Study on Impact of Foreign Sourcing of Systems

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Office of the Deputy Under Secretary of Defense for Industrial Policy

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Executive Summary

The Study

Recent operations in Iraq raised concerns that foreign nations might restrict or preclude shipments of defense articles for DoD applications during internationally unpopular engagements. Given this possibility, the Department of Defense decided to review the extent to which it depends on foreign suppliers for operationally important defense systems.

This effort complements and expands the 2001 Study on Impact of Foreign Sourcing of Systems mandated by section 831 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001. The 2001 study focused largely on combat platforms (AH-64D Longbow Apache, F/A-18 E/F Super Hornet, M1A2 Abrams Main Battle Tank Systems Enhancement Program, Patriot Missile Ground Station, and the Advanced Amphibious Assault Vehicle); and three "consumable" precision guided munitions, the Joint Direct Attack Munition (JDAM), Longbow Hellfire Missile, and the Advanced Medium Range Air-to-Air Missile (AMRAAM).

The current selection of systems to study is shaped by the recent experiences in Operations Enduring Freedom and Iraqi Freedom. Those operations were conducted largely as "come-as-you-are" conflicts with the combat platforms already deployed to our forces; and they consumed significant quantities of precision guided munitions. As a result, this study is focused on those items that were or would be in high demand and/or consumed during similar future operations.

The Department contacted a total of 806 prime contractors and first and second tier subcontractors in order to collect and evaluate information for:

- Guided Multiple Launch Rocket System (GMLRS)
- Army Tactical Missile System (ATACMS)
- Patriot Advanced Capability (PAC3) Missile
- Tactical Tomahawk Missile
- Stand-Off Land Attack Missile - Expanded Response (SLAM-ER)
- Joint Standoff Weapon (JSOW)
- Paveway II Laser-Guided Bombs (LGB)
- Predator Unmanned Aerial Vehicle
- F414 Engine
- Sensor Fused Weapon and Wind Corrected Munition Dispenser (SFW and WCMD)
- Joint Service Lightweight Integrated Suit Technology (JSLIST) Chemical Protective Suit

Conclusions

Foreign sources provide limited amounts of materiel for the identified programs.

For the twelve programs evaluated as part of this study of foreign sources in defense programs, the Department identified a total of 73 first, second, and third tier foreign subcontractors. The total value of the prime contracts totaled $2.23 billion. The total value of the subcontracted effort for the programs totaled $986 million; about $96.5 million of that amount was subcontracted to foreign sources. Collectively, foreign subcontracts represent about four percent of the total contract value and less than ten percent of the value of all subcontracts for these programs.

PROGRAM	# FOREIGN SUBCONTRACTORS	VALUE OF FOREIGN SUBCONTRACTS ($M)	VALUE OF FOREIGN SUBCONTRACTS AS A % OF TOTAL SUBCONTRACTS	VALUE OF FOREIGN SUBCONTRACTS AS A % OF PRIME CONTRACT VALUE
JSLIST	8	$35.0	62.5%	12.5%
PAC-3	25	$23.1	12.3%	6.2%
F414	4	$19.1	10.9%	4.6%
PREDATOR	5	$1.0	14.5%	3.3%
WCMD	11	$2.0	4.3%	3.2%
TACTICAL TOMAHAWK	3	$6.8	5.5%	2.8%
SFW	4	$2.9	7.8%	2.5%
GMLRS	3	$2.6	6.1%	2.3%
SLAM-ER	5	$1.0	3.3%	1.6%
ATACMS	3	$2.2	3.8%	1.5%
PAVEWAY	1	$0.7	0.4%	0.2%
JSOW	1	$0.1	0.1%	0.1%
Subtotal without JSLIST	**65**	**$61.5**	**6.6%**	**3.2%**
Total	**73**	**$96.5**	**9.8%**	**4.3%**

The aggregate value of foreign subcontracts is skewed by the inclusion of the Joint Service Lightweight Integrated Suit Technology (JSLIST) chemical protective suit. The JSLIST suit is unusual in that it is not a weapon system, nor a component of a weapon system. It is a piece of vital protective equipment; its cutting edge technology originates overseas; and the Department is bringing this cutting edge technology into the United States. The total value of program subcontracts, exclusive of JSLIST suits, awarded to foreign sources is significantly smaller ($61.5 million versus $96.5 million) -- about six percent of the total subcontract value and about three percent of the prime contract value.

Utilization of these foreign sources for these programs does not impact long-term readiness.

The use of foreign sources has not negatively impacted long-term readiness or national security. In fact the use of non-U.S. suppliers: (1) permits the Department to access state-of-the-art technologies and industrial capabilities; (2) promotes consistency and fairness in dealing with U.S. allies; (3) encourages development of interoperable weapons systems; (4) encourages development of mutually beneficial industrial linkages that enhance U.S. industry's access to global markets; and (5) exposes U.S. industry to international competition, helping to ensure that U.S. firms remain innovative and efficient.

Going forward, utilization of the identified foreign sources is not likely to impact the long-term readiness of the Armed Forces. The foreign sources are as likely to be able to meet program cost, performance, and delivery requirements as are domestic sources. Additionally, the identified foreign sources do not constitute a foreign vulnerability that poses a risk to national security. The vast majority of the foreign sources are from NATO nations or other nations with whom we have had enduring military and commercial relationships. Despite very public opposition of some of the firm's host nations to U.S. actions during operations in Afghanistan or Iraq, at no time did the foreign suppliers (including twenty German and two French suppliers) restrict the provision or sale of these components to the Department because of U.S. military operations.

Utilization of these foreign sources does not impact the economic viability of the national technology and industrial base.

The national technology and industrial base is not put at risk by the use of the foreign suppliers reflected within this study. The value of total program subcontracts, exclusive of JSLIST suits, awarded to foreign sources is very limited (about $61.5 million). The vast majority of the total contract value, in excess of 95 percent, is retained domestically. In some cases the national technology and industrial base is being enhanced as domestic capabilities are being established for several key items now procured from foreign sources.

In most cases, domestic suppliers are available for the parts, components, and materials provided by the foreign sources.

The Department identified only four instances where domestic sources were not available to compete for items subcontracted to foreign suppliers.

The Department generally does not mandate supplier selections to its contractors. The Department expects its contractors to select reliable, capable suppliers consistent with obtaining best value, encouraging effective competition, and meeting national security requirements. Although the sampled programs contained several instances of offsets and an international cooperative program (Guided Multiple Launch Rocket System),

generally, prime contractors and first and second tier suppliers indicated they selected foreign subcontractors for specific items because those subcontractors offered the best combination of price, performance, and delivery.

The results of this study are consistent with recent related studies.

An October 2001 *Study on Impact of Foreign Sourcing of Systems* (eight weapons systems, including several weapons platforms) identified a total of 86 first, second, and third tier foreign subcontractors. The value of the subcontracted effort for the programs totaled $4.07 billion; about $66 million of that amount was subcontracted to foreign sources. Collectively, foreign subcontracts represented less than two percent of the value of all subcontracts for the programs.

An August 2003 report, *Department of Defense Fiscal Year 2002 Purchases from Foreign Entities,* reported that DoD prime contract procurement actions during Fiscal Year 2002 totaled $170.8 billion. Of that amount, approximately $7.0 billion (about four percent) was for contracts with a place of performance outside the United States. Of the $7 billion dollars, about $1.6 billion (23 percent of foreign purchases and less than one percent of all procurements) was expended for military hardware. (The balance was for subsistence, fuel, construction services, and other miscellaneous items.)

1. DoD Approach

1.1. Programs

To ensure that its evaluation addressed critical parts, components, and materials in the current defense environment, The Department collected information for the specified programs based on Fiscal Year (FY) 2003 or most recent contracts as follows:

- Guided Multiple Launch Rocket System (GMLRS)
- Army Tactical Missile System (ATACMS)
- Patriot Advanced Capability (PAC3) Missile
- Tactical Tomahawk Missile
- Stand-Off Land Attack Missile - Expanded Response (SLAM-ER)
- Joint Standoff Weapon (JSOW)
- Paveway II Laser-Guided Bombs (LGB)
- Predator Unmanned Aerial Vehicle
- F414 Engine
- Sensor Fused Weapon and Wind Corrected Munition Dispenser (SFW and WCMD)
- Joint Service Lightweight Integrated Suit Technology (JSLIST) Chemical Protective Suit

1.2. Analytical Objectives

To address the study's questions, Department identified four objectives:

What is the impact of obtaining such parts, components, and materials from foreign sources on the readiness of the Armed Forces?

The Department identified the products provided by foreign sources (down to the third subtier) for each program, the name and location of the company providing them, the number of such foreign sources, and the value of the foreign-sourced products compared to the entire contract and to all subcontracts for the program.

What is the impact on military readiness that would result from the loss of the ability to obtain such parts, components, and materials from the identified foreign sources?.

