200/100 Series Firewalls		Netscreen Integrated Firewall Security Platforms
VPN	VPN 3000 Series Concentrators ASA 5500 Series	Eudemon 1000/500/200/100 Series Firewalls		Netscreen Integrated Firewall Security Platforms SSL VPN Appliances
Intrusion Prevention	IPS 4200 Series Sensors ASA 5500 Series	Quidway S8500 IDS Module		Intrusion Prevention Product Line
Integrated Security Software	IOS Firewall	Intranet Security Solution		JUNOS

6. Marketplace for Optical Networking Products

	Cisco	Huawei	Alcatel	Juniper
Metro Core	ONS 15600 MSPP ONS 15454 MSPP	OptiX Metro 1050/3000/5000	1670 SM	



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Metro Edge / Access	ONS 15327 MSPP ONS 15310 ONS 15302/305 MSPP	OptiX Metro 100/500/1000	1642 Edge Multiplexer 1660 SM Optical Multi-Service Node	
Metro DWDM	ONS 15454 MSTP ONS 15500 Series Metro DWDM	OptiX METRO 6100/6040 DWDM OptiX BWS 1600G DWDM	1696 Metrospan (Metro WDM)	



Gregory S. Herzog
Manager - U.S. Export Compliance
Global Procurement Services
ConocoPhillips Company

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December 5, 2006

Ms. Sheila Quarterman
Regulatory Policy Division
Bureau of Industry and Security
Department of Commerce
P.O. Box 273
Washington, DC 20044

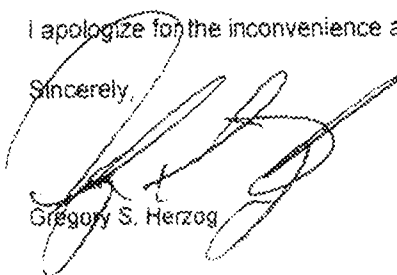
Re: Revisions and Clarification of Export and Reexport Controls for the People's
Republic of China (PRC); New Authorization Validated End-User, RIN 0694-
AD75

Dear Ms. Quarterman,

To confirm our telephone conversation earlier this afternoon, please disregard the request for confidential treatment in the letter dated December 4, 2006 and submitted by Adam L. Kupetsky on behalf of ConocoPhillips Company. It is understood that the letter will be a matter of public record and will be available for public review and copying.

I apologize for the inconvenience and thank you for your call.

Sincerely,



Gregory S. Herzog

cc: Ron C. Schultz
Adam L. Kupetsky

~~CONFIDENTIAL-TREATMENT-REQUESTED.~~

December 4, 2006

Mr. Matthew Borman
Deputy Assistant Secretary for Export Administration
U.S. Department of Commerce
1401 Constitution Avenue, N.W., Room 3886-C
Washington, DC 20230

Re: Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC); New Authorization Validated End-User, RIN 0694-AD75

Dear Mr. Borman:

ConocoPhillips submits these comments regarding the proposed Bureau of Industry and Security ("BIS") regulations that would impose additional controls on exports to China. BIS has carefully considered public comments and appropriately reduced the CCL items that would be covered by the proposed Regulation. ConocoPhillips appreciates BIS' response to comments and continues to urge BIS to add export controls for China only as necessary to attain the legitimate policy objective of not assisting in the development of Chinese military power. Any such changes should be tailored to avoid unnecessarily disrupting US-China commerce that benefits the United States.

ConocoPhillips is an integrated oil and gas exploration, production, refining and marketing company with significant oil and gas exploration and production activities in China. Among other things, ConocoPhillips is developing a \$4 billion oil project in Bohai Bay, China. This and similar activities have brought substantial benefits to the United States. ConocoPhillips' activity in China requires a significant amount of US exports into the Chinese market, creating business for US companies. Companies such as ConocoPhillips and its vendors are able to enhance their operations in China as a result of expanded China-US trade. Moreover, as US companies increase US business activity in China, businesses and governments in China are more likely to adopt US standard business practices, thus increasing demand for US products and services. ConocoPhillips has also noticed that commercial trade between China and the United States encourages and instills in Chinese employees a market-focused, ethical and democratic spirit. This supports US foreign policy goals by drawing China into the global economy and increasing its incentive to act constructively, and by enhancing trust and openness between countries.

With respect to the proposed regulations, ConocoPhillips is pleased with the level of public engagement that BIS has used in its process to develop these regulations. Since seeking comment on the proposed regulations on July 6, 2006, BIS has held at least five public meetings throughout the United States to discuss the rationale for the proposed rule and answer questions. In addition, BIS officials have raised and addressed the proposed regulations in other conferences, including the annual Update conference in Washington, DC and the IBC Global Trade Controls conference in London. BIS has also posed a Q&A document on its website. Even before seeking comment formally, BIS consulted very closely with the key stakeholders to shape the proposed regulations. BIS' efforts throughout this rulemaking have been outstanding.

ConocoPhillips supports the appropriate reduction in ECCNs that would have been subject to new licensing controls in the published proposal. Unnecessary licensing requirements for certain items could have resulted in hampering legitimate civil projects in China.

PROPRIETARY AND CONFIDENTIAL

These changes attest to BIS' prudent balancing of preserving beneficial commerce between the United States and China with the United States' foreign policy objectives.

Upon reviewing the proposed regulations, ConocoPhillips has noted additional steps that BIS can take, consistent with this approach, to narrow and clarify the scope of the regulations in order to prevent unintended and unnecessary limitations on commerce with China. Under proposed EAR Section 744.21, a license for an item controlled under the new regulations is required if the exporter "[has] knowledge that the item is or may be intended, entirely or in part, for a 'military end-use' in China. The proposed regulations define 'military end-use', in turn, as 'incorporation into, or use for the production, design, development, maintenance, operation, installation, or deployment, repair, overhaul, or refurbishing of [USML or IML] items'. As a result of these provisions, companies such as ConocoPhillips may be prevented from supplying a non-controlled product (such as refined oil) directly or indirectly to military customers in China merely because the items used to make such a product would require a license if incorporated into a military end-use. For example, a machine tool (or machine tool technology) exported into China for producing or refining oil should not be considered to be "intended ... for a military end-use" just because it was used to produce or refine oil into products that may in due course be sold to the Chinese military for use in the production of or incidental to USML or IML items. Such a result would expand the scope of the proposed regulations to cover virtually all commerce between the U.S. companies and China. To remedy this problem, ConocoPhillips urges BIS to consider clarifying "intended ... for a military end-use" to make clear that this phrase only includes items intended to be directly incorporated into or directly used for the production, development, operation, installation or deployment, repair, overhaul or refurbishing of USML or IML items. By making this clarification, BIS would avoid placing an unnecessary burden on legitimate civil commerce while continuing to prevent the export of controlled items to the Chinese military.

ConocoPhillips appreciates the opportunity to comment on the proposed China regulations and BIS' willingness to consider our comments. To date, BIS has listened closely to the concerns and has appropriately modified its proposals in response. BIS has narrowed the proposed regulations to tailor them to the goal of limiting the availability of sensitive products and technology to China's military. ConocoPhillips urges BIS to continue this process and, prior to adopting final rules, to clarify and narrow the scope of the proposed rules to ensure certainty and the lightest burden on US-China commerce consistent with the United States' foreign policy aims.

* * *

~~This letter contains confidential and business proprietary information, the release of which would cause substantial commercial and competitive harm. We, therefore, request that confidential treatment, including non-disclosure under the Freedom of Information Act, be accorded to this letter.~~

We appreciate your consideration of our concerns as set forth in this letter. If you have questions or require further information, please contact Gregory S. Herzog, Manager, US Export Compliance, ConocoPhillips Company, at 918 661 3910.

Sincerely,

/s/ Adam L. Kupetsky

Adam L. Kupetsky
Advisor, US Export Compliance
ConocoPhillips Company

cc: Gregory S. Herzog
Ron C. Schultz

Chick Payne
Import Export Compliance Coordinator
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chick.payne@xomox.com

December 4, 2006

Sheila Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry & Security
Department of Commerce
14th Street & Pennsylvania Ave., NW
Room 2705
Washington, DC 20230

Attention: RIN 0694-AD75

Re: **July 6, 2006 Federal Register Notice Proposing Amendments to
Export Controls Relating to China**

Dear Ms. Quarterman:

Please accept this letter as the comment of Xomox Corporation on the Federal Register Notice published July 6th proposing to amend the Export Administration Regulations with specific reference to China. Xomox Corporation ("Xomox") is a member of the Crane Co. group of companies. It manufactures valves at its facilities in Cincinnati, Ohio and employs approximately 200 individuals in the United States.

On May 31, 2002, the definition of valves controlled under ECCN 2B350.g was expanded dramatically and, for the first time, covered some of the valves manufactured by Xomox. We began applying for export licenses shortly thereafter. On April 14, 2005, the list of countries requiring an export license as a condition of receiving valves governed by ECCN 2B350.g was expanded to include all countries other than those that are members of the Australia Group. The number of export license applications submitted by Xomox increased correspondingly. We understand that these valves are subject to export controls because of their potential use in the manufacture or development of chemical and biological weapons. In reality, however, we sell these valves to customers who use them in a variety of perfectly legitimate civilian applications, including chemical, pulp and paper, oil refinery and related process industries.

We note that, in our international sales, we compete against manufacturers of comparable products that are located in countries outside the Australia Group. We therefore question the effectiveness of these export controls in denying access to these controlled valves to customers located in countries that are not Australia Group members.

The proposed rule published on July 6th would require that, for virtually every export license for China, an application could not even be submitted until the applicant had received a copy of the Import or End User Certificate issued by the Department of Scientific and Technological Development and Trade in Technology of the PRC Ministry of Commerce ("MOFCOM"). The preamble to the proposed rule states that an actual copy of the certificate need not be submitted with the license application "to minimize the impact that this expanded support documentation requirement will have on exporters." This makes no sense. If an application cannot be submitted until the applicant has received a copy of the certificate, what additional burden is there in requiring that a copy accompany the application? The real burden comes with the delay in involved in obtaining a certificate from MOFCOM.

The most recent annual report issued by BIS states that "China is the largest single export market among the controlled country group, with eighty percent of the total."¹ The preamble to the proposed rule notes that "approximately \$2.4 billion worth of exports were licensed for export to the PRC, while \$12.5 million worth of exports were denied." Thus, while many export licenses for China are submitted, almost all are granted.² Under the existing EAR, end-use certificates are required for only a limited set of products exported to China. Even under these more limited regulations, however, U.S. exporters have experienced lengthy delays in obtaining certificates from MOFCOM. If the proposed rule is adopted, MOFCOM will presumably be flooded with requests for certificates and delays can only be expected to grow.

Insofar as other exporting countries are not adopting a requirement that license applications be submitted only after receiving a MOFCOM certificate, our foreign competitors will experience an immediate and profound competitive advantage in supplying controlled products to Chinese customers. The preamble to the proposed rule indicates that the expanded end-use certificate requirement will facilitate BIS's ability to conduct end use checks on exports and that "facilitation of end-use checks should facilitate increased U.S. exports to the PRC." Nothing could be further from the truth. If a MOFCOM certificate is required before submitting export license applications for China, Chinese customers will look to non-U.S. suppliers and the volume of controlled exports to China will plummet.

We question the need to involve the Chinese government in obtaining assurance that BIS will be able to conduct end-use checks. Under the proposed new authorization Validated End-User ("VEU"), it is the Chinese End-User that is required to submit to the U.S. exporter a certification that, *inter alia*, it agrees to allow on-site visits by U.S. government officials to verify end-use. If the End-User's certification is sufficient for purpose of VEU, why is it not also sufficient for purposes of submitting routine export license applications? The Department of Commerce already has an understanding with its counterpart in China relating to end-use visits. Requiring MOFCOM certificates would seem to do little to strengthen this pre-existing agreement. If anything, requiring a similar certificate from the actual Chinese End-User would seem to be of greater benefit to BIS in assuring that individual Chinese companies in fact cooperate with end-use visits.

