DEPARTMENT OF THE NAVY
COMMANDER OPERATIONAL TEST AND EVALUATION FORCE
7970 DIVEN STREET
NORFOLK, VIRGINIA 23505-1498

COMOPTEVFORINST 3980.1
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COMOPTEVFOR INSTRUCTION 3980.1

Subj: OPERATIONAL TEST DIRECTOR'S MANUAL

Encl: (1) Operational Test Director's Manual

1. Purpose. Establish policy and guidance on all aspects of operational test and evaluation for the Operational Test Director (OTD). This instruction is a complete revision and should be reviewed in its entirety.

2. Cancellation. COMOPTEVFORINST 3960.1H and all COMOPTEVFOR Policy and Information Notices (PIN) prior to and including PIN 05-2.

3. Discussion. This revision includes extensive and substantive changes to the OTD Guide, now renamed the OTD Manual, including the incorporation of multiple COMOPTEVFOR PINs. The change from "Guide" to "Manual" is intended to highlight the directive nature of the enclosed policies and procedures.

4. Action

a. This manual is published for use by OPTEVFOR OTDs, operational test coordinators, and their chain of command.

b. Personnel noting required or desired changes to this instruction or the enclosed OTD Manual should provide recommended changes via their chain of command to the COMOPTEVFOR Policy Director, Code 01B.

c. As required, a PIN may be published to immediately implement a change to command Test and Evaluation (T&E) policy. Published PINs will remain in effective until included in the next formal change to the OTD Manual.

5. Distribution. This manual is not distributed in paper form. It is available electronically in the following formats: Microsoft Word and Adobe Acrobat on the command's LAN in the

OT&E Reference Library; and on the command's website at http://www.cotf.navy.mil/otdmanual.htm as an Adobe Acrobat file.

M. J. STAHL
Deputy

Distribution: (COMOPTEVFORINST 5216.2R)
Lists I, II & III

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Acronyms and Abbreviations

6PP	Six-Part Paragraph
AAP	Abbreviated Acquisition Program
ACAT	Acquisition Category
ACOS	Assistant Chief of Staff
ACTD	Advanced Concept Technology Demonstration
AFWTF	Atlantic Fleet Weapons Test Facility
ALSP	Acquisition Logistic Support Plan
A_o	Operational Availability
AO	Action Officer
AOA	Analysis of Alternatives
APB	Acquisition Program Baseline
APN	Aircraft Procurement, Navy
ARB	Acquisition Review Board
ASD(NII)	Assistant Secretary of Defense for Networks and Information Integration
ASN RDA	Assistant Secretary of the Navy (Research, Development, and Acquisition)
AUTEC	Atlantic Undersea Test and Evaluation Center
BIT	Built-in Test
CAAS	Contractor Assistance and Advisory Service
CAE	Component Acquisition Executive
CCP	Consolidated Cryptologic Program
CD	Capabilities Document
CDD	Capability Development Document
CIO	Chief Information Officer
CL	Confidentiality Level
CNO	Chief of Naval Operations
CO	Commanding Officer
COI	Critical Operational Issue
COMLANTFLT	Commander, Atlantic Fleet
COMOPTEVFOR	Commander, Operational Test and Evaluation Force
COMSUBLANT	Commander, Submarine Fleet Atlantic
COMSUBPAC	Commander, Submarine Fleet Pacific
CONOPS	Concept of Operations
COR	Contracting Officer Representative
CPD	Capabilities Production Document
CS	Contracted Service
CT	Contractor Test(ing)
CTF	Commander Task Force

Acronyms and Abbreviations (Cont)

CTP	Comparative Test Program
DA	Developing Agency
DED	Demonstration Execution Document
DGSIT	Deploying Group System Integration Testing
DIRLAUTH	Direct Liaison Authorization
DoN	Department of the Navy
DoD	Department of Defense
DOT&E	Director of Operations Test and Evaluation
DOTMLPF	Doctrine, Organization, Training, Material, Leadership, Personnel, and Facilities
DR	Decision Review
DRPM	Direct Reporting Program Manager
DT	Developmental Test(ing)
DT&E	Developmental Test and Evaluation
DVAL	Data Link Vulnerability Assessment
EA	Evolutionary Acquisition
ECM	Electronic Countermeasure
ECP	Engineering Change Proposal
EMI	Electromagnetic Interference
EOA	Early Operational Assessment
EU	Extended Use
EXTORP	Exercise Torpedo
FA	False Alarm
FAh	False Alarms per Hour
FAR	Federal Acquisition Regulation
FHN	Family Housing, Navy
FMC	Full Mission Capable
FMR	Financial Management Regulations
FOT&E	Follow-on Operational Test and Evaluation
FPIN	Financial Policy and Information Notice
FRP	Full Rate Production
FRPD	Full Rate Production Decision
FSA	Field Support Activity
FXP	Fleet Exercise Publication
FWE	Foreign Weapons Evaluation
HMX	Marine Helicopter Squadron
HQ	Headquarters

Acronyms and Abbreviations (Cont)

IA	Information Assurance
IAP	Integrated Assessment Plan
ICD	Initial Capabilities Document
ID	Identification
ILSP	Integrated Logistic Support Plan
INSURV	Inspection and Survey
IOC	Initial Operational Capability
IOT&E	Initial Operational Test and Evaluation
IREP	Integrated Refractive Effects Prediction
ISIC	Immediate Superior in Command
IT	Integrated Test(ing)
ITT	Integrated Test Team
JCIDS	Joint Capabilities Integrations Development System
JCTD	Joint Capabilities Technology Demonstration
JITC	Joint Interoperability Test Command
JT	Joint Test
JT&E	Joint Test and Evaluation
JMETL	Joint Mission Essential Task List
KMS	Knowledge Management System
KPP	Key Performance Parameter
LAN	Local Area Network
LBTS	Land-Based Test Site
LFT	Live Fire Testing
LFT&E	Live Fire Test and Evaluation
LMUA	Limited Military Utility Assessment
LOI	Letter of Instruction
LOO	Letter of Observation
LRIP	Low Rate Initial Production
LSA	Logistic Support Analysis
M&S	Modeling and Simulation
M-DEMO	Maintenance Demonstration
MAC	Mission Assurance Category
MAIS	Major Automated Information System
MaxCMTOMF	Maximum Corrective Maintenance Time for Operational Mission Failures
MBTD	Mission-Based Test Design
MC_{MA}	Mission Capability by Primary Mission Area

Acronyms and Abbreviations (Cont)

MCMTOMF	Mean Corrective Maintenance Time for Operational Mission Failures
$MCMTOMF_{SW}$	Mean Corrective Maintenance Time for Operational Mission Faults - Software
MCN	Military Construction, Navy
MCOTEA	Marine Corps Operational Test and Evaluation Activity
MCR	Mission Completion Rate
MDA	Milestone Decision Authority
MDAP	Major Defense Acquisition Program
MESM	Mission Essential Subsystem Matrix
MET	Mission Essential Task
METL	Mission Essential Task List
METOC	Meteorological/Oceanographic
MFHBOMF	Mean Flight Hours Between Operational Mission Failures
MFHBUM	Mean Flight Hours Between Unscheduled Maintenance
MNS	Mission Need Statement
MOA	Memorandum of Agreement
MOE	Measure of Effectiveness
MOP	Measure of Performance
MOS	Measure of Suitability
MOT&E	Multiservice Operational Test and Evaluation
MPN	Military Personnel, Navy
MR	Maintenance Ratio
MRT	Mean Reboot Time
MRTc	Mean Reboot Time, Cold
MRTw	Mean Reboot Time, Warm
M&S	Modeling and Simulation
MS	Milestone
MTBOMF	Mean Time Between Operational Mission Failures
$MTBOMF_{HW}$	Mean Time Between Operational Mission Failures, Hardware
$MTBOMF_{sw}$	Mean Time Between Operational Mission Faults, Software
$MTBOMF_{SYS}$	Mean Time Between Operational Mission Failures, System
MTBUM	Mean Time Between Unscheduled Maintenance
MTP	Management and Transition Plan
MUA	Military Utility Assessment

Acronyms and Abbreviations (Cont)

NATO	North Atlantic Treaty Organization
NAVAIRSYSCOM	Naval Air System Commander
NAVMETOCCEN	Naval Meteorology and Oceanography Center
NIB	Not-to-Interfere Basis
NLT	No Later Than
NMC	Not Mission Capable
NMET	Navy Mobile Environmental Team
NOI	Notice of Intent
NPDM	Navy Program Decision Meeting
NSA	National Security Agency
NTP	Navy Training Plan
NWCF	Navy Working Capital Funds
NWP	Naval Warfare Publication
NWS	New Weapons System
O&MN	Operations and Maintenance, Navy
O&MNR	Operations and Maintenance, Navy Reserve
OA	Operational Assessment
OAR	Operational Test Agency Assessment Report
OCE	Officer Conducting the Exercise
OER	Operational Test Agency Evaluation Report
OFER	Operational Test Agency Follow-on Evaluation Report
OM	Operational Manager
OMAR	Operational Test Agency Milestone Assessment Report
OMB	Office of Management and Budget
OMF	Operational Mission Failure
ONI	Office of Naval Intelligence
ONR	Office of Naval Research
OOC	Observation of Operational Capability
OPAREA	Operating Area
OPCON	Operational Consideration
OPEVAL	Operational Evaluation
OPN	Other Procurement, Navy
OPORD	Operations Order
OPSEC	Operations Security
OPTEVFOR	Operational Test and Evaluation Force
ORD	Operational Requirements Document
OSD	Office of the Secretary of Defense
OT	Operational Test(ing)
OT&E	Operational Test and Evaluation
OTA	Operational Test Agency

Acronyms and Abbreviations (Cont)

OTC	Operational Test Coordinator
OTD	Operational Test Director
OTRR	Operational Test Readiness Review
OUA	Operational Utility Assessment
OTG	OPTEVFOR Tactics Guide
PANMC	Procurement of Ammunition, Navy and Marine Corps
P_{cd}	Probability of Correct Detection
P_{cfi}	Probability of Correct Fault Isolation
PDA	Personal Digital Assistant
PEO	Program Executive Office/Officer
P_h	Probability of Hit
P_k	Probability of Kill
PIN	Policy and Information Notice
PIT	Platform Information Technology
P_s	Probability of Survival
PM	Program Manager
PMC	Partial Mission Capable
POC	Point of Contact
POP	Project Operations
QRA	Quick Reaction Assessment
QRT	Quick Reaction Test
R	Reliability
RALOT	Risk Assessment Level of Test
RDT&E	Research Development Test and Evaluation
RDT&EN	Research Development Test and Evaluation - Navy
RDA	Research, Development, and Acquisition
RPN	Reserve Personnel, Navy
S&T	Scientific and Technological
SAT	Satisfactory
SCN	Ship Construction, Navy
SDD	System Development and Demonstration
SDTS	Self-Defense Test Ship
SECNAV	Secretary of the Navy
SELEX	Selected Exercise
SEPCOR	Separate Correspondence
SES	Senior Executive Service
SIGSEC	Signal Security
SME	Subject Matter Expert

Acronyms and Abbreviations (Cont)

SOF	Statement of Functionality
SOW	Statement of Work
SPECWAR	Special Warfare
SQT	Software Qualification Test(ing)
SSA	Software Support Activity
STAR	System Threat Assessment Report
SYSCOM	Systems Command
T&E	Test and Evaluation
TA	Threat Assessment
TAD	Temporary Assigned Duty
TAMD	Threat and Air Missile Defense
TECG	Test and Evaluation Coordinating Group
TECHEVAL	Technical Evaluation
TEIN	Test and Evaluation Identification Number
TEMP	Test and Evaluation Master Plan
TEPS	Test and Evaluation Program System
TM	Technical Manager
TPWG	Test Planning Working Group
TTP	Tactics, Techniques, and Procedures
UJTL	Universal Joint Task List
UNSAT	Unsatisfactory
UNTL	Universal Navy Task List
USAF	United States Air Force
USC	Unites States Code
USD(AT&L)	Under Secretary of Defense (Acquisition, Technology, and Logistics)
USMC	United States Marine Corp
USNTPS	United States Naval Test Pilot School
USSOCOM	United States Special Operations Command
USW	Undersea Warfare
VADM	Vice Admiral
VCD	Verification of Correction of Deficiencies
VX	Air Test Squadron
VX-1	AIRTEVRON ONE
VX-9	AIRTEVRON NINE
WIPT	Working Integrated Product Team
WPN	Weapon Procurement, Navy
XM	Transition Manager

CHAPTER 1

INTRODUCTION

101. ADMIRAL'S MESSAGE

The mission of the Operational Test and Evaluation Force (OPTEVFOR) is to independently and objectively evaluate the operational effectiveness and suitability of new and improved warfighting capabilities. The Chief of Naval Operations (CNO) has tasked us to ensure that new capabilities developed for the Fleet undergo a disciplined and rigorous Operational Test and Evaluation (OT&E) before introduction. In delivering this service, we maintain the highest standards of integrity and objectivity.

102. PURPOSE

The purpose of this manual is to familiarize the reader with the role of OT&E conducted in connection with the acquisition and procurement of naval weapons and warfare support systems, and to prescribe policies and procedures for the planning, conduct, and reporting of OT&E of new and improved systems.

103. BACKGROUND

By direction of the CNO, the Commander, Operational Test and Evaluation Force (COMOPTEVFOR) is chartered to conduct OT&E of systems in Acquisition Category (ACAT) I, II, III, and IVT procurement programs. OT&E is conducted in as near a realistic operational environment as possible with Fleet personnel operating and maintaining the system under test. Wherever possible, simulated hostile threat action is employed to stress the system and to provide pseudo-realism. Although operational experience of the naval personnel conducting OT&E is not specifically addressed in this manual, it is of utmost importance to the validity of OT&E results, conclusions, and recommendations. To that end, meticulous planning, preparation, prosecution, and reporting of OT&E are mandatory.

104. MISSION STATEMENT

As the independent agent for OT&E in the Navy's acquisition process, OPTEVFOR conducts OT&E in an operationally realistic environment. We will leverage existing Navy and joint events as practical to provide an assessment of system performance in a joint operational environment. We will advise the CNO on the operational effectiveness and suitability of new and improved warfighting capabilities, tactics, and procedures.

105. CORE VALUES

OPTEVFOR's core values include:

- The highest integrity in conducting tests and writing reports
- An objective viewpoint
- Competent evaluators
- Relevant, value-added products
- Operational expertise

106. STRATEGIC VISION

OPTEVFOR will provide evaluations of Department of Defense (DoD) warfighting products to ensure the capabilities delivered to the joint fighting forces are integrated, effective, suitable, and interoperable. The capabilities delivered will be tested in a joint operational environment by a highly skilled and trained diverse workforce in partnership with industry, academia, and fighting forces representatives.

107. COMMANDER'S FOCUS AREAS

The following four focus areas build upon the CNO guidance for 2007 and COMOPTEVFOR strategic goals:

- Workforce
- Process management
- Test design and execution
- Engagement in provider enterprise

CHAPTER 2

TEST AND EVALUATION CONCEPTS AND PROCESSES

201. INTRODUCTION

a. Per SECNAVINST 5000.2C, Test and Evaluation (T&E) programs will be structured to:

- Provide essential information for assessment of acquisition risk and for decisionmaking.
- Verify attainment of technical performance specifications and objectives.
- Verify that systems are operationally effective and suitable for intended use.

b. To accomplish these objectives, two principal types of T&E are conducted: Developmental Test and Evaluation (DT&E) and OT&E. Each is discussed in detail in SECNAVINST 5000.2C. The relationship between DT&E and OT&E is discussed in detail throughout this chapter**.** The Operational Test Director (OTD) has an important role to play in both DT&E and OT&E.

c. OT&E methodology is in the midst of two related, but separate transformations:

- Functional-based test design to Mission-Based Test Design (MBTD)
- Separate stand-alone test periods and strategies (whether combined with Developmental Testing (DT) or independent) to Integrated Test (IT) strategies

During this evolution of OT&E, OTDs will strive to transition to MBTD and IT strategies as soon as possible. Regardless of the strategy, there are numerous types of testing that occur during the development and fielding of a new system. The challenge for the OTD is to understand the entire testing continuum for the system and with that knowledge, to minimize redundant T&E requirements where possible without compromising Operational Test (OT) objectives.

d. This chapter will provide T&E concepts that apply to all testing strategies and methodologies.

202. PURPOSE OF OT&E

a. The purpose of Initial Operational Test and Evaluation (IOT&E) is to allow an accurate evaluation of the operational effectiveness and operational suitability of the weapon system in actual Fleet use and combat employment. Prior to IOT&E

(commonly referred to as Operational Evaluation (OPEVAL)), a new weapon system should have thoroughly proven its capability to meet technical specifications through DT&E, culminating in Technical Evaluation (TECHEVAL). COMOPTEVFOR's responsibility is to structure and conduct an IOT&E that will prove the weapon system's capability in a realistic operational environment when maintained and operated by Sailors, subjected to routine wear-and-tear, and employed in typical combat conditions against a simulated enemy who fights back. While DT&E deals principally with instrumented tests and statistically valid data, IOT&E deals with operational realism and the uncertainties of combat.

b. During IOT&E, efforts should be made to expose the weapon system to as many actual operational circumstances and scenarios as possible. The objective is not always to acquire statistically significant data, or a box score of successes and failures, (since replications are seldom possible), but rather to gain the most complete understanding possible of the weapon system's capabilities under stress. In technical testing, it is generally possible to state the purpose of the test with certainty. In OT, the value derived is often unplanned, resulting not from the basic purpose of the test, but from realistic aspects that were injected simply because they are likely to exist in actual Fleet or combat employment. Thus, OT involves more than mere scientific observation and data collection. Reasonable opportunity should be provided in test planning (chapter 6) for the unexpected to occur, as it usually does in combat.

203. DEFINITIONS OF T&E

a. DT&E. DT&E is planned and conducted by the Developing Agency (DA), usually a Systems Command (SYSCOM) or a Program Executive Officer (PEO). Per SECNAVINST 5000.2C, DT&E programs will:

- Identify potential operational and technological limitations of the alternative concepts and design options being pursued.
- Support the identification of cost-performance tradeoffs.
- Support the identification and description of design risks.
- Substantiate that contract technical performance and manufacturing process requirements have been achieved.
- Support the decision to certify the system ready for OT&E.

b. OT&E

(1) In the Navy, OT&E is planned and reported directly to CNO by COMOPTEVFOR. OT&E is required for all ACAT I, II, III, and IVT programs. Table 2-1 provides a description of the criteria for ACAT and Abbreviated Acquisition Programs (AAP).

(2) OT&E is not required for ACAT IVM or AAP programs per SECNAVINST 5000.2C. Written concurrence from COMOPTEVFOR is required for designation of a program as an ACAT IVM or AAP. OT&E has the following distinguishing characteristics:

Table 2-1. Description and Decision Authority for ACAT I-IV and AAPs

Acquisition Category	Criteria for ACAT or AAP Designation	Decision Authority
ACAT I	• Major Defense Acquisition Programs (MDAPs) (10 USC 2430) • RDT&E total expenditure >$365 million in FY 2000 constant dollars, or • Procurement total expenditure >$2.19 billion in FY 2000 constant dollars, or • USD(AT&L) designation as special interest	ACAT ID: USD(AT&L) ACAT IC: SECNAV, or if delegated, ASN RDA as the CAE
ACAT IA	• Major Automated Information Systems (MAIS) • Program costs/year (all appropriations) >$32 million in FY 2000 constant dollars, or • Total program costs >$126 million in FY 2000 constant dollars, or • Total life-cycle costs >$378 million in FY 2000 constant dollars • ASD(NII) designation as special interest	ACAT IAM: ASD(NII)/DoD CIO ACAT IAC: ASN RDA, as delegated by the DoD CIO
ACAT II	• Does not meet the criteria for ACAT I • Major systems (10 USC 2302(5)) • RDT&E total expenditure >$140 million in FY 2000 constant dollars, or • Procurement total expenditure >$660 million in FY 2000 constant dollars, or • ASN RDA designation as special interest • Not applicable to IT system programs	ASN RDA, or the individual designated by ASN RDA
ACAT III	• Does not meet the criteria for ACAT II or above • Weapon system programs: o RDT&E total expenditure ≤$140 million in FY 2000 constant dollars, or o Procurement total expenditure ≤$660	Cognizant PEO, SYSCOM Commander, DRPM, or designated flag officer or SES official

Table 2-1. Description and Decision Authority for ACAT I-IV and AAPs		
Acquisition Category	**Criteria for ACAT or AAP Designation**	**Decision Authority**
	million in FY 2000 constant dollars, and o Affects mission characteristics of ships or aircraft or combat capability • Information technology system programs: o Program costs/year ≥$15 million ≤$32 million in FY 2000 constant dollars, or o Total program costs ≥$30 million ≤$126 million in FY 2000 constant dollars, or o Total life-cycle costs ≤$378 million in FY 2000 constant dollars	ASN RDA, or designee, for programs not assigned to a PEO, SYSCOM, or DRPM
ACAT IVT	• Does not meet the criteria for ACAT III or above • Requires OT&E • Weapon system programs: o RDT&E total expenditure ≤$140 million in FY 2000 constant dollars, or o Procurement total expenditure ≤$660 million in FY 2000 constant dollars • Information technology system programs: o Program costs/year <$15 million, or o Total program costs <$30 million, or o Total life-cycle costs ≤$378 million in FY 2000 constant dollars	Cognizant PEO, SYSCOM Commander, DRPM, or designated flag officer, SES official, or PM ASN RDA, or designee, for programs not assigned to a PEO, SYSCOM, or DRPM
ACAT IVM	• Does not meet the criteria for ACAT III or above • Does not require OT&E as concurred with by OTA • Weapon system programs: o RDT&E total expenditure ≥$10 million ≤$140 million in FY 2000 constant dollars, or o Procurement expenditure ≥$25 million/year ≥$50 million total ≤$660 million total in FY 2000 constant dollars • Not applicable to information technology	Cognizant PEO, SYSCOM Commander, DRPM, or designated flag officer, SES official, or PM ASN RDA or designee for programs not assigned to a PEO, SYSCOM, or DRPM

Table 2-1. Description and Decision Authority for ACAT I-IV and AAPs		
Acquisition Category	**Criteria for ACAT or AAP Designation**	**Decision Authority**
	system programs	
Abbreviated Acquisition Program	• Does not meet the criteria for ACAT IV or above • Does not require OT&E as concurred with in writing by OTA • Weapon system programs: o Development total expenditure <$10 million, and o Production or services expenditure <$25 million/year, <$50 million total • Information technology system programs: o Program costs/year <$15 million, and o Total program costs <$30 million	Cognizant PEO, SYSCOM Commander, DRPM, or designated flag officer, SES official, or PM ASN RDA or designee for programs not assigned to a PEO, SYSCOM, or DRPM

RDT&E	Research, Development, Test, and Evaluation
USD(AT&L)	Under Secretary of Defense (Acquisition, Technology, and Logistics)
ASN RDA	Assistant Secretary of the Navy (Research, Development, and Acquisition)
CAE	Component Acquisition Executive
ASD(NII)	Assistant Secretary of Defense for Networks and Information Integration
CIO	Chief Information Officer
SES	Senior Executive Service
SYSCOM	Systems Command
DRPM	Direct Reporting Program Manager
OTA	Operational Test Agency
PM	Program Manager
SECNAV	Secretary of the Navy
USC	United States Code

(a) Threat-representative forces (friendly and opposing) will be used whenever possible, and will employ realistic tactics and targets.

(b) Typical users (Fleet personnel) are required to operate and maintain the system or item for OT under conditions simulating combat stress and peacetime conditions.

- Contractor operation of the system under test is not permitted in IOT&E and Follow-on Operational Test and Evaluation (FOT&E). For all OT phases prior to IOT&E, data collected from contractor operations may be used for risk assessments based on the OTD's determination of OT useable data.
- During early OT&E, maintenance by Fleet personnel is not always feasible. Maintainability data collected from observations of contractor maintenance may be used for operational risk assessments. On occasion, the Navy's maintenance plan states a continuing role for contractor personnel in organizational-level maintenance. When testing a system with an approved plan of this kind, contractor personnel participation is permitted exactly as specified in the approved plan, and their performance is subject to review and analysis just as if they were Sailors.

(c) The test article will be representative of the intended production equipment. It will also be installed as closely as possible, as is expected in the Fleet.

(d) Production or production-representative articles will be used for the dedicated phase of IOT&E that supports the post-Milestone (MS) C Full Rate Production (FRP) Decision Review (DR).

(e) Sufficient and accurate data must be recorded during the test to document all operationally significant system or equipment characteristics.

(f) OT&E also includes the evaluation and analysis of data from an operational viewpoint to assess or determine the operational effectiveness and operational suitability of a system.

204. APPARENT OVERLAP OF DT&E AND OT&E

DT&E and OT&E necessarily examine the same performance features of a system; however, their viewpoints are completely different. This fundamental difference (viewpoint) means that DT&E and OT&E actually are completely different; DT&E and OT&E normally differ in the way tests are conducted, what is being tested, the evaluation criteria and the test measurements, and the database. Table 2-2 illustrates this comparison.

Table 2-2. Apparent Overlap of DT&E and OT&E

How Tests are Conducted	
DT&E testing is properly conducted: • In a controlled environment that minimizes the chance that unknown or unmeasured variables will affect system performance • By technical personnel skilled at "tweaking" to maximize	OT&E testing is properly conducted: • In an operationally realistic environment (e.g., high seas, temperature extremes, high density electromagnetic environments) under conditions simulating combat stress and peacetime conditions

Table 2-2. Apparent Overlap of DT&E and OT&E	
performance • Against simulated threats tailored to demonstrate various aspects of specified system technical performance	• With Fleet operators and maintenance personnel • Against threats which replicate, as closely as possible, the spectrum of operational characters • Using Fleet tactics
Testing Subject/Topic	
DT&E tests a weapon or a "blackbox," whatever the development program involves. (Seldom does a development program involve a complete weapon system.)	OT&E tests total weapon systems. If a missile is being developed, OT&E does not test only the missile itself, but rather the missile system, which includes the firing platform; that platform's detection, classification, and targeting systems; the people who man it; logistical support; interfacing equipment; etc.
Evaluation Criteria	
DT&E – Technical criteria are parameters measured during controlled DT&E tests.	OT&E – Operational criteria are the CNO-provided minimum acceptable operational performance requirements (older programs) or measures of effectiveness/suitability (newer programs), or thresholds, which quantify the Critical Operational Issues (COI).
Measurement and Frequency	
DT&E • The DA generally knows what he/she wants to measure (some particular parameter: launch velocity; the number of g's pulled as the missile acquires; time to climb; etc.). • DT&E tests are structured to hold many things constant, isolate others, and allow measurement of one or two parameters of interest. • It is generally possible to verify data statistically through replication of tests.	OT&E • It is often not possible to specify measurements. • The objective is often simply to create combat conditions as closely as possible and record data as events unfold. • For aviation OT&E, with highly time-compressed test events and a high cost for OT&E, it is mandatory that OTDs know exactly what parameters of their system must be examined to resolve the specified COI. • OT&E cannot enjoy the luxury of isolating a variable. Methods of data capture must be devised during operational evolutions or during postoperation analysis. • It is often not possible to replicate data because interactions during tests are unique.
General Note: Data collection instrumentation used for DT should be reviewed to determine if anything new developed for the system, or if the data acquired during DT can assist in data collection during OT.	

205. TYPES OF OT

a. Operational Assessments (OA). The focus of an OA is to identify system enhancements and assess:

- Significant trends noted in development efforts
- Programmatic voids
- Areas of risk
- Adequacy of requirements from a testability perspective
- Capability of the system under test to meet performance goals in operational effectiveness and suitability at IOT&E

OAs can be made at any time using technology demonstrators, prototypes, mockups, or simulations, but do not substitute for the IOT&E necessary to support FRP decisions. An OA does not have to use production-representative articles. An MDAP or Office of the Secretary of Defense (OSD)-designated T&E oversight program requires an OA to support a Limited Rate Initial Production (LRIP) decision and can support other program reviews. All OAs are included in Part IV and V of the Test and Evaluation Master Plan (TEMP). For programs on the OSD T&E oversight list, the OA test plans require formal approval by Director, Operational Test and Evaluation (DOT&E). OAs do not support FRP DRs, Fleet release, or introduction recommendations. There are two types of OAs:

(1) OT-A (Early Operational Assessment (EOA)) is conducted during the Concept and Technology Development Phase. Results support decisionmakers at MS-B in determining whether to continue development and approve entry into the System Development and Demonstration phase of the acquisition cycle.

(2) OT-B (OA) is OT&E conducted during the System Development and Demonstration phase. OT-B may be subdivided into discrete phases (e.g., OT-B1, OT-B2, etc.). OAs will be conducted to discover areas that are a risk to successfully passing IOT&E. Results of OT-B assessments identify program enhancements and risks, and the final OT-B phase will support the MS-C LRIP decision by the Milestone Decision Authority (MDA).

b. IOT&E. OT-C is OT&E conducted on a production-representative test article during the Production and Deployment Phase of the acquisition cycle, and is a prerequisite for the FRP DR. COMOPTEVFOR makes a determination on operational effectiveness and operational suitability, and a recommendation regarding Fleet introduction.

c. Verification of Correction of Deficiencies (VCD). *VCD is not a major phase*, but is included as a phase of OT when necessary. A VCD is not a preplanned phase in the TEMP, but can be injected into the test program after a formal phase of OT to verify that certain deficiencies have been corrected. No TEMP update is required, and no new test plan is required; the VCD simply relies on pertinent parts of the test plan from the previous OT phase. A VCD must be tied to the previous phase of testing it applies to (i.e., a VCD for OT-B1 would be "OT-B1(VCD"). VCDs are done to assist the MDA in ensuring that the deficiencies cited as corrected by the PM from a previous

phase of OT have actually been corrected prior to the authority making an LRIP decision. This type of test will examine only those COIs that have been corrected and will not require end-to-end testing of the system. The purpose is to show the deficiencies as demonstrated corrected, demonstrated not corrected, or as not demonstrated (pre-IOT&E, no COI resolution). If a VCD enables us to resolve COIs (beyond IOT&E), then they should be listed as resolved in the VCD report, thereby reducing or eliminating the need for later phases of OT for the specific purpose of verifying the deficiency has been corrected. See Chapter 8, Evaluation Reports, for report requirements.

d. FOT&E. FOT&E is all OT&E conducted after the IOT&E. FOT&E is divided into two major phases:

(1) OT-D is FOT&E conducted after IOT&E (post-MS-C/FRP DR), using equipment of the same design as in IOT&E or preferably production systems. It includes completion of any deferred or incomplete OT&E. OT-D is described in detail in Chapter 5, TEMP.

(2) OT-E is FOT&E conducted on production systems, unless previously covered in OT-D. The major objective of OT-E is the validation of the operational effectiveness and operational suitability of production systems. OT-E should be scheduled and conducted in every program in which production articles have not undergone previous OT&E.

e. Quick Reaction Assessment (QRA). Operational necessity may, at times, dictate modifying the established OT process to achieve a rapid capability in the Fleet. In these cases, the program sponsor may want a quick assessment by COMOPTEVFOR concerning operational considerations and capabilities of the system. If a QRA is needed, the program sponsor will send a request to CNO (N091), info COMOPTEVFOR. If approved, COMOPTEVFOR will conduct the assessment and issue a report as soon as possible. Information obtained that is critical to the Fleet may be issued via interim reports on an as-required basis. *A QRA will not be used to resolve COIs or provide a limited Fleet introduction/Fleet introduction/Fleet release recommendation*.

The following information must be included in the QRA request:

- Purpose of the assessment and, specifically, what questions the program sponsor wants answered
- Length of time available for the assessment
- Funding available for the assessment

f. Software Testing. Software will be operationally tested in the system in which the application is installed or implemented when fielded. The software to be used for IOT&E of the core block will provide a performance baseline for testing subsequent

increments. Software improvements will be reflected in subsequent increments. For each increment of software for a software-intensive system, the OTD shall use the DoD guidelines for conducting OT&E for software-intensive system increments and Department of the Navy (DoN) Acquisition and Capabilities Guidebook, Annexes 5-F, G, and H for determining elements of risk and the appropriate level of OT.

(1) Software Qualification Testing (SQT). When a software revision or increment is to be released as part of an acquisition MS decision, the OT is considered to be an IOT&E. When a software revision or increment is to be released not in conjunction with an MS decision, it may be designated an SQT. SQT applies to software modifications of limited scope, as determined by CNO (N091), such as aircraft and weapon systems' operational flight programs and other systems in which software provides a similar function. When a program is approved for SQT, CNO (N091) will assign a Test and Evaluation Identification Number (TEIN); and an SQT TEMP will be written using the format from SECNAVINST 5000.2C. For SQT, a Statement of Functionality (SOF) prepared by the DA and approved by the program sponsor will be used to develop the SQT TEMP. SQT reports use the standard OPTEVFOR evaluation report format template. (see chapter 8)

(2) SOF. The Program Manager (PM) will forward an SOF 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 SOF will:

- Define new capabilities of the improved software.
- Address corrections to previous deficiencies that the new software is intended to correct.
- Address any capabilities that were deleted or modified.
- Describe the breadth and depth of regression testing conducted.
- Address specific operational requirement(s) of the new software.
- Describe safety and/or security issues or functions added, modified, or deleted.

g. The two products of OT&E are:

- The evaluation report.
- The OPTEVFOR Tactics Guide (OTG). Not every test will result in an OTG. Most OTGs are produced in support of air warfare systems. Surface and undersea tactics are usually not addressed by OTGs, but rather by Surface Warfare Development Group and Submarine Development Squadrons, respectively.

206. INTEGRATING DT AND OT

SECNAVINST 5000.2C requires that planning for DT and OT be coordinated at the test design stages so that each test phase uses resources efficiently to yield the

data necessary to satisfy common needs of the DA and the OT&E agency. There are several concepts for integrating T&E, to include combined DT/OT, DT assist, and IT. Regardless of how T&E is integrated, there must be an independent OT period for determining operational effectiveness and suitability, and making a recommendation for fielding in support of an FRP of the system under test. The following paragraphs describe each of these concepts.

a. Combined DT/OT. Combined DT/OT, in its strictest sense, is a test phase in which DT and OT testers share test assets and data, and in which the events meet DT and OT requirements. An example of this would be a test in which DT and OT testers collect data from every event or flight. The following comments apply to combined DT/OT in a broad sense:

(1) While combined testing may be possible in some cases, the widely differing objectives of DT&E and OT&E make it more difficult to combine the two than it may first appear. The explanation is as follows:

(a) DT&E is properly conducted to test some individual specification or parameter (e.g., the number of g's pulled by a projectile) with other parameters held constant. The test is designed to measure *technical performance* of a system.

(b) In OT&E, proper technical performance with regard to individual specifications and parameters is assumed. The mission of OPTEVFOR is to assess whether, given this technical performance, the weapon system can be operationally effective and operationally suitable when employed under typical combat and environmental conditions by Fleet personnel against an enemy who fights back. Thus, OT&E is conducted on a mission-by-mission basis, varying such factors as sea state, visibility, own-ship speed and maneuvers, the method of illumination, range, firing doctrine, target maneuvers, enemy countermeasures, etc.

(2) Early planning for combined DT and OT *is essential* to ensure efficient use of resources. Participation by OPTEVFOR in the planning and execution of combined tests must ensure that the tests conducted and data collected are sufficient and credible to meet OT&E requirements.

(3) In all cases, a separate and independent OT test plan will be provided, and separate and independent evaluation of OT results will be conducted and reported.

(4) Prior to combined DT/OT, the OTD should review the DT&E test plan for the technical characteristics, test objectives, and to understand how the DA intends to test the system. We need to know what will be tested and how it may impact OT.

(5) Combined DT/OT requires a Memorandum of Agreement (MOA) between the DA and COMOPTEVFOR that outlines the DT and OT test objectives, capabilities/functions to be demonstrated, test conditions, test operations, etc. sample 5-9 is a standard MOA. The MOA format is also available on the Local Area

Network (LAN) under Y:\OT&E_Reference Library_\OT&E Formats\ MSWORD\DT-OT MOA.doc

b. DT Assist

(1) DT assist is simply DT with active involvement of OT personnel. It is not assigned an OT number and *is not a formal phase of OT*. OT testers help execute the DT plan. There is no OT plan, and no OT report is prepared. DT assist is often done to allow OTDs to become more familiar with a system, to supplement DT personnel, or to allow DT on Air Test Squadron (VX) aircraft. In all cases, we provide the system's developers with an early operational perspective. Though COMOPTEVFOR does not provide a formal report, if desired by program management, we may provide a two- or three-page Letter of Observation (LOO) (see sample 8-8) indicating our system observations based on our exposure to date.

(2) Table 2-3 is provided to highlight the differences between DT assist and formal combined DT/OT phases of testing

(a) In DT assists, we *do not* attempt to resolve COIs, reach conclusions regarding operational effectiveness or suitability, or make recommendations regarding limited Fleet introduction or Fleet introduction.

(b) DT assist is more than a mere observation of DT. OTDs have routinely monitored DT, and that should continue. Only when we take an active role in the DT effort should our involvement be characterized as DT assist. DT assist should be characterized on the program integrated schedule just as combined DT/OT is shown, with simultaneous DT and OT activity. However, if it is not included on the schedule, a DT assist may still be pursued and accomplished.

(c) As is the case for all DT data, if the data meet OT requirements they can be used to supplement OT data and help resolve COIs in future phases.

(d) DT assist requires an MOA. Use the DT assist MOA format (sample 5-10) and tailor it for your needs.

(e) DT Assist After MS-C. DT assist can be employed during any phase of the acquisition process, including post-MS-C. However, it is most appropriate for “fly and fix” applications where COI resolution and conclusions regarding effectiveness and suitability are neither needed nor desired. Because most programs are seeking “effective and suitable” conclusions after MS-C, the DT assist approach is often not the vehicle of choice. It could be used effectively, though, as a lead-in to formal IOT&E or during FOT&E.

c. IT. IT is the collaborative planning and collaborative execution of test phases and events to provide data in support of independent analysis, evaluation, and reporting by all stakeholders, particularly the DT (contractor and government) and OT

Table 2-3. DT Assist-Combined DT/OT-Integrated Test Comparison		
DT Assist	**Combined DT/OT**	**Integrated Test**
No OT number assigned because we're assisting in DT. It is not a formal phase of OT.	This is a formal phase of OT, complete with OT number, such OT-A.	Formal phase of OT and assigned an IT number, such as IT-A1.
MOA signed by COMOPTEVFOR Assistant Chief of Staff (ACOS) or VX CO required with PM.	MOA required with PM.	Integrated Test Team (ITT) Charter required. An MOA may be required for documenting mission analysis prior to a TEMP or TEMP update.
No OT test plan.	OTA test plan required.	OTA test plan required.
MBTD as applicable.	MBTD as applicable.	MBTD recommended.
No OT report; at most, a 2-3 page letter signed by COMOPTEVFOR ACOS to PM.	OA report required.	LOO or Operational Test Agency Assessment Report (OAR)/Milestone Assessment Report (OMAR) required.
COIs not specifically addressed, and not resolved.	COIs always addressed with color codes.	COIs addressed commensurate with type of report.
No conclusions reached.	Conclusions: COI risk assessments and recommendation for continued program development.	Conclusions: Commensurate with type of report. No effectiveness or suitability determinations and Fleet introduction recommendations may be made.
Certification message not required from PM.	Certification message generally required from PM.	Certification message is not required from PM.
Operational Test Readiness Review (OTRR) not required.	OTRR generally applies.	Level of readiness review varies by program.
May be discussed in TEMP Part IV - optional.	Must be discussed in TEMP Part IV.	Must be discussed in the TEMP.
Data may be used to support COI resolutions in later stages of OT&E.	Data may be used to support COI resolutions - now or later.	Data may be used to support COI resolutions - now or later.
Not appropriate for VCDs. VCD requires a brief report and OT number.	Appropriate for VCD.	May be appropriate for VCD.
Recommended for inclusion in TEMP Part II Integrated Schedule - optional Example: DT XXXXXXX DT-B OT XXXXXXX DT ASSIST	Required for inclusion in TEMP Part II Integrated Schedule. Example: DT XXXXXXX DT-B OT XXXXXXX OT-A	Required for inclusion in TEMP Part II Integrated Schedule. Independent OT periods must be designated as "OT-X." Example: IT XXXXXXX IT-B
Documentation signatory authority is per table 2-4.		

communities. IT blends or combines Contractor Testing (CT), DT, and OT to form a cohesive testing continuum. This integration cannot occur, unless the participants (contractor test director, developmental test director, and OTD) have determined their entering requirements for adequate testing of the system under evaluation. IT does not remove or combine any of COMOPTEVFOR's current or future requirements for reporting based on a separate (OPTEVFOR) analysis of the shared test information produced by the IT effort. IT does not eliminate the requirement for an independent IOT&E phase of OT&E. However, the expectation is that the IOT&E period will be less in scope and time due to the early integrated involvement of operational testers throughout the entire continuum of system development. IT entails a significant departure from legacy OT methodology and encompasses several key planning paradigms, including:

- A requirement for the OT team to provide detailed OT input to the IT planning process and provide it much earlier in the program schedule than the norm for previous OT planning.
- The sharing of data throughout development and the associated IT periods. This sharing will support the monitoring and assessment of system capabilities, attributes, Key Performance Parameters (KPP), Measures of Effectiveness (MOE) and Measures of Suitability (MOS) in order to support the resolution of most COIs, pending completion of the IOT&E.

Robust testing minimizes surprises when the product is sent to the warfighter and ensures the specified capabilities are evaluated in the operational environment. Risk is reduced by bringing all testing agents together early in the process to ensure capabilities are tied to missions and tasks, mission-based testing is conducted, system anomalies/deficiencies are identified early in the process, and all data are shared. Cost is reduced by the sharing of resources, elimination of duplicative testing, and the early identification and correction of deficiencies. Schedule compression is achieved by combined versus sequential testing and the sharing of high demand testing assets. None of these objectives can be achieved without the cooperation of all parties and a commitment to a team approach between program office, OT, DT, and contractor personnel.

207. MBTD

a. MBTD is COMOPTEVFOR's primary test planning methodology and shall be used, unless an alternative methodology is specifically approved by the Commander. (Some programs have already received this approval.) With MBTD, OTDs:

- Conduct mission analysis.
- Develop mission-based COIs from the mission analysis.
- Determine conditions that affect mission performance.

- Create a framework that establishes data requirements for assessing/resolving mission-based COIs.

b. For a detailed description of the MBTD process, see chapter 6.

208. OBSERVATION OF OPERATIONAL CAPABILITY (OOC)

a. Applicability and Scope of OOC. Occasionally, due to acquisition or programmatic issues, systems or equipment enter the Fleet with no previous OT&E. In these cases, COMOPTEVFOR may conduct an OOC. This is not a formal phase of OT and cannot be used to support an acquisition decision. An OOC shall not be used in place of formal OT&E for programs of record. This is an accounting of the capability of a system as gauged against either the previous (i.e., replaced system) capability or the system's capabilities document. Outcomes of the OOC for each system capability will be addressed as one of the following:

(1) Capability Observed

(a) Successfully Demonstrated. The system successfully demonstrated the operational capability and equaled or exceeded performance requirements (Pass).

(b) Not Successfully Demonstrated. The system failed to demonstrate the operational capability (Fail).

(2) Capability Not Observed. The system was unable to demonstrate a capability which was available on a previously fielded system or is identified in the system Operational Requirements Document (ORD) or Capabilities Development Document (CDD) (Capability Regression).

b. Conduct of OOC

(1) An OOC can be made at the request of Fleet units or at the discretion of COMOPTEVFOR and does not require certification from the applicable program office. Coordination will be directly among CNO (912), COMOPTEVFOR, and the chain of command of a Fleet unit on which the system is installed; and will normally be on a not-to-interfere basis.

(2) An OOC is applicable to new systems, improvements/modifications to existing systems, including Engineering Change Proposals (ECP), ship alterations, ordnance alterations, and software modifications that have already been fielded. As this is not a formal phase of OT, we will not publish a test plan. However, we will use a similar legacy system test plan, if appropriate, when one is available.

c. Reporting OOC

(1) Due to the inherent limitations associated with conducting an OOC, we will not make any determination or assessment of system effectiveness or suitability. However, COMOPTEVFOR may provide a recommendation regarding continued Fleet release and the need for formal OT based on an overall observation of system performance to enhance mission capability.

(2) Report OOC results within 30 days of completion by either message or letter, as appropriate, and send to:

- CNO (N912)
- CNO sponsor
- The chain of command of the Fleet unit(s) on which the system is installed
- The appropriate SYSCOM or PEOs, and
- Appropriate program office

209. JOINT TEST PROGRAMS

a. Discussion. COMOPTEVFOR's mandate is to test and evaluate new and improved warfighting capability in as near a realistic operational environment as possible, which should include some testing in a joint environment for most programs. However, simply conducting OT of a Navy-only acquisition program in a joint environment does not make it a joint test program. For the purposes of this document, joint OT is defined as any test of a system, subsystem, component, or technology program that involves funding or formal management (including test management) by more than one DoD component, with the goal of providing a new or improved capability for a validated joint need. This includes programs where one DoD component may be acting as acquisition agent for another DoD component.

b. Types of Joint Testing. There are three basic types of tests for joint programs: Multiservice Operational Test and Evaluation (MOT&E), Joint Test and Evaluation (JT&E), and Joint Capabilities Technology Demonstrations (JCTD). MOT&E is the OT&E process, agreed upon by all four OTAs, for formal joint DoD acquisition programs that comply with the DoD Directive 5000.1 and are funded through the various service budgets. JT&E and JCTD are joint test concepts that are outside the DoD Directive 5000.1 and are funded outside the normal service budget process. While JT&Es and JCTDs attempt to address shortfalls in joint warfighting, JT&E has a Tactics, Techniques, and Procedures (TTP) focus, and JCTD has a technology/hardware focus.

210. MOT&E

a. MOT&E. MOT&E is OT conducted jointly by two or more services for formal DoD acquisition programs. A lead organization will be designated to coordinate all

testing involving more than one military department or defense agency. This lead organization will prepare a single TEMP, test plan, and a single T&E report on the operational effectiveness and suitability of the system for each participating organization. The basic framework for the conduct of MOT&E is contained in the MOA for MOT&E.

b. Navy Lead Service. When the Navy is lead service, OT&E will be conducted per the provisions of SECNAVINST 5000.2C and this manual. COMOPTEVFOR performs essentially the same functions as in normal OT&E, with the following modifications:

(1) All planning will be coordinated with other service OT&E agencies.

(2) COMOPTEVFOR will begin the planning process by issuing a call to other service OT&E agencies for COIs and their test objectives. These issues and objectives will then be consolidated into a single list and coordinated with other service OT&E agencies.

(3) Formal coordination action on the TEMP will accommodate other service OT&E requirements and inputs.

(4) Participating OT&E agency test directors and/or project officers will meet to assign responsibilities for accomplishment of the critical issues/test objectives (from the consolidated list in paragraph (2) above).

(5) Each participating agency will then prepare the portion of the overall test plan for their assigned critical issues/objectives, in OPTEVFOR test plan format, and will identify its data needs. OPTEVFOR will then prepare the MOT&E test plan.

(6) The appropriate Office of Naval Intelligence (ONI) Capstone Threat Assessment (TA) will be the TA used for overall program and Navy-unique threat issues. Other services may supplement the threat requirements of the ONI Capstone TA through use of their service-unique TAs.

c. Other Lead Service. When another service has the lead, either a fully integrated TEMP or a Navy appendix to the lead service TEMP, if necessary, will be prepared that clearly reflects the unique Navy testing aspects of the program, in addition to addressing multiservice testing. The threat for overall program issues, based on the ONI Capstone TA, will also be addressed in the integrated TEMP or Navy appendix. This integrated TEMP or Navy appendix will provide the basis for planning and executing Navy-unique testing.

d. Discrepancy Reporting. The lead OT&E agency is responsible for ensuring a system is established to track discrepancies and to provide periodic status reports to participating OT&E agencies. Control of promulgation of such reports should be included in an MOA between the participating OT&E agencies. An example of another

agency's reporting is the service reports that can be issued by any Air Force organization.

e. Deviations from Lead Service OT&E Procedures. Deviations from lead service OT&E procedures may be authorized by written agreement between participating OT&E agencies. Close coordination will be required to ensure the requirements of Navy OT&E are met.

f. Test Reporting. For major programs, the lead service will prepare and coordinate the single (interim or final) report, reflecting the system's operational effectiveness and operational suitability for each service. If a participating service deems it necessary to produce an independent evaluation report, it will be appended to the single MOT&E final report.

