CERTIFICATION OF SYSTEM READINESS FOR DEDICATED OPERATIONAL TEST AND EVALUATION

NOTICE: This publication is available digitally on the SAF/AAD WWW site at: http://afpubs.hq.af.mil. If you lack access, contact your Publishing Distribution Office (PDO).

This manual implements AFPD 63-1, *Acquisition System*, by providing a structured mechanism for identifying and reducing risks associated with transitioning from developmental test and evaluation (DT&E) to dedicated operational test and evaluation (OT&E). A standard framework or "process" is detailed in 33 "templates" which contain historical information and practical advise about how to reduce or eliminate risk. The certification process helps document the pursuit of a credible and effective development program. Use of the certification process is mandatory for reviewing all acquisition category programs. However, the contents of the templates are not directive and do not supersede existing acquisition guidance. The requirement for certification of system readiness for OT&E descends from Department of Defense Instruction (DoDI) 5000.2, *Defense Acquisition Management Policies and Procedures*, February 23, 1991 with Change 1, and Air Supplement with Change 1. Use this manual with Air Force 10-, 63-, and 99-series publications to ensure full understanding of the certification process and the terms used in the attachments. This manual applies to all Air Force activities, including Air National Guard and US Air Force Reserve units and members.

Chapter 1

OVERVIEW OF THE CERTIFICATION PROCESS

1.1. Abbreviations and Acronyms. **Attachment 1** lists abbreviations and acronyms used in this manual. **Attachment 2** through **Attachment 34** are certification templates.

1.2. The Process. This manual presents a structured mechanism or "process" to identify problems and risks associated with transitioning from developmental test and evaluation (DT&E) to dedicated operational test and evaluation (OT&E). It establishes a disciplined review and "certification process" beginning in the early stages of acquisition programs and culminates in more successful OT&E outcomes. The certification process is a tool to help acquisition managers at all levels identify risks, reach negotiated agreements on issues, and render more accurate assessments of system readiness to begin dedicated OT&E.

1.3. Organizational Structure. The certification process uses a matrix of 33 certification "templates" which list specific problem or risk areas that have hindered the smooth transition to and execution of dedicated OT&E. All templates are based on lessons learned from historical reviews and analyses of numerous acquisition programs. The templates help identify risks, then assist in the implementation of strategies for eliminating or reducing those risks to acceptable levels. The certification process also documents the results of a sound risk reduction program.

1.4. Responsibilities. DoD directives require a certifying official from the developing agency to formally certify systems are ready to enter the dedicated phase of OT&E. The certification process cuts across many organizational lines and brings together diverse elements of the acquisition community. Other agencies associated with the acquisition program are responsible for providing information, analysis, and candid feedback for their assigned areas in support of the certification process.

 1.4.1. PEO/DAC. The Program Executive Officer (PEO), Designated Acquisition Commander (DAC), or equivalent official is the "certifying official" for assigned programs. In some cases, the program manager (PM) may be the certifying official. The certifying official will determine the broad scope and requirements for certifying system readiness to begin the dedicated phase of OT&E for all assigned programs according to AFI 63-101, *Acquisition System*.

 1.4.2. SPO. The system program office (SPO) will act as office of primary responsibility (OPR) for implementing an effective system certification process. The PM will assign an OPR for organizing the process, gathering information, scheduling reviews, negotiating consensus on issues and solutions, and assembling certification briefings and messages.

 1.4.3. OTA. The operational test agency (OTA) will participate in the certification process by assisting the SPO and carrying out responsibilities as agreed. The OTA will lead the effort to mobilize resources required for dedicated OT&E, among other things.

 1.4.4. Using Command. The lead using command will participate in the certification process by assisting the SPO and OTA and carrying out responsibilities as agreed. The lead using command ensures system requirements documents are complete, among other things.

1.4.5. The Acquisition Staff. The acquisition staff (SAF/AQ and HQ USAF/TE) will monitor the certification process for continued effectiveness, and periodically update the templates to ensure Air Force systems transition smoothly into dedicated OT&E.

1.4.6. Headquarters Air Force Materiel Command (HQ AFMC). HQ AFMC will support the development and testing of systems according to AFI 63-101, participate in the certification process by assisting the SPO, and carry out responsibilities as agreed.

1.4.7. Other Organizations. Other support organizations needed in the systems acquisition process will support the SPO and the certification process as agreed.

1.5. Use. The certification process will be used for all acquisition category (ACAT) programs; however, the contents of each template are not directive and do not supersede existing acquisition guidance. The templates are to be used in parallel with, not substitutes for, formal Air Force guidance. For the purposes of this manual, "dedicated OT&E" refers to that phase of initial OT&E (IOT&E) or qualification OT&E (QOT&E) which must be done separately and independently prior to the full rate production decision.

Chapter 2

THE CERTIFICATION PROCESS

2.1. Overview. Proper risk management requires the development of a systematic, disciplined plan to identify problems and risks. A proven risk management technique is to examine the successes, failures, problems, and solutions of similar or past programs for "lessons learned" that can be applied to current programs. Another technique is to systematically comb through the entire program using specific decision criteria based on historical data. The certification process combines these techniques with a system for assigning responsibility and tracking accountability for results.

2.2. Scope. The matrix of 33 certification templates in Figure 2.1. covers a broad range of subjects that have historically impacted systems transitioning from DT&E to dedicated OT&E. Not all templates may apply to every program. The templates are arranged in three major groups: Test Planning and Documentation; System Design and Performance; and Test Assets and Support. These templates may be used in conjunction with the templates in Department of Defense Directive (DoDD) 4245.7-M, *Transition from Development to Production,* September 1995, with Change 1. All templates are designed to increase the visibility of potential risk factors and facilitate a streamlined, executive-level review.

2.3. Team Effort. Since any risk reduction process is a team function, program managers must provide the right organizational structure and continuous motivation to make it effective. Risk is eliminated only when existing conditions that cause problems are changed. These changes will typically occur at levels not normally visible to senior decision makers.

2.4. Continuous Process. The certification process must be viewed as a continuous effort, not a single event in time. It is not tied to any particular acquisition milestone; however, final certification for dedicated OT&E must come before Milestone (MS) III or the fielding decision, whichever is appropriate.

    2.4.1. Starting Early. To be most effective, the certification process must begin as early as practical in new development programs. Early on, the program manager (PM) will use the templates grouped under Test Planning and Documentation (**Attachment 2** through **Attachment 13**). These templates look past the system itself to areas upstream in the acquisition process where earlier fixes to problems generate large future paybacks. The System Design and Performance group of templates (**Attachment 14** through **Attachment 23**) focuses on activities after MS II and before dedicated OT&E begins. The Test Assets and Support group of templates (**Attachment 24** through **Attachment 34**) helps ensure all required assets come together in preparation for dedicated OT&E. As acquisition programs move from MS I toward MS III, the PM's focus will shift from left to right in **Figure 1.1.**

    2.4.2. Series of Reviews. System certification is a series of reviews culminating in the final certification of readiness for dedicated OT&E. Each certifying official should decide early how to structure the certification process for each program. He or she should decide on the best forum for conducting the reviews and how frequently they should be done. Some suggestions are using the Test Planning Working Group (TPWG) or, if the acquisition program warrants, forming a special Operational Test Readiness Review Group. Representatives at the appropriate level (e.g., action officers) are required to attend.

    2.4.3. Frequency of Reviews Certifying officials should tailor the review schedule to their need for information and the needs of the program. In general, the frequency of reviews should increase as the

program approaches the final certification date. Early in the development program, a year between reviews may be sufficient, but as dedicated OT&E draws near, reviews should be spaced at 3 to 6 week intervals. As a minimum, a review should occur 30 to 60 calendar days before start of dedicated OT&E to ensure weak areas are fixed in time. As reviews proceed, PMs may find some templates are chronologically too early (or too late) to have immediate impact on a program. Line items within each template are also arranged chronologically where possible. All templates and line items should be covered at each review to ensure adequate lead times are planned, to address requirements changes, and to correct past oversights.

2.5. The Certification Review Cycle. A systematic series of candid "review-assessment-negotiation-reporting" cycles will promote meaningful dialogue between the developer, the operational test agency (OTA), and the using command(s). The certification review OPR (typically the SPO) will periodically issue a call for roundtable meetings, create an open forum for discussion, consolidate all inputs from all participating agencies, and report results.

2.5.1. Review. A thorough review of all system requirements and resource needs is the first step in assessing a program's readiness to begin dedicated OT&E. Each participant (subject area expert) in the certification process should review assigned areas of responsibility and intensify ongoing efforts to reach unmet goals. Compare demonstrated system performance to required system performance, and compare available resources to required resources. A coherent, complete linkage should extend from system/program requirements down through the planned methods and resources for demonstrating technical and operational performance. Any flaws, inconsistencies, contradictions, voids, or disconnects are potential issues and areas of risk. Accurate and complete inputs are needed from all participants.

2.5.2. Assessment. The reviewer should next assess the shortfalls identified in the template review for impacts on the OT&E program. Candid assessments of the system's readiness (the risk of not passing OT&E) are crucial to the success of the certification process.

