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OFFICE OF THE CHIEF OF NAVAL OPERATIONS
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OPNAV INSTRUCTION 3960.16A

From: Chief of Naval Operations

Subj: NAVY TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE),
AUTOMATIC TEST SYSTEMS (ATS), AND METROLOGY AND
CALIBRATION (METCAL)

Ref: (a) CJCSI 3170.01D, Joint Capabilities Integration and
Development System
(b) SECNAVINST 5000.2C
(c) SECNAVINST 5400.15A
(d) NAVAIR 17-35QAC-01A, NAVSEA 04-4734A, USMC TI-4733-
35/23A, Naval and Marine Corps Calibration Laboratory
Audit/Certification Manual
(e) MIL-STD-1839C, DOD Standard Practice for Calibration
and Measurement Requirements
(f) NAVAIR 17-35NCA-1, NAVSEA ST700-AA-LST-010/NCA, Navy
Calibration Activity List (NCA)
(g) NAVAIR 17-35FR-06, Facility Requirements for Navy
Calibration Laboratories
(h) NAVAIR 17-35MTL-1, NAVSEA OD 45845, Metrology
Requirements List (METRL)
(i) NAVAIR 17-35NCE-1, NAVSEA OD 48939, USMC TI-4733-
45/16, Navy Calibration Equipment List (NCE)
(j) NAVAIR 17-35TR-08 Technical Requirements for
Calibration Labels and Tags
(k) OPNAVINST 4790.2J
(l) OPNAVINST 4700.7K
(m) OPNAVINST 4000.57F
(n) OP 43P6B, Metrology Automated System for Uniform
Recall and Reporting (MEASURE) Users Manual
(o) OD 58483/NAVAIR 17-35TR-05 Technical Requirements for
Calibration Interval Establishment for TAMS
(p) NAVAIR 17-35TR-06, Technical Requirements for
Technical Review of Calibration Intervals

Encl: (1) LIST OF ACRONYMS

1. Purpose. To set policy and assign responsibility for the execution of the Navy TMDE, ATS, and METCAL programs, and supporting information resource management. This instruction is a substantial revision and should be reviewed in its entirety.

2. Cancellation. OPNAVINST 3960.16. |

Comment [hg1]: Page: 2
Move this up to Purpose paragraph.

3. Discussion

a. The complexity of weapons platforms, systems, and support systems, especially electronic subsystems and components, give importance to the Navy's test, monitoring, and diagnostic capability and the need for improved measurement assurance. Optimal use of efficient test and diagnostic capabilities can reduce total ownership costs. Early life cycle development of measurement and calibration performance capability, based on fundamentals of reference (a), is required to deliver technologically sound, sustainable, and affordable diagnostic and measurement systems.

b. Reference (b) defines Chief of Naval Operations (CNO)/Commandant of the Marine Corps responsibilities for readiness, planning, and programming to satisfy operational capability needs, and for providing acquisition logistics assistance to Assistant Secretary of the Navy (Research, Development and Acquisition)(ASN(RD&A)) (Deputy ASN (Logistics)) as well as all of the specific additional responsibilities listed in reference (c).

c. TMDE and ATS are used for monitoring and testing all types of systems, equipment and devices, and the environmental conditions under which these systems and personnel operate. The measurement accuracy of Navy TMDE and ATS used for quantitative and qualitative measurements is ensured through calibration traceability to the National Institute of Standards and Technology, and Department of Defense (DOD) approved sources.

4. Scope and Applicability. This instruction applies to all components of the Navy Department, including Marine Corps aviation units, responsible for research, design, test, acquisition, operation, and logistics support of weapons platforms, weapon systems, operational and support systems, including TMDE, ATS, and METCAL equipment. The Navy TMDE, ATS, and METCAL programs are applicable to all measurement areas of

the physical sciences except Radiation Detection, Indication, and Computation (RADIAC) devices, the Marine Corps Test Measurement and Diagnostic Equipment Program and the Marine Corps Automated Test Equipment (ATE) Program.

