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Appendix III

Test and Evaluation

- References:
- (a) DOD 5000.3-M-4, "Joint T&E Procedures Manual," Aug 88 (NOTAL)
 - (b) Commander, Naval Sea Systems Command Process Description, "Live Fire Test and Evaluation (LFT&E) of U.S. Navy Ships - Process Description," Jun 93 (NOTAL)
 - (c) OPNAVINST 9072.2, "Shock Hardening of Surface Ships," 12 Jan 87 (NOTAL)
 - (d) DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," 15 Mar 96 (NOTAL)
 - (e) Joint Logistics Commanders Guidance for use of, "Evolutionary Acquisition Strategy To Acquire Weapon Systems," May 95 (NOTAL)
 - (f) SECNAVINST 5090.6, "Evaluation of Environmental Effects from Department of the Navy Actions," 26 Jul 91 (NOTAL)
 - (g) OPNAVINST 5090.1B, "Environmental and Natural Resources Program Manual," 1 Nov 94 (NOTAL)

1.1 Test and Evaluation (T&E) Responsibilities and Points of Contact

1.1.1 Navy Responsibilities and Points of Contact

1. Chief of Naval Operations (CNO) (N091). Serves as the principal interface between CNO and Assistant Secretary of the Navy (Research, Development and Acquisition) (ASN(RD&A)), on matters relating to T&E. Responsibilities include:
 - a. Acting for CNO in resolving T&E issues.
 - b. Establishing and issuing policy regarding conduct of operational T&E.
 - c. Coordinating T&E document preparation.
 - d. Providing principal liaison with Commander, Operational Test and Evaluation Force (COMOPTEVFOR) on operational test requirements and execution.
 - e. Acting for CNO as the single point of contact for interface with DoD's Director, Operational Test and Evaluation (DOT&E) for test and evaluation master plan (TEMP) and test plan coordination and approval.

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f. Serving as the Office of the Chief of Naval Operations (OPNAV) point of contact with the Office of the Secretary of Defense (OSD) on joint service testing matters conducted in accordance with reference (a).

g. Coordinating operational test and evaluation (OT&E) support for the United States Marine Corps (USMC).

h. CNO (N091) is designated as the Navy LFT&E primary point of contact.

2. Board of Inspection and Survey (INSURV). INSURV shall conduct acceptance trials and inspections of all ships and service craft prior to acceptance for naval service. For aircraft programs selected for INSURV oversight, INSURV shall:

a. Monitor all developmental test and evaluation (DT&E) conducted by the developing activity (DA) and submit an independent technical assessment to CNO and the Secretary of the Navy (SECNAV) at each key milestone decision point.

b. Provide quarterly status updates to CNO.

c. When appropriate, submit independent reports of major problems to the CNO.

d. Submit an independent technical assessment of readiness for Operational Evaluation (OPEVAL) to CNO and COMOPTEVFOR. See this instruction, enclosure 3, paragraph 3.4, for further guidance.

e. Conduct INSURV Aircraft Trials. INSURV final phase DT-III Trials shall determine if military specifications of the contract have been satisfactorily fulfilled; evaluate engineering changes and corrections; verify the effectiveness of product improvement actions; and the applicability of pre-production test results to the production aircraft weapon system. The DA shall fund INSURV DT-III testing.

3. Test Planning Working Group (TPWG)/T&E Coordinating Group (TECG). TPWG and TECG policy, membership, and focus are provided in enclosure (7), appendix III, paragraph 1.2.1 and 1.2.2, respectively.

1.1.2 Marine Corps Responsibilities and Points of Contact

1. Commandant of the Marine Corps (CMC) and Headquarters Marine Corps Staff

a. CMC. T&E in the system acquisition process directly supports the CMC's responsibilities for ensuring the readiness and mission capability of the Fleet Marine Force (FMF). The CMC shall issue service policies, procedures, and

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requirements for Marine Corps Joint Test and Evaluation (JT&E).

b. Deputy Chief of Staff for Programs and Resources DC/S(P&R). Specific T&E responsibilities shall include:

- (1) Providing oversight of programming activities related to DT&E, Operational Test and Evaluation (OT&E), and JT&E.
- (2) Coordinating with the Commander, Marine Corps Systems Command (COMMARCORSYSCOM) to ensure that budgetary and programmatic decisions support JT&E and the Marine Corps mission and budget.

c. Deputy Chief of Staff for Manpower and Reserve Affairs (DC/S M&RA). After consultation with COMMARCORSYSCOM and the Director, Marine Corps Operational Test and Evaluation Activity (MCOTEA), the DC/S M&RA shall:

- (1) Oversee manpower and personnel requirements for Marine Corps participation in JT&E.
- (2) Assign a Deputy Test Director (TD) for multi-service OT&E of ACAT I and designated ACAT II programs.
- (3) Assign a TD for OT&E of ACAT I and designated ACAT II programs.
- (4) Assign a Deputy TD for JT&E-approved programs after appropriate coordination.

d. Deputy Chief of Staff for Installations and Logistics (DC/S I&L). DC/S(I&L) shall:

- (1) Act as the focal point for interface with the Board of Operating Directors for Test and Evaluation (BoOD(T&E)).
- (2) Serve as functional manager for Marine Corps automated information systems (AISs) logistics systems.
- (3) Develop the concept of employment (COE) and mission essential functions for AISs and interoperability and standards requirements for operational requirements documents (ORDs).
- (4) In coordination with COMMARCORSYSCOM, the Marine Corps DRPMs, and Director, MCOTEA, shall provide a representative to assist in determining AIS program failure definition (FD)/scoring criteria (SC) for each AIS

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program under development and will provide a voting member for scoring conferences.