2.5.2.1. Standard for Judging Readiness. Every template and template line item uses the same ideal standard for assessing system readiness and risk level: "Will the system be ready for and successfully complete dedicated OT&E in this area?" The cumulative total of all judgments about these risks will indicate if the complete system is ready for dedicated OT&E. This candid assessment is the heart of the certification process.

2.5.2.2. Develop Exit Criteria. Program managers must know what events or facts must occur to achieve program goals before dedicated OT&E starts. Empirical, performance-based exit criteria should be developed for each identified deficiency or issue. Satisfaction of the exit criteria in terms of demonstrated system performance is the best means to ensure readiness for dedicated OT&E. If possible, use an "end-to-end system integration test," or "pre-IOT&E," before starting dedicated OT&E to make DT&E more operationally relevant and to serve as a predictor of future operational performance. Subjective value judgments backed up by sound technical and military judgment may also be necessary. Areas judged "not ready" will require explanation and an action plan to reach the exit criteria.

2.5.2.3. If Standards Are Not Met. Some template line items may not reach the "ideal standard" (e.g., are not expected to be ready for dedicated OT&E) after close scrutiny. For example, technical orders are often unavailable, produced late, or incomplete at the start of dedicated OT&E. A few unavoidable departures from the ideal standard are expected, yet these areas still

require constant, long-term management attention. Waivers from certain areas of OT&E should be discussed. Negotiation of exit criteria and action plans will be required.

2.5.3. Negotiation. Risk areas persisting after repeated reviews are likely to impact the conduct of OT&E. Certification process participants must negotiate workaround plans and solutions, or agree to some limitations on dedicated OT&E. The SPO is the focal point for attaining negotiated consensus on managing risks. Workarounds and solutions must be in the best interests of the Air Force. Operational test agency (OTA) officials must be satisfied the strength, objectivity, and independence of OT&E will not be compromised, while the program office must retain sufficient management flexibility to find optimal solutions. Again, sound military and technical judgment are required to reach a corporate Air Force decision to proceed into dedicated OT&E.

2.5.4. Reporting. The SPO is responsible for consolidating all participants' inputs and observations and preparing the certification briefing or report. Explicit action plans and exit criteria should be developed for each deficient area.

2.5.4.1. Reporting Final Certification The length and format of the certification briefing or report are discretionary and should be tailored to fit the acquisition program. The final product should be an executive-level review of the entire program conveying enough information for senior decision-makers to make informed judgments of system readiness. The review must broaden senior leadership's perspective to the "macro" level where overall program risk is assessed along with supporting details, if required.

2.5.4.2. Reporting to Certifying Officials. After reviewing the briefing or report, the PM will forward it to the certifying official (PEO, DAC, or designated official) who remains responsible for final certification of system readiness. The PM should brief the certifying official within 30 calendar days prior to the planned start of dedicated OT&E. Representatives from appropriate levels of the using command, OTA, RTO, and other participating organizations are required.

2.5.4.3. Pre-Certification Briefings. For complex programs, a series of pre-certification reviews may add value to the certification process. The purpose of multiple reviews is to keep certification officials better prepared as the program nears final certification. Key issues and problems can be identified earlier, and quality direction and feedback attained from the certifying official.

2.5.4.4. Series of Final Certifications. Some complex systems are developed and deployed in increasing increments of capability over long periods. These systems will require a series of final certifications, followed by dedicated stages of OT&E, with each stage adding specific mission capabilities. This series of final certifications will be presented to the certifying official and certification messages sent in the same manner and format as other final certifications.

2.6. Tailoring the Process. As early as practical, certifying officials and PMs should tailor the certification process to their need for information. The review, assessment, negotiation, and reporting cycle should be repeated as often as necessary.

2.6.1. Templates Not Program Specific. Since the templates are not program specific, certifying officials may tailor them, with OTA and using command assistance, to fit specific programs or groups of programs. Some templates may require greater or lesser emphasis depending on the program and its phase of development. The templates give PMs maximum flexibility in focusing and structuring

their reviews without losing sight of the original objective--providing an executive-level review of the program.

2.6.2. Tailoring Level of Detail. Program managers may attach additional information or levels of detail to the templates at their discretion. Some examples might be exit and pass-fail criteria, action plans, requirements thresholds, lists of acquisition regulations and standards, watch lists, breakdowns of specific line items, and points of contact. Additional templates can be developed to cover new areas. On the other hand, aggregation of templates and template line items can reduce redundancy and help managers concentrate on known risk areas. In short, tailor each certification program to attain the best results.

2.7. Multiservice Programs. This certification process shall be the primary certification method for all programs when the Air Force is the lead service. For programs where the Air Force is not the lead, flow the results of this process into the other Service's certification process.

2.8. Updating the Templates. The certification process and templates are expected to mature through feedback from certifications and as the acquisition process evolves. Further changes will result from advanced technologies, improved test and evaluation methods, revised acquisition procedures, and restructure of the DoD test infrastructure. All certification process users should forward their observations and suggested improvements to SAF/AQXA and AF/TEP. Feedback is essential to keep the process and templates up to date.
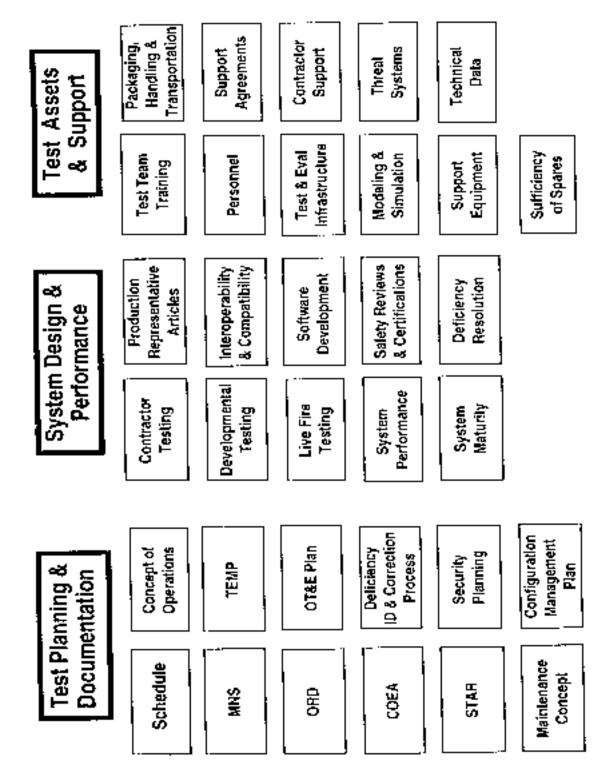
Figure 2.1. Matrix of Certification Templates

Test Assets & Support

Packaging, Handling & Transportation	Support Agreements	Contractor Support	Threat Systems	Technical Data
Test Team Training	Personnel	Test & Eval Infrastructure	Modeling & Simulation	Support Equipment
				Sufficiency of Spares

System Design & Performance

Production Representative Articles	Interoperability & Compatibility	Software Development	Safety Reviews & Certifications	Deficiency Resolution
Contractor Testing	Developmental Testing	Live Fire Testing	System Performance	System Maturity

Test Planning & Documentation

Concept of Operations	TEMP	OT&E Plan	Deficiency ID & Correction Process	Security Planning	Configuration Management Plan
Schedule	MNS	ORD	COEA	STAR	Maintenance Concept

Chapter 3

TEMPLATE STRUCTURE

3.1. Interlocking Matrix.   The templates form a matrix of interlocking subject areas spanning an entire acquisition program. Each template introduces order and reduces risk in a specific segment or aspect of acquisition programs. Some duplication and cross-referencing between templates are necessary because acquisition programs rely on many overlapping disciplines. Decisions about risk in one area often affect other areas. Cross-referencing also facilitates broad area reviews as well as special subject area reviews.

3.2. Consolidation of Multiple Sources.   Each template consolidates as much critical information as possible from multiple sources into a succinct "checklist." Air Force Policy Directives, Air Force Instructions, and DoD Directives are not cited since complete document lists are impractical for this type and level of review, and different groups of documents may apply to various programs. Programmatic and regulatory details are left to OPRs and collateral agencies more thoroughly conversant with specific acquisition guidance. Citation of minimum detail should help PMs, certifying officials, testers, and users stay squarely focused on quality and readiness issues at the executive-level of review. All information in each template is arranged chronologically as much as possible.

3.3. Answering Template Line Items. Each template contains line items phrased as statements of fact rather than questions. Each line item should elicit a brief summary of program status in that subject area rather than a superficial "yes" or "no" response. The entire group of statements covers the template subject area, but further analysis may be required in certain cases. Line items may be answered individually or in groups depending on how the certification OPR or PM tailors the certification process. Each template can function as a "tailored checklist" and as a road map for future activities in preparation for dedicated OT&E. As a general rule, aggregation of line items should increase as the review rises up through the chain of command.

3.4. Focus on Ends, Not Means.   The templates emphasize "what must be done" rather than "how to do it." No specific problem solving methods are advocated over any other, leaving program managers maximum flexibility to implement their own "best practices." The templates focus on the ends rather than the means.

