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

3980
Ser 00/ 3 9 1

JUN 2 8 2005

POLICY AND INFORMATION NOTICE 05-1

SUBJ: OPERATIONAL TEST AND EVALUATION (OT&E) FRAMEWORK AND THE INTEGRATED TESTING (IT) METHODOLOGY

Ref: (a) DOD Directive 5000.1
(b) DODINST 5000.2
(c) SECNAVINST 5000.2C
(d) COMOPTEVFORINST 3960.1H

Encl: (1) OT&E Framework and IT Planning Methodology Guide
(2) Mission Analysis and OT&E Framework Depiction/Examples
(3) OT&E Framework Format
(4) IT&E Terms and Definitions

1. **Purpose**. This notice provides the methodology required to develop the OT&E Framework and is the primary document for defining the framework for IT. This methodology encompasses operational testing (OT) for the system under test, as well as integration of OT requirements with developmental testing (DT) and contractor testing (CT) requirements to form an IT event matrix. This OT&E Framework defines the OT objectives and the requirements for resolution of each critical operational issue (COI) and replaces the OT test plan. The intent is to achieve these OT objectives and resolve COIs as early in the IT process as possible. Those OT objectives not realized in the IT portion will be added to the operational test director's (OTD) operational evaluation (OPEVAL) plan. This notice also highlights the process for establishing an integrated test team (ITT) that will take the product of the integration effort, the IT matrix, and execute the IT effort.

2. **Background**

a. Paragraph E1.11 of reference (a) states: "Test and evaluation shall be integrated throughout the defense acquisition process." References (b) and (c) expand on this IT approach to acquisition. These recent directives notwithstanding, "integrated testing" to date has meant early involvement by OT in the development process, often as part of the test and evaluation (T&E) working integrated process team.

This early involvement might have included some DT/OT, but seldom did it involve an ITT, and even then OPEVAL remained, for the most part, unaffected in scope or emphasis by this ITT approach.

b. COMOPTEVFOR's strategic plan identified several areas where transformation is required to ensure OT&E remains relevant in the evolutionary acquisition process. In addition, CNO challenged the Navy and Marine Corps T&E communities to streamline T&E. Embracing an "integrated" testing concept is a first step towards achieving significant cost, schedule, and test resource savings over traditional approaches. Although there are opportunities for efficiencies using traditional operational and developmental test plan methods, they do not result in a true, integrated test design. As an example, one of the key issues for OT is the fact that detailed OT planning occurs not long before the actual test. While this has been accepted for a traditional T&E process, we can do better through the use of the IT approach. COMOPTEVFOR and Navy Systems Commands are collaborating to resolve these process differences by integrating independent test planning into a common process that will result in more effective testing, and, more importantly, delivery of a better product to the war fighter sooner and at a reduced cost.

c. This policy and information notice (PIN) addresses the OT framework development phase of the test planning methodology, with a key product being a test matrix, coherent in form and definition with that needed for integration with the DT/CT test planning products.

3. Guidance. OTDs and operational test coordinators (OTC) will use the OT&E Framework development methodology guide listed in enclosure (1) to plan for IT. Enclosures (2) and (3) provide additional information and examples to assist the OTD in successful completion of this process. Enclosure (4) provides the definitions for terms common to the IT process. This PIN supports the initiation of a new "business" process for OPTEVFOR. Since this PIN may not provide sufficient detail for all levels of experience, there will be baseline training provided through the command's OTD Course on this process. Specific guidance is:

- Use this process as the baseline OT planning methodology.
- This process supersedes those processes described in the OTD Guide (reference (d)) for all test planning endeavors.

- Provide immediate feedback regarding implementation difficulty, desire to tailor for specific program entry point or level of complexity, and process effectiveness.
- Document and submit process improvement recommendations.

4. Implementation. Within 45 days, each division will present a plan to transition their programs to this OT&E Framework. The intent is to have as many programs as possible transitioned by the next phase of OT. It is recognized that there are some programs that are so close to starting test that it is impractical to shift to this framework. Therefore, divisions need to provide a rationale in transition plans for those programs that you deem impractical for transition by the next phase of OT, and when they will transition to this methodology. This policy is planned for inclusion in the next revision of reference (d).

5. Effective Policy and Information Notices. None.

DAVID ARCHITZEL

Distribution: (COMOPTEVFORINST 5216.2P)
List I
List III

SUBJ: OPERATIONAL TEST AND EVALUATION (OT&E) FRAMEWORK AND INTEGRATED TESTING (IT) METHODOLOGY

THIS PAGE INTENTIONALLY LEFT BLANK

OT&E FRAMEWORK and IT PLANNING PROCESS

1. IT Process Objective

"Integrated testing" blends or combines contractor, developmental, and OT 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.

Intrinsic in this process change to "Integrated Testing" is a major transformation in the way OPTEVFOR OTDs, OTCs, and analysts plan OT.
This transformation entails a significant departure from the standard "OTD Guide" methodology and encompasses several key OT planning paradigms, including:

- First, OT shifts from functional-based effectiveness testing to mission-based effectiveness testing. This is accomplished by taking the product of the mission analysis (described below) and establishing mission-related effectiveness COIs. The standard OPTEVFOR suitability COIs shall continue to be used for suitability testing.
- Second, the OT team must provide sufficient detail in the OT input (OT&E Framework) to the IT planning process and provide it much earlier in the program schedule than the norm for previous OT planning.
- Third, OT moves from designing tests around confidence levels to a design-of-experiments approach. This is based on a product of the mission analysis effort where conditions that affect the performance of a mission are established.
- Fourth, OT uses the shared data from the IT period to "answer" or achieve resolution on as many measures of effectiveness (MOE) and measures of suitability (MOS) as possible. The goal being to have sufficient data/test information at the end of the IT phase to resolve most COIs, pending successful completion of the final independent OT phase.
- Fifth, the independent OT phase or OPEVAL is now a mission performance confirmation instead of the former all encompassing system evaluation where most, if not all, of the data were produced to resolve COIs.

CNO set a primary goal to push new and improved capabilities/technology to the war fighter faster and more efficiently. The following four main objectives of the IT process encompass CNO's goal:

- Plan and conduct robust testing
- Reduce risk
- Reduce cost
- Compress schedule

Robust testing minimizes "surprises" when the product is sent to the war fighter 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 mission, mission oriented 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 vs. sequential testing and the sharing of high-demand testing assets. None of these objectives can be achieved without the cooperation of all parties and commitment to a "team" approach between the program office, OT, DT, and contractor personnel involved.