For the purpose of this study, the Department evaluated "readiness" using two basic criteria: (1) the extent to which the foreign sources have met and are projected to continue to meet, delivery requirements (i.e., demonstrated "availability"); and (2) the extent to which use of the foreign source for the application constitutes a "foreign vulnerability." Foreign suppliers may represent a foreign vulnerability when they are

a sole source supplier[1], or a dominant supplier in a product area with there is a high market concentration, *combined* with political or geopolitical vulnerability. That is, a sole source supplier existing in only one physical location and vulnerable to serious political instability may not be available when needed. Additionally, a non-U.S. source may represent a foreign vulnerability when it supplies technologies and/or products that are classified, offer unique warfighting superiority, or could be used by foreign nations to develop countermeasures. However, the Department has agreements with many allied and friendly nations for safeguarding classified military information. Foreign sources would not automatically represent a foreign vulnerability if they provide classified or unique technologies or products; this must be determined by individual circumstance.[2]

The use of a foreign supplier, or even dependence on a foreign supplier, does not in and of itself impact readiness. In fact, the appropriate use of non-U.S. suppliers: (1) permits the Department to access state-of-the-art technologies and industrial capabilities; (2) promotes consistency and fairness in dealing with U.S. allies[3]; (3) encourages development of interoperable weapons systems; (4) encourages development of mutually beneficial industrial linkages that enhance U.S. industry's access to global markets; and (5) exposes U.S. industry to international competition, helping to ensure that U.S. firms remain innovative and efficient.

To evaluate the potential impact on readiness that would result from an inability to obtain required products from the foreign sources, the Department considered the likelihood of such a scenario, the extent to which the foreign supplier is a sole or single source[4], and the extent to which domestic suppliers are or could be available, if needed.

To what extent does utilization of these foreign sources impact the economic viability of the national technology and industrial base?

The Department addressed the extent to which the relevant segment of the national technology and industrial base is impacted by obtaining the specified products from foreign sources. While every order to a foreign supplier means lost business to a U.S. supplier, the Department sought to determine if such a sale significantly impacted the relevant segment of the national technology and industrial base.

[1] A *sole source* is a supplier that possesses unique equipment, processes, facilities, or technologies; and is the only source capable of producing the item. Other sources might be available with significant additional cost, time, and/or risk.
[2] "Assessing Defense Industrial Capabilities," DoD 5000.60-H, April 1996 (section 5.2).
[3] By giving evidence to non-U.S. suppliers that they have a fair opportunity to be awarded contracts and subcontracts for DoD weapons systems.
[4] A single source is a supplier that is the only source for the product, now, but other sources are or could be available if needed without significant additional cost, time, and risk.

To what extent are domestic sources available for the parts, components, and materials provided by the foreign sources?

The Department identified those domestic suppliers that are producing, or could produce, identical or similar products.[5]

1.3. Data Collection

As required by the Paperwork Reduction Act, the Department secured approval from the Office of Management and Budget (OMB) to collect the required data from industry. That approval was granted on May 28, 2003; authority expired on November 30, 2003. Industry participation in the study was voluntary. There was no statutory or contractual requirement for either domestic or foreign sources to respond to the Departments information request. DoD personnel did, however, take specific steps to explain the purpose of the study to the DoD program offices and contractors, and solicit the maximum possible cooperation. The prime contractors responded positively by providing the requested information and asking their subcontractors to do the same.

Using the authorities provided to it by OMB, the Department collected supplier information from the Military Departments and DoD program offices, prime contractors, first tier subcontractors, and second tier subcontractors. Therefore, the study identifies and evaluates foreign sources for the identified programs from the prime contractors through the third subtier.

The Appendix contains additional information on the study process.

1.4 Definitions

The following definitions apply:

- Domestic Source – a person or organization that falls within the term "national technology and industrial base" as defined in section 2500(1) of title 10, United States Code.

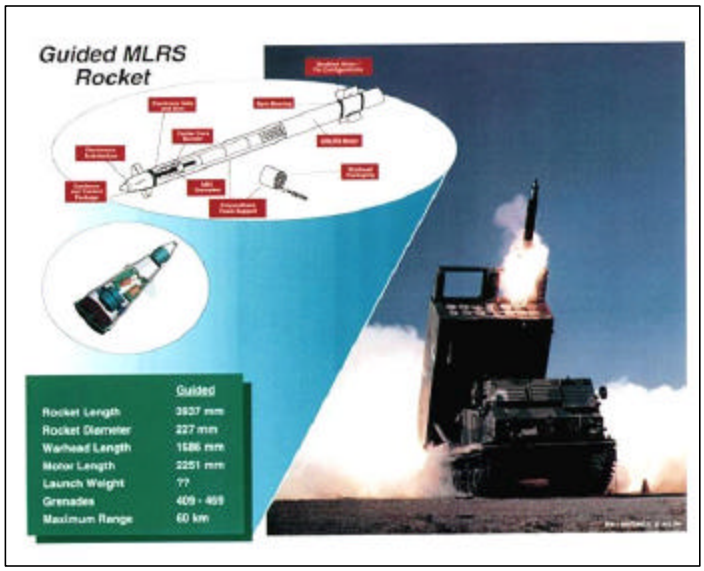
- Foreign Source – a person or organization that does not fall within the meaning of the term "national technology and industrial base" as defined in section 2500(1) of title 10, United States Code.

- National Technology and Industrial Base – persons and organizations that are engaged in research, development, production, or maintenance activities conducted within the United States and Canada (section 2500(1) of title 10, United States Code).

[5] DoD generally does not mandate supplier selections to its contractors. DoD expects its contractors to select reliable, capable suppliers consistent with obtaining best value, encouraging effective competition, and meeting national security requirements.

2. Results

2.1. Guided Multiple Launch Rocket System (GMLRS)



Lockheed-Martin Corporation produces the GMLRS at its Camden, AR facility. The GMLRS has a desired range of 60 to 70 kilometers. It has a Global Positioning System (GPS) receiver guidance package integrated with a low-cost inertial system integrated on a product-improved rocket body with small canards on the guided rocket nose to provide basic maneuverability and enhance the accuracy of the system. GMLRS completed system development and demonstration tests in December 2002 and entered low-rate initial production in 2003. Initial operating capability (IOC) is scheduled for 2005. GMLRS is an international program involving the United Kingdom, Italy, France, and Germany as well as the U.S. The industrial team includes Diehl (Germany), MBDA (France) and FiatAvio (Italy).

Extent of Foreign Sourcing

The value of the prime contract is $113.7 million. The value of subcontract effort identified for this program totaled $42.5 million. Of this amount, foreign-sourced subcontracts totaled $2.6 million (about six percent of the value of all subcontracts and about two percent of the total contract value). Respondents identified a total of 14 first tier subcontractors (two of which were foreign), five second tier subcontractors (none were foreign), and one third tier foreign subcontractor. Foreign subcontractors are from France, Germany, and New Zealand.

GMLRS Foreign Subcontractors

TIER	ITEM(S)	APPLICATION	COUNTRY
1	Thermal Batteries	Guidance and Control	France
1	Engineering Services	Airframe Substructure	Germany
3	Oscillators	Guidance	New Zealand

Availability and Foreign Vulnerability

***Availability*:** Demonstrated and projected availability is not a concern. All identified foreign subcontractors have demonstrated the ability to meet performance, schedule, and cost requirements in the past, including during the active combat phases of Operations Enduring Freedom and Iraqi Freedom. All are projected to continue to do so in the future.

***Foreign Vulnerability*:** Utilization of the identified foreign suppliers does not constitute a foreign vulnerability. Foreign suppliers are located in France, Germany, and New Zealand. Of the three foreign subcontractors identified, none were identified as a sole source. Supply disruption is not likely since the current suppliers have demonstrated reliability in the past and domestic suppliers are available should the current suppliers falter. In any event, none of the foreign-sourced items is classified or offers unique military superiority.

Impact on National Technology and Industrial Base

The economic viability of the national technology and industrial base is not endangered by use of the identified foreign sources for this program. The value of all foreign subcontracts is only $2.5 million. Additionally, five domestic suppliers (for thermal batteries, engineering services, and oscillators) are available. They are capable, competitive, and will continue to be capable of competing for this and similar business.

Availability of Domestic Sources

Although domestic suppliers are not now utilized for certain items for this program, domestic suppliers with comparable capabilities are available to produce the foreign-sourced items, given some additional qualification time and cost. Customers (prime contractors and/or first and second tier subcontractors) reported that foreign subcontractors were selected for price, performance, and/or schedule considerations.

GMLRS

TIER	ITEM(S)	Country	Domestic Suppliers?
1	Thermal Batteries	France	1
1	Engineering Services	Germany	1
3	Oscillators	New Zealand	3

2.2. Army Tactical Missile System BLK IA

The Army Tactical Missile System (ATACMS) is a surface-to-surface long-range guided solid rocket motor, semi-ballistic missile that provides near all weather, day and night, precision strike capability at ranges beyond existing cannons, rockets, and missiles. ATACMS is an evolutionary family of missiles that includes the Block I, Block IA, Block IA Unitary and the Block II. Lockheed Martin Missiles and Fire Control (LM M&FC), Grand Prairie, TX is the prime contractor. Block IA (BLK 1A) uses an improved version of the ATACMS Block I Missile Guidance Set (IMGS) to achieve the improved accuracy needed to meet BLK IA system requirements for mission accuracy. The IMGS uses an embedded GPS receiver to receive and process GPS satellite navigation signals and integrate the GPS data into the inertial guidance scheme to improve navigational accuracy. Current foreign ATACMS customers include Bahrain, Greece, South Korea, and Turkey. Exports help to offset overhead increases resulting from reductions in U.S. purchases. However, it is only with Turkey that the contractor has an industrial participation agreement for this program.