2. Director, Marine Corps Intelligence Center (MCIC). The Director, MCIC shall provide COMMARCORSYSCOM, Marine Corps Direct Reporting Program Managers (DRPMs), and Director, MCOTEA with a test threat support package (TTSP) based on the latest system threat assessment (STA). The TTSP shall include all threat data required to support developmental and operational testing.
3. Commanding General, Marine Corps Combat Development Command (CG, MCCDC). CG, MCCDC shall:

- a. Develop the concept of employment (COE) and mission essential functions for proposed non-automated information systems and interoperability and standards requirements for operational requirements documents (ORDs).

- b. In coordination with COMMARCORSYSCOM, the Marine Corps DRPMs, and Director, MCOTEA, shall provide a representative to assist in determining non-AIS program FD/SC for each program under development and will provide a voting member for scoring conferences.

4. COMMARCORSYSCOM. COMMARCORSYSCOM shall:

- a. Budget for DT&E and OT&E.

- b. Provide a test support package (TSP) to the Director, MCOTEA, 1 year before scheduled operational test (OT) start. The TSP shall include program documentation prepared during the acquisition process which supports test planning and conduct. As a minimum, it shall include an ORD, a STA, a threat scenario, a MCCDC-approved Concept of Employment, program documentation addressing support, and life-cycle management of hardware and computer resources and an organizational structure to include a table of organization and table of equipment. Upon request, COMMARCORSYSCOM shall provide software documentation. The threat scenario must include a signed concurrence from MCIC.

- c. Serve as the Marine Corps point of contact with Office of the Secretary of Defense (OSD) on matters relating to Live Fire Test and Evaluation (LFT&E) and on joint service testing matters in accordance with reference (a).

- d. Consolidate and process quarterly requests for use of naval fleet assets in support of research, development, test, and evaluation (RDT&E) requirements.

- e. Represent the Marine Corps in all joint DT&E matters.

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f. Exercise review and approval authority over TEMPs for all assigned programs and those multiservice programs.

g. Establish and chair a Test Integration Working Group (TIWG) for all assigned programs. See the Deskbook (DON Section) for additional information.

h. Certify that systems are safe and ready for DT&E and OT&E.

i. Manage the Marine Corps External Airlift Transportation (EAT) Certification Program.

j. Manage the Marine Corps Foreign Comparative Test Program.

5. Director, Marine Corps Operational Test and Evaluation Activity (MCOTEA). The Director, MCOTEA shall ensure that the OT of all acquisition category (ACAT) I, IA, II, III, and IV programs is effectively planned, conducted, evaluated, and reported, and shall:

a. Coordinate the scheduling of resources for OT requiring FMF support through the Five Year Master Test Plan (FYMTP) published annually with quarterly updates.

b. Host and chair a TIWG for determining FD/SC for each program. See the Deskbook (DON Section) for further guidance.

c. Prepare Part IV of the TEMP with the exception of live fire test and evaluation.

d. Request, from CMC, the assignment of a TD for ACAT I and certain ACAT II programs.

e. Task the FMF and other commands in matters related to OT&E by publishing a Test Planning Document (TPD).

f. When significant test limitations are identified, advise the milestone decision authority (MDA) of risk associated in the procurement decision.

g. Manage those OSD-directed multiservice OT&Es for which the Marine Corps is tasked.

h. Chair and conduct an operational test readiness review (OTRR) for determining a program's readiness to proceed with OT&E. See the Deskbook (DON Section) for further guidance.

i. Prepare and provide directly to the CMC, within 120 days after completion of OT&E, an independent evaluation report (IER) for all OT&E.

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j. Coordinate Marine Corps support for other military services' OT&Es.

k. Advise the BoOD(T&E) on OT&E matters.

l. Chair an annual OT&E planning conference. The conference shall have representation from the FMF, appropriate HQMC staff offices, MCCDC, MARCORSYSCOM, and others, as appropriate.

m. Maintain direct liaison with Director, DTSE&E, the FMF for OT&E matters, and other military activities and commands, as required.

6. FMF. The Commanding Generals, Fleet Marine Force Pacific (FMFPAC) and Fleet Marine Force Atlantic (FMFLANT) shall each:

a. Designate a test coordinator as a focal point for all T&E matters.

b. Support MCOTEA in the T&E of new concepts, equipment, and systems.

c. Provide a TD who will write the OT report and submit it to MCOTEA via the CG of the appropriate FMF within 30 days of completion of OT&E for an ACAT II, III, or IV program.

d. Provide personnel and equipment to participate in JT&E programs, as required.

1.2 Test Planning

1.2.1 Test Planning Working Group (TPWG)

TPWGs provide the forum for discussing, coordinating, and resolving of test planning goals and issues. Examples of TPWG meeting topics are listed in the Deskbook (DON Section). The following are activities for establishing a TPWG:

1. The TPWG shall be chaired by the PM or designated representative (normally military O-6/O-5 or civilian equivalent).
2. The recommended TPWG membership should include the requirements officer (RO), the T&E coordinator (CNO (N912)), COMOPTEVFOR staff, program office DT&E representatives, and Systems Command (SYSCOM) T&E Division representatives, ASN(RD&A) staff, joint service representatives, OSD personnel, and contractors, as applicable.
3. The frequency of TPWG meetings shall be established by the PM and meeting minutes shall be published.

1.2.2 Test and Evaluation Coordination Group (TECG)

When T&E issues arise that cannot be resolved between the applicable commands or when extensive T&E coordination is required, a TECG shall be convened. A TECG may also be used to implement urgent required changes to the TEMP. When used for urgent TEMP changes either a page change shall be issued or the formal report of the TECG shall be attached to the TEMP as an annex until the next required update or revision.