2. Getting Started

The initial steps in the IT process are alike no matter where in the acquisition process a program resides when the IT decision is made. Entry at some point between milestones A and B is best, but a post-milestone B entry is workable. The process is also applicable to follow-on operational test and evaluation (FOT&E), although the integration process may prove more challenging. While some portions of this process may be abbreviated, the IT process would be completed, in its entirety, for each increment or spiral of a program that employs incremental or spiral development as its acquisition strategy.

The first step in the process involves a meeting or series of meetings, between the program representatives and the OTD/C to establish some basic ground rules, develop agreed definitions for key terms and process inputs, and develop a list of pertinent documentation. Topics for this meeting should include:

- Define format and content for testing requirements inputs to the IT matrix database.
- Determine where the IT matrix database will be maintained and who will have access.
- Derive test data and information sharing rules (this may be adjusted for the ITT charter).
- Establish separate analysis/reporting requirements.
- Develop a list of acquisition and operational documents to support the mission analysis effort.
- Determine who should participate in/support the mission analysis effort and where and when it will commence.
- Define process for capturing/identifying comparative cost savings and schedule compression based on the IT effort.

These rules definitions must be documented (first, in a memorandum of agreement (MOA) and approved at an appropriate level (Assistant Chief of Staff /Program Manager (PM)). It is also important for the PM to ensure the contractor is given the appropriate information from this document, since they will be (post down-select) a member of the IT team.

Figure 1 is an overview of the entire IT process showing the steps associated with a mission analysis for the system under evaluation and the steps to develop the information necessary to author an OT&E Framework. It also depicts how the OT&E Framework feeds the integration process 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.)

IT Construct

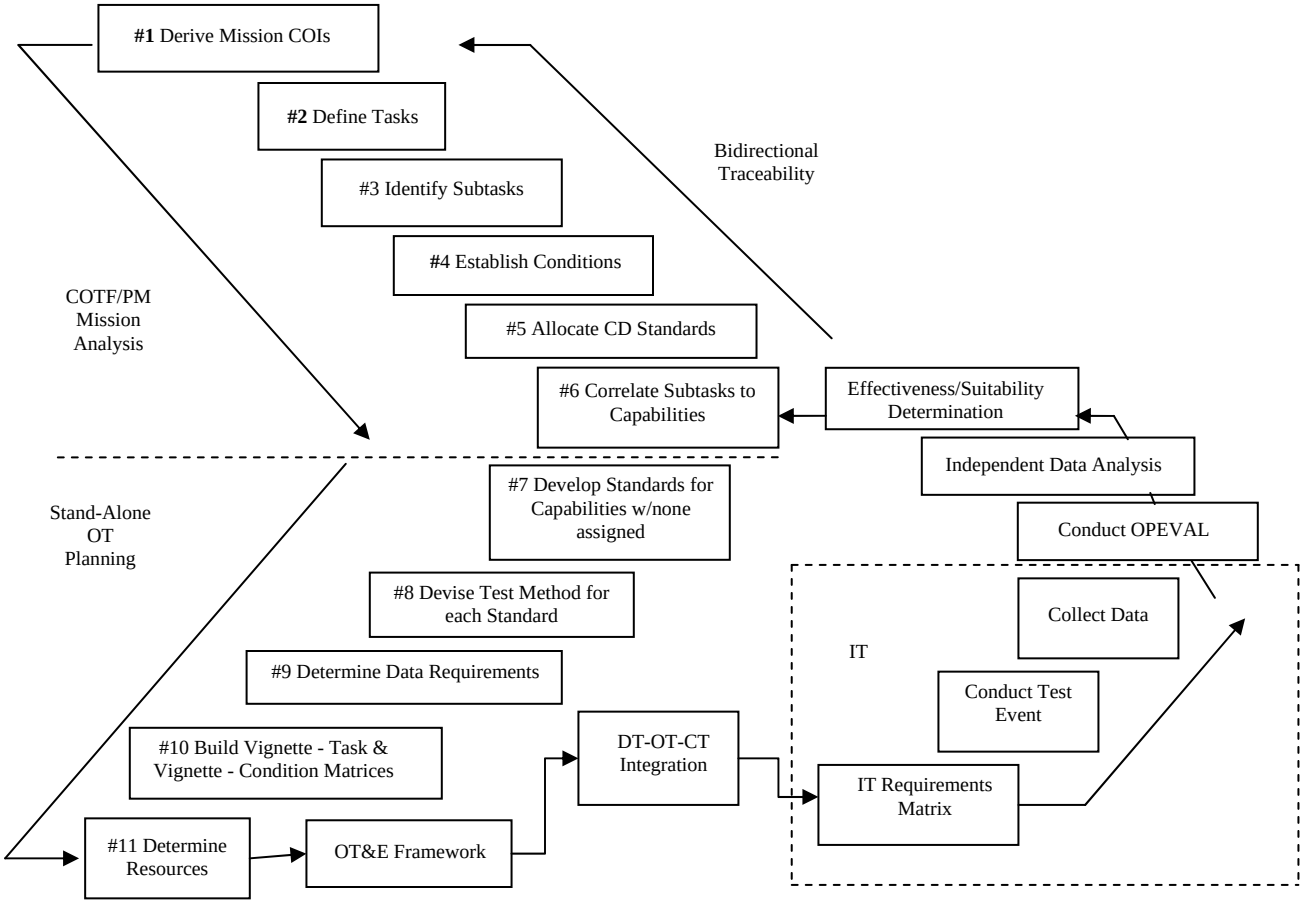


Figure 1. IT Process Flow Chart

To ensure all members of the ITT are working from the same foundation, OPTEVFOR, the PM, and other key participants must complete and agree on the product of a mission analysis for the system.

3. Mission Analysis

The mission analysis is a joint effort between OPTEVFOR and the program representatives, and should include other participants such as the CNO sponsor, Fleet Forces Command (N8) representative, and operational user representatives. Other subject matter experts (SME) may be included to ensure this evolution is correct. These SMEs might include center of excellence representatives (Naval Strike Air Warfare Center, Surface Warfare Development Group, etc.), fleet training representatives (COMSECOND/THIRDFLT, TACTRAGRULANT/PAC, etc.) or Joint Forces Command and other service representatives for joint or multiservice programs. The purpose of this series of steps is to derive the mission-related COIs, reduce the mission areas into tasks and subtasks, and then correlate the product of this effort with the requirements or capabilities from the operational requirements document (ORD) /capabilities document (CD). This ensures DT, OT, and CT (when included) are in full agreement concerning the missions, tasks, and defined capabilities

and allows direct traceability of any system characteristics, metrics, enhancements, or deficiencies to a mission or missions. Before starting the mission analysis**, check with the PM and sponsor to see if some form of mission analysis has already been completed** to support a manpower reduction or capabilities assessment, among other possibilities. Gaining access to this information could reduce the effort required to complete the mission analysis process. Again, the results of the mission analysis must be documented and approved in the TEMP. If a TEMP update is too far in the future for this kind of agreement, an MOA should be used.