Extent of Foreign Sourcing

The value of the prime contract is $145.4 million. The value of subcontract efforts identified for this program totaled $58.2 million. Of this amount, foreign-sourced subcontracts totaled $2.2 million (about four percent of the value of all subcontracts and about one and a half percent of the total contract value). Respondents identified a total of three first tier foreign subcontractors, and no second or third tier foreign subcontractors. All foreign subcontractors are from Turkey; they were selected to satisfy offset agreements.

ATACMS Block 1A Foreign Subcontractors

TIER	ITEM(S)	APPLICATION	COUNTRY
1	Wiring Harness	Missile Guidance System	Turkey
1	Machined Sheet Metal Parts	Missile Aft Section	Turkey
1	Machined Sheet Metal Parts	Missile Guidance System	Turkey

Availability and Foreign Vulnerability

***Availability*:** Demonstrated and projected availability is not a concern. All identified foreign subcontractors have demonstrated the ability to meet performance, schedule,

and cost requirements in the past, including during the active combat phases of Operations Enduring Freedom and Iraqi Freedom. All are projected to continue to do so in the future.

***Foreign Vulnerability*:** Utilization of the identified foreign suppliers does not constitute a foreign vulnerability. All foreign suppliers are located in Turkey; none are identified as a sole source producer. Supply disruption is not likely since the current suppliers have demonstrated reliability in the past and domestic suppliers are available should the current suppliers falter. None of the foreign-sourced items is classified or offers unique military superiority.

Impact on National Technology and Industrial Base

The economic viability of the national technology and industrial base is not endangered by use of the identified foreign sources for this program. The value of all foreign subcontracts is only $2.2 million. Additionally, domestic suppliers within the electronics and machined metal parts industry segments supplying comparable products from the United States are capable, and competitive. They will continue to be capable of competing for this and similar business.

Availability of Domestic Sources

Although domestic suppliers are not now utilized for certain items for this program, domestic suppliers with comparable capabilities are available to produce the foreign-sourced items, given some additional qualification time and cost. All of the material identified below initially was produced by LM M&FC internally; and was outsourced to meet offset requirements.

ATACMS Block 1A

TIER	ITEM(S)	COUNTRY	DOMESTIC SUPPLIERS?
1	Wiring Harness	Turkey	1
1	Machined Sheet Metal Parts	Turkey	1
1	Machined Sheet Metal Parts	Turkey	1

2.3. Patriot Advanced Capability-3 (PAC-3) Missile

The PAC-3 missile is the next-generation upgrade to the existing Patriot Air Defense System. It adds advanced hit-to-kill technology to destroy tactical ballistic missiles, cruise missiles, and air breathing cruise missiles or aircraft. The PAC-3 missile's precision guidance system, featuring an active onboard radar seeker, enables complete target destruction through the kinetic energy released by directly hitting the target. LM M&FC, Grand Prairie, TX, is the prime contractor. The PAC-3 Missile segment upgrade consists of the PAC-3 Missile, missile canisters, the Fire Solution Computer and the Enhanced Launcher Electronics System. Production will take place at LM M&FC's facilities in Grand Prairie and Lufkin, TX, and the PAC-3 Missile final assembly, test, all-up-round facility in Camden, AR. PAC-3 currently is in low rate initial production and is projected to enter into full rate production in 2004. LM M&FC was awarded contracts to accelerate production of the PAC-3 and to produce an additional 12 missiles in FY03. The Department is encouraging potential foreign customers of PAC-3 to place their orders as soon as possible to help decrease per-unit price through higher annual procurement. In addition, the Medium Extended Air Defense System (MEADS) will use the PAC-3 interceptor. Germany and the Netherlands are current operators of the Patriot and could be the first to acquire the PAC-3 for their missile batteries. In addition, countries such as Egypt, Greece, Switzerland, South Korea, Taiwan, Thailand, and Japan have indicated a desire to acquire a missile interceptor.

Extent of Foreign Sourcing

The value of the prime contract is $375 million. The value of subcontract effort identified for this program totaled $187.9 million. Of this amount, foreign-sourced subcontracts totaled $23.1 million (about 12 percent of the value of all subcontracts and about six percent of the total contract value). Respondents identified a total of 37 first tier subcontractors (two of which were foreign), 42 second tier subcontractors (fifteen were foreign), and eight third tier foreign subcontractors. Foreign subcontractors are from the Netherlands, the United Kingdom, Belgium, and Germany. In the case of the launch canister and the Missile Aft Section, Dutch and German subcontractors were selected to meet offset requirements; they then selected local second and third tier suppliers.

PAC-3 Foreign Subcontractors

TIER	ITEM(S)	APPLICATION	COUNTRY
1	Machine Metal Parts & Fabrications	Launch Canister	Netherlands
1	Machine Metal Parts & Fabrications	Missile Aft Section Lethality Enhancer & Enhanced Launch Electronic System (ELES)	Germany
2	Raw Materials, Metal	Launch Canister	Netherlands
2	Metal Extrusions	Launch Canister	Belgium
2	Conductive Paint	Launch Canister	Netherlands
2	Electrical Cabling	Launch Canister	Netherlands
2	Composites	Launch Canister	United Kingdom
2	Machining & Forgings	Launch Canister	Netherlands
2	Testing	Launch Canister	Netherlands
2	Titanium Casting	Launch Canister	Belgium
2	Aluminum Castings	Launch Canister	Germany
2	Aluminum & Steel Castings	Launch Canister	Germany
2	Thermal Batteries	Missile Aft Section Lethality Enhancer & Enhanced Launch Electronic System (ELES)	Germany
2	Machine Metal Parts & Fabrications, Electrical & Electric Components	Missile Aft Section Lethality Enhancer & Enhanced Launch Electronic System (ELES)	Germany
2	Machine Metal Parts & Fabrications, Electrical & Electric Components	Missile Aft Section Lethality Enhancer & Enhanced Launch Electronic System (ELES)	Germany
2	Lethality Enhancer Assembly	Missile Aft Section Lethality Enhancer & Enhanced Launch Electronic System (ELES)	Germany
2	Steel Bars	Missile Aft Section Lethality Enhancer & Enhanced Launch Electronic System (ELES)	Netherlands
3	ELES Chassis Kit	Missile Aft Section Lethality Enhancer & Enhanced Launch Electronic System (ELES)	Germany
3	ELES Chassis Kit	Missile Aft Section Lethality Enhancer & Enhanced Launch Electronic System (ELES)	Germany

3	ELES Chassis Kit	Missile Aft Section Lethality Enhancer & Enhanced Launch Electronic System (ELES)	Germany
3	ACS Flexprints, PWB	Missile Aft Section Lethality Enhancer & Enhanced Launch Electronic System (ELES)	Germany
3	UMB Flex Harness	Missile Aft Section Lethality Enhancer & Enhanced Launch Electronic System (ELES)	Germany
3	Casting, Control Surface	Missile Aft Section Lethality Enhancer & Enhanced Launch Electronic System (ELES)	Germany
3	Metal Fabrications	Missile Aft Section Lethality Enhancer & Enhanced Launch Electronic System (ELES)	Germany
3	Stainless Steel & Alloy Bars	Launch Canister	United Kingdom

Availability and Foreign Vulnerability

***Availability*:** Demonstrated and projected availability is not a concern. All identified foreign subcontractors have demonstrated the ability to meet performance, schedule, and cost requirements in the past, including during the active combat phases of Operations Enduring Freedom and Iraqi Freedom. All are projected to continue to do so in the future.

***Foreign Vulnerability*:** Utilization of the identified foreign suppliers does not constitute a foreign vulnerability. All foreign suppliers are located in NATO countries. There are domestic sources available for similar items or alternate designs for all but one of the foreign-sourced items. The lethality enhancer assembly was identified as having a sole source German producer, with no identified domestic alternate source. Supply disruption is not likely since the current supplier has demonstrated reliability in the past. None of the foreign-sourced items is classified or offers unique military superiority.

Impact on National Technology and Industrial Base

The economic viability of the national technology and industrial base is not endangered by use of the identified foreign sources for this program. The value of all foreign subcontracts is $23.1 million. Additionally, domestic suppliers within the metal parts, thermal batteries, composites and electrical components industry segments are capable, and competitive. Except as noted below for the lethality enhancer assembly for which no domestic supplier is available, domestic firms will continue to be capable of competing for this and similar future business.

Availability of Domestic Sources

For the most part, domestic suppliers are, or could become, available to produce the foreign-sourced items, given some additional qualification time and cost. Customers (prime contractors and/or first and second tier subcontractors) reported that foreign subcontractors generally were selected for price, performance, and/or schedule considerations. As noted earlier, offset agreements were a factor in some cases. Domestic suppliers could be qualified to produce the materials identified below; however, there would significant additional qualification time and risk.