In short, if the proposed rule is adopted, we recommend that, rather than requiring MOFCOM certificates before the submission of export license applications for China, U.S. exporters instead be required to obtain certificates from their Chinese customers acknowledging their agreement to allow end-

¹ Bureau of Industry and Security Annual Report, Fiscal Year 2005 at 90 (hereinafter "FY 2005 Report").

² For products governed by ECCN 2B350 there were over 200 individual export license applications submitted in FY 2005 alone. FY 2005 Report at 77.

use visits.

Thank you for your consideration of this comment.

**Best regards,
Xomox Corporation**

Chick Payne

ICOTT INDUSTRY COALITION ON TECHNOLOGY TRANSFER
1700 K Street, N.W., Washington, D.C. 20006 (202) 282-5994

November 29, 2006

VIA E-MAIL AND FIRST CLASS MAIL

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th Street & Pennsylvania Avenue, N.W.
Room 2705
Washington, D.C. 20230

Attn: Ms. Sheila Quarterman

RIN 0694-AD75

Re: Proposed Rule: Revisions and Clarification of Export and Reexport Controls for the People's Republic of China (PRC); New Authorization Validated End-User (71 Fed. Reg. 38,313 (July 6, 2006))

Dear Ms. Quarterman:

The Industry Coalition on Technology Transfer ("ICOTT") appreciates the opportunity to comment on the above-referenced proposed rule. The proposal would establish: (i) a new Validated End-User authorization for certain vetted end-users in China and potentially, other countries, and (ii) a new control (the "China Control") based on knowledge of a military end-use for certain CCL items that do not currently require a license for export to the People's Republic of China ("PRC").

ICOTT and its member associations recognize the critical importance of protecting U.S. national security. We support reasonable and effective export controls. The many companies represented by ICOTT's member associations are on the frontline of the U.S. export control process and devote considerable time, effort and expense to assure that export transactions comply with applicable export regulations. It is from this vantage point that we see serious problems with both aspects of the proposed rule.

For the reasons set forth below, ICOTT believes that the proposed Validated End-User authorization is a promising concept. However, this aspect of the proposed rule will require further significant revision if it is to be of help to many exporters.

ICOTT also urges that the additional restrictions on transfers to China set forth in the proposed rule not be adopted. The China Control represents a reversion to controls on items that were decontrolled to China's military by Presidents Ronald Reagan and George H.W. Bush starting in 1991 and would not meaningfully enhance U.S. national security. Further action on this proposal at this time would be particularly ill-timed, in view of the recent establishment of a high level, comprehensive strategic dialogue between the United States and China and the urgent need for close cooperation with China on the North Korean nuclear threat. Additionally, the China Control would impose substantial and unnecessary economic and compliance burdens on U.S. exporters and the U.S. economy. There are more appropriate—and less burdensome—approaches that would address the Government's specific concerns if additional controls are needed for certain military-end use items destined for the PRC.

I. The Validated End User Authorization is Promising But Requires Significant Revision

The proposed VEU authorization is a promising concept. A broadly applicable and flexibly and efficiently administered VEU program could substantially benefit a wide range of significant U.S. exporters. In particular, such a program could substantially reduce the unnecessary costs to industry and government of repetitive licensing for exports of the same items to the same customers. It could enable the Department to more effectively deploy its licensing and enforcement resources. It could also help U.S. exporters compete more effectively against foreign competitors who can often receive export authorizations more expeditiously from their governments.

As currently formulated, however, the Department's VEU proposal raises a number of issues and concerns that will seriously limit its attractiveness to U.S. exporters. If the proposal is to be useful to a significant number of exporters, it will require further significant expansion and revision. Among other things:

- The Department should provide a more detailed explanation of the benefits to U.S. exporters and their customers of obtaining VEU authorizations. The proposed rule is unclear on this important point.
- Tying the VEU authorization to a specified list of ECCNs will limit the authorization's utility and will lead to needless administrative burdens for exporters and the Department. Additionally, there was some confusion in prior discussions of the proposal whether the term "item" included technology as well as hardware. Not including technology would make the VEU authorization virtually useless to many technology-based exporters. Overly restrictive coverage of items could significantly impede any improved trade with China and other eligible countries. The VEU authorization should, instead, permit users vetted in the VEU process to receive all products and technology under all ECCNs, other than items controlled for MT or CC reasons, as long as these items are for internal

use or consumption. At the very least, a "license-free zone" should apply to exports to U.S. subsidiaries in China and other eligible countries. The regulations should also expressly state that the VEU authorization applies to technology.

- The proposed rule employs evaluation factors that are too extensive and/or ill-defined. The Department should significantly tighten the focus of these evaluation factors to better assist exporters and potential end users in deciding whether to seek VEU status. For instance, one evaluation factor is the "party's relationships with U.S. and foreign companies." Providing illustrative examples of such relationships (e.g., foreign affiliates of U.S. exporters that currently receive significant licensed exports) might aid in the export community's understanding of the VEU process.
- The proposed rule notes that VEU authorization users "will be audited on a routine basis." Unless clarified, this statement may limit interest in the VEU program by suggesting that users of the VEU authorization will be subject to broad and extensive additional audits. The Department should make clear that audits under the VEU program will be limited to issues of VEU compliance. For other compliance matters, the Department's normal auditing procedures should apply.
- The Department should eliminate or limit the certifications required of eligible end users under the VEU authorization. For instance, potential VEUs might hesitate to make certifications regarding on-site visits given the Chinese Government's historical sensitivity about such visits.
- The Department should also make a particular and concerted effort to work with major exporters to assure that the VEU authorization is workable and useful and can evolve to meet their needs. Among other things, the Department should provide extensive additional guidance on the program, answers to frequently asked questions and model applications.

II. The China Control Should Not be Adopted

A. The China Control Would Provide No Demonstrable National Security Benefits

The Department states that the purpose of the proposed China Control is to implement U.S. policy to "deny exports that will contribute to the advancement of Chinese military capabilities." 71 Fed. Reg. at 38314. However, the Department has failed to demonstrate that the rule would accomplish this goal. The rule will not meaningfully contribute to U.S. national

security. Indeed, adoption of the China Control could damage overall national security by diverting and wasting export control resources and harming the competitive position of U.S. suppliers.

The China Control would be ineffective because there is wide scale Chinese and other foreign availability of most, if not all of the items, that the proposal seeks to control. We understand that comments to be submitted by the National Foreign Trade Council and others will include numerous examples covering multiple ECCNs, on the proposed list that are available from European producers and other sources, including in many cases, producers in China itself.

The broad extent of the proposed rule's "List of Items Subject to Military End-Use License Requirement" and the broad coverage of many of the forty-seven individual items listed would also make effective administration of the proposed controls a daunting, if not impossible, task. For instance, item 10(i) on the proposed control list would control exports of "aircraft" and "parts and components" not currently subject to licensing requirements. This category would cover an astounding array of the many thousands of parts and components in an aircraft, down to nuts and bolts. ECCN 9A991, for example, covers thousands of parts and components, the vast majority of which are general purpose items having no military significance.

It is also important to bear in mind the nature of the items on the Department's proposed control list. By definition, the items on the proposed list are those that the United States and its allies have decontrolled since 1991 (under initiatives instigated under Presidents Reagan and George H.W. Bush) because they will not contribute to the PRC's military capabilities and/or because the items are so widely available as to be incapable of control. Imposing new controls on such items will not meaningfully enhance U.S. national security.

Additionally, adopting the proposed control on China would almost certainly be a unilateral step by the United States, taken without the support of our Wassenaar allies. Italy and the United Kingdom have indicated that they will not apply to the PRC the Wassenaar understanding regarding non-listed dual-use items. There have been no suggestions that other allies are prepared to follow the U.S. lead on such controls. It is our understanding that the governments of the U.K., Germany, and Italy have stated definitively that they will not impose these controls.

Department officials have contended that unilateral adoption of the China Control would help attract foreign support by demonstrating U.S. resolve on the issue. However, it is likely that this action would have precisely the opposite effect, reinforcing foreign complaints against the unilateralist tendencies in U.S. foreign and defense policy. Moreover, once unilateral restrictions on exports by U.S. firms are in place, foreign competitors still exporting to China can be expected to press their governments even more aggressively to avoid the imposition of similar controls. If the Administration is truly serious about adopting the proposed controls on a multilateral basis, we urge the Department to make implementation of the proposal contingent on the adoption and enforcement of similar controls by Wassenaar Arrangement allies.

As ICOTT has frequently noted, imposing unilateral controls in the face of extensive foreign availability is a fruitless exercise, akin to attempting to contain a river by building only half a dam. The futility of this effort is particularly pronounced in the present case, in which the "river" of items that the Department is seeking to control is especially broad and in which our allies have indicated no interest in completing the other portion of the dam. Adopting the China Control will thus likely be an ineffectual and wasteful exercise that will not contribute to U.S. national security.

B. The China Control Conflicts With Recent U.S. Initiatives With China

Further action on the China Control would also be inconsistent with a major Administration initiative, announced in the months since the proposed rule was published, and is likely to be a significant irritant in U.S.-China relations during a particularly sensitive period.

In late September 2006, President Bush and Chinese President Hu Jintao agreed to a U.S. proposal to establish a Strategic Economic Dialogue between the United States and the PRC. In announcing this new initiative, the White House noted that it is intended to help "establish an overarching bilateral economic framework" between the two countries, create "a forum for discussing cross-cutting issues," and "provide support and guidance for . . . existing bilateral economic forums." This unprecedented Dialogue will be led by officials at the highest levels of both governments and envisions active participation by both Presidents in its work. Both governments have hailed the new Dialogue as a constructive mechanism to address longstanding bilateral economic and trade issues in a coordinated and integrated manner. The White House has announced that the first Dialogue meeting will take place before the end of 2006.

The China Control appears to be the antithesis of the Administration's welcome initiative to address bilateral relations with the PRC in a holistic manner. As other commentators have noted, the proposed rule, like recent proposals on "deemed exports" and defense acquisition regulations, appears to be part of an ill-considered and unfocused approach to export regulation—an approach that is not coordinated with or integrated into overall U.S. policy. For the Administration's new Strategic Economic Dialogue to be successful, the U.S. Government must fully evaluate proposed trade controls in the context of overall U.S. policy towards China. Suspending further action on the China Control to allow for such further study would be a good first step in this regard.

Chinese officials repeatedly have said that U.S. export controls are a contributing factor to the current U.S. trade imbalance with China. They can be expected to place considerable emphasis on this point in the new Strategic Economic Dialogue. As has been widely reported, PRC officials and trade experts have severely criticized the China Control, contending that it will hinder U.S.-China trade. Among other things, they note that the proposed rule's expansion of the End User Certificate ("EUC") requirement will severely overload the certificate-issuing process at the PRC's Ministry of Commerce and will stifle bilateral trade between the United States and China, causing harm to companies from both countries. Additionally, they also note that the

forty-seven categories of items covered by the proposed rule include items whose export to China the United States has previously determined to pose no threat to U.S. national security.

China's close cooperation with the United States is also particularly important in achieving a diplomatic resolution of the serious threat posed by North Korea's nuclear program. China is widely viewed by foreign policy experts as the one country having the greatest influence on North Korea. Needlessly antagonizing China through the adoption of the China Control would jeopardize Sino-U.S. cooperation on Korea at this critical time.