The "Mission Analysis" is conducted by the participants using the documented concept of operations (CONOPS) or employment for the system to be tested, the current CD (may still be draft if early in program acquisition cycle), the Universal Navy Task List (UNTL), OPNAV Instruction 3500.38A (for Joint programs refer to the Universal Joint Task List, CJCSM 3500.04C), and other appropriate documents to derive the missions applicable to the system to be tested. Some of these documents may not exist or may only exist in draft form for programs that are pre-Milestone B. This should NOT deter the mission analysis effort. In fact, the requirement to complete a mission analysis in order to conduct IT can be used as an incentive to push the development of these documents.

The missions derived for the system under test are then broken down into a task and subtask hierarchy. Once this is complete, all requirements/capabilities are matched with the tasks and subtasks in a matrix. The participants should use the graphic depiction templates described below to assist in this analysis. These templates will become the medium for documentation of the mission analysis results. Examples of these graphic depiction templates are contained in enclosure (2).

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 tasks. That is, one task must be completed before another one can begin (prerequisite or successor); one task might begin at the same time as another one (concurrent beginning); or one task might have to be completed at the same time as another (concurrent ending).

The **informational view** of tasks takes the block diagram from the temporal view and *adds the inputs, outputs,* and *conditions* to it. Inputs to a step or block in the process would be required information or assets to perform tasks (e.g., task of selecting targets to attack requires intelligence data). Output of a step or block is the information or product resulting from the performance of the task (e.g., task of selecting targets to attack yields target lists). Some tasks provide inputs to other tasks or require inputs from other tasks. As you will note in the examples in enclosure (2), the informational view is also where you will show the conditions (variables such as weather, terrain, or location) that may influence a step or block.

The **spatial view** uses a line diagram to depict the *sequencing of steps or subtasks to perform a task or mission*. This view flows from the previous views and allows someone unfamiliar with the mission or process to see the sequence and interactions of a given task or mission.

Below is a step-by-step 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. While the process has been depicted as "steps," in actuality two or three of these "steps" may be done together or even repeated several times to accomplish the breakdown of a given mission into tasks, subtasks, and conditions.

Step One is to identify the mission COIs by first conducting an analysis of available documents (ORD/CD, Navy Mission Essential Task List, and CONOPS) to identify the mission areas for the system under test. This step begins the linkage between mission areas and system capabilities. As detailed test planning continues, test events are linked back through required capabilities to their mission-related COIs. From these mission areas, the effectiveness COIs related to mission can be written, which are combined with other effectiveness COIs (i.e., Joint Interoperability and Survivability) and the standard OPTEVFOR suitability COIs to form the basis for OPTEVFOR's effectiveness and suitability determination.

Step Two is to analyze each mission to define the tasks required to support and perform the mission. The breakdown of a mission into tasks starts with mission essential tasks from the UNTL for that mission and then are refined, if necessary, for the system to be tested.

Step Three is the subtask definition. Subtasks are discrete actions the system under test must perform to execute each task. UNTL may provide some help in completing this step, but this is, for the most part, a "chalk board," or, trial and error effort. The primary issue in this step is to identify sufficient (minimum/adequate) subtask detail in order to:

- Define the actions that a tester will evaluate to determine successful task performance.
- Allow all ORD-/CD-provided capabilities and measures (standards) to be assigned to specific subtask(s). Don't forget that suitability COIs with their corresponding capabilities and measures must be considered as well.
- Accommodate the impact of conditions (step **four**) on a given mission. In other words, a task should be broken down into the associated subtasks, if the conditions accompanying those subtasks could impact mission accomplishment (this is one reason the steps outlined here may actually be performed together and/or repeated several times).

In this step the temporal view templates are produced to assist in the breakdown of the tasks. As the analysis continues, the informational view templates showing inputs and outputs are constructed. A mission-to-subtask matrix can now be completed for each mission. This matrix will support the capability correlation process in step **six**. In developing this matrix, the mission analysis participants should establish a convenient numbering system (as shown in enclosure (2)) for the mission-task-subtask breakdown.

Step Four is to establish conditions for each subtask in the informational view templates. Conditions are variables of the operating environment that affect the performance of the task. 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 task performance and form the operational context for selected

tasks. Conditions and their defined parameters are provided in the UNTL. These UNTL conditions may require modification to fit the system-specified capabilities, or new conditions may need to be created for specific subtask situations where UNTL conditions are not appropriate. Conditions are added to the informational view template created in step **three**. With the temporal and informational view templates completed for each mission down to the subtask level, the spatial view template is constructed for each mission or task depending on the complexity of the mission. The spatial view template provides a confirmation that the mission or task breakdown that the mission analysis participants have derived is accurate.

Step Five is to allocate ORD-/CD-provided standards to each task. A *standard* provides a way of expressing the acceptable performance of the system under test under a specific set of conditions. Standards consist of measures and criteria. A measure provides the basis for describing the task performance; a criterion defines the acceptable level of performance. With the approved measures and criteria (key performance parameters (KPP) and thresholds) found in the CD allocated to the appropriate tasks, traceability is established between standards and mission.

The best approach to document this step is to establish a database which will continue to be populated in the next step and will end up forming the basis for the OT-DT-CT inputs to the integration effort.

Step Six is to correlate tasks and subtasks to specific capabilities/requirements from the ORD/CD. This step entails culling each capability or requirement from the ORD/CD and assigning all mission(s), task(s) and subtask(s) that apply to it. The numbering system developed in conjunction with steps **two** and **three** facilitates this correlation. If a capability is documented and no tasks can be reasonably assigned to it, then it is either an orphan requirement or a program requirement that has little or no relation to the effectiveness of the system. These requirements should be scrutinized before being discounted, as they can sometimes be traced to suitability or life cycle requirements.

Per step **five**, this continues the population of a database that OPTEVFOR and the program will share. This database now provides the linkage between capabilities and the acceptable standards for the accomplishment of the desired mission. Several database tools exist that are used to support tracking of multiple interrelated parameters.

This completes the mission analysis section and provides the OTD with the prerequisites for stand-alone OT planning. 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, then a memorandum of understanding can be used in the interim.

4. Separate OT Planning

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 requirements for OT and DT (and CT when appropriate). OT and DT planners must document their stand-alone requirements, 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 effective and suitable 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&E Framework.