1. TECGs shall be convened by CNO (N912) via formal correspondence. TECG membership shall include:
 - a. CNO (N912) Division Director - Chair.
 - b. Applicable CNO (N912) T&E Coordinator - Co-chair.
 - c. RO.
 - d. PM.
 - e. OPTEVFOR Assistant Chief of Staff (ACOS) or Deputy ACOS (DACOS) (for the particular warfare specialty).
 - f. Operational TD (or designated representative).
 - g. Applicable ASN(RD&A) staff representative.
 - h. Others as appropriate.
2. The results of the TECG shall be reported in formal correspondence to all attendees.
3. The National Security Agency (NSA) has primary responsibility for developing and testing Consolidated Cryptologic Program (CCP) systems. A CCP TECG shall be used to identify Navy-unique effectiveness and suitability issues for emergency CCP Programs, develop a coordinated Navy position on cryptologic T&E issues, and determine the extent of Navy participation in multiservice testing. A CCP TECG may also be used to resolve issues relating to assigning or canceling CCP T&E Identification Numbers (TEIN).

1.2.3 Test Integration Working Group (TIWG)

TIWG is established to effect Marine Corps T&E coordination. The procedures and membership are in the Deskbook (DON Section).

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1.3 Navy General Test & Evaluation Procedures

1.3.1 Developmental Test and Evaluation (DT&E)

DT&E shall be conducted in three major phases. The specific objectives of each phase shall be developed by the DA and outlined in the TEMP. Use of properly validated modeling and simulation techniques to assess areas in which testing is not yet possible or practical, as well as establishing and implementing software development metrics, is encouraged. Specific descriptions of developmental testing phases are in the Deskbook (DON Section) and should be referenced for additional information.

1.3.1.1 DT-I

DT-I is conducted during program definition and risk reduction to support Milestone II.

1.3.1.2 DT-II

DT-II is conducted during engineering and manufacturing development (EMD) to support the Milestone III decision and shall include, as a minimum, testing to determine:

1. Safety, the effects of volatile materials, and insensitive munitions.
2. All electromagnetic environmental effects, such as: electromagnetic compatibility (EMC), electromagnetic interference (EMI), electronic countermeasures (ECM), electronic countercountermeasures (ECCM), electromagnetic vulnerability (EMV), hazards of electromagnetic radiation to ordnance and fuel (HERO), and hazards of electromagnetic radiation (RADHAZ) to personnel.
3. The effectiveness and supportability of any built-in diagnostics.

At Milestone II, COMOPTEVFOR and the DA shall determine what constitutes production representative hardware and what degree of software maturity (e.g., software requirements, software quality, computer resource utilization, build release content) is necessary for technical evaluation (TECHEVAL) data to be used in support of OT&E. Software to be used for OPEVAL shall be the same as or functionally representative of that software intended for fleet use at initial operational capability (IOC) of a system and will be validated during TECHEVAL. CNO (N091) shall arbitrate issues regarding production and fleet representative hardware and level of software development either by directive or by a decision subsequent to convening a TECG.

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1.3.1.3 DT-III

DT-III is conducted during production, fielding/ deployment, and operational support.

1. Production acceptance test and evaluation (PAT&E) shall be the responsibility of the DA. PAT&E objectives, excluding factory inspections and certifications, shall be outlined in the TEMP.
2. For aircraft and selected aviation system acquisition programs, the final phase of DT-III shall be conducted by the INSURV.

1.3.1.4 DT&E Schedules

The DA shall provide COMOPTEVFOR with schedules of DT&E activities, program and system documentation (in draft form, if necessary), and access to DT&E activities.

1.3.1.5 DT&E Test Data

All relevant DT&E data shall be made available to keep all agencies apprised of program test results.

1.3.1.6 DT&E/OT&E Interface

During combined DT and OT it may be necessary for a dedicated period of OT. This dedicated period, generally near the end of combined testing, is necessary for COMOPTEVFOR to evaluate system performance in an operationally representative environment as possible. COMOPTEVFOR shall participate in DT&E planning, monitor DT&E, assess relevant OT&E issues, and provide feedback to the DA. The Acquisition Coordination Team (ACT) is encouraged to facilitate this planning process. Specific conditions and responsibilities, including the sharing of test data, shall be outlined via a memorandum of agreement (MOA) between the DA and COMOPTEVFOR. The MOA must address the statutory limitations on contractor involvement in operational testing. TECHEVAL and OPEVAL shall not be combined.

1.3.1.7 Operator and Maintenance Training

The DA shall provide system operator and maintenance training for the Operational Test Director (OTD) and members of the operational test team (including crew members). Scheduling of this training shall be coordinated between OPTEVFOR and the DA.

1.3.1.8 Live Fire Test and Evaluation (LFT&E)

LFT&E shall be addressed in Part IV of the TEMP.

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1.3.1.8.1 LFT&E of High Value Platforms

The DA for an ACAT I or II covered major system, major munitions, or missile program shall implement reference (b) in order to comply with the LFT&E statute 10 U.S.C. 2366.

1.3.1.8.2 LFT&E of Ships

For ships, the qualification of the survivability baseline is conducted during construction and shakedown. During construction, tests and inspections confirm the achievement of compliance with the requirements of the shipbuilding specification in the areas of shock hardening, air blast hardening, fire containment, damage control features, structural hardening, and chemical, biological, and radiological (CBR) protection. During the 1-year shakedown period following delivery of the lead ship of a class, or early follow ship as determined in accordance with reference (c), a full-ship shock trial shall be conducted to identify any unknown weakness in the ability of the ship to withstand specified levels of shock from underwater explosions.

1.3.1.8.3 LFT&E Reporting Requirements

To satisfy reporting requirements, the DA shall prepare a report of LFT&E to be submitted to DOT&E, via CNO (N091), in time to allow OSD 45 days to prepare an independent report and submit it to Congress prior to the program proceeding beyond low-rate initial production (LRIP). CNO (N091), as the OPNAV LFT&E focal point, shall be apprised of problems when specific programs are unable to meet the provisions of reference (d) and this instruction and shall be kept informed of the LFT&E program progress and execution.