In this context, adopting the China Control would be an ill-timed and very unhelpful step. Suspending further action on the proposed rule—a rule which, as noted, would provide no demonstrable security benefits to the United States—would eliminate an unnecessary irritant that could complicate Sino-U.S. diplomacy and the Administration's laudable effort to address relations with China on a comprehensive basis.

C. The China Control Would Impose Substantial and Unnecessary Compliance Burdens and Harm the Competitive Position of U.S. Exporters

The U.S. private sector plays a key role in the U.S. export control process, screening numerous export transactions to assure compliance with the wide array of U.S. export requirements. The China Control would substantially complicate these critical private sector compliance functions. It would create confusion and ambiguity, and would impose significant additional burdens, costs, and risks. At the same time, the proposal would harm the competitive position of U.S. producers and, by extension, U.S. national security.

The broad definition of "military end use" in proposed section 744.21(f) would, as a practical matter, require that exporters of parts and components determine whether their customer is producing a military item. This would impose substantial new compliance burdens, especially for exporters who deal primarily or exclusively in items exportable with "No License Required" to China or are unfamiliar with USML requirements. Similarly, the broad and ill-defined definition of "support" and "deploy" in proposed section 744.6(a)(1)(ii) would impose new compliance obligations and costs on the many entities that help facilitate export transactions, including freight forwarders, financial institutions, and others. Additionally, there are serious questions about the Department's legal basis for new "support" and intra-country "transfer" controls. The application of the proposed rule to reexports and to transfers within China would also be difficult to administer and raises a host of other practical and international political complications. When faced with a conflict between U.S. and Chinese law, how can a Chinese company be expected to comply with U.S. law in preference to its own domestic law? When combined with the Department's use of the existing broad standard of "knowledge," these broad and ambiguous requirements would also create significant new risks for many different U.S. exporters, as well as the many other entities that support U.S. exports.

The proposed rule will also harm U.S. exporters by impeding trade in U.S. goods with the PRC, both in the categories covered by the proposal and in other currently controlled categories.

The proposed revisions to section 748.10 would significantly expand the requirement that exporters obtain an End-User Certificate from the PRC's Ministry of Commerce. However, the Department has been unable to provide any assurances that the Ministry of Commerce will be able and willing to administer this new requirement. Department officials have stated only that they have no reason to believe that the Ministry of Commerce will not cooperate with the new EUC requirement. However, Chinese export control experts have been quoted as saying that the proposed regulation will overload the certificate-issuing process and will delay exports to China of items subject to both new and current controls. Moreover, it is curious that the Department expects the Ministry of Commerce to play such a central role in enforcing new export control requirements that the Ministry has criticized. It is entirely possible that the Ministry might protest the new controls by refusing to issue or delaying the issuance of the required EUCs. Given the widespread foreign availability of many of the listed items, it is also entirely possible that PRC customers would simply purchase items—including those subject to current controls—from PRC or non-U.S. suppliers to avoid the delays that the Ministry of Commerce foresees in the EUC process.

The proposal's reexport restrictions would also negatively affect global trade opportunities for U.S. exporters. Private sector export compliance officials in the United States understand that their counterparts at European and Japanese companies can spend as much as eighty percent of their time complying with U.S. reexport controls. The proposed rule's new restrictions on items not requiring a license and its requirement to make military end-use determinations could significantly add to these burdens. The proposed rule will lead foreign manufacturers to "design-out" U.S. components and/or to view U.S. suppliers less favorably.

For example, one prominent European telecommunications customer of many ICOTT association member companies has calculated that it would cost that company \$165 million to revise its export compliance system to comply with the China Control. The company does not currently need to classify their products down to the XX99X level because no country other than the United States requires that level of classification, and the difference between EAR99 and XX99X classifications is only meaningful for reexports to Iran, North Korea, and Sudan. As a result, to comply with the requirements of the China Control, the company would have to reclassify millions of products and components that currently have no ECCN, redesign its order processing system to accommodate the change – only for China -- and then incorporate the new screening requirements. The company would also have to make this change for several systems that are not part of its central compliance system. Alternatively, this European firm would have to identify every U.S. component and establish a complex, manual system to screen all sales to China for military end-use. Further, it would have to train all export and sales personnel for sales in China on the implementation of the rule.

China is potentially the largest telecommunications market in the world and is currently the fastest growing. In contrast, the United States is not the sole source of many telecommunications products and components. Accordingly, this company and other European suppliers have said they will likely design out U.S. content wherever possible because that will

be far more cost effective than complying with the new China Control. We expect other companies to reach the same conclusions over time.

Once U.S. companies lose a market so important, they will lose markets in other areas of the world because most global companies look for suppliers to support their worldwide sales, not just for sales to China or certain other countries.¹

For all these reasons, the proposed rule would impose significant compliance and business opportunity costs on U.S. exporters.

D. The Proposed Rule is a "Major Rule"

In explaining the proposed rule, Deputy Assistant Secretary for Export Administration Matthew Borman has stated that it would affect "tens of millions of dollars" in U.S. exports to the PRC. However, the full impact of the proposed China Control on the U.S. economy would be significantly greater. In evaluating the economic effects of the proposed rule, it is important to focus not only on the actual exports that the proposal would directly effect, but also on the significant compliance costs that would be incurred in screening numerous other transactions and on the negative effects that the new controls would have on the competitive position of U.S. exporters. For the reasons noted above, when viewed on this more comprehensive basis, the proposed rule's cost impacts would necessarily be significantly higher than the Department has estimated. Indeed, the proposed rule qualifies as a "major rule" under 5 U.S.C. § 506 because its annual effect on the U.S. economy would exceed \$100 million and/or because it would have "significant adverse effects . . . on the ability of United States-based enterprises to compete with foreign-based enterprises in . . . export markets." As stated above, one company alone has calculated its increased compliance costs at \$165 million to redesign its electronic compliance program, incorporate military end-use screening, and provide training to affected personnel.

E. An "Is Informed" Standard is a More Effective and Less Burdensome Approach to Controlling Military End-Use Exports of Concern to China

When viewed from a cost-benefit standpoint, the China Control would provide few, if any, national security benefits and would impose substantial costs on U.S. exporters and the U.S. economy. There is, however, an effective and less burdensome alternative approach to this issue. Applying the proposed controls on the basis of an "is informed" standard, like that employed by the United Kingdom in the Wassenaar context, would enable U.S. officials to control those exports that they determine have the potential to contribute to China's military capabilities. At the same time, this standard would very significantly reduce the compliance and business

¹ Lessons learned on loss of market share due to overreaching U.S. export controls should not be lost. See seminal studies: J. David Richardson, *Sizing Up U.S. Export Disincentives* (Institute for International Economics 1993); *Finding Common Ground: U.S. Export Controls in a Changed Global Environment* (National Academy of Sciences 1992); *Balancing the National Interest: U.S. National Security Export Controls and Global Economic Competition* (NAS 1987).

opportunity costs of the controls. To the extent that the U.S. Government determines that new controls on military end-use exports to China are advisable, we urge the Department to consider this more focused approach. Any such approach, of course, should require that all potential exporters, not just a "chosen" few, be advised of the identities of restricted foreign purchasers.

* * * * *

For all of the foregoing reasons, as well as the reasons that we anticipate will be advanced by other commenters, ICOTT urges that: (i) the new VEU authorization be expanded and revised considerably to make it attractive to U.S. exporters and (ii) the proposed new China Control not be adopted.

Founded in 1983, ICOTT is a group of major trade associations whose hundreds of individual member firms export controlled goods and technology from the United States. ICOTT's principal purposes are to advise U.S. Government officials of industry concerns about export controls, and to inform ICOTT's member trade associations (and in turn their member firms) about U.S. Government export control activities.

Sincerely,



Edward F. Gerwin, Jr.
Deputy Executive Secretary

November 28, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
14th and Pennsylvania Ave, NW, Room 2705
Washington, DC 20230

ATTN: RIN 0694-AD75

Re: Revisions and Clarification of Export and Re-Export Controls for the People's Republic of China (PRC): New Authorization Validated End-Use 71 FR 38313-01, July 6, 2006

To Whom It May Concern:

The American Chemistry Council (ACC) is pleased to submit the following comments regarding the Bureau of Industry and Security's (BIS) proposed amendments to the Export Administration Regulations published in the Federal Register on July 6, 2006. The proposed amendments revise and clarify the United States licensing and policy requirements for the export and re-export of goods and technology to the Peoples Republic of China (PRC).

ACC represents the leading companies engaged in the business of chemistry. Council members apply the science of chemistry to make innovative products and services that make people's lives better, healthier and safer. The Council is committed to improved environmental, health and safety performance through Responsible Care, common sense advocacy designed to address major public policy issues, and health and environmental research and product testing. Many of the Council members have significant business relations with the PRC and the proposed amendments will impact business processes and require further attention to existing compliance procedures.

The following comments address the BIS proposal related to the (1) the list of items subject to the military end-use license requirement, (2) the definition of military end use, (3) the definition of knowledge, (4) end user certificate, and (5) validated end users.

I. Supplement No. 2 to Part 744 – List of Items Subject to the Military End-Use License Requirements of Section 744.21

a) Cross Referencing Export Control Classification Number (ECCN) Items Found in Supplement No. 2 to Part 744

Section 744.21 will impose a license requirement for certain items listed in Supplement No. 2 to Part 744 if the exporter has knowledge that the item is intended for military end use in PRC. ACC believes that confusion may occur when evaluating ECCN entries found in the Commerce Control List separately from the provisions of Section 744.21. To eliminate this concern, ACC is recommending that each of the forty-seven (47) ECCN entries found in the Commerce Control List include a cross-reference. Specifically, a related control note to each ECCN entry could be added that states the following:

"This entry does not control (.....) if the destination country is the PRC and the item is destined for a military end use. See 15 CFR 744.21 for specific license and End Use Certificate requirements for the PRC. The country chart is not used to determine all license requirements for the PRC for this ECCN."

b) ECCN 1C995: Chemical Weapon Precursors at Concentrations Less Than 10% or 30%

One of the items proposed to be subject to the military end-use license requirement in the PRC is ECCN 1C995. This entry currently regulates chemical weapon precursors controlled under the Chemical Weapons Convention (CWC) and by the Australia Group (AG) at concentrations less than 10% or 30% and destined for either AT Column 1 Countries and/or Cuba. ACC believes that the potential risk of these mixtures materially contributing to the military capability of the PRC does not warrant the regulatory burden associated with complying with the military end-use licenses requirement. Further, these requirements would place U.S. companies in a competitively disadvantaged position vs. other countries that do business with the PRC. We therefore are requesting that 1C995 be removed from Supplement No. 2 to Part 744 for the following reasons.

First, ACC questions the feasibility of PRC or other importers being able to remove the small amount of chemical weapon precursor material from a mixture and then applying it for use in a weapon of mass destruction. In some cases, the removal of the chemical weapon precursor may be difficult if not impossible. In those cases where the chemical weapon precursor may be easily extracted, the utility of the PRC obtaining these mixtures from the U.S. may be diminished if the pure chemical can be purchased from other countries whose controls are not as extensive as those in the U.S. Without BIS providing substantial data documenting the use of these mixtures for proliferation purposes, ACC believes the proposed regulation is overly restrictive.

Secondly, the PRC is a party to the Chemical Weapons Convention, which controls the manufacture of 1C350 and 1C355 chemical precursors. Many of the 1C350 chemicals are manufactured in the PRC. One example, triethanolamine, is used in minute amounts in shampoos, and personal care emulsions. Restricting mixtures containing chemicals that are already available through indigenous supply is non-productive. Finally, other CWC or AG countries do not specifically control chemical weapon precursor mixtures containing less than 10% or 30% of the listed or scheduled chemical precursor. Imposing the control on U.S. companies will give an unfair advantage to European and Asian competitors in China who can sell without additional end use screening, end use certificates or license requirement.