3.5. Assigning Responsibilities. A single lead agent, or OPR, is suggested for each line item on all templates to assist PMs and other participants focus responsibility and increase accountability for results. Final determination of OPR should be assigned as required to improve organizational efficiency, and should be based on who is best suited to complete each task or final product. (Note that final approval authority for some line items may lie at higher levels.) The suggested OPR is a starting point and may vary by program. While other agencies are expected to participate on a collateral basis, multiple OPRs and offices of collateral responsibility (OCR) are not listed since responsibility would be defocused, and all variations between programs cannot be covered. Once identified and agreed upon, the OPR must produce a high quality review in assigned areas and gain the required level of participation from OCRs. The PM is the OPR for ensuring the entire certification process is properly executed.

Chapter 4

CERTIFICATION MESSAGES

4.1. Message Purpose. The certification message plays a critical part in the certification process. It documents in writing the level of agreement among participants in the certification process and specifies the extent of system readiness for dedicated OT&E within stated constraints. It confirms the certification process was properly followed, and serves as a quantifiable benchmark of projected capabilities against which to check OT&E results.

4.2. Contents. The certifying official should not simply enumerate what was ready for dedicated OT&E and what was not ready, but summarize the critical areas and processes accomplished. Organize the certification message to parallel the program's tailored certification process and discuss any agreed-upon limitations to OT&E. As a minimum, certification messages must review the following areas:

4.2.1. Briefly describe the OT&E program and which phase(s) of dedicated OT&E the message supports. Include OT&E start and end dates.

4.2.2. Briefly describe how the certification program was structured and executed.

4.2.3. List the templates (or line items, if necessary) which are fully certified as ready for dedicated OT&E without caveats or limitations.

4.2.4. List the templates (or line items, if necessary) which are not ready or have qualifications, caveats, and limitations and explain why. Describe any proposed workarounds, if required.

4.2.5. List any other system attributes not ready for OT&E or not expected to meet operational requirements in the ORD.

4.2.6. List any areas of disagreement with the OTA, the user(s), or other participants and the rationale.

4.2.7. List any required waivers or areas excluded from OT&E, the rationale, and future plans to clear the waivers. Note that approval of a waiver does not eliminate or alter the requirement for OT&E. Waived items must be tested in subsequent OT&E or the ORD must be changed.

4.2.8. List MAJCOM points of contact for the system's certification process.

4.3. Addressees. The PM will summarize the final certification briefing in a message to the OTA commander, with information copies to SAF/AQ, HQ USAF/TE, HQ USAF/XO, HQ AFMC/DO/XR, the DAC and HQ USAF/PEO, the responsible developmental test organization, and other participants. The message will be released at flag officer level.

4.4. Certification Acceptance. The OTA commander will acknowledge the certification message and "accept" the system before commencing dedicated OT&E. The acceptance message officially confirms OTA agreement (or disagreement) with the certifying official's assessments and conclusions, and concurs (or nonconcurs) with the decision to begin dedicated OT&E. Unless acted upon, the certifying official's message and OTA commander's acceptance message become the de facto corporate Air Force decision to proceed into dedicated OT&E.

4.5. Acceptance Message Contents. In drafting the acceptance message, consider the system's state of readiness for OT&E, the availability of resources, and if operational effectiveness and suitability can be successfully evaluated. Discuss the impacts of any unresolved issues, caveats, limitations to test, or waivers in the certification message which bear on the decision to proceed with OT&E. Send the acceptance message to SAF/AQ, AF/TE, the PEO, DAC, and PM, and the user(s) as a minimum.

4.6. Decertification and Recertification. Despite the developer's best efforts, systems may fail to perform as planned, and continuation of OT&E is not in the best interests of the Government. In these cases, either the OTA commander or the certifying official has the option of decertifying the system and returning it to DT&E. A decertification message is required. Before the system resumes dedicated OT&E, the certifying official must again certify the system via message after appropriate corrective actions have been taken. If a system is decertified, all templates should be revisited and modified, if necessary, to improve future certification reviews of that system.

RICHARD E. HAWLEY, Lt General, USAF
Principal Deputy, Assistant Secretary of the
 Air Force for Acquisition

Attachment 1

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

Abbreviations and Acronyms

ACAT—Acquisition Category

ADM—Acquisition Decision Memorandum

AFB—Air Force Base

AFI—Air Force Instruction

AFMC—Air Force Materiel Command

AFPD—Air Force Policy Directive

AFR—Air Force Regulation

APB—Acquisition Program Baseline

BDRSK—Battle Damage Repair Spares Kit

C—a symbol for "contractor"

C4I—command, control, communications, computers, and intelligence

CLS—Contractor Logistics Support

CND —cannot duplicate

COEA—Cost and Operational Effectiveness Analysis

COI—critical operational issue

CONOPS—Concept of Operations

DAC—designated acquisition commander

DIA—Defense Intelligence Agency

DISA—Defense Information Systems Agency

DoD—Department of Defense

DoDD—Department of Defense Directive

DoDI—Department of Defense Instruction

DPG—Defense Planning Guidance

DR—Deficiency Report (formerly called PQDR or SR)

DT—developmental test

DT&E—developmental test and evaluation

EC—electronic combat

ECAC—Electromagnetic Compatibility Analysis Center

e.g.—*exempli gratia*, meaning "for example"

EIS—Environmental Impact Statement

FOT&E—follow-on operational test and evaluation

FRACAS—Failure Reporting and Corrective Action System

GFE—government furnished equipment

HQ USAF—Headquarters, United States Air Force, Washington DC

IAW—in accordance with

ICS—Interim Contractor Support

ID—identification

ILS—Integrated Logistics Support

IOT&E—initial operational test and evaluation

JITC—Joint Interoperability Test Center

JRMET—Joint Reliability and Maintainability Evaluation Team

LFT—live fire test

LRU—line-replaceable unit

MC—Maintenance Concept

MIPRB—Material Improvement Program Review Board

MNS—Mission Need Statement

MOA—Memorandum of Agreement

MOE—measure of effectiveness

MOP—measure of performance

MOU—Memorandum of Understanding

MRSP—Mobility Readiness Spares Package

MS—milestone

M&S—modeling and simulation

OCR—office of collateral responsibility

OPSEC—operations security

OPR—office of primary responsibility

ORD—Operational Requirements Document

OSD—Office of the Secretary of Defense

OSHA—Occupational Safety and Health Act

OT—operational test

OTA—operational test agency

OT&E—operational test and evaluation

PEO—program executive officer

PM—program manager

PMP—Program Management Plan

PPBS—Planning, Programming, and Budgeting System

PQDR—Product Quality Deficiency Report

QOT&E—qualification operational test and evaluation

R&D—research and development

R&M—reliability and maintainability

RCM—Requirements Correlation Matrix

RDT&E—research, development, test and evaluation

RTO—responsible test organization

SAF—Secretary of the Air Force

SCG—Security Classification Guide

SE—support equipment

SMM—System Maturity Matrix

SPO—system program office

STA—System Threat Assessment

STAR—System Threat Assessment Report

TADIL—Tactical Digital Information Link

T&E—test and evaluation

TEMP—Test and Evaluation Master Plan

TO—technical order

TPWG—Test Planning Working Group

V&V—verification and validation

VV&A—verification, validation, and accreditation

Attachment 2

TEST PLANNING AND DOCUMENTATION SCHEDULE TEMPLATE

A2.1. Begin using the OT&E Certification Process as early as possible to help identify all long-lead items and risk areas. (All)

A2.2. Schedule sufficient numbers of certification reviews using the certification process. Frequency of reviews should increase as the program nears the start of dedicated OT&E. (PM)

A2.3. Resolve open issues, particularly with requirements, early enough to permit orderly planning and transition to dedicated OT&E. (PM)

A2.4. Develop realistic, achievable acquisition and test schedules and ensure they are "harmonized" throughout all program documents. Avoid "success oriented" schedules. (PM)

A2.5. Check for congressional and PPBS schedule constraints and incorporate into the acquisition schedule. (PM)

A2.6. Where "concurrent" testing is planned, ensure test planning starts early and that independent operational test objectives are not compromised. (OTA)

A2.7. Ensure availability of sufficient and timely RDT&E funding and procurement appropriations during each budget cycle to keep the program in technical balance. (PM)

A2.8. Conduct the final certification briefing a minimum of 30 days (if possible) prior to starting dedicated OT&E to allow sufficient time to address any remaining issues. (PM)

Attachment 3

TEST PLANNING AND DOCUMENTATION MISSION NEED STATEMENT (MNS) TEM-PLATE

A3.1. The MNS must be current and support the latest DPG. (User)

A3.2. The MNS must be coordinated, validated, and approved at the appropriate levels. (User)

A3.3. The MNS' mission capabilities must accurately flow down (be linked) through the ORD, COEA, CONOPS, and TEMP to the OT&E concept and OT&E plan. (User)

A3.4. The system must satisfy projected mission area deficiencies in the MNS and DPG before it is certified ready for dedicated OT&E. (PM)

A3.5. The "strategy-to-task" and "task-to-need" framework in the Mission Area Assessment, Mission Need Analysis, and the MNS must continue to support the preferred solution in the COEA. (User)