1.3.1.8.3.1 LFT&E Waivers

Waivers from realistic survivability testing (i.e., full-up system-level) and lethality testing and certifications to Congress that live fire testing would be unreasonably expensive and impractical, shall be submitted by the MDA to DOT&E and Congress prior to Milestone II. Waivers shall be coordinated with the program sponsor and CNO (N091). Waivers and certifications to Congress for ACAT III and IV programs shall also be coordinated with ASN(RD&A).

1.3.2 Operational Test and Evaluation (OT&E)

OT&E is subdivided into initial OT&E (IOT&E) and follow-on OT&E (FOT&E). For each program, critical operational issues (COIs) shall be developed by OPTEVFOR and published in part IV of the TEMP. The COIs are linked to CNO requirements established in the ORD. The phases listed below shall be tailored through further sub-division, as required.

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1.3.2.1 IOT&E

IOT&E is all OT&E up to and including the completion of OPEVAL.

1.3.2.1.1 Operational Assessments (OAs)

When the maturity of a system will not support a full operational test, an OA may be conducted. OAs can be made at any time using technology demonstrators, prototypes, mockups, or simulations, but will not substitute for the independent OT&E necessary to support full production decisions. OAs can be used to support a LRIP decision and are included in Part IV of the TEMP. For programs that have OSD oversight and an acquisition is planned, the OA Plans shall be briefed by appropriate OPTEVFOR staff and formally approved by DOT&E.

Early operational assessments (EOAs) are conducted during the program definition and risk reduction phase to support Milestone II. Tests will employ virtual models, advanced development models (ADMs), prototypes, brass-boards, or surrogate systems. The primary objectives of an EOA are to provide an early projection of a system's potential operational effectiveness and potential operational suitability. An EOA shall be considered for ACAT I and II programs, other programs receiving DOT&E oversight, and other ACAT programs, as appropriate.

1.3.2.1.2 OT-I (EOAs)

OT-I tests shall employ advanced development models, prototypes, brass-boards, or surrogate systems. OT-I shall be conducted, when appropriate, for ACAT I programs. OT-I shall be conducted, when appropriate, for ACAT II, other programs receiving DOT&E oversight, and other ACAT programs.

1.3.2.1.3 OT-II

In most programs, at least one complete phase of OT&E is a prerequisite to startup of the production line. The milestone decision authority (MDA) shall determine if OT&E is required prior to start-up of the production line. If there are two or more phases of OT-II, the final phase of OT-II is a formal OPEVAL. OPEVAL shall include a recommendation for fleet introduction and is a prerequisite for beyond LRIP (BLRIP) approval.

1.3.2.1.4 OPEVAL

Equipment/software introduced into the tested system for OPEVAL or FOT&E shall be production representative. See this instruction, enclosure (7), appendix III, paragraph 1.3.1.2, for software OPEVAL requirements. The level of system development shall be documented in the TEMP parts III and IV. OPEVAL shall

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commence upon the DA's certification of readiness for operational testing unless otherwise directed by CNO (N091) or if waivers are required (see this instruction, enclosure (3)). OPEVAL shall not begin until after completion of TECHEVAL and receipt and consideration of the TECHEVAL results by CNO (N091) and COMOPTEVFOR. The time allotted between completion of OPEVAL and the Milestone III decision must allow 90 days for preparing the evaluation report by COMOPTEVFOR plus any additional time required by the DA to plan for discrepancy correction. Requests for earlier reporting shall be made to CNO (N091) and shall be considered on a case-by-case basis. If production or fleet introduction is not approved at Milestone III, subsequent T&E shall be identified as further phases of DT-II and OT-II. If the system is approved for acquisition of additional LRIP quantities because significant deficiencies remain, CNO may schedule an "OPEVAL Phase II", rather than retest during FOT&E.

1.3.2.2 FOT&E

FOT&E is all OT&E after the final phase of OPEVAL.

1.3.2.2.1 OT-III

OT-III shall be conducted, if appropriate, to evaluate correction of deficiencies in production systems, to complete deferred or incomplete IOT&E, and to continue tactics development.

1.3.2.2.2 OT-IV

OT-IV shall be scheduled and conducted to evaluate operational effectiveness and suitability for every program in which production models have not undergone previous OT&E.

1.3.2.3 OT Resource Requirements

COMOPTEVFOR shall advise the DA of OT&E resource requirements and maintain continuous close liaison with the DA over the life of the program. CNO (N091) shall resolve issues when there is a disagreement between the DA and COMOPTEVFOR.

1.3.2.4 OT Data

COMOPTEVFOR shall provide OT data to the DA and others upon request after issuance of the final test report. The exceptions to this policy are anomaly reports and deficiency reports which are explained in this instruction, enclosure (3).

1.3.2.5 Combined DT&E/OT&E

See this instruction, enclosure (3), paragraph 3.4.2, and enclosure (7), paragraph 1.3.1.6.

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1.3.3 Software Qualification Testing (SQT)

Post-Milestone III software testing, that is solely intended for a fleet release recommendation of software, shall be conducted by COMOPTEVFOR as SQT. SQT applies to software modifications of limited scope, as determined by CNO (N091), such as aircraft and weapons systems operational flight programs (OFPs) and other systems in which software provides a similar function. When a program is approved for SQT, CNO (N091) shall assign a TEIN, when required. If a new TEIN is assigned, a SQT TEMP shall be written using the title page format of this instruction, enclosure (7), appendix III, TEMP Cover Page Format For Software Qualification Testing Programs. For SQT, a statement of functionality prepared by the DA and approved by the program sponsor shall be used to develop the SQT TEMP.

1. **Software Release to the Fleet for Existing Hardware Platforms.** There is no need to re-evaluate hardware reliability, maintainability, availability, and logistics supportability for new software releases for existing hardware platforms, unless other deficiencies exist which require re-evaluation.
2. **Software Release to the Fleet for New Hardware Platforms.** An OPEVAL or FOT&E is required for full fleet release (FFR) of existing software ported to a new hardware platform.