PAC-3

TIER	ITEM(S)	COUNTRY	DOMESTIC SUPPLIERS?
1	Machine Metal Parts & Fabrications	Netherlands	1
1	Machine Metal Parts & Fabrications	Germany	1
2	Raw Materials, Metal	Netherlands	Many
2	Metal Extrusions	Belgium	Many
2	Conductive Paint	Netherlands	Many
2	Electrical Cabling	Belgium	Many
2	Composites	United Kingdom	3
2	Machining & Forgings	Netherlands	Many
2	Testing	Netherlands	Many
2	Titanium Casting[6]	Netherlands	3
2	Aluminum Castings	Germany	Many
2	Aluminum & Steel Castings	Germany	Many
2	Thermal Batteries	Germany	2
2	Machine Metal Parts & Fabrications, Electrical & Electric Components	Germany	1
2	Machine Metal Parts & Fabrications, Electrical & Electric Components	Germany	1
2	Lethality Enhancer Assembly	Germany	0
2	Steel Bars[7]	Netherlands	Many
3	ELES Chassis Kit	Germany	Many

[6] Procurement of specialty metals from a non-U.S. supplier in furtherance of agreements with foreign governments in which both such governments agree to remove barriers to purchases of supplies produced in the other country is authorized by 10 USC Sec 2533a(e)(1)(b)

[7] Ibid

3	ELES Chassis Kit	Germany	Many
3	ELES Chassis Kit	Germany	Many
3	ACS Flexprints, PWB	Germany	1
3	UMB Flex Harness	Germany	1
3	Casting, Control Surface	Germany	1
3	Metal Fabrications	Germany	1
3	Stainless Steel & Alloy Bars	United Kingdom	1

2.4. Tactical Tomahawk Missile

Tomahawk, a surface and submarine-launched standoff weapon, is the Navy's weapon of choice for critical, long-range precision strike missions. The Tactical Tomahawk Missile (TTM) is the Navy's next-generation tactical cruise missile. It is in low rate initial production. TTM will incorporate innovative technologies to provide new operational capabilities while reducing acquisition and life-cycle costs. The TTM will be equipped with jam-resistant GPS receivers, an Inertial Navigation System, and a Digital Scene Matching Area Correlator. The missile is outfitted with a data link to allow it to loiter over the battlefield and be retargeted in flight. This capability will enable the Tactical Tomahawk to respond to emerging targets as a battlefield situation evolves. The missile also will be able to provide battle damage assessments via its onboard video camera. Scheduled for fleet introduction in 2004, a single version of the Tactical Tomahawk is in development. Additional versions, plus various performance enhancement packages for existing missiles, may be produced later. Raytheon Missile Systems Co., Tucson, AZ, is the prime contractor where the design, development, engineering, assembly, integration and test will be completed. Final assembly, ordnance and rocket motor loading, final checkout and test will take place in Raytheon's Camden, AR facility. TTM exports likely will be limited.

Extent of Foreign Sourcing

The value of the prime contract is $244 million. The value of subcontract effort identified for this program totaled $123.6 million. Of this amount, foreign-sourced subcontracts totaled $6.8 million (about six percent of the value of all subcontracts and about three percent of the total contract value). Respondents identified a total of 25 first tier subcontractors (one of which was foreign), 44 second tier subcontractors (two were foreign), and no third tier foreign subcontractors. Foreign subcontractors are from the United Kingdom and Italy.

Tactical Tomahawk Foreign Subcontractors

TIER	ITEM(S)	APPLICATION	COUNTRY
1	Circuit Card Assemblies Power Filter Unit Secondary Power Unit AC / DC Converter	Missile Guidance & Control	United Kingdom
2	Ball screw	Guidance & Control	Italy
2	Cooler Control Card Power Assembly Video Assembly Sensor Control Card	Guidance & Control	United Kingdom

Availability and Foreign Vulnerability

***Availability*:** Demonstrated and projected availability is not a concern. Identified foreign subcontractors have demonstrated the ability to meet performance, schedule, and cost requirements in the past including during the active combat phases of Operations Enduring Freedom and Iraqi Freedom. All are projected to continue to do so in the future.

***Foreign Vulnerability*:** Utilization of the identified foreign suppliers does not constitute a foreign vulnerability. Foreign suppliers are located in the United Kingdom and Italy. Of the three foreign subcontractors identified, none were identified as a sole source. Supply disruption is not likely since the current suppliers have demonstrated reliability in the past and domestic suppliers are available should the current suppliers falter. In any event, none of the foreign-sourced items is classified or offers unique military superiority.

Impact on National Technology and Industrial Base

The economic viability of the national technology and industrial base is not endangered by use of the identified foreign sources for this program. The value of all foreign subcontracts is only $6.8 million. Domestic suppliers within the electronics and machined parts industry segments are capable and competitive. They will continue to be capable of competing for this and similar business.

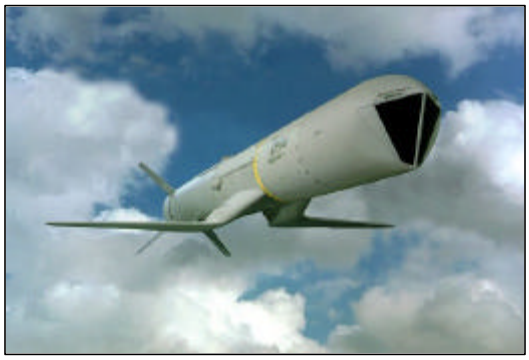
Availability of Domestic Sources

Although domestic suppliers are not now utilized for certain items for this program, domestic suppliers with comparable capabilities are available to produce the foreign-sourced items, given some additional qualification time and cost. Customers (prime contractors and/or first and second tier subcontractors) reported that foreign subcontractors were selected for price, performance, and/or schedule considerations.

Tactical Tomahawk

TIER	ITEM(S)	COUNTRY	DOMESTIC SUPPLIERS?
1	Circuit Card Assembly Power Filter Unit Secondary Power Unit AC / DC Converter	United Kingdom	3
2	Ball screw	Italy	1
2	Cooler Control Card Power Assembly Video Assembly Sensor Control Card	United Kingdom	3

2.5. Stand-Off Land Attack Missile, Expanded Response (SLAM-ER)



Stand-Off Land Attack Missile, Expanded Response (SLAM-ER) was developed in 1994, and entered full-scale production in May 2000. SLAM-ER is a variant of the baseline SLAM, a derivative of the Harpoon Missile. The SLAM-ER is designed to perform the same operations as the baseline SLAM with improved features such as an enhanced warhead, better range, an advanced data line and target opportunity mode, a jam-resistant five-channel GPS navigation capability, and improved terminal sensors with improved real-time target designation. SLAM-ER contains an Automatic Target Acquisition capability; earlier SLAM missiles are being retrofitted with that capability. SLAM-ER addresses the Navy's requirements for a precision-guided "standoff outside of area defense" weapon and extends the weapon system's combat effectiveness, providing an effective, long range, precision strike option for both pre-planned and target of opportunity attack missions against land and ship targets. The McDonnell Douglas Corp., a wholly owned subsidiary of the Boeing Co., St. Louis, MO, is the prime contractor and is currently under contract with the U.S. Navy to produce 197 SLAM-ERs. Production expected to continue beyond 2005. While the Harpoon missile has been exported to over 20 countries worldwide, SLAM-ER received its first foreign order from South Korea for 49 missiles in 2003. Canada**,** Australia, the United Kingdom, and Taiwan have indicated an interest in procuring the SLAM-ER.

Extent of Foreign Sourcing

The value of the prime contract is $61.6 million. The value of subcontract effort identified for this program totaled $30 million. Of this amount, foreign-sourced subcontracts totaled $1 million (about three percent of the value of all subcontracts and less than two percent of the total contract value). Respondents identified a total of sixteen first tier subcontractors (one of which was foreign), twenty second tier subcontractors (four were foreign), and no third tier foreign subcontractors. All foreign subcontractors are from the United Kingdom.

SLAM-ER Foreign Subcontractors

TIER	ITEM(S)	APPLICATION	COUNTRY
1	Wing Assemblies	Guidance & Control	United Kingdom
2	Forming of Wing Skins	Guidance & Control	United Kingdom
2	Bonding of Wings	Guidance & Control	United Kingdom
2	Fasteners	Guidance & Control	United Kingdom
2	Wing Skin	Guidance & Control	United Kingdom

Availability and Foreign Vulnerability

Availability: Demonstrated and projected availability is not a concern. All identified foreign subcontractors have demonstrated the ability to meet performance, schedule, and cost requirements in the past including during the active combat phases of Operations Enduring Freedom and Iraqi Freedom. All are projected to continue to do so in the future.

Foreign Vulnerability**:** Utilization of the identified foreign suppliers does not constitute a foreign vulnerability. All foreign suppliers are located in the United Kingdom. Of the 5 foreign subcontractors identified, none were identified as a sole source. Supply disruption is not likely since the current suppliers have demonstrated reliability in the past and multiple domestic suppliers are available should the current suppliers falter. In any event, none of the foreign-sourced items is classified or offers unique military superiority.