5. Definitions

a. TMDE includes all devices used to measure, calibrate, gage, test, inspect, diagnose, or otherwise examine materials, supplies, and equipment to determine compliance with specifications, engineering drawings, technical orders, technical manuals, and maintenance instructions.

b. ATS include ATE hardware and their operating software, Test Program Sets (TPS), which include the hardware, software and documentation required to interface with and test individual weapon system components, and associated software development environments. The term "ATS" also includes on-system automatic diagnostics and testing.

c. METCAL is a combination of two independent yet connected ideas. Metrology is the science of measurement for determination of conformance to technical requirements, including the development of standards and systems for absolute and relative measurements. Calibration is the comparison of a measurement system or device of unverified accuracy with a measurement system of known and greater accuracy to detect any deviation from required performance specifications of the unverified measurement system or device.

d. Calibration Service Provider is an umbrella term including Original Equipment Manufacturer (OEM), Commercial Calibration Activities, and other government agencies providing calibration services to the Navy as a major line of business. Typically these activities are certified to comply with reference (d) or are accredited by a nationally recognized third party accreditation body.

e. Similarly, the term "Commercial Service Providers" means suppliers of Navy TMDE who may calibrate their own products but are not engaged in calibration as a major line of business, and other commercial laboratories providing low volume, model specific or unique parameter calibration services. These activities are typically not certified or accredited, but must maintain quality systems acceptable to the government.

6. Policy. CNO policy is to provide the organizational, intermediate, and depot maintenance levels with diagnostic capabilities to detect, isolate, and correct faults, and to ensure all TMDE used for quantitative measurements is maintained and calibrated. Maintenance and calibration shall be performed at the maintenance echelon that can best ensure proper accomplishment, taking into consideration applicable laws, urgency, priority, crew impact, capability, capacity, and total ownership cost. CNO policy requires USN/USMC to:

a. Carry out the policies of references (a), (b), and (c).

b. Centrally manage policies and processes required for TMDE, ATS, and METCAL programs.

c. Implement a common Navy laboratory certification process per reference (d) to ensure compliance with METCAL policies. All Navy calibration laboratories shall be reviewed at least once every three years.

d. Sponsor and maintain a research and development program for TMDE, ATS, and METCAL to address current needs and emerging technologies.

e. Sponsor and support Joint Service initiatives of the Joint Logistic Commanders (JLC) in the areas of TMDE, ATS, and METCAL.

f. Encourage the use of inter-service support agreements with other services and agencies to optimize utilization of calibration facilities.

g. Invoke reference (e) in all applicable Prime System and Equipment development and procurement contracts to ensure measurement and calibration requirements are identified as part of the Integrated Logistics Support (ILS) process. These requirements shall be identified early in the design and acquisition of all weapon systems and provided to the appropriate Systems Command (SYSCOM) to facilitate development of TMDE and METCAL support. This support shall be available upon Initial Operating Capability.

h. Sponsor the development of calibration procedures, calibration standards (CALSTD), calibration intervals, support

equipment recommendation data or equivalent, and calibration/measurement requirements summary data or equivalent during the acquisition of weapons platforms, weapon systems, operational systems, and support systems.

i. Minimize the use of special purpose (peculiar) test equipment and maximize the use of approved commercially available/non-developmental, standardized general purpose test equipment.

j. Comply with DOD ATS acquisition strategies. Address Navy and aviation Marine Corps requirements for automatic testing with the Consolidated Automated Support System (CASS), the Navy's standard family of ATE. Ensure new design ATE is not acquired if the requirement can be satisfied by CASS. Exceptions to the use of CASS shall require a waiver approved by the ASN (RD&A). Waivers shall be routed via the DOD Automatic Test Systems Executive Directorate (Naval Air Systems Command (NAVAIRSYSCOM) PMA260). Continually evolve CASS to meet Navy testing needs.