2. Section 744.21(a)(1): Definition of "Knowledge" for Military use

In the preamble to the proposed rule BIS has stated that "knowledge" for purposes of determining military end use has the same meaning as defined in Section 772.1 of the EAR. However, during the Public Forum meeting held after the proposal was issued, BIS representatives suggested that a broader definition for "knowledge" is expected when determining military end use. At this meeting BIS stated that companies can't "sell blindly" and that "not asking" about end use is not acceptable practice. However, it was also stated that informing customers (distributors) that they should not resell for use in weapons of mass destruction or to "denied parties" was an acceptable alternative to obtaining a statement of ultimate end use.

To alleviate any confusion between these statements and the proposed rule language, ACC is recommending that BIS clarify in the final rule that the meaning of "knowledge" for the purposes of Section 744.21 is the same as defined in Section 772.1 of the EAR. In addition, we request the BIS provide guidance citing examples of what constitutes knowledge, taking into consideration the nuances

associated with dealing with the PRC (i.e. ownership structures and a state run economy) and trying to obtain verification of end use.

3. Section 744.21(f): Definition of Military End Use

In section 744.21(f) “military end use” is defined as “incorporated into, or use for the production, design, development, maintenance, operation, installation or deployment, repair, overhaul, or refurbishing of items...” ACC believes this definition of is too broad and could unintentionally capture too many items thereby expanding the scope of the requirements beyond that which can be reasonably managed by both industry and BIS alike. Specifically, the inclusion of the term “incorporated into” would require that general use materials be subject to the new requirements. For example, hydraulic fluid (1C996) sold for general use but “incorporated into” an armored vehicle could require an end use certificate and a license. We cannot believe that the BIS would suggest these types of activities be regulated as “military end use.” ACC therefore recommends that definition be limited to ‘use for the production, design or development of items’.

4. Section 748.10: End User Certificates

The BIS proposal would require exporters to obtain an End-User Certificate, issued by the PRC Ministry of Commerce, “for all items that require a license for any reason” and exceed a total value of \$5,000 [emphasis added]. ACC is very concerned with the how this statement could be misinterpreted. Our understanding is that end use certificates will only be required if the use associated with the export is subject to a license. If a different use for the item were not subject to a license, than the export of the item for that use would not require an end use certificate. However, the use of the phrase “for all items that require a license for any reason” implies that because one use requires a license (and the end use certificate) all uses, even those not subject to a license may also require the end use certificate.

For example ECCN 1A290 requires a license to the PRC only if you have knowledge that the item is intended for military end use. Other uses (i.e. civil uses for commercial purposes) are not controlled and would not require a license. Therefore, items controlled under ECCN 1A290 and destined for the PRC would only require an end use certificate if the export is intended for military use. When considering the phrase “for all items that require a license for any reason”, however, one could interpret that because the military use is licensable and subject to end use certificate requirements, the civil and commercial use is also subject to the end use certificate requirements. ACC believes that this is an incorrect interpretation and needs to be clarified in the final regulation. Therefore, we recommend that the language in 748.10 (a) be revised to specify that:

“... or, in the case of the PRC, end use certification would only be necessary for those exported items whose intended use in the PRC requires a license.”

5. Section 748.15: Authorization of Validated End Users (VEU)

In section 748.15 BIS proposes to establish an authorization for validated end users to allow for the export of designated items to certain end users in eligible destinations, including the PRC. One of the requirements for a VEU company is that they agree to allow on-site visits by U.S. Government officials to verify the end-users’ compliance with the conditions of authorization. Although ACC agrees that on-site visits are required for compliance purposes, we believe that they can be disruptive to business and both U.S. parent and PRC owned companies would hesitate to take advantage of this option unless certain parameters are defined.

Specifically, ACC recommends that the regulations be more precise regarding from which agency the U.S. Government officials will be. We also recommend that the number of visits be clearly defined along with sufficient advanced notice being defined. We suggest that the regulations be written to specify that visits by U.S. officials will not exceed three (3) per year and that a fourteen (14) day notice will be provided prior to any visit.

Another concern with the authorized validated end user provision was raised as a result of BIS staff comments made at the Public Forum meeting. BIS stated that an authorized VEU company in the PRC could exchange national security (NS) controlled technology with the U.S using this exception. A PRC national employed by the PRC VEU and located in the U.S. (so a deemed export) could use license exception VEU. This could be very beneficial to U.S. business, as it would allow technology exchange between the U.S. and U.S owned companies located in the PRC without the lengthy wait for a license. As the deemed export and technology exchange aspect of the VEU is not apparent, ACC recommends that language be added to the regulation to specifically draw attention to it.

Conclusion

ACC appreciates the opportunity to submit these comments on proposed controls for exports and re-exports to the PRC and respectfully requests that BIS take them into consideration when developing the final rule. Please feel free to contact me at (703) 741-5246 or ted_cromwell@americanchemistry.com if I can answer any questions or provide additional information.

Sincerely,



T. Ted Cromwell
Sr. Director, Security and Operations

December 4, 2006

U.S. Department of Commerce
Bureau of Industry and Security
Regulatory Policy Division
Office of Exporter Services
14th St. and Pennsylvania Ave., NW, Room 2705
Washington, DC 20230



TDK U.S.A. Corporation
901 Franklin Avenue, PO Box 9302, Garden City, NY 11530
Phone (516) 535-2600 FAX (516) 294-8318
www.tdk.com

Attn: Sheila Quarterman; RIN 0694-AD75

RE: Proposed Rule – Revisions and Clarifications of Export and Reexport Controls for the People’s Republic of China; New Authorization Validated End-User (71 Fed. Reg. 38,313 (July 6, 2006))

TDK USA Corporation (“TDK”) is pleased to submit to the Commerce Department’s Bureau of Industry and Security (“BIS”) the following comments on the proposed amendments to the Export Administration Regulations (“EAR”) identified above.

Introduction and Overview

TDK manufactures recording media, ferrite products, recording device products, inductors, ceramic capacitors, magnet, head for hard disk drive (“HDD”) and other components. The company operates in two segments, Electronic Materials and Components, and Recording Media. The Electronic Materials and Components segment offers electronic materials, such as capacitors, and ferrite cores and magnets; electronic devices, including inductive devices, high-frequency components, and other products; recording devices, such as heads for hard disk drives and other types of heads; and semiconductors and others other products. The Recording Media segment offers audiotapes, videotapes, optical media, and tape-based data storage media for computers. TDK markets its products through sales representatives and subsidiary companies in Japan and in various countries in North America, Europe, and Asia. The company was established in 1935 and is headquartered in Tokyo, Japan.

The products made by TDK companies are overwhelmingly designed and used to manufacture wholly commercial and civilian electronic devices that are mass produced and mass marketed. Because our customers for HDD head have facilities in Asia, TDK has HDD head manufacturing facilities in Asia, including China. Many semi-conductor equipments and parts are required to manufacture the

head for HDD, therefore TDK and its suppliers have applied for US Export License for equipment, parts, etc.

TDK US companies mainly exports dual-use equipment, materials, parts for HDD Head and most of end-users are TDK group companies in China. Therefore, diversion risk is minimal.

Military End-Use Rule

TDK does not have any comments about the military End-Use Rule.

Validated End-User Provision

TDK welcomes the creative method that underlies the validated end-user ("VEU") proposal. It is important that the U.S. government find a way to ensure that U.S. companies can, without the need for individual export licenses, supply their full range of commercial items to reliable commercial facilities in China. In particular, the VEU proposal could substantially reduce the cost of repetitive licensing.

Under the current latest proposal, BIS would accept requests to be listed as a validated end-user in the form of an advisory opinion request, as set forth in proposed new section 748.15(a)(2) of the EAR. TDK would like to suggest that BIS should include VEU request application at SNAP-R or any other Electric application system. In this way, BIS will be able to control the VEU request effectively and efficiently and it results in speeding up the process within BIS.

MOFCOM Certificates

The proposed new Ministry of Commerce ("MOFCOM") certificate requirement would increase exporter costs and time and could result in delays for exporting to China. TDK is concerned that the Chinese government Chinese authorities concede that they will be unable to administer the program in a timely manner.

The rationale for a \$5,000 threshold is unstated and unclear. It would be so low as to cause the certificate requirement to cover the most controlled semi-conductor equipment and parts of TDK exports. We understand that the purpose of this proposal is to ensure that the U.S. government is able to conduct end-use checks on an increased number of exported items. But TDK urges that the threshold be

reviewed and BIS should introduce MOFCOM certificate requirement step-by-step except the National Security reasons.

Below is an example;

1st Step: Require MOFCOM certificate in case the value exceeds \$50,000 except NS items In case, the value does not exceed \$50,000, only BIS-711 (Statement by Ultimate Consignee and Purchaser) is required.

2nd Step: Require MOFCOM certificate in case the value exceeds \$25,000 except NS items In case, the value does not exceed \$25,000, only BIS-711 (Statement by Ultimate Consignee and Purchaser) is required.

3rd Step: Require MOFCOM certificate in case the value exceeds \$10,000 except NS items In case, the value does not exceed \$10,000, only BIS-711 (Statement by Ultimate Consignee and Purchaser) is required.

For reasons other than NS, the requirement for MOFCOM certificate should be \$10,000 threshold instead of \$5,000 threshold.

Conclusion

The impact of the proposal will depend greatly on a company's particular business model as well as the nature and volume of a company's transactions with China. To summarize the TDK position, we see both potential and areas of concern in this proposal. We support the VEU concept with the reservations and recommendations stated above. MOFCOM certificate could hurt U.S. commercial business to China. Once again, TDK appreciates the opportunity to address this important matter. Please do not hesitate to contact me if you have questions about our submission.

Sincerely,



Kazuyoshi Onishi

Senior Manager

Trade Control and Corporate Planning

TDK USA Corporation

From: <slita@deweyballantine.com>
To: <publiccomments@bis.doc.gov>
Date: Mon, Dec 4, 2006 3:10 PM
Subject: SIA Comments on Proposed Rulemaking (RIN 0694 -AD75)

This email contained an attached file "SIA_Comments.pdf" that was Parked by MessageScreen(tm) Email Firewall. You may retrieve it at <http://mx1.bis.doc.gov/showfile.php?58BF7B9887B58644BE861B15D346E4CF4574808D00090EB0>
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Attached please find the Semiconductor Industry Association's comments in response to the July 6, 2006, proposed rulemaking (RIN 0694-AD75) to revise and clarify the United States' policy for exports and reexports of dual-use items to the People's Republic of China.

-Steve Lita

Stephen J. Lita
Trade Specialist
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-Notice-----

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CC: <CMcFadden@deweyballantine.com>, <david.rose@intel.com>

December 3, 2006

Sheila Quarterman
Office of Exporter Services
Regulatory Policy Division
Bureau of Industry and Security
U.S. Department of Commerce
14th Street & Pennsylvania Avenue, N.W.
Room 2705
Washington, D.C. 20230

ATTENTION: RIN 0694--AD75

Re: Request for Comments on Revisions and Clarification of Export and
Reexport Controls for the People's Republic of China; New Authorization
Validated End-User (71 Fed. Reg. 38313)

Dear Ms. Quarterman:

The Semiconductor Industry Association ("SIA") is pleased to respond to the request for comments on the proposed rulemaking to export and reexport controls for the People's Republic of China ("PRC") and the new authorization for validated end-users ("VEUs").