1.3.3.1 Statement of Functionality

The PM shall forward a Statement of Functionality to COMOPTEVFOR, via the program sponsor, copy to CNO (N912). The program sponsor's endorsement will serve as validation of software requirements for that intended release. The statement of functionality shall define:

1. New capabilities of the improved software.
2. Corrections to previous deficiencies that the new software is intended to correct.
3. Any capabilities that were deleted.
4. Description of the breadth and depth of regression testing conducted.
5. Specific operational requirement(s) the new software will address.
6. Safety and/or security issues or functions added, modified, or deleted.

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1.3.4 TEMP

For all programs requiring OT&E, the TEMP is the controlling T&E management document, or T&E management portion of a single acquisition document. The TEMP shall be prepared in accordance with reference (d), appendix III.

1.3.5 Land Based Test Sites (LBTSS)

Use of these facilities during the early stages of development is encouraged. COMOPTEVFOR shall advise CNO (N091) on the adequacy of the LBTSS for the conduct of OT&E. Use of a LBTSS for OPEVAL or FOT&E shall be approved by CNO (N091). The following are not considered LBTSSs:

1. Test facilities used to develop individual equipments, subsystems, or software.
2. Ships and aircraft used as test beds.
3. General purpose engineering or test facilities.

1.3.6 Special T&E Considerations

1.3.6.1 T&E of Ships

CNO (N091) shall determine when a new ship requires full ship OT&E. DT&E and IOT&E prior to Milestone II shall normally address T&E of individual, new, or modified shipboard systems. T&E on individual weapon systems, as well as T&E at LBTSSs, shall be a primary focus during testing. For prototype or lead ship acquisition programs, T&E shall be conducted on the prototype or lead LRIP ship as well as on individual systems.

1.3.6.2 T&E of Space Systems

Since prototype satellites are often launched as operational satellites, T&E for space systems emphasizes DT&E. Once in orbit, any test of the satellite is also a test of the ground links and other peripheral equipment. For very large systems, nonflying qualification models may be built for DT&E, and are often used as the core of LBTSSs to develop the earth terminals.

1.3.6.3 T&E of Modifications

The recommendations of COMOPTEVFOR, the DA, the CNO resource and program sponsor(s), and INSURV (where applicable) shall be considered by CNO (N091) in determining the scope of testing.

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1.3.6.4 T&E of Computer Resources

Computer resources testing shall be documented in the program TEMP. Planning, programming, and budgeting of computer resources T&E shall be within the context of overall system development. The DA shall provide COMOPTEVFOR any program plans relating to computer resource T&E considerations.

Standard embedded computer resources (SECR) are computer resources acquired as a standard commodity for use in other systems. Consequently, the use of SECR in DON is no longer required in new systems, but shall be supported in deployed systems and systems currently being procured with SECR. For those host systems still using SECR, the T&E procedures of this paragraph shall be followed. SECR does not include application software. SECR operational effectiveness and suitability is not normally evaluated separately from the operational effectiveness and suitability of the host system. OT&E of SECR on a stand-alone basis is not appropriate. Initial SECR acquisition shall include a complete DT&E program ending with a TECHEVAL, which shall be conducted on a production representative system in an operational environment. The results of these tests shall provide the basis for SECR LRIP decisions. OPTEVFOR shall participate in SECR DT&E and provide assessments, as appropriate, to the CNO and the MDA. The specific role of OPTEVFOR in DT&E shall be established in the SECR TEMP.

1.3.6.5 T&E of Non-Developmental Items/Commercial Off-The-Shelf (NDI/COTS)

Prior to an NDI/COTS acquisition decision, the DA, with the assistance of COMOPTEVFOR, shall assess the adequacy of any previously conducted DT&E, OT&E, contractor, or other source data and provide recommendations to CNO (N091) on the need for additional T&E requirements. When the procurement of a system developed or tested by a non-DON DA is being planned, a memorandum of understanding (MOU) between the activities involved will address the acceptance of prior T&E results. If additional T&E is required, the DA shall request initiation of a T&E program through TEIN assignment.

1.3.6.6 T&E of Warfare Systems

T&E of acquisition programs designated as warfare systems shall include testing to demonstrate that specifications and standards identified by the Space and Naval Warfare Systems Command (SPAWARSYSCOM), Warfare Systems Architect (WSA), and Warfare Systems Engineer (WSE) have been met.

1.3.6.7 OPTEVFOR Tactics Guides

COMOPTEVFOR shall issue a "Tactics Guide" for systems whenever the information gained in OT&E and by other means is useful to ship and aircraft commands and commands charged with

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subsequent tactics development.

1.3.6.8 Extension of Application

An extension of application eliminates the requirement for OPEVAL by COMOPTEVFOR for the common system, subsystem, or equipment. Concurrence of the suitability of extension of application shall be obtained via COMOPTEVFOR. Extension of application does not eliminate the need to obtain fleet introduction approval from the program sponsor. A period of FOT&E shall be considered to verify that integration of the system, subsystem, or equipment into the host platform has not degraded performance. Following FOT&E, the program sponsor shall determine if full fleet introduction or installation is appropriate.

1.3.6.9 T&E of Evolutionary Acquisition (EA) Systems

References (d), (e), and this instruction are the primary guides for developing an EA strategy. Operational testing requirements for EA programs may preclude updating the TEMP in a timely manner. For EA programs, the initial TEMP shall comply with reference (d), appendix III. DT&E and OT&E shall concentrate on the T&E required for the basic core and the first increment. TEMP annexes shall be used for all subsequent increment testing. The specific format for the annexes shall be coordinated with CNO (N912). The program ORD shall reflect the changes to system requirements prior to TEMP update or revision. A phased OPEVAL approach shall be considered to support an EA strategy. FOT&E or SQT shall be considered between increments when software releases require testing by COMOPTEVFOR.