k. Include TPS development and distribution costs in the life cycle cost of ATE for acquisition planning and any logistics support or affordability analyses.

l. Have ATE for field, depot, and factory testing that is compatible with the approved family of testers to ensure maximum diagnostic compatibility between government and industry. The same diagnostics capability should be used under operational and depot conditions and to perform factory diagnostics for units under production.

m. Ensure individual measurement results can be traced through an unbroken chain of calibrations to accepted references (U. S. National Standards, Natural Physical Constants, Ratio Type Calibrations, Consensus Standards, or National Standards of other countries which are correlated with U. S. National Standards).

n. Use TMDE capable of measuring or generating stimuli to a higher accuracy than the measurement parameters being supported. Unless otherwise specified, a minimum Test Accuracy Ratio (TAR) of 4 to 1 is desired, and the actual TAR shall be documented. If a TAR of 4 to 1 cannot be achieved, the design activity shall analyze the measurement requirements and provide documented

justification for the lesser TAR to the METCAL Technical Agent designated in paragraph 8.n. for resolution and approval by the Executive Director for Navy METCAL.

o. Establish an objective end of period reliability goal for TMDE equal to or greater than 85 percent, with the threshold reliability in no case to be lower than 72 percent.

p. Uniquely identify all calibration laboratories contained in reference (f).

q. Promote efficiency by limiting capabilities of DON calibration facilities commensurate with the accuracies required for the assigned workload. Maintain a calibration laboratory and activity hierarchy within the Navy that will ensure traceability to national or international standards and include as a minimum:

(1) Navy Primary Standards Laboratory (NPSL) maintains and disseminates the most accurate units of measurement within the Navy, and provides support to lower echelon calibration laboratories.

(2) Navy Calibration Laboratories (NCL)(including depot laboratories, Regional Calibration Centers, and Marine Mobile Calibration Complexes) calibrate and repair CALSTDs and test equipment from lower echelon calibration laboratories, fleet activities, and shore activities and obtain services from NPSL as required for assets beyond their capability.

(3) Intermediate laboratories, tenders and aviation Field Calibration Activities (FCA) calibrate and repair test equipment and standards within their capability from lower echelon calibration activities, fleet activities and shore activities, and will obtain services from NPSL, and depot laboratories as required for assets beyond their capability.

(4) Organizational laboratories and non-aviation FCAs calibrate test equipment from fleet and shore activities within the capability of their approved phase package and obtain services from NPSL, depot, and intermediate laboratories as required.

r. Maintain laboratory and FCA facilities per reference (g).

s. Only use laboratories contained in the Navy Approved Calibration Sources List and authorized by SYSCOMs, Strategic Systems Program (SSP), or Chief, Bureau of Medicine and Surgery (BUMED).

t. Establish and maintain a single Automated Information System (AIS) in support of METCAL, and collect management and technical data required for program administration.

u. Calibrate TMDE per the approved procedures and intervals specified in reference (h) using approved standards identified in reference (i).

v. Use approved labels and tags per reference (j) to identify the calibration status of the equipment.

w. Allow Navy calibration laboratories to calibrate TMDE belonging to Navy contractors on an actual cost basis when adequate capacity is available.

x. Require Calibration Service Providers and other Commercial Service Providers who may supply or calibrate Navy TMDE to maintain calibration systems acceptable to the Navy as part of their quality program or inspection process.

y. Maintain a METCAL training program for personnel performing calibration and repair of TMDE.

z. Minimize hazardous material in the TMDE, ATS, and METCAL program.

7. Actions and Responsibilities

a. Commands managing or using Navy TMDE, ATS, and METCAL shall:

(1) Comply with the policies of this instruction.

(2) Issue implementing instructions as required.

(3) Obtain calibration services from SYSCOM/SSP/BUMED authorized laboratories and FCAs.