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

Step Seven is where the OTD develops standards (measures) for any capability/requirement that has not been allocated a standard or standards from the ORD/CD. For those capabilities that are qualitative in nature (often involving suitability COIs such as Human Factors, Training, and Safety), an OTD may be tempted to assume they will be covered by surveys, so a standard isn't necessary. While assigning a standard to every qualitative capability may not be possible, effort should be made to do so. In any case, each capability must have defined testing requirements in order to integrate the CT, DT, and OT test plans.

Step Eight involves the OTD devising testing procedures for each standard or qualitative capability considering the tasks, subtasks and conditions associated with that capability. This step delineates the actions required to collect the necessary data to satisfy the standard/qualitative capability. The OTD must consider each task/subtask and determine the limits or defining characteristics of that evolution. This, combined with the conditions, will allow the OTD to define the specific data to be collected to determine whether the system can perform the task/subtask. Steps **eight** and **nine** should be accomplished together for a given standard/qualitative capability.

Step Nine is deriving data requirements. Hand-in-hand with the test procedures determination is defining the data required to satisfy the standard/qualitative capability. Data requirements must be described in sufficient detail to support the integration process. Data requirements will be both quantitative and qualitative. For qualitative data, "conduct survey" is not sufficient detail. The OTD must define what qualitative information is required to support standard and COI resolution.

As steps **seven, eight,** and **nine** are completed, the resulting information will be added to an OPTEVFOR version of the capabilities database created/populated in steps **five** and **six.**

Step Ten involves the OTD's team (analyst, other operational testers) taking the tasks, subtasks, conditions, test procedures, and data requirements, and building the vignettes. "Vignettes" are convenient or logical groupings of subtasks to allow testing and data collection for several standards. Vignettes may range from the execution of a single subtask to the conduct of an entire mission sequence. Since all capabilities/requirements and their associated standards have already been linked to task(s) and subtask(s), these vignettes will account for all tasks and subtasks with their associated conditions.

The OTD's team must evaluate all of the conditions generated in step **four** to determine their true relevance to task or subtask performance in the context of this test. 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 analyst training.

Some form of independent OT (OPEVAL) will be required at the end of the IT phase. The OTD should plan a series of vignettes designed for this purpose. This begs the question of how much independent OT is required. The general approach is to consider this independent OT phase as a confirmation that the system can perform the missions assigned. In contrast to the traditional OPEVAL that may include hundreds or thousands of test events and last several months, this should be more like the final exam at the end of a semester since most, if not all, of your COIs should already be resolved. As already stated though, any OT objectives/requirements not completed in IT will be added to this independent OT plan.

To facilitate the integration process and provide fidelity to the OT&E Framework, the OTD should identify each vignette as a candidate for integration or as an independent OT or OPEVAL vignette in the final vignette matrix.

Step Eleven. With the previous steps completed, the OT team now has all the information required to determine the test assets and resources required to perform a stand-alone OT of the system. Again, the OT team must define these resource requirements in sufficient detail to support the IT integration process. A proper vignette matrix will allow the OT team to predict key resource requirements, including:

- Number of test assets with any specific configuration requirements
- Specific range time, instrumentation, and threat requirements
- Any special instrumentation or data collection requirements
- Specific aircraft, ship, submarine, unit, or exercise support requirements
- Flight hours, at-sea time, or system operating time
- Any modeling and simulation requirements
- Specific operator or maintenance training requirements
- Prefaulted modules or maintenance demonstrations

These resources are identified for each vignette and then rolled up to determine the actual stand-alone OT&E requirements. The OTD should also identify any potential limitations to test for inclusion in the OT&E 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.

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&E Framework with the key component being the final vignette matrix developed through this process.

5. OT&E Framework

The OT&E Framework is the primary document for defining adequate OT 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 OPEVAL requirements. The OT&E Framework replaces the existing operational test plan as the document that authorizes and guides the OTD in conducting OPEVAL. 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 the release of the capabilities development document (CDD). Since the whole process is based on the mission or missions the system under test must support, and missions seldom change, any changes to the OT&E Framework are expected to be minor. However, this update or change to the OT&E Framework would be an appropriate place to document any limitations to test that arise during the course of the IT effort.

Enclosure (3) provides the format for this document. Once this document is approved by OPTEVFOR, and DOT&E for oversight programs, the OTD is ready to begin the integration process. This document will also provide the basis for the OT input to the TEMP. Any future changes to the OT&E Framework would be handled in the same way changes to an approved test plan are handled. An OPEVAL concept of test brief will be given to COMOPTEVFOR 130 days prior to the start of test for both Director, Operational Test and Evaluation (DOT&E) oversight and nonoversight programs. For DOT&E oversight programs, this brief will then be given to DOT&E 120 days prior to the start of testing, per reference (b). Moreover, 30 days prior to OPEVAL for nonoversight programs and 60 days prior to OPEVAL for oversight programs, COMOPTEVFOR will release an OPEVAL Statement of Objectives Letter that will provide the status of IT and readiness for OPEVAL, including any limitations to test. This letter will also validate the list of OT objectives for OPEVAL and detail any changes to the current OT&E Framework for the OPEVAL period.

6. IT Integration

With the OT&E 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 testing requirements 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

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

The product of the IT integration effort should be an IT database, similar in structure and content to the OT&E Framework database (step **nine**), but merged with DT and CT requirements.

Figure 2 illustrates this process.