211. JT&E

a. Overview. JT&E evaluates concepts, TTPs, architectures, processes, and addresses specific warfighter needs and issues that occur in joint environments. The JT&E program is funded and directed by DOT&E, specifically the Deputy Director, Air Warfare, per DoD Instruction 5010.41. Detailed guidance on the conduct of JT&E is available in the JT&E Program Handbook located on the command's LANs (classified and unclassified) in Y:\OT&E Reference Library or on the JT&E Web site at www.jte.osd.mil. There are two types of JT&E:

- Quick Reaction Test (QRT), normally lasting less than 1 year
- Joint Test (JT), up to 3 years in duration

b. QRT and JTs may use the MOT&E MOA to guide the relationship among participating OTAs.

c. Documentation and Test Reporting. Detailed guidance is available in the JT&E Program Handbook.

d. Where Navy expertise and liaison is required, CNO (N091) will task COMOPTEVFOR to provide an OTD to act in a Navy operational oversight function. When tasked, QRTs and JTs will be assigned a 5000-series local TEIN for tracking and administration within the Test and Evaluation Program System (TEPS).

212. JCTDs

a. Background. A JCTD is an integrating effort to assemble and demonstrate a desired capability based on mature advanced technologies in a realistic environment to clearly establish military and/or operational utility. In response to a combatant commander’s request, the USD/AT&L approves all new-start JCTDs by issuing an

approval memorandum. Each JCTD is assigned a sponsor, typically a combatant command who represents the end user of the system or capability.

Once the JCTD makes it through the approval process, a Working Integrated Product Team (WIPT) is developed to plan, coordinate, and execute the assessments of the JCTD. The WIPT is comprised of members who fall under three distinct managers of the program.

(1) Operational Manager (OM). The OM plans, schedules, and executes the OAs. The OM starts the process with the assistance of an OTA to develop COIs, which make up the foundation of the Integrated Assessment Plan (IAP). The IAP is similar to a TEMP and is the overarching test schedule for the program. The OM is also responsible for drafting the Demonstration Execution Documents (DED) for each OA. The DED is similar to a test plan.

(2) Technical Manager (TM). The TM is responsible for, and manages the budget for the JCTD and all contracts and acquisition instruments for the program. The TM is also responsible for delivering the Joint Capability Solution to the OM for the assessments. The TM is responsible for ensuring that any technologies are adequately mature and have met all technical and safety certifications before they are used in any operational demonstrations.

(3) Transition Manager (XM). The XM is responsible for planning and supporting any Extended Use (EU) of the interim capability. The XM identifies and facilitates funding for the transition of the capabilities and for any EU period that has been planned. The XM is responsible for all transition documentation for the capability to enter the Joint Capabilities Integrations Development System (JCIDS). All three managers are codevelopers of the implementation directive, management plan, and the transition plan. Through the W-IPT, they all work closely together in each phase of the program to ensure that the program is properly planned, executed, and remains on schedule.

b. COMOPTEVFOR Participation. Many JCTDs will have little or no Navy interest, while a few may be developing an important new capability for the Fleet. COMOPTEVFOR (in conjunction with N091; Commander, Fleet Forces Command; Navy Expeditionary Combat Command, etc.) will determine which JCTDs merit our participation, the assignment of an OTD, and the conduct of an Operational Utility Assessment (OUA). Since JCTDs are not formal acquisition, COMOPTEVFOR has no official mandate for participation in the process. But given that JCTDs may eventually transition to formal acquisition and the rigors of OT, early involvement in selected JCTDs can be critical to rapid development and deployment to the Fleet. With COMOPTEVFOR approval, a JCTD will be assigned an OTD and will receive an appropriate level of attention, which could well exceed that normally expended on a formal acquisition program.

An OUA (replacing the Military Utility Assessment (MUA) or Limited Military Utility Assessment (LMUA)) must be conducted by an independent activity (like COMOPTEVFOR). Following the demonstration(s) and depending on the success, a JCTD may transition to a formal acquisition program at the appropriate MS, may be produced in small quantities and introduced to the Fleet; or may be shelved. JCTDs are not acquisition programs; they transition solutions to the combatant commander.

c. Documentation. Because a JCTD is not a formal acquisition program, it will not have the traditional DoD and SECNAV documentation. The following are the JCTD documents:

(1) Management and Transition Plan (MTP). Each JCTD is required to have an MTP, which is basically an agreement between the developer and sponsor. Included should be an overview of the JCTD, a schedule of planned events and demonstrations, programmatic and organizational details, funding information, COIs, and a description of the residual operational capability expected upon completion of the demonstration(s). Requirements may be incorporated in the MTP or may not be documented at all. JCTD sponsors may include a Concept of Operations (CONOPS), which addresses theater-level interoperability, compatibility, and integration issues.

(2) IAP. A TEMP-like document, the IAP, includes an OA approach and an OUA framework. The OA approach section includes the schedule, demonstration venues and participants, data requirements, resources, and constraints. The OUA framework includes COIs, objectives, top-level capabilities and metrics, Measures of Performance (MOP), and MOEs.

(3) CONOPS and TTP Outline. The CONOP and TTP outline should include required capabilities with metrics, CONOPS, COIs, the expected threat and operational environments, operational scenarios, and tactical vignettes.

(4) DED. The DED is akin to a standard test plan for a nonoversight program.

(5) Final Reports. Final reports for JCTDs are similar to the EOA/OA formats and are described in Chapter 8, Evaluation Reports.

d. Requirements. Since JCTDs are technology demonstrations by nature, most will not have a formal set of performance requirements. The demonstration is often used to quantify system capabilities and define requirements. If there are no thresholds or objectives, do not “shake the tree” for them. Simply ascertain what the JCTD is meant to do, and determine what COIs and MOEs/MOPs are needed to reflect those capabilities. Also, ask how the JCTD *could* be used. Bring ideas before the WIPT and get agreement, then do the test planning. Our participation in JCTDs should focus on:

- Providing a sound OT methodology, complete with COIs, MOEs, and MOPs
- Developing COIs and MOEs/MOPs, including suitability issues

- Assessing and documenting the demonstration results so that transition to formal acquisition will be as easy as possible
- Making recommendations for system improvement
- Identifying strengths and weaknesses observed

e. TEPS. When tasked, JCTDs will be assigned a 5000-series local TEIN for tracking and administration within TEPS.

f. More Information. For JCTD Modeling and Simulation (M&S), see paragraph 224. For contractor participation, see paragraph 215. For reporting procedures, see chapter 8, paragraph 810.

213. PERFORMANCE BASELINE

We occasionally encounter a capabilities document that specifies that a new system must be "equal to or better than" its predecessor. In such cases, we need a performance baseline against which to evaluate the new system. This has sometimes caused us to conduct extra testing just for collecting baseline data on the existing system. Where possible, however, it is preferable to use results of previous OT on the existing system for our baseline.

214. EVOLUTIONARY ACQUISITION (EA)

EA is the preferred DoD strategy for rapid acquisition of mature technology for the user. EA strategies: (1) define, develop, produce, and deploy an initial, militarily useful capability (Increment 1); and (2) plan for subsequent development, production, and deployment of increments beyond the initial capability over time (Increments 2 and beyond). The following are two approaches to EA:

- Spiral Development. The capability document includes a firm definition of the first increment, but the remaining increments and the precise end-state capabilities of the system are not known at program initiation.
- Incremental Development. The capability document includes a firm definition of the entire end-state capability and firm definitions of each increment, including an initial operating capability date for each increment.

Per DoD Instruction 5000.2 and SECNAVINST 5000.2C:

a. EA is based on defining a basic core capability and a series of evolutionary increments that lead to a final system that will evolve further without a complete redesign (without becoming a new initiative or program). The T&E strategy will be consistent with the time-phased capabilities identified in the CDD/Capabilities Production Document (CPD) and will be depicted in the system's TEMP.

b. Development of each increment shall begin with a MS-B and production shall begin with a MS-C.

c. IOT&E shall be conducted for each increment for systems using an EA strategy and will support the FRP and fielding of that increment.

215. CONFLICT OF INTEREST IN CONTRACTOR SUPPORT

The specialized nature of weapon systems development leads to an inherent risk of conflict of interest on the part of contractors involved in project development and those supporting COMOPTEVFOR's OT, except as noted concerning JCTD or legacy Advanced Concept Technology Demonstration (ACTD). The OTD is responsible for reviewing the level of contractor involvement in project development, including DT.

a. Title 10, U.S. Code Section 2399 states: "A contractor that has participated in (or is participating in) the development, production, or testing of a system for a military department or Defense Agency (or for another contractor of the Department of Defense) may not be involved (in any way) in the establishment of criteria for data collection, performance assessment, or evaluation activities for the operational test and evaluation."

b. The OTD should request a list of contractors and their level of support from the developing agency prior to submitting a requirement for contract analysis support. This information is included in the contract profile sheet.

c. COMOPTEVFOR's intent is to avoid all conflict of interest situations. In the case where a mitigation plan is submitted by a potential bidder, it will be evaluated during the contract selection process. If a mitigation plan is endorsed by COMOPTEVFOR, a waiver is required from DOT&E prior to contract award.

d. If a potential conflict of interest arises after contract award, immediately contact the Contracting Officer Representative (COR) for review and submission to the Contracting Officer for resolution.

e. JCTDs and ACTDs are not subject to the rules of formal acquisition, and Title 10 U.S. Code does not apply; therefore, contractors can be expected to participate in JCTD/ACTDs. If and when the JCTD/ACTD transitions to formal acquisition, we will ensure the independence of our IOT&E.

216. SELECTED EXERCISE (SELEX) OBSERVATION

OTCs and OTDs will not act as SELEX observers during any phase of OT&E. This does not reflect a lack of confidence in your ability and qualification to act as SELEX observers; rather, such observation may detract from the primary objective (i.e., execution of the test plan).

217. ADDRESSING THE THREAT IN OT&E

SECNAVINST 5000.2C and OPNAVINST 3811.1 require that OT&E be conducted in a realistic, threat-representative environment using applicable threat systems or simulated systems and actual threat tactics. SECNAVINST 5000.2C requires that a TA be prepared to support program initiation at MS-A and be maintained in a current and approved or validated status throughout the acquisition process. ONI produces Capstone TAs that serve as the basic authoritative TA for acquisition programs. The OTD must be aware of the ONI TA(s) that defines and discusses the threats affecting assigned programs. The timeframe of the threat to be addressed will start at Initial Operational Capability (IOC) of the program and extend to the end of its expected operational lifetime. Assigned command intelligence officers at Headquarters (HQ), AIRTEVRON ONE (VX-1), AIRTEVRON NINE (VX-9), and VMX-22 are cognizant of threat-related matters and concerns, and OTDs must establish close liaison with these personnel. The OTD must also ensure consideration is given to the threat throughout the OT&E process, and that the threat is properly addressed in TEMPs (see chapter 5), test plans (see chapter 6), and evaluation reports (see chapter 8).

a. Types of Intelligence Available. There are two categories of intelligence data that are of interest to the OTD: finished intelligence products and operational intelligence.

(1) Finished Intelligence includes validated Scientific and Technological (S&T) data on the current and projected characteristics and capabilities of foreign weapon systems, platforms, etc. Validated data on enemy tactics and strategy for the employment of their forces and weapon systems are also of interest.

(a) ONI produces S&T intelligence to support Navy development and acquisition programs. The ONI products of greatest interest to the OTD are the Capstone TAs that represent the official service and DoD position regarding the known and projected threat. The OTD must understand the threat the system is designed to counter and incorporate threat intelligence into the OT&E process to ensure effective OT&E of the Navy's future weapon systems.

(b) ONI produces finished intelligence on enemy tactics, strategy, and employment of forces, and produces the Naval Warfare Publication (NWP) 12 series and related analytical studies and assessments. The NWP 12 series and United States Air Force (USAF) MCM Manual 3-1, Volume II (Threat Reference Guide and Countertactics) publications are particularly important for test scenario development.

(2) Operational intelligence in the OT&E environment concerns primarily routine reporting of perishable data on foreign ship or aircraft locations, and reporting on foreign surveillance and collection activities directed against friendly forces or at-sea testing. Request operational intelligence support to minimize Operations Security (OPSEC) vulnerabilities and reduce the threat from hostile intelligence-collection efforts.

b. When to Use Intelligence. The OTD will find threat support intelligence particularly important in developing the TEMP and constructing test plans. By using validated S&T and tactical intelligence products, the OTD can develop a thorough understanding of the threat to the system that will help to:

- Identify COIs.
- Develop realistic test scenarios.
- Determine required OT resources (e.g., numbers and types of targets and simulators).
- Articulate threat-related test limitations.

The OTD is encouraged to coordinate closely with assigned intelligence personnel to obtain the threat support needed for effective OT.

218. MARINE CORPS OPERATIONAL TEST AND EVALUATION ACTIVITY (MCOTEA) COORDINATION

During the OT&E planning process (e.g., preparation of the part IV Input, Comment Letter, etc.), the OTD must consider the project's applicability to United States Marine Corps (USMC) use. Check with the Marine Corps liaison officer for project applicability. If applicable, the OTD must coordinate with MCOTEA to determine its interest and need for further involvement. If MCOTEA needs to be involved, make the DA and program sponsor aware of their interest. Once the CNO has directed MCOTEA involvement, OPTEVFOR will perform additional coordination and provide MCOTEA with program documentation per SECNAVINST 5000.2C. If the Marine Corps needs OT&E support from OPTEVFOR, it will request such support from CNO (N091), who will then provide direction to COMOPTEVFOR.

219. U.S. SPECIAL OPERATIONS COMMAND (USSOCOM) NAVY SPECIAL WARFARE (SPECWAR) RESEARCH, DEVELOPMENT, AND ACQUISITION (RDA) POLICY

a. Procedures for USSOCOM (and its component SPECWAR) systems and equipment must be streamlined to ensure the most rapid possible progress from the concept stage through final development. In many instances, USSOCOM/SPECWAR systems are needed to meet preparedness requirements for contingency operations around the world. The following references provide guidance for RDA procedures for USSOCOM/SPECWAR systems or equipment and are located in Y:\OT&E_Reference_Library\USSOCOM Acquisition:

- USSOCOM Directive 70-1, Acquisition Management System Policy, of 11 April 2001
- USSOCOM Directive 71-4, Requirements Generation System, of 18 October 2000

b. Applicable USSOCOM MOAs for Navy, Air Force, and Army are in Y:\OT&E_Reference_Library\Memorandums of Agreement.

220. FOREIGN WEAPONS EVALUATION (FWE) AND NORTH ATLANTIC TREATY ORGANIZATION (NATO) COMPARATIVE TEST PROGRAMS (CTP)

a. FWE and NATO CTP programs evaluate foreign weapon systems, equipment, and technologies that can satisfy a specific U.S. requirement. FWE and NATO CTP are essentially the same, except:

(1) FWE applies to any system, subsystem, or component purchased from a friendly or neutral country that is available for procurement by the U.S.

(2) NATO CTP applies only to items of NATO origin.

b. CNO, under the policy guidance of the ASN RDA, has responsibility within the Navy for management and program execution of FWE and NATO CTP.

c. When procurement of a foreign weapon system is planned, CNO will direct the DA and COMOPTEVFOR to assess the adequacy of any previously conducted DT&E and OT&E, and to provide recommendations on the need for additional T&E prior to procurement. If additional T&E is required, CNO (N091) will assign an ACAT and TEIN. T&E will then be conducted using normal system procurement procedures.

d. Close liaison between the FWE and NATO CTP project personnel and COMOPTEVFOR is required during test planning and evaluation periods to ensure data can be effectively used in follow-on OT.

e. Additional information on FWE and NATO CTP is available in SECNAVINST 5000.2C.

221. LIVE FIRE TEST AND EVALUATION (LFT&E)

a. Live Fire Testing (LFT) is conducted to provide a timely and thorough assessment of the vulnerability and lethality of a system as it progresses through its development and subsequent production phases. The primary emphasis of LFT is on realistic testing as a source of personnel casualty, vulnerability, and lethality information, taking into account the susceptibility to attack and combat performance of the system. LFT will include, when feasible, the firing of threat munitions (or surrogates) at operational, combat-loaded U.S. weapon systems to test their vulnerability; and/or the firing of U.S. munitions or missiles against operational, combat-loaded threat targets (or surrogates) to test the lethality of those munitions or missiles. Guidelines for the conduct of LFT&E are provided in SECNAVINST 5000.2C.

b. The basic planning document for LFT&E is the TEMP. The TEMP Part IV will contain a separate section (paragraph E) that charts the LFT&E course of action during

the acquisition process. The LFT&E section of Part IV of the TEMP will be developed by the DA under the cognizance of DOT&E and will include:

- Description of the overall LFT&E strategy for the item
- Critical LFT&E issues
- Required levels of system vulnerability/lethality
- Management of the LFT&E program
- LFT&E schedule, funding plans, and requirements
- Related prior and future LFT&E efforts
- Evaluation plan and shot selection process
- Major test limitations for the conduct of LFT&E

LFT&E resource requirements (including test articles and instrumentation) will be appropriately identified in the TEMP Part V T&E Resource Summary. See chapter 5 for TEMP details.

c. Within the Navy, LFT&E is a requirement of OT&E with COMOPTEVFOR's major interest being system vulnerability and lethality. The role of the OTD in LFT&E will be to:

- Review the LFT&E section of the TEMP.
- Request a copy of the detailed LFT&E plan for review.
- Monitor the LFT to obtain a firsthand impression of the vulnerability or lethality of the system under test.
- Obtain a copy of the detailed LFT&E report for review.

222. MISSILE SYSTEM EFFECTIVENESS

Of particular interest is the analysis and evaluation of missile system effectiveness against air targets. The following criteria will be applied within the force for surface-to-air and air-to-air missile system T&E. (They may also be applicable to other types of munitions.) The results of each missile firing will be reported as delineated below. These results provide the basis for evaluating the attainment of "probability of success" and/or "probability of kill." These criteria are not applicable to those programs that use "probability of hit" as an effectiveness parameter.

a. Success. The basic requirement for a success is achievement of target kill (warhead-configured missiles) or, when a nonwarhead missile is fired, satisfactory fusing operation within kill radius of the target, including allowance for direct hits.

b. Failure. Any firing test when the criterion for success was not achieved.

c. Incomplete. Any firing aborted because of a circumstance peculiar to the test or where a valid target is not present throughout the firing test, and no data are obtained.

d. Undetermined. Any firing where data are insufficient to permit an assessment of success or failure.

e. Missile Firing Reports. To protect OT&E data until after evaluation, all missile firing reports directed by higher authority will be forwarded directly to COMOPTEVFOR with no information addees. The cognizant warfare division will readdress the report as required.

223. OT&E IN SELF-DEFENSE TEST SHIPS (SDTS)

a. Realistic OT for softkill and short-range, hardkill self-defense weapon systems is often restricted by safety considerations that prohibit threat-representative target presentations for manned ships. The following is COMOPTEVFOR policy for use of the SDTS in OT and subsequent resolution of COIs:

(1) SDTS testing will normally be conducted as a combined DT/OT phase with an accompanying MOA.

(2) SDTS firings may be used to resolve effectiveness COIs, if appropriate.

(3) SDTS system data may be used to aid in resolution of some suitability COIs.

b. SDTS testing alone will not replace IOT&E. Fleet-representative installations operated and maintained by Fleet-representative personnel will be required to resolve suitability COIs. Accordingly, an independent phase of OT, including complete detect-to-engage scenarios with live weapons firing events, as appropriate, must be conducted in Fleet units with systems operated by Fleet personnel to verify effectiveness COIs and resolve suitability COIs.

224. MODELING AND SIMULATION (M&S) IN OT&E

DoD directives encourage the use of M&S to assist in projecting operational effectiveness and operational suitability prior to MS-B, but limit its use in subsequent OT&E to that of supplementing OT&E test data. Because of the increased emphasis on the use of simulation in early OT&E, the OTD must carefully consider requirements for the use of threat simulation. Critical to the success of M&S is the early inclusion of adequate funding requirements in the Part V of the TEMP. The OTD must also ensure that the program's test team has a clear understanding of the documentation necessary to get COMOPTEVFOR's accreditation for the intended application of M&S in OT&E. COMOPTEVFORINST 5000.1A, Use of Modeling and Simulation (M&S) in Operational Testing, provides detailed guidelines for the use of simulation in OT.

225. LAND-BASED TEST SITES (LBTS)

An LBTS is a facility that duplicates, simulates, or stimulates the employment of a system's planned operational installation and used for the purpose of conducting DT. Intent to use an LBTS in lieu of the actual host platform for OT will be included in the TEMP Part IV. See Chapter 6, Test Planning, for additional details.

226. SIGNIFICANT ALTERATIONS

It's not possible to provide an explicit definition of a significant alteration, which is handled much like a new system for system acquisition purposes. The decision to classify a modification, ECP, ordnance alteration, block upgrade, product improvement, etc., as a significant alteration is based on the scope of the change, the funding level, the importance of the system, the numbers to be produced, etc. CNO (N091) will consider factors such as these in making the decision. In general, where an alteration is intended to improve a warfighting capability vice suitability, the alteration would require some measure of OT&E prior to Fleet introduction. The judgment of COMOPTEVFOR, the DA, the CNO Resource and Program Sponsor, and (where applicable) the Naval Board of Inspection and Survey (INSURV) will be major factors considered by N091 in determining the applicability and scope of testing significant alterations.

227. DOCUMENT SIGNATURE AUTHORITY

a. Preparing. Table 2-4 identifies OPTEVFOR signature authority for the various OT&E documents. Its focus is on:

- TEMP input, comment, and forwarding letters
- Test plans
- Evaluation reports
- Letters of Instruction (LOI)
- OTGs
- Support documentation

The smooth documents for the VXs, and rough and smooth for HMX-1 are to be provided to HQ Codes 40, 50, or 60, as appropriate, via electronic transfer (E-mail). Coordination is also required with Code 60 for software-intensive programs.

b. Routing. Blank rough draft routing slips are found in each Division's Admin office. Routing procedures should be discussed with your section head and/or division deputy director (B-code). Smooth documents require a blue blazer. The format for the blue blazer is found on the LAN in the Y:\OT&E_Reference_Library\Document Route Forms folder. When using the format, rename the file.

Table 2-4. Signature Authority

T&E Document	Response Time	Brief Required	Signature Authority		
			00	01	ACOS
TEMP	5 working days	Yes	X		
All oversight test plans (Note 1)	60 days prior to ops	Yes	X		
All evaluation reports (Note 2)	60-90 days after test	Yes	X		
Verification of Correction of Deficiencies (VCD) and Quick Reaction Assessment (QRA) messages/reports		Yes	X		
Initial Impressions Message		Yes	X		
All OT&E support letters (OTD & ACOS responsible for drafting)	30 days prior to ops	No	X		
Deficiency report messages		Yes	X		
All missile firing reports directed by higher authority (ACOS will readdress as required)		No	X		
Release of test data (test data retained by Navy labs require N091 approval)		No	X		
M&S Accreditation Letter for IOT&E/FOT&E	NLT 90 days prior to test	Yes	X		
Letters for Observation of Operational Capabilities (OOC)	30 days after ops	Yes	X		
Framework Documents	None yet specified	Yes	X		
IA/Interoperability Assessment Reports	None yet specified	Yes	X		
Integrated Assessment Plan (IAP)		Yes	X		
Operational Utility Assessment (OUA) reports		Yes	X		
Military Utility Assessment (MUA) reports		Yes	X		
Limited Military Utility Assessment (LMUA) reports		Yes	X		
Risk Assessment Level of Test (RALOT) Report		Yes	X		
Initial Capabilities Document (ICD)/CDD/CPD Comment Letter		Note 3		X	
TEMP comment letters (0-6 reviews)	30 days from receipt	No		X	
OOC MOA		No		X	
All other correspondence as directed by 00		No		X	

00

01

ACOS

Table 2-4. Signature Authority

T&E Document	Response Time	Brief Required	Signature Authority		
			00	01	ACOS
Nonoversight test plans	30 days prior to ops	Note 4			X
Demonstration Execution Document (DED)	30 days prior to ops	Note 4			X
Anomaly report messages		Note 5			X
TEMP input letters	90 days	No			X
Standard/Combined DT/OT memorandums of agreement	30 days prior to test (at test plan signing)	No			X
Support documentation (Integrated Logistic Support Plan (ILSP), Navy Training Plan (NTP), etc.)	15 days	No			X (Note 7)
M&S Accreditation Letter for non-IOT&E or FOT&E	NLT 90 days prior to test	No			X
VX Squadron Project Assignment Letters		No			X
Letters of Instruction (LOI) (Note 8)	30 days prior to ops	No			X
Trusted agent forms	30 days prior to ops	No			X
DT assist MOAs	30 days prior to ops	No			ACOS/ VX CO
DT Assist Letters of Observation (LOO)	90 days after ops	As required			X
OT commencement messages		No			X
OT completion messages	End of test as determined by ACOS	No			X
ACAT IVM & AAP concurrence letters		Note 6			X
OPTEVFOR Tactics Guides (OTG)	120 days after evaluation report	As required (Note 6)			VX CO (Note 9)

Notes:
1. Commander briefs and signs all ACAT I, DOT&E oversight, and controversial test plans. Also, the Commander may brief and sign all standard test plans, *when desired,* 30 days prior to ops.
2. 90 days for ACAT I/IA and MOT&E; 60 days for all others.
3. Briefs are on a case-by-case basis. 00 will sign comment letters with contentious issues.

Table 2-4. Signature Authority
4. ACOS signs (keep 00 informed; briefs would be on a case-by-case basis) standard ACAT II, III, and IVT test plans. Staff through 20 Div or 01 prior to ACOS signature. 5. Brief 00 (01 in his absence) prior to message release. 6. Keep 00 informed. 7. Use title, not "By Direction." 8. LOIs prepared at VX/HMX may be released by the squadron CO. 9. VX COs authorized to sign "By direction." 00 will sign controversial and special-interest OTGs. Briefing requirements will be determined on a case-by-case basis.

c. Briefing. General brief template can be found on the LAN in Y:\OT&E_Reference_Library\OT&EFormats. Specifics for TEMPs, test plans, and final reports are found in chapters 5, 6, and 8, respectively.

(1) General Briefing Information. OT&E briefings are like any other Navy briefing. They cover the facts in a logical, concise fashion. Guidance on OPTEVFOR OT&E briefs, including their content and format, and information on briefs in the Washington area or to decisionmakers are also discussed in this chapter.

(2) Briefing Preparation Tips. The following tips for briefs are provided to assist in the preparation of hard copy handouts:

(a) Ensure the presentation slides are of professional quality (i.e., correct spelling; proper English; all text print the same size) and are consistent in format and appearance (header and footer print, slides are all portrait or all landscape, and page numbers included for each slide).

(b) Do not use copies of pages from documents. Extract the needed information and form bullets for the slide.

(c) Avoid placing too much information on one slide; limit data to no more than 12 lines. This may require spreading the message over several slides, but that is much better than using small print and having the slides appear crowded.

(d) Briefers should include their first name or nickname on their introductory briefing slide.

(e) Ensure the slides are in the correct order and are matched to the presentation. This is very important when it comes to keeping the audience's attention and getting the message across.

(f) Bring all cited references to the brief.

(g) Keep the brief in operational terms. Use only the minimum required technical terms to accurately convey the meaning.

(h) The OTD may be asked to revise one or more briefing slides for the Commander. Typically, only the corrected slides should be resubmitted; concentrate on the directed changes. Provide a script with the new hard copy of the slides if necessary. Highlight the areas modified or changed by placing the old slides to the left. Mark modified areas of the document with a bar on the right-hand side.

(i) The OTD may be asked to rebrief the material. Again, present only the material that has been changed.

(j) If a typographical error or similar mistake is found in the slide, ignore it. The corrections should have been made before the briefing.

(k) Comment on the contents of each slide, emphasizing key points. *Do not just present the slide and let the audience read it*. The OTD is there as the OT&E expert to provide answers and discuss the issues, not to hand out paper. Since the slides are all bulletized, the OTD cannot just read the slide to the audience. Instead, as each slide is presented, describe the important points. Avoid statements such as "This slide is . . ." or "This slide contains . . .." Instead, introduce the slide in a sentence, such as: "We defined the limitations as . . ." or "Based on this testing, we concluded that . . .."

(l) Ensure that the discussion follows the same order as the slide. If an item is not important enough to mention or discuss, don't list it on the slide. Prepare backup slides on material that may interest the Commander or things that may need more information. Present them only if the need arises.

(m) Limit your use of acronyms, and never use an acronym or abbreviation without first defining it (e.g., Automatic Battery Monitoring System).

(n) Avoid the use of trade jargon; speak plain English. Be clear and concise in your delivery, and remember that you are the expert on your subject.

(3) Preparing Washington Briefs (Acquisition Review Board (ARB), Navy Program Decision Meeting (NPDM), etc.). The cognizant ACOS must provide the following information to the Commander upon learning of a decision meeting involving a CNO project for which OPTEVFOR conducted OT&E:

- Type of decision forum
- Date, time, and place
- Purpose of the decision forum (MS and production level)
- Schedule of preliminary briefs
- Whether a formal presentation is required
- Recommended COMOPTEVFOR briefer and other attendees
- Whether attendance by the Commander is recommended

(4) Presenting Washington Briefs (ARB, NPDM, etc.)

(a) Format. OPTEVFOR is typically limited in the number of slides that can be presented at an ARB or NPDM; the number varies with the scope and complexity of test. As a general rule, plan for 10 or fewer slides. A suggested outline is provided below.

- Introductory slide (your name, etc.)
- Test summary
- Major conclusions
- COMOPTEVFOR recommendations

(b) Results. If the results are based on too small a sample size (e.g., insufficient database), the OTD should clearly state in his oral presentation that an outcome is being reported. Avoid using words such as inadequate test time, etc., in the presentation or on any slides. Limit the contents of the slide to the parameter, result, and threshold. If remarks are included, avoid making statements that others may perceive as being unsupported by fact or the results.

(c) Correction of Deficiencies. If the DA reports they have corrected some of the deficiencies listed, the OTD must be aware of this. This requires close liaison with the DA decision meeting. In the package to the Commander, inform the Commander that outstanding deficiencies are being reported as corrected by the DA. The OTD should request direction on whether to explain these results in the briefing.

(d) Negative Conclusions. If OPTEVFOR recommends against Fleet introduction of the system, the briefing must fully substantiate negative conclusions and recommendations.

(e) COMOPTEVFOR's Position. The OTD must ensure that the Commander's position is accurately conveyed at the proper time; (i.e., during the brief and during any discussions that may follow). If the OTD is unsure about the Commander’s position, the question should be raised for the Commander's review. The OTD is expected to propose a COMOPTEVFOR position, provided it can be supported.

228. DOCUMENT REVIEW

The following OT&E documents are reviewed *twice* (rough draft and smooth) by the Staff Editor's office (Code 01E) (see table 2-4 for signature requirements for all documents):

- ORD comment letters
- TEMP input, comment, and forwarding letters*
- All test plans

- All evaluation reports
- MOAs
- TEMP and test plan change letters

*Note: TEMPS for signatures which require no changes and involve nothing more than a new cover letter do not require rough routing. Only a smooth route is required.

a. Rough Draft Review. This is an initial, double-spaced review for *all* technical and editorial issues. Technical issues are those areas that deal with building TEMPs, test plans, evaluation reports, and tactics guides. Everything is examined during this review — from verifying correct thresholds and parameters, major and minor test limitations, test dates, complete COI lists, test results, conclusions, recommendations, and security classification markings — to overall format, an incorrect paragraph title, or a misplaced comma. All pertinent reference documentation is required to be submitted with the document to be reviewed.

b. Smooth Review. This review is a final check for overall format, correct page numbering, and typos only. The document is on letterhead paper, single-spaced, and ready for signature.

CHAPTER 2

TEST AND EVALUATION POLICY

Sample Format

Sample 2-1 Observation of Operational Capability (OOC)

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CHAPTER 3

FOUNDATION DOCUMENTS

301. INTRODUCTION

a. This chapter provides a basic description of the foundation documents, the questions the OTD should ask, and the OTD's responsibility in the review of the documents. Resources (Chapter 4) provides additional information on this topic.

b. OTDs have an obligation to get involved as early as possible in the development of a new weapon system. This includes providing meaningful input to various foundation documents. The entire defense acquisition system has undergone significant changes since the introduction of the Joint Capabilities Integration Development System (JCIDS) in 2003. Since many programs continue to use legacy documents, this chapter will discuss legacy and current foundation documents, including:

- Mission Needs Statement (MNS)
- Operational Requirements Document (ORD)
- Analysis of Alternatives (AOA)
- Acquisition Program Baseline (APB)
- Acquisition Information Assurance (IA) Strategy
- Initial Capabilities Document (ICD)
- Capability Development Document (CDD)
- Capability Production Document (CPD)

302. MISSION NEED STATEMENT (MNS)

DoD Regulation 5000.2R (a legacy document) required DoD components to document deficiencies in capabilities and opportunities to provide new capabilities in an MNS expressed in broad operational terms. System performance objectives and minimum acceptable requirements were developed from the MNS as part of the development of the ORD. OTDs may encounter MNS and ORD documents supporting legacy programs.

303. OPERATIONAL REQUIREMENTS DOCUMENT (ORD)

DoD Regulation 5000.2R (a legacy document) mandated use of the ORD to document system requirements. Although the JCIDS process uses capabilities

documents for system definition, some programs may still use an ORD to define system requirements.

304. ANALYSIS OF ALTERNATIVES (AOA)

The use, format, and content of an AOA are described in DoD Instruction 5000.2. An AOA is an analytical comparison of operational effectiveness, suitability, and life-cycle cost of alternatives that satisfy established mission capability requirements. The OTD may use the AOA as a source document supporting MBTD and TEMP development.

305. ACQUISITION PROGRAM BASELINE (APB)

The PM initially develops the APB as a concept baseline prior to program initiation. A development baseline and a production baseline are prepared for MS-B and -C. These baselines capture the key parameters that define the system. The objectives and thresholds are listed. Key parameters are the MOEs and MOSs identified in the requirements/capabilities document. The APB should be reviewed to ensure consistency between the requirements/capabilities document, the baseline which establishes explicit performance and thresholds, and the TEMP.

306. ACQUISITION INFORMATION ASSURANCE (IA) STRATEGY

IA is defined as measures that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and nonrepudiation. This includes providing for restoration of information systems by incorporating protection, detection, and reaction capabilities. IA must be addressed for all weapon systems; command, control, communications, computers, intelligence, surveillance, and reconnaissance systems; and information technology programs that depend on external information sources or provide information to other DoD systems. (See DoD 8500.1/.2 and SECNAV 5239.3A.)

307. INITIAL CAPABILITIES DOCUMENT (ICD)

The ICD is required before MS-A, as part of the JCIDS process. It is the equivalent of the legacy MNS, but is much more definitive in describing the program to be developed. The required format is prescribed by the JCIDS Manual. An ICD documents the requirement for a materiel or nonmateriel approach, or an approach that is a combination of materiel and nonmateriel, to satisfy specific capability gap(s). It defines the capability gap(s) in terms of the functional area, the relevant range of military operations, desired effects, time, and Doctrine, Organization, Training, Material, Leadership, Personnel, and Facilities (DOTMLPF), education, and policy implications and constraints. The outcome of an ICD could be one or more joint DOTMLPF Change Recommendations (DCRs) or CDDs. Programs that enter the acquisition process at MS-B shall have an ICD that provides the context in which the capability was

determined and approved, and a CDD that describes specific program requirements. Pre-MS-A projects shall rely on the ICD as the basis for the evaluation strategy.

308. CAPABILITY DEVELOPMENT DOCUMENT (CDD)

The CDD is required at MS-B and serves the same purpose as the legacy ORD. The CDD outlines an affordable increment of militarily useful, logistically supportable, and technically mature capability. The CDD may define multiple increments if there is sufficient definition of the performance attributes (key performance parameters, key system attributes, and other attributes) to allow approval of multiple increments. The CDD is required at Milestone B for new programs and for each increment of an evolutionary acquisition program.

309. CAPABILITY PRODUCTION DOCUMENT (CPD)

The CPD is required at MS-C as part of the JCIDS process. This is the capabilities document that supports IOT&E. The CPD reflects the operational requirements resulting from System Development and Demonstration (SDD) and details the performance expected of the production system. Software shall have demonstrated the maturity level required in the CPD prior to deploying it to the operational environment. Once the maturity level has been demonstrated, the system or increment is base-lined, and a methodical and synchronized deployment plan is implemented for all applicable locations. OT&E shall determine the operational effectiveness and suitability of a system under realistic operational conditions, including combat; determine if thresholds in the approved CPD and COIs have been satisfied; and assess impacts to combat operations.

310. REVIEWING FOUNDATION DOCUMENTS

When reviewing these documents, consider the following:

- From an operational viewpoint, why develop it?
- How will it be used?
- In what installations or platforms?
- In what environments (natural and manmade)?
- How well should it work? When?
- What must DT&E and OT&E do to prove the system's operational effectiveness and suitability? When?

Refer to samples 3-1 through 3-4 for comment letter formats.

311. MATRIX

Consider developing a cross-correlation matrix that relates to the requirements of the upper-level documents (MNS or ICD, CDD or ORD, etc.), the MOEs/MOSs of Part I of the TEMP, the COIs, the tests, the test plan run matrix, and, ultimately, the final results. This approach ensures accountability to requirements.

CHAPTER 3

FOUNDATION DOCUMENTS

Sample Format

Sample 3-1 Requirements Document Comment Letter

Sample 3-2 Requirements Document No Comment Letter

Sample 3-3 Capabilities Document Comment Letter

Sample 3-4 Capabilities Document No Comment Letter

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CHAPTER 4

RESOURCES

401. INTRODUCTION

This chapter focuses on resources available to the OTD. The chapter includes such topics as Points of Contact (POC), services, instructions, responsibilities, and specific resources available to the OTD. This chapter is also intended to provide an overview of the resource tools necessary to accomplish the job of an OTD.

402. ELECTRONIC RESOURCES

a. OT&E Reference Library. Electronic resources are available on the command's LANs (classified and unclassified) in Y:\OT&E Reference Library. The OT&E Reference Library has a variety of valuable resources that are particularly useful for the OTD, including:

- Standardized COMOPTEVFOR OT&E Document formats
- COMOPTEVFOR Acronym and Abbreviation List (CAAL)
- COMOPTEVFOR OT&E Document Writing Guide
- Security classification marking instructions
- COMOPTEVFOR Analyst's Handbook
- DoD, CJCS, SECNAV, and OPNAV T&E Instructions
- DOT&E Guidance
- Policy and Information Notices (PIN)
- Standard Operating Procedures (SOP)
- Various Memorandums of Agreement

b. Test and Evaluation Program System (TEPS). TEPS is a module within the COMOPTEVFOR Knowledge Management System (KMS) on the unclassified LAN. TEPS is a Web-based management tool designed to assist the OTD/Operational Test Coordinator (OTC) in the tracking and administration of projects, Fleet services scheduling, and activity reports. Access to the TEPS database is limited to members of COMOPTEVFOR. When a TEIN assignment letter is received from OPNAV N912, the new TEIN is entered into the TEPS database, and the appropriate COMOPTEVFOR OTD desk code is assigned. When required, a temporary local TEIN (3000-XXX) series may be assigned to programs that have not yet been assigned a formal TEIN by N912.

c. TEPS Requirements

(1) Key Data Fields. Data fields that must be filled in prior to saving a project or phase page are marked with a red asterisk. Table 4-1 lists additional key data fields that are critical to program management and require OTD/OTC focus.

Table 4-1. Critical TEPS Fields

Data Field	Field Location	Comment
Short Title	Project Main	Programs may have multiple short titles. Include common abbreviations to assist the search for programs when the TEIN is unknown.
Status	Project Main	• "OPEN" - COMOPTEVFOR is expending resources (funding, OTD time attending meetings, etc.) . • "OPEN NO OT" - No involvement from OPTEVFOR is anticipated (program is fielded with no planned improvements). • "REC CNX" - Program has been or is being removed from the Fleet
Test Status	Phase Main	The KMS Test Plan and Final Report Trackers check this field. Selecting "CNX" removes the phase from all trackers.
Est. Start Date	Phase Main	The KMS Test Plan Trackers are based on this date.
Start Date	Phase Main	The date actual testing began. Should be the same as the start test message.
End Date	Phase Main	The date testing ended (to include data collection). The KMS Final Report Trackers are based on this date. Should be the same as the end of test message.
Est. End Date	Phase Main	The KMS Final Report Trackers use this date when End Date has not been filled in.
Test Result Code	Phase Main	After the final report is signed, select the appropriate option from the pull-down menu. Contact Code 01B in cases where the option is not clear.
Recommend Code	Phase Main	After the final report is signed, select the appropriate option from the pull-down menu.
Project COIs	Project COI	Ensure all COIs have been entered.
Phase COIs	Phase COI	Ensure all COIs for the phase appear. After the final report is signed, edit each COI to update the assessment or resolution, as appropriate. For RED or UNSAT COIs, a remark may be added to clarify the deficiency.
Major	Phase COI Edit	After the final report is signed, select the appropriate number

Table 4-1. Critical TEPS Fields		
Data Field	**Field Location**	**Comment**
Deficiencies	for IOT&E and FOT&E Phases	of major deficiencies associated with each COI.
Final Report	Phase Documentation Final Report Edit	The KMS Final Report Trackers look for a completion date. For phases that do not have final report, use the "NA" status to remove the phase from the Final Report Trackers.
TP SIG COTF and TP SIG DOT&E	Phase Documentation TP SIG COTF and DOT&E Edit	The KMS Test Plan Trackers look for a completion date. For phases that do not have test plans, use the "NA" status to remove the phase from the Test Plan Trackers. TP SIG DOT&E is only required for DOT&E oversight programs.

(2) Document Archiving. TEPS shall be used to archive key OT&E documents on the unclassified LAN. Uploading documents is done in either Project Documentation or Phase Documentation, depending on the document. Until a classified version of TEPS is implemented, ensure only unclassified documents are uploaded and archived in TEPS. As the following documents become available, final signed electronic copies shall be uploaded and stored in the TEPS database:

- TEMP
- TEMP comment letter
- Test plan
- Final report
- Deficiency report message
- Anomaly report message
- M&S accreditation letter
- MOAs
- LOOs
- OT commencement message (start test message)
- OT completion message (end of test message)
- Requirements documents (ICD, CDD, CPD, ORD, etc.)

d. Shared Drives. The K: drives on the unclassified and classified LANs are shared drives that support access to and storage of T&E documents. The drives are organized by division, and each division is organized by section, with each section organized by office code. While each division may set its own requirements, at a minimum, the K: drive folders for individual programs should be structured with the following guidelines.

(1) Program Folder. Program folders should be named with the TEIN and short name (e.g., K:\40\41\0371-03 CBASS). Each program folder should have subfolders for the following, as required:

- Each phase of test
- Requirements documents
- Framework
- Funding
- TEMP

(2) Phase of Test. Within program folders, each phase of test should have its own folder using the name of the phase (e.g., K:\50\54\541\0201-08 EA-18G\OT-B1. Each phase of test should have folders for the following documents:

- Briefs
- Messages
- Final report
- Test plan

(3) Documents. Once a final, signed official document is available, save the document in .pdf or .doc format, as applicable, in the appropriate folder. Remove all draft documents from the main document folder by either deleting the draft document or moving it to a history folder. This action may prevent confusion as to which document is the most current. Update the document tracker when the document is given to a different division. (See yeoman for access.)

403. PHYSICAL RESOURCES

Depending on the program, an OTD may need to arrange for support (i.e., data collection/analysis/reduction, ranges, targets, etc.) from a variety of activities. In addition to the resources available within the divisions and from the program offices, COMOPTEVFOR's Fleet Resources office (Code 01D4, extension 3284) and Test Resource Requirements (Code 01C1, extension 3290) can provide assistance in obtaining necessary support.

404. TEMPORARY ASSIGNED DUTY (TAD) TRAVEL

All TAD travel must be approved by division ACOSs/DACOS and processed by the staff travel office. Requests for orders must be accomplished via the EBSuite financial or the Defense Travel System management system for all program- and command-funded travel requirements.

a. It is COMOPTEVFOR's policy that all personnel exercise discretion in the stewardship of taxpayer funds and to be frugal in the use of appropriated funds in support of travel by:

- Limiting travel to the absolute minimum level necessary to accomplish the mission in terms of the number of travelers, mode of travel, duration of travel, alternatives to travel, etc.
- Using teleconferencing and video-teleconferencing capabilities in lieu of travel whenever possible.
- Using government quarters, where available; where appropriate, travel arrangements to locations in which government quarters exist should be done in a timely manner to allow COMOPTEVFOR travelers to use government lodging while on travel.
- Minimizing resource expenditure for vehicle rentals by ride-sharing arrangements whenever two or more personnel are traveling to the same place.

b. Defense Acquisition University pays for travel associated with training of Defense Acquisition Workforce Improvement Act-designated personnel. Funding must be identified and received by the traveler prior to the processing of orders.

c. Travel by staff personnel to support programs that have passed MS-C will normally require the use of command Operation and Maintenance, Navy (O&MN) funds. A review of any exceptions must be completed to ensure the appropriate use of scarce O&MN funding.

d. The Defense Travel System is being implemented at OPTEVFOR for travel.

405. FISCAL/FUNDING GUIDANCE

a. COMOPTEVFOR personnel involved with managing appropriated funds shall, at all times, act as good stewards of fiscal resources provided for the purpose of executing this command's mission. The policy objective will be to establish and maintain a solid and unquestionable reputation for fiscal responsibility such that COMOPTEVFOR becomes synonymous with the ideals of fiscal integrity, frugality, and value-added.

b. In support of the general policy and to facilitate becoming a model of fiscal excellence, OPTEVFOR leadership and management personnel, particularly those directly involved with funds management and/or execution, will, in their appropriated funds dealings, always act conservatively, consistently, and unquestionably in the best interests of the command and the Navy, and, just as importantly, in the best interest of the American taxpayers. To be effective, funds administrators and managers should have a fundamental understanding and appreciation for basic financial principles and,

an understanding of the regulations and policies that must be followed. The following overview policy guidance is provided.

(1) Sources of Funds. COMOPTEVFOR is financially supported by a variety of different funding sources:

(a) Direct Operating Funds. COMOPTEVFOR is a "mission-funded" activity (i.e., resourced to perform its mission directly through the annual Congressional appropriations process), where funds are appropriated by Congress directly to support the core COMOPTEVFOR mission. Such directly appropriated funds are sometimes interchangeably referred to as direct funds, direct operating funds, mission funds, or core funds. In any event, COMOPTEVFOR's annual operating funds (less FOT&E travel support) are provided solely from within the Research, Development, Test, and Evaluation - Navy (RD&TE-N) appropriation. After the annual RDT&E-N appropriation by Congress, authority to obligate and expend these funds flows from Congress to the Treasury, then to the Office of Management and Budget (OMB), to the DoD Comptroller, to the DoN Comptroller, then to the Office of Naval Research (ONR) Comptroller, and finally, to COMOPTEVFOR, where the funds are deposited (after various adjustments along the way) into our operating account. RDT&E-N funds are legally available for obligation for 2 years – the appropriation and the funds therein are said to have a 2-year life. However, because these funds are appropriated as our direct annual operating budget, COMOPTEVFOR is incrementally funded on an annual basis and is expected to obligate the funds within the first year of the life of the appropriation. Thereafter, new annual appropriations are made, again with A 2-year legal life, but with the expectation that we will obligate all of the operating funds by the end of the first fiscal year.

(b) Reimbursable Funds. In addition to our direct annual operating funds, COMOPTEVFOR receives and is responsible for the proper execution of funds from various projects and PMs. Unlike the direct operating funds from the RDT&E-N appropriation, these funds are not to provide for core COMOPTEVFOR annual operating requirements, but rather for specific T&E requirements unique to individual projects from which the funds are provided. Such funds provide for range support, lab support, analytic support, test weapons, targets, program-specific travel, etc. In one sense, they are used to supplement our annual operating funds provided for by the RDT&E-N, but only to the extent that the funds are used to support specific T&E requirements for which the command is not supported and/or funded directly within RDT&E-N (e.g., range support, lab support, targets, test weapons, program-specific travel, etc.). It is inappropriate to use program funds (reimbursables) for acquiring goods and/or services that are considered to be a core part of our mission. Use of reimbursable funds for such purposes is considered an illegal augmentation of an appropriation and a violation of U.S. Code Title 31, section 1517. (It is sometimes referred to as the "Anti-Deficiency Act," discussed later; basically, it directs activities to not exceed their annual funds operating authority.) Additional guidance regarding use

of reimbursable funding by OTDs and OTCs is included in paragraph 406, Amplifying Guidance on Reimbursable Funds Use.