(4) Submit waivers for non-CASS ATE to ASN (RD&A) via NAVAIRSYSCOM and waivers for remaining TMDE policy requirements to Commander, Naval Sea Systems Command (COMNAVSEASYSYSCOM), Commander, Naval Air Systems Command (COMNAVAIRSYSCOM), Strategic Systems Programs (SSP), and Commander, Space and Naval Systems Command (SPAWARSYSCOM) as appropriate.

b. Director, Material Readiness and Logistics/DCNO (Fleet Readiness and Logistics), CNO (N4), and Deputy Chief of Naval Operations (Warfare Requirements and Programs, CNO (N6/N7)) shall:

(1) Implement and monitor the TMDE, ATS, and METCAL program. All CNO directives pertaining to TMDE, ATS, and METCAL shall be submitted to the Fleet Readiness Division, CNO (N43), for review. References (k), (l), and (m) shall be reviewed for impact on TMDE, ATS, and METCAL policy.

(2) Designate and serve as resource sponsor for an Executive Director for Navy METCAL to provide technical and management oversight and coordination of common functions within the Navy METCAL program and participate in Joint Service initiatives.

(3) Establish a Test and Monitoring Systems (TAMS) Executive Board, chaired by the Executive Director for Navy METCAL. The chairperson serves as the single point of contact in the Navy for the TMDE and METCAL programs.

(4) Support and serve as resource sponsor for:

(a) TMDE, ATS and METCAL for systems and activities under their management.

(b) Navy research, development and procurement of ATE - CNO (N78) lead, and for METCAL - CNO (N43) lead.

c. Executive Director for Navy METCAL: NAVSEASYSYSCOM is designated as the Executive Director for Navy METCAL. NAVSEASYSYSCOM shall implement the roles and responsibilities as delineated in the CNO-approved Executive Director charter. The Executive Director for Navy METCAL shall:

(1) Provide advocacy to resource sponsors for calibration, calibration support, and TMDE support programs across all SYSCOMs.

(2) Establish Navy calibration system quality program acceptance criteria for Calibration Service Providers and Commercial Service Providers who may supply or calibrate Navy TMDE and promulgate Navy Approved Calibration Sources List.

(3) Ensure central funding requirements aligned with assigned duties are developed and submitted in accordance with established DON policies.

(4) Chair the TAMS Executive Board (TAMS EB).

(5) Serve as Navy Office of Primary Responsibility (OPR) to the Joint Logistics Commanders (JLC) on matters pertaining to Navy metrology and calibration.

(6) Provide the Navy representative to the JLC Joint Technical Coordinating Group-Calibration and Measurement Technology (JTTCG-CMT).

(7) Serve as the Navy program manager for the Navy METCAL Research and Development (R&D) program.

d. TAMS Executive Board shall:

(1) Function as Executive Steering Committee and board of directors for TMDE, ATS, and METCAL.

(2) Consist of senior representatives from COMNAVAIRSYSCOM, COMNAVSEASYSYSCOM, SSP, COMSPAWARSYSYSCOM, MARCORSYSYSCOM, COMPACFLT, and Fleet Forces Command. The Executive Director may invite representatives from other commands as required.

(3) Provide corporate overview and guidance for the Navy TMDE, ATS, and METCAL programs including policy, procedures, processes, instructions, standards and guidance for procurement, operations and maintenance within CNO policy guidelines.

(4) Establish and task standing committees and working groups to review functional areas for process improvements and to improve quality or reduce cost of operation.

(5) Review proposals for shared program resources and recommend appropriate SYSCOM funding.

(6) Provide technical direction and manage the execution of Joint Naval Audit/Certification Team to ensure established policies are met and NCLs operate in compliance with reference (d).

(7) Participate in all calibration reviews, decisions, processes, and policy actions at the CNO level that result from any boards, committees or steering groups.

e. COMNAVAIRSYSCOM, COMNAVSEASYSYSCOM, COMSPAWARSYSCOM, and SSP shall:

(1) Provide senior representatives to the TAMS EB.