1.3.6.10 T&E of Software

Software shall be operationally tested in the system in which the software application is installed or implemented when fielded. The software to be used for OPEVAL and FOT&E shall be the software intended for fleet use. Software improvements shall be reflected in sequential releases. Software releases shall fall into three categories: major, minor, or maintenance. CNO (N091) shall resolve issues on the category of a software release as it relates to T&E.

1.3.6.10.1 Major Releases

Major releases shall require operational testing by COMOPTEVFOR. Such releases involve a change that adds new functions or warfare capabilities, interfaces with a different weapon system, redesigns the software architecture, ports the software to a new hardware platform, or rewrites the software in a different language.

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1.3.6.10.2 Minor Releases

Minor releases are improvements that do not add any significant functions or interfaces and shall be tested by COMOPTEVFOR if requested by the PM and approved by CNO (N091). Numerous minor releases can lead to degraded software reliability and performance. In such cases, OPTEVFOR operational testing shall be considered by the PM or may be directed by CNO (N091).

1.3.6.10.3 Maintenance Releases

Maintenance releases are "fixes" for minor problems and shall not require testing by COMOPTEVFOR. However, COMOPTEVFOR testing is appropriate when maintenance releases are so numerous as to jeopardize the reliability and performance of the software.

1.3.6.11 Verification of Corrected Deficiencies In Previous OT

This evaluation shall apply to only those COIs that have been corrected and the evaluation shall not require end-to-end testing of the complete system. The DA shall submit retesting requests to CNO (N091) with an info copy to COMOPTEVFOR. The TEMP need not be updated/revised prior to a verification of correction of deficiencies. Rather, the verification of correction of deficiencies and its results shall be incorporated in the next scheduled TEMP update/revision.

1.3.6.12 Modeling and Simulation (M&S)

M&S refers to computer-based modeling and simulation, hardware-in-the-loop hybrid simulators, and person-in-the-loop hybrid simulators. OT&E shall not be based exclusively on computer modeling. A verification, validation, and accreditation process with supporting documentation shall be required to accredit the model. COMOPTEVFOR shall accredit all models used to supplement OT. Operational testers shall be involved early in M&S planning to develop test scenarios and define test range, target, threat, and test article requirements for incorporation in the TEMP. Examples of when M&S may be used include:

1. To assess the adequacy of future test plans.
2. To assess performance against threats for which there currently is no suitable target.
3. To adequately test complex systems in dense combat environments.

1.3.6.13 Quick Reaction Assessment (ORA)

When operational necessity dictates, it may be required to modify the established operational testing process to rapidly achieve a rapid capability in the fleet (see related rapid

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deployment capability (RDC) process in this instruction, enclosure (1), paragraph 1.9). In such cases, the program sponsor may obtain a quick COMOPTEVFOR assessment of operational considerations and system capabilities. If such an assessment is desired the program sponsor shall request a QRA from CNO (N091), info COMOPTEVFOR. When approved, COMOPTEVFOR shall conduct the assessment and issue a report as soon as possible with interim information if needed. A QRA shall be used by COMOPTEVFOR to assess operational effectiveness and suitability. The following information shall be included in the QRA request:

1. The purpose of the assessment and, specifically, what questions the program sponsor wants answered.
2. The length of time available for the assessment.
3. The funding available for the assessment.

1.3.6.14 Joint Interoperability

For programs requiring joint interoperability, joint interoperability COIs shall be used to address effectiveness during operational testing. Joint interoperability requirements shall be addressed in the ORD. When joint interoperability is not addressed in the ORD, the ORD shall be updated for all milestones to include joint interoperability requirements for the system, or a memorandum shall be issued by CNO (N8) which explicitly states that "no joint interoperability requirements exist." For SQT, the statement of functionality shall be used to state joint interoperability requirement.

1.3.6.15 Environmental Protection

Testing shall be planned to ensure compliance with applicable environmental requirements including the National Environmental Policy Act (NEPA). References (f) and (g) shall be used to ensure that test planning, resource allocation, site selection, and execution are performed in a manner that minimizes impact on the environment. Requirements for special environmentally compliant facilities, tools, and methods shall be identified early by the DA and COMOPTEVFOR to allow for funding and development. The results of these requirements shall be outlined in the environmental, safety, and health evaluation and those aspects which directly affect testing shall be addressed in the TEMP as limitations or conditions of the testing.

1.3.7 RDT&E Support

RDT&E support is provided by operational forces to the DA, COMOPTEVFOR, INSURV, or a research and development (R&D) agency, for the accomplishment of T&E. RDT&E support shall not be provided except under the provisions of this instruction.

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1.3.7.1 Levels of Support

Three levels of RDT&E support are as follows:

1. Dedicated support - precludes employment of the supporting unit(s) in other missions.
2. Concurrent support - permits employment of the supporting unit(s) in activities other than RDT&E support, but could have an operational impact upon unit employment.
3. Not-to-interfere basis (NIB) support - permits RDT&E operational employment of the supporting unit(s) without significant interference with primary mission accomplishment.

1.3.7.2 RDT&E Support Approval

CNO (N091) shall approve RDT&E support requirements from two inputs:

1. Updated quarterly DT&E service requests from PEOs/SYSCOMs/DRPMS based on requirements established in TEMPs, Non-Acquisition Program Definition Documents (NAPDDs), or other test documentation.
2. Updated quarterly OT&E requests from COMOPTEVFOR.

1.3.7.3 Requests for RDT&E Support

RDT&E support requirements shall be submitted to CNO (N912), with a copy to COMOPTEVFOR, and shall be updated on a quarterly basis beginning 9 months prior to the quarter in which services are needed (See Deskbook (DON Section) for formats). This ensures requirements are addressed at fleet employment scheduling conferences. CNO (N912) shall be notified immediately of any support cancellations.