Impact on National Technology and Industrial Base

The economic viability of the national technology and industrial base is not endangered by use of the identified foreign sources for this program. The value of all foreign subcontracts is only $1 million. Additionally, domestic suppliers within the airframe former and aluminum industry segments are capable and competitive. Domestic firms will continue to be capable of competing for this and similar business.

Availability of Domestic Sources

Although domestic suppliers are not now utilized for certain items for this program, multiple domestic suppliers with comparable capabilities are available to produce the foreign-sourced items, given some additional qualification time and cost. Customers (prime contractors and/or first and second tier subcontractors) reported that foreign subcontractors were selected for price, performance, and/or schedule considerations.

SLAM-ER

TIER	ITEM(S)	COUNTRY	DOMESTIC SUPPLIERS?
1	Wing Assemblies	United Kingdom	Many
2	Forming of Wing Skins	United Kingdom	Many
2	Bonding of Wings	United Kingdom	Many
2	Fasteners	United Kingdom	Many
2	Wing Skin	United Kingdom	Many

2.6. Joint Standoff Weapon (JSOW)

The AGM-154A Joint Standoff Weapon (JSOW) is under development by Raytheon for the Air Force and the Navy. The JSOW is intended to provide a low cost, highly lethal glide weapon with a standoff capability. The JSOW family of kinematically efficient, air-to-surface glide weapons provides standoff capabilities from 15 nautical miles (low altitude launch) to 40 nautical miles (high altitude launch). The JSOW-A will be used against a variety of land and sea targets and will operate from ranges outside enemy point defenses. The JSOW-A is a launch and leave weapon that employs a tightly coupled GPS/Inertial Navigation System (INS), and is capable of day/night and adverse weather operations. The JSOW-A is not exported, currently.

Extent of Foreign Sourcing

The value of the prime contract is $85 million. The value of subcontract effort identified for this program totaled $40.8 million. Of this amount, foreign-sourced subcontracts totaled $54,000 (less than one percent of the value of all subcontracts and less than one tenth of one percent of the contract value). Respondents identified no first tier foreign subcontractors, 22 second tier subcontractors (one was foreign), and no third tier foreign subcontractors. The one foreign subcontractor is from Italy. It was selected to meet offset agreements.

Joint Standoff Weapon Foreign Subcontractors

TIER	ITEM(S)	APPLICATION	COUNTRY
2	Ball screw	Missile Actuator and Control	Italy

Availability and Foreign Vulnerability

Availability: Demonstrated and projected availability is not a concern. The identified foreign subcontractor has demonstrated the ability to meet performance, schedule, and cost requirements in the past including during the active combat phases of Operations Enduring Freedom and Iraqi Freedom. It is projected to continue to do so in the future.

***Foreign Vulnerability*:** Utilization of the identified foreign supplier does not constitute a foreign vulnerability. The foreign supplier is located in Italy and is not a sole source. Supply disruption is not likely since the current supplier has demonstrated reliability in the past, and a domestic supplier is available should the current supplier falter. In any event, the foreign-sourced item is not classified nor does it offer unique military superiority.

Impact on National Technology and Industrial Base

The economic viability of the national technology and industrial base is not endangered by use of the identified foreign source for this program. The value of the foreign subcontract is only $54,000. Additionally, domestic suppliers are capable and competitive. Domestic firms will continue to be capable of competing for this and similar business.

Availability of Domestic Sources

A domestic supplier is available to produce the ball screw given some additional qualification time and cost.

Joint Standoff Weapon

TIER	ITEM(S)	COUNTRY	DOMESTIC SUPPLIERS?
2	Ball screw	Italy	1

2.7. Paveway II Laser-Guided Bombs (LGBs)

Paveway II Laser Guided Bombs (LGBs) are unpowered precision guided munitions based on a series of low-drag, general-purpose unguided bombs (GBUs) converted to tactically effective munitions. LGB Paveway kits consist of a Computer Control Group (CCG), a front-end guidance system, and an Air Foil Group (AFG) that includes the flight stability fins for the aft end of the bomb. Paveway II's semi-active laser guided munitions home on reflected energy directed on the target; and feature accuracy, reliability and cost effectiveness. The variants of the Paveway II LGBs are GBU-10 (Mk 84 2000 lb.), GBU-12 (Mk 82 500 lb.), and GBU-16 (Mk 83 1,000 lb.) bombs. Since 1975 and until 2001, Raytheon Missile Systems Company (RMSC) had been the sole source for Paveway II kits. RMSC manufactures the CCG kits in Tucson, AZ and the AFG kits in McKinney, TX. The U.S. Navy and Air Force are reaping the benefits of a lower price for Paveway II kits since Lockheed Martin, Archbald, PA became a second source in 2001. Twenty-two other nations have acquired one or more versions of the Paveway.

Extent of Foreign Sourcing

The values of the prime contracts are $302.5 million. The value of subcontract effort identified for this program totaled $181.4 million. Of this amount, foreign-sourced subcontracts totaled $700,000 (less than one-half of one percent of the value of all subcontracts and less than one quarter of one percent of the total contract value). Respondents identified a total of 53 first tier subcontractors (none of which was foreign), 64 second tier subcontractors (none were foreign), and one third tier foreign subcontractor. The sole foreign subcontractor is from Germany.

Laser-Guided Bombs (LGB) Foreign Subcontractors

Tier	Item(s)	Application	Country
3	Aluminum Tubing	Aft Casting	Germany

Availability and Foreign Vulnerability

***Availability*:** Demonstrated and projected availability is not a concern. The foreign subcontractor has demonstrated the ability to meet performance, schedule, and cost requirements in the past, including during the active combat phases of Operations Enduring Freedom and Iraqi Freedom and is projected to continue to do so in the future.

***Foreign Vulnerability*:** Utilization of the identified foreign supplier does not constitute a foreign vulnerability. The foreign supplier is located in Germany. Supply disruption is not likely since it has demonstrated reliability in the past and a domestic supplier is available should the current supplier falter. In any event, the foreign-sourced item is not classified nor does it offer unique military superiority.

Impact on National Technology and Industrial Base

The economic viability of the national technology and industrial base is not endangered by use of the identified foreign source for this program. The value of the foreign subcontract is only $700,000. Additionally, domestic suppliers within the processed aluminum industry segment are capable and competitive; and will continue to be capable of competing for this and similar business.

Availability of Domestic Sources

A domestic supplier is available to produce the foreign-sourced item, given some additional qualification time and cost. The second tier subcontractor reported that it selected a foreign subcontractor for price, performance, and/or schedule considerations.

Paveway II

TIER	ITEM(S)	COUNTRY	DOMESTIC SUPPLIERS?
3	Aluminum Tubing	Germany	1

2.8. Predator Unmanned Aerial Vehicle

General Atomics Aeronautical Systems is the prime contractor for the Predator Unmanned Aerial Vehicle (UAV) for the U.S. Air Force and the Italian Air Force. Predator is a semi-autonomous, retaskable, unmanned aerial vehicle reconnaissance system providing reconnaissance, surveillance, target acquisition and direct strike capability to theater commanders. Flying at medium altitudes (15-20K ft), Predator has endurance in excess of 24 hours and can provide real-time full motion video, synthetic aperture radar, and limited laser designation for precision guided munitions. Some Predators, and all Predators currently in production, can carry two Hellfire laser-guided missiles for ground attack. Predator has supported numerous operational deployments to EUCOM and CENTCOM. During the height of fighting in Operations Iraqi Freedom, four Predators were airborne at the same time, a first, with command and control for most Predators being maintained by units located in the CONUS.

Extent of Foreign Sourcing

The value of the prime contract is $30.6 million. The value of subcontract effort identified for this program totaled $7.1 million. Of this amount, foreign-sourced subcontracts totaled $1.1 million (about 15 percent of the value of all subcontracts and less than 4 percent of the value of the prime contract). Respondents identified a total of 29 first tier subcontractors (3 of which were foreign), nine second tier subcontractors (2 were foreign), and no third tier foreign subcontractors. Foreign subcontractors are from Belgium, Austria, the United Kingdom, Switzerland, and Japan.

Predator Foreign Subcontractors

TIER	ITEM(S)	APPLICATION	COUNTRY
1	Heads up Display System	Ground Control Station	Belgium
1	Rotax Engine	Engine	Austria
1	CRU and PMC Computer Boards	Vehicle Avionics	United Kingdom
2	SATCOM Data Terminals	Ground Station and Air Vehicle	Switzerland
2	VCR and Hi-8mm	Ground Station and Air Vehicle	Japan

Availability and Foreign Vulnerability

***Availability*:** Demonstrated and projected availability is not a concern. All identified foreign subcontractors have demonstrated the ability to meet performance, schedule, and cost requirements in the past, including during the active combat phases of

Operations Enduring Freedom and Iraqi Freedom. All are projected to continue to do so in the future.