A3.6. The system must provide the needed capabilities against the most current DIA-validated threat described in the STAR. (PM)

A3.7. Possible joint, multi-national, or multi-service uses described in the MNS must be addressed during the system's development. (PM)

A3.8. The system must satisfy key constraints and boundary conditions relating to national-level defense planning and support identified in the MNS and DPG. (PM)

Attachment 4

**TEST PLANNING AND DOCUMENTATION OPERATIONAL REQUIREMENTS DOCU-
MENT (ORD) TEMPLATE**

A4.1. The system's characteristics and capabilities must satisfy each proposed concept in the MNS. (User)

A4.2. The ORD must be coordinated and approved at appropriate levels prior to each milestone, after major program changes, and sufficiently early to develop the OT&E test concept and plan. (User)

A4.3. All thresholds and objectives must be stated in operational terms and defined in measurable, beneficial increments of capability. (User)

- Requirements should be stated in such a manner that "testable" MOEs/MOPs can be developed. MOEs must be quantitatively measurable through analytically-based evaluation methods when possible. (User)

- An RCM must be attached that accurately summarizes the system characteristics and capabilities described in the ORD. The RCM must be up-to-date and in the proper format. (User)

A4.4. All key parameters, MOEs, threats, definitions, and other criteria must be consistent (harmonized) between the latest ORD, MNS, STAR, COEA, CONOPS, and APB. (User)

A4.5. High risk areas and potential problems must be identified prior to start of dedicated OT&E. (User)

A4.6. If increments of operational capability are planned, adequate information must be available to develop the SMM prior to development of the OT&E plan. (User)

A4.7. Changes to the ORD must be reviewed by the developing, OT&E, and all using commands. (User)

- After MS II, the ORD should be modified only due to changes in the MNS or cost-schedule-performance trade-offs conducted during Phase II. (User)

- Changes must be finalized early enough not to have adverse impacts on the successful completion of dedicated OT&E. (User)

- Open requirements issues must be documented and resolved prior to start of dedicated OT&E. (User)

- The ORD and RCM must contain a complete audit trail documenting rationale for all requirements changes, including changes from the APB. (User)

Attachment 5

TEST PLANNING AND DOCUMENTATION COST & OPERATIONAL EFFECTIVENESS ANALYSIS (COEA) TEMPLATE

A5.1. The COEA (if required) must be updated, validated, and approved at the appropriate level prior to each MS. (User)

A5.2. All reasonable alternatives must be objectively described. A preferred alternative and its military worth must be clearly identified. (User)

- All relevant costs must be identified using objective engineering and business estimates. (PM)
- All assumptions and constraints must be explicitly identified and supported by the latest MNS or ORD. (User)
- Acceptable ranges of performance must be established using rigorous cost-benefit, trade-off, and sensitivity analyses to show decision makers at what points certain degradations in system cost or performance yield outcomes that no longer satisfy the mission need. (User)

A5.3. Develop MOEs reflecting operational utility and show how they were derived from the MNS. (User)

- MOEs at the operational task level must be "testable" in order to develop DT&E and OT&E test plans and concepts. MOEs must be developed as early as possible and agreed to between user and tester. (User)
- MOEs, MOPs, and test criteria must be linked to system performance thresholds stated in the latest MNS and ORD and "track" throughout the program's development. (User)

A5.4. As requirements are refined, threats evolve, and tactics change in the ORD, STAR, CONOPS, and MC, incorporate these changes into the COEA and the OT&E plan. Ensure all requirements remain "harmonized" and current. (User)

A5.5. Describe all data bases and M&S assets used in the analysis. Ensure they are up-to-date and V&V'ed before use in the COEA. (User) (See M&S Template)

- Ensure all data bases and M&S assets are VV&A'ed before use in dedicated OT&E. (OTA)

Attachment 6

TEST PLANNING AND DOCUMENTATION SYSTEM THREAT ASSESSMENT REPORT (STAR) TEMPLATE

A6.1. The STAR* must remain valid and current with updates made prior to each MS. (PM)

A6.2. The STAR must be approved by AF/IN. For ACAT I programs, it must be validated by DIA. (PM)

A6.3. The STAR must be consistent with current DoD projections and "harmonized" with the threats listed in the MNS, ORD, and COEA. (PM)

A6.4. Program objectives from the ORD must be accurately summarized in the STAR. (PM)

A6.5. Sufficient threat detail must be provided to support system R&D and the development of realistic operational mission scenarios in support of the OT&E plan and schedule. (PM)
- All threats must be described in system-specific terms. (PM)
- Threat "shot doctrine" and employment tactics must be described. (PM)
- The "reactive" threat and potential countermeasures must be described. (PM)
- Sources for projections and areas of uncertainty must be cited. (PM)

* This template refers equally to the System Threat Assessment (STA) as well as the STAR.

Attachment 7

TEST PLANNING AND DOCUMENTATION MAINTENANCE CONCEPT TEMPLATE

A7.1. The MC must describe the optimal system maintenance strategies, concepts, and methods based on the suitability requirements in the MNS and ORD. (User)

- The MC must be consistent with the using command's and AFMC's logistics support plans and infrastructure. (User)
- The system must use an acceptable interservice, organic, and/or contractor mix. (User)
- The MC must identify potential high-risk areas and problem areas (such as poor integrated diagnostics, CND, software failures, and data integrity). (User)
- Limitations and work-arounds must be identified. (User)

A7.2. Logistics and readiness MOEs, criteria, thresholds, objectives, and definitions in the MNS and ORD must accurately flow down (be linked) to the MC, which must in turn be linked to the OT&E concept and plan. (User)

A7.3. The strategies and plans in the MC must be sufficiently detailed to support early development of the OT&E concept and OT&E plan. (User)

A7.4. Realistic suitability test scenarios for DT&E must be developed from the MC and be consistent with the CONOPS. (PM) Realistic suitability scenarios for OT&E must also be developed. (OTA)

A7.5. The system must be supportable in dedicated OT&E using the MC's strategies and plans. (PM)

- DT&E must demonstrate the system is viable and supportable according to the MC and ready for dedicated OT&E. (PM)
- The system must demonstrate the capability to satisfy each of the fourteen elements of operational suitability and the ten ILS elements. (PM)
- The system's design must successfully address the quantitative and qualitative constraints identified in the MC. (PM)

A7.6. System maturity, logistics support, available resources, personnel, etc. must be sufficient to support the MC and maintenance plan during dedicated OT&E. (OTA) (See template series under Test Assets and Support)

Attachment 8

TEST PLANNING AND DOCUMENTATION CONCEPT OF OPERATIONS (CONOPS) TEM-PLATE

A8.1. The CONOPS must describe optimal system employment methods and tactics and be based on the operational requirements in the latest MNS and ORD. (User)

- The OT&E concept and OT&E plan must be developed from the strategies in the CONOPS. (OTA)
- The CONOPS must be sufficiently detailed to permit early development of operationally realistic test scenarios and tactics for the OT&E test concept and test plan. (User)

A8.2. Operational effectiveness requirements, criteria, thresholds, objectives, and definitions in the MNS and ORD must accurately flow down (be linked) to the CONOPS, which must in turn be linked to the OT&E test concept and OT&E plan. (User)

- Changes in the MNS, ORD, STAR, COEA, MC, and TEMP must be analyzed for potential impacts on the CONOPS, which in turn affect the OT&E plan. (User)

A8.3. Realistic test scenarios for DT&E must be developed from the CONOPS and be consistent with the MC. (PM) Realistic test scenarios for dedicated OT&E must also be developed. (OTA)

A8.4. The system must demonstrate readiness for dedicated OT&E in its intended operational environment using the CONOPS' strategies and plans. (PM)

- The system must clearly demonstrate in DT&E the potential to perform the roles, missions, and tasks described in the CONOPS. (PM)
- The system's design must successfully address the quantitative and qualitative constraints identified in the CONOPS that impact system performance in dedicated OT&E. (PM)

Attachment 9

TEST PLANNING AND DOCUMENTATION TEST & EVALUATION MASTER PLAN (TEMP) TEMPLATE

A9.1. The TPWG or other designated forum must review the status of system certification as directed by the certifying official. (PM)

A9.2. The TEMP must be updated, coordinated, and approved at appropriate levels prior to each MS and after major program changes. (PM)

- Open issues must be addressed. Changes required by OSD or other decision authorities must be incorporated as agreed. (PM)
- Coordination must be timely and efficiently planned to minimize chances of late rejection and negative impacts on dedicated OT&E. (PM)

A9.3. The TEMP must be accurately "harmonized" with the most recent ORD, STAR, MC, CONOPS, and COEA. (PM)

A9.4. The APB and ADM must be reviewed to ensure new directions, requirements, and critical technical parameters are included in the TEMP as appropriate. (PM)

A9.5. The TEMP must establish clear relationships between 1) test management strategy and structure, program schedule, and required resources, and 2) performance requirements, COIs, critical technical parameters, evaluation criteria, and MS decision points. (PM)