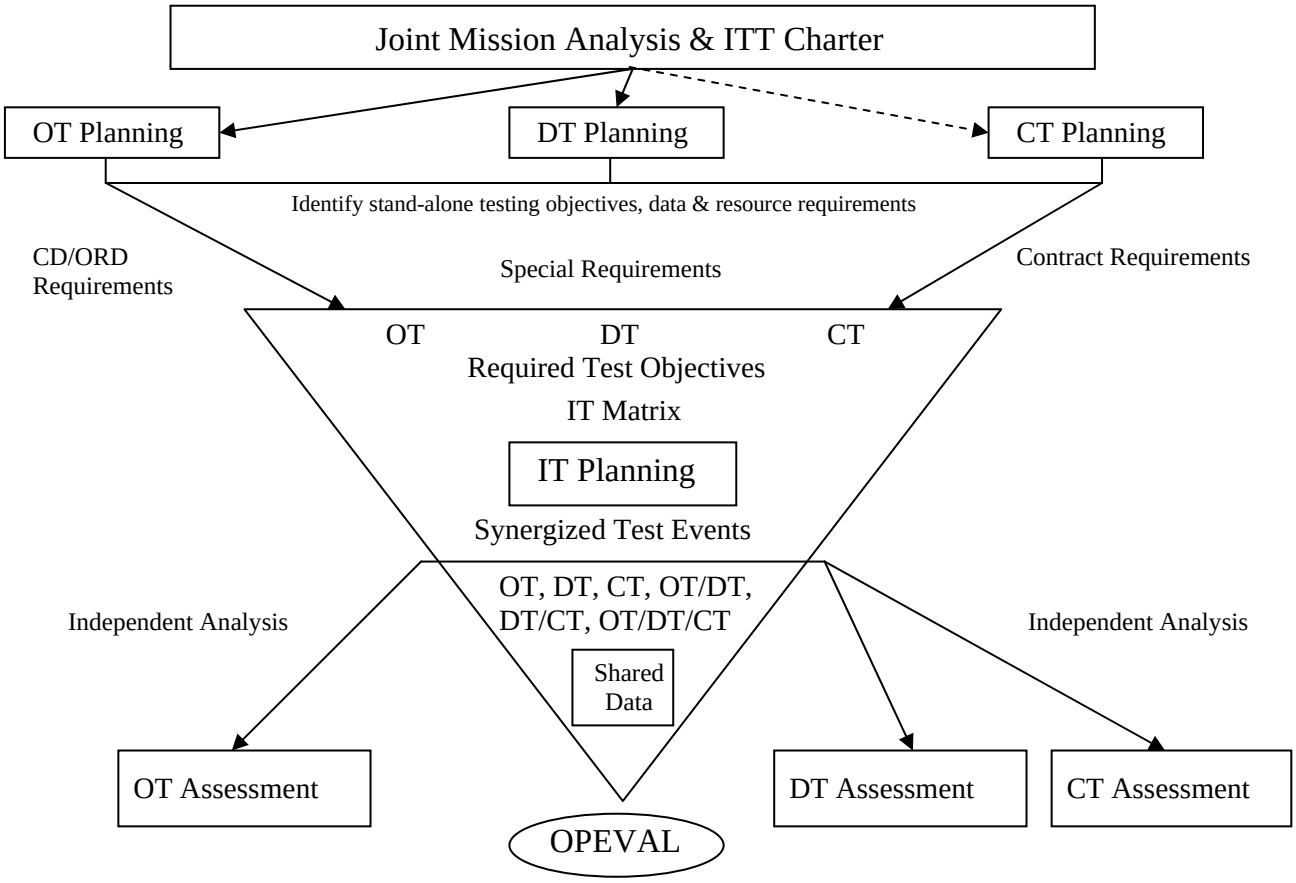


Figure 2. IT Overview

7. Reporting

By definition, IT replaces operational assessments (OA) or combined DT/OT events in the context of early involvement. The reports from OAs and combined DT/OT events often supported program decision points, which must still be supported during the course of IT. These reports, provided at designated points in the course of the IT effort, will be termed COMOPTEVFOR Decisional Assessment Reports. Decisional assessment report requirements should be listed in the TEMP and commonly support defense acquisition boards or milestones. In addition, since an IT phase could last anywhere from months to years, OPTEVFOR must provide periodic feedback to the PM on the progress of the program and the IT effort. These reports will be termed COMOPTEVFOR Informational Assessment Reports, with the periodicity agreed to in the TEMP. These reports are similar to the Letter of Observation provided for a DT assist.

8. Summary

At this point a review of figure 1 and the steps/process depicted would be appropriate. Enclosure (2) contains a flow chart of the process for each step with inputs and outputs and an example (generic) of the product or products that result from the accomplishment of the step.

OT&E Framework
Mission Analysis

Step 1 Derive Mission COIs

Step 2 Define Mission Tasks

Step 3 Identify Mission Subtasks

Step 4 Establish Conditions

Step 5 Allocate Capability Document Standards

Step 6 Correlate Subtasks to Capabilities

Document Mission Analysis Results

OT&E Framework
Mission Analysis Step One
Derive Mission COIs

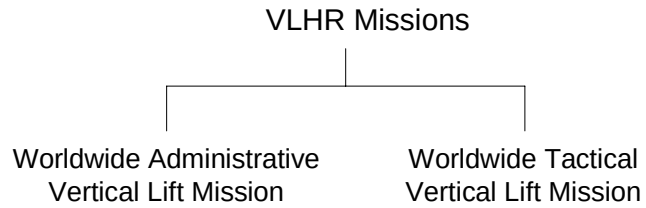
Inputs: CONOPS, UNTLs, STAR, Tactics Guides, CD/ORD

Derive Mission COIs

- Gather data, information, and documents related to the missions the system will support
- Analyze information
- Determine assigned and derived missions the system supports

Outputs: Documented mission COIs to be combined with required effectiveness COIs and standard suitability COIs

Example of Mission COIs for Vertical Lift Helicopter Replacement (VLHR)



VLHR Critical Operational Issues

–Will the VLHR support the worldwide administrative vertical lift mission?

–Will the VLHR support the worldwide tactical vertical lift mission?

OT&E Framework
Mission Analysis Step Two
Define Tasks

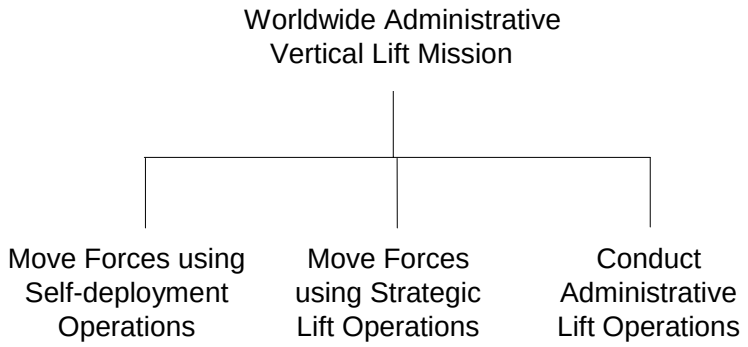
Input: Documented mission areas, UNTL, SMEs