The SIA is the leading voice for the semiconductor industry and has represented U.S. semiconductor companies since 1977. SIA member companies comprise more than 85 percent of the U.S. semiconductor industry.

Revision of License Requirements with Respect to Military End-Use

SIA endorses the express goal of facilitating U.S. exports to legitimate civil end-users in the PRC. In addition, SIA does not object to the Commerce Department's attempt to scrutinize exports that would make a material contribution to the military capability of the PRC. However, SIA has concerns regarding the justification and implementation of the proposal to impose new license requirements on commercial-off-the-shelf ("COTS") items that may be used to support military end-use.

SIA is pleased that the understanding reached between the U.S. semiconductor industry and the Commerce Department on May 20, 2003, concerning the definition of "military end-user" with respect to microprocessors will be unaffected by the proposed regulation. By limiting military end-user license requirements to only those semiconductor devices that are incorporated into munitions items, the Commerce Department created a bright-line test that, as a practical matter, has worked effectively for both industry and government.

Commerce Department officials have stated that the rule was proposed based in part on requirements of the Wassenaar Arrangement as well as the need to comply with the arms embargo the United States imposed on the PRC in 1989. U.S. Government officials maintain that they have evidence that the PRC is using commercial-off-the-shelf items in its weapons systems and this undermines the U.S. arms embargo.

The appearance of COTS items in Chinese weapons systems is not an appropriate basis to sustain licensing requirements and is not adequate justification for the promulgation of this rule. COTS items are civilian commodities that possess no special military characteristics and are of no strategic consequence. For this reason, SIA disagrees with the U.S. Government's contention that COTS can make a material contribution to the military capability of the PRC and empower the PRC to circumvent the U.S. arms embargo.

The mass-market, civilian nature of many COTS items ensures that they have widespread foreign availability. Unilaterally controlling the export of COTS items by U.S. exporters to PRC military end-use will have no impact on the ability of the PRC to procure these items from other countries. Controlling the export of COTS items to the PRC is simply not an effective way to address compliance with the U.S. arms embargo. On the contrary, it merely distracts from items of true national security significance, dilutes the ability of the export control system to screen for actual threats and creates competitive burdens for U.S. exporters.

Additionally, no evidence has been presented that the 47 Export Control Classification Numbers ("ECCNs") captured by the proposed regulation, which are currently not subject to national security controls, can contribute to the advancement of Chinese military capabilities. This deficiency is especially significant for semiconductor manufacturing equipment which is primarily fixed, not easily diverted, and far removed from military systems. SIA believes that this approach is unjustified and unnecessary.

SIA also has strong reservations concerning the unilateral nature of the proposed rule. Unilateral export control policies, such as those in the proposed regulation, have long been shown to be ineffective. To have an impact, a policy of this nature should be implemented multilaterally and with the full participation of other Wassenaar Arrangement member countries. At present, the United States is the only Wassenaar member likely to implement the Statement of Understanding on Control of Non-Listed Dual-Use Items with respect to the PRC. Indeed, SIA understands that some European signatories to Wassenaar have made it clear that the Statement of Understanding will not apply to their exports to the PRC. Attempting to impose unilateral licensing restrictions on widely available products is an exercise in futility.

Many important terms and definitions regarding military end-use are overly broad or unclear. The meanings of "use for," "support" and "deploy" are vague and without boundaries. These deficiencies can be expected to create significant compliance burdens

and impose unnecessary liabilities on companies involved in all aspects of an export transaction.

SIA further objects to the Commerce Department's attempt to expand the parties that are liable for an export transaction beyond the exporter to include entities that merely support the exportation. Suppliers and intermediaries that are merely providing a service for or contributing to an export should not be forced to accept responsibility or liability for a transaction that is under the direction and control of the exporter.

Finally, SIA renews its longstanding objection to the Commerce Department's inclusion of "transfer" in § 744.21. The proposed regulation should apply only to exports and reexports. There is no adequate legal basis or need for license requirements to extend to "transfers" within a country. The Export Administration Act of 1979, as amended, which is no longer in effect, was directed at the control of exports and reexports. The statute was never meant to control transfers within a country that have no export or reexport implications. This proposal therefore represents an unwarranted expansion of control even if the enabling statute were in effect. To seek such an expansion without explanation and while operating only under presidential executive authority is especially overreaching.

Revision of End-User Certificate Requirements

SIA has a number of concerns regarding the proposed end-user certificate requirements. The proposed regulation does not provide a justification for revising the end-user certificate requirements or explain how the proposal relates to the recently concluded understanding and the exchange of letters on this subject by the Vice Minister of Commerce of the PRC and the U.S. Under Secretary of Commerce for Industry and Security. In addition, the proposed regulation does not explain how end-user certificates "will facilitate BIS's ability to conduct end-use checks."

SIA is also concerned about the PRC government's ability and willingness to comply with provisions in the proposed regulation. The proposal would greatly expand the end-user certificate requirement and could overwhelm the Chinese system for such certificates, leading to substantial delays for U.S. companies seeking export approval. Even if the PRC government is willing to fully cooperate, it is not assured that the Ministry of Commerce will have sufficient resources to expeditiously issue end-user certificates.

Finally, there is a concern that the PRC government could be discriminatory in its treatment of importers and end-users and give preference to Chinese companies or state-owned enterprises when processing end-user certificates. This could lead to delays and inequities for U.S. companies and put U.S. exporters at a competitive disadvantage.

New Authorization for Validated End-Users

SIA is in favor of the VEU concept and appreciates the Commerce Department's efforts to facilitate the timely approval of export licenses, limit the need for duplicative licenses and increase certainty and predictability in the export control system. SIA agrees that the proposed rule could provide important benefits to U.S. exporters that engage in high volume or repetitious transactions. At the same time, the degree to which exporters could actually benefit depends in great part on the details of the rule's implementation.

In general, the proposed regulation is ambiguous and requires BIS to evaluate potential VEU applicants on a range of ill-defined factors including a party's "capability to comply," and a party's "relationship" with U.S. and foreign companies. The proposed regulation also provides no guidance on due diligence while increasing the potential liability for U.S. companies. All of these features will make exporters reluctant to attempt to utilize the VEU authorization.

The Commerce Department has also not made clear the exact purpose and extent of end-use visits. The proposed rule sets forth various reasons for on-site inspections including determining the *bona fides* of potential and actual end-users, conducting pre-license checks and post-shipment verifications and verifying compliance. Taken together, these reasons represent an expansion of the end-visit understanding that the United States currently maintains with the PRC government. Expansive and unrestrained site visits will pose a major impediment to use of the VEU.

As currently written, the proposed rule does not explicitly encompass the export of technology to the PRC, an issue that is of great importance to SIA member companies. However, SIA understands from Commerce Department officials that BIS intends to correct this oversight and include technology within the scope of the VEU in the final rule. Because exports of semiconductor equipment involve rapidly advancing technology levels and multiple ECCNs, they are likely to exceed the scope of the proposed rule. SIA member companies would appreciate clarification on this subject.

SIA is concerned that the proposed VEU regulation could be especially intrusive, onerous and complicated for Chinese end-users. Instead of increasing transparency and efficiency, VEU applications could lead to uncertainty and lengthy delays in the export system, especially given the granting of VEU status requires the consent of multiple U.S. government agencies through a process that has no apparent timeframe for issuing approval or denial.

Linking VEU authorization to specific ECCNs will limit the proposed rule's usefulness. The proposed VEU authorization system would be more effective if it permitted U.S. companies to export all items not explicitly prohibited, including technology, to companies that have received VEU authorization.

There is further concern that companies in the PRC would be unwilling to submit to U.S. legal jurisdiction and requirements simply to receive U.S. exports on a consolidated export licensing basis. Similarly, past history suggests that bulk licenses often are accompanied by special license conditions that are not applicable to individual export licenses, e.g. governing foreign nationals, technology levels or use of certain equipment. These features can greatly limit the benefits of the VEU proposal and make its use unattractive. While Commerce Department officials contend that VEU status is a reward for PRC companies with a history of export compliance and non-proliferation, excessive restrictions and requirements could offset any benefits and undermine the VEU authorization system.

The auditing and reporting requirements for companies that use a VEU also appear to be unnecessarily burdensome. The proposed regulation does not make clear to what extent on-site visits, reporting and auditing requirements for a VEU differ from those conditions imposed on an individual license. Standard BIS auditing policies for exporters should be sufficient and should be limited to only those activities covered by the authorization.

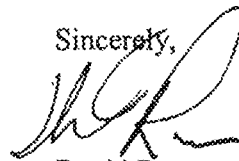
Finally, the proposed regulation states that VEU users will be "audited on a routine basis." The proposal should provide specific limitations on the scope of such audits.

* * *

In principle, and as a practical matter, a unilateral expansion of U.S. export controls on innocuous, COTS items will not strengthen U.S. national security. And while the proposed VEU authorization system could benefit U.S. companies and their customers in the PRC, the system's usefulness will ultimately depend upon the willingness of companies in the PRC to see it as a net benefit and not a net burden.

SIA appreciates the opportunity to comment on the proposed rule and looks forward to continuing its cooperation with BIS on these issues. Please feel free to contact the undersigned if you have questions regarding these comments.

Sincerely,



David Rose
Chairman
SIA Export Controls Committee

From: "Pfautz, Leanne" <PfautzL@staff.abanet.org>
To: <publiccomments@bis.doc.gov>
Date: Thu, Dec 14, 2006 11:02 AM
Subject: RIN 094-AD75

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These comments are sent on behalf of the American Bar Association Section of International Law. If you have any questions, please contact me.

Leanne Pfautz

Director

ABA Section of International Law

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COMMENTS OF THE AMERICAN BAR ASSOCIATION

SECTION OF INTERNATIONAL LAW

IN RESPONSE TO THE DEPARTMENT OF COMMERCE PROPOSED REGULATION

TO REVISE U.S. CONTROLS ON THE EXPORT OF DUAL-USE COMMODITIES TO

THE PEOPLE'S REPUBLIC OF CHINA

NOVEMBER 2006

The Section of International Law (the "Section") of the American Bar Association ("ABA") appreciates the opportunity to present its views regarding the U.S. Department of Commerce, Bureau of Industry and Security ("BIS") proposed regulation "Revision and Clarification of Export and Reexport Controls for the People's Republic of China; New Authorization Validated End-User," 71 Fed. Reg. 38,313 (July 6, 2006). The views expressed herein are being presented on behalf of the Section. They have not been approved by the House of Delegates or the Board of Governors of the ABA and, accordingly, should not be construed as representing the policy of the ABA.

EXECUTIVE SUMMARY

In brief summary, the Section's comments address the following issues:

- I. Introduction of Key Themes: The key themes of the Section's comments are (1) The likelihood of achieving important national security goals must be balanced by the possibility of unduly burdening legitimate trade with China; (2) the Administration should obtain multilateral support for the controls before adopting a final rule; and (3) industry concerns, reflected in the formal comments of various exporters industry groups, should be taken into account in crafting any final rule.
- II. Military End Use Proposal. In order to be effective, the proposed military end-use control should be narrowly tailored such that it does not unduly prejudice legitimate trade. The specific responsibilities of U.S. industry, including confirmation that the proposed rule imposes no increased obligations of due diligence, should be clarified. The impact of the proposed rule on the U.S.-China strategic relationship and the U.S.-China trade relationship should be carefully considered before BIS adopts a final rule. Several suggested changes are provided to address these issues.
- III. Validated End-User Proposal. The Section agrees that a validated end-user procedure would be beneficial if it relieved companies that export dual-use goods and technology to Chinese entities on a recurring basis of the burden of seeking a license for each shipment. However, in order to achieve the potential benefits, the Section recommends that BIS revise the proposed regulation to clarify the

potential benefits, to establish clear procedures for VEU administration, to avoid any unnecessary recordkeeping, compliance or auditing burdens for exporters, re-exporters or Chinese end-users, and to reduce potential users' perceived risk of participating.