- The OT&E program must be executable in terms of structure, schedule, and resources. (OTA)
- Dedicated OT&E test resource shortfalls or limitations potentially impacting dedicated OT&E must be identified and discussed in the TEMP. (OTA)
- Describe the M&S assets to be used in dedicated OT&E. Ensure they are VV&A'ed and their use is approved. (OTA) (See M&S Template)
- The test strategy and structure must use an established "test process," if available. (PM)
- If LFT is required, include the LFT strategy in the TEMP. (PM)
- The sources of all technical parameters/requirements must be documented. (PM)

A9.6. The TEMP must describe what DT&E, OT&E, or combined DT/OT has done or will do to ensure the system has the potential to meet all user requirements in dedicated OT&E. (PM)

- Show how all critical issues and MOEs will be addressed in dedicated OT&E. (OTA)
- Proposed work-arounds (to include contractor involvement) must be sound, feasible, and consistent with national policy. (PM)

A9.7. Rationale and provision must be made for any testing deferred past dedicated OT&E into FOT&E. (PM)

Attachment 10

TEST PLANNING AND DOCUMENTATION OPERATIONAL TEST AND EVALUATION (OT&E) PLAN TEMPLATE

A10.1. The OT&E test concept must be developed and briefed as early as feasible. (OTA)

- The OT&E concept must describe the characteristics of the operational and maintenance environments and test scenarios the system will encounter in dedicated OT&E. Sufficient detail must be included to assist PMs introduce the correct level of operational realism into DT&E. (OTA)

- After OT&E concept review, the DT&E program must be made sufficiently rigorous to ensure user requirements can be met or exceeded in these environments. (PM)

- Ensure TPWG meetings are scheduled and structured to add value to the dedicated OT&E through better MS reviews and certification briefings. (PM)

A10.2. The OT&E test plan must be developed and coordinated as early as feasible at appropriate levels. If an OSD oversight program, OSD/DOT&E approval of test plan adequacy is required. (OTA)

- Adequate lead time must be provided to review and approve the plan, to include latest changes, prior to system certification. (OTA)

- The plan and its MOEs must have clearly defined linkages, or be "harmonized" with the MNS, ORD, COEA, TEMP, and STAR. (OTA)

A10.3. A phase of rigorous, dedicated OT&E must be planned with sound T&E methodologies evident throughout. (OTA)

- Sufficiently realistic testing must be planned that emulates expected combat and peacetime training environments. (OTA)

- Open issues and disconnects (such as with test methodologies, requirements, and MOEs) must be resolved. (OTA)

- Definitions, formulas, models, scenarios, and evaluation criteria must be standardized as much as possible between the DT&E and dedicated OT&E plans. (OTA)

- M&S assets planned for dedicated OT&E should be as consistent as possible with the M&S assets used in the COEA and the DT&E. (OTA) (See M&S Template)

A10.4. All resource requirements (M&S support, test articles, training, fault analysis, contracting, etc.) must be identified. (OTA) (See template series under Test Assets and Support.)

A10.5. A program with combined DT&E/OT&E must ensure the following:

- None of the dedicated DT&E or dedicated OT&E test objectives are compromised as a result of combined testing. (OTA)

- DT&E data and formats are useable in dedicated OT&E as much as possible. (OTA)

- Test item configurations are rigorously controlled according to plan. (PM) (See Configuration Management Plan Template)

- Duplication and gaps in testing are minimized. (OTA)

- A prudent number of backup resources (test assets, funds, etc.) are available to supplement dedicated OT&E if planned DT&E data is unusable or unavailable. (PM)

A10.6. Describe all dedicated OT&E test limitations (lack of test resources, time, system capabilities, insufficient realism, etc.) that may impact the MS III decision. (OTA)

- Describe how these test limitations will be addressed in FOT&E and beyond. (OTA)
- Detailed test procedures must be developed and provided to the SPO. Test procedures should be dry run. (OTA)

Attachment 11

TEST PLANNING AND DOCUMENTATION DEFICIENCY IDENTIFICATION AND CORRECTION PROCESS TEMPLATE

A11.1. A contractor-owned and -based deficiency reporting (DR) system (formerly PQDR) must be established and provide usable results to the Government's DR system. (C)

A11.2. A Government-run DR system must be established for promptly identifying and accurately reporting system deficiencies. (PM)

A11.3. A MIPRB must ensure resolution of all DRs and list the impacts to dedicated OT&E. (PM)

A11.4. A DR Review Board will review, validate, and prioritize all DRs on a timely basis. (PM)

A11.5. A Failure Reporting and Corrective Action System (FRACAS), or similar system, must be used to report, track, and provide corrective action status to all specification deficiencies. (PM)

A11.6. A JRMET and a Test Data Scoring Board must be established to review all R&M data. (PM)

A11.7. Contractor testing and open deficiencies from DT&E must not preclude successful conduct of dedicated OT&E and the achievement of operational requirements. (PM) (See Deficiency Resolution Template)

Attachment 12

TEST PLANNING AND DOCUMENTATION SECURITY PLANNING TEMPLATE

A12.1. Identify security constraints and their impacts on dedicated OT&E. Develop work arounds where possible. (OTA)

A12.2. The system OPSEC plan must be current and system engineering security requirements accomplished. (PM)

- Identify and resolve any disconnects between service and system SCGs. (PM)
- Ensure secure communications and/or frequencies (if required) are in place to support system-level DT&E and dedicated OT&E. (PM)
- Ensure data encryption and encoding devices are available (if required). (PM)
- Ensure security measures and requirements (such as TEMPEST and HAVE HEMP) are accomplished and current. (PM)

A12.3. The system's SCG and Program Protection Plan must be current. (PM)

- Ensure computer system security protection measures are accomplished and current. (PM)

A12.4. Security clearances and required security training for test team personnel must support the dedicated OT&E plan and schedule. (OTA)

Attachment 13

TEST PLANNING AND DOCUMENTATION CONFIGURATION MANAGEMANT PLAN TEMPLATE

A13.1. A system configuration control mechanism must be in place for all system components and support items (hardware, software, support equipment, GFE, etc.). (PM) (See Production Representative Articles Template)

- A Configuration Management Plan and configuration baselines must be used to ensure an orderly transition from one MS decision point to the next. (PM)
- The Government must have sufficient control or oversight over the configuration to ensure the results of dedicated OT&E are not invalidated. (PM)

A13.2. The exact system configuration must be traceable throughout the program. (PM)

- Ensure the capability exists to assess any configuration differences between preproduction and production test articles. (PM)

A13.3. If known deficiencies remain in test articles before start of dedicated OT&E, the Configuration Management Plan must describe strategies for managing the following areas: (See Deficiency Resolution Template)

- System form, fit, and function must not be adversely affected as a result of each deficiency. (PM)
- The impacts of fixing before versus after dedicated OT&E must be assessed. (PM)
- Additional testing needed to verify correction of deficiencies must be identified. (PM)
- The system configuration will be stable and production representative before the start of dedicated OT&E. (PM)

A13.4. Identify in the plan any system development or maturity issues that negatively impact the OT&E plan and schedule in support of the next MS review. (PM)

A13.5. Certify that the start of full-rate production will not invalidate OT&E's results due to changes in or termination of any quality control procedures or mechanisms (such as environmental stress screening) used during preproduction. (PM)

Attachment 14

SYSTEM DESIGN AND PERFORMANCE CONTRACTOR TESTING TEMPLATE

A14.1. Ensure all system specifications and contractor requirements reflect the latest ORD changes. Late ORD changes may not be practical to reflect in the system spec. (PM)

A14.2. A comprehensive test plan for contractor development, qualification, and production acceptance testing must be in place. (C)

- The plan must minimize overlaps and gaps and collect maximum information from every test event. (C)
- Requirements and specifications must flow down accurately and clearly from prime contractors to subcontractors. (C)
- Test methods selected must determine if all aspects of the spec and user requirements can be met. (C)
- Multiple test events should be performed under varying conditions to demonstrate specification compliance. (C)
- Sub-system and system pass/fail specification thresholds must be directly traceable to the stated operational requirements in the latest ORD. (PM)
- A realistic (attainable) event-driven test schedule must be proposed and funded. (C)

A14.3. Contractor testing must demonstrate that the system and/or components are performing as planned at each step in development. (C)

- Government engineering analysis should determine if test results support achievement of the spec and if the system is projected to meet operational requirements. (PM)

A14.4. Ensure contractor personnel will not be involved in dedicated OT&E except where permitted by law. (OTA) (See Contractor Support Template)

A14.5. Periodic reviews should be made of available government facilities with the goal of using them in contractor testing wherever cost-effective and feasible. (PM)

A14.6. A deficiency identification, tracking, and correction system must be in place to monitor test failures. (C) (See Deficiency ID and Correction Process Template)

- All test failures and resultant system design changes must be documented and analyzed. Tests must be repeated as necessary to verify specification compliance. (C)
- Document all changes to specification threshold (pass/fail) values and rationale. (PM)
- Government review must continually monitor for impacts on DT&E and dedicated OT&E. (PM)

A14.7. Planned contractor testing must be completed according to the contract specification before government acceptance and dedicated OT&E. (C)

- Contractor testing deferred past government acceptance of the system should be documented and approved in the TEMP. Impacts to DT&E and dedicated OT&E must be documented. (PM)

Attachment 15

SYSTEM DESIGN AND PERFORMANCE DEVELOPMENTAL TESTING TEMPLATE

A15.1. System requirements in the ORD must accurately flow down through the contract specifications and be demonstrated during DT&E. (PM)

A15.2. When design-cost-performance trade-offs are made that may not meet user requirements, user concurrence must be obtained and documented. (PM) (User must document in ORD and RCM.)