***Foreign Vulnerability*:** Utilization of the identified foreign suppliers does not constitute a foreign vulnerability. Foreign suppliers are located in Belgium, Austria, the United Kingdom, Switzerland, and Japan. Of the five foreign subcontractors identified, none were identified as a sole source. Supply disruption is not likely since the current suppliers have demonstrated reliability in the past and multiple domestic suppliers are available should the current suppliers falter. In any event, none of the foreign-sourced items is classified or offers unique military superiority.

Impact on National Technology and Industrial Base

The economic viability of the national technology and industrial base is not endangered by use of the identified foreign sources for this program. The value of all foreign subcontracts is only $7.1 million. Domestic electronics, engine, and avionics suppliers are capable, competitive, and will continue to be capable of competing for this and similar business.

Availability of Domestic Sources

Although domestic suppliers are not now utilized for certain items for this program, multiple domestic suppliers with comparable capabilities are available to produce the foreign-sourced items, given some additional qualification time and cost. The satellite communication (SATCOM) data terminals are commercial-off-the-shelf (COTS) hardware and the Swiss vendor was chosen due to the technical capability of its product. Customers (prime contractors and first tier subcontractors) reported that foreign subcontractors were selected for price, performance, and/or schedule considerations.

Predator

TIER	ITEM(S)	COUNTRY	DOMESTIC SUPPLIERS?
1	Heads up Display System	Belgium	Many
1	Rotax Engine	Austria	Many
1	CRU and PMC Computer Boards	United Kingdom	Many
2	SATCOM Data Terminals	Switzerland	Many
2	VCR and Hi-8mm	Japan	Many

2.9. F414 Engine

The F414-GE-400 engine, is produced by General Electric for the Boeing F/A-18E/F Super Hornet. The engine has been in production since late 1998 and production is planned to continue through 2012. The F414 delivers 35 percent more thrust than the original F404, significantly improving the Boeing F/A-18 E/F Super Hornet's range, payload and survivability. Advanced technology features such as a Full Authority Digital Electronic Control (FADEC) improve operational characteristics of the engine while the use of the latest materials and cooling techniques allow for higher temperatures and pressures without sacrificing component life. To date over 262 engines (at about $3.85 million each) have been delivered for U.S. Navy applications. The European Aeronautic Defense and Space Company (EADS), headquartered in the Netherlands, has chosen the F414 to power its Mako advanced trainer. The Mako aircraft still is under development and there are no customers for it at this time.

Extent of Foreign Sourcing

The value of the prime contract is $415 million. The value of subcontract effort identified for this program totaled $175.2 million. Of this amount, foreign-sourced subcontracts totaled $19.1 million (about 11 percent of the value of all subcontracts and about five percent of the total contract value). Respondents identified a total of 78 first tier subcontractors (two of which were foreign), 125 second tier subcontractors (two were foreign), and no third tier foreign subcontractors. Foreign subcontractors are from the Russian Federation, Singapore, Spain, and Sweden.

F414 Engine Foreign Subcontractors

TIER	ITEM(S)	APPLICATION	COUNTRY
1	Fan Case	F414-GE-400 Gas Turbine Engine	Spain
1	Mid-frame Compressor Case Assembly Stage 1 Fan Disc	F414-GE-400 Gas Turbine Engine	Sweden
2	Frame Body Titanium	F414-GE-400 Gas Turbine Engine	Russian Federation
2	Body Assembly Valve	F414-GE-400 Gas Turbine Engine	Singapore

Availability and Foreign Vulnerability

***Availability*:** Demonstrated and projected availability is not a concern. All identified foreign subcontractors have demonstrated the ability to meet performance, schedule, and cost requirements in the past, including during the active combat phases of Operations Enduring Freedom and Iraqi Freedom. All are projected to continue to do so in the future.

***Foreign Vulnerability*:** Utilization of the identified foreign suppliers does not constitute a foreign vulnerability. Foreign suppliers are located in Spain, the Russian Federation, Sweden, and Singapore. Of the four foreign subcontractors (one supplier provides three items) identified, none were identified as a sole source. Supply disruption is not likely since the current suppliers have demonstrated reliability in the past and additional qualified domestic suppliers are available should the current suppliers falter. None of the foreign-sourced items is classified or offers unique military superiority.

Impact on National Technology and Industrial Base

The economic viability of the national technology and industrial base is not endangered by use of the identified foreign sources for this program. The value of all foreign subcontracts is only $19 million. The value of specialty metals that originate from a non-U.S. source is only $14,076 (less than one ten-thousandth of one percent of the total contract value). Domestic machined parts and specialty metal suppliers are capable and competitive. Domestic firms will continue to be capable of competing for this and similar business.

Availability of Domestic Sources

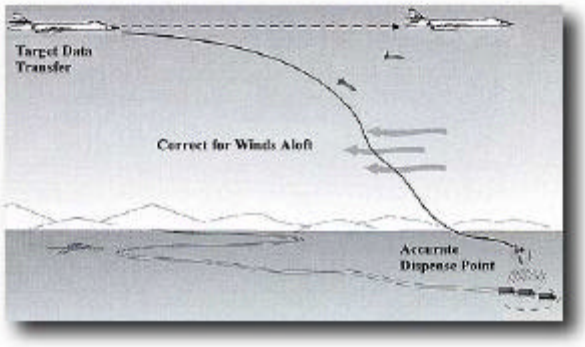
Although domestic suppliers are not now utilized for certain items for this program, domestic suppliers with comparable capabilities are available to produce the foreign-sourced items, given some additional qualification time and cost. Customers (prime contractors and/or first and second tier subcontractors) reported that foreign subcontractors were selected for price, performance, and/or schedule considerations.

F414 Engine

TIER	ITEM(S)	COUNTRY	DOMESTIC SUPPLIERS?
1	Fan Case	Spain	1
1	Mid-frame	Sweden	1
1	Compressor Case Assembly	Sweden	1
1	Stage 1 Fan Disc	Sweden	1
2	Frame Body Titanium[8]	Russian Federation	2
2	Body Assembly Valve	Singapore	1

[8] The Defense Logistics Agency (then the parent of the now Defense Contract Management Agency), authorized the use of a non-domestic source for titanium on the F414 program in 1996. It allowed a deviation from the Defense Federal Acquisition Regulation Supplement Specialty Metal Clause, as part of a Single Process Initiative. The Single Process Initiative focused on the use of common processes and performance specifications on Department of Defense contracts, aligning DoD programs and facilitating civil-military integration. It consolidated or eliminated multiple processes, specifications and standards in all contracts on a facility-wide basis.

2.10. Sensor Fuzed Weapon/Wind Corrected Munitions Dispenser



The Wind Corrected Munitions Dispenser (WCMD) is an inexpensive tail kit that inertially steers the CBU-97 Sensor Fuzed Weapon (SFW) from a known release point to precise target coordinates while compensating for launch transients, winds aloft, surface winds, and adverse weather. This allows medium/high altitude weapons employment to provide fighter and bomber aircraft a sanctuary against short range surface-to-air missiles and anti-aircraft artillery fire. As of 2003, Textron Systems, Wilmington, MA, has produced a total of 2,828 SFWs. Production for this system is expected to continue throughout 2009. Although interest in this system is growing overseas, especially in Europe, Textron Systems has not yet received any foreign production orders. Lockheed Martin Integrated Systems (LMIS), Orlando, FL is the prime contractor responsible for the WCMD and is in full rate production. Foreign countries that may purchase the WCMD kits include Israel and the Netherlands (users of the CBU-89/B) and Egypt and Turkey (users of the CBU-87).

2.10.1. Sensor Fuzed Weapon

Extent of Foreign Sourcing

The value of the prime contract is $115 million. The value of subcontract effort identified for this program totaled $37.2 million. Of this amount, foreign-sourced subcontracts totaled $2.9 million (about eight percent of the value of all subcontracts and about two and one half percent of the total contract value). Respondents identified a total of 25 first tier subcontractors (one of which was foreign), 27 second tier subcontractors (three were foreign), and no third tier foreign subcontractors. Three of the foreign subcontractors are from Israel, and one is from Malaysia.

SFW Foreign Subcontractors

Tier	Item(s)	Application	Country
1	Thermal Battery	Guidance & Control	Israel
2	X-ray Tests	Thermal Battery (Guidance & Control)	Israel
2	Discs/pellets cutting	Thermal Battery (Guidance & Control)	Israel
2	Semiconductor Package, Single Outline Integrated Circuit Form,	Thermal Battery (Guidance & Control)	Malaysia

Availability and Foreign Vulnerability

***Availability*:** Demonstrated and projected availability is not a concern. All identified foreign subcontractors have demonstrated the ability to meet performance, schedule, and cost requirements in the past, including during the active combat phases of Operations Enduring Freedom and Iraqi Freedom. All are projected to continue to do so in the future.

***Foreign Vulnerability*:** Utilization of the identified foreign suppliers does not constitute a foreign vulnerability. Of the subcontracts identified, only the thermal battery was identified as a sole source. Supply disruption is not likely since the current suppliers have demonstrated reliability in the past and additional suppliers are available should the current suppliers falter. In any event, none of the foreign-sourced items is classified or offers unique military superiority.