Define Task

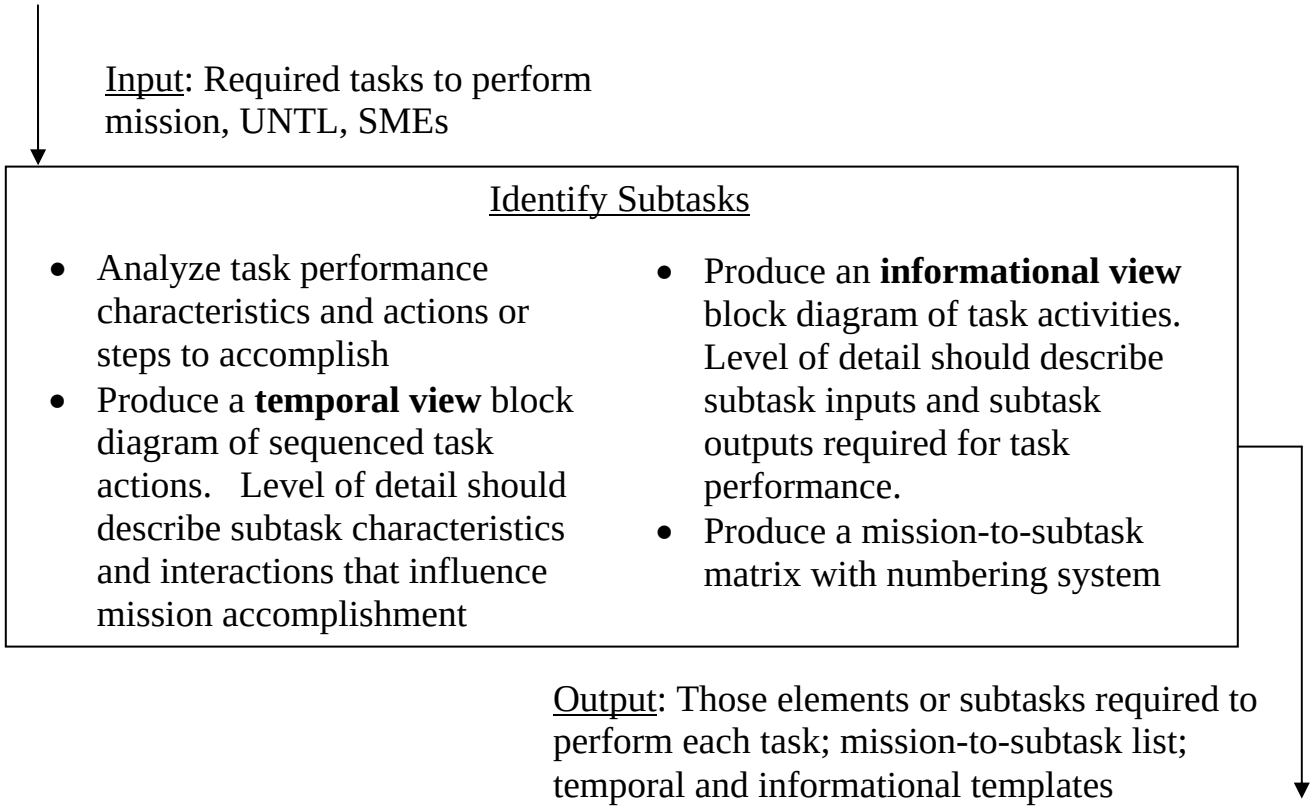
- Analyze each mission
- Determine the tasks that the system must perform to accomplished the mission

Output: Those tasks required to successfully perform the identified mission

Example of VLHR tasks required to perform the Worldwide Administrative Lift mission