A15.3. The DT&E schedule and testing must be planned and executed to allow sufficient time to certify system readiness, start dedicated OT&E, and complete dedicated OT&E before MS III. (PM)
- DT&E must demonstrate that system design is complete and acquisition risks have been minimized. (PM)
- DT&E must validate that contractor testing is complete, or that a plan exists to finish testing. (PM) (See Contractor Testing Template)
- The results of DT&E indicate the system will perform successfully in dedicated OT&E and will meet MS III approval criteria. All specified technical thresholds have been met. (RTO)
- Sufficient suitability testing must be conducted to permit credible predictions about system R&M. All suitability thresholds have been assessed as achievable. (RTO)

A15.4. A government-run DR system must be in place in support of DT&E and OT&E for identifying, tracking, and reporting deficiencies. (PM) (See Deficiency ID &Correction Process Template)

A15.5. The government must be in control of a system configuration tracking and control process during DT&E that will support dedicated OT&E. (PM)
- The system design must be finalized with no major changes planned prior to dedicated OT&E. (PM) (See Production Representative Articles Template)

A15.6. Sufficient operationally relevant DT&E must be done, culminating in a "dress rehearsal" in the final phase of test, to determine if operational requirements can be met before dedicated OT&E. (RTO)
- Sufficient interoperability and compatibility testing with other systems must be done. (PM) (See Interoperability and Compatibility Template)

A15.7. LFT (if required) must be complete before start of dedicated OT&E, or a waiver approved prior to MS II. (PM) (See LFT Template)

A15.8. SEEK EAGLE should be completed prior to dedicated OT&E. If not, ensure flight clearances are available for use in dedicated OT&E. (PM)

A15.9. For combined T&E, minimize duplication and gaps in testing and the use of facilities. (OTA) (See OT&E Plan Template)
- Data formats used in DT&E and OT&E must be compatible to maximize availability and usability of data. (OTA)

A15.10. An agreed-upon plan and rationale must exist (i.e., in the TEMP) for testing any areas or capabilities deferred past the start of dedicated OT&E. (PM)

- If there are any incomplete test areas, explain why and give impacts on dedicated OT&E. (RTO)

A15.11. Ensure sufficient interim DT&E results and conclusions are available to support certification of readiness for dedicated OT&E. (RTO)

Attachment 16

SYSTEM DESIGN AND PERFORMANCE LIVE FIRE TESTING TEMPLATE

A16.1. Review the most current requirements, threats, and operational scenarios in the MNS, ORD, STAR, CONOPS, APB, and COEA to determine if the system is a "covered system." OSD concurrance is required. (PM)

A16.2. If LFT is required (for a covered system), it must be completed before start of dedicated OT&E or a LFT waiver approved before MS II. (PM)

A16.3. If LFT is required, determine LFT scope and complete a cost-benefit analysis. (PM)
- If LFT is determined to be cost-effective and will be accomplished, include a LFT strategy in the TEMP and prepare a LFT plan for OSD comments. (PM)
- Provide a LFT report to OSD for comments and before certification for dedicated OT&E. (PM)

A16.4. If LFT is determined <u>not</u> to be cost effective, prepare a LFT waiver request package with an alternate plan for vulnerability/lethality testing for HQ USAF and OSD approval before MS II. (PM)
- Include the alternate vulnerability/lethality testing strategy in the TEMP. (PM)
- Provide the alternate plan to OSD for comments. (PM)
- Provide a vulnerability/lethality test report to OSD for comments and before certification for dedicated OT&E. (PM)

A16.5. Deficiencies identified during LFT that are to be corrected must be tracked and retested prior to certification for dedicated OT&E. (PM)

A16.6. Fully comply with all system-specific congressional direction regarding LFT. (PM)

Attachment 17

SYSTEM DESIGN AND PERFORMANCE SYSTEM PERFORMANCE TEMPLATE

A17.1. The system must demonstrate it is capable of meeting operational effectiveness and suitability requirements in its intended operational environment using operationally relevant scenarios. (PM)

- The system must demonstrate that it will perform successfully in dedicated OT&E (meet user requirements) and will meet MS III approval criteria. (PM)
- Areas of system effectiveness and suitability must be reviewed against requirements (MOEs, MOPs, thresholds, objectives, and other test criteria). (PM)

A17.2. System T&E must demonstrate that known design problems have been identified and corrected or resolved. (PM) (See Deficiency Resolution Template)

- Any remaining problem areas must have minimal impact on the outcome of dedicated OT&E. (PM)
- Fixes must be identified for all problems deferred past the start of dedicated OT&E into FOT&E. (PM)

A17.3. System software must be sufficiently stable and mature to enter OT&E. (PM)

A17.4. System integration problems must be corrected to allow operators to satisfy mission requirements. The system must be ready for system- or mission-level testing. (PM)

- Integration <u>among</u> system components and subsystems must optimize total system design and performance capabilities. (PM)

A17.5. If the system was planned to be certified in increments of increasing capability (maturity), describe what capabilities are lacking at this time. (PM)

- If the system is developed using an approved SMM, it must meet user-validated interim requirements for this stage of development during OT&E. (PM) (See System Maturity Template)

A17.6. LFT (if required) must be complete and achieve required (acceptable) levels of system survivability or lethality. (PM) (See LFT Template)

Attachment 18

SYSTEM DESIGN AND PERFORMANCE SYSTEM MATURITY TEMPLATE

A18.1. Interim requirements for system and sub-system components (to include support equipment) should be stated in the ORD and RCM. (User)

- Target dates for these maturity levels should be provided. (User)

A18.2. Interim values for system and sub-system level components (to include support equipment) must be available in the SMM and transferred into the spec. (PM)

- A reliability and maintainability (R&M) growth plan must be developed and coordinated. (PM)

- Identify any system development and/or maturity aspects impacting the ability to start and complete dedicated OT&E in time to support MS III. (PM)

A18.3. The system's development progress must adhere to the specified interim and/or mature values and schedules in the SMM. (PM)

- DT&E must demonstrate the system is on track (expected to meet interim and/or mature values at the specified maturity levels) to be certified ready for dedicated OT&E. (PM)

- Any constraints precluding the system from meeting interim and/or mature requirements during dedicated OT&E must be assessed. (PM)

A18.4. System configuration must be carefully controlled as the system matures. (PM) (See Configuration Management Plan Template)

- Identify differences between the OT&E configuration and the production configuration, to include an assessment of potential impacts on the validity of dedicated OT&E. (PM)

A18.5. The system and its sub-systems must demonstrate decreasing rates of problem identification. (PM)

Attachment 19

SYSTEM DESIGN AND PERFORMANCE PRODUCTION REPRESENTATIVE ARTICLES TEMPLATE

A19.1. Articles (to include support equipment, software, GFE) must be as production-representative as possible and available in the required quantities to support the dedicated OT&E plan and schedule. (PM)

A19.2. A system configuration control mechanism must be in place for all system components and support items (hardware, software, support equipment, GFE, etc.). (PM)

- The Government must have sufficient control or oversight over the configuration to ensure the results of dedicated OT&E are not invalidated. (PM) (See Configuration Management Plan Template)
- The exact system configuration must be traceable throughout the program. (PM)

A19.3. Assess any configuration differences between preproduction and production test articles and the expected impact on the validity of dedicated OT&E. (OTA)

A19.4. Ensure the design is compatible with factory production procedures. (PM)

A19.5. If known deficiencies remain in test articles (See Deficiency Resolution Template):

- Certify how form, fit, and function are affected as a result of each deficiency. (PM)
- Assess the impacts of fixing before versus after dedicated OT&E. (PM)
- Identify additional testing needed to verify correction of deficiencies. (PM)

A19.6. Certify that the start of rate production will not invalidate dedicated OT&E results due to changes in or termination of any quality control procedures or mechanisms (such as environmental stress screening) used during preproduction. (PM)

A19.7. Identify any system development or system maturity issues that negatively impact the OT&E plan and schedule or support the next MS review. (PM)

A19.8. Other systems and subsystems required to interoperate with the test articles (including external systems) must be available to permit testing in an operationally realistic manner. (OTA)

- A process must be in place to manage system integration with other required systems and subsystems. (PM)
- Ensure embedded test instrumentation is "invisible" to system performance and operators. (PM)

Attachment 20

SYSTEM DESIGN AND PERFORMANCE INTEROPERABILITY & COMPATIBILITY TEMPLATE

A20.1. The system must be interoperable and compatible with other systems as required in the MNS, ORD, APB, TEMP, and/or by DISA. (PM)

- The system's performance must not be degraded when operated with other systems during OT&E and in the intended operational environment. Likewise, the system must not degrade the performance characteristics of other systems beyond the limits stated in the ORD. (PM)