(c) FOT&E Travel Funds. The third source of funds from which COMOPTEVFOR draws each year is from O&MN appropriation. These funds funnel to us in much the same way as the RDT&E-N funds, as described above, except that they are provided to us via the CNO Field Support Activity (FSA) Comptroller (vice the ONR Comptroller). These funds have a 1-year life for obligation (vice 2 as in the case of our core RDT&E-N funds) and must be fully obligated prior to the end of each fiscal year. We may use these funds for one purpose alone: travel in support of FOT&E. The DoD Financial Management Regulations (FMR) and the Department of the Navy Financial Policy Management direct that FOT&E (OT-C and OT-D) efforts demonstrating operational suitability are to be funded from within the O&MN appropriation. Because COMOPTEVFOR is centrally funded for O&MN money to be used for FOT&E travel, the command cannot accept O&MN from outside sources to be used for FOT&E travel. There are three exceptions to the requirement as it pertains to FOT&E as follows:

- The travel involves evaluation of system components that were not available for testing during IOT&E.
- The travel involves accomplishment of deferred or incomplete IOT&E.
- The travel involves verification and correction of deficiencies discovered during IOT&E.

(d) Exceptions. When one of these exceptions applies, as determined by the COMOPTEVFOR Comptroller, FOT&E expenditures may be funded via other appropriations. The specific types/sources of money that may be used under this exception criteria vary with circumstances; thus, an OTD/OTC involved with this situation should liaison with the COMOPTEVFOR Comptroller early on to determine the most appropriate funding. This policy extends to reimbursable orders citing Navy Working Capital Funds (NWCF). Within the body of a funding document, NWCF will state what the source appropriation is to ensure COMOPTEVFOR financial records are maintained to provide a good audit trail, and to ensure COMOPTEVFOR can demonstrate compliance with the law/policy.

(2) Uses of Funds and "Color of Money." The concept of "color of money" involves important issues that leaders and managers need to be familiar with. First, "color of money" is an expression referring to the appropriation from which the money originates. The color is important in that there are laws and regulations that dictate what different appropriations can and cannot be used for. There are a number of appropriations supporting the Navy's various missions and functions, including, but not limited to:

- O&MN
- Operations and Maintenance, Navy Reserve (O&MNR)

- Military Personnel, Navy (MPN)
- Reserve Personnel, Navy (RPN)
- Aircraft Procurement, Navy (APN)
- Ship Construction, Navy (SCN)
- Weapons Procurement, Navy (WPN)
- Other Procurement, Navy (OPN)
- Procurement of Ammunition, Navy and Marine Corps (PANMC)
- RDT&E-N
- Military Construction, Navy (MCN, often referred to as MILCON)
- Family Housing, Navy (FHN)

(a) As previously indicated, COMOPTEVFOR receives direct annual operating fund support from just two sources: RDT&E-N (annual operating budget) and O&MN (FOT&E travel funding).

(b) With respect to reimbursable funds received from program offices, OPTEVFOR serves primarily as a central pass through/funding agent for such funds intended to support T&E activities that essentially occur "outside the fence." In this regard, COMOPTEVFOR handles program funds from numerous appropriations, including O&MN, RDT&E-N, APN, SCN, OPN, and WPN.

(c) Each appropriation is defined by statute and regulations as to what it may be used for. Inappropriate use of an appropriation (even though the actual expenditure may otherwise be appropriate/legal) constitutes a violation of USC Title 31, Section 1301 (sometimes referred to as the "color of money" statute).

(d) The following examples are provided with reference to the appropriations most commonly used by COMOPTEVFOR in the area of reimbursable program funds:

1. O&MN. Finances the basic day-to-day operations of the Fleet and principal shore activities (except in the case of COMOPTEVFOR, where RDT&E-N funds are used for all expenses for which most other commands use O&MN). OM&N supplies funds for annual operating expenses for other activities and Fleet commands, such as supplies, utilities, civilian manpower, travel, administrative support, fuel, repair parts, OPTAR, transportation leasing arrangements, maintenance of property, etc.

2. RDT&E-N. Finances the expenses necessary for basic and applied scientific RDT&E, including maintenance, rehabilitation, lease, and operation of facilities as authorized by law. In the case of COMOPTEVFOR, it serves as our equivalent of O&MN for purposes of covering our annual operating expenses. The appropriation is subdivided into seven budget activities: basic research, applied research, advanced technology development, advanced component development and

prototypes, system development and demonstration, management support (in which COMOPTEVFOR falls), and operational system development.

3. APN. Finances the procurement of Navy and Marine Corps aircraft and provides for related supporting programs. Supporting programs include equipment for modification of in-service aircraft, aircraft spare parts, ground support and training equipment, and industrial facilities and tools.

4. SCN. Finances primarily the construction of new ships, but also the conversion of existing ships (e.g., the SSN to SSGN conversion program), including all hull, mechanical, and electrical equipment; electronics; guns; torpedo and missile launching systems; and communications systems.

5. WPN. Finances the procurement of missiles, torpedoes, guns, and ancillary weapons-related supporting equipment for naval forces and Marine air forces. Supporting equipment includes equipment for modification of in-service missiles, torpedoes, guns, and gun mounts; targets used in weapons training exercises and weapons evaluation; hardware for navigation and communications satellite, and other space programs; spare parts; ground support and training equipment; and industrial facilities and tools required for the production and maintenance of missiles.

6. OPN. Finances the procurement, production, and modernization of equipment not otherwise provided for. Such equipments range from the latest electronic sensors required to update the naval forces to trucks, training equipment, and spare parts. This equipment is an integral part of programs to improve the Fleet and shore establishment by expanding or maintaining existing capabilities or replacing ineffective units.

(3) Statutory Implications

(a) There are several fundamental laws COMOPTEVFOR leadership and management personnel, to include OTDs/OTCs, should be peripherally familiar with, as they serve as the underpinning for much of the “how and why” funds are administered the way they are. The laws are frequently referred to in the aggregate as the Anti-Deficiency Act:

1. USC 31, Section 1301. Commonly referred to as the “color of money” or “purpose” statute, it states that funds may only be obligated and expended for the purposes authorized by the Congress in specific appropriations acts or other laws. It is a primary control that the Congress exercises over the executive branch.

2. USC 31, Section 1341. States that an officer or employee of the United States may not authorize an obligation exceeding the amount available in an appropriation or make any obligation before the appropriation becomes effective in law.

3. USC 31, 1517. States that an officer or employee of the United States may not authorize an obligation in excess of an apportionment. An apportionment is a subdivision of a congressional appropriation that carries with it legal responsibilities. COMOPTEVFOR is apportioned resources from both the RDT&E-N and O&MN appropriations, neither of which we may exceed in either obligations or expenditures.

(b) Penalties for violation of these statues include suspension from duty without pay and/or removal from office and/or restitution of funds to the treasury by the responsible or accountable individual. If the violation is deemed "knowing and willful," the penalty can include fines of up to $5,000 and/or up to 2 years in jail. Violations are reported up the DoN/DoD/OMB administrative chain to the executive branch. The law mandates that violations be reported to the President, then to Congress.

(4) Misappropriation of Funds. Funding received from any source may not be used for a purpose not specifically provided for in the law. Reimbursable funding also requires authorization from the issuing authority as to how the funds are intended to be used. Where doubt exists, an OTD/OTC should check with the COMOPTEVFOR Comptroller for a determination as to whether a planned use of funds is appropriate.

406. AMPLIFYING GUIDANCE ON REIMBURSABLE FUNDS USE

a. General Guidance Regarding Reimbursables. COMOPTEVFOR personnel responsible for managing reimbursable funds from program offices (sometimes referred to in the colloquial as "PM funds") in support of planned T&E efforts will adhere to the following broad principles:

(1) COMOPTEVFOR personnel charged with managing appropriated funds shall, at all times, act as good stewards of fiscal resources provided for executing the command's mission.

(2) Reimbursable funding will be used only for the purposes described in broad terms herein and will always be managed in a conservative manner so as to reflect positively on the command if/when subjected to audits by program offices or other outside agencies.

(3) Reimbursable funding will not be used to augment direct appropriated (mission) funds.

(4) COMOPTEVFOR personnel will not rely exclusively on PM approval for use of reimbursable funds – once a funding document is accepted by COMOPTEVFOR, sole fiduciary responsibility for the proper use of the funds resides with COMOPTEVFOR and the Comptroller. This command, not the program office, becomes thereafter solely responsible and accountable for any misdeeds (perceived or real), regardless of whatever authorization or enabling support may have been involved by program offices or other outside activities.

(5) Funding for all CNO project support is the responsibility of the DA (often referred to as the program office). Each OTD/OTC responsible for a CNO project requiring the technical expertise of research laboratories or contractor services is responsible for coordinating the transfer of funds from the DA to the COMOPTEVFOR Comptroller. A periodic review of the Part V Resource Summary in each TEMP is essential for updating funding requirements to support any analytical contracts, range time, laboratory requirements, or TAD travel needed in the course of the project's active life. The movement of resources by a DA can often take weeks or months, so early identification of funding issues within a program by the OTD/OTC is essential.

The appropriate use of reimbursable funds provided to this command by program offices is consistent with the COMOPTEVFOR overarching policy that requires all of us to act as good stewards of fiscal resources. Because of past confusion within the command as to the appropriate uses of reimbursable funding, every OTD/OTC should have a thorough understanding of the guidance in this section. If additional assistance or clarification relative to a specific use of reimbursable funding is required by an OTD/OTC, he/she should contact the COMOPTEVFOR Comptroller for resolution.

In interpreting federal appropriations law, the Supreme Court has stated that an established fundamental rule is that "The expenditure of public funds is proper only when specifically authorized . . . not that public funds may be expended unless prohibited . . .." This axiom is important where federal monies are concerned, since it refutes the popular and common misconception that "if the rules don't say I can't, then I can."

In addition to various Supreme Court rulings, the United States Comptroller General decisions have repeatedly demonstrated that where taxpayer funds are involved, traditional concepts like "show me where it says I can't" and "it's easier to get forgiveness than permission" are not applicable. Expenditures of federal funds are appropriate only when the law/regulations/policy are supportive. A corollary to this precept is that where federal law or departmental regulations/policy are silent on an issue, expenditures related to that issue are not authorized.

Where two (or more) appropriations or sources of funds are equally and legally appropriate for a given purpose, it is left to the command as to which source of funds will be used for that purpose; but once a source is selected, the command must thereafter assiduously follow the same policy and use only that source of funds for that purpose. Once a command has selected a funding source for a given purpose, subsequently selecting an alternative source of funds when/if the original source is unavailable (or for any other reason), is inappropriate and potentially illegal.

A command may not augment direct appropriated funds by any means; if a given appropriation is specifically earmarked for use for certain purposes, and thereafter that source of funds is deemed inadequate or perceived to be inadequate for the

purpose(s) intended, a command cannot decide to use other sources of funds for such purposes (even when/if the alternative source is the same “color of money”). Such an act could represent an inappropriate augmentation of funds and could ultimately lead to an Anti-Deficiency Act violation on the part of the command.

b. Specific Guidance Regarding Reimbursables. While exceptions may arise that will be adjudicated by the Comptroller’s office, the specific provisions apply at COMOPTEVFOR with respect to use of reimbursable funding. In general, the following uses of reimbursable funding received from PMs are acceptable (assuming the “color of money” stipulations discussed further below are met):

(1) Analytic Support Services. Includes contractor and lab support services unique to the program from which the funds are provided. Such services or support will use reimbursable program funding when the services or support is not otherwise available from the staff. An OTD/OTC must exercise care in establishing an appropriate professional and personal relationship with support contractor personnel. The contractual support provided by a contractor must never result in or give the outward appearance of a “personal services” contract. As stated in FAR 37.104(b), a personal services contract is one that, by its terms, or as administered, makes the contractor employees appear to be, in effect, government employees.

(a) All command support contracts are nonpersonal contracts and prohibit government employees from acting in the capacity of a “supervisor.” Each contract has a program manager within the company to oversee and manage the workload of each contracted employee. Vacations, time off, sick leave, etc., are all approved by the contractor's management and not by command/government personnel. Additionally, command personnel are not authorized to give contractors working in the facility "59," minutes as can be given to civil servants. Any time not spent in support of a negotiated contract must be approved by the program manager prior to contractor personnel participating in command social events or ceremonies during the work day to determine if that time will be paid out of overhead or if the individual is charged vacation time.

(b) However, technical cognizance and discussions of project status are essential, and should be conducted between division personnel and contractor personnel to ensure:

- Clear understanding of program support requirements
- A successful working environment
- Adequate support to the command’s mission

(2) Flying Hour Support. Reimbursable funds from the program supported will pay for required flying hours in support of program T&E.

(3) Lab/Range Services. Lab/range services in support of T&E will be funded using reimbursable funds from the program being tested.

(4) IOT&E Travel. IOT&E travel for programs of record will be funded using reimbursable program funds. After MS-C, travel in support of FOT&E will be funded with O&MN funding, as previously discussed.

(5) Program-Unique Equipment, Supplies, or Consumables

(a) This is arguably the most sensitive use of program funding. Caution is warranted where such purchases are concerned, since there is an inherently greater risk of a well intended, but nonetheless inappropriate, purchasing decision; thereafter, resulting in an unintended violation of law. Equipment purchases involving program reimbursable funding must involve singularly unique equipment, the focus of which is exclusively in support of the specific program providing the funds. (The same direction applies to program-unique supplies, and consumables.) The command is mission-funded and as such, is expected to provide for common equipment, supplies and consumables needed to support our direct funded military/civilian personnel and our mission from within our annual direct operating funds. Therefore, the policy at COMOPTEVFOR will be that procurement of equipment or consumables using reimbursable funds will be the exception to the rule; and such purchases will receive greater scrutiny during the requisition approval process and require Comptroller office approval prior to ordering.

(b) When questionable or high-risk purchases are denied, OTDs are encouraged to exercise the option of returning available funds to the program such that the program office's procurement/supply team orders such items for subsequent loan to the OTD/COMOPTEVFOR. This relationship with a PM keeps COMOPTEVFOR clear of fiduciary liability issues with regard to future audits and places such risk on the program office. In cases where such equipment/supplies procurement are deemed program-unique and acceptable for funding via program reimbursable funds, and are preapproved by the PM's office (approved within the narrative on the funding document) and the COMOPTEVFOR Comptroller (responsible for ensuring legal/policy requirements are met by this command), the OTD will solicit and obtain written guidance from the PM as to disposition of the equipment/supplies upon completion of the project and prior to actual ordering of the items(s).

c. Inappropriate Uses of Reimbursable Funding. In general, the following are inappropriate uses of reimbursable funds. Appropriate alternative sources of funds are as indicated.

(1) IT Equipment. Unless absolutely unique to a specific project, IT equipment (computers, monitors, laptops, PDAs, etc.) will not be purchased using program reimbursable funds. If deemed appropriate, and subject to funds availability, the command's mission funding (direct appropriated RDT&E-N) will normally be used for such purposes. (Note: while most hardware fits this category, some software applications may justify use of program funds if unique to the program. Details provided

to the Comptroller office will assist in determining the appropriate source of funds in such cases.)

(2) Mobile Phones/Other Personal Communications Equipment. Cell/mobile phones, Blackberries, and other PDAs will not be purchased using program reimbursable funds. If deemed appropriate and necessary for the conduct of the command's mission, and subject to funds availability, the command's direct funding (mission-funded RDT&E-N) will be used for this purpose. Given the cost/sensitivity involving procurement of such equipment, the Comptroller's office is prohibited from ordering such equipment, unless advance approval from the 00/01 level has been provided.

(3) Office Supplies. Unless absolutely unique to a specific program or project, office supplies will not be procured using program reimbursable funds. Subject to availability, the command's mission-funded RDT&E-N funding will normally be used for this purpose.

(4) Personal Items. Personal items, other than those otherwise addressed herein, will not normally be purchased using reimbursable program funds. In most instances, the general rule is that purchase of personal items using federal funds is forbidden. Where such items may be allowed, whether or not to use mission or reimbursable funding would depend on whether or not the requested items can be shown to be exclusively related to a specific program. Disallowed personal items include wearing apparel, uniform items, sunglasses, sunscreen, food items of any description, food preparation items of any description, entertainment items (other than such items received as part of the command awards system), etc.

(5) Full-Time Civilian Hires. COMOPTEVFOR will not hire permanent civilian positions using reimbursable funding. Subject to availability, the command's mission-funded RDT&E-N funding is used for this purpose. Reimbursable program funds may be used to support manpower requirements using contractor or laboratory/working capital fund manpower (such that the personnel are not full-time COMOPTEVFOR employees).

d. "Color of Money" Concerns. The above guidance does not address the "color of money" issues that sometimes arise regarding use of reimbursable funding. Program offices often have at their disposal various "colors of money" involving appropriations as diverse as O&MN, OPN, RDT&E-N, SCN, APN, PANMC, WPN, etc. When a PM sends reimbursable funding to COMOPTEVFOR, it is done with the understanding that, upon acceptance, fiduciary responsibility for proper use of the funds and compliance with law/regulations transfers to COMOPTEVFOR. Because the burden of risk transfers with the funds, program offices may not always be as discriminating as COMOPTEVFOR in selection of funding sources for a particular purpose. COMOPTEVFOR will accept and use reimbursable funds subject to the following "color of money" timeline guidance:

(1) Through IOT&E. In general, until IOT&E is complete, and in order to comply with legal/regulatory/policy restrictions on the use of various appropriations, the program office should provide RDT&E-N funds. In general, prior to completion of IOT&E, COMOPTEVFOR may not use procurement appropriations such as APN, SCN, OPN, WPN, or PANMC for use in support of T&E functions.

(2) Post-IOT&E. In general, after IOT&E, and to comply with legal/regulatory/policy restrictions on the use of various appropriations, either O&MN or a procurement appropriation (i.e., APN, SCN, OPN, WPN, PANMC) would be justified, depending on the specific item being procured. For travel in support of FOT&E, separate guidance is addressed in paragraph 405a(1), Sources of Funds. In any event, once IOT&E is complete, COMOPTEVFOR will generally no longer be able to accept/use program office reimbursable RDT&E-N funds for supporting follow-on T&E.

COMOPTEVFOR's policy will be to ensure that PM funds in support of T&E efforts are used in a fiscally responsible manner. While there may be exceptions to the rules above relative to use of reimbursable (PM) funds, it is expected that exceptions/waivers to the guidance herein will be rare. In questionable circumstances where disagreement exists regarding interpretation and implementation of this policy regarding appropriate use of reimbursable funds, the COMOPTEVFOR Comptroller is charged with making a final determination as to the appropriate course of action, guided by the precepts herein if guidance is not otherwise specified in higher level guidance/documentation. To the extent that a Comptroller decision is questioned, an appeal can be made to the Commander via the Chief of Staff, but the Comptroller decision will stand, pending follow-on arbitration.

e. Reimbursable Funding Documents. All reimbursable funding documents are to be forwarded to the COMOPTEVFOR Comptroller on a Project Directive, Military Interdepartmental Purchase Request, NAVCOMPT Form 2276, Request for Contractual Procurement; or NAVCOMPT Form 2275, Order for Work and Services. The type of funding document used will generally depend on the type of support required by the OTD/OTC. The Comptroller will review all incoming funding documents to ensure the document used by the issuer was the appropriate type for the work to be performed and/or how the funds are to be used. The Comptroller also confirms the source of funding is appropriate for the work to be performed such that COMOPTEVFOR remains compliant with fiscal laws relative to proper use of appropriated funding. Funds are accepted and disbursed to either cognizant external activities or the force contract officer for contractor support. Funding intended for use on an analytical support contract must be: (1) received as direct citation, and (2) authorized for use in support of Contracted Services (CS) (formerly Contractor Assistance and Advisory Service (CAAS)). The funding document should contain a statement that the funds are, or are not, authorized for CS and should use the appropriate funds coding to designate the funds as useable for CS.

f. Additional Fiscal Guidance/Support Available. Additional information regarding the use of funding providing to COMOPTEVFOR can be found in Financial Policy and Information Notices (FPIN) published by the command. FPINs can be found on the COMOPTEVFOR KMS. (Log in to KMS homepage, pull down "Mission Support" menu, select "COMOPTEVFOR Instructions," then "FPINs.") Should questions or issues relative to the use of funds arise for which the OTD/OTC is unable to ascertain the correct approach and that are beyond the scope of OTD Manual/FPIN guidance, the OTD/OTC should contact the Comptroller and/or Deputy Comptroller direct for specific assistance. The Comptroller/Deputy have access to Fiscal Policy and Fiscal Law offices on the staff of the SECNAV that can be queried to ensure the command safeguards funds, and uses funding in a legal manner and within the bounds of the law/policy. When in doubt, an OTD/OTC should contact the Comptroller's office for issue resolution; early notification of a brewing problem works best since legal/policy issues may require outside adjudication.

407. ANALYTICAL SUPPORT PROCEDURES

In the course of testing, there will invariably be a requirement to obtain additional technical support from government ranges, laboratories, and universities or support from defense contractors to perform the mission of OT&E. To that end, the following provides guidance for obtaining required support:

a. First and foremost, there must be a bona fide requirement for external support. Second, the program sponsor must have the resources to fund test support. Third, review existing contract vehicles and laboratories to determine if additional work can be placed on existing vehicles or if a new effort is required to support the mission.

b. All contracting requirements must be vetted through the cognizant division for review and approval.

c. No work will be accomplished without funding received and accepted from the program sponsors.

d. All contracting actions will directly support the command mission.

408. CONTRACTING PROCEDURES

a. Identifying the Need. When a need is identified for analytical or staff service support, it is the responsibility of the OTD to notify the designated division technical representative and/or command's COR.

b. Review TEMP. Accurate resources must be identified in Part V, Resource Summary, of each TEMP.

c. Appropriate Use. Advisory and assistance services may be used to obtain technical expertise in various specialties to support the T&E of CNO-assigned

programs. Contracts shall be written using performance-based work statements that clearly specify tasks with associated deliverables measured by established quality standards to ensure quality and timeliness.

d. Inappropriate Use. Advisory and assistance services shall not be used to:

(1) Bypass or undermine personnel ceilings, pay limitations, or competitive employment procedures.

(2) Contract former government employees on a preferential basis. Contractors shall not be used outside the scope of the contract in the capacity of a de facto government employee.

e. Requirements Generation. Requirements listed in the SOW intended to be used as the basis for contracts must be developed independent of contractor influence. Contractors that prepare (or assist in the preparation of) a SOW are prohibited from competing for that contract. FAR 9.505-2(b)

f. Government Surveillance. A time-and-materials contract provides no positive profit incentive to the contractor for cost control or labor efficiency. Therefore, appropriate surveillance of contractor performance by the OTD is required to give reasonable assurance that efficient methods and effective cost controls are being used.

g. Unauthorized Commitments. COR/OTD/OTCs shall make no unauthorized commitments or promises of any kind purporting to bind the government, to include authorizing contractors to work at risk (i.e., working in the absence of a signed contract or appropriately obligated funding).

h. Procurement Integrity

(1) All contractual communications (requests for proposals, invoice billing questions) shall take place through the contracting/ordering officer or designated COR.

(2) A warranted contracting officer is the only one authorized to financially obligate the government for COMOPTEVFOR. OTD/OTCs that tell a contractor to incur costs, without a signed contract in place, have made an unauthorized commitment.

(3) Government employees are generally prohibited from discussing future requirements (new, upcoming contracts) and/or source selection criteria with contractors (violation of the Procurement Integrity Act).

(4) Contractors are never authorized to work “at risk;” (i.e., without appropriate funding in place authorized by the contracting officer).

(5) Contractors that develop, produce, or test an item/system are generally prohibited from consideration for a contract to perform IOT&E on that component or

system, unless there is a contractor-developed mitigation strategy that is approved with a DOT&E waiver, as applicable and required (violation of Title 10 US Code 2399).

409. OTD RESPONSIBILITIES

a. To obtain analytical support, OTDs should notify their division technical representative/COR of requirements.

b. Notify the PM at the cognizant **systems** command of funding requirements and coordinate the transfer of direct-cite CAAS funds to COMOPTEVFOR for contractor support.

c. Originate the specific tasking requirements, as required by the force contracting officer, to obtain the correct level and type of contracting support for your program.

d. Ensure requirements are adequately defined in the task order, required deliverables are listed, known or estimated travel is identified, and the government cost proposal is within the ceiling of available project funds.

e. Do not discuss the cost of an order with contractor personnel or the amount of funding available to support the project. OTDs cannot authorize contractor personnel to work without a signed task order.

f. Notify the COR immediately in the event of unsatisfactory support by contractor personnel.

g. Recognize that you do not have the authority to make changes to an order once that task has been negotiated and accepted by the contractor. If changes or revisions are required, submit them in writing to the COR and proper procedures will be taken to effect a modification to the order. Changes include revisions to travel, additional labor, change in deliverables, material, etc. The cognizant contracting officer/ordering officer is the only person authorized to effect task order changes.

h. OTDs are the first link with the contractor and, as such, a great responsibility is placed on each OTD using analytical support contracts. Each OTD is relied upon to maintain the necessary distance from contractors to demonstrate nonpersonal services, where the personnel rendering the services are not subject, either by the contract's terms or by the manner of its administration, to the supervision and control usually prevailing in relationships between the Government and its employees.

i. Technical discussions are authorized and encouraged between OTDs and the contractor support team. OTDs are cautioned against making an unauthorized commitment. Do not change the scope of work through verbal discussions, make travel changes, or request additional tasking without the prior approval of the ordering officer via the designated COR.

j. OTD/OTCs are responsible for providing the COR with properly prepared and complete tasking and cost estimates when a support requirement exists.

410. CONTRACTING OFFICER REPRESENTATIVE (COR) RESPONSIBILITIES

a. COR duties for all unclassified contracts at headquarters will be performed by the staff supply officer. Quotas are reserved by the force contracting branch for COR training.

b. COR duties for all classified contracts force-wide remain with the cognizant division OTD. This policy has been established due to the sensitivity of project information and the “need-to-know” requirement. The same procedures are followed for selection and training.

c. Provide direct liaison between all OTD/OTCs using a support contract and the force contracting/ordering officer.

d. Allow at least 30 working days prior to expected start date for the task order to be processed by the force contracting branch.

e. Review OTD task requirements to ensure they are adequately defined in the task order. The more specific the requirements, the more professionally the contractor can support the effort. Do not assume that the contractor will know exactly what is required if the order is vague.

f. Keep close communications with all OTDs obtaining support under an assigned contract. It is the responsibility of each OTD to notify the COR immediately if the contractor is not performing satisfactorily. The COR must then notify the force contracting branch for corrective action to be taken to support the OTD’s requirement.

g. The COR for each analytical support contract will periodically perform site visits to the contractor's facility. These visits will be documented and filed for audit purposes.

h. The COR is not authorized to effect any changes to a task order. Requests for changes will be done in writing and provided, when possible, at least 10 working days prior to the effective date. Long-range planning and coordination with the OTDs will ensure task order modifications are accomplished in a timely manner.

i. The COR must notify the force contracting branch when concerned about the legality of any contractor support. Recommendations will then be made to the deputy commander and chief of staff on the appropriate course of action.

j. CORs will perform all functions as outlined in NAVSUPINST 4205.3A, Contracting Officer Representative (COR), and further defined in COTFINST 4330.1G, Contracting Officer Representative (COR).

k. The COR must review each contractor invoice and discuss with the cognizant OTD the hours and travel being billed. Once the OTD agrees that billing accurately reflects the services received, the COR signs the front sheet of the invoice (original and two copies) and the certification of performance page. All CORs should maintain a copy of invoices received. The COR will send the original and one copy back to the force contract officer for processing.

411. USE OF CONTRACTOR PERSONNEL

Technical services contractors will support the OTD as follows:

a. Review programs documentation and provide inputs for modifications to:

- TEMPs
- Test plans
- OTGs
- Computer Resources Life Cycle Management Plan
- Navy Training Plans (NTP)
- Design Engineering Documentation
- Integrated Logistic Support Plans

b. Data collection:

(1) Provide onsite collection and initial data evaluation for quick review of test progress.

(2) Provide feedback to the COR on quality and validity of externally collected data (data collected by Fleet users).

(3) Address questions such as:

- Were correct data collected?
- Can the data be used to apply to a COI?

c. Data analysis:

- Analyze data.
- Reduce data for purposes of report inputs, such as COI resolutions.

d. Provide lessons learned outline:

- List and explain problem areas of data gathering.
- Identify problems with the facility for gathering data.

- Provide ideas for improving test conduct.

e. Attend meetings for the *sole* purpose of collecting information for the OTD.

f. Contractors shall not:

- Plan the test.
- Ensure the proper conduct of testing.
- Liaison with other services on behalf of COMOPTEVFOR.
- Speak for COMOPTEVFOR at program meetings, conferences, or other official gatherings.
- Determine test results after reducing and analyzing data.
- Write the finished TEMP, test plan, or final report.

412. ACQUISITION OF CONTRACT SUPPORT

When technical support services are required or an existing contract expires, the procedures are as follows:

a. Headquarters' OTDs will notify the division technical representative and/or the designated COR. Subordinate command OTDs will notify the squadron-designated COR, who, in turn, will work closely with the force contracting branch.

b. The OTD/OTC will contact the cognizant program office for assistance to obtain funding for contractual support.

c. Upon approval from subordinate command commanding officer or cognizant headquarters deputy/assistant chief of staff, the OTD will work closely with the force contracting branch to prepare all the necessary paperwork required to obtain critical analytical support.

413. RELEVANT RESOURCE DOCUMENTS

- Y:/General/OTDContracts/Omnibus/Contract Assistance Guidelines.doc
- Y:/General/OTDContracts/Omnibus/Contract Profile Sheet
- Y:/General/OTDContracts/Omnibus/Omnibus IGCE
- Y:/General/OTDContracts/Omnibus/Sample SOW

414. CONTRACTOR SUPPORT

Support for GENSER programs is available under the Multiple Award Omnibus contract awarded 17 July 2007 as a base year with four option periods to support the command T&E requirements. Information regarding these resources can be obtained from the Force Contracting Officer (Code 14).

415. FLEET SERVICES

a. COMOPTEVFOR is the RDT&E Fleet support scheduling agent for CNO (N091), including all DT and OT associated with acquisition programs, and those projects and initiatives endorsed by CNO (N091) as requiring Fleet support under this process.

b. The primary method to identify Fleet support for acquisition projects is in Part V of the TEMP. TEMP inputs should be as specific as possible. These are used to plan and program not only Fleet support, but also financial support, ranges, targets, simulators, and other required support.

416. REQUESTING FLEET SERVICES

There are two types of Fleet service requests: standard (quarterly) and emergent.

a. Standard Fleet Service Requests

(1) Approximately 2 to 3 months prior to the Fleet scheduling conferences (7 to 9 months prior to the actual operation period), CNO (N091) sends the "Quarterly Call for Fleet RDT&E Support Requirements for . . . Quarter FY . . ." to all RDT&E agencies soliciting Fleet support requirements. OTDs submit their Fleet service requests on the COMOPTEVFOR unclassified LAN in the TEPS application. Fleet service requests are added within a project's phase by selecting "Fleet Services" in the "Phase Menu," then selecting "Add a Fleet service request here." This request should be as accurate, detailed, and flexible as possible to allow the COMOPTEVFOR Fleet schedulers the maximum leeway to schedule the required assets. This will help prevent a "no fill" at the scheduling conference and ensure that all assets required are obtained. List applicable Mission Essential Task List (METL)/Joint Mission Essential Task List (JMETL), which could be accomplished by Fleet units participating in the T&E event. The following is a list of recurring service request questions to ensure comprehensive request data:

- Hours per day?
- Day or night?
- Hours per sortie?
- Sorties per day?
- Dedicated or Not-to-Interfere Basis (NIB)?
- Consecutive? If not, minimum and maximum time between periods?
- In connection with other units?
- Can this be in connection with transit, Fleet exercise, or other Project Operations (POP)?

- Why these specific date(s)? How rigid are these dates?
- Which day(s) (when in connection with other assets) ?
- Can these tests be done simultaneously?
- DT or OT?
- Phase?
- Why this specific unit?
- Is same unit(s) required each day (period)?
- Installation time?
- Removal time?
- Is this required or preferred?
- Is range required? If so, which range?
- Which units have this equipment?
- Does this affect deployability?
- Any riders? Justify number of riders.
- Was anything done with Direct Liaison Authorized (DIRLAUTH) and Separate Correspondence (SEPCOR) from last quarter?
- Is this a continuation of previous quarter services?
- What type augmentation?
- Can more testing be done each day (period)?
- If this asset is not available, are remainder of services required?
- Where?
- Is this time maximum or minimum?

(2) COMOPTEVFOR schedulers codes (01D4 (east coast) and 60P4 (west coast)) will forward all OT requests received via the TEPS database to CNO (N912F) for prioritization. Once the prioritization is complete, CNO (912F) will forward the "Fleet RDT&E Support Requirements for . . . Quarter FY . . ." to the schedulers, who, in turn, will forward them to the OTDs.

(3) CNO (N912C) assigns a priority to each request. Understanding three facts about these priorities is essential:

- A priority applies only to one fiscal quarter.
- A priority is only assigned if Fleet support is requested.
- These are CNO priorities applying only to Fleet RDT&E support and must be integrated into the other Fleet priorities.

Further details concerning this prioritization are discussed in SECNAVINST 5000.2C.

(4) If the request for Fleet support does not appear in the appropriate Fleet RDT&E support requirements forecast data, or is inaccurate, contact 01D4.

(5) When the conference is completed, Fleet resources schedulers will contact the respective OTDs by either E-mail or voice mail with the results of the conference. The following is a list of possible conference results:

(a) Unit Assigned. When a specific unit is assigned, the OTD should, at the earliest opportunity, contact either the unit assigned, or the command or activity that has been given DIRLAUTH to ensure that the requirements are known and integrated into the unit's planning at an early stage. This coordination should not be delayed awaiting an official (i.e., written) assignment. Once the assignment is made at the Fleet scheduling conference, it is official. The written document only promulgates this assignment.

(b) DIRLAUTH Only. No services have been assigned, but the OTD must contact the provider to coordinate project needs.

(c) No Fill. No services are assigned. Try again next quarter or, if services are a must for the time requested, prepare an impact statement for CNO. All impact statement messages will be sent from COMOPTEVFOR.

(d) Open. Usually brought about because the required unit is currently unavailable; however, it may become available sometime after the conference.

(6) In all cases, it is advisable that the OTD contact the DA regarding assigned services to close the loop. Record traffic with the service provider is highly recommended to avoid misunderstanding of requirements.

b. Emergent Requirements

(1) Emergent requirements occur when a need arises for Fleet support after the deadline for scheduling conference submission has passed, or services are required in addition to those that were considered at the scheduling conference. When the need occurs, the OTD will conduct any necessary informal liaison to determine the feasibility (not a commitment) of the emergent services. If the feasibility check yields a negative response, a decision will be made as to whether or not an emergent request will be initiated. It is always a courtesy, and often a necessity, to initiate informal liaison at the type commander level prior to contacting units under their control. The OTD should obtain permission of the person with whom he spoke or met to reference their phone call or meeting in the request by COMOPTEVFOR. VX-1 or VX-9 should transmit a message request to COMOPTEVFOR. COMOPTEVFOR will release *all* emergent service requests. CNO will support NIB emergent services only. If concurrent or dedicated services are required, program sponsor support at the Vice Admiral (VADM) level will be required to justify the request.

(2) Emergent requests or schedule change requests severely diminish the effectiveness of efforts to stabilize ship schedules, identify tasks which can be fulfilled concurrently by a single unit, and fill requests for Fleet support. To minimize OPTEVFOR's contribution to such problems, the following conditions must be met prior to requesting emergent services:

(a) Certification of readiness for OT must have been received.

(b) The proposed testing, in the timeframe specified, must be in response to a CNO-directed deadline.

(c) The emergent service request must state why services were not requested during the scheduling conference.

(d) A draft or final test plan must be available so that services required can be clearly identified.

c. Asset Requests Not Scheduled at Conferences

(1) Commander, Naval Reserve Force. This is a flag-to-flag request and will be initiated by COMOPTEVFOR via the chain of command.

(2) Range Service and Operating Area (OPAREA) Support. Range and OPAREA requests are normally coordinated directly with the facility's scheduling authority. This policy applies to Atlantic Fleet Weapons Test Facility (AFWTF) and Atlantic Undersea Test and Evaluation Center (AUTEC). However, due to the demand for these facilities, it is advantageous to request range services in conjunction with support requirements requested at the Commander, Atlantic Fleet (COMLANTFLT) scheduling conference.

(3) Exercise Torpedoes (EXTORP). The OTD must submit requests for EXTORPs via message to the cognizant type commander. The DA will normally provide the RDT&E funding for EXTORP turnaround.

d. Fifth, Sixth, or Seventh Fleet Services

(1) Requests for Fifth, Sixth or Seventh Fleet services must be submitted to OPTEVFOR 01D40, complying with the format, procedures, and lead time required for routine scheduling conference submissions. The requests will be sent to CNO (N912C), who will assign a priority and forward the consolidated requirements to the appropriate Fleet commander by message. Requests not meeting the lead time criteria must be submitted per procedures established for emergent requirements.

(2) Informal liaison is necessary to ensure that the required services are feasible, but the OTD must ensure that the liaison is conducted carefully throughout the operational chain of command for those services desired.

417. NON-NAVY SERVICE REQUESTS

a. There are a variety of test resources available from non-Navy sources, including U.S. Air Force, U.S. Army, U.S. Coast Guard, Canadian forces, and civilian contract services. Contact the OPTEVFOR Fleet Resource Scheduler (Code 01D4), (757) 282-5546, extension 3284, for assistance.

b. Canadian RDT&E Support. All requests for Canadian RDT&E support (e.g., ranges, hosting, Fleet support) will be coordinated through the OPTEVFOR Fleet Resource Scheduler (Code 01D4), extension 3284. Information concerning Canadian Forces' capability and informal inquiry into availability of support may be coordinated through the Canadian Navy Exchange Officer in 70 Division.

418. RELATED COMMUNICATIONS

a. Notice of Intent (NOI). The primary purpose of an NOI is to reserve a submerged OPAREA and establish procedures which will minimize mutual interference between submerged submarines, and between submarines and other operations, such as surface ships using variable depth sonar or dropping of explosive ordnance. Commander, Submarine Fleet Atlantic (COMSUBLANT)/Commander, Task Force (CTF) 42 is COMCLANTFLT's submarine operating authority and is assigned the responsibility of coordinating and approving NOI requests. COMCLANTFLTINST C3124.4 series provides the procedures for requesting an NOI. If the test area, participating units, and timeframe are well-defined, the NOI requests should be sent to CTF 42. If test operations are ill-defined or inherently flexible, the responsibility for requesting the NOI rests with the primary participating unit.

b. Communication Plans. Communication plans are an integral component of any LOI. This first step in formulation of a comprehensive plan is the assignment of frequencies for short-term tactical and training evolutions. Guidance for submitting frequency requests is contained in annex K of COMCLANTFLT OPORD 2000 series.

419. METEOROLOGICAL/OCEANOGRAPHIC (METOC) ENVIRONMENTAL SUPPORT

a. An OTD may benefit from METOC support during the test planning and test execution phases of OT&E. Internal METOC support requirements may be coordinated with the Staff Oceanographer (Code 811R) or the Aerographer's Mate (Code 626A), while external METOC support is available from Navy Mobile Environmental Team (NMET) personnel. When required, OTDs must receive adequate and timely environmental support (predictions, observations, interpretation of data) during OT&E. If the test platform/site neither has organic oceanographic nor meteorological personnel to support the OTD, the NMET may be a viable solution.

b. Navy Mobile Environmental Team (NMET). The primary mission of the NMET is to provide METOC environmental forecasting and observation support for

temporary requirements (less than 120 days) in the Atlantic, Pacific, and Indian Ocean regions (including adjacent bodies of water, such as the Mediterranean and Norwegian Seas, Sea of Okhotsk, Gulf of Mexico, Persian Gulf, etc.).

(1) NMET support includes:

- Oceanographic and meteorological forecasting and interpretation
- Sensor and weapon system performance prediction (Integrated Refractive Effects Predictions (IREP), tailored acoustic propagation loss and raytrace forecasts, etc.)
- Tactical recommendations for optimum sensor performance
- Ship weather, bathythermograph, oceanographic, and upper air observations

(2) NMET Funding. NAVOCEANCOMINST 3140.13 states that travel and per diem expenses to provide support to Fleet T&E of weapon and sensor systems is nonreimbursable (i.e., we don't pay). The ship or submarine provides berthing and a workspace for the team (usually a one- or two-person team). NMET support provides an excellent opportunity for the OTD to obtain accurate environmental data at no cost to OPTEVFOR or the project.

(3) NMET Request Procedures. Requests for NMET services will be from the nearest naval meteorology and oceanography command activity which is NMET-capable. NAVMETOCCEN Norfolk provides support to the Atlantic Ocean, Caribbean region, and Mediterranean Sea areas of responsibilities. NAVMETOCCEN San Diego supports the Pacific Ocean, Indian Ocean, and Northern Arabian Gulf. Requests for NMET support should include:

- Type of support (forecasting, observing, upper air, or acoustics and ASW)
- Nature of deployment (include CNO project number)
- Name of ship(s) NMET will be embarked upon
- Embarkation and disembarkation dates and locations

420. OCEANOGRAPHER RESPONSIBILITIES

When directed, the OPTEVFOR oceanographer will:

a. Advise the Commander on METOC environmental impact on naval weapons systems, particularly during OT&E.

b. Assist in the document review process to ensure METOC environmental factors are considered.

c. Assist the OTC/OTDs in obtaining NMET support services from the appropriate NAVOCEANCOM activity.

d. Assist in the tactics development phase of OT to ensure any system can be effectively employed within METOC environmental constraints.

e. Assist the OTC/OTDs in obtaining necessary hydrographic, topographic, or aeronautical charts for OPAREAs where testing will be conducted.

f. Monitor METOC forecasts and conditions during OT, and brief appropriate staff personnel of the effects on test platforms and systems.

421. NAVY TRAINING PLANS (NTP)

NTPs are prepared per OPNAV P-751-2-9-97 (Training Planning Process Methodology Guide), OPNAV P-751-3-9-97 (Training Planning Process Methodology Manual), and OPNAV 1500.76 (Navy Training System Requirements, Acquisition, and Management). These documents are on the command's LANs (classified and unclassified) in Y:\\OT&E_Reference_Library\ALS_Development_Tools. The following is a guideline for reviewing the seven sections of an NTP:

a. Part I, Technical Program Data. Ensure this section includes the title of the program, security classification, NTP principles, operational uses, technical and operational evaluation requirements, description of the equipment, system or subsystem being replaced, significant interfaces with other systems, maintenance levels (organizational, intermediate, or depot), logistics, schedules, manpower requirements, and training concept.

b. Part II, Billet and Personnel Requirements. Ensure this section identifies the quantity and quality of billets required to support the new system based on projected installation. If a new system replaces an old system, the billets to be phased out should be considered in manpower determination.

c. Part III, Training Requirements. This section describes in detail the data reflected in parts I and II. The reviewer should ensure that these data are accurately reflected in this section.

d. Part IV, Training Logistic Support Requirements. This section identifies training hardware requirements, such as technical training equipment, test equipment, general purpose and special test equipment, special purpose and special tools, and electronic test equipment and repair parts needed to maintain these equipments. Requirements for facility, training services, curricula materials, training aids, and technical manuals should be included.

e. Part V, Major MSs. Ensure the MSs developed for the new system are stated in this section. The MSs should identify the key controlling events pertaining to the introduction of the new equipment, system, or subsystem. The key lead times and events are those used in planning the identification, acquisition, detailing, and sequence for manning and training personnel.

f. Part VI, Actions and/or Decisions. This section briefly describes the actions required to solve pertinent problems in the development process and a concise statement of all appropriate conference decisions affecting the required elements of the NTP.

g. Part VII, POCs. Ensure all POCs applicable to the development of the NTP are listed. All NTP principles listed in part I of the NTP should be included.

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CHAPTER 5

THE TEST AND EVALUATION MASTER PLAN (TEMP)

501. INTRODUCTION

The TEMP is the single most important T&E document associated with an acquisition program. It is the controlling T&E management document for all acquisition programs and, in general, must be approved prior to commencement of OT&E. Any departure from TEMP approval policy will be on a case-by-case basis and approved by the Commander. The TEMP is directive in nature, and defines and integrates test objectives, critical issues, system characteristics, test responsibilities, resource requirements, and test schedules.

502. PURPOSE OF THE TEMP

a. The basic purpose of the TEMP is to combine the DA's DT&E plans and COMOPTEVFOR's OT&E plans into one integrated master plan approved by the CNO or higher authority (except ACAT IVT TEMPs, which are approved by the PEO/DA and COMOPTEVFOR). Because the PEO/DA and COMOPTEVFOR have independent authority, within their respective areas, to determine program test periods and test resources, it is imperative that these independent efforts be integrated into a single program structure.

b. Per SECNAVINST 5000. 2C, COMOPTEVFOR develops the COIs for each program and publishes them in Part IV of the TEMP. The COIs are linked to CNO requirements established in the ORD, ICD, CDD, or Capabilities Production Document (CPD).

c. The hardest part of this process is determining the essential elements of operational effectiveness and operational suitability, the COIs to be resolved in OT&E, and the questions which must be answered to resolve the issues. A contributing factor to the difficulty is the number of sources or agencies. Ideally, MOEs and MOSs will have been clearly established in the requirements documents, and COMOPTEVFOR will have already reviewed these for testability and appropriateness. When the DA provides a list of MOEs and MOSs on a first-draft TEMP, the OTD ensures that they are operational characteristics, not technical characteristics. Remember, the DA thinks technically, not operationally. Technical backgrounds should not overshadow an operational background. Confronted with a new weapon system or equipment, and having understood why it's being developed, the OTD should ask two basic questions:

- What should it do from an operational mission accomplishment viewpoint?
- What shouldn't it do from an operational mission accomplishment viewpoint?

d. For example, consider a buoy carried externally on a submarine that is designed to release automatically if test depth is exceeded. The buoy surfaces and transmits an emergency message identifying the submarine and reporting its location at buoy release, etc., at regular intervals over the life of its battery. Viewed as part of an overall system, and this viewpoint is crucial to the process, there are two fundamental characteristics associated with operational effectiveness of the buoy:

- If test depth is exceeded, there must be a high probability that the ground station will receive an accurate distress message.
- The buoy must not release when it's not supposed to (e.g., during high-speed transits, maneuvers, etc.).

e. Note that parameters, such as output power, battery endurance, etc., while related to the first operational characteristic are, in fact, technical characteristics and are not to be directly evaluated in OT&E. However, if they are known or found to be inadequate for operational use, their impact on overall operational effectiveness should be considered.

f. If the elements of operational effectiveness and operational suitability are defined correctly (i.e., if the COIs are correctly stated), the rest of the job becomes almost bookkeeping. If the definition is wrong, the error may remain throughout test planning and test operations, only to be recognized in the reporting process—and lead to a limitation that says COMOPTEVFOR didn't ask the right questions. OTD responsibilities also include ensuring that validated intelligence threat data are considered throughout the entire OT&E process. This includes periodically reviewing the intelligence threat materials, knowing the critical intelligence parameters of that project, being sensitive to new intelligence data, and maintaining continuous liaison with assigned intelligence personnel.

g. CNO review and concurrence in ACAT I through III TEMPs is required because:

(1) Establishment of thresholds and objectives in the TEMP Part I is a CNO responsibility.

(2) Scope of testing affects Research, Development, Test and Evaluation (RDT&E) funding, which CNO must provide.

(3) Most testing involves committing Fleet units and schedules.

(4) CNO is the central T&E point of contact for the DA and COMOPTEVFOR, thus, enabling resolution of differences.

h. The TEMP serves several secondary purposes:

(1) It allows all involved to see exactly what hurdles the system must clear and when.

(2) It allows the DA to project T&E costs, which must be funded.

(3) It allows Fleet, range, simulator, and target schedulers to plan, well in advance, for the required services. Specifics, including requirements for new or modified facilities, must also be identified in TEMPs.

503. TEMP POLICIES

a. Contents. The contents of the TEMP and the relationship of key portions to the successful completion of the overall OT&E program cannot be overstated. An approved TEMP, or an approved TEMP revision, constitutes direction to conduct the specified T&E program, including the sponsor's committed support, and constitutes approval of the COIs. Test plans will be prepared directly from the TEMP and will carry out its provisions. The basic format is described in succeeding paragraphs. Each OTD and OTC must be familiar with this chapter and SECNAVINST 5000.2C.

b. Reviews. TEMPs may be reviewed in their entirety twice: once when the DA submits a draft for comment, and again when the final version is received for the Commander's signature. Before the first review, the OTD should have provided the DA with OT&E schedule inputs for Part II, a complete Part IV, and OT&E resource requirements for the Part V. At that time, OT-C and OT-D should be included in the schedule. The OTD's review of the complete TEMP should address all parts, including replacement of draft Part IV, if necessary. The OTD should be especially sensitive to resource and schedule inadequacies in the final draft TEMP, and ensure that COMOPTEVFOR points them out to CNO. The DA is responsible for ensuring the TEMP is updated at milestones, when the program baseline has been breached, or on other occasions when the program has changed significantly. The OTD works closely with the DA to ensure COMOPTEVFOR's input is provided in sufficient time to support the required update, ensuring that COMOPTEVFOR is not responsible for program delays while preparing TEMP updates.

c. Updates. The TEMP must be updated at all milestones, when significant program changes occur, or when the program baseline has been breached. TEMPs and TEMP updates are considered overdue by N091 if not approved at the OPNAV level 60 days prior to commencement of testing related to the next milestone. Certification of TEMP currency (i.e., no change required for next milestone) should be sent to the office of the Director of Strategic and Tactical Systems/DD, Developmental Test and Evaluation (S&TS/DT&E) via N091. Updates may be made by use of correction pages and by a letter indicating "no change."