- IV. End-Use Certificate. The proposed rule would expand end use certificate requirements for items and technologies requiring a license to China, and trigger additional inspections and require substantial cooperation with the Chinese Ministry of Commerce (MOFCOM). The Section recommends that BIS carefully assess whether the increased inspections will meet their stated goal, which is to "facilitate increased U.S. exports to the PRC." In any event, the Section recommends that before any final rule is adopted, adequate resources in the MOFCOM be ensured, procedures and requirements be worked out in advance with MOFCOM so that they are rationalized, and BIS's assessment of the paperwork burden on exporters and reexporters should be revised.

I. Introduction

The Section is concerned that the proposed regulation will not achieve its intended national security and economic objectives and benefits, without excessive costs, unless the Administration (1) implements the regulation in a way that does not unduly burden industry or threaten legitimate exports; (2) can obtain multilateral support for the new military end-use control prior to enactment of a final rule, (3) takes into account specific industry concerns and suggestions regarding each aspect of the proposed rule.

In this connection, the Section suggests that BIS ensure that the scope of the commodities affected by the military end-use control is properly limited, a mechanism is provided to release commodities from the scope of the proposed rule, clear procedures and timeframes should be developed for the new authorization for validated end-users.

Also, key aspects of the proposal will depend upon cooperation from the Chinese Government, e.g., the provision of end user certification by MOFCOM. Before implementing the rule, the Administration should ensure such cooperation is in place.¹

II. Military End-Use Proposal

The military end-use control included in the proposed regulation is intended to strengthen controls on specific items that have the ability to materially enhance Chinese military power. This proposal has its roots in a 2003 agreement among key exporting countries, under the

¹ Given these infirmities of the proposed rule, certain members of the committee responsible for drafting these comments expressed the dissenting view that BIS should withdraw the proposal for reconsideration and re-engineering, in order to build consensus and multilateral support for a revised proposal. In the event the rule is withdrawn, the Section would be pleased to assist BIS in any efforts to craft a revised proposal.

Wassenaar Arrangement, under which members agreed to restrict exports of unlisted dual-use items when exporters are informed that the item is destined for military end-use in a country subject to a United Nations arms embargo or a regional arms embargo to which the member adheres.

This proposal has its roots in a 2003 Statement of Understanding (SOU) on Control of Non-Listed Dual-Use Items under the Wassenaar Arrangement. The Wassenaar Arrangement is a non-treaty organization composed of 40 states. Participating States agree to contribute to regional and international security and stability by promoting transparency and greater responsibility in transfers of conventional arms and dual-use goods and technologies. The 2003 SOU restricts exports of unlisted dual-use items when exporters are informed that the items in question are or may be intended, entirely or in part, for a military end-use in a country subject to a UN arms embargo or any relevant regional arms embargo either binding on a Participating State or to which a Participating State has voluntarily consented to adhere.

Under the BIS proposal, certain items that do not currently require a license to be exported to China would now require a license where the exporter has knowledge that the items are destined for a military end-use in the PRC. The proposal applies to 47 different product categories on the BIS Commerce Control List. A military end-use is defined as “incorporation into, or use for the production, design, development, maintenance, operation, installation, or deployment repair, overhaul, or refurbishing” of a munitions item, i.e. a defense article. Consistent with the existing BIS regulations, “knowledge” would exist where an exporter has “positive knowledge” that the military end-use is substantially certain to occur, and also where the exporter is aware of a high probability of such military end-use. Knowledge could be inferred from the exporter’s conscious disregard of relevant facts and/or the exporter’s willful avoidance of such facts.

A. Effectiveness of Proposed Control

We recognize that there are substantial U.S. national security and foreign policy concerns regarding China’s military development and future posture, and we believe appropriate controls must be developed that meet these concerns without unduly prejudicing legitimate trade.

Such a balanced approach to adoption of new export controls is in keeping with the policy that the Administration has adopted with respect to China: encourage China’s peaceful integration into international institutions as a “responsible stakeholder” through expanded, legitimate trade, while simultaneously preparing to address contingencies if China’s emergence as a regional power is not smooth. Accordingly, the list of items identified as subject to the proposed new control should be limited to components critical to the Department of Defense’s publicly articulated concerns over Chinese programs in the areas of: modernization of its strategic missile forces; research, development, production and weaponization of biological agents and a chemical warfare program; pre-emptive long-range precision strike capabilities, information dominance, command and control, and integrated air defense; software and integrated circuit industries vital for information technology and network-centric warfare; development of an indigenous microelectronics industry to provide integrated circuits for future military systems like advanced phased-array radars; and the intent to acquire Western state-of-the

art thermal-imaging night-vision infrared technologies.²

It is a traditional and well established principle in U.S. export controls that the effectiveness of export controls requires both promotion of U.S. national security goals and the protection, maintenance, and expansion of legitimate trade. In short, any new rule must achieve goals relating to both "industry" and "security." An important corollary to this principle is that export controls should rarely be imposed for symbolic purposes. Rather, the actual effectiveness of the controls in advancing U.S. security goals generally must be the basis on which new controls should be judged.

In the case of the proposed military end-use proposal, there are significant questions regarding the likely effectiveness of the proposed control, for at least two reasons: First, as many industry comments on the proposed rule set forth in detail, there is substantial evidence that many of the newly controlled items are available from foreign sources. Indeed, industry is concerned that in some cases, equivalent products apparently are available from indigenous Chinese sources. We urge that the Administration carefully consider comments submitted by industry regarding the foreign / indigenous availability of the covered items.

Second, it is unclear that any of the Wassenaar Arrangement governments will impose effective controls substantially similar to the proposed rule. If it is important from a national security standpoint to deny Chinese military end-use of these items, then we urge the Administration to obtain the support of key allies for such a proposal and devote significant political resources to that effort. The Administration should seek Wassenaar support before publishing any final rule. We understand that the Administration intends to do so.

If such support cannot be obtained from a country that is an alternative supplier of a particular covered item, or the item is available from an indigenous Chinese source, then the Administration generally should exclude that item from the covered list. The ABA Section on International Law would be pleased to work with BIS to develop an efficient system for identifying and excluding foreign-available items from the list of items subject to the military end-use control, based on objective criteria and evidence. In any event, such a mechanism should be developed and implemented before any final rule is published.

B. Impact on U.S. Industry

The proposed control would affect exports, re-exports, and transfers. In addition, as noted in more detail in Part II.D below, many of the terms in the proposed regulation are broad and vague. In part for these reasons, many industry comments on the proposed regulation have expressed the concern that additional due diligence will be required in order to comply with the new rule. BIS should either clarify that no new due diligence is required by the new rule, or

² Statement of Ms. Beth M. McCormick, Deputy Under Secretary of Defense for Technology Security Policy and National Disclosure Policy (Acting), and Director, Defense Technology Security Administration (Acting), 109th Cong. 2d Sess., Hearing before the U.S.- China Economic and Security Review Commission, March 17, 2006, at 144-145, available at http://www.uscc.gov/hearings/2006hearings/transcripts/march16_17/March_16-17_FINAL.pdf ("Hearings").

should revise the scope of the prohibitions accordingly.

Separately, the proposed rule will reinforce the perception of American firms as unreliable suppliers to customers in China and elsewhere, if the rule is not implemented multilaterally. There is already evidence that foreign customers, including in China, source from non-U.S. suppliers because of U.S. export control policies. In addition, there are real concerns that European and Asian competitors will use the new rule as leverage to discourage Chinese customers from considering American suppliers. If the rule is implemented in a unilateral manner, competitors from countries not subject to the unilateral control could use the U.S. control to their advantage at the expense of the burdened U.S. firms. Moreover, certain foreign or Chinese competitors may seek to derail U.S. exporters' transactions by alleging to BIS Export Enforcement personnel that a Chinese company has military ties. Once an investigation is initiated, U.S. exporters may feel compelled to disengage until the matter is resolved.

Similarly, because the proposed regulation would apply to re-exports, foreign companies will be less willing to purchase U.S.-origin goods for incorporation into their products destined for the Chinese market, since the new U.S. control would require these foreign companies to screen for prohibited military end-use.

Other terms of the proposed rule (including the controls on "facilitation" and "transfer") mean that any adverse effects on U.S. industry would go beyond producers of goods, technology and software. Entities throughout the supply chain would be affected as the proposed rule would broaden the compliance burden for freight forwarders and other facilitators. These effects must be considered in balancing the industry and security interests affected by the rule.

Finally, because the proposed rule contains no provision for contract sanctity, the enactment of a final rule would immediately adversely impact existing business contracts and relationships including, among others, banks and financial institutions involved in transactions subject to the control.

C. Impact on U.S.-China Relationship

The proposed rule must also be considered in the broad context of the U.S.-China relationship, to ensure that it does not have unwarranted impact on important evolving bilateral issues in the relationship, including relevant security and trade initiatives.

The effects of the proposed new controls on current U.S.-Chinese bilateral and multilateral security issues should not be discounted. As former Deputy Secretary of State Zoellick noted in his May 10, 2006 testimony before the House of Representatives Committee on International Relations, the U.S. is "deeply engaged" with China on "critical global problems." The incremental gains to U.S. national security from the proposed new controls therefore must be balanced against the possible loss of, or reduction in, Chinese cooperation on a host of important international and national security issues. The success of U.S. policy depends on Chinese cooperation in such critical areas as: China's central role in restarting the Six-Party Talks with North Korea on the North's nuclear program, as well as China's active participation in any U.N. nuclear test-related sanctions program against North Korea; non-proliferation generally,

including with respect to Iran's missile and nuclear programs; cooperation with U.S. homeland security programs, where China's cooperation as the one of the largest exporters of goods to the U.S. is critical to the success of U.S. Customs homeland security programs to inspect cargo containers before they ship from foreign ports to the United States.

Bilateral initiatives, such as the Senior Dialogue, the agreements to expand senior-level military visits, naval ship visits, military academy exchanges and interactions among junior officers that resulted from Defense Secretary Rumsfeld's October 2005 visit to China, and the agreement at last April's presidential summit to increase military-to-military exchanges and discuss strategic nuclear forces, which are designed to increase transparency about Chinese actions and intentions, also could be jeopardized. Similarly, as a permanent member of the UN Security Council, China's cooperation is critical to resolving any number of international issues and, in some cases China possesses unique influence. For example, with respect to the genocide occurring in Darfur, China is uniquely positioned as the major investor in Sudan's oil industry to exercise leverage on Sudan's Government. In summary, the potential harm to U.S.-Chinese cooperation on a range of issues critical to U.S. security policy should be carefully weighed against the identified benefits of the proposed new controls.

The same point applies regarding the potential impact on the U.S. international economic policy agenda. China is increasingly important to U.S. economic policy priorities, both bilaterally and multilaterally, as a few examples will show. Treasury Secretary Henry Paulson recently established the Senior Economic Dialogue with top Chinese leaders in order to address a host of bilateral economic issues of concern, including China's management of the Yuan-Dollar exchange rate. This Dialogue builds on the bilateral Joint Commission on Commerce and Trade, a Cabinet-level body that seeks to make progress on key trade issues. At the multilateral level, the Administration is seeking for China to take a larger leadership role in the success of the Doha round of World Trade Organization negotiations, which is an important Presidential priority. China also has a central role in the Asia-Pacific Economic Cooperation (APEC) forum. Thus, there are a host of important U.S. economic priorities that could be affected by the Chinese reaction to the proposed rule.