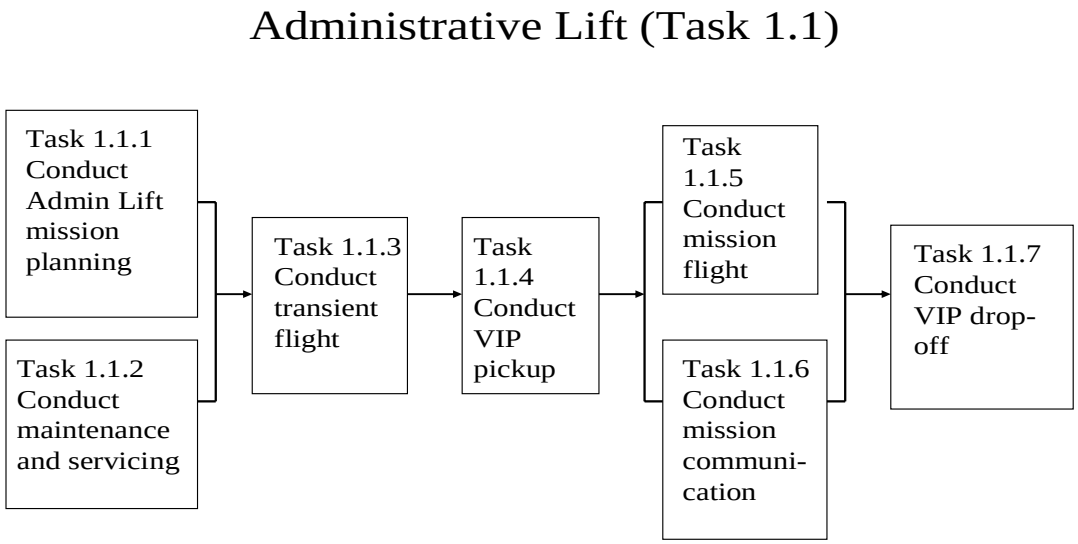


OT&E Framework
Mission Analysis Step Three
Identify Subtasks



OT&E Framework
Mission Analysis Step Three (cont.)
Identify Subtasks

Example of a VLHR temporal view template of sequenced task activities



OT&E Framework
Mission Analysis Step Three (cont.)
Identify Subtasks

Example of Indentured Hierarchal Numbering System

1.0 Administrative Vertical Lift Mission

1.1 Administrative Lift Task

1.1.1 Conduct Admin lift mission planning

1.1.2 Conduct maintenance and servicing

1.1.3 Conduct transit flight

1.1.3.1 Conduct engine start/turn-up procedures

1.1.3.2 Taxi for take-off procedures

1.1.3.3 Conduct take-off and climb-out procedures

1.1.3.4 Conduct in-flight procedures

1.1.3.5 Conduct approach to hover-out-of-ground-effect (HOGE) procedures

1.1.3.6 Conduct vertical landing procedures

1.1.4 Conduct very important person (VIP) pick-up

1.1.4.1 Conduct VIP shutdown procedures

1.1.4.2 Prepare VLHR for VIP and passengers (PAX)

1.1.4.3 Load VIP and PAX

1.1.4.4 Conduct turn-up procedures

1.1.5 Conduct Mission Flight

1.1.5.1 Conduct vertical take-off to HOGE

1.1.5.2 Conduct climb-out procedures

1.1.5.3 Conduct in-flight procedures

1.1.5.4 Conduct approach to HOGE procedures

1.1.5.5 Conduct vertical landing procedures

1.1.6 Conduct Mission Communications

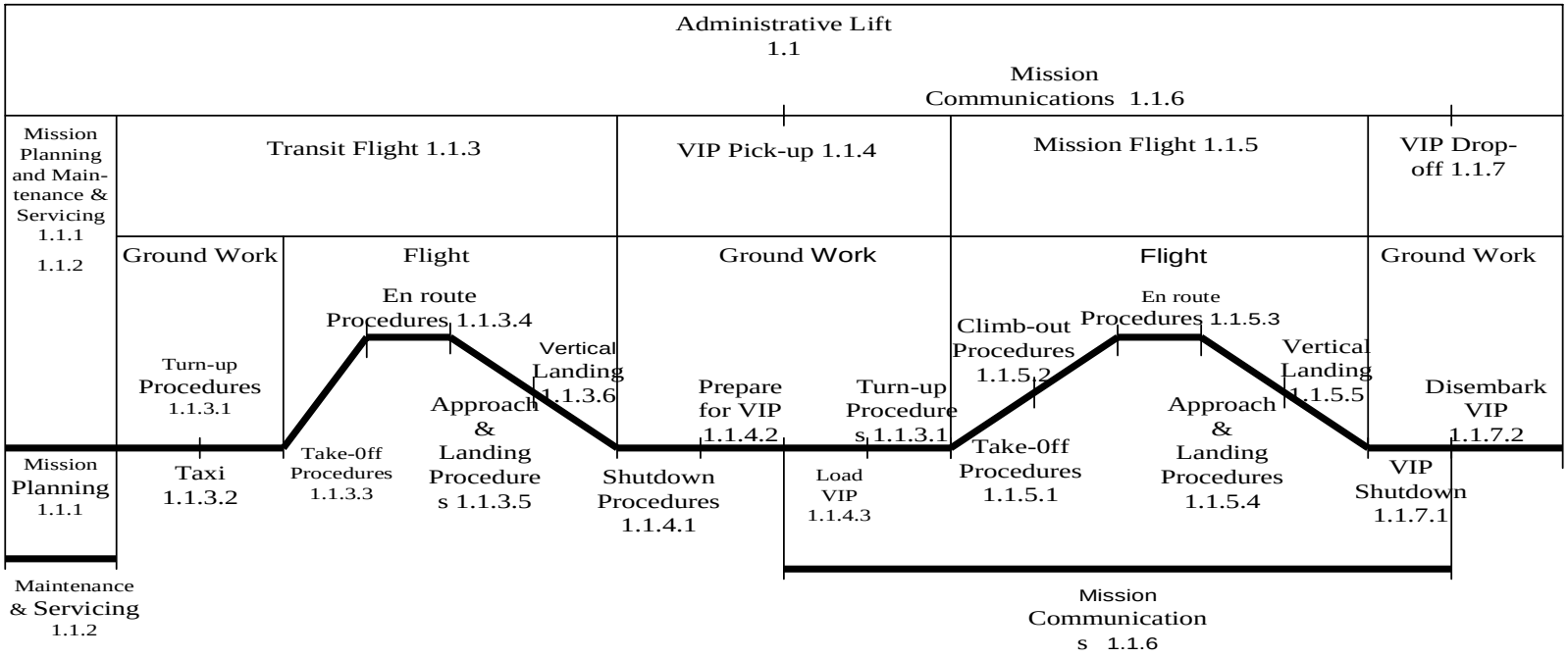
1.1.7 Conduct VIP drop-off

1.1.7.1 Conduct VIP shutdown procedures

1.1.7.2 Disembark VIP and PAX

OT&E Framework
Mission Analysis Step Three (cont.)
Identify Subtasks

Administrative Lift
Spatial View Template Task 1.1



OT&E Framework
Mission Analysis Step Four
Establish Conditions

Input: Task to subtasks breakdown; informational view template; UNTLs; CD; CONOPS; SMEs

Identify Conditions

- Review subtask analysis, CD, and CONOPS to determine conditions & compare to UNTLs
- Document UNTL defined conditions, modified UNTL conditions, unique system conditions

Output: Conditions directory; mission-to-subtask matrix w/ conditions added; informational view template w/ conditions

Example of conditions in the VLHR conditions directory. These conditions are UNTL defined

VLHR Conditions Directory

1.2 Sea

Those factors associated with the continuous salt-water ocean system to include oceans, seas, gulfs, inlets, bays, sounds, straits, channels, and rivers

Descriptors:

Open (open ocean, blue water beyond 5 nm of land)

Littoral (coastal, within 5 nm of land areas)

Riverine (inland from littoral terrain to include rivers, canals, and delta area connected to landlocked water)

1.2.1 Sea State

Roughness of seas caused by wind or disturbance

Descriptors:

Calm to slight (Beaufort Force < 5, Sea State 3 or less, Seas 4 ft or less)

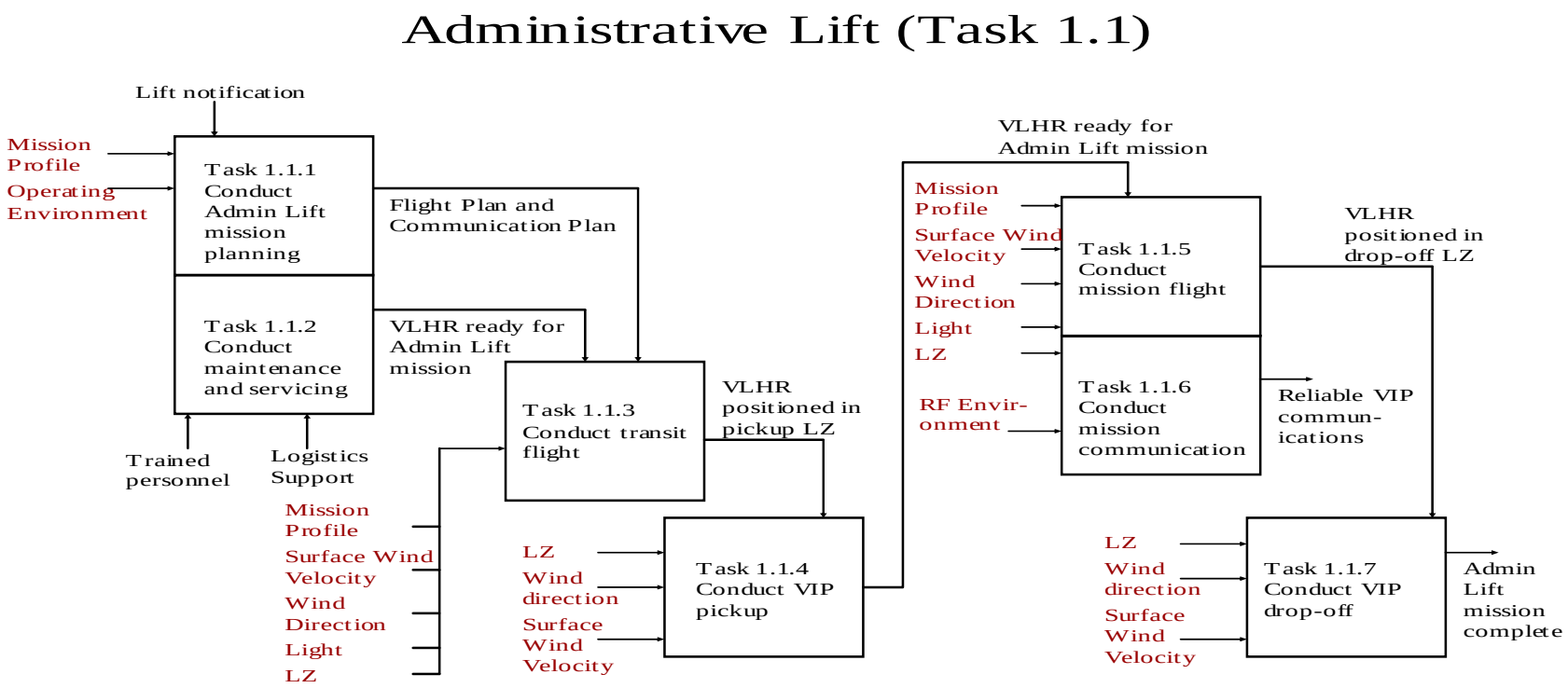
Moderate (Beaufort Force 5, Sea State 4, Seas 4 to 8 ft)