(2) Provide technical and administrative support to the TAMS EB.

(3) Provide guidance to acquisition managers regarding TMDE, ATS, and METCAL acquisition, selection and support.

(4) Approve requests for establishment and disestablishment of calibration laboratories and activities.

(5) Authorize use of laboratories on Navy Approved Calibration Sources List as appropriate for activities under their technical cognizance.

(6) Establish calibration laboratory and FCA review procedures and manage cognizant calibration laboratories and FCAs.

(7) Budget and fund for procurement of CALSTDs and required ILS.

(8) Review TMDE excesses and re-distribute TMDE to fill deficiencies prior to initiating additional procurement.

(9) Develop and maintain adequate training programs for personnel.

(10) Ensure cognizant calibration facilities are in compliance with reference (d).

(11) Provide TMDE inventory and calibration data to the METCAL central database.

(12) Participate in JLC projects as required.

(13) Submit all Navy Stock Account Cog 7Z, General Purpose Electronic Test Equipment (GPETE) requirements to NAVSEASYSKOM.

f. COMNAVAIRSYSKOM shall:

(1) Designate as the office for DOD's Executive Directorate for ATS NAVAIR PMA260 (the Navy's Lead for ATS).

(2) Serve as the Navy program manager for the Metrology Automated System for Uniform Recall and Reporting (MEASURE) AIS for Navy use and update reference (n).

(3) Budget and fund for initial outfitting of GPETE for aviation activities and for replacement of GPETE determined to be obsolete or obsolescent.

(4) Budget and fund for the calibration of aviation TMDE beyond the capability of the Fleet.

(5) Manage Navy Primary Standards Lab.

(6) Manage the development and update of a calibration recall and scheduling system for Navy use.

(7) Manage the Support Equipment Resources Management Information System (SERMIS) program.

g. COMNAVSEASYSKOM shall:

(1) Budget and fund for standardization of GPETE and for replacement of GPETE determined to be obsolete or obsolescent for non-aviation Fleet activities. Procure GPETE for initial outfitting of Ship Construction Navy (SCN). Procure GPETE for the Fleet Modernization programs with funding to be provided by cognizant PEO or Ship Program Manager (SPM).

(2) Serve as the Navy-wide acquisition manager for GPETE (7Z COG).

(3) Manage the Ships/Shore Portable Electrical/Electronic Test Equipment Requirements List (SPETERL).

(4) Serve as the Navy-wide acquisition manager for GPETE to coordinate, prioritize, and execute planned GPETE requirements for procurement.

(5) Maintain a Navy Central Data Base Facility (CDBF) for METCAL.

h. Director, SSP shall:

(1) Establish, implement, and maintain a support and Test and Measurement Equipment (T&ME) control system to ensure the availability and support of T&ME used onboard TRIDENT submarines, per reference (m). SSP shall also establish, implement, and maintain a support and T&ME control system for Guided Missile Submarines (SSGN).

i. Program Executive Officers (PEO), and Direct Reporting Program Managers (DRPM) shall:

(1) In conjunction with supporting SYSCOMs or SSP, establish the TMDE, ATS, and METCAL requirements for their systems.

(2) Minimize the use of special purpose (peculiar) test equipment and maximize the use of approved commercially available/non-developmental, standardized general purpose test equipment. If requirements cannot be met by general purpose test equipment, fund for research, development, procurement, and life cycle support of special purpose test equipment. METCAL R&D efforts will be coordinated with the Navy METCAL R&D program manager and Measurement Science Department (MSD), Naval Surface Warfare Center (NSWC) Corona.

(3) Fund for procurement of TMDE, ATS, METCAL, and other ILS elements per references (b) and (c). Coordinate with and follow the procedures of the appropriate SYSCOM or SSP with respect to the selection, procurement, and ILS of TMDE, ATS, and METCAL.