1.3.7.4 Unscheduled RDT&E Support Requirements

RDT&E support requests received after the 9-month deadline (paragraph 1.3.7.3) shall be postponed to the following quarter unless the urgency is justified in writing by the program sponsor and submitted to CNO (N091). Unscheduled RDT&E support requirements shall be submitted by message to CNO (N912) and the program/resource sponsor with info copies to the Fleet Commanders in Chief (FLTCINC) and commands involved.

1.3.7.5 Fleet Support Priorities

The determining factor in assigning priorities shall be the urgency of maintaining the RDT&E schedule. CNO (N091) shall assign a fleet support priority, as defined below, each quarter

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to all RDT&E support programs in the CNO quarterly RDT&E support requirements.

1. Priority ONE - support takes precedence over normal fleet operations. RDT&E support requiring the degree of urgency to assign a priority ONE shall be requested in writing by the program sponsor, without delegation. This request shall contain justifying information including: the next milestone and its date, the decision forum, the impact should the milestone slip, and the date of the latest approved TEMP.
2. Priority TWO - support takes precedence within normal fleet operations.
3. Priority THREE - normal fleet operations take precedence over support.

1.3.7.6 RDT&E Support Scheduling

COMOPTEVFOR shall coordinate RDT&E support scheduling for CNO.

1.3.7.7 Conduct of At-Sea T&E

The operational test coordinator (OTC), or designated representative, shall be responsible for the conduct of at-sea OT&E. The DA shall be responsible for the conduct of at-sea DT&E. They shall be guided by the priorities established in paragraph 1.3.7.5 of this appendix.

1.3.8 T&E Funding Responsibility

1.3.8.1 Developing Activity (DA) Responsibilities

The DA shall plan, program, budget, and fund the costs of all resources identified in the approved TEMP except as noted below. Operating costs for VX squadrons for DT&E and OT&E will be provided on a reimbursable basis by the DA. Funds for OT&E shall be transferred to COMOPTEVFOR for distribution as required. The DA shall not be required to fund:

1. Fleet operating costs for RDT&E support,
2. Fleet travel for training,
3. Non-program-related OPTEVFOR travel and administrative costs, and
4. Non-program-related INSURV travel and administrative costs.

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1.3.8.2 FLTCINC Responsibilities

FLTCINCs shall plan, program, budget, and fund fleet travel for training, operating costs for RDT&E support provided by fleet units, and all costs of OT-IV except procurement costs of the systems tested and OPTEVFOR costs.

1.3.8.3 INSURV Responsibilities

INSURV shall plan, program, budget, and fund INSURV travel costs and costs not related to programs under test.

1.3.8.4 Non-Acquisition Programs

Responsibilities for T&E costs for non-acquisition programs are the same as those above. The R&D agency has responsibilities equivalent to those of the DA.

1.3.8.5 Waivers

Waivers of these funding requirements shall be requested, when necessary, from CNO (N82) (see this instruction, enclosure (1), paragraph 1.3.6).

1.3.9 T&E Identification Number (TEIN)

1.3.9.1 TEIN Assignment

CNO (N091) shall assign a TEIN to each DA's program. The recommended format for a TEIN request is provided in the Deskbook (DON Section). Requests shall be forwarded via the program sponsor. These numbers shall be assigned for the life of the program. Six types of programs shall be identified:

1. ACAT programs.
2. Tactics programs (Code "T").
3. Software Qualification Programs (Code "S").
4. OSD-Directed joint T&E programs (Code "J").
5. Non-acquisition programs (Code "K").
6. Foreign comparative testing (FCT) programs (Code "F"), only when fleet services will be required to support testing.

1.3.9.2 Required Documentation

TEINs shall not be assigned to programs that do not have approved documentation. Minimum documentation requirements are:

1. An approved ORD for ACAT programs.

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2. A NAPDD for non-acquisition programs (when required by this instruction).
3. Documentation as discussed in this instruction, enclosure (1), paragraph 1.3.6, for technology based programs.
4. Designation as a Software Qualification Program.

By endorsement, the program sponsor shall ensure the request for TEIN assignment is supported by a valid ORD, NAPDD or RDC.

1.3.9.3 Program Groups

TEINs shall be structured for generic project groups and subprojects. Generic project groups shall be consolidated by identifying the basic project and functionally related sub-projects. If the project for which a TEIN is being requested is a sub-project of an existing project group, it shall be so noted and the generic project number shall be included. Likewise, multiple TEINs may be requested in a single letter.

1.3.9.4 Consolidated Cryptologic Programs (CCP)

Assignment of CCP TEINs shall be in accordance with the following procedures:

1. Commander Naval Security Group (COMNAVSECGRU) shall review draft project baseline summary one (PBS-I) on new CCP programs.
2. If COMNAVSECGRU determines that the system has significant and continuous Navy tactical implications, the PBS-I will be sent to COMOPTEVFOR for review.
3. If COMOPTEVFOR concurs, COMNAVSECGRU shall include the requirement for Navy operational testing in PBS-I comments to the National Security Agency and forward a recommendation for TEIN assignment to CNO (N912).

1.3.9.5 Inactive TEINs

CNO (N912) shall, with DA and program sponsor review, cancel TEINs which have been inactive in excess of 1 year and/or require no further testing.

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References: (a) DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," 15 Mar 96 (NOTAL)

2.1 TEMP Processing and Cover Sheets

This instruction, enclosure (7), appendix III contains the Navy TEMP cover sheet formats for ACAT I, II, III, and IV programs on the following pages after paragraph 2.7.

The OPNAV implementation procedures for preparing, endorsing, and approving Navy TEMPs are described in the following paragraphs.