Impact on National Technology and Industrial Base

The economic viability of the national technology and industrial base is not endangered by use of the identified foreign sources for this program. The value of all foreign subcontracts is only $2.9 million. Although not producing the thermal battery for this specific application, a domestic thermal battery supplier is capable, competitive, and innovative. The firm will continue to be capable of competing for this and similar business.

Availability of Domestic Sources

Except for the thermal battery, multiple domestic suppliers are, or could become, available to produce the foreign-sourced items, given some additional qualification time and cost. Customers (prime contractors and/or first and second tier subcontractors) reported that foreign subcontractors were selected for price, performance, and/or schedule considerations.

SFW

TIER	ITEM(S)	COUNTRY	DOMESTIC SUPPLIERS?
1	Thermal Battery	Israel	2
2	X-ray Tests	Israel	Many
2	Discs/pellets cutting	Israel	Many
2	Semiconductor Package, Single Outline Integrated Circuit Form,	Israel	Many

2.10.2. Wind Corrected Munitions Dispenser

Extent of Foreign Sourcing

The value of the prime contract is $63.8 million. The value of subcontract effort identified for this program totaled $46.8 million. Of this amount, foreign-sourced subcontracts totaled $2 million (about four percent of the value of all subcontracts and about three percent of the total contract value). Respondents identified a total of 15 first tier subcontractors (1 of which was foreign), 45 second tier subcontractors (nine were foreign), and one third tier foreign subcontractor. Foreign subcontractors are from Israel, France, and the United Kingdom.

WCMD Foreign Subcontractors

TIER	ITEM(S)	APPLICATION	COUNTRY
1	Thermal Batteries	Guidance & Control	Israel
2	Battery Cover	Thermal Battery	Israel
2	Battery Case	Thermal Battery	Israel
2	Electrical Wiring	Thermal Battery	Israel
2	X-Ray Testing	Thermal Battery	Israel
2	Discs / Pellet Cutting	Thermal Battery	Israel
2	Battery Header	Thermal Battery	Israel
2	Insulation Sleeve	Thermal Battery	United Kingdom
2	Battery Cover	Thermal Battery	United Kingdom
2	Electric Match	Thermal Battery	France
3	Gold Ring	IMU	United Kingdom

Availability and Foreign Vulnerability

***Availability*:** Demonstrated and projected availability is not a concern. All identified foreign subcontractors have demonstrated the ability to meet performance, schedule, and cost requirements in the past, including during the active combat phases of Operations Enduring Freedom and Iraqi Freedom. All are projected to continue to do so in the future.

***Foreign Vulnerability*:** Utilization of the identified foreign suppliers does not constitute a foreign vulnerability. Foreign suppliers are located in Israel, France, and the United Kingdom. Of the 11 foreign subcontractors identified, only one (the electric match supplier) was identified as a sole source. Supply disruption is not likely since the

current suppliers have demonstrated reliability in the past and additional suppliers are available should the current suppliers falter. In any event, none of the foreign-sourced items is classified or offers unique military superiority.

Impact on National Technology and Industrial Base

The economic viability of the national technology and industrial base is not endangered by use of the identified foreign sources for this program. The value of all foreign subcontracts is only $4.9 million. Additionally, the suppliers of comparable products are capable, competitive, and innovative. Except as noted below for the electric match for which no domestic supplier is available, these domestic firms will continue to be capable of competing for this and similar business.

Availability of Domestic Sources

Except for the electric match, domestic suppliers are, or could become, available to produce the foreign-sourced items, given some additional qualification time and cost. Customers (prime contractors and/or first and second tier subcontractors) reported that foreign subcontractors were selected for price, performance, and/or schedule considerations.

WCMD

TIER	ITEM(S)	COUNTRY	DOMESTIC SUPPLIERS?
1	Thermal Batteries	Israel	2
2	Battery Cover	Israel	Many
2	Battery Case	Israel	Many
2	Electrical Wiring	Israel	Many
2	X-Ray Testing	Israel	Many
2	Discs / Pellet Cutting	Israel	Many
2	Battery Header	Israel	Many
2	Insulation Sleeve	United Kingdom	Many
2	Battery Cover	United Kingdom	Many
2	Electric Match	France	0
3	Gold Ring	United Kingdom	1

2.11. Joint Service Lightweight Integrated Suit Technology (JSLIST) Chemical Protective Suit

The Joint Service Lightweight Suit Technology (JSLIST) chemical protective suit is a two-piece jacket and trouser design with an integrated hood compatible with respective Service masks and other items of chemical protective equipment. The JSLIST garment offers a number of advantages over the current chemical protection overgarment. It features state-of-the-art chemical protective lining technology which provides increased chemical protection while allowing more mobility for the wearer. It provides 24-hour protection against chemical agents through 45 days of wear and 6 launderings. There are four JSLIST prime contractors under the overall umbrella of the National Institute for the Severely Handicapped (NISH) (Southeastern Kentucky Rehabilitation Institute, Group Home Foundation, Peckham Vocational Industries, Inc., and National Center for the Employment of the Disabled)). They receive 100 percent of JSLIST requirements and grant a small annual purchase exception to a fifth supplier, Creative Apparel.

Extent of Foreign Sourcing

The total value of the prime contracts is $280.2 million. The value of subcontract effort identified for this program totaled $56 million. Of this amount, foreign-sourced subcontracts totaled $35 million (about 63 percent of the value of all subcontracts and about 20 percent of the total contract value). Respondents identified a total of 21 first tier subcontractors (none of which was foreign), nine second tier subcontractors (one was foreign), and seven third tier foreign subcontractors. Foreign subcontractors are from the United Kingdom, Germany, Austria, Finland, and Japan.

JSLIST Foreign Subcontractors

TIER	ITEM(S)	APPLICATION	COUNTRY
2	JSLIST Filter Liner Fabric	Shell Fabric Liner Fabric	Germany
3	Copper & Zinc Plate Strip	Eyelets & Washers	UK
3	Copper & Zinc Plate Strip	Eyelets & Washers	Finland
3	Polyester Tricot Fabric	Liner Fabric	Germany
3	Adhesive	Liner Fabric	Germany
3	BAC (Beads Activated Carbon)	Liner Fabric	Japan
3	Polyester Non woven Fabric	Liner Fabric	Austria
3	Polyester Non woven Fabric	Liner Fabric	Germany

Availability and Foreign Vulnerability

Availability: Demonstrated and projected availability is not a concern for any material except for the BAC (beads activated carbon). All identified foreign subcontractors have demonstrated the ability to meet performance, schedule, and cost requirements in the past. All foreign suppliers, including the BAC manufacturer, met or exceeded program requirements in all previous years, including the unexpectedly high levels of demand that began prior to Operation Iraqi Freedom. Collectively the JSLIST suppliers surged production from 70,000 suits per month to 128,000 suits per month for Operation Iraqi Freedom. However, with its present production capacity, the Japanese manufacturer has limited ability to sustain a long-term production at the extraordinarily high levels of demand experienced in 2003. As a result, supplies of BAC are lower than desired for late FY03 - early FY04. The National Center for the Employment of the Disabled (NCED) recently notified the Department that there will be a 50 percent production shortage as the Japanese BAC manufacturer for the fabric liner works off a backlog of orders that it did not fill as it serviced the U.S. demand prior to and during Operation Iraqi Freedom. In response to the carbon bead constraint, the German fabric maker has decided to build a carbon bead production facility in the United States and has begun work on site selection. The fabric manufacturer estimates that it will cost an estimated $50 million and 24 months time to establish a carbon bead production facility in the United States. Finally, the German fabric maker has established a production facility for the JLIST filter liner fabric in Eastport, ME.

***Foreign Vulnerability*:** Utilization of the identified foreign suppliers does not constitute a foreign vulnerability. All foreign suppliers are located in Japan, Austria, Germany, the United Kingdom, and Finland, and performed superbly during recent operations in Iraq. Of the six foreign subcontractors identified, only two (the BAC and adhesive suppliers) were identified as a sole source. Supply disruption is not likely for any material except carbon beads since the current suppliers have demonstrated reliability in the past and domestic suppliers are available (except for the BAC and adhesive) should the current suppliers falter. As noted above, the German fabric maker has decided to build a carbon bead production facility in the United States. Although none of these items are classified, the unique carbon bead and liner material do offer U.S. troops unparalleled protection against chemical and biological agents.

Impact on National Technology and Industrial Base

The economic viability of the national technology and industrial base is not endangered by use of the identified foreign sources for this program. Although the value of all foreign subcontracts is $35 million (of $280.2 million), that unusually high value is driven by the need to use a patented non-U.S. technology to protect U.S. troops. Although the process remains proprietary, the German fabric maker has established a production facility for JSLIST Filter Liner Fabric, and is planning a BAC facility in the United States.

Availability of Domestic Sources

For the most part, domestic suppliers could become available to produce the foreign-sourced items, given the acquisition of intellectual property, additional qualification time and cost. In fact, a U.S. capacity has been established for the liner fabric and is being established for the carbon beads.