(4) Obtain calibration services from SYSCOM, SSP, or BUMED authorized laboratories.

j. COMNAVSUPSYSCOM shall:

(1) Procure TMDE in support of SYSCOM and SSP requirements.

(2) Identify Navy-approved TMDE on NAVSUPSYSCOM websites.

(3) Procure or develop required ILS for TMDE as specified by the SYSCOMs or SSP.

k. Fleet Forces Command, COMPACFLT, Type Commanders and Shore Commanders shall:

(1) Provide a senior representative to the TAMS Executive Board (Fleet Forces Command and COMPACFLT only).

(2) Fund for the calibration and repair of their TMDE, including CALSTDs, except as noted. Notes: (1) NAVAIRSYSCOM will fund for calibration of fleet aviation TMDE (Individual Material Readiness List (IMRL) equipment), and calibration and repair of CALSTDs beyond the calibration capability of the fleet. (2) SSP will fund for TRIDENT, and SSGN TMDE calibration and repair.

(3) Budget and fund for replacement of non-aviation TMDE (including CALSTDs) that is either beyond economical repair or obsolete (Shore Commanders only).

(4) Verify TMDE allowances and submit change requests to the TMDE allowance manager for the appropriate SYSCOM or SSP.

(5) Inventory TMDE and report the inventory to the Navy configuration databases, i.e., the Ship Configuration and Logistics Support Information System (SCLISIS) for non-aviation activities, and SERMIS for aviation activities.

(6) Redistribute excess TMDE as follows: Aviation activities and TRIDENT activities will follow the guidance of

COMNAVAIRSYSCOM and SSP respectively. Non-aviation fleet and shore activities will coordinate with their TYCOM Consolidated TMDE Readiness Assessment (CTRA) Program Manager.

(7) Periodically review their laboratories and ensure the laboratories comply with the policies of this instruction and the applicable SYSCOM instruction. Fund certification audits of non-aviation afloat and ashore FCAs and shore laboratories.

(8) Provide properly trained personnel to authorize calibration activities for TMDE repair and calibration and to manage assigned standards and calibration laboratories and FCAs in accordance with the policy of this instruction and guidance provided by the appropriate SYSCOM.

(9) Use existing laboratory resources to the maximum extent possible. Submit all proposals for establishment or major changes to laboratories and FCAs to the appropriate SYSCOM via the chain of command.

(10) Calibrate TMDE in accordance with the procedures and calibration intervals specified in reference (h).

(11) Obtain calibration services from SYSCOM, SSP, or BUMED authorized laboratories.

(12) Use the approved CNO AIS to report METCAL transaction and recall data.

1. Chief, Bureau of Medicine and Surgery shall:

(1) Establish, procure and maintain TMDE allowances required to support assigned missions.

(2) Budget and fund for TMDE (including CALSTDs) and associated ILS required to support assigned missions. Procure common test equipment through the Navy GPETE acquisition manager, COMNAVSEASYSYSCOM.

(3) Use existing laboratory resources to the maximum extent possible. Submit all proposals for establishment or major changes to calibration laboratories and FCAs to the Executive Director for Navy METCAL.

(4) Calibrate TMDE in accordance with the procedures and calibration intervals specified in reference (h).

(5) Authorize use of laboratories on Navy Approved Calibration Sources List as appropriate for activities under their technical cognizance.

(6) Utilize approved Navy data systems to maintain TMDE inventory, and METCAL transactions.

(7) Perform TMDE inventories and report the inventory to the Navy configuration database.

m. Commanding Officer, NSWC Corona shall:

(1) Serve as scientific and technical agent for the Navy METCAL Program.

(2) Support the Navy's acquisition and logistics managers to help ensure the Navy's calibration requirements are identified and that measurement capability and CALSTDs are properly planned, implemented, and supported.