D. Specific Comments

If the proposed rule is made final, BIS should change or clarify certain aspects of the new control to address the following issues.

- Change the "knowledge" standard so that exports are only controlled when the exporter has "positive knowledge" that the item is destined for a military end-use. This is the standard that was discussed by BIS officials in various public forums prior to the publication of the proposed rule. For example A "positive knowledge" standard would greatly reduce the uncertainty and due diligence burden associated with the current proposal. In any event, if anything other than a "positive knowledge" standard is adopted, the rule should be accompanied by published guidance is published clarifying the circumstances in which knowledge will be inferred (e.g., clarification that the mere fact that a company may be state-owned or may have some munitions manufacturing would not justify inferring "knowledge").

- Clarify the definition of munitions item to address the current ambiguity that arises from broadly referring to the U.S. Munitions List. There is long-standing concern in the U.S. defense trade community that the jurisdiction of the U.S. Munitions List is vague, due to its reliance on general concepts such as “specifically designed.” Such ambiguity would pose particular concerns in the current context, because exporters of dual-use commodities may not be well versed in the State Department’s interpretation of the U.S. Munitions List. Moreover, foreign and Chinese parties are likely to be even less well-informed. The Section recommends that BIS consider whether there are ways to reduce this ambiguity in order to enable exporters, re-exporters and end-users to comply with this rule without undue burden.
- Provide clear “due diligence” and safe harbor guidance. Elements of this guidance should include, at minimum, the following:
 - Confirm that the rule creates no new expectation of due diligence by exporters or reexporters, and guidance regarding appropriate due diligence steps that exporters could take in this area in order to come within a “safe harbor.”
 - Confirm that the new control does not apply to prohibit exports to an entity in China that will use the item to manufacture non-munitions items that themselves will be used to manufacture or deploy munitions items. In other words, confirmation that the activities of the exporter’s “customer’s customer” are not the focus of this control.
 - Confirm that the control does not apply simply because the end-user is a military entity (e.g., the PLA), given the range of civil activities that are conducted by Chinese military entities. (This is consistent with guidance posted on BIS’s Internet site in October 2006). Rather, the guidance should clearly state that the control does not apply unless there is a specific military end-use associated with the transaction.
 - Withdraw the licensing standard that determines whether a proposed transaction “would make a material contribution to the military capabilities of the Chinese military,” focusing instead on whether the proposed transaction will be intended, entirely or in part, for a military end-use, as defined in the new proposed rule.
- Revise proposed Supplement No. 2 to Part 744 at paragraph (6) (pertaining to information security items). Because certain strong encryption hardware and software items (under Export Control Classification Numbers 5A002 and 5D002) have already been decontrolled for export to non-government users in China under License Exception ENC, the Supplement as currently drafted could subject some lower level encryption software items (under ECCNs 5A992 and 5D992) to a higher level of control than the stronger encryption items in most circumstances. The proposed rule should be revised to avoid creating this anomalous situation.
 - Confirm that only those items specifically listed in Supplement No. 2 to Part 744

are subject to the military end-use control (e.g., that 5A002 and 5D002 items are not subject to the control)

- Provide a mechanism for encryption items to be exempted from the list under conditions analogous to License Exception ENC.
- Clarify the relationship between existing License Exceptions available for China and the proposed military end-use control. For example, a comprehensive list of items exportable to China under existing License Exceptions could be published before the final regulation is published, and those items explicitly exempted from the proposed military end-use prohibition.
- Provide a specific process for informing all exporters of any “additional prohibition” described in Section 744.21(a)(2)(b) of the proposed rule. To the extent possible, BIS should avoid non-public, individual notifications in favor of public notice in the Federal Register. Opportunity for comment should be provided where possible, and industry should be afforded adequate time to implement any new prohibitions.
- Provide a specific process for adding new commodities to the prohibited list. Notice of the proposed addition of new commodities to the prohibited list should be published in the Federal Register. Opportunity for comment should be provided, and industry should be afforded adequate time to implement the new requirements.
- Provide a specific process for exporters to nominate particular items for exclusion from the prohibited list, with specific regulatory deadlines for each step of the process
- In order to avoid adverse effects on existing business contracts involving exporters, banks, financial institutions, and other entities involved in transactions subject to the control, BIS should include in any final rule a provision for contract sanctity.

III. Validated End-User Proposal

The Section welcomes BIS’s proposal of authorization Validated End User (“VEU”), set forth in proposed 15 C.F.R. § 748.15. The VEU proposal would relieve companies that export dual-use goods and technology to Chinese entities on a recurring basis of the burden of seeking a license for each shipment. Exports classified under specific, approved CCL categories could be sent to a VEU without a license, even where one would normally be required. To qualify for VEU status, PRC-based companies could file an application with BIS themselves, or U.S. exporters could seek VEU status on behalf of their Chinese customers. The application process would require BIS to evaluate PRC-based companies on a number of factors, including: a demonstrated record of exclusively civilian activities; past compliance with U.S. export controls; capability to comply with VEU requirements; and corporate relationships with U.S. or foreign companies. VEU status would be granted to a PRC company only for specific categories of controlled items, and the Chinese end-users would need to accept periodic on-site compliance reviews by the U.S. government. The U.S. government would also consider the status of China’s export control system and China’s adherence to multilateral export control regimes.

The VEU proposal appropriately seeks to promote legitimate U.S. exports to China by reducing current repetitive licensing burdens imposed on exports to bona fide commercial end-users, many of whom are affiliates or commercial partners of U.S. companies and/or companies headquartered in countries who are our close allies. Moreover, the VEU proposal appropriately seeks to establish a “virtuous competition” among Chinese end-users, in which the companies who demonstrate that they will not divert U.S. items to inappropriate end-uses are able to get better access to U.S. high technology.

However, in order to achieve the potential benefits from the VEU initiative, the Section recommends that BIS revise the proposed regulation to clarify the potential benefits, to establish clear procedures for VEU administration, to avoid any unnecessary recordkeeping, compliance or auditing burdens for exporters, re-exporters or Chinese end-users, and to reduce potential users’ perceived risk of participating. Such revisions would help achieve the potential benefits from the implementation of the program and promote the Administration’s laudable goals of increasing legitimate U.S. exports to China.

We discuss below (1) the types of U.S. industries that could benefit from the program and the types that are less likely to benefit; and (2) the actions that we suggest are appropriate to ensure the proposed VEU program is as successful as possible in achieving its goals.

A. The Benefit of VEU Will Vary Depending on the U.S. Industry Involved

The benefit of the VEU program for U.S. exporters will primarily depend on the characteristics of the exporting industry in question. In general, the VEU program is likely to be valuable to industries exhibiting two principal characteristics: (1) the industry in question already exports a significant amount of controlled commodities to the PRC; and (2) the industry’s exports are to a limited number of known, high-volume customers in the PRC that are affiliated with the exporter, foreign- or wholly-owned subsidiaries, and/or PRC companies that are wholly independent from Chinese government control. A good example is the U.S. semiconductor equipment industry, which supplies controlled manufacturing equipment under export licenses to a discrete number of Chinese foundries. Authorization VEU could significantly reduce the compliance burdens for such companies of repeatedly licensing the same items to the same Chinese end-users.

On the other hand, for industries that do not exhibit these characteristics, we believe there would be little incentive to participate in the VEU program. For example, for industry sectors that export products to the PRC for which no license is necessary, or for which licenses are routinely denied by BIS, the VEU program will hold little value.

Moreover, industries that sell to a large number of customers also are not likely to benefit from the VEU program because they likely do not have sufficient incentive to qualify more than a small number of their larger PRC customers. Particularly for these industries, the smaller the additional recordkeeping, compliance burden and legal risk associated with the VEU program (as discussed below), the more inclined they may be to qualify additional Chinese customers.

U.S. companies selling to PRC customers in certain industries with a military heritage, such as the aerospace industry, are likely to find it difficult to qualify their customers for VEU status due to those customers' prior involvement in non-civilian activities.

Given our understanding of the universe of industries affected by the VEU proposal, we believe that there are only a few industries to which the VEU proposal would deliver significant benefits. That said, those industries that would realize significant benefits are likely to be those that are most affected by current export controls of dual-use items to the PRC, such as the semiconductor equipment industry described above.

B. Specific Concerns with VEU and Suggestions for Improving the Program

In order to achieve the important objective of the VEU proposal, the Section recommends that BIS seek to enhance the potential utility of the VEU program, and to avoid any unnecessary administrative burdens from the VEU proposal, in order to maximize the potential benefit to those U.S. industries that could use the program effectively. We have the following specific suggestions for increasing the potential utility of the VEU program.

1. Application of VEU to Specific Controlled Technology

BIS should provide guidance to confirm that certain intangible technology items, such as development or production technology for high-performance computers, will be authorized for export under authorization VEU. As many U.S. companies manufacture high-technology goods in the PRC at their wholly-owned subsidiaries, the inclusion of specific technology Export Control Classification Numbers (ECCNs) in the VEU program would significantly increase its utility.

As a related comment, BIS should confirm in its final rule that authorization VEU will allow the release of technology to PRC nationals in the United States if the PRC national is a full-time employee of the entity with approved VEU status. Such confirmation potentially could increase the incentive for U.S. exporters and Chinese end-users to seek authorizations under the program. Allowing the use of VEU in such "deemed export" situations is warranted, given that the same PRC national could obtain unrestricted access to technology that is exported to the PRC under VEU to his or her employer.

2. VEU Approval Process and Criteria

One major concern is the lack of definition in the VEU application and approval process. Proposed 15 C.F.R. § 748.15 requires that U.S. exporters or their Chinese customers submit a request for an advisory opinion, pursuant to 15 C.F.R. § 748.3(c), for the purposes of certification. Neither the proposal nor the existing advisory opinion process sets forth specific timetables or procedures for BIS review of VEU advisory opinions. Moreover, the proposal contemplates a review of the VEU application based on an open-ended list of criteria, including "the party's record of exclusive engagement in civil end-use and activities; the party's compliance with U.S. export controls; the party's capability to comply with the requirements of authorization VEU; the party's agreement to on-site compliance reviews by representatives of the

United States government; and the party's relationships with U.S. and foreign companies.”

Without clarification by BIS of the scope of investigation and review, and defined procedures and timetables employed to conduct such reviews, both potential sponsoring companies and sponsored VEUs may be reluctant to embark upon the VEU process.

We also urge BIS to clarify in the final rule that the denial of VEU status to a Chinese end-user does not constitute a “red flag” for the purposes of ongoing licensing and compliance. This action would avoid a potential disincentive for VEU applications, and would be fully consistent with BIS’s confirmation in the Supplementary Guidance published on the BIS website on October 13, that if BIS does not approve an end-user’s validated end-user application, the presence of that end-user in a transaction will not trigger a new license requirement and would not preclude approval of licenses for exports to that end-user. BIS stated further that “VEU status is pertinent only to transactions where licenses would otherwise be required. Accordingly, lack of approval of a VEU application would neither add to nor take away from the licensing requirements otherwise applicable to exports to a given end-user.”

3. Early Announcement of VEU Approvals

We recommend that BIS announce at or shortly after the publication of the final rule that one or more Chinese end-users has been certified as an approved VEU. Such an announcement could increase the perception in the U.S. exporter community that the program is viable and of potential value to them. Moreover, such early announcements could send an important signal to U.S. exporters regarding the breadth of technologies that will be approved for VEU. We understand that BIS staff have been actively engaged in identifying appropriate candidates for the VEU program and appreciate this proactive approach.