JSLIST

TIER	ITEM(S)	COUNTRY	DOMESTIC SUPPLIERS?
2	JSLIST Filter Liner Fabric	Germany	1
3	Copper & Zinc Plate Strip	United Kingdom	Many
3	Polyester Tricot Fabric	Germany	Unknown
3	Adhesive	Germany	0
3	BAC (Beads Activated Carbon)	Japan	0
3	Polyester Non woven Fabric	Austria	Unknown
3	Copper & Zinc Plate Strip	Finland	Many

3. Conclusions

Foreign sources provide limited amounts of materiel for the identified programs.

For the programs evaluated, the Department identified a total of 73 first, second, and third tier foreign subcontractors. The total value of the prime contracts totaled $2.23 billion. The total value of the subcontracted effort for the programs totaled $986 million. About $96 million of that amount was subcontracted to foreign sources. Collectively, foreign subcontracts represent about four percent of the total contract value and less than ten percent of the value of all subcontracts for these programs.

The aggregate value of foreign subcontracts is skewed by the inclusion of the Joint Service Lightweight Integrated Suit Technology (JSLIST) chemical protective suit. The JSLIST suit is unusual in that it is not a weapon system, nor a component of a weapon system. It is a piece of vital protective equipment; its cutting edge technology originates overseas; and the Department is bringing this cutting edge technology into the United States. The value of total program subcontracts, exclusive of JSLIST suits, awarded to foreign sources is significantly smaller ($61.5 million versus $96.5 million) -- about six percent of the total subcontract value and about three percent of the prime contract value.

PROGRAM	# FOREIGN SUBCONTRACTORS	VALUE OF FOREIGN SUBCONTRACTS ($M)	VALUE OF FOREIGN SUBCONTRACTS AS A % OF TOTAL SUBCONTRACTS	VALUE OF FOREIGN SUBCONTRACTS AS A % OF PRIME CONTRACT VALUE
JSLIST	8	$35.0	62.5%	12.5%
PAC-3	25	$23.1	12.3%	6.2%
F414	4	$19.1	10.9%	4.6%
PREDATOR	5	$1.0	14.5%	3.3%
WCMD	11	$2.0	4.3%	3.2%
TACTICAL TOMAHAWK	3	$6.8	5.5%	2.8%
SFW	4	$2.9	7.8%	2.5%
GMLRS	3	$2.6	6.1%	2.3%
SLAM-ER	5	$1.0	3.3%	1.6%
ATACMS	3	$2.2	3.8%	1.5%
PAVEWAY	1	$0.7	0.4%	0.2%
JSOW	1	$0.1	0.1%	0.1%
Subtotal without JSLIST	**65**	**$61.5**	**6.6%**	**3.2%**
Total	**73**	**$96.5**	**9.8%**	**4.3%**

Utilizing these foreign sources for these programs does not impact long-term readiness.

In general, the use of foreign sources, in and of itself, does not negatively impact national security. In fact, appropriate use of non-U.S. suppliers: (1) promotes consistency and fairness in dealing with U.S. allies[9]; (2) permits DoD to access state-of-the-art technologies and industrial capabilities; (3) exposes U.S. industry to international competition, helping to ensure that U.S. firms remain innovative and efficient; (4) encourages development of interoperable weapons systems; and (5) encourages development of mutually beneficial industrial linkages that enhance U.S. industry's access to global markets.

Utilizing the identified foreign sources does not impact the long-term readiness of the Armed Forces. The foreign sources are as likely to be able to meet program cost, performance, and delivery requirements as are domestic sources. Additionally, none of the identified foreign sources constitutes a foreign vulnerability that poses a risk to national security. The vast majority of the foreign sources are from NATO nations or other historically reliable trading partner nations. Experience with these systems during the active combat phases of Operations Enduring Freedom and Iraqi Freedom has demonstrated that the selected suppliers (including twenty German and two French suppliers) have both the ability and resolve to meet performance, schedule, and cost requirements. The availability of alternative domestic sources for most foreign sourced items further reduces the risk for supply disruption. Additionally, one key supplier (the German fabric maker) has established a U.S. production facility for JLIST Filter Liner Fabric, and is building a carbon beads facility in the United States to further reduce risk.

Utilizing these foreign sources does not impact the economic viability of the national technology and industrial base.

The value of total program subcontracts awarded to foreign sources is limited (about $96.5 million – about four percent of the total contract value and less than ten percent of the total subcontract value). Business within the relevant industry segments will sustain essential industrial and technological capabilities sufficient to meet current and projected DoD needs. Domestic firms within those industry segments will continue to be capable of competing for the foreign-sourced items and similar items. Additionally, domestic capabilities have been established for the JSLIST liner fabric. and a domestic source is being established for the JSLIST BAC spheres now being procured from a Japanese source.

[9] By giving evidence to non-U.S. suppliers that they have a fair opportunity to be awarded contracts and subcontracts for DoD weapons systems

In most cases, domestic suppliers are available for the parts, components, and materials provided by the foreign sources.

The Department generally does not mandate supplier selections to its contractors. The Department expects its contractors to select reliable, capable suppliers consistent with obtaining best value, encouraging effective competition, and meeting national security requirements. Generally, prime contractors and first and second tier suppliers indicated they selected the foreign subcontractors for specific items because those subcontractors offered the best combination of price, performance, and delivery.

In some cases domestic suppliers are not available to compete for the items currently subcontracted to foreign sources. With the exception of the lethality enhancer for the PAC3, domestic sources could be developed with little risk, given additional time and funding.

Foreign-Sourced items for which Domestic Sources Are Not Available

Program	Item	Foreign Source Country
JSLIST	Bead Activated Carbon	Japan
PAC3	Lethality Enhancer Assembly	Germany
WCMD	Electric Match	France
SFW	Thermal Battery	Israel

Appendix

Study Process

A. Roles and Responsibilities

1. Office of the Under Secretary of Defense (Acquisition, Technology & Logistics)

    - Office of primary responsibility
    - Structured study
    - Obtained OMB approval for data collection
    - Solicited support from Service Acquisition Executives, Defense Contract Management Agency, and prime contractors
    - Planned, participated in, and monitored information collection
    - Performed final analysis and prepared final report

2. Defense Contract Management Agency Industrial Analysis Center

    - Developed information collection plan and collected data
    - Followed-up with individual subcontractors that did not respond to questionnaire; requested response
    - Performed preliminary analysis
    - Provided support for final analysis and final report

3. Military Departments and DoD Program offices

    - Provided information on identified programs and government furnished equipment for those programs

4. Prime Contractors

    - Identified direct subcontractors and provided information on those subcontractors
    - Requested their subcontractors respond to questionnaire

5. Subcontractors

    - Identified direct subcontractors and provided information on those subcontractors (down to the third subtier)

B. Subcontract Information Collection Thresholds:

1. Subcontracts to U.S. suppliers valued at over $100,000

2. Subcontracts to non-U.S. suppliers valued at over $25,000

C. Response Rates

Prime Contractors - 100 percent PROGRAM	CONTRACTOR	RESPONSE RATE (%)
GMLRS	Lockheed Martin Missile and Fire Control	100%
ATACMS	Lockheed Martin Missile and Fire Control	100%
PAC-3	Lockheed Martin Missile and Fire Control	100%
TACTICAL TOMAHAWK	Raytheon Missile Systems Company	100%
SLAM-ER	The Boeing Company	100%
JSOW	Raytheon Missile Systems Company	100%
PAVEWAY	Lockheed Martin NE&SS	100%
PAVEWAY	Raytheon Missile Systems Company	100%
PREDATOR	General Atomic Aeronautical Systems	100%
F414	GE Aircraft Engines	100%
SFW	Textron Systems	100%
WCMD	Lockheed Martin Missile and Fire Control	100%
JSLIST	Creative Apparel	100%
JSLIST	Group Home Foundation	100%
JSLIST	NCED	100%
JSLIST	Peckham	100%
JSLIST	Sekri	100%

1. First Tier Subcontractors 64 Percent

PROGRAM	# RESPONSES RECEIVED	RESPONSE RATE (%)
GMLRS	8	57%
ATACMS	14	67%
PAC-3	21	57%
TACTICAL TOMAHAWK	19	76%
SLAM-ER	12	75%
JSOW	19	62%
PAVEWAY (LM)	22	61%
PAVEWAY(Raytheon)	12	71%
PREDATOR	17	59%
F414	50	64%
SFW	16	64%
WCMD	14	93%
JSLIST (5 Primes)	10	48%
TOTAL	**231**	**64%**

2. Second Tier Subcontractors 50 percent

PROGRAM	# RESPONSES RECEIVED	RESPONSE RATE (%)
GMLRS	**2**	**40%**
ATACMS	**17**	**41%**
PAC-3	**26**	**62%**
TACTICAL TOMAHAWK	**20**	**45%**
SLAM-ER	**6**	**30%**
JSOW	**15**	**68%**
PAVEWAY (LM)	**12**	**55%**
PAVEWAY(Raytheon)	**26**	**62%**
PREDATOR	**7**	**78%**
F414	**125**	**47%**
SFW	**15**	**56%**
WCMD	**14**	**31%**
JSLIST (5 Primes)	**5**	**56%**
Total	**214**	**50%**