504. TEMP BASICS

a. A TEMP is prepared jointly by the DA and COMOPTEVFOR, with the involvement of both the OPNAV program sponsor and the N091 T&E coordinator in early draft reviews. During the TEMP review process, the OTD should ensure the minimum acceptable operational performance requirements (older programs) or MOE/MOS (newer programs) from the approved ORD/ICD/CDD/CPD are incorporated. COMOPTEVFOR contributes to all parts of the TEMP (in working sessions, through comment letters, etc.) and provides the OT&E portions throughout the document. The parts specifically provided by COMOPTEVFOR are to be drafted by the OTD. Formal review of the TEMP for all ACAT levels is initiated by transmission of the DA's proposed draft to COMOPTEVFOR. Identify the COIs that must be resolved by OT&E.

b. The TEMP is required at MS-B for all programs. Since the TEMP is prepared jointly by the DA and COMOPTEVFOR, it is essential for the OTD to be involved in all stages of TEMP preparation. This requires familiarity with other program documentation (MNS, ORD, ICD/CDD/CPD, Information Assurance (IA) strategy, ONI Capstone TA, etc.) and close coordination with the DA, particularly during program changes.

c. If TEMP development is moving too slowly, the OTC and ACOS should be involved as soon as possible.

d. The OTD should handle as much as possible at informal working sessions and through informal inputs. At all times, ensure the DA understands that a formal COMOPTEVFOR review will take place. If the TEMP is not the way COMOPTEVFOR requires it, it should be stated officially.

e. Test and Evaluation Coordinating Group (TECG). If the DA and COMOPTEVFOR cannot agree, a draft will not be forwarded to CNO. The N091 T&E coordinator will be notified, at which time he or she will consider forming a TECG to resolve the issues.

(1) A TECG will convene when T&E issues arise that cannot be resolved between the applicable commands or when extensive T&E coordination is required. A TECG may also be used to implement urgent required changes to TEMPs. In this case, either a page change will be issued or the formal report of the TECG will be attached to the TEMP as an annex until the next required update or revision.

(2) TECGs will be convened by the Director, Test and Evaluation Division (CNO (N912)), via formal correspondence that outlines the purpose for convening the TECG, identifies the attendees, and provides an advance agenda for review prior to the meeting. Additional information on TECGs is in SECNAVINST 5000.2C.

(3) National Security Agency (NSA) has primary responsibility for developing and testing Consolidated Cryptologic Program (CCP) systems. A CCP TECG will be

used to identify Navy-unique effectiveness and suitability issues for emergent 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 assignment or cancellation of CCP TEINs.

f. COMOPTEVFOR normally prefers to have an approved MNS, ORD/ICD/CDD, and ONI Capstone TA prior to commenting on a TEMP. However, if COMOPTEVFOR has commented on a draft ORD/ICD/CDD and the DA or CNO is urging us to provide TEMP comments prior to ORD/ICD/CDD approval, we may try to provide them. Also, if reference documentation is too immature or there are too many contentious issues to allow providing meaningful comments, TEMP comments will not be forwarded until the reference documentation is approved at the CNO level and provided to COMOPTEVFOR.

g. There is a reason for each phase of OT&E, normally association with a programmatic decision for the system being tested. If there is a properly prepared TEMP, the reason for each phase of future OT&E will be stated in the appropriate OT&E Objective paragraph of Part IV. The reasons most frequently associated with phases of OT&E are:

(1) OT-A EOA. To support a recommendation on engineering and manufacturing development (MS-B), or to provide an early risk assessment of new operational concepts or systems.

(2) OT-B OA. To provide a risk assessment to the MDA at the MS-C/LRIP decision or provide a risk assessment, as called for in the TEMP.

(3) OT-C IOT&E. To determine the operational effectiveness and operational suitability, and to provide recommendations regarding Fleet introduction and FRP to the MDA.

(4) OT-D. To complete any incomplete or deferred IOT&E and to verify correction of deficiencies identified in IOT&E.

(5) OT-E. To verify the operational effectiveness and operational suitability of the production version of the system.

h. For multiservice or joint programs, a single, integrated TEMP is required. Component-unique content requirements, particularly evaluation criteria associated with COIs, can be addressed in a component-prepared annex to the basic TEMP. TEMPs for multiservice programs will be prepared in close coordination with other participating services' OTAs and will be approved jointly by CNO (N091) and the representatives of the military chiefs of the other participating services. When the Navy is designated as executive lead for development and T&E, TEMP preparation will be per SECNAVINST 5000.2C. The lead service will provide the baseline threat documentation. If the Navy

is not the lead service, Navy-unique threat issues will be addressed in the integrated TEMP or Navy annex, using the appropriate ONI Capstone TA.

i. For a program consisting of a collection of individual systems, a Capstone TEMP integrating the T&E program for the entire system may be prepared. A Capstone TEMP addresses the T&E of a defense system comprised of a collection of stand-alone component systems, which function collectively to achieve the objectives of the defense system. Individual, system-unique content requirements are to be addressed in an annex to the basic Capstone TEMP. The requirement for a Capstone TEMP is dependent upon the degree of integration and interoperability required to satisfy the total system's minimum acceptable operational performance requirements (older programs) or MOE/MOS (newer programs).

505. BASIC TEMP FORMAT

While acknowledging that there is no mandatory format for the TEMP, the Defense Acquisition Guidebook does provide a suggested format. Table 5-1 summarizes each part of the TEMP and the recommended page length. Specific review criteria are discussed later in the chapter. This is what the OTD should expect to see when reviewing a TEMP from the DA:

Table 5-1. Basic TEMP Format

Section	Description
Title Page	Program title, name and submittal, concurrence and approval signatures.
Part I - System Introduction	Contains mission description, system TA, MOE and MOS, system description, and critical technical parameters.
Part II - Integrated Test Program Summary	Contains Integrated Test Program Schedule and Management. *
Part III - DT&E Outline	Contains DT&E Overview, DT&E to Date, and Future DT&E.
Part IV - OT&E Outline	Contains OT&E Overview; COIs; OT&E to Date; Future OT&E; and LFT&E. (10 pages)**
Part V - T&E Resource Summary	Contains test articles; test sites and instrumentation; test support equipment; threat systems, and simulators; test targets and expendables; operational force test support; simulations, models, and test beds; special requirements; T&E funding requirements; and manpower and training. *
Annex A - Bibliography	Cite all documents referred to in the TEMP, and all reports documenting DT&E and OT&E.
Annex B - Acronyms & Abbreviations	List and define all acronyms and abbreviations used in TEMP. Ensure acronyms are defined at their first usage.
Annex C - Points of Contact	Complete list of points of contact.

* May use foldouts if desired/required.
** Every effort should be made to remain within the page limit guidelines. COMOPTEVFOR policy is to avoid using appendices if at all possible in Navy TEMPS; however, for programs with complex and extensive histories, it may be useful to issue an annex for OT&E to date.

506. REVIEW AND INPUTS TO TEMPS

COMOPTEVFOR reviews the entire TEMP with particular attention to:

a. Part I, System Introduction

(1) Mission Description (paragraph 1a). The purpose of the system is clearly stated, and program documents (MNS, ORD/ICD/CDD/CPD, etc.) are referenced. The Mission Assurance Classification (MAC) is listed, and the Confidentiality Level (CL) is identified. Refer to DoD 8500 series for further details.

(2) System TA (paragraph 1b). The current ONI Capstone TA or other approved threat document is referenced, and the threat environment is briefly summarized. OTDs, in coordination with the staff intelligence officer, must ensure the system TA paragraph in the initial TEMP, and subsequent TEMP updates, adequately references the ONI Capstone TA and briefly summarizes the threat environment described therein. The threat statement should include any restrictions on how the system will meet and/or counter the threat, as provided for in the ONI Capstone TA.

(3) MOEs and MOSs (paragraph 1c). (For older programs, this may still be referred to as minimum acceptable operational performance requirements.) The ORD/ICD/CDD/CPD is referenced, and critical operational effectiveness and suitability parameters are accurately summarized. All the parameters needed for a complete operational evaluation have been provided. If not, develop appropriate parameters, in consultation with the assigned project analyst, and request a threshold (if appropriate) from CNO via the TEMP comment letter. Ensure threshold values provided by CNO make sense operationally (e.g., interoperable with TEMP-specified systems, better than the current system, etc.). Where possible, ensure that all effectiveness and suitability parameters in this paragraph are testable, and have been assigned threshold values. Parameters that are not quantifiable (e.g., logistic supportability, compatibility, etc.) should be addressed as COIs in Part IV of the TEMP. See paragraph 615 for more on suitability calculations.

(4) System Description (paragraph 1d). All system key functions and interfaces are briefly described. All parts of the system are named and listed so there is no uncertainty as to what makes up the system. Interfaces with existing or planned systems are addressed, and interoperability requirements with other services, DoD components, or allies are addressed. Unique system characteristics that may require special test and analysis (resistance to countermeasures; development of new threat simulation, simulators, or targets) are adequately described.

(5) Critical Technical Parameters (paragraph 1e). A measurable critical system characteristic, that when achieved, allows the attainment of a desired operational performance capability. CTPs are measures derived from desired user

capabilities (capabilities documents) and are normally used in Developmental Test and Evaluation (DT&E).

b. Part II, Integrated Test Program Summary

(1) Integrated Test Program Schedule (paragraph 2a)

(a) Test Program Schedule. COMOPTEVFOR inputs the OT&E-related portions of the Integrated Schedule. Ensure the schedule includes:

- A graphic presentation of program MS, availability of test articles, DT and OT periods, and production schedules
- A phase of OT&E to support each MS decision beginning with MS-B (OT-A for EOAs, and OT-B1 for OAs)
- At least 30 days between completion of TECHEVAL and commencement of IOT&E
- Past VCD phases. A VCD must be tied to the phase of testing it applies to (i.e., a VCD for OT-B1 would be “OT-B1A (VCD)”)
- At least 90 days (plus any additional time required by other activities to prepare for the decision forum) between completion of a phase of OT and the MS decision it supports
- OT-C and OT-D, even if dates have to be estimated or “Dates TBD” noted on the schedule
- Scheduling of system IOC and its definition included in a footnote
- Event dates, such as MS decision points, test article availability, software version releases, LRIP deliveries, FRP deliveries, IOC, full operational capability, and statutorily required reports
- A single schedule for multiservice or joint and Capstone TEMPs showing all DoD component system event dates

(b) Financial Data

- Check RDT&E and procurement funding with source documents to ensure consistency. Check that the funding is broken down by FY and funding category.
- Ensure planned cumulative funding expenditures are presented by appropriation.
- Ensure financial data are consistent with the APB document. This is a DoD component document prepared and submitted to the milestone decision authority in support of MS-A, B, C, and D reviews. It concisely highlights the status of a program and its readiness to proceed into the next phase of the acquisition cycle.

(2) Management (paragraph 2b). Ensure the responsibilities of participating organizations are clearly and properly defined, and, if agreed upon, integrated or combined DT and OT is properly addressed, including the requirement for an MOA.

(a) Ensure the DA provides the date (fiscal quarter) when the decision to proceed beyond LRIP is planned. LRIP quantities required for OT&E must be identified for the DOT&E approval prior to MS-B for ACAT I programs, and other acquisition category programs designated for Office of the Secretary of Defense T&E oversight.

(b) Identify and discuss any operational issues and vulnerability and lethality LFT&E requirements that will not be addressed before proceeding beyond LRIP.

c. Part III, DT&E Outline (about 10 pages)

(1) Review for completeness, including IA controls, survivability, lethality, special requirements, critical test items, and test limitations.

(2) Ensure dates coincide with the APB document.

d. Part IV, OT&E Outline (about 10 pages)

COMOPTEVFOR has sole responsibility for preparation of the OT&E outline. This should not normally exceed 10 pages in length. See sample 5-7 for a detailed format and additional guidance. The OTD should ensure that a new Part IV is issued when the OT&E program changes. The only changes or alterations made to Part IV will be made by COMOPTEVFOR. If the OT&E outline must exceed 10 pages because of a complex or extensive OT&E history, an annex may be prepared. The key paragraphs of the Part IV OT&E outline and its contents are:

(1) Paragraph A, OT&E Overview. This paragraph discusses how OT&E is structured to provide operationally oriented evaluations or assessments to support each major MS decision. It also discusses how the OT&E examines, or has examined, the system in a realistic operating environment, including threat-representative opposing forces and targets, and the expected range of the natural environment.

(2) Paragraph B, COIs. These are the critical operational effectiveness and operational suitability issues that must be examined in OT&E to determine the system's capability to perform its mission. A COI is phrased as a question that must be answered to properly evaluate operational effectiveness (e.g., "Will the system detect the threat in a combat environment at adequate range to allow successful engagement?") and operational suitability (e.g., "Will the system be safe to operate in a combat environment?"). One of the most difficult tasks facing the OTD in evaluating a system's operational effectiveness is deciding on the COIs that constitute an operationally effective system. Governing directives addressing COIs are necessarily vague and speak in generalities. There is no standard cookbook approach to operational effectiveness COIs that apply in every case, since systems may be as simple as a hand-held radio, or as complex as a DDG 51 or multimission aircraft. Since the COIs inform the DA early in the program of our critical issues and allow us to obtain

approval of the COIs when the basic TEMP is approved, the following must be considered when developing COIs:

(a) COIs must address all aspects of the system necessary to determine its operational effectiveness and operational suitability.

(b) COIs are not thresholds. For example, do not say, "Is the system's Mean Time Between Operational Failures (MTBOMF) at least 200 hours?" Instead say, "Will the reliability of the system support completion of its mission?"

(c) While observing this distinction between COIs and thresholds, be sure that every MOE and MOS in Part I of the TEMP can be related to one or more COI. For example, if CNO has specified a required probability of detection, be sure that the detection stage of the engagement sequence is included within the array of COIs, and that end-game considerations have not been the only concentration.

(d) COIs are not technical specifications. Think operationally—instead of trying to address a technical specification, ask the question, "Will the system be safe to operate and maintain?"

(e) Since the COIs address a system's capability or performance, begin the COI with "Will." List beneath the COI each capability or function that needs to be examined during phases of testing. Indicate the phase of testing at the end of each COI (e.g., (OT-B1) (OT-C2) (OT-C)) or, if the COI will be tested in all phases, that information is contained in the lead-in paragraph.

(f) The wording of COIs should be as specific as possible to include a question for each mission/capability/function the COI is intended to address, particularly in the case of operational effectiveness issues.

(g) If applicable, ensure IA, joint interoperability, survivability, and tactics are included as effectiveness issues. Joint interoperability is relevant to a system as an effectiveness issue if the system provides services or information to, or accepts services or information from, other systems on joint interfaces. In such cases, if joint interoperability is not addressed as a COI in its own right, it must be addressed as part of one or more of the mission-based effectiveness COIs.

(h) The following guidelines will help you determine applicability for IA:

- The IA COI has become a standard for all information technology systems. To determine applicability of the IA COI, an information technology system includes: all weapon systems; and any equipment or interconnected system or subsystem of equipment that has use in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission or reception of data and includes computer software, firmware, and hardware.

- DoD Instruction 5000.2 states, “All weapon, Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR), and information programs that are dependent on external information sources, or that provide information to other DoD systems, shall be tested and evaluated for information assurance.”
- The IA COI validates the operational controls provided in the DODI 8500.2C by ensuring the systems’ effectiveness to protect the data, detect and respond to threats, and restore the system data in response to threats. The MAC and CL determine the level of IA testing required for a system. The attachments in DoDI 8500.2 list the controls to be evaluated.
- Systems designated as Platform Information Technology (PIT) must also address the IA COI. The level of testing in a PIT derives from the interconnections with the network or other systems, and the Mission Assurance Category (MAC) and Confidentiality Level (CL). MAC I, Classified systems would require a more robust level of testing than a MAC III, Public. If no PIT interconnection exists, then the system does not have any IA requirements.

Table 5-2, taken from DoDI 8500.2 (page 50 of 102), identifies the various MAC and CLs along with testing requirements:

Table 5-2. Applicable Controls (by MAC and CL)

MAC and CL	Applicable IA Controls from DoDI 8500.2
MAC I, Classified	Attachments A1 and A4
MAC I, Sensitive	Attachments A1 and A5
MAC I, Public	Attachments A1 and A6
MAC II, Classified	Attachments A2 and A4
MAC II, Sensitive	Attachments A2 and A5
MAC II, Public	Attachments A3 and A6
MAC III, Classified	Attachments A3 and A4
MAC III, Sensitive	Attachments A3 and A5
MAC III, Public	Attachments A3 and A6

(i) Ensure all the standard suitability issues, including safety, have been addressed.

(3) Paragraph C, OT&E to Date. This paragraph will address each phase of OT&E previously conducted and includes:

(a) Test Phases. The test phase and dates conducted.

(b) Configuration Description. A brief description of the system tested and where it was installed.

(c) OT&E Events and Results. This paragraph addresses where the tests were conducted, who operated and maintained the equipment, COMOPTEVFOR's conclusions regarding operational effectiveness and operational suitability, COMOPTEVFOR's major recommendations regarding the system (e.g., continued program development, Fleet introduction, etc.), the COIs intended for resolution, and how they were resolved.

(4) Paragraph D, Future OT&E. This section will separately address all future phases of OT&E and will include the following information for each phase of testing:

(a) Test Phases. The test phase and dates to be conducted.

(b) Configuration Description. Identify the system to be tested during each phase, and describe any differences between the tested system and the system that will be fielded, including where applicable, software maturity performance and criticality to mission performance, and the extent of integration with other systems with which it must be interoperable or compatible. Characterize the system (e.g., prototype, engineering development model, production representative, or production configuration).

(c) OT&E Objective. This paragraph states the purpose of the phase of testing, and includes the COIs to be addressed by each phase and the milestone decision review(s) supported. The following should be considered when preparing the OT&E Objective paragraph:

1. When preparing the purpose statement, give careful thought to the phase of testing and the configuration of the equipment or system being tested. Ensure that tactics development is included if a Tactics Guide is required.

2. In those cases prior to MS-B where an EOA OT-A is being conducted using breadboard systems, modeling, or simulation, the purpose will be to assess the risks of the system. (Note that this assessment will be accomplished through observations or monitoring of operation of the breadboard system, model, simulation, or DT.)

3. In early phases of OT&E after MS-B, where the equipment configuration is more closely representative of the final configuration or where testing is being conducted on a production-representative system prior to IOT&E, the purpose will still be to assess the risks of the system. However, the OTD should have a much clearer picture, given the system metrics, of how the actual system will perform.

4. For IOT&E, the purpose will always be to determine the operational effectiveness and operational suitability of the system.

5. For FOT&E (e.g., OT-D), the objective will be to verify those COIs that had been resolved satisfactorily during IOT&E, and assess those COIs that should have been assessed in IOT&E, but require additional testing because they were not resolved. In those cases where the FOT&E is to determine the operational effectiveness and operational suitability of a system or software upgrade and its readiness for Fleet introduction, or to determine its readiness for Fleet introduction into a new platform, and the FOT&E is in effect an IOT&E, the IOT&E rules for determining and assessing COIs apply.

6. When a new or updated version of system software is proposed for Fleet release, the OT&E Objective paragraph will state that the testing will be accomplished on the host system with the specific software version installed (e.g., the purpose of testing will be to "determine the operational effectiveness and operational suitability of the New Weapons System (NWS) with NWS-4 software installed"). This will ensure the purpose of testing is stated per command policy regarding testing systems, not black boxes, etc., and will further ensure the test plan and evaluation report state the current purpose of testing.

7. When listing COIs for the applicable phase of testing, show a column for operational effectiveness and a column for operational suitability. Ensure that the COIs listed in these columns agree with what is listed in the COI paragraph.

(d) OT&E Events/Scope of Testing/Scenarios

1. Events. Use this paragraph to quantify testing (e.g., What will be done? How many runs? How many launches?) and to state the need for a maintainability demonstration.

2. Scope of Testing. Use this paragraph to state the period of time the testing will be conducted, to what degree the system will be tested, the type of resources to be used, the threat simulators and the simulation(s) to be employed, the type of representative personnel who will operate and maintain the system, and the status of the logistic support.

3. Scenarios. The scenarios for each phase of OT&E are the basis for the scenarios that will be used conducting the system OT&E. The scenarios must be well thought out and reflected in the scenarios provided in the test plan. Summarize the scenarios and identify the events to be conducted. Indicate that the scenarios will be based on the threat as derived from the applicable ONI Capstone TA. Refer to the ONI Capstone TA by number, title, and date. Indicate the environment in which the testing will occur.

(e) Limitations. This paragraph will be included for each future OT&E phase and must identify those factors (e.g., threat realism, test target limitations, environmental constraints, etc.) that will preclude a full and completely realistic OT. The limitations in OT&E phases must be well thought out and placed in the Part IV with the thought in mind that they will more than likely be a limitation when the time for OT&E occurs. When addressing test limitations, include:

1. Each limitation's impact on the assessment (EOAs/OAs)/resolution (IOT&E/FOT&E) of COIs. (Indicate in parentheses after each test limitation the COI(s) affected, except for minor limitations.)

2. Each limitation's effect on the ability to draw conclusions regarding operational effectiveness and operational suitability (IOT&E/FOT&E), or recommending continued program development (EOA/OA).

3. Any resource requirements not available or which have been removed from the TEMP by CNO direction.

4. If a target or simulator is used that is not completely threat-representative, how or in what way does it not fully represent the threat. A supporting matrix of threat-to-simulator characteristics and capabilities could be included to clearly identify the differences.

(5) Paragraph E, LFT& E. See chapter 2, paragraph 221. For those programs where a requirement to conduct LFT&E has been established, the TEMP will contain a separate section that charts LFT&E actions over the entire acquisition process. Review the LFT&E section and ensure:

- Planned testing supports the operational aspects of live-fire testing of survivability, lethality, range, size/weight, etc.
- Continuous LFT&E (shown in Part IV, paragraph E) from component-level testing and analysis during the concept demonstration and validation phase to full-up testing prior to major production decisions.
- Planned targets, threat systems or surrogates, and models and simulators are threat-representative and based on the current TA.
- Sufficient assets are provided to address IA, system survivability, and lethality.

e. Part V, T&E Resource Summary. Confirm the T&E Resource Summary is prepared per SECNAVINST 5000.2C. COMOPTEVFOR provides input for the OT&E-related portions of the T&E resource requirements. (A rationale is not required for our inputs to this section of the TEMP; however, the number of assets requested must be defensible.) SECNAVINST 5000.2C requires that major shortfalls in resources be included in the TEMP. Include all required OT&E resources (e.g., threat simulators or surrogates against which the system will be tested, and other systems and joint

interfaces needed to support assessment of joint interoperability) in the initial TEMP without regard to the objections of other agencies. Should CNO determine the program may proceed without the resource, he may direct its removal from the TEMP. Such items will also be included in the limitations section.

f. Supporting Materials. Review Annex A (Bibliography), Annex B (Acronyms and Abbreviations), and Annex C (Points of Contact) for completeness.

507. TEMP APPROVAL

Once all issues have been resolved, the smooth TEMP will be signed and dated by COMOPTEVFOR and the DA, then submitted to CNO (N091) for final staffing and approval at the appropriate level. For ACAT IVT programs, the TEMP will be effective once signed by the SYSCOM's Commander or PEO, and COMOPTEVFOR.

508. DA COORDINATING OFFICES

Each SYSCOM has an office responsible for coordinating all TEMPs and TEMP comment letters. To facilitate proper distribution of our TEMP comment letters, ensure that these offices are either "copy to" or "Action" addees, as appropriate, when TEMP comment letters are sent to PMs in those SYSCOMs. The cognizant offices are SPAWAR (SPAWAR-053-4), NAVSEA (SEA-62T), and NAVAIR (AIR-5.1).

509. PREPARATION, ROUTING, AND RELEASE OF TEMP DOCUMENTS

a. TEMP Initial Input Letters

(1) Initial inputs to new TEMPs are provided to the DA no later than 90 days after receipt of the CNO project TEIN assignment letter.

(2) The division ACOS and Air Test Squadron (VX)/Marine Helicopter Squadron (HMX) CO are allotted 75 days from receipt of the project assignment letter to prepare a draft input letter. The OTD works in coordination with the scheduler, logistics specialist, analyst, oceanographer, and intelligence, and submits the draft input letter to the technical editor, Code 01E, for technical review. Input letters are signed by the Chief of Staff. Briefings are normally not required. Timelines are summarized in table 5-3.

Table 5-3. TEMP Initial Input Letter Timelines

Days	HQ Action	VX/HMX Action
75 (Since receipt of TEIN Assignment Letter	1st Chop - Document starts route to: analyst, editors, intel (as applicable).*	VX - Route rough draft to analyst and tech editor (in squadron), and intel (as applicable). HMX - Send to HQ via Code 50 liaison

Table 5-3. TEMP Initial Input Letter Timelines		
Days	**HQ Action**	**VX/HMX Action**
		for HQ review process.
80	2nd Chop - Originator receives comments from reviewers and makes appropriate changes. Code 50 liaison return HMX documents to originator for any major changes.	VX/HMX - Make appropriate changes.
81	Route smooth draft to 01B and 01.	Get VX/HMX CO's approval of document.
83	Prepare smooth document.	Prepare smooth document, send to HQ via Code 50.
85	Route smooth at HQ to editors, 01B, and 01 for signature.	N/A
90	HQ mailroom distributes.	N/A
*HQ B codes may waive reviews if deemed not applicable.		

b. TEMP Comment Letters. The originator prepares letters commenting on TEMP contents within 30 calendar days after receipt of the TEMP from the DA. Timelines are summarized in table 5-4.

Table 5-4. TEMP Comment Letter Timelines		
Days	**HQ Action**	**VX/HMX Action**
15 (from receipt of TEMP)	1st Chop - Document starts rough route to: analyst, editors, intel (as applicable).*	VX - Route rough draft to analyst and tech editor (in squadron), and intel (as applicable). HMX - Send to HQ via Code 50 liaison for HQ review process.
20	2nd Chop - Originator receives comments from reviewers, makes appropriate changes; prepares and routes "smooth rough" to 01B and 01. Code 50 liaison return HMX documents to originator for any major changes.	VX/HMX - Make appropriate changes and get CO's approval of document.
25	Prepare and route smooth to editors, 01B, and 01 for signature.	Prepare smooth and provide to HQ via Code 50.
30	HQ mailroom distributes.	N/A
*HQ B codes may waive reviews if deemed not applicable.		

c. TEMP Comment Letter Signature. TEMP comment letters are signed by the Chief of Staff. Briefings are normally not required.

d. TEMPs and TEMP Forwarding Letters. TEMPs and forwarding letters should be staffed and returned to the cognizant SYSCOM as soon as possible after receipt of the TEMP for signature. Staffing is the same as for TEMP comment letters, except timelines are to be minimized to the maximum extent. The Commander signs all TEMPs and TEMP forwarding letters. Briefings are normally required.

e. Requesting Deadline Extensions for Input and Comment Letters. An extension request will be submitted to the Policy/Project Manager (Code 01B) providing the reason for any delay and the projected new due date. This information will be used to update the weekly list of overdue T&E correspondence.

CHAPTER 5

TEST AND EVALUATION MASTER PLAN (TEMP)

Sample Formats

Sample 5-1	TEMP Input Letter
Sample 5-2	TEMP Comment Letter no Major Comment
Sample 5-3	TEMP Comment Letter with Major Comment
Sample 5-4	TEMP Forwarding Letter - Comment
Sample 5-5	TEMP Forwarding Letter – No Comment
Sample 5-6	TEMP Detailed Comments
Sample 5-7	Part IV
Sample 5-8	Assignment Letter
Sample 5-9	DT-OT Memorandum of Agreement
Sample 5-10	DT Assist Memorandum of Agreement
Sample 5-11	TEMP Change Letter

CHAPTER 6

TEST PLANNING

601. INTRODUCTION

This chapter contains discussion of test planning and the format to use when writing a test plan.

a. OT consists of the following elements:

(1) Exercising a system or equipment under conditions that are as close as possible to the expected natural, operational, and combat environment using operational scenarios in which forces (friendly and opposing) employ realistic tactics against targets that fight back.

(2) The test article itself:

(a) Is representative (considering the stage of development) of the intended production equipment.

(b) Is installed (considering the stage of development) as it is expected to be installed in the Fleet.

(c) Is operated and usually maintained by Fleet personnel. Operation by Fleet personnel is always required for OT once a more mature system is available. System operation by contractors voids OT in all but the earliest phases, usually OT-A/OT-A1 (EOAs/OAs) when there is only a prototype or brassboard, or while depending on simulation. The same is not true of maintenance. During early IOT&E, maintenance by Fleet personnel is usually not possible, making maintainability data unusable for COI evaluation. (Note that even when there is no OT, an operational evaluation of technical data is always possible.) On occasion, the Navy's maintenance plan states a continuing role for contractor personnel in organizational-level maintenance. When testing a system with an approved plan of this kind, contractor personnel participation is permitted exactly as specified in the approved plan, and their performance is subject to review and analysis just as if they were sailors.

(d) OT seeks to provide data on system performance (where performance includes all the elements of operational effectiveness and operational suitability) in the operational environment. This environment includes many things. Among these are the people (operators, maintainers, etc.); the other systems that will also be consuming power, radiating, etc., in the same ship or aircraft; ships or aircraft in the vicinity, employing their own systems; established constraints or rules of engagement; natural

environmental factors (visibility, sea state, oceanographic, etc.); the simulated enemy and the tactics, countermeasures, etc., the operator employs; etc. If the system will be employed in the Fleet in a variety of scenarios, investigate all of them before repeating any. This will ensure the most complete data coverage if unforeseen circumstances cut testing short. Always strive to maximize test variables while acquiring data in areas not yet explored. Not all variables are identifiable before testing; therefore, be alert for the unexpected and be ready to record its results.

(3) Record sufficient data accurately during the test to document all operationally significant system or equipment characteristics.

602. LONG-RANGE PLANNING

a. A T&E WIPT will be used by the SYSCOM/PM as early as MS-A for ACAT I/II programs. This group, formerly known as the Test Plan Working Group (TPWG) will provide discussion of, coordination on, and resolution of test planning goals and issues; opportunities for the open dialogue necessary for properly designed and adequately tested systems in preparation for OT; and the forum necessary for review of required management-level program documentation (MNS, ORD/ICD/CDD/CPD, and TEMP).

b. The T&E WIPT will be chaired by the PM or designated representative (military O-6/O-5 or civilian equivalent). The membership should include the requirements officer, N912 T&E Coordinator, COMOPTEVFOR representative (the OTD, including VX/HMX OTDs), program office DT representative, ASN Research, Development, and Acquisition (RDA) staff, and contractors, as applicable. Depending on the program, representation could include joint service representatives and OSD personnel.

c. The frequency of T&E WIPT meetings will be determined by the PM. Minutes of each meeting should be distributed to all members.

603. TEST PLAN PREPARATION

a. ACAT Programs. Test plans are required for each identified phase of OT&E (e.g., OT-A, OT-B, OT-C, etc.). The preparation for OT&E must concentrate on a number of fundamental issues important to the overall OT&E process. These include: the purpose of the test; capabilities/functions of the COIs to be examined; how the test will be conducted, whether operation-oriented or scenario-oriented testing will be used; evaluation criteria against which test results will be measured; resources required to support OT&E; data collection methods and requirements; and data analysis methods to be employed. Once these issues have been resolved, test plan writing can begin.

b. Non-ACAT Programs. The early nature of this level of effort lends itself to a modified OA vice a modified OT or evaluation. The standard OPTEVFOR test plan in its entirety may not be appropriate; formal OT&E is not required for these programs. As a minimum, the test plan should contain the following elements:

(1) A cover letter signed by the appropriate ACOS/VX/HMX CO.

(2) An abbreviated test plan document in paragraph form, consisting of: background; description of the areas to be assessed or questions to be answered (focusing on the previously identified COIs); procedures or methods to be used to conduct the assessment; any limitations that may exist; and a description of the report to be provided upon completion.

c. JCTDs (formerly Advanced Concept Technology Demonstrations (ACTD)). Depending on the previously agreed to level of COMOPTEVFOR involvement with the particular JCTD, we will generally follow the IAP, providing inputs for COIs and MOP/MOEs. The scope of the evaluation is further refined in the Demonstration Execution Document (DED), a document similar to a test plan that provides sufficient detail to measure MOPs and MOEs, and to analyze each COI. COIs will be evaluated using EOA/OA color codes, assessing military or operational utility. We will not attempt to resolve JCTD COIs as satisfactory (SAT) or unsatisfactory (UNSAT). That task must wait until after transition to formal acquisition, if that occurs.

604. MBTD PLANNING PROCESS

a. The initial steps in the MBTD process are alike, regardless of where in the acquisition process a program resides when the decision is made to employ the MBTD methodology. Entry at some point between MS-A and B is best, but a post-MS-B entry is viable. The process is also applicable to FOT&E, although the integration process may prove more challenging. While some portions of this process may be abbreviated, the MBTD planning process should be followed in its entirety, for each increment or spiral of a program that employs incremental or spiral development as its acquisition strategy.

b. To initiate the MBTD process, a meeting or series of meetings should be held between the program T&E stakeholders (T&E WIPT members to include the sponsor, CNO N912 representative, DOT&E representative (if oversight) and DT representative) and the OTD/C. These meetings are intended to:

- Define and map the overarching T&E strategy to ensure all stakeholders start from the same philosophical foundation.
- Develop a list of acquisition and operational documents required to support the mission analysis effort.
- Determine who should participate in/support the mission analysis effort and where and when it will commence.
- Define the format and content of testing requirements inputs to an IT matrix database (if IT is applicable).
- Determine where the IT matrix database (if IT applicable) will be maintained and who will have access.

- Derive test data and information sharing rules (may be adjusted for the ITT charter).
- Establish separate analysis/reporting requirements.

c. These ground rules and definitions should be documented in the approved TEMP. However, if the TEMP or a TEMP update is too far in the future, these ground rules may be incorporated in an MOA approved at an appropriate level (ACOS/PM), later to be followed by approval in the TEMP. It is important for the PM to ensure the developing contractor(s) is given the appropriate information from these documents since they will be (postdown-select) a member of the T&E team.

d. Figure 6-1 provides an overview of the MBTD and OT Framework development process. It shows the steps associated with a mission analysis for the system under test and the steps to develop the information necessary to author the OT Framework. It also depicts how the OT Framework feeds the IT integration process (if applicable) and how the mission analysis provides the OTD/C the capability to trace the results of testing back to the mission (bidirectional traceability). (This figure will become much clearer after the steps depicted in the mission analysis and stand-alone OT planning sections have been presented and discussed.)

e. Mission Analysis. The purpose of mission analysis is to identify the tasks the system will support, derive the mission-based COIs, break down the tasks into subtasks, and then correlate the product of this effort with the required capabilities (and their associated attributes) from the ORD/Capabilities Document (CD). This effort will enable the direct traceability of any system enhancement, risk area, or deficiency discovered during testing to a mission or missions.

(1) To ensure all T&E members are working from the same foundation, key participants must first complete and agree on the mission analysis for the system. Mission analysis is a combined effort among COMOPTEVFOR, the program representatives (T&E WIPT), and other participants such as the Fleet Forces Command (N8) representatives and operational users. Additional Subject Matter Experts (SME) may be included to ensure this evolution is completed thoroughly. These SMEs might include center-of- excellence representatives (Naval Strike Air Warfare Center, Surface Warfare Development Group, etc.), Fleet training representatives (Commander, Second Fleet/Third Fleet), Tactical Training Group Atlantic/Pacific, etc.), Joint Forces Command personnel, or other service representatives for joint or multiservice programs. Inclusion of these key participants ensures DT, OT, and CT stakeholders (when included) are in full agreement concerning the missions, tasks, requirements, and defined capability attributes of the system.

(2) Before starting the mission analysis, the OTD should check with the PM and sponsor to see if some form of mission analysis has already been completed to support an analysis of alternatives, functional capabilities board, manpower reduction, or training assessment, among other possibilities. Gaining access to this information could significantly reduce the effort required to complete the mission analysis process.

MBTD/IT Construct

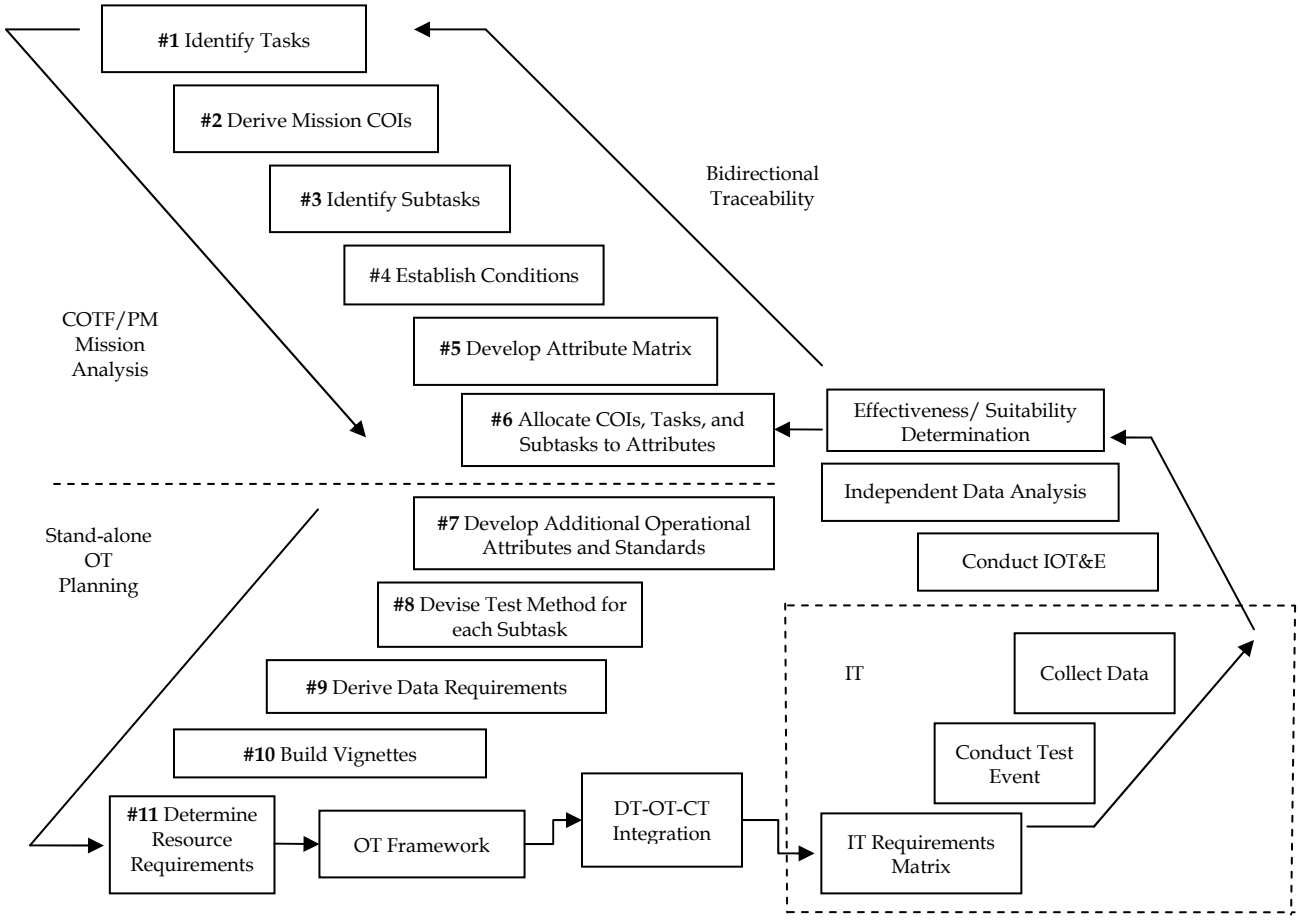

Figure 6-1. MBTD (and IT when applicable) Process Flow Chart

(3) The mission analysis is conducted by the participants to derive the tasks and missions applicable to the system to be tested using the following system documents:

- The CONOPS or concept of employment
- The current ORD/CD
- The Universal Navy Task List (UNTL) (OPNAVINST 3500.38B)
- The Universal Joint Task List (UJTL), (CJCSM 3500.04C) (for joint programs)
- The Navy (or Marine) METL

- Other appropriate documents

Some of these documents may not exist or may only exist in draft form for programs that are pre-MS-B. This should NOT deter the mission analysis effort. In fact, the requirement to complete a mission analysis to perform MBTD can be used as an incentive to push the development of these documents or to help identify shortfalls and deficiencies in the documents. Once the system missions and tasks have been derived from the documents, a mission-task-subtask hierarchy for the system is developed. Following this, all requirements and capability attributes are matched with appropriate tasks and subtasks.

f. Detailed Process Description. The following is a detailed description of the mission analysis process. As noted earlier, this process may be rather simple if a mission analysis of some kind has already been completed, or it may take considerable effort and several meetings to complete. Mission analysis is an iterative process where two or three of these "steps" will be conducted together and repeated several times to accomplish the breakdown of a given mission into tasks, subtasks, and conditions. Once completed, the results of the mission analysis must be documented in the OT Framework and approved in the TEMP (or MOA), as described above.

(1) Step One: Identify Tasks. This process is heavily influenced by the available documentation and its contents. To begin this step, an analysis of available documents (ORD/CD, CONOPS, UNTL, and METL for units employing the system under test) must be conducted to identify the tasks that the system under test will support. Because of the variability of these documents, the process of identifying tasks may be as easy as extracting specific Mission Essential Tasks (MET) from the CD or as complicated as reviewing the entire UNTL to determine appropriate system tasks. While these processes have similarities, the approach to each case should be different.

Step One, Case 1: The METs that the system will support are known and well documented in the CONOPS section of the CD or some other task lists (e.g., METLs for units employing the system under test or similar legacy systems.) In such cases, all of the known METs are collected and sorted into categories as either "mission tasks" or "supporting tasks." The definition of mission tasks is highly dependent upon the system and the unit employing it. Supporting tasks include those tasks that support a defined mission task or multiple mission tasks. Tasks like, "conduct navigation" might fit into the supporting category since navigation is generally not a stand-alone mission. A task like "clear minefields, barriers, and obstacles" could be categorized as a mission task for a minesweeping unit or a supporting task for a strike group commander. Once all tasks have been pulled from the CD, the entire UNTL should next be reviewed to determine if there are other tasks that would likely fit the system under test, but which may not be called out in available documentation. When conducting this review, it is important to note that task titles can be misleading or incomplete. As such, the full task description must be read to determine if the task is applicable to the system under test. If additional tasks are

selected, agreement between all stakeholders should be sought early in the process to ensure that all selected tasks are appropriate for test. At the completion of step one, the OTD should have a documented list of all mission and supporting tasks, as shown in sample 6-1.

Step One, Case 2: Specific METs are not adequately documented. This could occur because the new system is unique and has no legacy counterpart or because the ORD/CD is written from a warfare area centric perspective (i.e., Antiair Warfare (AAW), Undersea Warfare (USW), etc.). In these cases, there may be no direct relationships established to the UNTL. As a result, all available requirements documents must be analyzed to determine what missions the system might support. These could be very broad, such as AAW, or more focused depending upon the system. Armed with a notional mission list, the UNTL should next be reviewed and appropriate UNTL tasks should be "mapped" to the notional mission list. For example, if USW was considered as a potential mission to be supported by the system under test, the UNTL task "Attack Submerged Targets" (NTA 3.2.1.2) might be mapped to the mission. The review of the UNTL could also yield unique mission tasks not found in other documents and/or supporting tasks which could be considered for multiple missions. When conducting this review, it is important to note that task titles can be misleading or incomplete. As such, the full task description must be read to determine if the task is applicable to the system under test. Once tasks have been selected, agreement between all stakeholders should be sought early in the process to ensure that all selected tasks are appropriate for test. At the completion of step one, the OTD should have a documented list of all mission and supporting tasks, as shown in sample 6-1.

(2) Step Two: Derive Mission COIs. Working from the list of mission tasks identified in step one, the mission COIs should be derived next. This can be done by either creating COIs from individual mission tasks or by grouping similar mission tasks to form a single COI. For example, the CD could specify that the system under test support the mission tasks "Conduct Counterattack" (MCT 1.6.1.2.2) and "Conduct Spoiling Attack" (MCT 1.6.1.2.1) for a USMC platoon. In such a case, two separate COIs could be created, or these tasks could be combined under a single COI such as "Conduct Attack." These determinations are made based upon operational judgment and experience. Care should be taken to ensure that tasks are combined in such a way as to make the COI specific enough to be relevant to the unit using the system, but not so specific that each COI merely constitutes a simple variation of an overarching mission. As additional steps in the MBTD process are completed, the similarities in task breakdowns, conditional variations, and capabilities correlation that exist between COIs may become more obvious and may result in the need to adjust the COI list.

The end result of step two is a list of specific COIs written in the following format:

"Will the (system under test) support accomplishment of (mission statement or XYZ in performing mission statement)?"

Additionally, a COI/task summary (as shown below) and a COI task breakdown hierarchy (as depicted in sample 6-1) should also be developed.

COI 1 (COI Short Title)
Task 1.1: Conduct XYZ (NTA x.x.x)
Task 1.2: Perform ABC (NTA x.x.x)

COI 2 (COI Short Title)
Task 2.1: Execute LMN (NTA x.x.x)

These first two steps form the foundation for the linkage between COI missions and system capabilities. As detailed test planning continues, mission-related COIs will be linked to subtasks, capability attributes and associated test events and data requirements. The eventual determination of system effectiveness and suitability will result from the analysis of the data used to resolve these COIs.

(3) Step Three: Identify Subtasks. Subtasks are discrete actions that must be performed to execute each task. In steps one and two, some supporting subtasks from the UNTL may have been identified. These subtasks, and others identified in this step, will be used to provide a breakdown of task execution. The UNTL may provide some help in completing this step, but this is, for the most part, a “chalkboard” or trial and error effort requiring system user expertise. The correct level of subtask breakdown will enable the identification of all conditions (in step four) that have the potential to impact task performance. It will also allow for correlation of capability attributes to specific subtasks.

In this step, temporal views (per the definition below) will be produced for each task to depict the breakdown of the task into its component subtasks. The numbering system established in step two for the mission-task breakdown is further expanded to include the subtasks. The result will be an indentured hierarchical numbering of each mission-task-subtask breakdown. Even though some subtasks will be duplicative and will appear in multiple task breakdowns, they should be separately numbered under each parent task. A cross-reference table of these subtasks is then generated to document these redundancies. At the completion of step three, the OTD should have a temporal view for each task, a mission-to-subtask hierarchical list, and a subtask cross-reference table (as shown in sample 6-1).

The temporal view is a block diagram that depicts the steps of the task process *in order of occurrence*. Temporal interactions refer to the *sequencing* of subtasks (i.e., one subtask must be completed before another one can begin (prerequisite or successor); one subtask might begin at the same time as another one (concurrent beginning); or one subtask might have to be completed at the same time as another (concurrent ending)).

(4) Step Four: Establish Conditions. This step consists of establishing and documenting the conditions that apply to each subtask, and producing informational views (per the definition below) for each task. Conditions are variables of the operating environment that affect the performance of the subtask. Conditions describe the physical (littoral, open ocean, calm seas, low visibility, etc.), military (single unit/task force/joint operations, aircraft division, etc.), and civil (population density, civil unrest, etc.) variations that impact subtask performance and form the operational context for selected subtasks. While a standard generic list of conditions and their associated descriptors (i.e., predefined parameters) is provided in the UNTL, for the most part, conditions/descriptors should be derived or implied for the ORD/CD. In those cases where UNTL conditions/descriptors are used, they will likely require modification to fit the system-specified capabilities. In some cases, new conditions and/or descriptors will need to be created for specific subtask situations where UNTL conditions and descriptors are not appropriate, or where a grouping of two or more conditions better describes the variable impacting performance. Inputs and outputs are those things that act as the triggers for progressing through the subtasks. They may include data elements used to determine satisfactory task accomplishment or compliance with performance and/or support attribute standards.

The informational view is produced by taking the temporal view (from step three) and first adding applicable conditions for each subtask. Once conditions have been added, subtask inputs and outputs are added. At the completion of step four, the OTD should have produced a conditions directory listing applicable conditions for all subtasks and an informational view for each task (as shown in sample 6-1).