Such announcements would also help address the fact that some companies perceive there to be a significant “free-rider” problem associated with the proposal. To qualify their customers for VEU, U.S. exporters would have to expend time and resources up-front to qualify one or more of their customers, and incur compliance, recordkeeping and auditing burdens going forward, when their competitors will also reap the benefits of that customer’s qualification. To the extent that BIS can publish VEU approvals on its own, doing so could meaningfully address the “free rider” problem associated with the proposal.

4. Record-keeping, Auditing, and Compliance

Proposed 15 C.F.R. 748.15(f) requires: (1) annual reports to BIS regarding the identity of the VEUs to which the exporter had shipped in the previous year, and numerous details regarding the quantity, identity and destination of the items shipped; and (2) annual on-site audits in China, “on a routine basis”, by BIS officials. BIS should clarify the exact scope of the annual reports, and more importantly, the annual audits, in order to avoid any unnecessary additional compliance costs associated with the program.

BIS should clarify how BIS will assess VEU applicant compliance, and should clarify the documents or other methods by which applicants may demonstrate their compliance with VEU

requirements. For example, this would be relevant to the proposed requirement that items shipped under authorization VEU, if not used at the end-user's facility, will be used in a destination over which "the end-user demonstrates effective control." Proposed 15 C.F.R. § 748.15(d)(1). It would be helpful to clarify typical facts that would support such a demonstration of "effective control."

5. Dedicating Staff Resources

BIS should confirm its arrangements with other federal agencies and MOFCOM to devote sufficient staff resources to the VEU program at its inception, and that the new authorization and auditing procedures are clearly defined and subject to strict deadlines. Without the assurance of such deadlines and adequate personnel in the U.S. and China dedicated to administering the program, there will inevitably be significant delays in certifying and authorizing end-users, thus significantly reducing the benefits associated with the program and increasing the burden on legitimate trade.

6. Legal Risk Associated with VEU

There are concerns that the program, as currently proposed, would subject both U.S. exporters and Chinese end-users to a significant level of legal risk. Users of the new authorization VEU could risk penalty under Chinese domestic laws that can restrict companies from giving certain types of information to a foreign government and agreeing to foreign law enforcement resources and activities on sovereign Chinese territory. China's trade secrets and state secrets laws are vague and therefore subject to interpretation. For example, the ability for the U.S. Government to verify "the [Chinese] party's record of exclusive engagement in civil end-use activities" implies that U.S. government investigators would review the internal records of Chinese companies, with potential for retaliation by the PRC government. To reduce the disincentive to seek VEU status for Chinese end-users, BIS should discuss this issue with MOFCOM and obtain official confirmation that applicants for authorization VEU will not face penalties under Chinese domestic laws for actions arising out of such applications.³

C. Chinese Legal Impediments

Chinese law may also hamper implementation of the new authorization VEU in its present form. Certain information that would be requested by the U.S. government from Chinese companies for application for VEU status (as well as the on-site compliance review audits to be conducted by the U.S. government), may be characterized as state secrets under the protection of Chinese law. Current application of these laws indicates that U.S. firms and their employees in China may face liability under the proposed rule for VEU-related activities.

³ There is also concern that allegations by competitors regarding the Chinese customer could disrupt the functioning of the proposed VEU mechanism. An allegation that the Chinese customer is involved with the Chinese military could lead the U.S. government to suspend the VEU authorization, pending investigation. While the U.S. exporter seeks to either restore the VEU or to obtain an individual license, the competing company could offer immediate availability and delivery. To promote use of the VEU authorization, BIS should provide assurances to the exporting community that VEU authorizations will not be suspended without well-founded evidence.

1. Relevant Chinese Law

Article 3 of the State Security Law of the People's Republic of China states that "all state organs...public organizations, enterprises and institutions shall have the duty to safeguard the security of the State." Article 4 states that any act committed by an organization or individuals "endangering the security of the People's Republic of China shall be prosecuted according to law".

Article 21 of the Law of the People's Republic of China on Guarding State Secrets states that "when state secrets have to be furnished for the benefits of contracts and cooperation with foreign countries, approval must be obtained in line with the proscribed procedures." Also, according to Article 11 of this law, when people are not sure whether a matter is a state secret, they should submit inquiries to the State Secret Guarding Department to determine the classification.

Most provinces in China enforce this law by enacting their own local enforcement procedures. But this process does not have an established single entry point or nationally transparent procedure. Therefore, the State Security Law of the PRC and the Law of PRC on Guarding State Secrets explicitly impose the duty on Chinese citizens and managers of enterprises not to commit any act that may endanger the "security, honor and interests of the State," and it is their responsibility to clarify the matter when they are uncertain about the classification of any information they wish to provide a foreign person, entity or government.

2. Potential Effect of the VEU Information and Procedural Requirements

The information requirements of the VEU process are broad. In its explanation of the information requirements, BIS states in the proposed regulation that a non-exhaustive list of specific factors will be taken into consideration (see discussion above in Section III.B.2 of this Comment). Furthermore, in the provisions of the proposed rule applicable to the procurement of VEU authorization status and VEU operations (EAR Section 748.15, proposed at 71 FR 38320), list the information requirements necessary to obtain VEU status (Section 748.15(a)(1), and the information which must be made available upon request and may be subject to audit by BIS. The information so identified includes both detailed administrative and transactional information. The transactional information, which would include not only the items manufactured and to whom it was shipped may come within the ambit of the above-cited Chinese laws unless specifically cleared by the Chinese authorities.

As liability attaches to both the entity and its owners, as well as to individuals (such as managers), the Section recommends that the U.S. government seek an agreement with China providing either a blanket approval of this information sharing or a transparent procedure by which the Chinese government would review such information requests to ensure propriety. Absent such an agreement, the VEU authorization mechanism may be hampered by existing Chinese Law and may present an unacceptable liability exposure to U.S. firms and their overseas managerial employees.

D. Conclusion

Unless such improvements are made to the VEU proposal, we are concerned that many companies may see the additional compliance burdens associated with authorization VEU – additional application, recordkeeping, reporting and U.S. government audit requirements – as greater than those currently associated with members’ long-established export licensing compliance programs. This concern is increased by the potential “free-rider” problem and the potential for legal risk associated with VEU participation. Accordingly, we urge BIS to provide significant additional clarification on the issues outlined in this comment. Without such guidance, the VEU authorization’s goal of increasing U.S. exports of civilian end-use technology to the PRC could founder on industry’s perception of too little benefit and too much additional cost being associated with the program.

IV. End-Use Certificate (EUC)

The proposed rule would require exporters to obtain an End-User Certificate (EUC) issued by the Ministry of Commerce (MOFCOM) of the People’s Republic of China for all items that both require a license to China for any reason, and exceed a total value of \$5,000.00. Currently, the EUC requirement applies only to the export to China of items controlled for national security reasons. In addition, the proposed rule would eliminate the current requirement that U.S. exporters submit the Chinese EUC to BIS along with their license applications before obtaining government authorization prior to shipment to China. Instead, the rule would require exporters to include the serial number of the PRC End-User Certificate in the appropriate field of the license application.

A. Expanding the End-Use Certificate Requirement

The reason given in the proposed rule for the change in the EUC requirements is “to strengthen implementation of the April 2004 end-use visit understanding between the PRC and the U.S.”, which set in place the framework for official on-site inspections by representatives of both MOFCOM and the BIS Office of Export Enforcement. The proposed rule would expand the EUC requirement for all items and technologies requiring a license to China, and thereby provide the trigger for additional official on-site inspections to all exports of controlled goods and technologies over the \$5,000 threshold. BIS states that it “anticipates that this expansion of the EUC requirement will facilitate BIS’ ability to conduct end-use checks on exports and re-exports of all controlled goods and technologies to China, consistent with the existing end-use understanding.” Before any final rule is promulgated, we recommend that BIS carefully assess whether the increased number of end-use checks will “facilitate increased U.S. exports to the PRC” as stated in the proposal.

The proposal acknowledges that the expanded EUC documentation will have an impact on exporters and re-exporters. However, to “minimize the impact that this expanded support documentation will have on exporters, BIS proposes to eliminate the requirement that exporters provide the EUC along with other required support documentation as part of the license review process. Instead, the proposed rule would require exporters to include the serial number of the Chinese EUC in the appropriate field of the license application and retain the MOFCOM EUC in its files for the regulatory record keeping period of five years. (The proposal does not change the EUC requirement for all computer exports to the PRC that require licenses prior to shipment to

China.) The impact of the EUC requirement in the proposed rule could be significant: reportedly only 35 of the 1,303 license granted for export to China in fiscal year 2005 had listed values less than \$5,000. The implementation of the EUC requirement for all controlled items and technologies could result in lengthy backlogs that would hamper legitimate U.S.-China trade.

B. Ensure Adequate MOFCOM Resources

Since publication of the rule, BIS officials have confirmed that BIS does not know whether MOFCOM will have adequate resources to meet the increased demand for EUCs by exporters and re-exporters anticipated under the rule. Currently, the number of staff at MOFCOM involved in export control is reported to be nine individuals, who have additional responsibilities other than export control and on-site inspections. The Chinese government has expressed public concern that it will have difficulty in coping with the new EUC requirement.

Similar concerns have arisen concerning the number of BIS staffing dedicated to do the follow-up on-site inspections that the EUC requirement may generate. At this time, there is only one BIS/OEE staff member who is responsible for, among other things, conducting official end-use on-site inspections with MOFCOM staff. When this individual is not in China, on-site inspections come to a standstill and transactions cannot go forward until that person returns to work. With the increased number of on-site inspections expected to be triggered by the expansion of the EUC requirement, the Section suggests that BIS increase its own staffing to meet any increased number of on-site inspections under the proposed rule or, in the alternative, avoid significant increases in the volume of end-use inspections.

C. Revise Paperwork Burden Assessment

The Section appreciates the stated intent to mitigate the impact of the EUC requirement by allowing exporters to submit the EUC serial number rather than a copy of the certificate as part of the supporting documentation for the application. However, the potential delay and burden on legitimate trade arises not from providing a physical copy of the EUC to BIS, but from obtaining the issuance of the EUC from MOFCOM in the first instance. The exporter or re-exporter will not know the serial number of the EUC until it has the certificate in hand. Hence, the option of submitting the EUC serial number does not materially reduce the administrative burden to exporters. We believe the proposal is incorrect in stating that under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.) (PRA) that "Import Certificates and End-User Certificates" carry a paperwork "burden of 15 minutes per submission" on the license application. The burden on the exporter exceeds this level due to the effort involved to obtain the EUC from MOFCOM. The PRA estimate should be revised upward accordingly.

D. Rationalize End-Use Certificate Requirement

BIS should consider whether there is a more focused standard to identify the licenses for controlled items and technologies having critical national security implications for which an EUC would be required, for only then would there be present significant national security issues that warrant an official post-shipment verification. It has not been demonstrated that all items over the \$5,000 threshold rise to this level of national security concern. We urge BIS to work

with MOFCOM to rationalize under what circumstances an end-use on-site inspection is to be required for especially sensitive items and technologies. Although the rule seeks to enable BIS to conduct end-use on-site inspections for all controlled goods and technologies above the \$5,000 threshold, a better use of government resources overall – as well as the resources of exporters and re-exporters – would be to determine what items and technologies are most sensitive from a national security perspective and to require the EUC for those transactions only.. Before implementing the proposed rule, we recommend that BIS establish with MOFCOM an implementation system so that the expanded EUC requirement does not result in delayed shipments or foreign retaliation against U.S. products.

IV. Conclusion

The Section appreciates the opportunity to submit comments on this rule and is available to provide any further assistance that BIS may desire.

Respectfully submitted,

Deborah Enix-Ross, Chair