- Quantify how much degradation (or enhancement) will result in other interoperable systems' performance characteristics when the system is deployed. (PM)

A20.2. Data passed to and from other independent and interoperable systems must be compatible. (PM)

A20.3. For C^4I systems:

- Interface control documents are needed with affected agencies to establish data exchange formats, communication protocols, etc. (PM)

- Contact the AF/PTU at Langley AFB for status of TADIL and standards interoperability. (PM)

- Obtain DISA and JITC joint interoperability certification as required. (PM)

A20.4. Ensure compliance with the USAF Electromagnetic Compatibility Program and Radio Frequency Spectrum Management guidelines. Assistance available at ECAC. (PM)

A20.5. Other systems and subsystems required to interoperate with the test articles (including external systems) must be available to permit testing in an operationally realistic manner. (OTA)

- A process must be in place to manage system integration with other required systems and subsystems. (PM)

- Ensure embedded test instrumentation is "invisible" to system performance and operators. (PM)

Attachment 21

SYSTEM DESIGN & PERFORMANCE SOFTWARE DEVELOPMENT TEMPLATE

A21.1. System functionality and maturity must be developmentally tested at the system level prior to the start of dedicated OT&E. (PM)

A21.2. Define software-related exit criteria at MS II. These criteria may be modified and/or criteria added as appropriate during system development. (PM)

A21.3. Develop and implement a "requirements traceability" metric to measure the adherance of the software products (to include design and code) to the ORD requirements. (PM)

A21.4. System level integration testing of software and hardware-software-firmware interfaces must be monitored, documented, and complete. (PM)

A21.5. Ensure interoperability requirements are met by verifying software interfaces are operational. (PM) (See Interoperability and Compatibility Template)
- The software must be tested at the unit, integration, and system levels, and if the software is modified, adequate regression testing must be done. (PM)

A21.6. Known software and firmware discrepancies affecting system performance or the dedicated OT&E must be properly documented and appropriate corrective action(s) taken. (PM)

A21.7. Sufficient regression testing must be done at the unit, integration, and system levels to ensure any changes do not result in additional defects. (PM)

A21.8. Ensure the Government has an effective software configuration management and control system and control procedures in place. (PM) (See Configuration Management Plan Template)

A21.9. Software manuals (Software User's Manual(s), Software Programmer's Manual, Computer System Operator's Manual, Firmware Support Manual, and Computer System Diagnostic Manual) must be validated and up-to-date with the current software baseline. They must be sufficient to support dedicated OT&E. (PM)

A21.10. Software and firmware configurations must be fully documented and "frozen" before starting dedicated OT&E. Changes must not be implemented during dedicated OT&E. (PM)

A21.11. The software must be stable (operate error free for a reasonable length of time prior to dedicated OT&E). (PM)

A21.12. The software must be certified (security, flight safety, and nuclear weapons) for operational use as appropriate. (PM)

A21.13. Government facilities, tools, and manpower must adequately support fielding of the software if the MC requires the Government to maintain the software. (PM)

A21.14. Contractor software support (if required for the fielded system) must be representative and available to support the OT&E plan and schedule. (PM)

Attachment 22

SYSTEM DESIGN AND PERFORMANCE SAFETY REVIEWS AND CERTIFICATIONS TEMPLATE

A22.1. The system must be capable of being safely operated and maintained during dedicated OT&E and in its intended operational environment. (PM)

A22.2. All catastrophic and critical hazards (Category I and II) must be addressed through the Safety Review Board and closed before the start of dedicated OT&E. (PM)
- The CONOPS and MC must be reviewed, and safety constraints and limitations addressed. (PM)
- Perform a Hazard Analysis to minimize risks during dedicated OT&E. (PM)
- Review OSHA, State, and Air Force hazardous waste regulations for compliance. (PM)
- Environmental impacts must be identified, mitigated, or neutralized. (PM)

A22.3. Validated technical, safety, and procedural manuals must be available to support the dedicated OT&E plan and schedule. (PM)

A22.4. Operator and maintenance personnel must have safety training completed in time to support the OT&E plan and schedule. (OTA)

A22.5. Formal certifications may be required from the following boards: (PM)
- Nonnuclear Munitions Safety Board
- Conventional Munitions Board
- Flight Safety Board
- Airframe Certification
- Range Safety
- Directorate of Nuclear Safety

A22.6. Obtain operational flight waivers for systems requiring release from aircraft. (OTA)

Attachment 23

SYSTEM DESIGN AND PERFORMANCE DEFICIENCY RESOLUTION TEMPLATE

A23.1. All deficiencies must be promptly and accurately reported and tracked. (PM)

A23.2. Known deficiencies or capabilities deferred past the start of dedicated OT&E must be reviewed and prioritized by a DR review board and an impact analysis performed. (PM)

- Category I and II deficiencies having impacts on OT&E or any COI must be fixed and closure verified according to an agreed upon plan. (PM)
- Ensure dedicated OT&E can be completed as planned and results will not be invalidated due to deferred deficiencies. (PM)
- Assess any synergistic relationships between deficiencies for impact on dedicated OT&E. (PM)
- Deficiencies should be rank-ordered, and the most critical worked first or as agreed to by the user(s) and RTO(s). (PM)
- User and RTO concurrence is required in the rank-ordering. (User)

A23.3. The deficiency analysis process must be complete and coordinated with users and testers prior to the start of dedicated OT&E. (PM)

A23.4. If some deficiencies cannot be corrected or resolved prior to start of dedicated OT&E, develop a plan for testing deferred capabilities and fixes after dedicated OT&E is done. (PM)

- Define the scope and content of software and hardware releases planned after completion of dedicated OT&E. (PM)

A23.5. System form, fit, and function must not be affected if dedicated OT&E is conducted with any knowndeficiencies. (PM) (See Production Representative Articles Template)

Attachment 24

TEST ASSETS AND SUPPORT TEST TEAM TRAINING TEMPLATE

A24.1. OT&E test team training requirements and assets must be identified early and in sufficient detail. (OTA)

- For multi-service and multi-national systems, additional multi-service/national training requirements must be identified. (OTA)

A24.2. Required training must be adequately contracted for, funded, and scheduled to assure completion at the times required in the OT&E plan and schedule. (PM)

- Software maintenance training must be completed for OT&E evaluators if the software maintenance concept is for the Government to maintain the software. (PM)
- OT&E test team personnel must be certified proficient in their respective skills before the start of dedicated OT&E. (OTA)
- Training must include normal and emergency operations to operate and maintain the system(s) according to the CONOPS and MC. (PM)

A24.3. Dry run all test procedures before start of dedicated OT&E. (OTA)

Attachment 25

TEST ASSETS AND SUPPORT PERSONNEL TEMPLATE

A25.1. Identify OT&E test team personnel requirements, including software maintenance skills and security clearances. Number of personnel and skill levels must be representative of the field (reflect the operational environment). (OTA)

A25.2. Written job descriptions must be available for test team personnel. (OTA)

A25.3. Written agreements must be in place establishing the sources for required personnel. (OTA)

A25.4. Estimates of maintenance requirements (in terms of man hours and personnel) for LRUs, sub-systems, and the full system must be available. (PM)

A25.5. Contractor support (ICS and CLS) must be identified. (PM)

A25.6. Required training, including Type I training, must be completed or scheduled for completion to support the OT&E plan and schedule. (PM) (See Test Team Training Template)

Attachment 26

TEST ASSETS AND SUPPORT TEST & EVALUATION INFRASTRUCTURE TEMPLATE

A26.1. Resources and funding must be approved to start and sustain a credible OT&E program. (PM)

A26.2. Test ranges (both indoor and outdoor) and other test facilities must be properly equipped, manned, funded, scheduled, and personnel briefed before start of dedicated OT&E. (OTA)

A26.3. Realistic targets (or validated target simulators) must be in the most current operational configuration(s) and available in sufficient quantities. (PM)

A26.4. Sufficient threat densities, either in open-air or indoor facilities, must rigorously stress the system in as realistic a combat environment as possible. (OTA) (See Threat Systems Template)

A26.5. Adequate test instrumentation and data reduction capabilities must be identified, funded, scheduled, and support agreements negotiated on use rates and data requirements. (OTA)

A26.6. Modeling and simulation assets (including simulators, test drivers, and scenarios) must be VV&A'ed, scheduled, and available to support the OT&E plan and schedule. (OTA)

A26.7. Use the appropriate "test process" (i.e. EC Test Process) if available. (PM)

A26.8. Identify T&E infrastructure shortfalls in the TEMP and inform AF/TE. (PM)

A26.9. An EIS (if required) addressing all Federal, State, Air Force, and local restrictions must be completed and approved, or waivers granted. (RTO)

Attachment 27

TEST ASSETS AND SUPPORT MODELING & SIMULATION TEMPLATE

A27.1. Develop a M&S plan for the system linking M&S requirements throughout the program (from the COEA through the MS III decision). (PM)

- Show how proposed M&S resources support the program by linking them directly to requirements and the COEA. (PM)

- M&S requirements, including interfaces with other systems, must be identified and included in the TEMP. (PM)