The informational view is a temporal view block diagram with *conditions, inputs, and outputs* added to it. Inputs are required information or assets to perform a subtask (e.g., subtask of selecting targets to attack requires intelligence data). Outputs are the information or product resulting from the performance of the subtask (e.g., the subtask of selecting targets to attack must yield a target list). Some subtasks provide inputs *to* other subtasks or require inputs *from* other subtasks.

(5) Step Five: Develop Attribute Matrix. In step five, all capability attributes from the ORD/CD are documented in matrix format. Sometimes referred to in legacy documents as a “requirement,” an *attribute* is defined as “a quantitative or qualitative characteristic of an element or its actions.” For purposes of this discussion, “element” refers to the system. Per the definition above, attributes may be either quantitative or qualitative in nature. Qualitative attributes will not normally have numbers associated with them, but may be expressed in terms of an action or outcome required from the system. Quantitative attributes, on the other hand, will usually have associated numbers and may have quantifiable standards. A *standard* is defined as “the minimum acceptable proficiency required in the performance of a particular task under a specified set of conditions” and consists of a measure and criterion. A measure provides the basis for describing the task performance; a criterion defines the acceptable level of performance.

To complete step five, the ORD/CD must be reviewed and all attributes must be documented in table/spreadsheet format as shown in sample 6-1. Each attribute should be given a unique sequential number prefaced by the letter "A" to help avoid confusion between the multiple numbering schemes in the OT Framework. Additionally, ORD/CD reference paragraph numbers should be included with the attribute itself for future reference. Required attributes may be explicated as such in the ORD/CD, or may be described in terms of key phrases like "the system shall . . . ." or "the system must be capable of . . . .", or may be derived from other indications that a characteristic cited in the document is required or expected of the system. In some cases, multiple attributes may be derived from a single statement. For example, a requirement like "capable of operation from sea level to 10,000 feet with an accuracy of ±5 feet," really describes two attributes (altitude and accuracy). In some cases, the attribute itself may only be expressed in terms of a standard, such as "capable of operation from -20° to 150°F." In other cases, the attribute may not have an associated standard. Nevertheless, each attribute must be included in the matrix.

Once all attributes have been documented, standards must be defined. In many cases, these standards will be provided in the ORD/CD. In those instances, where an ORD/CD standard has not been provided, one must be defined. For those attributes that are qualitative in nature, it may be tempting to assume that a standard is not required since these attributes will be assessed/evaluated via survey. While assigning a quantitative standard to every qualitative attribute may not be possible, the attribute matrix must somehow specify what is "good enough" with regard to the attribute, even if a survey is used as the data collection method. This may mean setting a qualitative standard, the development of surrogate quantitative standards, or a combination of the two. In evaluating/assessing an attribute, multiple standards, both quantitative and qualitative may be required.

In a typical ORD/CD, there may be a significant number of required capability attributes which must be listed. While some may appear to be of little operational significance, all should initially be listed in the matrix. If it is determined that an attribute from the list cannot be reasonably associated to a COI, task, or subtask, it may later be dismissed as either an orphan attribute or a system attribute that has little or no relation to the operational effectiveness of the system. These attributes should be scrutinized before being discounted, as they can sometimes be traced to suitability or life cycle requirements.

At the completion of step five, the OTD should have a table or spreadsheet of all ORD/CD-defined attributes and their associated standards. This matrix will form the basis for subsequent steps as additional information is added, and will end up forming the basis for the OT-DT-CT input to the integration effort that occurs after framework development. An example attribute matrix is provided in sample 6-1.

(6) Step Six: Allocate COIs, Tasks, and Subtasks to Attributes. Step six continues the population of the attribute matrix created in step five by taking the

documented ORD/CD attributes and their associated standards, and linking COIs, tasks, and subtasks to them. While these linkages may be explicitly defined in the ORD/CD, many will not. As a result, at least a portion of these linkages will have to be determined based on operational experience. Additionally, many attributes may be linked to multiple missions, tasks, and subtasks, further complicating the process. Nevertheless, these linkages are absolutely essential to the direct traceability between attributes/standards (including Key Performance Parameters (KPP) and thresholds) and mission COIs. At the completion of this step, the attribute matrix developed in step five, and further populated with COI and subtask information (as depicted in sample 6-1), should form the basis of the attribute-to-subtask matrix. If, at the end of step six, it is determined that an attribute from the list cannot reasonably be associated to a COI, task, or subtask, consideration may be given to removing it from the list as either an orphan attribute or as a system attribute that has little or no relation to the operational effectiveness or suitability of the system. The program sponsor and other members of the ITT should be consulted prior to making a final decision with regard to removal of an attribute from the list since this database will be shared by T&E stakeholders within the ITT.

This completes the mission analysis section and provides the prerequisites for stand-alone OT planning. The first six steps of this process are designed to achieve consensus between all T&E stakeholders on the mission analysis for the system. If, at the end of this process, disagreements remain on some aspect of the mission analysis, the statutory requirement for OT independence dictates that further OT planning be based on the OT position regarding the specific disagreement. The product of this mission analysis effort, including the templates and the database, must be documented (to confirm agreement among the participants) in the evaluation strategy or TEMP. If the TEMP is still months away, an MOA can be used in the interim.

To complete the OT Framework, the OTD must complete an additional set of steps that are listed below. The following steps continue to build on the activities and requirements completed in mission analysis.

Once the mission analysis is complete and documented, OT and DT (and CT at some point) can begin *separate* test planning. Separate planning is conducted to produce the stand-alone test objectives for OT and DT (and CT, when appropriate).

OT and DT planners must document their test objectives, prior to integrating, to ensure:

- The IT and independent OT will provide OPTEVFOR sufficient data and assurance in the results of testing to make an effectiveness and suitability determination, and Fleet release/Fleet introduction recommendation.
- A basis is established for calculating savings/cost avoidance attributable to the IT effort.

- Each entity (OT, DT, and CT) has an adequate and approved framework for their testing and the integration process; for oversight programs, this would include DOT&E approval of the OT Framework.

The separate OT planning begins with the products of the mission analysis effort.

(7) Step Seven: Develop Additional Operational Attributes and Standards. In steps five and six, capability attributes/standards were extracted from the ORD/CD; standards were developed for those attributes for which none existed; and attributes/standards were tied to COIs, tasks, and subtasks. In step seven, the OTD expands these steps by developing operational attributes which were not included in the ORD/CD; developing associated standards for these attributes; and ultimately tying them to COIs, tasks, and subtasks. While this process can be completed sequentially, working backwards from the COI, task, and subtask level, asking the question, "What are the attributes necessary to complete this task?" will help stimulate thought for the development of operational attributes and their standards.

Even in an ideal case, the ORD/CD will not specify enough detail such that every possible operational consideration is documented. By developing a list of operational attributes to be used in conjunction with the ORD/CD documented attributes, the OTD helps to more clearly focus the testing toward answering the COI questions, ultimately avoiding the problem of becoming a mere "spec checker." In addition to documenting attributes, the OTD will also need to set standards for those attributes and, in some cases, develop additional standards for ORD/CD-defined attributes in much the same way as standards were set for attributes in step five. This step will be helpful in formulating "surveys" used to collect some of the necessary vignette or mission data.

Finally, as part of step seven, the OTD will need to associate the operational attributes and standards with COIs, tasks, and subtasks. At the completion of the process, the OTD should have a comprehensive attribute-to-subtask matrix that includes all necessary test attributes. An example is provided in sample 6-1. This comprehensive matrix is not intended to "add requirements," but rather, to ensure all requirements and operational expectations for the system are defined prior to the beginning of IT.

(8) Step Eight: Devise Test Methods for Each Subtask. Steps eight and nine together require the OTD to devise test methods for each subtask, considering the attributes/standards and data collection requirements associated with these subtasks. While listed as separate steps, they are completed simultaneously. Test methods will describe the approach to be used to collect the data necessary to determine the satisfactory execution of the subtask, and to determine performance as compared to the derived and implied standards. As such, data collection requirements must be known before test methods can be finalized. When completed, the test methods will form one of the building blocks for the vignette descriptions (to be discussed in step ten).

To begin step eight, the OTD should use the subtask cross-reference matrix developed in step three. While some method variations may be required between like subtasks, this matrix should tie all like subtasks together to enable the OTD to develop a common method for common subtasks. The process begins by adding "Attribute," "Test Method," and "Data Requirements" columns to the matrix. Using the matrix from step seven, the attribute numbers corresponding to the subtasks should be added. The confirmation of these attributes should significantly influence the test method design for each associated subtask. Once the test method has been developed, it is added to the matrix for each subtask. Data requirements are added to the final column (in conjunction with step nine). Because subtasks should be operationally relatable, it is not necessary to describe in detail every facet of the subtask when developing the test method. Rather, subtask accomplishment should be described in the context of testing to collect the necessary data. For example, a test method for the subtask "initialize the radar system" might read something like the following:

"Prior to executing the test, record test condition data (i.e., operator's name, date, time, temperature, etc.). With the radar system in the "standby mode," execute the radar initialization procedure (from the operator's manual), recording time from initiating the sequence until the "system ready" indication is received. Note any issues which may be described as annoying, or which degrade or prevent accomplishment of the task."

The same test method should <u>not</u> read like the following:

"The radar system will be turned on by positioning the selector switch to the on position. Next, the XYZ toggle key will be depressed until the top-level menu is displayed. The radar initialization softkey will be depressed, followed by pressing the softkey next to "yes". . ."

The ultimate purpose is to describe to the reader how the test will be conducted and not how to generically conduct a particular subtask. As stated above, the goal of this step is to ensure the collection of the data necessary to determine the satisfactory execution of the subtask and to determine performance as compared to the attributes/standards. An example of the test method matrix is included in sample 6-1.

(9) Step Nine: Derive Data Requirements. Hand-in-hand with the test method development in step eight, step nine involves deriving data requirements for all subtasks to determine whether the COI, task, and subtask have been satisfactorily accomplished, and whether all standards, quantitative and qualitative, have been met. Data requirements must be described in sufficient detail to support the integration process. Data requirements will be quantitative and qualitative. For qualitative data, "conduct survey" is not sufficient detail. While surveys may be needed, the OTD must first define what qualitative information is needed from the survey to support the resolution of COIs and standards before relevant, useful surveys can be constructed. Simply put, the OTD must answer the question, "What information do I need to

determine whether this task can be satisfactorily accomplished and meets all standards?"

At the completion of steps eight and nine, the OTD should have a test method/data requirements matrix that directly ties data elements back through test methods, standard, subtasks, tasks, and COIs. An example is provided in sample 6-1.

(10) Step Ten: Build Vignettes. Step ten involves the OTD's team (analyst, other operational testers) taking all of the information developed in steps one through nine and building test "vignettes." These vignettes are designed to ensure the thorough testing of all attributes, standards, tasks/subtasks, and missions. The construction of vignettes is a highly subjective and very iterative process based on the complexity of the system under test and the OTD's operational experience. It essentially involves parsing mission and task execution into manageable chunks which can be accomplished within a dedicated OT period or throughout the longer IT period. Vignette descriptions provide the test team with a detailed methodology and "game plan" for the execution of individual test events to ensure all OT objectives are met.

If the program is using the IT process, the OTD uses the vignette development process to determine how much independent OT is required at the completion of IT. The execution of the IT vignettes should provide much of the information necessary to resolve COIs prior to the actual commencement of IOT&E at the end of the IT phase. IOT&E then becomes a series of end-to-end mission confirmation events based around combined IT vignettes. As previously stated, any OT objectives not successfully met in IT are added to the independent IOT&E plan. In contrast to the historical OPEVAL that may have included hundreds or thousands of test events and lasted several months, the IT approach to IOT&E should be viewed more like the "final exam."

The construction of vignettes is more art than science. In some cases, vignettes may be constructed from single subtasks. In other cases, subtasks can be grouped together in logical bins to be executed together. In still other instances, the OTD may elect to go back to the temporal view and combine two subtasks into a single subtask, or deconstruct a single subtask into multiple subtasks. For example, combining a mission planning subtask with a subtask for uploading the mission plan to the system might be a logical vignette grouping, or might lead the OTD to go back to the temporal view and combine these as a single subtask like "plan and upload mission data." Besides the logical flow between subtasks, however, another factor to be considered when building vignettes is the number of conditions for each subtask. As subtasks, each with their own conditions and associated descriptors, are combined, the number of vignette permutations grows exponentially.

As a simple example, suppose an OTD was faced with a decision regarding combining two subtasks under one vignette. If the OTD elected to construct separate vignettes for both subtasks, each of which has two distinct associated conditions with three possible states (descriptors), there would be 9 (3^2) potential conditional variations

per vignette (or 18 total for the two separate vignettes). If, on the other hand, the OTD decided to combine the subtasks under a single vignette, there would be 81 (3^4) potential conditional variations.

This example might lead one to believe that vignettes should be based on a single subtask. While single subtask vignettes will reduce the number of conditional variations (and associated test events), conducting some vignettes in this manner may not provide significant operational relevance. The dictates of the logical flow of tasks may also make this approach impractical. In those cases where one subtask must be accomplished to conduct the next subtask, the OTD may have no choice but to combine subtasks in a single vignette to collect the necessary information. Another approach to grouping subtasks as vignettes might be to combine subtasks with like conditions under a single vignette. While this approach may work in some cases, it may not always make logical sense to group subtasks this way based on task flow, etc. This task-subtask-vignette-condition approach to OT follows a methodology termed "Design of Experiments." Design of Experiments, as it applies to this process, will be covered in the analysts' handbook.

As part of the vignette construction process, the OTD should first make an attempt to minimize the number of overall conditions associated with the task and its component subtasks. As part of step four, conditions were developed for each subtask. The conditions listed in the informational view included all conditions which could affect the performance of the particular subtask without regard to the system under test. In step ten, the condition list should be reviewed and narrowed down to include only those conditions which impact the performance of the system under test in relation to the subtask. For instance, visibility conditions could impact performance of a reconnaissance task, but visibility would not influence the performance of a Global Positioning System (GPS) receiver used to support the reconnaissance task. Once the condition list has been narrowed down, the art of developing vignettes, described above, can begin in earnest.

To begin the process, the OTD should decide on appropriate subtask parsing and develop basic vignette descriptions. These vignettes descriptions, their associated identifiers (see below), subtasks, and conditions should then be combined into a vignette-to-conditions matrix (or matrices), as depicted in sample 6-1. Unfortunately, in most cases, there will be many subtasks and associated conditions. Developing a single matrix (table or spreadsheet) across all subtasks, vignettes, and conditions may prove unwieldy. If so, consideration may be given to developing multiple matrices built around common conditions, vignettes, and/or tasks. Again, this is an iterative process that may require numerous changes. The end product of this process should provide the OTD with a basic description of the vignettes, which will be used to create more detailed vignette procedures.

When planning for IT, to facilitate the integration process and provide fidelity to the OT Framework, the OTD should identify each vignette (by number) as a candidate

for integration or as an independent OT or IOT&E vignette in the final vignette matrix. The vignette identifier shall follow the convention below:

- Each vignette will have a unique identifier prefaced by either “IT” or “OP.” “IT” events are those events that are planned to be conducted during IT. “OP” events are those that are planned for IOT&E.
- The identifier for the basic vignette will be based on COI number, task number vignette sequence, and a letter condition identifier. For example, IT 1-2-4A is:
  - A planned IT event
  - Associated with COI 1
  - Associated with task 2 of COI 1
  - The fourth vignette under task 2 of COI 1
  - Using condition set A

As vignettes are constructed, there may be some duplication, much like the subtask duplication described in step three. For example, the task breakdown for a system might include common subtasks like system initialization and navigation, which could be combined as a single vignette and executed similarly across all tasks. Because, the execution of these vignettes would be identical for each different task, do not repeat them (including all conditional variations) for every separate task. Rather, they could be executed once with the results applied across multiple tasks. As in the case of subtasks, vignettes should be cross-referenced to minimize duplication. To track this duplication, the OTD should develop a simple, cross-reference matrix as depicted in sample 6-1.

The test method and data requirements, derived in steps eight and nine, will support the development of detailed vignette procedures by adding fidelity to the vignette description. For instance, an attribute might state that no loss of data/information should occur when changing batteries on the system under test. The test method for an associated subtask might require the batteries to be changed during the execution of the subtask followed by confirmation that data/information was retained. The vignette for that subtask or group of subtasks must include a battery change as part of the detailed vignette execution procedure. Sample 6-1 provides examples of the tables that might be used to depict the detailed vignette procedures.

The output of step ten is a vignette-to-conditions matrix, a vignette cross-reference matrix, and a vignette procedures matrix to which resource requirements will be added in step eleven.

(11) Step Eleven: Determine Resource Requirements. With the previous steps completed, the OT team should have all the information required to determine test resource requirements for stand-alone OT of the system. Step eleven requires the OTD

to document these requirements in sufficient detail to support either dedicated OT or the IT integration process, including:

- Number of test articles with any specific configuration requirements
- Specific aircraft, ship, submarine, unit, or exercise support requirements
- Specific range, test site, instrumentation, and threat requirements
- Flight hours, at-sea time, or system operating time
- Special support equipment requirements
- Any M&S requirements
- Specific operator or maintenance training requirements
- Prefaulted modules or Maintenance Demonstrations (M-DEMO)
- Any special instrumentation or data collection requirements

These resources are identified by vignette and then rolled up to determine the overall stand-alone OT&E requirements. In this step, the OTD should also identify any potential limitations to test for inclusion in the OT Framework. These might include threat replication, inability to test the system in certain environments that were identified as significant conditions in step ten, or nonavailability of key test resources or instrumentation. A sample resource requirements matrix is provided in sample 6-1.

With the requirements/capabilities-to-subtask correlation already completed in the mission analysis effort, the OTD now can bidirectionally trace a data element all the way up to the mission COI. The OTD is now ready to write an OT Framework, with the key component being the final vignette matrix developed through this process.

605. OT FRAMEWORK

The OT Framework is the primary document for defining adequate OT and, when appropriate, for integrating the OT objectives with DT and CT objectives to form an IT matrix. It should also provide the basis for the OT input to the TEMP, and defines the OT objectives and the specific test requirements for resolution of each COI, and the OTD's minimum IOT&E test requirements. Since the framework is generated much earlier in the T&E process timeline, it must be reviewed and changed, if necessary, any time there are significant program or documentation changes/revisions, such as completion of CDR, the release of a CDD or CPD, or any major program perturbations. Since the whole process is based on the mission(s) that the system under test must support, and missions seldom change, any changes to the OT Framework are expected to be minor. However, this update or change to the OT Framework would be an appropriate place to document any limitations to test that arise during the course of the IT effort.

Sample 6-1 provides the basic format for this document. Once this document is approved by COMOPTEVFOR, and DOT&E for oversight programs, the OTD will be

ready to begin the integration process. Any future changes to the OT Framework would be handled in the same way changes to an approved test plan are handled. An IOT&E concept of test brief will be given to COMOPTEVFOR 130 days prior to the start of IOT&E. For DOT&E oversight programs, this brief will then be given to DOT&E 120 days prior to the start of IOT&E, per reference (b). In addition to the OT Framework and the required briefings, COMOPTEVFOR will provide a stand-alone IOT&E test plan not later than 30 days prior to IOT&E for nonoversight programs and 60 days prior to IOT&E for oversight programs. This "test plan" will be an update to the framework and will provide the status of IT and readiness for IOT&E, including any limitations to test. It will also validate the list of OT objectives for IOT&E and detail any additions to the OT Framework for the IOT&E period based on the results of the IT effort.

606. TEST INTEGRATION

IT blends or combines CT, DT, and OT to form a cohesive testing continuum. This integration cannot occur, unless the participants (CT, DT, and OT) have determined their entering objectives for adequate testing of the system under evaluation. IT does not alleviate the requirement for independent OT reporting based on separate OPTEVFOR analysis of the shared test information produced by the IT effort.

a. With the OT Framework approved, the integration process begins. The goal of this process is to identify any and all opportunities for synergy in planning, execution, and data collection during the IT period. The caveat, from an OT perspective, is that an identified synergy may be lost if the system configuration changes at a later date or the data collected is deemed unusable for some other reason. Each entity should be entering the process with a matrix of test objectives in a compatible format and based on an agreed mission analysis structure. The first thing to accomplish is preparing and obtaining approval of an ITT Charter. The charter will specify critical coordination factors such as:

- IT matrix development and format for OT, DT, and CT inputs
- Detailed IT event planning and execution process
- Data/test information sharing criteria
- Separate analysis/reporting
- Data format and handling
- Data repository location
- Data fidelity requirements
- Scoring criteria and formula for calculated metrics
- Process for arbitration of disputes
- Process for inclusion of supplemental or regression testing requirements
- Process for prioritization of testing requirements

- Method for identification of comparative cost savings/schedule compression as a result of IT

b. The ITT should stand up soon after contract award, which ensures OT participation early in the development of the system under test.

c. The product of the IT integration effort should be an IT database, similar in structure and content to the OT Framework database, but merged with DT and CT objectives. Figure 6-2 illustrates this process.

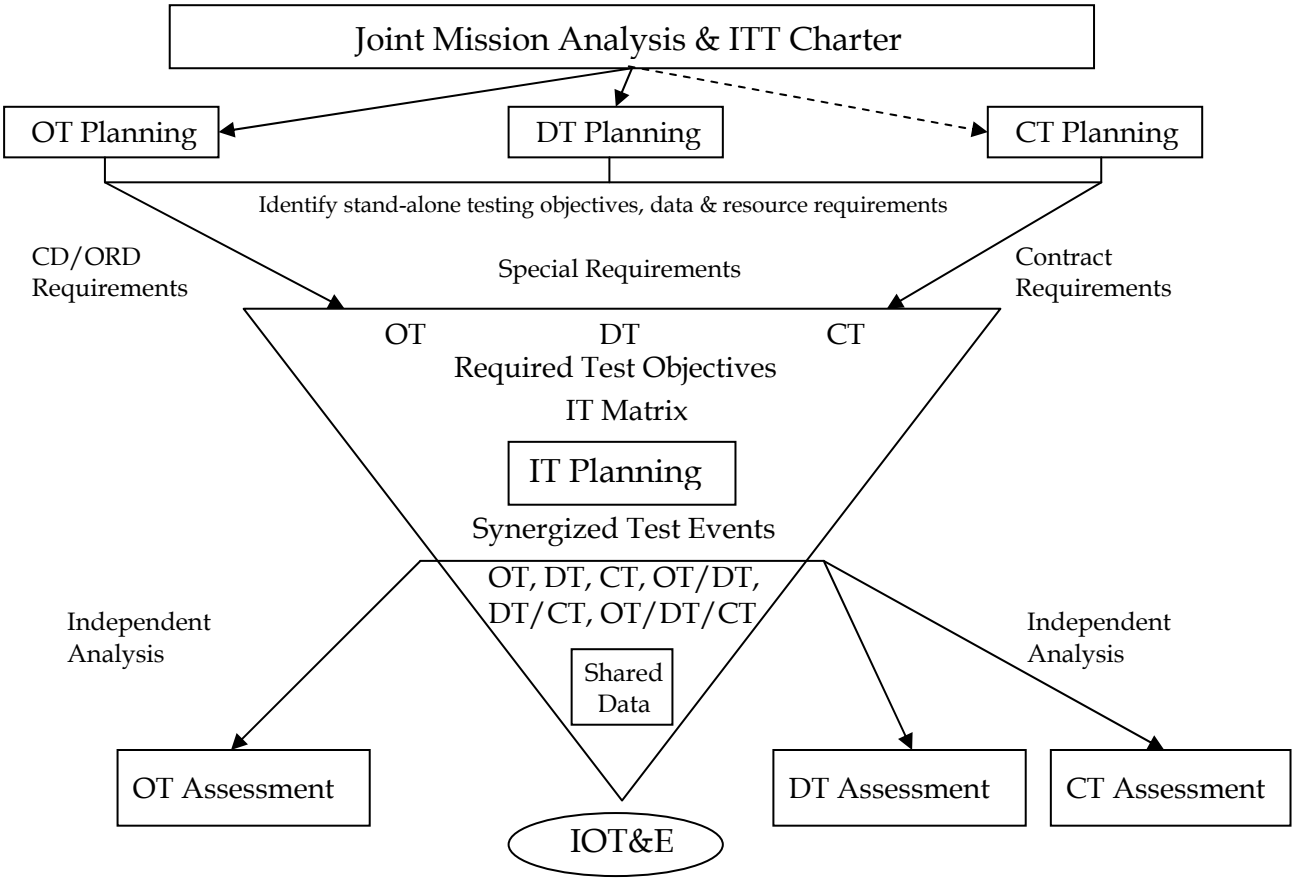

Figure 6-2. IT Overview

607. OPTEVFOR TEST PLANS

The basic format for COMOPTEVFOR test plans is found in sample 6-3.

a. E-tests are keyed to the COIs and are given the title of the COIs they are intended to address. A rare exception to this rule would be when the E-test titles are keyed to mission areas to better address COIs that span multiple missions.

b. Ten S-tests are standardized in COMOPTEVFOR test plans. They are:

(1) Test S-1, Reliability

(2) Test S-2, Maintainability

(3) Test S-3, Availability

(4) Test S-4, Logistic Supportability

(5) Test S-5, Compatibility

(6) Test S-6, Interoperability

(7) Test S-7, Training

(8) Test S-8, Human Factors

(9) Test S-9, Safety

(10) Test S-10, Documentation

c. All of the 10 standard S-tests will usually be applicable to IOT&E. Some may not be appropriate to very early OT&E phases (EOA/OA) (e.g., Test S-1) or to late FOT&E (e.g., Test S-7). In these cases, omit the inappropriate test(s), but do not change the test numbers of those that are used (e.g., Maintainability is always Test S-2). The standard S-tests (S-1 through S-10) by no means exhaust the possibilities of proper S-tests. Additional tests (S-11, etc.) may be used as required (e.g., Transportability).

608. COIs AND EVALUATION CRITERIA

a. Each phase of OT&E is basically an investigation of operational effectiveness and operational suitability of the system up to that point in time. In early phases, prior to IOT&E, COIs are assessed by evaluating risks associated with each COI. In IOT&E, COIs are resolved as either SAT or UNSAT, or are unresolved.

b. The essential elements of operational effectiveness, the things the system must do (and must not do) for mission accomplishment, vary from one system to the next. Some typical examples of MOEs are provided in table 6-1.

Table 6-1. Typical Elements of Operational Effectiveness

Test Item	Must Do	Must Not Do
Sub-launched Bathythermograph	(1) Be capable of launch in realistic operational conditions (2) Provide required data	(1) Restrict submarine maneuverability (2) Increase submarine detectability
Surface Ship Sonar	(1) Detect (2) Classify (3) Localize (4) Track	(1) Generate false alarms (2) Be easily defeated by acoustic countermeasures
Breathing Apparatus for Damage Control	(1) Provide life support	(1) Require excessive time to don and actuate (2) Degrade wearer's ability to do useful work
Airborne Deception Device	(1) Degrade surface-to-air tracking	(1) Increase detectability by search radars (2) Require restrictive maneuvers, flight attitudes, etc.
Command and Control System	(1) Provide indications and warnings to battle group commanders (2) Improve coordination of over-the-horizon-targeting operations	(1) Be easily detected and defeated by enemy countermeasures (2) Require extensive delays in delivering time-sensitive information
IA	(1) Protect (2) Detect (3) React (4) Restore	(1) Allow for the corruption or compromise of information (2) Allow for the degradation of systems (3) Allow mission critical capability loss without a backup system capable of conducting primary mission

c. For a given system, the essential measures of operational effectiveness and operational suitability form the framework for the capabilities and functions of the COIs, as outlined in paragraph C of Part IV of the TEMP. That is, the COIs define operational effectiveness and operational suitability for a given program. For example, the COI's capabilities and functions for testing a surface ship sonar, derived from table 6-1, would be:

(1) Will the sonar detect, classify, and track expected threat submarines in the natural acoustic environment?

(2) Will the sonar detect, classify, and track in the presence of acoustic countermeasures?

(3) Will the sonar localize targets?

(4) Will the sonar demonstrate an adequate false alarm rate?

(5) Will the operational performance or inherent characteristics of the sonar decrease the susceptibility or vulnerability of the submarine in which it is installed?

(6) Will the reliability of the sonar support completion of the submarine's mission?

d. In IOT&E, all COI capabilities and functions will be examined. During earlier OT&E, when the equipment does not closely approximate the planned production configuration (e.g., in OT-A or B with an advanced development model), not all COI capabilities and functions (or not all COIs) will be examined. For example, we might not examine interoperability as a COI in OT-B if the system interfaces have not been implemented.

e. The capabilities and functions of COIs for a phase of OT&E are documented in paragraph C of Part IV of the TEMP. For example, consider the OT-C IOT&E phase in the sample Part IV OT&E Overview paragraph in chapter 5. In the OT&E Objective paragraph, under the Operational Effectiveness and Operational Suitability columns:

(1) Each COI (e.g., Detection) relates directly to an E- or S-test (e.g., Test E-1, Detection). Each capability and/or function then becomes the object(s) of the E- and S-tests in sections 4 and 5 of the test plan.

(2) Additional objects that are not associated with COIs appear as additional E- or S-tests. Even though these objects are not considered COIs, they are just as important to the test plan, and considering them will produce more complete and meaningful OT&E.

f. The quantitative evaluation criteria of a phase of OT&E are also documented in Part I of the TEMP. There should be no qualitative evaluation criteria in Part I; qualitative requirements are in Part IV as COIs.

609. SCENARIO-ORIENTED OR OPERATION-ORIENTED TESTING

After the OTD has determined that there is a valid reason for a phase of OT&E, and defined and quantified the elements of operational effectiveness and operational suitability that are essential to the phase in terms of COIs and evaluation criteria, he/she is ready to decide how the capabilities and functions of the COIs will be met (i.e., how the equipment will be tested). If not doing MBTD, two common methods in OT&E are scenario-oriented testing and operation-oriented testing.

a. Scenario-oriented testing is commonly used for systems whose modes of operation or functions change in response to a changing operational situation (e.g., a radar suite). Scenarios are developed based upon the threat as derived from the applicable threat documents to stress the system under test in a realistic

threat-representative manner. Scenario-oriented testing typically allows the Fleet user the greatest flexibility in operating the system as the tactical situation changes, thus, affording the OTD greater opportunity to make informed decisions on the merits of the system and its capability to meet CNO-assigned thresholds.

(1) When developing the scenarios, the OTD must:

- Be complete and state what results are expected from each scenario.
- Describe the tactical situation at the start of the exercise (e.g., single-ship littoral operations with a high probability of air attack).
- Describe the situation that develops (e.g., electronic surveillance detection of enemy aircraft) and what is expected to happen (e.g., detection, acquisition, and engagement of the enemy aircraft).
- Supplement this narrative with diagrams or tables specifying the movements of exercise participants (friendly and enemy) and their expected actions at specific times.
- Develop a sufficient number of scenarios to test the system, and be prepared for the unexpected. Commanding officer's tactical decisions, loss of assets or services, or fouling of the firing ranges can all lead to unexpected results or noncompletion of scenarios.

(2) Multipurpose systems may require several scenarios to exercise their various capabilities.

(3) The data recorded during the scenarios are used for reconstruction and analysis of the various E-tests and S-tests. Often, scenario-oriented testing is dedicated testing (in terms of Fleet RDT&E support), although it can be accomplished on a not-to-interfere basis during Fleet exercises.

b. Operation-oriented testing is commonly used for equipment whose mode of operation or function does not change with the tactical situation (e.g., torpedo tubes or waste disposal systems). These systems are either *in use* or *not in use* and can be tested by just operating them in the anticipated environment. If operation-oriented testing is used, the events and conditions necessary during system operation must be specified (e.g., the targets and operating environments). Test events and conditions must provide an operationally realistic test of the system.

c. Whether the choice is scenario- or operation-oriented testing, the following must be kept in mind:

(1) Testing should include simulation of all possible enemy actions, including countermeasures to our tactics. The test must be set up to adequately replicate all reasonably expected actions that the target systems can be expected to encounter in a manner that is representative of enemy capabilities. Do not conduct every scenario in

the worst possible electronic attack environment against the worst possible threat, but rather, cover the range of environments and threats possible.

(2) The test environment, natural and electronic, should approximate the anticipated operating environment. Depending upon the system being tested, the following should be provided:

- The anticipated background noise caused by other ships, aircraft, etc., to determine the effects of Electromagnetic Interference (EMI).
- The anticipated natural environmental conditions, such as sea state, temperature, cloud cover, etc., to enable a determination of their effect on system performance.
- Operation of other equipment that may be used in conjunction with the tested equipment to allow evaluation of changes in electrical power loads, effects of gunfire-induced shock and vibration, EMI, etc.
- All relevant joint interfaces and other interfaced units/systems in the anticipated joint operating environment.

(3) The number of resources required for testing should reflect what the weapon system would realistically be expected to encounter in actual operations. For example, if damage control equipment under test could realistically be employed continuously for 96 hours, then planned OT should include such a scenario or operation.

610. USE OF PHOTOGRAPHY DURING OT&E

a. Whenever possible, and after obtaining appropriate permission, use photography (preferably digital photography) and videotaping during OT&E to:

(1) Provide illustrations to clarify the text of evaluation reports.

(2) Furnish the command with a supply of OT&E-oriented (as opposed to development- or sales-oriented) illustrations for use in briefings and presentations.

b. This photographic coverage may vary from amateur, candid-type photography by the OTD to professional coverage by the Fleet Audio Visual Command. Examples of types of photographic coverage that may be useful in evaluation reports or in briefings are photos of:

(1) Test personnel using hand-held equipment (e.g., metal detectors, ordnance examining and neutralization devices, onboard testers). These may reduce the amount of text in equipment description, and may provide useful illustrative slides.

(2) Equipment displays that illustrate points to be made in an evaluation report or briefing (e.g., before and after shots of scopes that illustrate effects of Electronic Countermeasures (ECM), shots of confusing or ambiguous symbology).

(3) Damage incurred during normal operations that illustrate inherent weaknesses of the equipment under test (e.g., missile fins bent during normal assembly, handling, or loading evolutions; cracks or excessive wear incurred during routine use).

(4) The test system underway during OT&E (e.g., SEAFOX making a swimmer recovery, the F/A-18 flying an OT&E mission). These may be used as general illustrations in reports or briefings, or may illustrate specific points (e.g., heavy spray obscuring a gunner's vision).

(5) The test system as installed in the ship, aircraft, etc., for general information or to illustrate an important aspect of the installation (e.g., inaccessibility for maintenance, antenna blockage by superstructure).

(6) Digital video (or video tapes) of the equipment in operation, for general information, for post-test analysis, or to illustrate an important aspect of the system (e.g., Close-in Weapons System (CIWS) engaging a target, a console before and during a computer hang-up).

c. When OTDs have obtained photographs of OT&E, they should be retained in the appropriate warfare division for use as required.

d. Sources of Assistance to the OTD

(1) The COMOPTEVFOR Comptroller (Code 30) and Force Supply Officer (Code 31) advises the OTD on matters associated with funding requirements for photographic coverage, including film and processing costs.

(2) The COMOPTEVFOR finance branch (Code 32) and Supply Officer (Code 31):

- Assist the OTD in completing forms, etc., associated with obtaining photographic services.
- Make arrangements for OTDs to obtain temporary subcustody of cameras.

611. LBTS

a. An LBTS is a facility that duplicates, simulates, or stimulates the employment of a system's planned operational installation and is used for the purpose of conducting DT. LBTS installations are often used during early stages of system development to test the integration of equipments, subsystems, and computer software programs. LBTS use must be justified based on cost effectiveness and needed capability.

b. Intent to use an LBTS in lieu of the actual host platform must be included in the TEMP. OT&E intended to support production decisions will be performed in the operational environment in preference to an LBTS. LBTS test data should normally be

used to support a limited production decision and not the more stringent full production decision. The following are not considered to be LBTS:

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

612. SPECIFYING THE E- AND S-TESTS

a. Each E- and S-test is based on a COI and addresses a capability or function of the OT&E phase, an aspect of a capability or function, or an aspect of several capabilities or functions. E- and S-tests are designed to help us determine what we need to know about the system, quantitative attributes included in the various MOEs and MOSs, and qualitative attributes, such as the adequacy of logistic support, technical manuals, and training.

b. In the design of OT, it is COMOPTEVFOR policy to ask for sufficient numbers of test assets or test time so that the risk of incorrectly resolving a quantitative MOE is acceptably low. As a part of that design, the OTD and assigned project analyst make an assumption of the expected distribution of the data to be collected. They then determine the sample size required for an 80-percent confidence level that the true value of the parameter exceeds the threshold, assuming that exactly one Operational Mission Failure (OMF) is observed during testing. (Also see paragraph 614 on how many or how long.)

c. To determine what E-tests are necessary, the OTD must examine each operational effectiveness COI and decide what needs to be known to demonstrate each capability or function of the COI. For example, consider the first capability of paragraph 608c – "Will the sonar detect, classify, and track . . . in the natural acoustic environment." What does the evaluator need to know to demonstrate this capability? The following come to mind:

(1) How often does detection occur against targets that should be detected? (The conditions that define "should be detected" should have been specified in the evaluation criteria.)

(2) At what ranges does detection occur? (Operationally useful ranges must be defined in the evaluation criteria.)

(3) Under what oceanographic conditions did the detection occur?

(4) Given detection, how often does classification occur?

(5) Of the classifications, how many are correct?

(6) Of the incorrect classifications, how many are critical (e.g., threat classified as nonthreat)?

(7) How long after detection does classification occur?

(8) At what ranges do classifications occur?

(9) Given detection, how often can a track be established on targets that should be tracked? ("Should be tracked" conditions should be specified in the evaluation criteria.)

(10) How long after detection are tracks established?

(11) At what ranges are tracks established?

(12) Given established tracks, how well are tracks held that should be held? ("Should be held" conditions should be specified in the evaluation criteria.)

d. These 12 questions suggest the following E-tests and associated MOEs:

(1) Test E-1, Detection

- MOE 1 -- Probability of detection

- MOE 2 -- Detection range

(2) Test E-2, Classification

- MOE 3 -- Probability of correct classification, given detection

- MOE 4 -- Probability of classifying a threat as a nonthreat

- MOE 5 -- Time between detection and classification

- MOE 6 -- Classification range

(3) Test E-3, Tracking

- MOE 7 -- Probability of establishing a track, given detection

- MOE 8 -- Time between detection and track establishment

- MOE 9 -- Range at track establishment

- MOE 10 -- Percent of time tracks are held

(a) In this example, the OTD will need to know quantitative things to demonstrate the capability; things that can be expressed as MOEs. These MOEs need not be limited to only the applicable quantitative parameters delineated in the TEMP. Any MOE providing meaningful information which could aid in resolving the COIs should be included in data analysis sections of the appropriate E-test or S-test.

(b) In addition to these MOEs, there will often be qualitative data the OTD must know. The data analysis sections of the test plan should describe these quantitative and qualitative criteria in sufficient detail so that an outside reader knows exactly what analysis will be conducted and how the results will be evaluated. Instead of saying only that logistic supportability will be qualitatively assessed, delineate exactly what measures will be used to make such an assessment. For example, actual onboard sparing of parts could be compared to the requirements specified for such sparing in the ILSP to determine if there are significant shortages of key parts which could significantly degrade weapon system performance.

e. Having defined the E-tests and MOEs for the first capability of the Detection COI, the OTD examines the second capability or function (as listed in paragraph 608c), "Will the sonar detect, classify, and track . . . in the presence of acoustic countermeasures?" The OTD notes that it is the same as the first capability, except that acoustic countermeasures have been added, and elects to treat the acoustic environment as a variable in tests E-1 through E-3. That is, the OTD decides to calculate MOEs 1 through 10 twice, with and without acoustic countermeasures. Had the OTD desired to do so, he/she might have specified (for example) a Test E-1, Detection (Natural Environment), a Test E-2, Detection (Countermeasures), and so on. After taking care of the second capability, the OTD proceeds to the remaining effectiveness COIs.

f. The process of selecting S-tests consists first of choosing the applicable tests from the list of standardized suitability tests, and then adding others as necessary. The tests selected will vary according to the system under test and the phase of OT&E. The following general guidelines apply:

(1) Reliability. A test of reliability is appropriate when the test system's design, construction, and installation are representative of those of the proposed production system (e.g., in IOT&E and FOT&E). In these phases of OT&E, it is possible to estimate the reliability of the operational system based on performance of the test system. In earlier phases of OT&E, when the test system is functionally equivalent to the production system, but is much different physically (e.g., a breadboard), extrapolation of MTBOMFs, etc., to the production configuration is not possible. In some systems, it is possible, even early in the design phase, to identify potential reliability problem areas based, for example, on the system's use of components known to have high failure rates in similar equipment. On the other hand, it may be appropriate to include a reliability test to validate the reliability of a production system. In examining

reliability, failures are categorized as OMFs and minor failures, and are defined in the glossary. Guidance for calculating reliability is provided in paragraph 615a.

(2) Maintainability. The conditions under which a maintainability test is appropriate are very similar to those for a reliability test. However, keep in mind that maintainability parameters, such as mean time to fault-locate and mean corrective maintenance time, have little meaning from an operational viewpoint, unless maintenance is accomplished by Fleet personnel. This is not necessarily the case for reliability parameters. In addition, there are occasions when maintainability is not an issue. For example, a target drone that is maintained under a maintenance agreement (contract) has reliability and availability thresholds, but may not have maintainability thresholds. Typical maintainability parameters to be examined are provided in paragraph 615b.

(3) Availability. A test of availability is appropriate when a measure of the system's readiness is required. The design of the availability test is dependent on the type of system, its mission(s), and how it must perform in the intended operating environment. Operational Availability (A_o) is the primary measure of material readiness for systems/subsystems being operationally tested, except for aircraft. The measures of readiness for aircraft are Full Mission Capable (FMC), Partial Mission Capable (PMC), and Mission Capability by Primary Mission Area (MC_{MA}). When designing a test, the OTD should refer to the glossary and paragraph 615c for the definition of availability terms and the parameters to be examined and the method of computing availability.

(4) Logistic Supportability. This test is usually required in IOT&E and FOT&E. Some systems that are production-prototyped early can be examined from a logistic supportability viewpoint earlier in IOT&E (e.g., systems used in explosive ordnance disposal). Systems that have unusual servicing requirements (e.g., pressurizing with an uncommon gas) or that use short-lived or extremely delicate parts should also be examined early to identify potential support problems in the Fleet. For software-intensive systems, this test must also evaluate the capabilities of the designated Software Support Activity (SSA) to adequately support future changes to the system software and maintain system configuration throughout the Fleet.

(a) The purpose of configuration management is to provide a systematic means for documenting and controlling the configuration of new equipment or systems, so total life cycle costs, contract requirements, schedules, operational performance and readiness, and integrated logistic support can be better regulated. Configuration management provides procedures for a disciplined approach to:

1. Identifying and documenting the functional and physical characteristics of the material item

2. Controlling changes to material items, their functional and physical characteristics, and configuration identification

3. Reporting and recording configuration information, including the status of all proposed, approved, and disapproved configuration changes, and maintenance of configuration records

(b) When appropriate, and within the constraints of the test program and test period, the OTD will assess the adequacy of configuration management during OT&E of equipment and weapon systems. This assessment will focus on noting changes to physical and functional characteristics in the equipment or system under test that have not been adequately documented. The assessment of configuration management will be conducted as part of Test S-4, Logistic Supportability.

(5) Compatibility. This test is usually required in IOT&E and FOT&E. Furthermore, even though the test system is an advanced development model in a temporary installation, compatibility tests during early IOT&E may reveal problems not anticipated by the designer: the need for an air-conditioned space, susceptibility to degradation from input power variations, an unanticipated EMI source, etc. Early identification of potential compatibility problems may allow simple changes (e.g., installation in a different location) that will prevent the system from failing in IOT&E.

(6) Interoperability. This test examines the interfaces between the test system and any associated systems (intra/interservice) (the system's capability to transfer information and/or services to or from other systems) during all phases of OT&E. A matrix delineating the possible interface combinations should be developed when writing the TEMP and be included in the test plan. Where appropriate, Navy occupational health, safety, and environmental considerations should be observed during testing.

(7) Training. This test is conducted as soon as a proposed training plan has been defined, and is repeated as necessary through all phases of OT&E.

(8) Human Factors. Observation of the human and machine interface (operability) must be examined in all phases of OT&E. This element addresses the interface among system hardware and software elements, and the human elements. Testing evaluates the system itself, what the system requires of the people who operate and maintain it, and how the system fits into the relationship with the people who are going to operate and maintain it. One method of assessing human factors is through development of a human factors checklist. The Federal Aviation Administration has prepared a human factors guide, portions of which will be helpful in developing a checklist to support OT&E. The guide is available on COMOPTEVFOR's unclassified and classified LANs in Y:\OT&E_Reference_Library\Human Factors COI Guidelines folder. Occupational health and safety should be considered in the human factors test.

(9) Safety. Procedures for checking safety aspects of a system are at times included as part of maintainability and interoperability tests. When safety is a primary

reason for developing a system, such as in a life support system, safety issues are usually addressed in the system's operational effectiveness COIs (e.g., the capability of the system to support life). The same is true of systems developed to perform hazardous tasks (e.g., explosive ordnance disposal equipment, to determine the system's capability to contain the effects of bomb detonation, for example).

(a) Systems not developed for safety reasons, that involve potentially hazardous operations, usually require a safety test. For example, IOT&E of a swimmer-delivered, remotely controlled limpet mine should include a safety test that addresses the possibility of premature or inadvertent actuation. When developing a test for safety, contact the Naval Safety Center for information on systems similar to the one being tested. They may be able to provide historical data on problems, which may help the OTD design the test. COMOPTEVFOR is not required to certify a system safe per Navy occupational safety and health standards and requirements; however, apparent health and environmental hazards should be noted and reported during OT.

(b) OTDs and OTCs must review system and ship/installation documents to assess whether safety and emergency procedures (e.g., loading, handling, operating, maintaining, hazardous material, etc.) relevant to system/equipment undergoing OT&E have been properly prepared and disseminated.

(10) Documentation. This test should start as early as possible, even with a review of preliminary manuals. A red-line copy of the final version of the documentation is acceptable for IOT&E. This allows issues with documentation found during IOT&E to be corrected in the documentation prior to final print and distribution of to the Fleet.

(11) Transportability. This test is conducted if appropriate to the system under test and when the configuration of the test item allows a meaningful test. Items designed to be transportable by human beings are frequently in near-production configurations early in their development, and transportability testing can begin correspondingly early. This test may be conducted as a subset of logistic supportability if it is not a critical issue.

(12) Wartime Usage Rates. Systems that contain elements that will be expended (e.g., gun systems (ammunition), missile systems (missiles), countermeasures systems (chaff, expendable decoys)) need to be examined for assurance that storage, resupply, etc., facilities will be adequate in wartime. This element of operational suitability is frequently addressed in logistic supportability.

(13) Manning. This test may be conducted as a subset of the training test or as a separate test. It is conducted as a separate test when manning is a COI.

g. The process of selecting MOSs is the same as the process of selecting MOEs: determining what the evaluator needs to know to adequately test and evaluate the suitability COIs. Using the thought process described for E-tests, but recognizing

that qualitative data usually have to be known to examine suitability issues, the OTD will generate something like the following:

(1) Test S-1, Reliability

- MOS 1 -- MTBOMF

- MOS 2 -- Factors that appear to affect reliability

(2) Test S-2, Maintainability

- MOS 3 -- Mean time to fault-locate

- MOS 4 -- Mean Corrective Maintenance Time for Operational Mission Failures (MCMTOMF)

- MOS 5 -- Maximum corrective maintenance time

- MOS 6 -- Mean time to restore software

(a) Aspects of maintenance that are excessively difficult, time-consuming, or unsafe

(b) The adequacy of technical documentation used in maintenance

(c) The adequacy of the proposed preventive maintenance schedule

h. Having specified the test and the data to be determined in each, the OTD can construct a table similar to table 6-2 (not required if using an OT Framework). A table like this becomes especially useful in complicated OT&E; for example, a whole-ship IOT&E where there may be many capabilities and subcapabilities that need to be examined.

Effectiveness and suitability analysts are experts at designing tests and in selecting MOEs, MOSs, etc. Be sure to get them involved in your planning early. For complex systems employing advanced technologies and concepts, assistance in developing MOE/MOS is available at the Naval Ship Weapon Systems Engineering Station, Port Hueneme, CA.