(3) Provide centralized direction and coordination to advance the state-of-the-art in metrology and calibration to keep pace with advancements in weapons and test equipment technology and measurement requirements as tasked by the appropriate SYSCOM or program office.

(4) Develop and evaluate CALSTDs specifications and standards as tasked by SYSCOMs and program offices.

(5) Represent the Navy on the JTCG-CMT as required by the Executive Director for Navy METCAL.

(6) Develop and maintain Navy calibration capability and environmental requirements, reference (g), for laboratories and FCAs. COMNAVAIRSYSCOM, COMNAVSEASYSYSCOM, SSP and COMMARCORSYSCOM shall approve the documents prior to release.

(7) Maintain the Metrology Requirements List - reference (h), and the Navy Calibration Equipment List - reference (i).

(8) Assign and maintain Navy laboratory codes and maintain reference (f).

(9) Approve and maintain approved calibration procedures and METCAL documentation for use at all Navy laboratories and FCAs except for NPSL primary measurement systems.

(10) Establish and adjust calibration intervals for all DON TMDE per references (o) and (p), except specific shipboard installed instrumentation assigned to NSWCCD-SSES Philadelphia by the Executive Director for Navy METCAL.

(11) Approve specifications for calibration labels and tags. Update and maintain reference (j).

(12) Execute the Navy's METCAL R&D program as directed by the METCAL R&D program manager.

(13) Coordinate the technical content of METCAL training with appropriate curriculum development authorities to ensure the needs of the Navy METCAL program are met.

J. A. Robb
Rear Admiral
Director, Fleet Readiness
Division

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LIST OF ACRONYMS

AIS	Automated Information System
ASN(RDA)	Assistant Secretary of the Navy (Research, Development, and Acquisition)
ATE	Automatic Test Equipment
ATS	Automatic Test Systems
CALSTD	Calibration Standard
CASS	Consolidated Automatic Support System
CDBF	Central Database Facility
CNO	Chief of Naval Operations
CTRA	Consolidated TMDE Readiness Assessment
CSP	Calibration Support Plan
DOD	Department of Defense
DON	Department of the Navy
EB	Executive Board
FCA	Field Calibration Activity
GPETE	General Purpose Electronic Test Equipment
ILS	Integrated Logistics Support
JLC	Joint Logistics Commanders
JTCG-CMT	Joint Technical Coordinating Group-Calibration and Measurement Technology
MARCORSSYSCOM	Marine Corps Systems Command
MEASURE	Metrology Automated System for Uniform Recall and Reporting
METCAL	Metrology and Calibration
METRL	Metrology Requirements List
NAMP	Naval Aviation Maintenance Program
NAVAIRSYSCOM	Naval Air Systems Command
NAVSEASYSCOM	Naval Sea Systems Command
NAVSUPSYSCOM	Naval Supply Systems Command
NCA	Navy Calibration Activity List
NCE	Navy Calibration Equipment List
NCL	Navy Calibration Laboratory
NPSL	Navy Primary Standards Laboratory
NSWC	Naval Surface Warfare Center
PTTI	Precise Time and Time Interval
RADIAC	Radiation Detection, Indication and Computation
R&D	Research and Development
SCLSIS	Ship Configuration and Logistics Support Information System
SCN	Ship Construction Navy
SERMIS	Support Equipment Resources Management Information System
SPAWARSSYSCOM	Space and Naval Warfare Systems Command
SPETERL	Ships Portable Electrical/Electronic Test Equipment Requirements List

Enclosure(1)

SPM	Ship Program Manager
SSGN	Guided Missile Submarine
SSP	Strategic Systems Programs
SYSCOM	Systems Command
T&ME	Test and Measurement Equipment
TAMS	Test and Monitoring System
TAR	Test Accuracy Ratio
TEMP	Test and Evaluation Master Plan
TMDE	Test, Measurement and Diagnostic Equipment
TPS	Test Program Set