- M&S assets should be usable by both the DT and OT test teams. The OT&E team should receive adequate training in their use. (PM)

- Definitions, formulas, and evaluation criteria used to determine operational effectiveness and suitability must be consistent between DT&E and dedicated OT&E. (OTA)

- The system's M&S support requirements (to include the system life cycle) must be identified as early as possible. A life cycle plan must be developed for ownership and maintenance of M&S assets after system deployment. (PM)

A27.2. A M&S VV&A plan must be developed with a comprehensive schedule that supports the OT&E plan and schedule. (OTA)

- Scenarios, test tools, and analysis tools required for testing must be adequately documented. (PM)

- M&S assets must be VV&A'ed independently of the developer and user before use in dedicated OT&E. Key assumptions (threats, tactics, etc) must also be VV&A'ed. (OTA)

- The design engineering notebook data must be reviewed. Physics models can be V&V'ed, whereas operations analyses are subjectively V&V'ed. Empirical test data should be used to establish model credibility. (PM)

- The correct M&S accreditation agent must be used. (OTA)

A27.3. Establish a M&S documentation and audit trail. (PM)

A27.4. If M&S will generate results used to support or influence major decisions, OSD/DOT&E must approve their use in dedicated OT&E. (OTA)

Attachment 28

TEST ASSETS AND SUPPORT SUPPORT EQUIPMENT TEMPLATE

A28.1. Peculiar, common, and unique* support equipment (SE) must be identified as early as feasible. (PM)

A28.2. Peculiar SE and its required support (technical data, spares, etc) must meet the maintenance times and capabilities stated in the ORD. (PM) (See System Performance Template)

- Peculiar SE must be available in required quantities to support the OT&E plan and schedule. (PM)
- Peculiar software SE and its supporting technical data, compilers, manuals, etc., must be available if the Government maintains the software. (PM)

A28.3. Peculiar SE must be in production representative configurations and fully interoperable and compatible with the system(s) it supports. (PM) (See Production Representative Articles Template)

- Assess any configuration differences between preproduction and production peculiar SE and the expected impact on the validity of dedicated OT&E. (PM)
- The Government must have positive control or oversight over SE configurations. (PM)

A28.4. Common SE must be identified and available in the required quantities to support the OT&E plan and schedule. (User)

A28.5. Unique SE must be identified and available in the required quantities to support the OT&E plan and schedule. (PM)

A28.6. SE training must be accomplished or scheduled to support the OT&E plan and schedule. (PM)

* Peculiar SE. SE under development in support of the system being tested.

Common SE. Fielded SE that supports existing systems used in dedicated OT&E.

Unique SE. Contractor or Government furnished SE for RDT&E use only.

Attachment 29

TEST ASSETS AND SUPPORT SUFFICIENCY OF SPARES TEMPLATE

A29.1. Sufficient spares must be available to support test assets, test scenarios, and SE according to the OT&E plan and schedule. Support levels must be based on the total number of expected operational test hours. (PM)

A29.2. Spares repair procedures and capabilities (for blue suit and/or CLS, if required) must be in place to support the OT&E plan and schedule. (PM)

A29.3. Provision must be made for timely failure confirmation and repair action reports to the OT&E test team. (PM)

A29.4. The management concepts for primary operating stocks, war readiness spares support, and for battle damage repair must be estimated prior to OT&E plan development. (PM)
- Candidate spares for two-level maintenance must be identified. (PM)
- Required spare levels for MRSP and BDRSK must be identified. (User)

A29.5. An Integrated Logistics Support Plan must be developed which accurately reflects the MC and CONOPS. (PM)
- Identify the risks and limitations in the spares which support dedicated OT&E. For spares with limited availability, define how quickly they must be replenished. (PM)
- The projected number of spares and rates of replenishment must support the ops tempo of the dedicated OT&E. (PM)

Attachment 30

TEST ASSETS AND SUPPORT PACKAGING, HANDLING, & TRANSPORTATION TEMPLATE

A30.1. Shipping containers, packaging, handling, and transportation components and methods must be fully qualified and expected to meet the requirements stated in the ORD. (PM)

- Operationally representative maintenance demonstration scenarios must be used. (PM)

A30.2. Adequate numbers of production representative shipping containers and packaging must be used to transport all test articles to the OT&E sites. (PM)

A30.3. TOs must be validated and available to support the OT&E plan and schedule. (PM)

A30.4. Shipping, transportation, receiving, and storage arrangements must be in place with the contractor and host base transportation offices to ensure timely shipping, receiving, and resource protection of test and support assets. (OTA)

A30.5. OT&E test team maintenance personnel must be adequately trained. (PM) (See Test Team Training Template)

Attachment 31

TEST ASSETS AND SUPPORT SUPPORT AGREEMENTS TEMPLATE

A31.1. MOUs and MOAs should establish the availability of test and support resources needed to support the OT&E plan and schedule. (OTA)

- For multi-service testing, comply with the terms of the "MOA on Multiservice Operational Test and Evaluation and Joint Test and Evaluation." (OTA)

A31.2. Host base support agreements should be established for using required ranges, test facilities, airspace, frequencies, etc., and base support functions such as supply, transportation, and billeting. (OTA)

A31.3. Necessary support agreements should be established with other Government agencies for such functions as data processing, failure analysis, communications, and security. (OTA)

A31.4. The potential for conflict of interest must be strictly avoided, mitigated, or neutralized before any contractor is allowed to participate in the support of dedicated OT&E. (OTA) (See Contractor Support Template)

Attachment 32

TEST ASSETS AND SUPPORT CONTRACTOR SUPPORT TEMPLATE

A32.1. All contractor assistance or services required to support dedicated OT&E must be identified in the OT&E test plan and TEMP. (Some types of contractor involvement are prohibited by national law.) (OTA)

- The potential for conflict of interest must be strictly avoided, mitigated, or neutralized before any contractor is allowed to participate in the support of dedicated OT&E. (OTA)

A32.2. OSD approval will be required for the following levels and types of contractor involvement in dedicated OT&E according to national law. (Check with contracting officer.) (OTA)

- Contractor maintenance and support actions may be of the same type that will be performed as part of ICS or CLS after the system is deployed. (OTA)
- Contractor conduct and reporting of failure analyses to assist in isolating causes of test failures. (OTA)
- Contractor provision of system-unique test equipment, testbeds, test facilities, instrumen-tation, data collection, and analysis. (OTA)
- Contractor logistics support and training (Type I) if such services have not yet been developed and are not available from Government sources. (OTA)

A32.3. System contractor report generation procedures must be established for depot-level repair and maintenance actions. (PM)

A32.4. Support contractor services must be established for any required data collection, reduction, and analysis capabilities needed in dedicated OT&E that are not performed by blue suiters. (OTA)

Attachment 33

TEST ASSETS AND SUPPORT THREAT SYSTEMS TEMPLATE

A33.1. Test threat "shot doctrine" and employment tactics must be correlated to the CONOPS and the STAR. (PM) (See STAR Template.)

A33.2. Test threat "shot doctrine" and employment tactics must be correlated to the CONOPS and the Test threat systems and related support required for dedicated OT&E, including M&S assets, must be identified and programmed as early as possible. (OTA)

A33.3. Test threat "shot doctrine" and employment tactics must be correlated to the CONOPS and the Test threat systems and M&S assets must be VV&A&'ed before use in dedicated OT&E. (OTA) (See M&S Template.)

A33.4. Test threat "shot doctrine" and employment tactics must be correlated to the CONOPS and the Identify known <u>system</u> limitations and voids in covering the threat spectrum. (PM)

- The system must demonstrate the required capabilities against the threats described in the ORD and STAR. (PM)
- If the system will be certified in increments of increasing capability, describe what capabilities are lacking at this time. (PM)
- Develop a comprehensive plan for dealing with system capabilities deferred past dedicated OT&E into FOT&E. (PM)

Identify known <u>test threat</u> limitations and voids in covering the threat spectrum. (PM)

- Describe those limitations in test threat capabilities and proposed fixes to AF/TE. (PM)
- Where limitations exist in test threat systems used for dedicated OT&E, obtain approval to fill gaps with facility testing and M&S. (PM)

A33.5. Sufficient threat densities must rigorously stress the system in an operationally relevant combat environment. (PM) (See T&E Infrastructure Template)

A33.6. Develop a data reduction and correlation plan for using all valid threat testing data. (PM)

Attachment 34

TEST ASSETS AND SUPPORT TECHNICAL DATA TEMPLATE

A34.1. Operator and maintainer technical data must be available to support the OT&E plan and schedule and be acceptable to the OT&E test director. (PM)

- TOs from other interoperable systems (hardware, software, GFE) must be available to support the OT&E plan and schedule. (PM)

- Technical data required to evaluate system suitability and software supportability (includes engineering drawings, lists, specifications, standards, process sheets, manuals, technical reports, catalog items, documentation of computer programs and related software) must be available to support the OT&E plan and schedule. (PM)

A34.2. TOs must be validated prior to use in dedicated OT&E. (PM)

A34.3. A Technical Order Management Agency must be in place to manage TO deliveries, changes, and other TO requirements. (PM)

- Procedures must be established to process changes to technical data and TOs. (PM)