Table 6-2. Capabilities Versus Tests

Capability	Applicable Tests	Major Elements
1*	E-1 through E-3	MOEs 1-10
2	E-1 through E-3	MOEs 1-10
3	E-4	MOEs 11 & 12
4	E-5	MOE 13
5	E-6	MOE 14

Table 6-2. Capabilities Versus Tests		
Capability	**Applicable Tests**	**Major Elements**
6	S-1 through S-3	MOSs 1-4 MOEs 1-4 Factors affecting reliability. Difficult, time-consuming, unsafe aspects of maintenance. Technical documentation. Preventive maintenance schedule. _____
7	S-4, S-5	_____
8	S-6, S-7	_____
9	S-8 through S-10	
* Numbers refer to the capabilities of paragraph 608e.		

i. In the preceding discussion, it was implied that the testing would consist either of scenario run-throughs or operation of the equipment under simulated operational conditions. While these exercises will usually satisfy most of the requirements of the evaluation, additional test procedures to be performed in addition to the exercises are often required. For example:

(1) Survivability frequently requires an assessment of many issues to determine if a system is vulnerable. An example of the special procedures involved is contained in paragraph 620.

(2) Reliability of new systems often exceeds the amount of available test time, making it difficult to quantify. Planning to review prior testing of the system and the reliability of similar systems already in the Fleet will aid in the assessment of reliability. See DT&E and Fleet data for more information.

(3) Maintainability frequently requires an M-DEMO, inserting prefaulted components in the equipment, and observing fault location and repair. In evaluations where MCMTOMF is an issue, always make provisions for M-DEMOs so that the maintainability of a highly reliable system can be assessed. Ensure the requirement for prefaulted modules is identified early in the TEMP and brought to the attention of the DA.

(4) Compatibility requires that equipment not associated with the test system be energized and de-energized, and that power variations be induced; when the scenarios and equipment operation do not provide a complete set of compatibility data, special turn-on and turn-off tests and the like must be planned.

613. DATA REQUIREMENTS

a. MOEs, MOSs, and qualitative data the OTD needs to know to examine the COIs are evaluated during post-test analysis after scenarios have been run and the equipment under test has been secured. This post-test analysis uses data recorded

during or shortly after equipment operation. In planning, the OTD must decide what data are needed and how the data will be acquired. These decisions should involve thoughtful consideration of data sources and what data are actually required (including measurements, with their inherent degrees of accuracy). These decisions may affect earlier elements of the evolving test plan (e.g., the way the scenarios were to be run). Planning usually involves interaction between various elements of the plan. To illustrate this, suppose the OTD had tentatively decided on open-ocean freeplay between a surface ship and a submarine. Later it's determined that the relative positions of the two vessels must be reconstructed with precision to determine a set of MOEs. This forces the OTD to use a range, and open-ocean freeplay is modified accordingly.

b. The major sources of data available to the OTD include:

(1) The System Under Test. Data are best obtained from the system under test by observing system display (scopes, meters, indicator lamps, etc.) while it is in operation and recording display data manually or by instruments (e.g., cameras) not connected to the system. This requires no alteration to the test system, which is a definite plus. Data sources that require alterations (hanging scopes and meters on the back of the console, etc.) should be used only with caution. If they were successfully used in earlier DT&E (e.g., during TECHEVAL prior to IOT&E), any installation problems (impedance mismatches, ground loops, etc.) that may have affected overall system performance have probably been discovered and corrected. If they were not used before, use them in OT&E only as a last resort, and allow sufficient prescenario or preoperation time for debugging. External data sources connected to the equipment under test, whether used in earlier DT&E or not, should be examined critically from the viewpoint of their effect on operational realism. Data sources should provide the operator with useful information not available in the proposed production configuration.

(2) Equipment Already in Service/Use. Navigation systems, radars, sonars, communications systems, etc., available in the Fleet are potential data sources that may, in fact, determine the class or type of ships or aircraft to be used in OT&E. For example, absolute position requirements for reconstruction may dictate that the test ship have an inertial navigation system onboard; relative position requirements may dictate that a participating ship have a certain type of search radar. Use of equipment already installed in Fleet units can help reduce the costs of OT&E by reducing the need for special instrumentation for test purposes.

(3) Test Support Activity and Range Equipment. Track plots, bomb impact data, electronic warfare simulator logs, etc., that are normally produced by ranges and other test support activities require no unusual tasking to obtain them, and their production (per se) does not detract from operational realism.

(4) Special-Purpose Instrumentation. Under this heading fall the instruments not available in the Fleet or through test support activities that are used to monitor elements of the scenario external to the system under test. Examples include

onboard cameras aimed at incoming targets to record the effects of gunfire, or portable voice recorders used by observers of a simulated combat engagement.

(5) Personnel Operating or Maintaining the Equipment. In addition to recording data in operation logs and maintenance records as required by the test plan, these personnel are sources of qualitative data through questionnaires and interviews. The adequacy of technical manuals is usually determined in this way.

(6) DT&E and Fleet Data

(a) COMOPTEVFOR's evaluation of any system should be based on a review of all pertinent data, regardless of the source. If data were acquired during non-OT&E, there must be every reason to assume that the same data would have resulted from OT&E. In determining whether or not data are pertinent for operational evaluation, ask the following questions regarding the conditions under which the data were collected:

1. Who operated the system? If contractors did, most results are useless for OT&E.

2. Who maintained the system? If Fleet Sailors operated it, but contractors maintained it, there may be some useful effectiveness and interoperability data; reliability data should be used with caution. For systems permanently maintained by contractor personnel, per the ILSP, maintainability performance is subject to review and analysis just as if maintained by Sailors.

3. What was the test environment? Aboard ship at sea? Sea state? Atmospheric ducting? In other words, how closely did the test environment simulate the operational realism associated with OT&E? The OTD may decide to use only environmentally representative data which comply with test scenarios. Test data obtained in controlled environments may not be useful for IOT&E.

4. Was the system altered or modified in any way during the testing? If hardware or software changes were made, be very selective in the use of prechange data. If the configuration of the system under test is changed during testing, particularly during IT or IOT&E, the OTD must assess the impact of the change on all data collected prior to the change. Due to the potential cost and schedule implications of additional OT, the DA's analysis of the scope and impact of the configuration change must be considered in the determination of whether or not to require additional testing to resolve COIs, with the concurrence of the OTD's chain of command.

(b) The two major potential data sources outside OPTEVFOR are:

1. DT&E Results for OT&E (including IOT&E). DT data can never be a complete substitute for OT data. However, DT data can be analyzed/assessed as part of the planning for OT. In addition, there are occasions when DT data can augment

the OT results. Examples include M-DEMOs, land-based testing, tests that meet OT requirements (final configuration, no contractors, Fleet operators, etc.). Other data must be evaluated on a case-by-case basis.

2. Fleet Data for FOT&E. During FOT&E, it sometimes happens that OPTEVFOR is evaluating systems that have already been deployed in significant numbers. In these cases, the test plan should make provisions for obtaining data on systems deployed in nonproject ships. Actual Fleet experience can provide essential information to an evaluation of operational effectiveness, and Maintenance, Material, and Management (3-M) data can be very useful in expanding the overall operational suitability database.

(c) Regarding the form in which data are obtained, the OTD should note that not only do data sources vary, but the form in which data can be obtained varies also. Thus, in FOT&E, operating times, system status, and maintenance information can be obtained from special OT&E data collection forms completed by operator and maintenance personnel. At the same time, it may be possible to obtain the same data from standard Navy operational forms that are already being completed on the system, such as equipment logs and maintenance forms. When the OTD can obtain OT&E data from logs, charts, forms, etc., being completed routinely, do so because:

1. The record already exists, and no special tasking is required other than ensuring OPTEVFOR gets a copy.

2. Recording the data will not affect operational realism, because recording is part of the operational routine.

c. Deciding what data are actually required is similar to deciding what needs to be known to examine each capability. Consider each MOE, MOS, and qualitative element within the framework of potential data sources, and double-check for impact on earlier phases of planning (scenarios, etc.). Some examples:

(1) MOE 1, Probability of Detection. The information we are after here is the ratio of the number of detections to the number of targets that should have been detected. For example, assume the scenario is being run by AUTEC, and that they are tracking the surface ship and the submarine. Assume also that the OTD is observing the sonar operator and has radio communication with AUTEC's plotting center. The OTD relays detection to AUTEC when the sonar operator calls it and records the operator's initial estimate of range and bearing, together with the time of the call. The required pieces of data are:

- A time-annotated plot of the two tracks, with ship and submarine positions marked at detection (provided by AUTEC)
- Sonar operator's range and bearing estimates at detection, to confirm that the detection was not a false detection (survey sheet)

- Acoustic conditions on the range, to establish the conditions under which a submarine should be detected (provided by AUTEC)

In the process described above, the OTD considers the data needed and how it would be obtained to the extent of considering actions and responsibilities during the exercise on AUTEC. Test planning requires that the OTD consider past events (e.g., selection of a scenario) and future events (e.g., assigning responsibilities during project operations) when addressing a particular phase of planning**.**

(2) MOS 1, MTBOMF. Here, the goal is to determine the average time between OMFs. In this example, total sonar operating time is divided by the number of OMFs. The required pieces of data are:

- A chronological record of system status, providing operating time, failure times, and the operator's assessment of the type of failures (from Sonar Operator's Log, Data Sheet S-1)
- Confirmation of the type of failures (from Maintenance Log, Data Sheet S-2)

d. Having determined the data requirements for the various MOEs, etc., the OTD can construct something like table 6-3, which for illustrative purposes, is based on table 6-2. Notice that the title of table 6-3 is Primary Data Sources. Backup data sources are very important, too; they can make the difference between demonstrating or not demonstrating a particular capability. In the surface ship and submarine exercise on AUTEC, loss of communications to AUTEC (for the detection transmission) or loss of AUTEC's plotting capability could be offset by correlating navigation information from both vessels and the survey sheet used to note the information. Information entered on the survey sheet could be a backup for a portable voice recorder with a bad battery.

Table 6-3. Primary Data Sources

Element	Data Requirement	Recorded
MOE 1	1. Time-annotated plot of positions 2. Range and bearing estimates at detection 3. Acoustic conditions	AUTEC Survey Sheet AUTEC
MOE 2	1. ----------	-----
*	*	*
*	*	*
*	*	*
*	*	*
*	*	*
*	*	*
MOS 1	1. System status record 2. Failures (number and type)	Form S-1 Forms S-1 and S-2

Table 6-3. Primary Data Sources		
Element	**Data Requirement**	**Recorded**
Reliability Factors	1. ----------	-----
*	*	*
*	*	*
*	*	*
*	*	*
*	*	*

e. One final consideration in this phase of planning is to identify any data items that, if not obtainable during an exercise in which they were supposed to be obtained, would cause testing to be suspended. For example, if AUTEC were the only source of time-position information, and if shortly after commencement of the exercise AUTEC's plotter became inoperative, the prepared OTD would suspend the operation because the exercise would not contribute any useful data to most MOEs. Rehearsing data collection methods and procedures prior to the actual start of test is recommended.

614. HOW MANY OR HOW LONG?

a. Determining how many times to run a scenario, or how long to operate the equipment, is a matter of judgment that involves interrelated, and sometimes conflicting, considerations. When expenditure of equipment is involved (e.g., missiles), the number of events has a sharp impact on the cost of conducting OT&E. The OTD must be prepared to defend his or her thinking because the DA will want to minimize OT&E costs. Consider the following:

(1) The variables that are involved. If, for example, we are interested in a craft's capability to deploy and retrieve underwater demolition team personnel, event runs at various combinations of environmental conditions (day and night, sea state, etc.) are needed in order to arrive at an overall system evaluation.

(2) The degree of risk we are willing to take in accepting a system that is bad or rejecting a system that is good (i.e., the confidence level).

(3) The cost of testing. It costs money to expend weapons and targets, to operate ships and aircraft, to operate a range, etc. This money has to be budgeted and is usually in short supply. Ask if the benefit gained by the level of testing desired justifies the added expenditure.

(4) The availability of Fleet services and range support. These usually boil down to matters of priority among competing requirements.

(5) The time available. Although COMOPTEVFOR's input is important in milestone decisions, it is not the only input. Furthermore, budgetary considerations often require that decisions be made, if at all possible, by certain dates. For these reasons, it is often desirable that testing be conducted so as to provide only those data absolutely essential to COMOPTEVFOR's evaluation.

b. There are no hard and fast rules for determining how many or how long. It is a combination of itemizing all the considerations described above to ensure an efficient OT. A properly prepared TEMP will contain an estimate of how many or how long.

615. SUITABILITY CALCULATIONS

a. Reliability. The parameters for addressing reliability are mission Reliability (R) and MTBOMF. For aircraft, system operating time may be expressed in flight hours, resulting in the parameter Mean Flight Hours Between Operational Mission Failures (MFHBOMF) rather than MTBOMF.

(1) R is the probability that the system will complete a mission without an OMF (hardware failure or software fault). R is recommended for systems which are operated only during a relatively short-duration mission (as opposed to operating more or less continuously).

$$R = \frac{\text{Number of Missions Without an Operational Mission Hardware Failure or Software Fault}}{\text{Total Number of Missions}}$$

(2) MTBOMF is used for more or less continuously operating systems. MTBOMF is addressed using the following parameters:

(a) MTBOMF, Hardware ($MTBOMF_{HW}$). $MTBOMF_{HW}$ is the mean time between operational mission hardware failures occurring during system operation and is calculated as:

$$MTBOMF_{HW} = \frac{\text{Total System Operating Time}}{\text{Number of Operational Mission Hardware Failures}}$$

where an operational mission hardware failure is one which prevents the system from performing one or more mission essential functions. System operating time includes only the time the system is operating and being stressed under operational loads. It does not include standby time. For aircraft, system operating time is from the attempt to start the aircraft with the intent to perform a mission until engine shutdown.

(b) MTBOMF, Software ($MTBOMF_{SW}$). $MTBOMF_{SW}$ is the mean time between operational mission software faults. A software fault is any interruption of system operation not directly attributable to hardware and is calculated as:

$$\text{MTBOMF}_{SW} = \frac{\text{Total System Operating Time}}{\text{Nunber of Operational Mission Software Faults}}$$

(c) MTBOMF, System (MTBOMF_{SYS}). MTBOMF_{SYS} is the mean time between operational mission hardware failures and operational mission software faults which occur during system operation and is calculated as:

$$\text{MTBOMF}_{SYS} = \frac{\text{Total System Operating Time}}{\text{Total Number of Operational Mission Hardware Failures / Software Faults}}$$

As a general rule, MTBOMF_{SYS} should not be used as a test measure when MTBOMF_{HW} and/or MTBOMF_{SW} can be used instead.

(d) Mission Completion Rate (MCR). MCR is for multimission systems with short mission duration (whole aircraft) and is calculated as:

$$\text{MCR} = \frac{\text{Number of Missions Successfully Completed}}{\text{Number of Missions Attempted}}$$

A mission is not successfully completed when it is aborted due to the occurrence of a system failure that precludes the system from performing the assigned mission. The number of missions attempted includes only those missions in which factors beyond the design control of the system, such as range delays or asset nonavailability, do not impede the successful completion of the mission. MCR may be used in addition to other R measures. MCR is rare, and, when used, should be in conjunction with one of the other reliability measures.

(e) Mean Time Between Unscheduled Maintenance/Mean Flight Hours Between Unscheduled Maintenance (MTBUM/MFHBUM). These are measures of the time (flight hours) between unscheduled maintenance actions (may or may not be hardware failure related) compared to total operating time.

$$\text{MTBUM / MFHBUM} = \frac{\text{Total System Operating Hours (Flight Hours)}}{\text{Number of Unscheduled Maintenance Actions}}$$

MTBUM/MFHBUM will be thresholded and reported on a case-by-case basis.

b. Maintainability. The parameters for addressing maintainability are MCMTOMF, Maximum Corrective Maintenance Time for Operational Mission Failures (MaxCMTOMF), Mean Corrective Maintenance Time for Operational Mission Faults, Software (MCMTOMF_{SW}), Mean Reboot Time (MRT), and Built-in Test (BIT), and Maintenance Ratio (MR).

(1) MCMTOMF is the average elapsed corrective maintenance time needed to repair all operational mission hardware failures. It includes time for maintenance preparation, fault location and isolation, onboard parts procurement, fault correction, adjustment and calibration, as well as follow-up checkout time. It does not include off-board logistic delay time.

$$\text{MCMTOMF} = \frac{\text{Total Elapsed Time to Correct Operational Mission Failures}}{\text{Total Number of Operational Mission Failures}}$$

Onboard logistic delay is the logistic delay associated with obtaining the spare part at the unit or organizational level. For aircraft systems, the unit level will be considered to be the squadron. Therefore, MCMTOMF will be calculated as the mean of the elapsed maintenance times (block A45 of the Maintenance Action Form).

(2) MaxCMTOMF is that time below which a specified percentage of corrective maintenance tasks must be completed to restore the system to operation after an OMF (e.g., 90 percent of all corrective maintenance times for operational mission hardware repairs will be less than MaxCMTOMF. This parameter is recommended when the time required to repair and restore the system due to operational urgency is considered an important aspect of the system under test.

(3) MCMTOMF_{SW} is the average elapsed time needed to restore a software-intensive system following an operational mission software fault. The system is considered to be restored when a tactical picture that is useful to the tactical action officer/operator is first established. This may include the time to restore all processes, functions, files, and databases to a tactically useful state, and the time required to physically reboot the system following an operational mission software fault.

It does not include the time to obtain spare parts or use the expertise of personnel outside the unit or organizational level. For aircraft systems, the unit level will be the squadron**.**

$$\text{MCMTOMFsw} = \frac{\text{Total Elapsed Time to Restore Software - Intensive Systems After an Operational Mission Software Fault}}{\text{Total Number of Operational Mission Software Faults}}$$

(4) MRT is the average elapsed time required to reboot a software-intensive system. MRT is addressed as MRT Cold (MRT_C) start and MRT Warm (MRT_W) start. MRT_C and MRT_W include only the time necessary to physically reboot the system, not the time required for restoration of the tactical picture as in MCMTOMF_{SW}.

$$\text{MRT} = \frac{\text{Total Elapsed Time to Reboot a Software - Intensive System}}{\text{Total Number of Software Reboots}}$$

(5) BIT is addressed using these parameters: Probability of Correct Detection (P_{cd}); Probability of Correct Fault Isolation (P_{cfi}); and Probability of a False Alarm (FA). It is recommended that all three equations be used together to ensure a complete picture of BIT performance.

(a) P_{cd} is a measure of BIT's capability to correctly detect failures/faults and is calculated as:

$$P_{cd} = \frac{\text{Number of Failures / Faults Correctly Detected by BIT}}{\text{Number of Actual System Failures / Faults}}$$

(b) P_{cfi} is a measure of BIT's capability to correctly isolate the failure to a specified replaceable assembly and is calculated as:

$$\text{Pcfi} = \frac{\text{Number of Failures Correctly Isolated}}{\text{Total Number of Failures Correctly Detected by BIT}}$$

(c) FA is the measure of BIT indicating a failure , where upon investigation, the failure cannot be confirmed, and is calculated as:

$$\text{FA} = \frac{\text{Number of Incorrect BIT Failure Indications}}{\text{Total Number of BIT Failure Indications}}$$

For system tests with few BIT failure indications, the FA rate may not provide an accurate measure of false alarms. The OTD may also calculate the number of False Alarms per System Operating Hour (FAh).

$$\text{FAh} = \frac{\text{Number of Incorrect BIT Failure Indications}}{\text{Total Number of Operating Hours}}$$

(6) MR. MR is a measure of the ratio of total maintenance man-hours required to perform required preventive maintenance and repair all hardware failures to operating/flight hours and is calculated as:

$$\text{MR} = \frac{\text{Total Maintenance Man - Hours to Accomplish Required Preventive Maintenance and Repair all Failures}}{\text{Total System Operating / Flight Hours}}$$

c. Availability. The parameter for addressing availability is A_o.

(1) For continuously operating systems, A_o is calculated as:

$$A_O = \frac{\text{Uptime}}{\text{Uptime} + \text{Downtime}}$$

where uptime is that time when the system is considered to be ready for use and is either operating, in standby, or off. Downtime is the time the system is down for repair of operational mission hardware failures and/or for restoration from operational mission software faults, including off-board logistic delays. It also includes planned maintenance time, with a periodicity less than or equal to the test duration time, that prevents the system from performing its assigned mission. Planned maintenance time that is of periodicity greater than the test duration time is considered neutral time and is not included in the A_o calculation.

(2) For on-demand systems, A_O is calculated as:

$$A_O = \frac{\text{Number of Times System was Available}}{\text{Number of Times System was Required}}$$

where the number of times the system was required shall include the number of times it was operationally required, but not used because the system was known to be inoperable.

(3) For multimission systems (i.e., whole aircraft, ships, or submarines), the measures of availability are FMC, PMC, and MC_{MA}.

(a) FMC is defined as the material condition of a system in which it can perform all of its missions. FMC is calculated using the same formula as A_o:

$$\text{FMC} = \frac{\text{Uptime}}{\text{Uptime} + \text{Downtime}}$$

where uptime is the time the test system is capable of performing all its missions (full mission capable), as defined by the MC_{MA} mission areas.

(b) PMC is defined as the material condition of a system in which it can perform at least one of its missions. PMC is calculated as:

$$\text{PMC} = \frac{\text{Uptime}}{\text{Uptime} + \text{Downtime}}$$

where uptime is the time the system is capable of performing at least one of its missions, as defined by the MC_{MA} mission areas.

(c) MC_{MA} is a measure of the system's capability to perform a specified mission and is calculated as:

$$MC_{MA} = \frac{\text{Uptime}}{\text{Uptime} + \text{Downtime}}$$

where uptime is the time the test system is capable of performing a specified mission. For aircraft, mission areas will be determined from the aircraft type Mission Essential Subsystem Matrices (MESM) per OPNAVINST 5442.4 series, as supplemented by operational experience.

Not Mission Capable (NMC) would be a measure of the proportion of time during which a system can perform none of its missions. Since NMC is the complement of PMC (i.e., NMC = 1-PMC), there is no need to use NMC. When calculating FMC and PMC, it may be useful to refer to "NMC time," which would be equivalent to PMC downtime. But, take care not to confuse terms for the measures with terms for system states or time accounting.

616. ADDRESSING THE THREAT IN TEST PLANNING

The OTD must consider the current TA in planning and preparing the OT plan, in which the following require consideration:

a. If the system will not be tested against some portion of the threat, as described in the applicable ONI Capstone TA or System Threat Assessment Report (STAR), a test limitation will be included to indicate the threat is not being completely addressed. The limitation must cite the specific current or projected threat, as described in the current TA, and reference the current TA. If the limitation is due to simulators or targets not being threat representative, cite the shortfalls as they relate to the specific current or projected threat system or capability.

b. The current and projected threat must be considered when developing the scenarios and test procedures of the test plan. The scenarios and test procedures will reference the current ONI Capstone TA or STAR, if applicable. When developing scenarios and test procedures, exclude all portions of the threat that will not be tested.

617. LOI REQUIREMENTS IN THE TEST PLAN

Project operations involving multiunit coordination will normally require issuing an LOI. The test plan will include a short discussion (in paragraph 303 of the test plan) on the LOI when one is to be issued. Information regarding the need for an LOI and the format is contained in chapter 7, paragraph 702.

618. THE IA E-TEST

a. This E-test will address the IA COI as enumerated in Part IV of the TEMP. Testing for IA shall be approached based on the requirements of SECNAVINST

5000.2C and per the DOT&E memorandum dated 21 Nov 2006, Policy for Operational Test and Evaluation of Information Assurance in Acquisition Programs.

b. COMOPTEVFOR Code 643 can provide information on, and make the initial contact with, the various independent agencies that conduct IA testing. Funding for the test should be documented in Part V of the TEMP and provided by the PM directly to the testing agency.

619. SURVIVABILITY'S QUANTITATIVE ESTIMATE

a. A quantitative estimate of survivability, or a subset of survivability, may be possible if the system can be tested against a realistic threat. It should be noted that most projects will not be capable of generating numbers; however, this paragraph serves to show survivability relationships. One method of achieving a quantitative result is to define the following probabilities, and then to approximate probability by percentages:

(1) Probability of Survival (P_s). The probability that the system will survive the hostile environment. P_s is a direct measure of the system's survivability.

(2) Probability of Hit (P_h). The probability that the system will be hit by a damage-causing mechanism, and is referred to as the susceptibility of the system.

(3) Probability of Kill (P_k) Given a Hit. The conditional probability that a system is killed given a hit, and is referred to as the vulnerability of a system.

(4) The probabilities are related as follows:

$$P_s = 1 - P_k$$

(5) Finally, the survivability equation becomes:

$$\underset{\text{survivability}}{P_s} = 1 - (\underset{\text{susceptibility}}{P_h} \times \underset{\text{vulnerability}}{P_k})$$

620. OTHER SURVIVABILITY CONSIDERATIONS

a. Air. Aircraft survivability testing usually must include destructive testing, ballistic penetrator analysis, etc., to study system operation after impact. This is often part of LFT&E and not a COMOPTEVFOR function, and, as such, should be a requirement placed upon the DA in program documentation and throughout the program. From an operational standpoint, the OTD has the prerogative to make a qualitative assessment of vulnerability features when the system is used in the intended operating environment. This qualitative assessment should be reported in the evaluation report and tactics guide, as applicable.

b. Surface. When evaluating a surface combatant, susceptibility may approach unity; thus, survivability approximately equals one minus vulnerability. Usually, survivability has the most meaning when talking about the entire weapon system (e.g., surface combatant). The OTD must use judgment when using survivability as an effectiveness measurement for smaller systems, such as a missile launcher, gun system, or a main feed pump.

c. Subsurface. For combat control systems, weapon systems, systems requiring exposure above the surface, or systems making active emissions, susceptibility is the submarine's susceptibility to being detected and/or localized. Vulnerability answers the question that, if attacked, how successful is that attack. Since vulnerability often involves a question of lethality, destructive tests may be the only means of obtaining absolute answers. Therefore, the results of technical destructive or explosive tests should not be overlooked as a vulnerability database.

d. Laser Designators. When addressing susceptibility in the test plan, consideration should be given to the effect a hostile laser designator may have on the system or operator.

621. THE SURVIVABILITY E-TEST

a. This E-test will address the survivability COI as enumerated in Part IV of the TEMP. Testing for survivability should be approached in two ways: that which can be done during active project operations and that which can only be done in a modeling and simulation environment.

b. The scenario-related E-tests must be designed to demonstrate the system's capability, or lack of capability, to accomplish its mission in the intended operating environment. The OTD should employ the best tactics and the best countermeasures available from friendly and opposing forces.

c. The E-test should focus on the capability of the system and its crew to avoid or withstand a manmade hostile environment without adversely impacting mission accomplishment. Here is where a majority of the DA's test results can be useful; these results will be available only if the OTD has ensured beforehand that the DA will provide COMOPTEVFOR with the results of tests he/she has conducted. Equipped with the threat statement, MOEs and MOSs, knowledge of test results to be expected from the DA, and the considerations of paragraph 615 (how many or how long?), the OTD should be able to prepare an E-test to fit the system testing needs. If technical questions arise, see Chapter 4, Resources.

622. JOINT INTEROPERABILITY ASSESSMENT/E-TEST

a. Joint interoperability is defined as the capability of systems, units, or forces to provide services or accept services from other systems, units, or forces, and to use the services so exchanged to enable them to operate effectively together (CJCSI

6212.01B). Assessment of the underlying technical details of supporting information exchanges is not usually within the province of OT&E. *Operational* joint interoperability (net-readiness) assessment should focus on the impacts on end-to-end operational effectiveness and mission task accomplishment. To this end, the assessment should address the evaluated system's impact on the quality and commonality of operational information available to operators among units operating together using joint interfaces, and the capability of cooperating units to use those interfaces to support coordinated action.

b. While joint interoperability contributes to mission effectiveness, it is not the only contributor. For this reason, high-level effectiveness measures, such as fratricides, leakers, and engagement range, do not isolate the level of joint interoperability attained. Instead, metrics that characterize the quality of the operational information held by members of the force, and the degree of commonality of that information among the members, more reliably indicate the level of joint interoperability. Quantitative MOEs have been developed and widely applied to address the quality of the operational picture provided to operators of warfare systems. These measures characterize the operational picture's completeness, clarity, correctness, and commonality and are summarized in table 6-4.

Table 6-4. MOEs

Measure	Definition	Significance
Completeness	Percent of objects depicted in the operational picture by at least one track	Do operators see everything that's there?
Clarity (a.k.a. Ambiguity)	Number of tracks per object represented in the operational picture	Are dual tracks cluttering up the picture?
Continuity	Rate (number per hour) of track number changes associated with a given object (track number turnover)	How stable are track designations? Does track 1234 remain associated with the threat during the time operators are talking with each other about it?
Commonality	Percent of tracks held on each unit associated with the same object and with the same Identification (ID)	Do all the operators see track 1234 on the same threat and with the same ID?
ID Completeness	Percent of objects in the picture with an associated track with ID other than unknown	Are objects being identified?
ID Accuracy (a.k.a. ID Correctness)	Percent of objects in the picture with at least one associated correctly identified tracks and no associated *incorrectly* identified tracks	Are objects being *correctly* identified and staying that way?

Table 6-4. MOEs		
Measure	**Definition**	**Significance**
ID Clarity	Percent of objects with at least one associated track ID'd correctly and at least one associated track ID'd incorrectly	Are objects identified unambiguously?

These measures are especially relevant to Theater and Air Missile Defense (TAMD) systems, as they are tied to thresholded parameters in TAMD and combat ID capstone and mission area requirements documents. They have also been used to assess ground and maritime operational pictures.

c. To employ these measures, it is necessary to collect track database data from interfacing systems and truth data on targets of interest. After the test, each system's track data must be matched to the truth data in a reconstruction of the depiction of the targets of interest presented by each system to the operators. Government Off-the-Shelf (GOTS) software tools exist to support performing these reconstructions and subsequent computation of the measures.

d. The above-described quantitative measures of joint interoperability complement qualitative assessments that should also be undertaken. These include your observations during conduct of the test, and operator inputs provided though surveys and event summaries. If possible, it is also useful to obtain assessments from the Joint Interoperability Test Command (JITC) and Deploying Group System Integration Testing (DGSIT). These inputs often provide information on specific instances of interoperability problems for which the quantitative measures provide the overall context. They also can be helpful in assessing the causes of the problems, especially whether or not they are induced by the system under test or by one or more of the interfaced systems.

623. OPSEC REQUIREMENTS OF TESTING

a. Background

(1) OPSEC, as it relates to COMOPTEVFOR testing, may be defined as the identification and protection of a broad spectrum of classified and open-source information that collectively reveals current and future U.S. military capabilities, plans, and operational procedures. In this respect, it encompasses and relates to other security programs such as SIGSEC, physical security, automated data processing, and operational deception.

(2) Basic guidance on OPSEC is contained in OPNAVINST 3432.1 series and COMOPTEVFORINST 3070.1 series.

b. Requirements for OPSEC in Test Planning

(1) COMOPTEVFOR testing is largely devoted to verifying the capabilities of new weapon systems and developing tactics for their use. For this reason, application of OPSEC thinking to COMOPTEVFOR test scenarios is extremely important to avoid unnecessary disclosure of weapon systems' capabilities and limitations.

(2) The application of OPSEC thinking to COMOPTEVFOR test scenarios is a two-step process:

- Identify those elements of information that require protection (e.g., communications, noncommunications, electromagnetic emissions, and tactics).
- Ensure a means of protecting these elements during OPTEVFOR testing and the subsequent analysis process.

This will be accomplished through use of the system's plan for protection of weapon system test and performance data (protection plan). OPNAVINST 5510.143 series, which establishes policy on SIGSEC, and OPNAVINST S3490.3 series, which provides guidance on cover and deception planning, are also useful for this purpose.

(3) It is the responsibility of the program sponsor, in coordination with the development coordinator, SYSCOM Commander, and COMOPTEVFOR to develop the protection plan. The format and directions for developing the plan are contained in CNO letter 5500 serial 983C3/6U355112 of 29 May 1986. Development of the plan will commence with promulgation of the ORD/CD. Should development of the plan progress too slowly, the OTD must coordinate with the program sponsor to ensure it is available to support timely development of the OT plan. The OTD's participation in protection plan development is required to ensure that OT is properly addressed. If satisfactory progress is not made in a timely manner, ensure the Commander is informed through the chain of command.

(4) The OTD should develop test plans that will analyze the test programs and ensure protection plan requirements have been included. (If the plan has been prepared correctly, questions involving SIGSEC and the possible need for OPSEC planning will be addressed as well.)

(5) Test scenarios, the interchange of information during project operations, and the dissemination of test data will be designed to minimize availability of useful information to unauthorized sources. Necessary instructions will be included in detailed test procedures.

(6) Prior to commencing tests, the OTD and a representative should brief test participants on security requirements of the test. The OTD must be prepared to recommend "go" or "no go" on OT based on the threat to OPSEC.

c. Assistance in developing an OPSEC plan and applying OPSEC requirements to individual test plans may be obtained from OT&E Support (Code 131) or the division OPSEC representative.

624. RELEASE OF INFORMATION TO THE PRESS OR OTHER AGENCIES

The OTD will occasionally receive requests from the media and other agencies for information on planned or ongoing OT&E, including requests to observe and film aspects of test opertions. Such requests will not be approved by COMOPTEVFOR. Specific instrutions regarding release of information to the media are contained in the sample test plan.

625. PRIVACY ACT REQUIREMENTS

a. SECNAVINST 5211.5 series implement the Privacy Act of 1974 within the Navy. Among other things, it defines personal information and specifies how this information may be obtained and maintained. DoN defines personal information as:

Information about an individual that is intimate or private to the individual, as distinguished from information related solely to the individual's official functions or public life.

b. COMOPTEVFOR test plans routinely ask operators and maintenance personnel to provide the following kinds of information on forms or questionnaires:

- Name of person completing the form
- Military experience and experience with the equipment under test (e.g., rank or rate, time in service, formal schooling on the equipment)
- Opinions regarding aspects of the equipment (e.g., were troubleshooting procedures adequate?)

c. Per SECNAVINST 5211.5, operators and maintenance personnel are not providing personal information when they fill in their names, information about their experience, and opinions about the equipment under test. This information may be requested on OT&E forms and questionnaires without the necessity for special procedures or Privacy Act statements.

d. Social security numbers are considered personal information and should not normally be requested on OT&E forms and questionnaires. If special circumstances make them necessary, contact the COMOPTEVFOR administrative officer for specific guidance on SECNAVINST 5211.5 procedures.

626. PREPARATION, ROUTING, AND RELEASE OF TEST PLANS

a. Preparation. Test plans for DOT&E oversight projects require approval by DOT&E no later than 60 days prior to start of project operations. The test plans for

nonoversight projects are completed so that COMOPTEVFOR issues them no later than 30 days prior to the start of project operations.

(1) For all oversight test plans, the PM will be provided a test plan brief after the Commander has signed the test plan, but before it is briefed to DOT&E.

(2) For all nonoversight test plans, the PM will be provided a test plan brief after the Chief of Staff has signed the test plan.

(3) The OTD will brief the OT concept to the PM prior to DT or TECHEVAL phases. Details as to the timing of this brief, and exceptions to this requirement, will be coordinated via the T&E WIPT. The key point is communication. The program office needs to know the OT outline in order to prepare adequately for OT.

b. DOT&E Oversight Test Plans. Table 6-5 summarizes the timelines:

Table 6-5. DOT&E Oversight Test Plan Timelines

Days Prior to Ops	HQ Action	VX/HMX Action
130	OTD/OTC present Concept of Test Brief to 00.	OTD present Concept of Test brief to 00 (HMX with HQ liaison (Code 50) coordination).
120	OTD/OTC present Concept of Test brief to DOT&E.	OTD present Concept of Test brief to DOT&E (HMX with HQ liaison (Code 50) coordination).
110	Originator starts rough draft route to: editors, intel, and METOC, if appropriate.*	VX - Originator start rough draft route at squadron to editors, analyst, intel; scheduler, resources, METOC (at HQ), if appropriate.** HMX - Send rough draft to HQ liaison (Code 50) for HQ review process.**
100	Originator incorporate changes, and division send draft test plan to DOT&E Action Officer (AO).	Originator incorporate change, and HQ division send draft test plan to DOT&E AO.
80	Originator receive Comment Resolution Matrix (CRM) from DOT&E AO and resolves any issues. Code 50 send HMX draft to originator for correction of major issues.**	Originator incorporate changes and resolve any issues,*** get CO's approval.
70	Originator make corrections and route smooth document to 01E, 20, 01; 00 for brief and signature.	Originator prepare smooth document and send to HQ liaison (Code 50).** Originator brief 00.

Table 6-5. DOT&E Oversight Test Plan Timelines		
Days Prior to Ops	**HQ Action**	**VX/HMX Action**
	HQ Code 50 route smooth VX/HMX documents to 01E, 20, 01; 00 for brief and signature.	
60	Originator submit COMOPTEVFOR approved test plan to DOT&E.	N/A
30	Division print document copies; mailroom distribute.	N/A
*HQ B-codes may waive reviews if deemed not applicable. **Use E-mail for applicable sections for HQ comments and for smooth document. ***Unresolved VX/HMX issues are briefed based on the squadron position and pointed out to the Commander.		

The Commander approves all CONOPS briefs being given to DOT&E and all test plans being forwarded for DOT&E review**.**

c. Non-DOT&E Oversight Test Plans. For nonoversight programs, if the Commander has not indicated a desire to review the test plan prior to approval, and if it is a standard program test plan, the Chief of Staff signs and releases the document. Table 6-6 summarizes non-DOT&E oversight test plan timeline:

Table 6-6. Non-DOT&E Oversight Test Plan Timelines		
Days Prior to Ops	**HQ Action**	**VX/HMX Action**
50	Originator start rough draft route to editors, intel, scheduler, resources,* and METOC.*	VX - Originator start rough draft route at squadron to editors, analyst, intel; (at HQ) scheduler, resources, METOC, if appropriate.** HMX - Send rough draft to HQ liaison (Code 50) for HQ review process.**
40	Originator incorporate changes and route smooth OTC, B-code for review. Code 50 send HMX draft to originator for correction of major issues.**	Originator incorporate changes and resolve any issues, get CO's approval.
35	Originator make corrections and route smooth document to division director for signature.	Originator prepare smooth document and send to HQ liaison (Code 50) for signature.**
30	Division print document copies; mailroom distribute.	N/A

Table 6-6. Non-DOT&E Oversight Test Plan Timelines		
Days Prior to Ops	**HQ Action**	**VX/HMX Action**
*HQ B-codes may waive reviews if deemed not applicable. **Use E-mail for applicable sections for HQ comments and for smooth document.		

627. BRIEFING TEST PLANS

a. General Test Plan Briefing Instructions. The Commander is prebriefed on all CONOPS briefs given to DOT&E and approves all test plans forwarded for DOT&E review.

(1) The Commander is briefed on all ACAT I and DOT&E oversight test plans (including OAs) as part of the test plan approval process. Briefings should be scheduled so that time is available to incorporate the Commander's guidance while still allowing at least 30 days (60 days if a DOT&E oversight program) between test plan distribution and commencement of project operations.

(2) It is not necessary to brief the standard sections of the test plan, sections 2, 6, and 7, unless there are deviations from the standard format. Detailed scenarios must be briefed prior to E- and S-tests so the Commander has an appreciation of the setting in which the test is to be conducted.

b. The Test Plan Brief

(1) The test plan is unique in the manner in which it is briefed, mainly due to its bulk and the fact that most of the issues have been defined previously in the appropriate TEMP. For the foregoing reasons and economic considerations (both time and money), test plan briefs are different from TEMP comment letter briefs.

(2) The sequence, format, and content of the test plan brief slides are provided below. If the OTD deviates from this sequence, a separate outline slide is required prior to system description.

(a) Introduction Slide:

Subject: Mk 48 Torpedo Advanced Capability (ADCAP)
CNO Project No.: 371
ACAT: II
Briefer: Lieutenant Commander Mark Martin

(b) Outline of Brief:

System Description
Background
Evaluation Criteria

Critical Operational Issues
Conduct of the Tests
- Test Scenarios
- E- and S-Tests
- Test Objects

Limitations
Resource Requirements
Reports

(c) System Description (bulletized). Describe the equipment to be tested, its relation to previously tested versions, and the planned production version. Use pictures, diagrams, and schematics, as appropriate.

(d) Background (bulletized). Addresses previous testing and results, what requirement this phase of testing fulfills; the milestone decision this testing supports, etc.

(e) Evaluation Criteria (bulletized or tabular). Derived from the TEMP.

(f) The COIS to be Resolved. Derived from the TEMP Part IV.

(g) Conduct of the Test. Typically several slides, including but not limited to:

- Where and when
- Operators and maintainers
- Test scenarios
- Test object(s) of each COI
- Number of iterations or attempts
- Natural and man-made environments
- E- and S-tests

(h) Limitations. Derived from the TEMP Part IV, plus any new ones.

(i) Resource Requirements (chapter 5). From TEMP Part V.

(j) Report Required. Type and due date.

Note that the system description, background, COIs, and the evaluation criteria are directly derived from the TEMP. The OTD can probably use the appropriate slides generated for the TEMP brief. Ensure that these slides also meet the format requirements described above and are consistent.

628. RALOT

When existing systems (post IOT&E) are modified, the scope of OT required to support a fielding decision must be determined. RALOT is an available tool for the OTA to assist in that decision process. RALOT is neither a checklist, nor a hard set of rules. It is a process for evaluating the proposed new capability in view of its likelihood of failure and the impact a failure would have on the overall system's mission. For every application, the RALOT process will need to be tailored to the characteristics of the specific system modification. The DoN Acquisition and Capabilities Guidebook, annex 5-F and 5-G (available in the COMOPTEVFOR OT&E Reference Library), provide detailed discussions and examples. While the RALOT process was initially designed for software intensive systems, it provides a rigorous and logical methodology for assessing risk associated with a modification to any system.

The product of the RALOT process is a determination by COMOPTEVFOR on the level of OT required for a system modification. For DOT&E oversight programs, COMOPTEVFOR's determination is briefed to DOT&E to get concurrence on the OT strategy. Based on the determination of aggregate risk, a cost-effective level of test is selected using table 6-7. Potential determinations are:

- Level I: After successful DT, conduct limited fielding, followed by an assessment of field performance by COMOPTEVFOR prior to full fielding.
- Level II: Assessment performed by COMOPTEVFOR using DT data witnessed by OT observers.
- Level III: Combined DT/OT.
- Level IV: Full IOT&E / FOT&E.

Table 6-7. Level of Test Determination Matrix

Failure Potential	Impact of Potential Failure on Mission			
	Minor	Moderate	Major	Catastrophic
Insignificant	I	I-II	II-III	III-IV
Low	I-II	II-III	III-IV	IV
Moderate	II-III	III-IV	III-IV	IV
High	III-IV	III-IV	IV	IV

CHAPTER 6

TEST PLANNING

Sample Formats

Sample 6-1 OT Framework

Sample 6-2 Test Plan Change Letter

Sample 6-3 Test Plan Format and Preparation Guidelines

CHAPTER 7

TEST OPERATIONS

701. OTD RESPONSIBILITIES BEFORE TEST OPERATIONS BEGIN

a. Complete a draft personal letter from COMOPTEVFOR to the CO of each unit scheduled to provide key services during the OT&E. Draft preparation of these letters is the responsibility of the project OTD (and appropriate ACOS or VX/HMX-1 CO) and must be submitted in a timely manner for the Commander's signature. The letter should be received by the participating unit CO (or flag commander) prior to the receipt of the test plan. The OTD should obtain the Commander's signature not later than 30 days prior to commencement of OT&E. For late changes in OT&E units, consider the use of a "personal for" message in lieu of a letter. Make sure the CO's name is correct and tailor the letter accordingly, especially if a change of command is scheduled subsequent to receipt of the letter and commencement of OT&E. Letters to COs of several units in the same battle group (i.e., all participating in the same OT&E) should each be personalized for that particular unit. Check with the COMOPTEVFOR Flag Writer (Code 003) to make sure other divisions have not sent the same letter to the same ship on a previous OT&E. Additionally, the ACOS will receive feedback copies from the flag writer to retain for future reference. These are particularly helpful for flag-to-flag letters.

(1) To a CO who has not previously provided key services for OT&E (and is, therefore, receiving his first personal letter from COMOPTEVFOR), complete a sample 7-1 letter based on the phase of testing. Tailor the letter to suit the testing, and if sending a letter to more than one CO, vary the wording between them to eliminate the appearance of form letters.

(2) To a CO who has previously provided key services for OT&E (and has, therefore, already received a long personal letter from COMOPTEVFOR), complete the sample 7-2 letter. Pay particular attention to the personalization of this letter, and ensure that it accurately acknowledges the CO's earlier support.

(3) At the same time the CO's letters are sent, also send a letter the CO's Immediate Superior in Command (ISIC). See sample 7-3.

b. As the date to begin test operations approaches (the time to commence this process will vary among systems), check to ensure that:

(1) Appropriately trained personnel will be available to operate and maintain the equipment.

(2) The equipment to be evaluated (including special support equipment) will be installed and checked out.

(3) Operator and maintenance manuals, the Integrated Logistic Support Plan/Acquisition Logistic Support Plan (ILSP/ALSP), NTP, and other necessary documentation will be available from the DA.

(4) Instrumentation (including range instrumentation) will be available and in working order.

(5) Targets, simulators, electronic warfare services, etc., will be available.

(6) Participants have received and understand test plans and LOIs.

(7) COMSUBLANT or Commander, Submarine Force Pacific (COMSUBPAC) concurred with the safety aspects of the test plans that involve use of submarines.

(8) RDT&E support services are on track.

(9) Contingency plans are available for the unexpected.

(10) Arrangements have been made for pretest briefings, including arrangements for additional briefers, if necessary.

(11) Special data forms and questionnaires are available in sufficient quantity.

(12) Proper safeguards are provided for all classified materials to be used during test operations. This includes obtaining proper authorization for removal from the command, transportation, and storage of classified materials to be hand-carried by the OTD or members of the COMOPTEVFOR test team.

(13) If appropriate, rehearsals of test operations are scheduled. Rehearsals are useful if they increase the likelihood of obtaining meaningful data, and are problematic if they destroy operational realism. Do not eliminate the possibility of having operators that have not been alerted, etc.

(14) Prefaulted modules will be available for an M-DEMO, if necessary.

(15) System certification for the test has been received by the DA.

c. Immediately prior to the start of test operations, ensure that:

(1) All hands know what they are supposed to do.

(2) The equipment to be evaluated is in working order.

(3) Equipment necessary to the test scenario and instrumentation equipment is in working order.

(4) Personnel to activate and deactivate data recorders, and backup data takers are in place.

(5) Time synchronization and communications have been established, as necessary.

(6) Data forms have been distributed, as necessary.

(7) Contingency plans have been discussed with appropriate personnel (e.g., with the CO of the test ship or unit).

702. LETTER OF INSTRUCTION (LOI)

a. COMLANTFLT Operations Order (OPORD) 2000 and COMPACFLT OPORD 201 authorize COMOPTEVFOR operational control of assigned forces, as provided for by the Fleet quarterly employment schedule, which constitutes an operation order. It is this authority, delegated by the Fleet commander(s), which permits COMOPTEVFOR to issue LOIs or any coordinating instructions affecting operation of Fleet units. The issuance of such LOIs or instructions cannot be assumed by, or delegated to, any agency outside the operational chain of command. The operations of Fleet units assigned by the Fleet quarterly employment schedule to support a CNO project (OT and DT) remain an operational command responsibility. DAs are not authorized to issue OPORDs to Fleet units, even during real-time, on-scene project operations. Project operations involving multiunit coordination will normally require the issuance of an LOI.

b. Test operations will be directed by the officer in tactical command, the senior CO of the assigned ship(s) or air squadron(s), in coordination with the on-scene technical and/or OTD and range facility director, as appropriate. COMOPTEVFOR will normally be the Officer Conducting the Exercise (OCE) for project operations, as defined by Fleet Exercise Publication (FXP) 5 series. Fleet units will usually remain under the operational control of the numbered Fleet commander or type commander. OTDs will coordinate with the DA, as necessary, and originate LOIs for project operations required for combined DT/OT. LOIs will be in the format shown in sample 7-4. The LOI will be typed, assigned a serial number, and released by the appropriate division ACOS or VX/HMX CO. The scheduler, Code 01D6, will conduct an independent verification to ensure the LOI is executable prior to release.

703. DA CERTIFICATION MESSAGE

When the DA determines a system is ready for OT&E, he/she will notify CNO (N091), the program sponsor, and COMOPTEVFOR by message of the system's readiness. The DA is also required to certify system readiness on systems undergoing OT&E that have been placed in a deficiency status, and for FOT&E when the purpose

of FOT&E is to conduct testing deferred from IOT&E or to demonstrate correction of IOT&E deficiencies. The certification message may request deferrals for items not ready or not available for testing. OTDs should take the following action when deferrals are requested or granted:

a. When the DA forwards a certification message containing a request for deferral(s) with which we do not agree, it may be appropriate to send a message to CNO (N091), presenting our rationale for recommending against granting the deferral.

b. When CNO (N091) has granted a deferral requested by the DA in the certification message, the OTD should discuss the following issues with the DA:

(1) When will the items for which a deferral was granted be available for OT&E?