2.2 TEMP Timing

Final TEMP approval should occur at least 30 days prior to the applicable testing or the next milestone. Accordingly, the DA should allow 30 days for COMOPTEVFOR and OPNAV to review the draft and 30 days to incorporate review comments and to route the TEMP for signatures.

For OSD oversight programs, a draft TEMP shall be submitted to OSD at least 65 days prior and a Navy-approved smooth TEMP 30 days (for final signature review) prior to the next milestone event.

2.3 TEMP Drafting/Submitting

The DA drafts the TEMP with RO and COMOPTEVFOR participation. The PM/DA shall draft the LFT&E section of part IV of the TEMP. COMOPTEVFOR is responsible for drafting part I, paragraph c; part IV; and inputs to applicable sections of part V. Part IV of the TEMP may not be changed without COMOPTEVFOR concurrence. The entire draft TEMP is sent to CNO (N912) for OPNAV review (ACAT I, II, and III). ACAT IVT draft TEMPs shall be sent to the applicable program sponsor for review and to COMOPTEVFOR for review and endorsement.

1. Requirements developed in the analysis of alternatives and incorporated in the ORD shall be listed in the TEMP.
2. CNO (N912) shall distribute copies of the draft TEMP to the applicable program sponsor, CNO (N4), CNO (N6), CNO (N8), and ASN(RD&A) for review and comment. All comments shall be returned to CNO (N912) for review and consolidation. CNO (N912) shall send consolidated TEMP comments, with rationale for all recommended

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changes, to the DA for incorporation into the final TEMP. If the program is subject to OSD T&E oversight, CNO (N912) shall deliver appropriate copies to OSD in accordance with reference (a). CNO (N091) is the single OPNAV point of contact with OSD for TEMP coordination.

2.4 TEMP Approval

CNO (N091) will resolve specific issues, and after resolution, the DA and COMOPTEVFOR shall sign and date the smooth TEMP and submit it to the program sponsor to continue the approval process. Sample TEMP cover pages for Navy programs are provided in this appendix on the pages following paragraph 2.7 below. A separate Navy TEMP cover sheet format is provided for software qualification testing. [Note: Use the cover page in this appendix on the page following paragraph 2.7 below, for all Navy programs with OSD T&E oversight.]

2.5 TEMP Distribution

The DA distributes approved TEMPs to all appropriate offices and commands. Approved TEMPs for ACAT IVM programs shall be sent to the applicable program sponsor and COMOPTEVFOR for information.

2.6 TEMP Updates

TEMP reviews, updates, or revisions are required for each milestone event. If the TEMP is still current, CNO (N091) will provide a written statement to the MDA that no changes to the TEMP are required. If not current, the DA shall prepare necessary changes or revisions.

2.7 TEMP Changes and Revisions

For minor changes, the requirement for a new TEMP signature page will be determined by CNO (N091) prior to distribution. TEMP copies held by other agencies shall be updated to accurately reflect changes. As a minimum, TEMP changes shall:

1. Contain a record of change page and a page containing a short summary of the changes.
2. Use change bars in the right margin.
3. Denote all pages containing changes with the notation "CH-___" at the upper right corner.

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4. Show the TEIN at the upper right on each page indicating which change version (e.g., all changes are numbered consecutively, TEMP 0527 CH-1). All changes are numbered.

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TEMP Cover Page Format For ACAT II Programs

TEMP NO. [Insert TEIN] REV. _____ [AS APPLICABLE]
 [PROGRAM TITLE]
 Acquisition Category (ACAT) II
 Program Element No. _____
 Project No. _____

SUBMITTED BY:

PROGRAM MANAGER _____

DATE _____

CONCURRENCE:

SYSCOM COMMANDER/PEO/DRPM _____

DATE _____

COMOPTEVFOR _____

DATE _____

PROGRAM SPONSOR (Flag) _____

DATE _____

APPROVED:

CNO (N091) _____

DATE _____

ASN(RD&A) _____

DATE _____

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TEMP Cover Page Format For ACAT IV Programs

TEMP NO. [Insert TEIN] REV. _____ [AS APPLICABLE]
[PROGRAM TITLE]
Acquisition Category (ACAT) IV
Program Element No. _____
Project No. _____

SUBMITTED BY:

PROGRAM MANAGER _____ DATE _____

CONCURRENCE:

COMOPTEVFOR _____ DATE _____
[for ACAT IVT only]

APPROVED:

MILESTONE DECISION AUTHORITY _____ DATE _____

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**TEMP Cover Page Format For
Software Qualification Testing Programs**

TEMP NO. [Insert TEIN] REV. _____ [AS APPLICABLE]
SOFTWARE QUALIFICATION TESTING FOR
[PROGRAM TITLE]
Program Element No. _____
Project No. _____

SUBMITTED BY:

PROGRAM MANAGER

DATE

CONCURRENCE:

COMOPTEVFOR

DATE

CNO (N091)

DATE

APPROVED:

SYSCOM COMMANDER/PEO/DRPM

DATE

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Navy Certification of Readiness for OT Message Content

The message certifying a system's readiness for OT&E shall contain the following information:

1. Name of the system
2. OT- [phase]
3. TEMP [number]
4. TEMP approval date
5. For software testing, identify the specific release to be tested.
6. Waivers (identify criteria in SECNAVINST 5000.2B to be waived, if any; if none, state "none"). (SECNAVINST 5000.2B shall be Ref A of the certification message)
7. State projected limitations that waived criteria will place on upcoming operational testing.
8. State when waived criteria will be met.
9. Deviations (identify deviations from a testing requirement directed in the TEMP; if none, state "none".). (The TEMP shall be Ref B of the certification message)
10. State projected limitations that waived TEMP requirement will place on upcoming operational testing.
11. State potential waiver impact on fleet use.
12. State when waived requirement will be available for subsequent operational testing.
13. Additional remarks.