(2) A deferral granted by the CNO neither eliminates the system's requirement to perform or meet the established threshold, nor obviates the need for the particular aspect to be operationally tested.

(3) A deferral will, in most cases, lead to a test limitation, but the deferred item should be fully tested in a later phase of OT&E.

c. Add limitations to the final report, as necessary, to reflect the deferral(s).

704. OT&E COMMENCEMENT

OT&E does not begin without an approved COMOPTEVFOR test plan, or DOT&E approved test plan for oversight programs. Transmit the commencement of OT message, sample 7-5, when testing actually begins.

705. EARLY TERMINATION AND DEFICIENCY REPORTS

a. If at any time during OT it becomes apparent that the system being tested will not demonstrate planned program capabilities for operational effectiveness and/or operational suitability, is unsafe to operate, or is wasting Fleet services, COMOPTEVFOR will transmit a deficiency report to CNO, information to the cognizant systems command/PEO, the prosecuting agency, and ASN RDA, suspending OT. The OTD should know in advance of testing under what conditions a recommendation for early termination should be made to COMOPTEVFOR. The OTD's analysts can help determine these conditions. COMOPTEVFOR will then provide the appropriate deficiency test data to the DA for corrective action. *The OTD in the field reports the deficiency directly to COMOPTEVFOR only. COMOPTEVFOR then decides whether or not to send an official report.*

b. When a system undergoing OT&E is placed in a deficiency status, recertification by the DA, per SECNAVINST 5000.2C, will be required prior to resumption of OT.

706. ANOMALY REPORTS

During OT, failures or anomalies may occur that impact OT and require correction, but are not so severe that a deficiency report is required. OTDs must keep their respective ACOS, or VX/HMX CO, informed of such events so that he/she, in turn, can keep the Commander informed. Should COMOPTEVFOR direct that the CNO and the DA be made immediately aware of the problem, an anomaly report will be prepared for COMOPTEVFOR's signature. The anomaly report will identify the failure or anomaly and its impact on OT and system performance. The anomaly report will be addressed to the CNO and the DA, and will allow the DA to begin immediate work on resolution of the problem. *The OTD in the field reports the anomaly directly to COMOPTEVFOR only. COMOPTEVFOR then forwards the report to the DA and other necessary personnel.* See sample 7-6 for the anomaly report in message format.

707. OTD RESPONSIBILITIES DURING TEST OPERATIONS

The OTD should ensure that:

a. Tests are conducted per the test plan and LOI; any deviations are noted, their impact assessed, and necessary corrective action taken; and contingency plans are implemented, as necessary. Unusual events during testing that may have some effect on test results should be noted. Be prepared to alter operations if circumstances warrant. Think in advance about what alterations can be tolerated.

b. All hands are briefed on the test plan and understand their roles. Manning up and rehearsing are required for success.

c. Data recorders are refilled, as necessary; recorded data are stored in a safe place.

d. Data forms, questionnaires, and/or survey sheets are completed, as specified in the test plan, and that they are turned in to the OTD prior to the end of test.

e. COMOPTEVFOR is advised of any potential issues that could result in a COI being unresolved or resolved unsatisfactorily.

f. Unauthorized tampering with equipment, which might invalidate test data, is prevented.

g. Reports are generated, as specified in the test plan.

708. OTD RESPONSIBILITIES AFTER TEST OPERATIONS

The OTD should ensure that:

a. Questionnaires are distributed, completed, and returned to the OTD (or as specified in the test plan).

b. When necessary, an M-DEMO is conducted.

c. Necessary debriefs are conducted, as are post-test interviews.

d. All other data are delivered to the OTD (or as specified in the test plan).

e. Once all data are delivered to the OTD, transmit the completion of OT message, sample 7-7.

f. Proper safeguards are provided for all classified materials being returned to the command by the OTD or members of the test team. This includes accounting to the security manager for all classified materials that were hand-carried prior to testing.

g. Analysis proceeds, as necessary, to allow the evaluation report deadline to be met.

h. The unit CO's report may be provided to the test platform's ISIC after promulgation of the evaluation report. Sample 7-8 is the ISIC forwarding letter.

709. OTD JOURNAL

Each OTD should maintain a chronological record of his/her project. It can serve many purposes. For instance, it provides a history for your replacement in the event you are transferred; it may enable you to answer new questions about an old test; it can serve as substantiating data if events, agreements, etc., are later questioned. It may be the sole record of something that later becomes important. This record may exist in several forms: loose-leaf notebooks, steno pads, memos for the record, cassette recordings, etc. Collectively, they are called an OTD journal. If an individual OTD journal consists of a combination of steno pads, recordings, etc., one document (the master) should maintain the overall chronology, and should reference individual steno pads, recordings, etc., for details, where appropriate.

The OTD journal cannot and will not serve as a substitute for data or survey sheets in the test plan. Ensure that adequate, accurate, and well thought-out data and survey sheets are available for collection of quantitative and qualitative information.

a. Content. The OTD journal records, for possible later use, data that the OTD hadn’t considered when developing the data or survey sheets, and may be of significance in the program. While each OTD must use his own judgment when

deciding what is significant, it is better to record too much data than too little. And it is better to record it as soon as an event occurs, rather than to wait until later and risk forgetting. Among the data that may have significance are E-mail, electronic draft and/or final documents, or paper copies of any of the following:

- Funding requirements and transactions for OT&E
- Discussions conducted at meetings or over the phone regarding future testing
- Summaries of program meetings and conferences, including attendees, areas of discussion, and stands taken by the various players
- Mention of working drafts, etc., exchanged between the OTD and other program individuals or offices with notations indicating where copies may be found in the OTD's files
- Notations summarizing verbal business contacts with individuals associated with the program (CNO, SYSCOM/PEO, labs, other OT agencies, DOT&E, contractors, etc.) with their codes, symbols, phone numbers, etc.
- Mention of receipt of incoming program messages, letters, data packages, etc., with their storage locations
- An on-scene record of testing (paragraph b below)
- A record of drafts (messages, reports, etc.) prepared for higher level review and approval (draft completion dates, cut-board dates, significant events in the review process, approval dates, etc.)
- Identification (by date/time group or serial number and date) of outgoing program documentation with primary addressee and storage location
- Significant program information (funding changes, schedule slippages, etc.) with the source of the information
- The line of reasoning that led to a particular stand on an issue or that resulted in the selection of certain parameters, etc., (may be of critical importance to a new OTD who is trying to determine why the previous OTD set the program up in this manner)

b. On-Scene Record of Testing. While thorough, well thought-out data and survey sheets in the test plan are necessary, a running account of testing may also play a part in an OTD journal. In many cases, this account is best made on a cassette recorder as the operation progresses. In any event, its purpose is to describe the way the testing actually occurred: what happened, when, and who (what) was involved. It identifies the operation (by run number, etc.) and provides a running, time-correlated commentary to the end of the exercise. Particular attention is on recording unusual events (breakdowns in communications, intruders in the area, etc.). Differences between actual and planned scenarios are noted and explained. The OTD's impressions, qualitative assessments of performance, and any other information which, later, might help him reconstruct the testing, are recorded. Keep in mind that an OTD journal is a document to help the OTD and his successor.

710. RELEASE OF TEST DATA

a. CNO has tasked COMOPTEVFOR to provide all OT data on failures and anomalies promptly to the DA and others (e.g., INSURV), as appropriate. This is accomplished by preparing an anomaly report, as provided for in paragraph 706, keeping in mind that COMOPTEVFOR alone will decide whether the CNO and DA (or others) should be informed and test data released.

b. During OT&E, all missile firing reports directed by higher authority will be forwarded directly to COMOPTEVFOR with no information addees. The cognizant warfare division will readdress the report as required. The purpose of this is to protect OT&E data until after evaluation.

c. When observers from outside the force are present during OT (e.g., Navy labs, firing ranges, etc.), the OTD will ensure that:

(1) Observers are briefed on their specific responsibilities regarding the confidentiality and proprietary nature of data obtained during OT.

(2) Observers are briefed on their responsibility not to reveal any test data or results to anyone other than their supervisors.

(3) The observer's parent command or activity is directed neither to issue a separate report nor release any test data prior to publication of the final evaluation report.

(4) Observers are afforded the opportunity to provide input to the evaluation process.

d. Observers and personnel from outside the force required to assist in the conduct of OT&E will be designated trusted agents of COMOPTEVFOR. As such, they will be required to execute the sample 7-9 COMOPTEVFOR Trusted Agent Form.

e. After promulgation of the evaluation report, test data may be released to other agencies upon request to, and approval from, COMOPTEVFOR. In the case of data retained by Navy labs, etc., once the evaluation report has been published, the data may be released upon approval of CNO (N091). Upon publication of the evaluation report, letters regarding release of test data will be sent to activities retaining the data.

f. The relationship of the OTC and OTD with the Fleet is an important one, particularly in the development of tactics. OTC and OTDs must be careful to avoid discussing results, evaluation, conclusions, and recommendations pertaining to a system in OT&E, to preclude pre-emption of the Commander's report to the CNO. Authority for evaluation of the test results, conclusions, and recommendations thereto, resides with the Commander.

711. DOT&E RESPONSIBILITIES WHEN OBSERVING OT

Members of the DOT&E staff and their support contractors will routinely observe OT&E for programs for which they exercise oversight. The following procedures have been agreed upon for DOT&E observation of OT&E:

a. Each observer will be briefed by the COMOPTEVFOR representative as to the observer's specific responsibilities regarding the confidentiality of data obtained during OT&E.

b. DOT&E observers will not, in any way, attempt to alter or direct the conduct of test operations. Conduct of the test will remain entirely under the control of the COMOPTEVFOR OTD.

c. To protect the integrity and security of Navy OT, DOT&E observers will not reveal any test data or results to anyone other than their DOT&E supervisors.

d. DOT&E will neither issue a separate report nor release any data prior to promulgation of the final evaluation report without advising the DoN in advance.

712. BOARD OF INSURV RESPONSIBILITIES

INSURV is tasked with certain responsibilities relating to RDT&E and the acquisition process. When tasked by CNO, President, Board of Inspection and Survey (PRESINSURV) will submit an individual technical assessment of readiness for OT&E to CNO and COMOPTEVFOR for all ships, craft, or ship installations at the ACAT I and II level.

CHAPTER 7

TEST OPERATIONS

Sample Formats

Sample 7-1	OT Support, First Time
Sample 7-2	OT Support Letter, Previous Support
Sample 7-3	ISIC Letter
Sample 7-4	Letter of Instruction
Sample 7-5	Commencement of OT Message
Sample 7-6	Anomaly Report Message
Sample 7-7	Completion of OT Message
Sample 7-8	ISIC Forwarding Letter
Sample 7-9	Trusted Agent Form

CHAPTER 8

EVALUATION REPORTS

801. INTRODUCTION

This chapter contains the basics of evaluation reports and the formats used for reporting test results.

a. The evaluation report provides the CNO with COMOPTEVFOR's conclusions regarding a system's operational effectiveness and operational suitability, and recommendations regarding Fleet introduction, further development, additional OT&E, etc. The evaluation report provides the information (test results, evaluation criteria, etc.) to substantiate COMOPTEVFOR's conclusions and recommendations.

b. Evaluation reports are prepared at the end of each OT&E phase and are required by DoD Instruction 5000.2 for MS-B and -C, and the FRP decisions. For high-interest programs, at the discretion of the Commander, conclusions and recommendations may be provided before the formal, full evaluation report is issued via either an Interim Report message (during testing) or an Initial Impressions message (after testing is complete). This does not alter the requirement for a report.

c. Publication deadlines are specified in paragraph 811, (Preparation, Routing, and Release of Evaluation Reports).

d. Evaluation reports, as one of COMOPTEVFOR's primary products, are the primary vehicles for maintaining COMOPTEVFOR's relevance within the acquisition process. Evaluation reports form the basis for decisions by acquisition customers by articulating the effectiveness and suitability of new systems and capabilities. Evaluation reports also provide a historical record of testing. A goal of all COMOPTEVFOR reports is to clearly communicate the results of our tests to our customers/stakeholders. The majority of these results are communicated in describing what was observed, then using operational expertise to evaluate the impact of those observations as they affect mission accomplishment. To be effective and useful to the customer, our communicated results should have four characteristics:

- The result must be **goal-directed.** The writer should identify the purpose of the result and its importance to reader.
- The result should be **clear, concise, and organized.** The writer should "cut to the chase" with logically formulated, direct, simple language.
- The result should be **easily understood by nonexperts in the subject matter.** The writer should not assume every reader has his or her skills and experience.

- The result should be **defendable.** This characteristic refers to, relies on, and reinforces COMOPTEVFOR's credibility.

An effective evaluation report incorporates these four characteristics. Additionally, an effective evaluation report is balanced. Balance is added to the report by including discussion of positives and negatives for the system in test. Avoid the tendency to focus solely upon the deficiencies (or negatives).

802. TYPES OF OPERATIONAL EVALUATION REPORTS

There are many types of reports provided as a result of OPTEVFOR involvement in programs. In the context of early involvement, EOAs and OAs, whether conducted as pure OT, combined DT/OT, or fully integrated, often support program decision points. These reports will be termed Operational Test Agency Assessment Report (OAR) or Operational Test Agency Milestone Assessment Report (OMAR). OAR/OMAR requirements should be listed in the TEMP, and commonly support defense acquisition boards or MSs. When OPTEVFOR is testing under the philosophy of fully integrated testing, the IT phase could last anywhere from months to years; and OPTEVFOR must provide periodic feedback (in addition to the OAR/OMAR that support decision points) to the PM on the progress of the program and the IT effort. This feedback shall be in the form of observations of system performance using the LOO format. The periodicity of LOOs shall be included in the system TEMP. For IOT&E and FOT&E, a determination of system effectiveness and suitability, and fielding recommendation is provided in the Operational Test Agency Evaluation Report (OER) or Operational Test Agency Follow-on Evaluation Report (OFER). The final type of OPTEVFOR report is the OOC. An OOC report is intended to be used only when reporting on a system/capability that has already been completely fielded without conducting OT.

Table 8-1 contains the various types of OT reports and instructions on which report format is appropriate for a particular test. Sample 8-1 provides a checklist to assist the OTD in writing the evaluation report.

803. SIX-PART PARAGRAPH (6PP) WRITING

A "tool" for ensuring effective report writing is referred to as the six-part paragraph or 6PP. The 6PP is used at Naval Air Systems Command (NAVAIRSYSCOM) and is taught at the U.S. Naval Test Pilot School (USNTPS). An adaptation of the methodology taught at USNTPS is discussed in the following sections. While a strict incorporation of all six parts of the 6PP is not always required, the intent and logic inherent in the thought process for communicating test results is demanded. The 6PP provides an ideal method for ensuring all COMOPTEVFOR written products are:

- Goal-directed
- Organized
- Clearly written

Table 8-1. Report Format Guidance

Report Type	Test Type	Purpose	Format
OAR	EOA/OA	Early involvement OT reports used in identifying system enhancements and significant areas of risk to the program's successful completion of IOT&E (OPEVAL). OARs are assessment reports that support all stakeholders, but do not support specific MS decisions.	Full Report Sample 8-2
OMAR	EOA/OA	Early involvement OT reports used to identify system enhancements and significant areas of risk to the program's successful completion of IOT&E (OPEVAL). OMARs are assessment reports used to support MS decision meetings.	Full Report Sample 8-2
OER	IOT&E (OPEVAL)	To report a full, complete phase of testing. Consists of a cover page, executive letter signed by the Commander, and accompanying enclosure(s). The enclosure contains full details of testing and analysis.	Full Report Sample 8-3
OFER	FOT&E SQT	To report a full, complete phase of testing. Consists of a cover page, executive letter signed by the Commander, and accompanying enclosure(s). The enclosure contains full details of testing and analysis. RALOT level 3 and 4 testing. To report on software upgrades, based on an SOF.	Full Report Sample 8-3
VCD	VCD	To report results for verifying correction of specific deficiencies (specific COIs only) from previous testing (no end-to-end testing). Usually a message format, unless too lengthy.	Message Sample 8-4
QRA	QRA	To report findings for operational considerations/system capabilities when it's necessary to achieve a rapid capability in the Fleet. Should only be used when OPTEVFOR has been directed to conduct a QRA. QRAs do not replace formal OT&E. They are used to support a rapid deployment of a capability to the Fleet. Usually a message format, unless too lengthy.	Message Sample 8-5
Interim Report	IOT&E/ FOT&E	Message report providing status of testing, an assessment of collected data, and a recommendation (if applicable), when unforeseen circumstances arise during OT. Upon completion of OT, the full formal report is still required.	Message Sample 8-6
Initial Impression Message	EOA/OA/ IOT&E/ FOT&E	Message report provided when, due to unforeseen time constraints, evaluation results are required after the completion of test and prior to the full OT report being published. The full formal report is still required.	Message Sample 8-7
LOO	IT DT Assist	To report system performance observations to the PEO/PM. Does not resolve COIs, provide risk assessment of COIs, or fielding recommendation. For IT, the LOO periodicity shall be identified in the TEMP.	Letter Signed by HQ Divisional

Table 8-1. Report Format Guidance

Report Type	Test Type	Purpose	Format
	(not a formal phase of testing)	RALOT level 1 and 2 type testing.	ACOS Sample 8-8
OOC		Product that provides observations of the system's capability to meet or not meet expected capability. Used for systems that have already fielded and did not have any OT. Not to be used for acquisition programs still in development that have not been fielded.	Letter Format Sample 2-1
MUA, LMUA, or OUA	JCTD	Product for the JCTDs that provide an assessment of military utility demonstrated. Not to be used for acquisition programs.	Full JCTD Report

- Logical
- Stylistically direct

Every effort should be made by OTDs to incorporate the 6PP style into all COMOPTEVFOR reports. The 6PP specifically applies to discussions of deficiencies and COI resolution during OT, and discussion of observations during DT assist and anomaly reports.

a. The Parts of the 6PP

All deficiencies, problems, or observations should be described in the observations, results, or summary of observation sections in a 6PP format. The paragraph is not divided overtly into six parts by any numbering or lettering scheme, but flows from one part to the next in prose. Again, each problem found, deficiency, or observation under comment should be described in the six-part format, as listed below:

- Part 1 (past tense). Establish the test conditions. The specific test conditions which affected the end result apply. These conditions bound the problem and support repeatability. State what was being evaluated and what the conditions for the test were. The “what” is generally the same as or very closely related to the problem or deficiency. The problem or deficiency should be called out as the title of the paragraph.
- Part 2 (past tense). Present data. State what data were collected. Only name that data as it relates to your analysis and conclusions. Data can be quantitative or qualitative. This can be what was observed.
- Part 3 (past tense). Analyze the data. What do the data say? The analysis could include a comparison to legacy systems. The analysis should be a logical bridge to the mission relation.
- Part 4 (future tense). Mission relation. The "so what." This part describes the impact to the Fleet, the operator, or the mission.
- Part 5 (present tense). Conclusion. Is the observation or deficiency a severe, major, or minor deficiency? Generally, is what was observed, tested, or looked at okay or not?
- Part 6 (future tense). Recommendation. A general timing as to correction of the deficiency. Things like, “should be corrected as soon as practicable” or “ . . . should be corrected prior to further testing,” etc.

Each of the parts should flow one into the other with logical transitions similar to that taught in a basic writing composition class. The verb tenses for each paragraph part are unique. Parts 1, 2, and 3 are always past tense. Part 4 is always future tense, and part 5 is always present tense. Part 6 is a recommendation and is future tense (should be corrected).

b. Constructing the 6PP

(1) Figure 8-1, below, depicts the graphical thought process conducted when building a 6PP. The 6PP should not be developed serially (i.e., starting with part 1 and proceeding to part 6). Rather, the paragraph should start with describing the problem or observation noted, stating the conclusion and recommendation, followed by the mission relation. Once these three items are known, data and analysis should be gathered to support the conclusion, and the test conditions relevant to the data. Once all this information is gathered, the paragraph should be assembled serially.

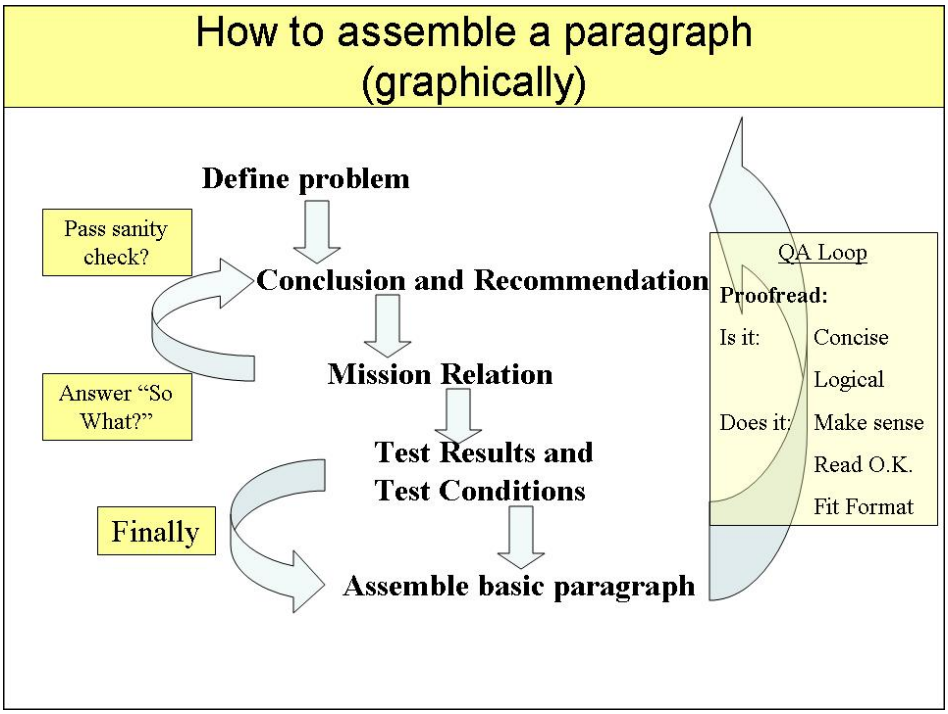

Figure 8-1. Graphic Representation of 6PP

(2) A guide to aid in constructing 6PP, in the form of questions to be answered, is presented below:

- What is your paragraph subject (problem)?
- How bad is it (severe, major, minor, satisfactory)?
- What is the impact on the mission, if not fixed?
- What are the data/test results that support the conclusion (qualitative and quantitative test results)?
- What test conditions were relevant to collecting the data?
- Can I help the reader understand the causes, or present potential solutions to the problem (analysis and specific recommendations)?
- Recommendation (timeline for correction).

(3) Now, the paragraph should be assembled and checked for logic. Are all parts of the paragraph present? Does the argument make sense? Does it say what you really wanted it to say? Does the discussion lead logically to the conclusion? Once these questions are answered affirmatively, the paragraph is ready for a final proofreading, looking for typographical errors, improper verb tenses, or other grammatical errors.

804. COI RISK ASSESSMENTS FOR OA AND EOA

a. General Risk Discussion

(1) EOA and OA reports are based not only on the "here and now," but also on what is anticipated to occur prior to IOT&E or FOT&E. To inform decisionmakers on OPTEVFOR's assessment of program risk, OTDs and OTCs make assessments regarding specific risk areas based on the results of data analysis. To that end, the 5 x 5 consequence versus likelihood risk matrix depicted in figure 8-2 shall be used as the basis for all risk assessments. This risk matrix is based upon the Navy's standard risk determination strategy adapted to the OT environment.

(2) The level or degree of risk is based upon the consequence of the issue and the likelihood of its occurrence during IOT&E or FOT&E. Consequence is a relatively clear-cut determination. To some degree, the issue identified/discovered will impact task execution and, inherently, the level of mission accomplishment.

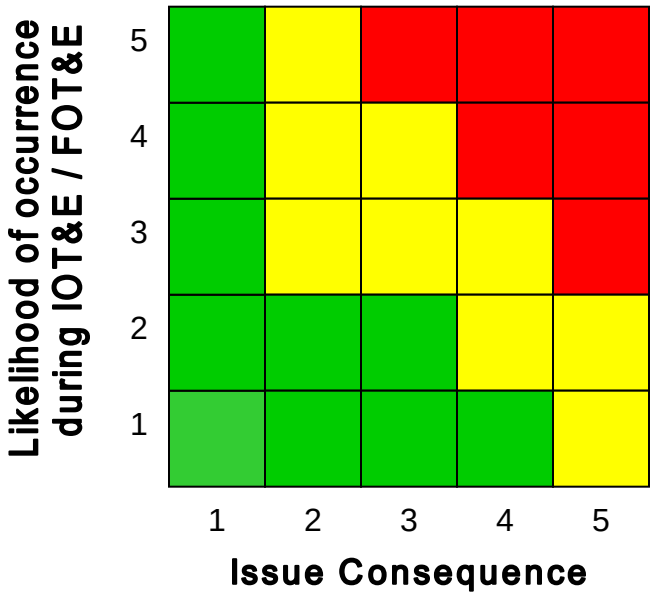

Figure 8-2. 5 x 5 Risk Matrix

(3) Likelihood, on the other hand, is somewhat less predictive since it is the dependent variable in the risk model. In general, the OTD must have some knowledge of the variables that drive the likelihood prediction, for example:

- Technical challenges to achieve required/desired performance
- Time available to correct/mitigate issues prior to IOT&E
- Funding available to correct/mitigate issues prior to IOT&E

(4) Often, the OTD will not have the expertise to make a risk assessment without some assistance. To make a technical, schedule, or cost risk assessment, the OTD will first need to thoroughly understand the issue and determine the PM's plans for correction and mitigation. This should lead to the development of questions to ask of appropriate SMEs to better understand the risk. In some cases, these SMEs may be program office (or even contractor) personnel. That is not to say the OTD should merely parrot the PM team's assessment, but use SME technical/programmatic knowledge combined with operational judgment to arrive at an independent conclusion. SMEs might include software and systems engineers, logisticians, budget analysts, risk management experts, academia, or Fleet operators.

(5) While not an all-encompassing list, some of the questions that might be asked include:

- Does the proposed change impact other critical functions?
- Is there a version of software documented for the proposed change?
- What is the developer's track record with making these types of changes?
- Are there metrics that might give insight into the program's track record regarding corrections?
- What is the "industry standard" for making these types of changes?
- How much developmental regression testing is being proposed?
- Are there suitability impacts as a result of the change?
- Does the change involve hardware and software?
- How much time is realistically needed to design and implement the change?
- Is the proposed solution technologically feasible?
- Where is the program in the development cycle?
- How much time is available prior to IOT&E?
- How expensive is the proposed change as compared to the overall program budget?
- Is there sufficient cost reserve to make the change?

b. The 5 x 5 Risk Matrix. Armed with the general information above, the OTD can use the 5 x 5 matrix to assess a wide variety of program risks. To use this tool, some basic definition of the axes is required.

(1) Issue Consequence Axis. The consequence axis has historically been the dominant axis used to provide COI color coding with minimal importance placed on likelihood of occurrence projected to IOT&E (or FOT&E). In the 5 x 5 risk matrix, this axis is only one part of the equation that provides a relative scale regarding the impact of the issue on the mission/COI based upon factors, including the frequency of occurrence, mission conditions when the issue was discovered, feasibility of workarounds, operator compensation required, etc. As issues (or potential issues) that impact mission accomplishment are identified, they should first be classified based on the definitions in table 8-2. (It should be noted that for an IOT&E, SQT, or FOT&E, this would form the entire issue classification.)

Table 8-2. Mission/COI Impact Classification

EOA/OA Mission Impact Level	Descriptor	Issue Definition
1	Minimal	Annoying system characteristic or nuisance that does not degrade operational/mission performance or suitability
2	Minor	Issue that degrades (but does not prevent) operational/mission performance or suitability, but can be overcome with operator compensation/workaround
3	Moderate	Issue that degrades (but does not prevent) operational/mission performance or suitability, no acceptable operator compensation/workaround
4	Significant	Issue that prevents operational/mission performance or suitability, but can be overcome with operator compensation/workaround
5	Severe	Issue that prevents operational/mission performance, cannot meet mission objectives or suitability threshold, with no workarounds

(2) Issue Likelihood of Occurrence at IOT&E/FOT&E

(a) Once consequence has been classified, the next step is to determine the likelihood of occurrence at IOT&E/FOT&E. The likelihood of occurrence focuses on the probability that the issue will exist at the time IOT&E/FOT&E commences, factoring in the current and expected level of maturity, and any potential mitigation plans by the program, as previously described. Table 8-3 provides basic guidance with regard to the scaling.

Table 8-3. Likelihood of Occurrence at IOT&E/FOT&E				
			Program Office Estimate of Impact to:	
Level	**Descriptor**	**OTD's estimate of likelihood of issue occurrence at IOT&E/FOT&E given the program's demonstrated maturity rate to date:**	**Future Schedule**	**Future Cost**
1	Negligible	One can reasonably assume no occurrence, and any correction should not be technically challenging within the current schedule prior to IOT&E.	Minimal or no impact	Minimal or no impact
2	Unlikely	Issue is possible, but less than likely (10 – 40%) and should be easily corrected/mitigated prior to IOT&E AND program plans are currently in place to address it.	Additional program activities required, able to meet key dates	Program funding sufficient as allocated to correct issue
3	Likely	Issue has a significant chance of occurrence (40 – 65%) and may be corrected/mitigated prior to IOT&E AND program plans <u>are not</u> currently in place to address it.	Minor schedule slip, no impact on key MSs	Program funding adequate, but reallocation necessary to correct issue
4	Highly Probable	Issue has a very high chance of occurrence (65 – 90%) and is deemed to be difficult to correct / mitigate prior to IOT&E.	Program critical path affected, impact to key MSs	Program funding not adequate
5	Near Certainty	Anticipate issue to occur (>90%) and is deemed nearly impossible to correct/ mitigate prior to IOT&E, unless substantial changes to the program are made.	Cannot meet key program MSs	

(b) The percentages are not meant to drive a mathematical computation of the likelihood of occurrence. Instead, they are merely a means to help the OTD assess the qualitative estimate of the likelihood of that issue occurring at IOT&E/FOT&E.

c. Definitions. The previous tables are meant to be intuitive. Nevertheless, the definitions below are intended to clarify some of the "finer points":

(1) Degraded operational performance/mission – The system's operational performance/mission is less than optimal because:

- Performance or quality of result is less than required or expected, or

- Time required to accomplish task is longer than required or expected.

(2) Degraded operational suitability – The system's suitability is less than optimal because supporting characteristics of the system detract from the ability to place the system in use and sustain it under operational conditions.

(3) Prevented operational performance/mission – The system's operational performance/mission is unsatisfactory because performance or quality of result is unsatisfactory to achieve a militarily useful operational capability for the system under test.

(4) Prevented operational suitability – The system's suitability is unsatisfactory because supporting characteristics of the system prevent the system from being placed in use and/or sustained under operational conditions without unsatisfactory impacts to employment strategy, concepts of operation, or effectiveness.

(5) "Can be overcome with operator compensation/workaround**"** – The particular issue can be resolved with additional training and/or experience such that the operator knows to do something (or not do something) that is otherwise not part of the normal training syllabus (operator compensation), or the operator solves the issue by taking some alternative course of action to accomplish the same end result (workaround). To be acceptable, it must be an action, or series of actions, that can reasonably be accomplished by an average Fleet user without excessive impact to other capabilities. It is important to note that operator compensation and workarounds can be engineered into the training for system operators.

(6) Once the magnitude for both axes has been decided, the matrix is used to determine the impact of the issue. Figure 8-3 is an example of an issue that has been determined to have an operational performance/mission impact of 4 and a likelihood of 3. The result yields a yellow (or moderate) assessment for the issue.

d. Overall COI Assessment

(1) The system's test report enclosure shall present a single 5 x 5 risk matrix for each COI, plotting each operational/mission performance or suitability issue. The overall risk attributed to a COI will be the greatest or highest risk individually attributed to an issue within the COI. The greatest or highest risk level presented in terms of a color code is:

- High – red
- Moderate – yellow
- Low – green

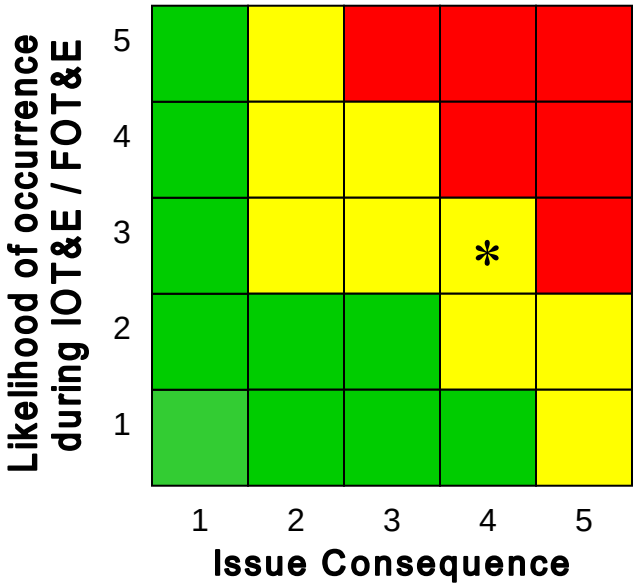

Figure 8-3. 5 x 5 Risk Matrix B

For example, a COI that has several issues assessed, and the greatest/highest single issue assessed is high risk (red) will result in the overall COI being assessed as high risk (red).

(2) In those cases where there are too many issues to be plotted on one matrix, the alternative is to list the issues in table form with a column for operational performance/mission/COI impact, a column for likelihood, and a column for issue assessment. This would result in a table similar to table 8-4. The system under test's executive summary COI table shall present the overall color-coded risk assessment for each COI (as done for current reports). Report examples 1 (risk matrix) and 2 (alternative table form) are shown on the following pages.

(a) Example 1, Risk Matrix Assessment (figure 8-4)

3. TEST E-1 - SHIP'S SELF-DEFENSE

- Will System X effectively defend the ship against threat aircraft and antiship cruise missiles?

3.1 Results (Red). [The overall COI risk assessment shall be the highest performance/ mission or suitability issue risk level presented in terms of a color code (red, yellow, or green).] System X was assessed as high risk in a number of important areas. System X design and testing completed to date has not demonstrated that the self-defense capabilities will be sufficient to meet the requirements/capabilities.

3.2 Areas of Risk. Each issue shall be listed in order of highest assessed risk to lowest.

1. Issue #1 Description (5 x 5). *Provide a description of the performance/mission issue.*

- **Operational Performance/Mission Consequence Assessment.** *Provide rationale for the consequence assessment level.*
- **Likelihood Assessment.** *Provide rationale for the likelihood assessment*.

2. Issue #2 Description (3 x 4). *Provide a description of the performance/mission issue.*

- **Operational Performance/Mission Consequence Assessment.** *Provide rationale for the consequence assessment level.*

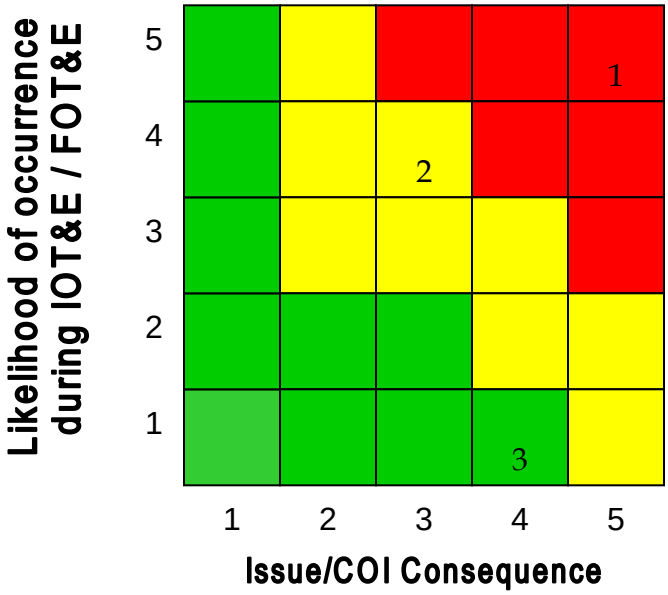

Figure 8-4. 5x5 Risk Matrix C

- **Likelihood Assessment.** *Provide rationale for the likelihood assessment*.

3. Issue #3 Description (3 x 1). *Provide a description of the performance/mission issue.*

- **Operational Performance/Mission Consequence Assessment.** *Provide rationale for the consequence assessment level.*
- **Likelihood Assessment.** *Provide rationale for the likelihood assessment*.

(b) Example 2, Risk Assessment Summary

Table 8-4. COI Occurrence/Consequence			
Issue	**Operational Performance/ Mission/COI Impact**	**Likelihood**	**Issue Assessment**
Issue #1 Description	5	5	**Red**
Issue #2 Description	3	4	**Yellow**
Issue #3 Description	3	1	**Green**
Overall COI Assessment			**Red**

805. DECIDING THE COI DEFICIENCY LEVELS FOR IOT&E OR FOT&E

A deficiency is defined as "lacking in some necessary quality, capability, or element" or "not up to a normal standard or complement." Operational capability is defined as "an ability or means that is directly traceable to an approved requirement (i.e., ORD, capabilities document, etc)." Mission-essential capability is defined as an ability that is inherently necessary to complete an assigned mission (e.g., a targeting mechanism is required to properly aim a weapon system, but the targeting mechanism/system may not be part of the weapon system under test). See figure 8-5 for the COI baseline deficiency decision tree. The following are the baseline deficiency definitions that shall be used throughout the evaluative process to make a final conclusion as to the deficiency level:

a. Severe. This prevents the accomplishment of a requirement designated as critical to achievement of a KPP. If a deficiency is determined to be severe, the affected COI must be resolved UNSAT for IOT&E and FOT&E.

b. Major. This adversely affects the accomplishment of an operational or mission-essential capability, and no workaround solution is known.

(1) If a deficiency is determined to be major, the affected COI should be resolved UNSAT for IOT&E and FOT&E. The COI may be "split" to adequately clarify the specific issue that is deficient.

(2) Conclusions for IOT&E and FOT&E will be tailored to clarify the specific situation/item affected by the major deficiency (e.g., system is determined to be effective in non-Electronic Countermeasures (ECM) environment and not effective in an ECM environment; system is suitable aboard a DD 963 Class ship, undetermined suitability for other ship classes, etc.).

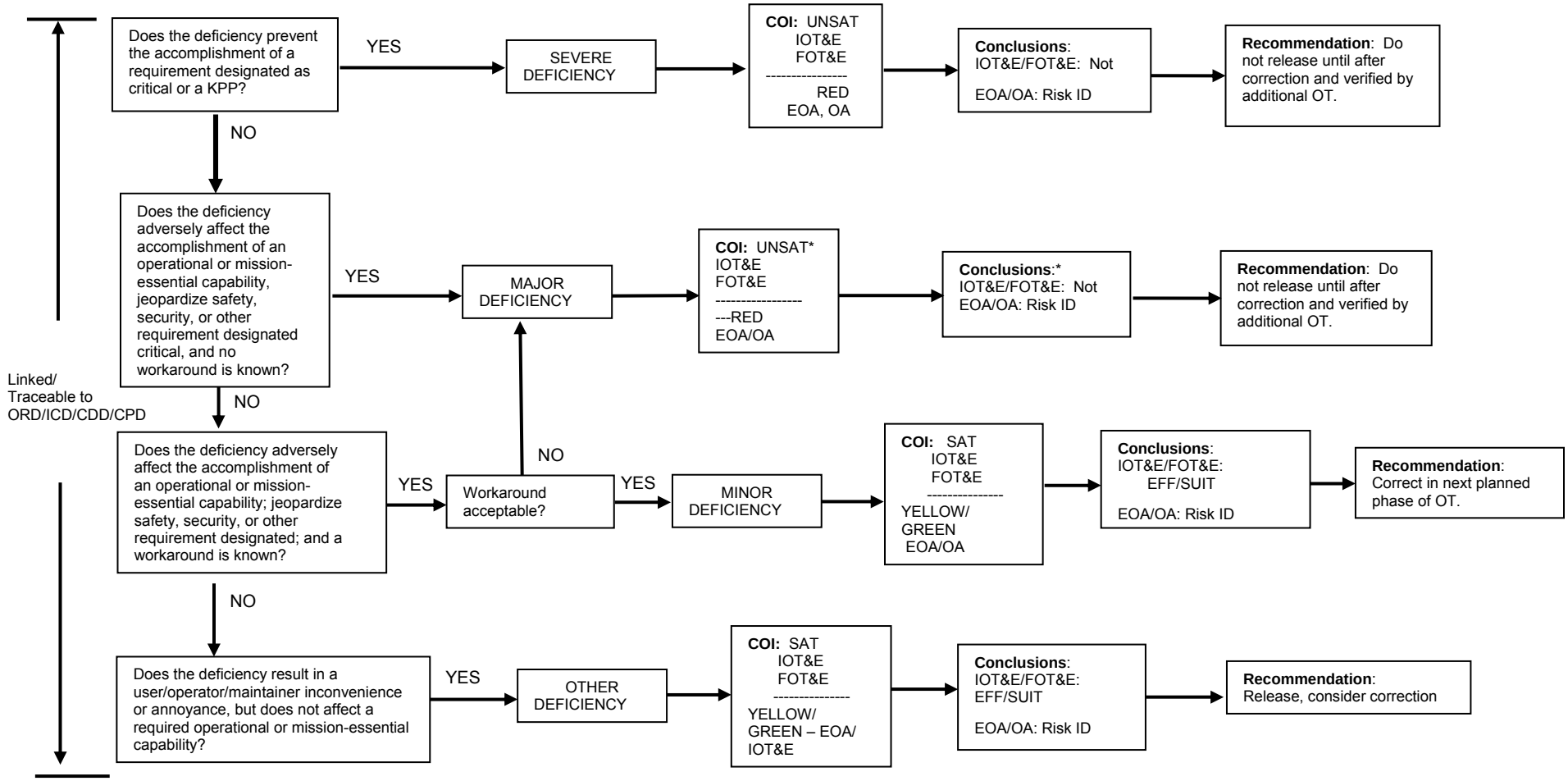

Figure 8-5. Baseline Deficiency Decision Tree

*Baseline definition. Must apply operational expertise for final COI resolution considering all aspects of the COI.

(3) The Fleet introduction recommendation would have a caveat for additional test or certification by PM to CNO via COMOPTEVFOR prior to Fleet introduction beyond current Fleet usage.

c. Minor. This adversely affects the accomplishment of an operational or mission-essential capability, but a workaround solution is known. If a workaround solution is deemed unacceptable, see *major deficiency* above.

(1) If a deficiency is determined to be minor, the affected COI may be resolved SAT for IOT&E and FOT&E.

(2) The effectiveness or suitability conclusion can be “determined effective and/or suitable” or “not" for either. If the overall effect of “many” minor deficiencies is considered in the aggregate to be approximately equivalent to a major, then the OTD should consider a negative conclusion, with a caveat in the Fleet introduction recommendation.

d. Other. This results in user/operator inconvenience or annoyance, but does not affect a required operational or mission-essential capability.

806. OPCONS

This is an optional paragraph, but is one of the more difficult to understand. The paragraph is used in two ways:

- To document evaluation considerations which apply operational reasoning to test results to substantiate conclusions or recommendations (or both) that are not directly derivable from the results
- To document tactical considerations which inform operational commanders of significant aspects (pro and con) of system employment, or make clear what special measures would be required to make the system more efficient in battle

OPCONS must be tied to the results or discussion of major/minor deficiencies/issues in the appropriate E- or S-test paragraph(s) of Section 3, Tests and Results in sample 8-2.

a. In some OT&E, once the results have been presented, the complete logic for conclusions and recommendations has been established. In other cases, however, operational reasoning suggests conclusions and/or recommendations that are not derived directly from results. Some examples:

(1) In testing, the following results were obtained:

- MTBOMF: 140 hours (criterion: $\geq$150 hours)

- MCMTOMF: 12 minutes (criterion: $\leq$60 minutes)

- A_o: 0.99 (criterion: $\geq$0.98)

A direct conclusion from these results may be that the system was not operationally suitable because it did not meet the reliability criterion. However, COMOPTEVFOR felt that:

- The system was "up" most of the time, as evidenced by the fact that A_o was high.
- The high A_o was attributable to short repair times, evidenced in low MCMTOMF.
- With the low MCMTOMF, an MTBOMF of 140 hours was acceptable from an operational viewpoint.

COMOPTEVFOR's views were developed in OPCONs. It provided the rationale for a conclusion that the system was operationally suitable, even though it did not meet the reliability criterion.

(2) During IOT&E of System X, repeated failures of in-service System Y were observed. System Y was being used as a backup data collection device, and its failures had no adverse effect on the evaluation of System X. Therefore, System Y's failures would neither be discussed under limitations, nor under results; determining System Y's reliability was not an object of the System X's IOT&E. However, COMOPTEVFOR desired to bring a potential System Y reliability problem to the CNO's attention. An OPCON was used to report the observed failures, and substantiate a recommendation to investigate System Y's reliability in the Fleet.

(3) During IOT&E of an acoustic signal processor, the system met all the evaluation criteria. During project operations, operators in the project ship pointed out an apparently simple change in processor logic that could provide a significant increase in capability, allowing target localization and the designed capability of providing target bearing. COMOPTEVFOR discussed this possibility in OPCONs, and then concluded (based on test results) that the processor was operationally effective and operationally suitable. COMOPTEVFOR's first recommendation was for Fleet introduction, the usual IOT&E recommendation on an operationally effective and operationally suitable system. The second recommendation was for providing the target localization capability prior to FOT&E.

b. Tactical employment is a by-product of the IOT&E. The OPCONs paragraph is structured, when appropriate, to tell the operational Commander what he needs to know to employ the system effectively and the pitfalls to avoid. When used this way, OPCONs serve as the starting point for the OPTEVFOR tactics guide (for air warfare projects), tactics inputs for Surface Warfare Development Group (for surface programs), and Submarine Development Squadron 12 (for undersea programs).

807. RESOLUTION OF COIs AT IOT&E AND FOT&E

a. OPTEVFOR addresses the resolution of COIs by satisfying the questions posed by the COIs. There is an audit trail from the COI questions through the E- and S-tests. This provides a flow so that the disposition of COIs is directly related to the evaluation of each designed test. Thus, when a test parameter is quantitative, the COI resolution is based on actual results relative to the operational threshold. For nonquantifiable parameters, the COI resolution must be based on two factors: (1) observed results, and (2) operational experience.

b. To resolve a COI, all of its capabilities must be demonstrated and no additional hardware or software changes anticipated prior to the MS decision. COIs are resolved as follows:

(1) Resolved. The COI was tested and resolved either satisfactorily (SAT) or unsatisfactorily (UNSAT).

(2) Unresolved. Used when a COI requires further testing for final resolution due to a major limitation. This is used when the COI has been tested, but cannot be resolved.

(3) Split Resolution. Used when the COI was tested, and resolution is not a singular determination. In these instances, split resolution will be used to clearly communicate the differing aspects of the COI resolution. The COI can be split to resolve one aspect (task or condition) as SAT and the other aspect as UNSAT or to communicate when part of the COI is either SAT or UNSAT, and part is unresolved due to a major test limitation.

(4) Not Tested. Used only when the COI was not tested during the particular phase of testing in which it was an issue for resolution. This normally is due to a major (CNO deferral) or severe limitation against the COI.

c. When a COI has been resolved UNSAT, the severe or major deficiencies that caused the UNSAT resolution must be reported in the Commander's report and the enclosure. A severe or major deficiency can impact other COIs, and the deficiency can be used to resolve additional COIs UNSAT. The analysis and evaluation will determine the most appropriate primary COI. Once the primary COI has been determined, those same deficiencies may be reported against other COIs as collateral deficiencies.

d. All COIs should be resolved by the completion of IOT&E. Difficulties achieving this must be brought to the attention of the Commander.

808. CONCLUSIONS AND RECOMMENDATIONS IN EVALUATION REPORTING

At the completion of each phase of OT, COMOPTEVFOR provides conclusions and recommendations regarding the system tested to CNO in an evaluation report. The

guidelines for determining the key elements of the conclusions and recommendations, based on the results of testing, are:

a. EOA/OA

(1) Conclusions. Prior to IOT&E, conclusions are presented as identification of system enhancements and of risks toward effectiveness and suitability COI resolution at IOT&E.

(2) Recommendations

(a) Production. There are a number of factors that must be considered before a decision is made to enter into production of a system; OT&E is only one of these many factors. Since COMOPTEVFOR is normally not aware of the status of many of the other issues affecting a production decision, it is inappropriate to comment on production issues based on OT&E alone. Accordingly, no conclusion or recommendation pertaining to production should appear in the evaluation report.

(b) OPTEVFOR recommendations for EOA/OA phases of testing will be "is" or "is not" recommended for continued program development.

b. IOT&E

(1) Conclusions. Conclusions in IOT&E (commonly referred to as OPEVAL) *must* be definitive (i.e., effective or not effective, suitable or not suitable). Sufficient data should be collected and an evaluation conducted to preclude being unable to completely resolve COIs, and affect an effective and suitable conclusion at IOT&E.

(a) Effectiveness. Conclusions normally address overall system effectiveness. However, in those cases where the system tested had effectiveness issues in several warfare (air, submarine, surface, etc.), mission, or environmental (e.g., jamming) areas, or in several threat regions, the system should be evaluated in each area or threat region and conclusions provided that address effectiveness in each area. Characterize the system's performance regarding where or under what conditions the system was or was not effective (e.g., effective in a non-EA environment, effective against specific threat class, or undetermined against other threat class, etc.) The following are basic definitions to be used during the evaluative process when determining system effectiveness:

1. Effective. Ideally, all effectiveness COIs were completely and satisfactorily resolved, and there were no severe or major deficiencies. However, through the evaluative process, it is possible for the system to be determined effective with one or more major deficiencies and/or unsatisfactory COI resolutions. Also, if as a result of deferrals or limitations to test, there are COIs or portions of COIs that remain unresolved/not tested, characterize the system effectiveness as accurately as possible and recommend additional OT&E to resolve these areas.

2. Not Effective. If all of the effectiveness COIs were not satisfactorily resolved due to severe or major deficiencies, then the system should not be concluded to be effective. System design and/or the nature of problems is such that there is low probability that issues can be resolved satisfactorily without redesign and verification by further OT&E; or, however well the system performed against TEMP effectiveness issues, the mission has insufficient utility.

(b) Suitability

1. Suitable. All suitability COIs were completely and satisfactorily resolved, and there were no severe or major deficiencies. However, through the evaluative process, it is possible for the system to be determined suitable with one or more major deficiencies and/or unsatisfactory COI resolutions. Also, if as a result of deferrals or limitations to test, there are COIs or portions of COIs that remain unresolved/not tested, characterize the system suitability as accurately as possible and recommend additional OT&E to resolve these areas.

2. Not Suitable. If all suitability COIs are not satisfactorily resolved, the system should usually not be concluded to be suitable. System design and/or the nature of problems is such that there is low probability that issues can be resolved satisfactorily without redesign and verification by further OT&E.

(2) Recommendations. A recommendation regarding Fleet introduction is obligatory if the system(s) is intended for Fleet use, or to support the Full Rate Production Decision (FRPD), or if the TEMP requires it. COMOPTEVFOR addresses Fleet introduction as follows:

(a) Fleet Introduction. If the system is concluded as operationally effective and suitable, Fleet introduction will normally be recommended. This recommendation may be made contingent upon completing specified actions to correct major deficiencies observed in IOT&E, including, if appropriate, verification in FOT&E.

(b) Limited Fleet Introduction. Limited Fleet introduction can sometimes be recommended if IOT&E results are not generally satisfactory, and it has been concluded that the system is not operationally effective and/or suitable, but there is some benefit to the Fleet by introducing the system in limited quantities to specified units. This recommendation will almost always be made contingent upon completion of corrective actions, and may be made contingent upon demonstrating those corrective actions in a subsequent phase of IOT&E or FOT&E. When recommending limited Fleet introduction, the conditions that must be satisfied before Fleet introduction should be specified, and will ordinarily include FOT&E whenever system design changes are necessary. The effectiveness and suitability features to be demonstrated in FOT&E must be specified. Whenever possible, a recommendation for limited Fleet introduction should specify to what level of units the introduction should be made (e.g., units required for next phase of OT&E, air squadrons operating in specific scenarios, etc.).

(c) No Fleet Introduction. A recommendation against Fleet introduction will be made if it has been concluded that the system is not operationally effective and/or suitable.

(3) Other Types of Recommendations

(a) A recommendation should be made addressing the purpose of the review or MS at which the OT&E results are to be considered if other than FRPD (e.g., proceed into full-scale engineering development).

(b) Recommendations may be made for corrective action on deficiencies noted in OT&E, but not of such significance that their correction has been specified as a prerequisite to limited Fleet introduction or Fleet introduction. No recommendation should be made on any deficiency, unless it caused a problem that degraded effectiveness or suitability.

c. FOT&E

(1) Conclusions. The conclusions drawn in FOT&E will address the system's operational effectiveness and operational suitability, and Fleet introduction if Fleet introduction was not recommended at IOT&E, or no IOT&E was conducted. When the FOT&E is being conducted to examine the integration of a system into other platforms or aircraft, the conclusion will address the system's operational effectiveness and operational suitability in the platform or aircraft tested, and, if applicable, Fleet introduction of the system in the platform or aircraft. In those cases where the FOT&E is conducted to examine an upgrade to a system already in production or release of an improved software revision, the conclusion will address the operational effectiveness and operational suitability of the system with the upgrade or new software, and Fleet introduction of the upgraded system or Fleet release of the new software version.

(2) Recommendations

(a) A recommendation regarding Fleet introduction is obligatory if a recommendation for Fleet introduction has not been made in previous OT&E.

(b) In those cases where the FOT&E is to examine the integration of a system into other platforms or aircraft, or to examine an upgrade to a system already in production, a recommendation regarding Fleet introduction is obligatory.

(c) The guidelines for determining the level of Fleet introduction of systems in FOT&E are the same as for IOT&E.

809. ADDRESSING THE THREAT IN EVALUATION REPORTS

The OTD must prepare the report as it relates to the current ONI Capstone TA or STAR; the one used to develop the test plan for the phase of testing being reported on.

If, between completion of the test phase and the preparation of the report, there is considerable change to the threat, the evaluation report should recommend further testing against the new, updated threat, as described in the updated TA. The OTD must address the threat in the test limitations (if applicable), results, conclusions, and recommendations. The OTD must specifically evaluate the impact the differences in performance between the actual threat and the surrogate used in testing have on reported results. For example, if a subsonic surrogate is used to simulate a near supersonic threat in a shipboard missile system test, the impact such as speed differential has on reaction times and engagements observed in testing must be evaluated.

810. JCTD REPORTING

Upon conclusion of a JCTD's demonstration, an OUA or LMUA will be produced, signed by COMOPTEVFOR, and forwarded to the OM. (See paragraph 212.) The OM may then use our report to assist in the assessment of the system's military utility. Our observations will state the planned and observed outcomes of the demonstration, an assessment of COIs/MOPs/MOEs, but no determination of effectiveness/suitability. Our report is not an OA. However, it can incorporate requirements set forth in an approved capabilities document. Of special importance is the summary paragraph, which details the conditions and limitations under which the data were taken.

811. PREPARATION, ROUTING, AND RELEASE OF EVALUATION REPORTS

Timelines for all Headquarters (HQ) and VX reports are identical. Any difficulties meeting them should be brought to the attention of the Chief of Staff (01) and the Policy Director/Deputy Chief of Staff (01B).

a. Initial Impression message timelines are summarized in table 8-5:

Table 8-5. Initial Impressions Message Timelines

Day	HQ Action	VX/HMX Action
20 (from end of OT)	Originator prepare rough document for technical review and route to tech editor and analyst; and intel, as appropriate.	VX - tech editor, intel, as appropriate, analyst (in squadron) HMX - Send rough draft to HQ via Code 50 OTC for full HQ review.*
23	Originator incorporate changes and prepare "clean" draft document, and route to 01B and 01. Code 50 send draft back to HMX-1 for major corrections.	VX and HMX - Incorporate changes and obtain CO's approval. Send smooth to HQ via Code 50 OTC.*

Table 8-5. Initial Impressions Message Timelines		
Day	**HQ Action**	**VX/HMX Action**
27	Originator prepare and route smooth document to 01B, 01; 00 for brief and signature.** Code 50 route smooth VX/HMX documents to above codes.	N/A
30	Message approved and sent.	N/A
*Use E-mail for applicable sections for HQ review/comments. **Unresolved issues are pointed out to the Commander by the briefer. The briefing (if required) to obtain the Commander's signature occurs no later than 30 days after completion of project operations.		

b. Evaluation Reports. The report will be published no later than 90 days after completion of project operations for ACAT I programs, and no later than 60 days for ACAT II-IVT and all non-ACAT programs. Timelines are summarized in tables 8-6 and 8-7.

Table 8-6. ACAT I Evaluation Report Timelines		
Day (NLT)	**HQ Action**	**VX/HMX Action**
45 (from end of test)	Originator completes rough draft report for technical review and routes to tech editor and analyst; and intel, as appropriate.	VX - tech editor, intel, as appropriate, and analyst. * HMX - Send rough draft to HQ via Code 50 for rough review through 01E.*
55	Originator incorporate changes and prepare "clean" draft report, and route to division deputy director.	VX - Send smooth to HQ via Code 50 OTC.* HMX- Incorporate changes and obtain CO's approval. Send smooth to HQ via Code 50 OTC.*
70	Division route smooth document to 01E, 01B, 01; 00 for signature and brief. **	N/A
90	Division print copies; mail room distribute.	N/A
NLT – Not Later Than		

Table 8-6. ACAT I Evaluation Report Timelines
* Use E-mail for applicable sections for HQ review/comment. ** Unresolved issues are pointed out to the Commander by the briefer. The briefing to obtain the Commander's signature occurs no later than 90 days after completion of project operations.

Table 8-7. ACAT II-IVT and all other Evaluation Report Timelines		
Day (NLT)	**HQ Action**	**VX/HMX ACTION**
35 (from end of test)	Originator completes rough draft report for technical review, and routes to tech editor and analyst; and intel, as appropriate.	VX - tech editor, intel, and analyst.* HMX - Send rough draft to HQ via Code 50 for rough review up to Code 01E.*
45	Originator incorporate changes and prepare "clean" draft report, and route to division deputy director.	VX - Send smooth to HQ via Code 50 OTC.* HMX- Incorporate changes and obtain CO's approval. Send smooth to HQ via Code 50 OTC.*
50	Division route smooth document to 01E, 01B, 01; 00 for signature and brief.**	N/A
60	Division print copies; mail room distribute.	N/A
* Use E-mail for applicable sections for HQ review/comment. ** Unresolved issues are pointed out to the Commander by the briefer. The briefing to obtain the Commander's signature occurs no later than 60 days after completion of project operations.		

CHAPTER 8

EVALUATION REPORTS

Sample Formats

Sample 8-1	OPTEVFOR Evaluation Report Checklist
Sample 8-2	EOA/OA Report (OAR/OMAR)
Sample 8-3	IOT&E/FOT&E Report (OER/OFER)
Sample 8-4	Verification of Correction of Deficiencies Report Message
Sample 8-5	Quick Reaction Assessment Report Message
Sample 8-6	Interim Report Message
Sample 8-7	Initial Impressions Message
Sample 8-8	DT Assist Letter of Observation

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Glossary

Acquisition Category (ACAT). Categories established to facilitate decentralized decisionmaking and execution and compliance with statutorily imposed requirements. The categories determine the level of review, decision authority, and applicable procedures. **ACAT I, ACAT II, ACAT III, and IV**

Acquisition Program Baseline. The PM initially develops the acquisition program baseline as a concept baseline for the Milestone A (MS-A) decision point. A development baseline and a production baseline are prepared for MSs -B and -C. These baselines capture the key parameters that define the system.

Advanced Concept Technology Demonstration (ACTD). An ACTD is an integrating effort to assemble and demonstrate a significant new military capability, based on maturing advanced technologies, in a realistic environment, to clearly establish military utility.

Advisory and Assistance Services. Technical support provided under contract by nongovernmental sources, with outputs that take the form of information, advice, opinions, alternatives, analyses, evaluations, recommendations, and training. FAR 37.104

Analytical Support. Support provided via military or civilian analysts, Navy laboratory or defense contractors to assist force personnel in data collection, reduction, and analysis in support of OT&E.

Analysis of Alternatives (AOA). The evaluation of the performance, operational effectiveness, operational suitability, and estimated costs of alternative systems to meet a mission capability. The analysis assesses the advantages and disadvantages of alternatives being considered to satisfy capabilities, and is normally conducted during the concept refinement phase to refine the system concept contained in the ICD.

Application Software. Consists of the computer program, firmware, and associated data that implement the operational capabilities required for tactical weapon system employment; e.g., target tracking, navigation, avionics programs, and BIT. A software change required because of changed system performance requirements or new or redesigned hardware shall be termed application vice support software.

Approval for Full Production (AFP). The decision for full production of a system. Normally occurs at the final MS-C.

Approval for Limited Production (ALP). The decision to produce a limited number of systems for use as additional test articles.

Attribute. A quantitative or qualitative characteristic of an element or its actions. For purposes of this discussion, “element,” refers to the system. Attributes may be either quantitative or qualitative in nature.

Availability. A measure of the degree to which an item is in an operable and committable state at the start of a mission when the mission is called for at an unknown (random) time. In OT&E, A_o is the usual measure. (See Operational Availability.)

Board of Inspection and Survey (INSURV) Responsibilities. INSURV is tasked with certain responsibilities relating to RDT&E and the acquisition process. When tasked by CNO, PRESINSURV will submit an individual technical assessment of readiness for OT&E to CNO and COMOPTEVFOR for all ships, craft, or ship installations at the ACAT I and II levels.

Capability Development Document (CDD). The CDD builds on the ICD and provides the detailed operational performance parameters necessary to design the proposed system. A MS-B decision follows the completion of technology development. An affordability determination results from the process of addressing cost during the requirements process and is included in each CDD using life-cycle cost or, if available, total ownership cost.

Capability Production Document (CPD). The CPD reflects the operational requirements resulting from SDD and details the performance expected of the production system. Software shall have demonstrated the maturity level required in the CPD prior to deploying it to the operational environment. Once the maturity level has been demonstrated, the system or increment is base-lined, and a methodical and synchronized deployment plan is implemented for all applicable locations. OT&E shall determine the operational effectiveness and suitability of a system under realistic operational conditions, including combat; determine if thresholds in the approved CPD and COIs have been satisfied; and assess impacts to combat operations.

Capstone Test and Evaluation Master Plan (TEMP). This a TEMP which addresses the testing and evaluation of a defense system comprised of a collection of "stand-alone" component systems which function collectively to achieve the objectives of the defense system.

Combined Developmental Testing (DT) AND OT. Used to save time and reduce costs; must be configured to meet operational capabilities/functions and developmental test objectives; must be covered by an MOA; and must be followed by an appropriate final period of testing which will emphasize appropriate separate OT before a MS-C decision.

Compatibility. One of the elements of operational suitability. The capability of a system or subsystem to operate in its intended environment without adverse effects to

or from other systems. Compatibility includes physical, functional, electrical and electronic, and environmental issues.

Computer Resources. The totality of computer hardware, firmware, software, personnel, documentation, supplies, services, and support services applied to a given effort.

Computer Software (or Software). A combination of associated computer instructions and computer data definitions required to enable the computer hardware to perform computational or control functions.

Computer Software Documentation. Technical data or information, including computer listings and printouts, which documents the requirements, design, or details of computer software; explains the capabilities and limitations of the software; or provides operation instructions for using or supporting computer software during the software's operational life.

Concurrent Testing. A form of combined DT/OT in which events are generally broken into separate DT and OT events. Concurrent testing consists of DT and OT testers on a ship, conducting separate and distinct test scenarios, some for DT, some for OT.

Condition. Variables of the environment that affect the performance of subtasks in the context of the assigned mission. They are categorized by conditions of the physical environment (e.g., sea state, terrain, or weather), military environment (e.g., forces assigned, threat, command relationships), and civil environment (e.g., political, cultural, and economic factors).

Contracting Officer Technical Representative (COTR). Personnel nominated by COMOPTEVFOR and appointed in writing by the contracting officer and designated in the contract, who provide technical direction/clarification and guidance with respect to the contract specifications or SOW. The term COR is now used interchangeably with COTR.

Cost and Operational Effectiveness Analysis (COEA). An analysis of the estimated costs and operational effectiveness of alternative materiel systems to meet a mission need and the associated program for acquiring each alternative.

Criteria. The element of a standard that defines acceptable levels of performance.

Critical Intelligence Parameters (CIP). CIPs are a series of threat thresholds established by program developers and managers for the purpose of improving threat support products over the life of the system. Emerging foreign capabilities or reevaluations which cross over these thresholds would critically impact the effectiveness and survivability of the U.S. acquisition program. CIPs are expressed in

terms of a potential adversary's quantity, type, force mix, and system capabilities for actual and projected specific threats.

Critical Operational Issues (COI). The critical aspects of a system's operational effectiveness and operational suitability that are intended for resolution during OT&E. They are developed by COMOPTEVFOR, they do not all address CNO-provided minimum acceptable operational performance requirements per se, and they appear in part IV of the TEMP.

Current Threat. The threat which has been fielded or is assessed to be currently available.

Developing Agency (DA). The DA is usually a SYSCOM/PEO. The agency responsible for system design and development, and accomplishment of DT&E to verify attainment of technical performance specifications and objectives.

Defense Acquisition Board (DAB). The senior DoD acquisition review board chaired by the Under Secretary of Defense for Acquisition. The Vice Chairman of the Joint Chiefs of Staff is the Vice-Chair. Other members of the board are the Deputy Under Secretary of Defense for Acquisition, service acquisition executives of the Army, Navy, and Air Force; the Director of Defense Research and Engineering; the Assistant Secretary of Defense for Program Analysis and Evaluation; the Comptroller of the Department of Defense; the Director of Operational Test and Evaluation; the appropriate DAB Chair; and the Defense Acquisition Board Executive Secretary. Other persons may attend at the invitation of the chair. (See DoD Directive 5000.49, Defense Acquisition Board.)

Direct Liaison Authorized (DIRLAUTH). That authority granted by a commander (any level) to a subordinate to directly consult or coordinate an action with a command or agency within or outside of the granting command. DIRLAUTH is more applicable to planning than operations and always carries with it the requirement of keeping the commander granting DIRLAUTH informed. DIRLAUTH is a coordination relationship, not an authority through which command may be exercised.

Director, Operational Test and Evaluation (DOT&E). According to DoD Directive 5000.1, DOT&E is the principle advisor to the Secretary of Defense on DoD OT&E matters.

Discrepancy Reporting. The lead OT&E agency is responsible for ensuring a system is established to track discrepancies and to provide periodic status reports to participating OT&E agencies. Control of promulgation of such reports should be included in an MOA between the participating OT&E agencies. An example of another agency's reporting is the service reports that can be issued by any Air Force organization.

DT Assist. Similar to an early phase of combined DT/OT, but with a predominantly DT flavor. OTDs take an active role in the DT effort. See paragraph 206.b for detailed information.

Developmental Test and Evaluation (DT&E). T&E conducted by the DA to assist in engineering design and development, and to verify attainment of technical performance specifications and objectives.

Datalink Vulnerability Assessment (DVAL). DVAL T&E methodology incorporates the component parts of vulnerability into a four-module approach for the T&E of antijam features of command, control, and communications; reconnaissance and intelligence; and weapons RF data links. The methodology facilitates the determination and quantification of the four components so that a vulnerability assessment that is based on fact and data, instead of assumptions and theory, can be accomplished.

Early Operational Assessment (EOA). An operational assessment (OT-I) conducted prior to, or in support of, MS-B. (See Operational Assessment.)

EVALUATION REPORT. One of the two products of OT&E (the other product is the tactics guide).

Evolutionary Acquisition (EA). EA is an acquisition strategy that applies to advanced technology, electronic, and software-intensive systems; and keys on the dynamics of technology and development and the potential of a system to evolve in incremental steps to a capability beyond the current technological capability (or core system).

Exit Criteria. Program-specific accomplishments that must be satisfactorily demonstrated before an effort or program can progress further in the current acquisition phase or transition to the next acquisition phase. Exit criteria may include such factors as critical test issues, the attainment of projected growth curves and baseline parameters, and the results of risk reduction efforts deemed critical to the decision to proceed further. Exit criteria supplement minimum required accomplishments and are specific to each acquisition phase.

Fleet-Releasable Software. Software for which OT&E results confirm that all significant design problems have been identified, that solutions to these problems are available, and that the software actually tested is effective and suitable for its intended use and meets operational requirements. This term is reserved for use by CNO following successful OT&E.

Fleet Services. These are used to plan and program not only Fleet support, but also financial support, ranges, targets, simulators, and other required support.

Follow-on Operational Test and Evaluation (FOT&E). That test and evaluation that is necessary during and after the production period to refine the estimates made during

OT&E to evaluate changes, and to reevaluate the system to ensure that it continues to meet operational needs and retains its effectiveness in a new environment or against a new threat.

Foreign Weapons Evaluation (FWE). FWE evaluates foreign weapons systems, equipment, and technologies that have the potential to satisfy a specific U.S. requirement. FWE applies to any system, subsystem, or component purchased from a friendly or neutral country which is available for procurement by the U.S.

Full Mission Capable (FMC). The percentage of time the test aircraft is capable of performing all its missions as defined in the MESM as supplemented by operational experience.

Full Rate Production Decision (FRPD). The decision to enter into full rate production for the system.

Human Factors. A body of scientific facts about human characteristics. The term covers all biomedical and psychosocial considerations. It includes, but is not limited to, principles and applications in the areas of human engineering, personnel selection, training, life support, job performance aids, and human performance evaluations (DoDINST 5000.2). OT includes examination of those elements of system operation and maintenance which influence the efficiency with which people can use systems to accomplish the operational mission of the system (e.g., arrangement of controls and displays), the work environment (e.g., room layout, noise level, temperature, lighting, etc.), the task (e.g., length and complexity of operating procedures), and personnel (e.g., capabilities of operators and maintainers).

Incremental Development. In this process, a desired capability is identified, an end-state requirement is known, and that requirement is met over time by developing several increments, each dependent on available mature technology.

Information Assurance (IA). Measures that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and nonrepudiation. This includes providing for restoration of information systems by incorporating protection, detection, and reaction capabilities. IA must be addressed for all weapons systems; command, control, communications, computers, intelligence, surveillance, and reconnaissance systems; and information technology programs that depend on external information sources or provide information to other DoD systems.

Informational View. A temporal view block diagram with *conditions, inputs, and outputs* added to it. Inputs are required information or assets to perform a subtask (e.g., subtask of selecting targets to attack requires intelligence data). Outputs are the information or product resulting from the performance of the subtask (e.g., the subtask

of selecting targets to attack must yield a target list). Some subtasks provide inputs *to* other subtasks or require inputs *from* other subtasks.

Initial Capabilities Document (ICD). Representatives from multiple DoD communities shall assist in formulating broad, time-phased, operational goals, and describing requisite capabilities in the ICD. Programs that enter the acquisition process at MS-B shall have an ICD that provides the context in which the capability was determined and approved, and a CDD that describes specific program requirements. Projects that undergo a MS-A decision shall have a T&E strategy that primarily addresses M&S, including identifying and managing the associated risk, and that evaluates system concepts against mission requirements. Pre-MS-A projects shall rely on the ICD as the basis for the evaluation strategy.

Initial Operational Capability (IOC). The first attainment of the capability to employ effectively a weapon, item of equipment, or system of approved specific characteristics, and which is manned or operated by a trained, equipped, and supported military unit or force.

Initial Operational Test and Evaluation (IOT&E). All OT&E conducted on production or production-representative articles, to support the decision to proceed beyond low-rate initial production. It is conducted to provide a valid estimate of expected system operational effectiveness and operational suitability.

Intelligence Production Requirement (IPR). An IPR may be initiated by a user whenever there is a perceived data gap. It may cover current, midterm, or long range intelligence requirements which cannot be wholly satisfied by the resources of the requester.

Integrated Program Summary (IPS). A DoD component document prepared and submitted to the MDA in support of MS-A, -B, -C, and -D reviews. It concisely highlights the status of a program and its readiness to proceed into the next phase of the acquisition cycle.

Integrated Testing (IT). IT is the collaborative planning and collaborative execution of test phases and events to provide data in support of independent analysis, evaluation, and reporting by all stakeholders, particularly the developmental (contractor and government) and OT communities.

Interoperability. The capability of systems, units, or forces to provide services to or accept services from other systems, units, or forces, and to use the services exchanged to operate effectively (DoDINST 5000.2). Effective exchange of information is emphasized. For example, a radar is interoperable with a gun system if the radar causes the gun to point at the target; the Carrier Aircraft Inertial Navigation System must be interoperable with the Ship's Inertial Navigation System for initial alignment; a fuze must be interoperable with the warhead in order for the firing signal to get through.

IT Integration. IT blends or combines contractor, developmental, and operational testing to form a cohesive testing continuum. This integration cannot occur unless the participants (CT, DT, and OT) have determined their entering requirements for adequate testing of the system under evaluation. IT does not remove or combine any of OPTEVFOR's current or future requirements for reporting based on a separate (OPTEVFOR) analysis of the shared test information produced by the IT effort.

Joint Acquisition Program. A directed joint effort for the development and procurement of systems, subsystems, equipment, software, or munitions as well as supporting equipment or systems, with the goal of providing a new or improved capability for a validated joint need. (DAU Glossary)

Joint Interoperability. Joint Interoperability is an E-test designed to examine the use of systems which must exchange information or services with non-Navy systems and platforms; that is, Army or Air Force and in some cases, Marines or Coast Guard. For instance, in designing an SP test for a submarine antenna, the capability of the antenna to assist the platform in communicating with Army helicopters, USAF aircraft and satellites, and a Marine CP would have to be examined.

Joint Test and Evaluation (JT&E) Program. An OSD program that is structured to evaluate or provide information on system performance, technical concepts, system requirements or improvements, and system interoperability; to improve or develop test methodologies; or for force structure planning, doctrine, or procedures.

Land-Based Test Sites (LBTS). An LBTS is a facility that duplicates, simulates, or stimulates the employment of a system's planned operational installation and use for the purpose of conducting DT.

Level of Repair Analysis (LORA). The technique used to determine whether an item should be repaired and at what maintenance level; i.e., organizational, intermediate, or depot.

Live Fire Test and Evaluation (LFT&E). LFT is conducted to provide a timely and thorough assessment of the vulnerability and lethality of a system as it progresses through its development and subsequent production phases. The primary emphasis of LFT is on realistic testing as a source of personnel casualty, vulnerability, and lethality information, taking into account the susceptibility to attack and combat performance of the system. LFT will include, when feasible, the firing of threat munitions (or surrogates) at operational, combat-loaded U.S. weapon systems to test their vulnerability; and/or the firing of U.S. munitions or missiles against operational, combat-loaded threat targets (or surrogates) to test the lethality of those munitions or missiles.

Logistic Supportability. The degree to which the planned logistics (including test equipment, spares and repair parts, technical data, support facilities, and training) and manpower meet system availability and wartime usage requirements.

Logistic Support Analysis (LSA). The selective application of scientific and engineering efforts undertaken during the acquisition process, as part of the system's engineering and design process, to assist in complying with supportability and other logistic support areas.

Low Rate Initial Production (LRIP). The production of a system in limited quantity to provide articles for additional OT&E to establish an initial production base, and to permit an orderly increase in the production rate sufficient to lead to full-rate production upon successful completion of OT&E.

Maintainability. The capability of an item to be retained in or restored to specified conditions when maintenance is performed by personnel having specified skill levels, using prescribed procedures and resources, at each prescribed level of maintenance and repair. MTFL, MCMTOMF, and MR are frequently calculated in maintainability evaluations.

Maintenance Deficiency Report (MDR). Project management responsibility turnover occurs in the Air Force when the logistics command accepts management of a program. RDT&E is then normally terminated and service reports are called MDRs.

Major Deficiency. An operational mission failure or software fault (precludes successful completion of a mission). If occurring in sufficient numbers during testing, can lead to a partially resolved or UNSAT resolution of a COI. On the other hand, only one major deficiency occurring may not lower the result to below a stated threshold, meaning that the COI is still resolved as SAT.

Marine Corps Operational Test and Evaluation Agency (MCOTEA) Material Support Date (MSD). The date when all necessary supply support of the system or equipment is furnished. Supply support includes allowance quantities stocked in the supply system or furnished directly to the end-user.

Matrix. The arrangement of specific elements into rows and columns to indicate interdependence or correlation.

Mean Corrective Maintenance Time for Operational Mission Failures (MCMTOMF). Normally computed as part of Test S-2, MCMTOMF is the average time required to perform active corrective maintenance. Corrective maintenance is the time during which one or more personnel are repairing an operational mission failure and includes: preparation, fault location, part procurement from local (onboard) sources, fault correction, adjustment and calibration, and follow-up checkout times. It excludes off-board logistic delay time.

Mean Time to Fault Locate (MTFL). The total fault location time divided by the number of critical failures. Frequently computed as part of Test S-2, Maintainability.

Measure. The element of a standard that provides the basis for describing varying levels of task performance.

Measure of Effectiveness (MOE). Addresses the quality of the operational picture provided to operators of warfare systems. These measures characterize the operational picture's completeness, clarity, correctness, and commonality. Tools used to measure results achieved in the overall mission and execution of assigned tasks. MOEs are a prerequisite to the performance of combat assessment.

Measure of Suitability (MOS). Expressions of the system's functional and interface design as they relate to the compatibility with other elements of the system, job, organization, other systems, and the working environment.

Milestone A Decision. The decision to establish a new acquisition program and establish a concept baseline containing initial program cost, schedule, and program objectives.

Milestone B Decision. The decision to begin engineering and manufacturing development of a concept.

Milestone C Decision. The decision to produce a system.

Minimum Acceptable Operational Performance Requirement. The value for a particular parameter that is required to provide a system capability that will satisfy the validated mission need. Also known as the performance threshold. This is used in programs dating prior to March 1996. These programs may or may not change terminology during TEMP updates.

Minor Failure. One that affects system performance, but does not impact the ability to perform the mission. This definition will be included in aircraft program documents where minor failures will be used in calculations such as MR or MFHBF (for older programs that still use this parameter).

Minor Deficiency. A deficiency that affects system performance, but does not impact the ability to perform the mission. Usually requires only a minor workaround to continue testing.

Mission. The task, together with the purpose, that clearly indicates the action to be taken and the reason therefore.

Mission Analysis. The mission analysis is a combined effort between OPTEVFOR and the program representatives (T&E IPT), and should include other participants such

as the Fleet Forces Command (N8) representative, and operational user representatives. Other SMEs may be included to ensure this evolution is completed correctly. These SMEs might include center of excellence representatives.

Mission-Based Test Design (MBTD). MBTD is COMOPTEVFOR's primary test planning methodology. The foundation of MBTD is the development of COIs and test vignettes based on tasks the warfighter will execute using the system under test. Test scope will be based upon conditions that impact the warfighter's execution of their tasks.

Mission Capability by Primary Mission Area (MC_{MA}). The percentage of time the test aircraft is capable of performing a specified mission.

Mission Need Statement (MNS). A statement of operational capability required to perform an assigned mission or to correct a deficiency in existing capability to perform the mission.

Mission Reliability. See Reliability.

Model. A model is a representation of an actual or conceptual system that involves mathematics, logical expressions, or computer simulations that can be used to predict how the system might perform or survive under various conditions or in a range of hostile environments.

Modeling and Simulation (M&S). DoD directives encourage the use of M&S to assist in projecting operational effectiveness and operational suitability prior to MS-B, but limit its use in subsequent OT&E to that of supplementing OT&E test data. Because of the increased emphasis on the use of simulation in early OT&E, the OTD must give careful consideration to requirements for the use of threat simulation.

Multiservice OT&E. OT&E conducted jointly by two or more services for systems to be acquired by more than one service, or for a service's systems which have interfaces with equipment of another service.

NATO Comparative Test Program (CTP). NATO CTPs evaluate foreign weapons systems, equipment, and technologies that have the potential to satisfy a specific U.S. requirement. NATO CTP applies only to items of NATO origin.

Navy Support Date (NSD). The date the Navy is responsible for providing material support for retail outfitting and wholesale requirements from the supply system. Support elements could include allowance quantities in the supply system, training, technical manuals, and other support documents such as allowance parts lists and preliminary allowance parts lists.

Nondevelopmental Item (NDI). Any item of supply that is available in the commercial marketplace:

- Any previously developed item of supply that is in use by a department or agency of the United States, a state or local government, or a foreign government with which the United States has a mutual defense cooperation agreement
- Any item of supply described in the above, that requires only minor modification in order to meet the requirements of the procuring agency
- Any item of supply that is currently being produced that does not meet the requirement of one of the above definitions, solely because the item is not yet in use or is not yet available in the commercial marketplace

Notice of Intent (NOI). The primary purpose of an NOI is to reserve a submerged operating area and establish procedures which will minimize mutual interference between submerged submarines, and between submarines and other operations such as surface ships using variable depth sonar or dropping of explosive ordnance.

Observation of Operational Capability (OOC). Occasionally, due to acquisition or programmatic issues, systems or equipment enter the Fleet with no previous OT&E. In these cases, COMOPTEVFOR may conduct an OOC. This is not a phase of formal OT, and, therefore, cannot be used to support an acquisition decision. This is an accounting of the capability of a system as gauged against either the previous (i.e., replaced system) capability, or the system's ORD (or CDD)**.**

Operational Assessment (OA). An evaluation of operational effectiveness and operational suitability made by an independent operational test activity, with user support as required, on other than production systems. The focus of an OA is on significant trends noted in development efforts, programmatic voids, areas of risk, adequacy of requirements, and the capability of the program to support adequate OT. OAs may be made at any time using technology demonstrators, prototypes, mockups, engineering development models, or simulations, but will not substitute for the independent OT&E necessary to support full production decisions.

Operational Availability (A_o). (See Availability for basic definition.) A_o is computed and reported as follows:

- For continuous-use system, operational availability shall be designated A_o and shall be determined as the ratio of system "uptime" to system "uptime plus downtime."
- For "on-demand" systems, operational availability shall be designated A_{od} and shall be determined as the ratio of the "number of times the system was available to perform as required "to the"total number of times its performance was required." (Note: "Total number of times its performance was required" shall be the number of times attempted and the number of times it was operationally demanded, but not attempted because the system was known to be inoperable.)

Operational Consideration (OPCON)

- To document evaluation considerations which apply operational reasoning to test results to substantiate conclusions or recommendations (or both) that are not directly derivable from the results
- To document tactical considerations which inform operational commanders of significant aspects (pro and con) of system employment, or make clear what special measures would be required to make the system more efficient in battle

Operational Effectiveness. The overall degree of mission accomplishment of a system when used by representative personnel in the environment planned, or expected (e.g., natural, electronic, threat etc.), for operational employment of the system, considering organization, doctrine, tactics, survivability, vulnerability, and threat (including countermeasures, initial nuclear weapons effects, and NBCC threats).

Operational Evaluation (OPEVAL). The last phase of OT&E prior to the full rate production decision. Commonly used term for IOT&E.

Operational Mission Failure. One which precludes successful completion of a mission, and must be specifically defined for each system.

Operational Mission Software Fault. One which precludes successful completion of a mission, and must be specifically defined for each system.

Operational Requirements Document (ORD). Although COMOPTEVFOR is not officially part of the formal ORD process, the OPNAV resource sponsor will usually provide the draft ORD to COMOPTEVFOR for review and comment. In conducting the review of the document, concentrate on the acquisition strategy (program structure). If a requirement appears too difficult or too simple, or if it is not testable, this is the opportunity to say so. Comments should be made if the list of performance parameters is incomplete.

Operational Suitability. The degree to which a system can be placed satisfactorily in field use with consideration given to reliability, maintainability, availability, logistic supportability, compatibility, interoperability, training, human factors, safety, documentation, transportability, wartime usage rates, manning requirements, and natural and environmental effects and impacts.

Operational Test and Evaluation (OT&E). The purpose of OT&E is to allow an accurate evaluation of the true operational effectiveness and operational suitability of the weapon system in actual Fleet use and combat employment.

Operations Security (OPSEC). OPSEC, as it relates to COMOPTEVFOR testing, may be defined as the identification and protection of a broad spectrum of classified and open-source information that collectively reveals current and future U.S. military capabilities, plans, and operational procedures. In this respect, it encompasses and

relates to other security programs such as SIGSEC, physical security, automated data processing, and operational deception.

OT Framework. The OT framework is the primary document for defining adequate OT when using the MBTD, and for integrating the OT requirements with DT and CT requirements to form an IT matrix. It defines the OT objectives and the requirements for resolution of each COI, as well as the OTD's minimum IOT&E requirements.

OTD Journal. The OTD journal records, for possible later use, data that the OTD hadn't considered when developing the data or survey sheets, and may be of significance in the program. While each OTD must use his own judgment when deciding what is significant, it is better to record too much data rather than too little. And, it is better to record it as soon as an event occurs, rather than to wait until later and risk forgetting.

Performance-Based Contracting. A type of contract structuring all aspects of an acquisition around the purpose of the work to be performed with the contract requirements set forth in clear, specific, and objective terms with measurable outcomes, as opposed to either the manner by which the work is to be performed or broad and imprecise statements of work. FAR 37.104

Personal Services Contracting. A type of contract that, by its express terms or as administered, makes the contractor personnel appear to be, in effect, Government employees. Personal services contracts are prohibited unless specifically authorized by statute. FAR 37.104

Production Acceptance Test and Evaluation (PAT&E). Testing conducted on production items to ensure systems meet contract specifications and requirements.

Program Element Descriptive Summary (PEDS). These documents are prepared annually by the DA. COMOPTEVFOR reviews drafts of these documents and provides the OT&E write-ups in their T&E sections. Guidance is set forth by the Project/Policy Manager (Code 01B) as each annual cycle begins.

Program Executive Officer (PEO). A military or civilian official who has primary responsibility for directing several ACAT I programs and for assigned ACAT II, III, and IV programs. A PEO has no other command or staff responsibilities within the component, and only reports to and receives guidance and direction from the DoD Component Acquisition Executive.

Program Manager (PM). A military or civilian official who is responsible for managing an acquisition program.

Projected Threat. A best estimate based on historical trends data, evidence of continuing research and development, postulated military requirements, technological

capabilities, and the best intelligence available. This threat consists of the weapon systems and characteristics that an adversary can be expected to develop and deploy during the specified period.

Provisioning Requirements Statement (PRS). The PRS (DD Form 1949-2) is a document that gives the contractor specific guidance on the exact provisioning information required by the government. It provides the methods to be used in the generation of provisioning data, and the range and depth of required data.

Provisioning Technical Documentation (PTD). The document furnished by the contractor for identification, determination of repair parts requirements, cataloging, and contractual formalization of items to be procured through the provisioning process. The PTD includes, but should not be limited to, provisioning lists, drawings, item descriptions, and cards and/or magnetic tapes.

Quick-Look Report. Directed only by CNO. An informal, usually abbreviated, evaluation report published by COMOPTEVFOR; always superseded by a formal evaluation report.

Quick Reaction Assessment (QRA) (U.S. Navy). Used when operational necessity dictates deploying a rapid capability in the Fleet. A QRA is a quick assessment that examines specific operational considerations and capabilities of a system. A QRA will not be used to resolve COIs.

Risk Assessment Level of Test (RALOT). A tool to be used by the OTA in determining the scope of the OT required to support fielding decisions for existing systems (post IOT&E) that have been modified.

Research, Development, Test, and Evaluation (RDT&E). See NAVSO P-2457 (RDT&E Management Guide).

Research Laboratories. Laboratories available to provide analytical support to COMOPTEVFOR in the OT&E of assigned CNO projects.

Reliability. The duration or probability of failure-free performance under stated conditions. In OT&E, reliability is usually reported in one of two ways:

- Mission Reliability (R). For equipment operated only during a relatively short duration mission (as opposed to equipment operated more or less continuously), the probability of completing the mission without an operational mission failure.
- MTBOMF. Mean time between operational mission failures. For more or less continuously operated equipment or systems. MTBOMF measures reliability as it relates to the overall mission of the equipment or system being tested and is the total operating time divided by the number of operational mission failures. MTBOMF is the figure used in the calculation of overall mission Reliability (R). MTBOMF is

sometimes modified to Mean Flight Hours Between Operational Mission Failures (MFHBOMF).

SECNAVINST 5000.2C. The fundamental Navy instruction on T&E.

Self-Defense Test Ship (SDTS). Realistic OT for softkill and short range hardkill self-defense weapon systems is often restricted by safety considerations that prohibit threat-representative target presentations for manned ships. For this reason, the former USS PAUL F FOSTER (DD 964) has been configured as an unmanned ship outfitted with current softkill and hardkill self-defense weapon systems for use by the DT and OT communities.

Simulation. A simulation is a method for implementing a model. It is the process of conducting experiments with a model for the purpose of understanding the behavior of the system modeled under selected conditions or of evaluating various strategies for the operation of the system within the limits imposed by developmental or operational criteria. Simulation may include the use of analog or digital devices, laboratory models, or test-bed sites. Simulations are usually programmed for solution on a computer; however, in the broadest sense, military exercises and war games are also simulations.

Simulator. A generic term used to describe a family of equipment used to represent threat weapon systems in DT, OT, and training. A threat simulator has one or more characteristics which, when detected by human senses or manmade sensors, provide the appearance of an actual threat weapon system with a prescribed degree of fidelity.

Software Qualification Test (SQT). Post-MS-C software testing will be conducted by COMOPTEVFOR as SQT and is solely intended for a Fleet release recommendation. SQT applies to software modifications of limited scope, such as aircraft and weapons systems Operational Flight Programs (OFP) and other systems in which software provides a similar function.

Software Test. Software will be operationally tested in the system in which the application is installed or implemented when fielded. The software to be used for IOT&E and FOT&E will be the software intended for Fleet use.

Software Upgrade (U.S. Navy). Navy software upgrades (releases) fall into three categories: ***Major*** -- adds new functions or warfare capabilities, interfaces with a different weapon system, redesigns the software architecture, or rewrites the software in a different language (requires OT by OPTEVFOR); ***Minor*** -- changes that do not add any significant functions or interfaces as determined by CNO (OT by OPTEVFOR upon CNO approval); ***Maintenance*** -- releases that are fixes to minor problems (no testing by OPTEVFOR).

Spiral Development. In this process, a desired capability is identified, but the end-state requirements are not known at program initiation.

Standard. The minimum acceptable proficiency required in the performance of a particular task under a specified set of conditions. Defined by the ORD/CD or assigned by OPTEVFOR standards, and consists of measures and criteria.

Standardized S-Tests. In OPTEVFOR test plans, the following standardized S-tests address the major elements of operational suitability. (Others may be added, as appropriate.)

- Test S-1, Reliability
- Test S-2, Maintainability
- Test S-3, Availability
- Test S-4, Logistic Supportability
- Test S-5, Compatibility
- Test S-6, Interoperability
- Test S-7, Training
- Test S-8, Human Factors
- Test S-9, Safety
- Test S-10, Documentation

Subtask. The further breakdown of a task into the discrete events or actions required to complete the task.

Support Material List (SML). A list of spares and repair parts required to support a system or equipment based on maintenance and phased support plans for a specified period of time, dollar amount, and degree of supply effectiveness.

Support Software. The system compilers, assemblers, utility packages, diagnostic routines, integration test programs, simulations, quality assurance programs, and other software required or used in the development and support of weapon system software.

Survivability. The capability of a system to avoid or withstand manmade, hostile environments without suffering an abortive impairment of its capability to accomplish its designated mission.

Susceptibility. The degree to which a device, equipment, or weapons system is open to effective attack due to one or more inherent weaknesses. (Susceptibility is a function of operational tactics, countermeasures, probability of the enemy fielding a threat, etc.) Susceptibility is considered a subset of survivability.

Synergy. Interaction of discrete agents or conditions such that the total effect is greater than the sum of the individual effects.

System Service Reports. Service reports are issued when a system in RDT&E has a major or minor failure. They may be issued during any phase of T&E or between scheduled phases of T&E.

System Threat Assessment. Describes the threat to be countered and the projected threat environment. The threat information should reference DIA or Service Technical Intelligence Center-approved documents.

System Threat Assessment Report (STAR). The STAR is the basic authoritative threat assessment tailored for and focused on a particular U.S. defense acquisition program. Included in the STAR is an assessment of those projected capabilities -- doctrine, strategy, tactics, organization, equipment, and military forces -- that a potential enemy could use to defeat or degrade the U.S. system during its employment. The STAR is initially prepared at MS-A for all ACAT I programs, and updated at MS-B, -C, and -D. A component-prepared system threat assessment is required at ACAT II, III, and IV programs.

Test and Evaluation Identification Number (TEIN). When a program becomes a program of record, the CNO will assign a TEIN. If the program is internal to COMOPTEVFOR the TEIN will start with 3000.

Tactical Development and Evaluation (TAC D&E). A program designed to improve tactical readiness through development of tactical doctrine for the effective employment of current combat systems or systems approaching IOC.

Task. A discrete event or action, not specific to a single unit, weapon system, or individual, that enables a mission or function to be accomplished by individuals and/or organizations.

Temporal View. A block diagram that depicts the steps of the task process *in order of occurrence*. Temporal interactions refer to the *sequencing* of subtasks. That is, one subtask must be completed before another one can begin (prerequisite or successor); one subtask might begin at the same time as another one (concurrent beginning); or one subtask might have to be completed at the same time as another (concurrent ending).

Test and Evaluation Coordinating Group (TECG). A TECG will convene when T&E issues arise that cannot be resolved between the applicable commands or when extensive T&E coordination is required. A TECG may also be used to implement urgent required changes to TEMPs. In this case, either a page change will be issued or the formal report of the TECG will be attached to the TEMP as an annex until the next required update or revision.

Test and Evaluation Master Plan. The controlling document for all T&E. The basic purpose of the TEMP is to combine the DA's DT&E plans and COMOPTEVFOR's

OT&E plans into one integrated master plan approved by the CNO or higher authority (except ACAT IVT TEMPs which are approved by the PEO/DA and COMOPTEVFOR). Because the PEO/DA and COMOPTEVFOR have independent authority, within their respective areas, to determine program test periods and test resources, it is imperative that these independent efforts be integrated into a single program structure. See SECNAVINST 5000.2C, DoD Directive 5000.1, and DoD Regulation 5000.2-R for format and content.

Test Reporting. For major programs, the lead service will prepare and coordinate the single (interim or final) report reflecting the system's operational effectiveness and operational suitability for each service. The participating services' independent evaluation reports will be appended to final reports.

Threat. The sum of the potential strengths, capabilities, and intentions of any enemy which can limit or negate mission accomplishment or reduce force, system, or equipment effectiveness.

Threat Assessment. The provisions of intelligence assessment of the threat in the appropriate context and detail necessary to support plans, programs, or actions. Threat support is normally provided in the form of threat or capabilities publications, generic threat assessments, and specific threat statements, all of which emphasize system projections and threat forecasts. Threat support also includes operational intelligence on foreign naval targets and force employment.

Threat Support. The provisions of intelligence assessments of the threat in the appropriate context and detail necessary to support plans, programs, or actions. Threat support is normally provided in the form of threat or capabilities publications, generic threat assessments, and specific threat statements, all of which emphasize system projections and threat forecasts. Threat support also includes operational intelligence on foreign naval targets and force employment.

Threat Validation. The evaluation of, and concurrence with, threat documentation. DIA evaluation of service-produced threats stresses the appropriateness and completeness of the intelligence positions and the logic of extrapolations from existing intelligence.

Threshold. The value of a baseline parameter that represents the minimum acceptable value which, in the user’s judgment, is necessary to satisfy the need. If threshold values are not achieved, program performance is seriously degraded, the program may be too costly, or the program may no longer be timely.

Top Level Requirements (TLR) and Top Level Specifications (TLS). For ship development and ship acquisition programs, TLRs and TLSs are prepared after the ORD or MNS. This additional set of documents is necessary because of the length and complexity of the ship design process.

Universal Navy Task List (UNTL). A list of Navy tasks considered essential to the accomplishment of an assigned or anticipated mission. OPNAV Instruction 3500.38A applies.

Validated Software. Validated software is application software with a technical evaluation completed by the procuring activity to determine whether the application software is functioning in a technically acceptable manner, whether it meets design and technical performance specifications, and whether it is technically suitable for operational evaluation.

Verification of Correction of Deficiencies (VCD) (U.S. Navy). VCDs are used to support acquisition decisions for limited or full rate production. Evaluation of corrections to specific deficiencies cited in a previous OT&E report will apply to only those COIs that have been corrected, and the evaluation will not require end-to-end testing of the complete system.

Vignette. A convenient or logical grouping of a task or several subtasks to allow testing and data collection for several standards. Vignettes are conducted under the varying conditions determined to have impact on the associated subtask performance.

Vulnerability. The characteristics of a system that causes it to suffer a degradation (loss or reduction of capability to perform the designated mission) as a result of having been subjected to a certain (defined) level of effects in an unnatural (man made) hostile environment. Vulnerability is considered a subset of survivability.

Weapon System Selection and Planning. This is the entire weapon system acquisition process, including planning and study and acquisition review, as well as research, development, test, and evaluation. It involves the CNO, the systems' commands and research and development centers, COMOPTEVFOR, and senior review authorities (e.g., SECNAV).

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