Rough (Beaufort Force 6 to 7, Sea State 5 to 6, Seas 8 to 16 ft)

Very Rough (Beaufort Force 8 to 9, Sea State 6, Seas 17 to 20 ft)

OT&E Framework
Mission Analysis Step Four (cont.)
Establish Conditions

Example of a VLHR informational view template of tasks w/ conditions



OT&E Framework
Mission Analysis Step Five
Allocate CD Standards

Input: Required KPPs & thresholds from CD/ORD

Allocate Standards

- Identify CD/ORD standards (KPPs & Thresholds) that measure acceptable performance
- Determine and assign task/subtasks to each standard

Output: Begins Capability-to-Subtask matrix development

VLHR Capability-to-Task Matrix

Standards	Missions	Task (Administrative)
1. The VLHR shall be able to carry internally the mission payload under standard and operational day conditions (T) [Increment 1]; high hot day (O) [Increment 2].	Both	Admin. Lift/Self-Deploy
2. Shall be able to fit in existing C-17 within 7 hours of initial notification and be capable of being mission ready within 8 hours upon arrival at destination (T) [Increment 1].	Both	Strategic Lift Movement

OT&E Framework
Mission Analysis Step Six
Correlate Subtasks to Capabilities

Input: Required capabilities; mission-to-subtask matrix; standards

Correlate Subtasks to Capabilities

- List all capabilities/ requirements from CD/ORD then assign mission, tasks, and subtasks to each capability in a matrix

Output: Subtask-to-capabilities matrix

Example of the VLHR Subtask-to-Capabilities Matrix

ORD	**Mission**	**Admin Lift - 1.1**	**Self-Deploy - 1.2**
Engine Start	Both		
The VLHR requires an alternate start capability contained within the aircraft capable of operations up to and including 10,000 feet mean sea level.	Both	1.1.3.4 1.1.5.3	1.2.3.4
The auxiliary power unit (APU) shall sustain aircraft systems with engines off line within the environmental conditions as defined in paragraph 4.4.1.	Both	1.1.2 1.1.3 1.1.3.1 1.1.4 1.1.4.1 1.1.4.2 1.1.4.3 1.1.4.4 1.1.7 1.1.7.1 1.1.7.2	1.2.3.1 1.2.3.7 1.2.4
The APU must be able to independently run all systems for at least 30 minutes (T).	Both	1.1.2 1.1.3 1.1.3.1 1.1.4 1.1.4.1 1.1.4.2 1.1.4.3 1.1.4.4 1.1.7 1.1.7.1 1.1.7.2	1.2.3.1 1.2.3.7 1.2.4

OT&E Framework
Mission Analysis Complete
Document Mission Analysis Results

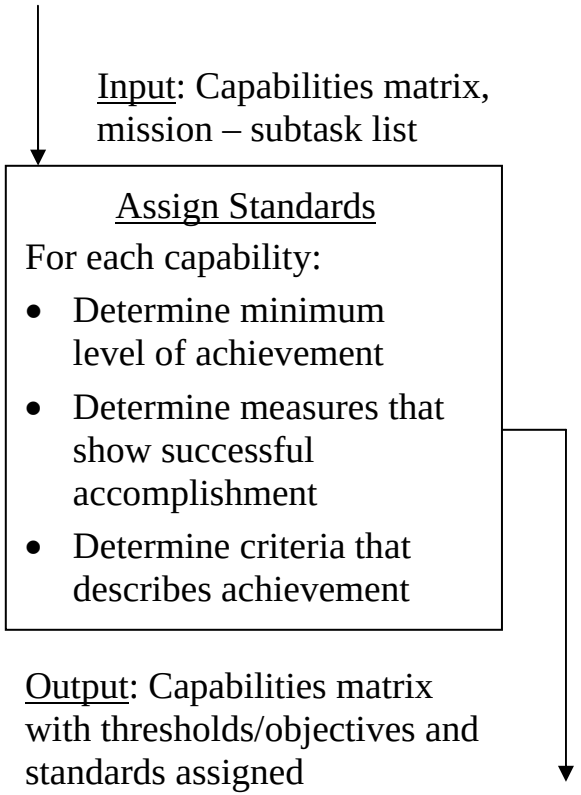
Document Mission Analysis Results in TEMP

- Document mission COIs
- Document required effectiveness COIs and standard suitability COIs
- Document systematic linkage of capabilities/requirements to mission through tasks and subtasks
  - ➢ Provides common ground for IT planning for OT, DT, and CT agencies
  - ➢ Establishes the structure for stand-alone OT&E Framework planning

OT&E Framework
Stand-Alone OT Planning

Step 7	Develop Standards for Capabilities w/ none assigned
Step 8	Devise Test Method for each Standard
Step 9	Derive Data Requirements
Step 10	Build Vignette - Task and Vignette - Condition Matrices
Step 11	Determine Resources
	Write OT&E Framework

OT&E Framework
Stand-Alone OT Planning Step Seven
Develop Standards for Capabilities w/ None Assigned



Example of the VLHR developed standards for capabilities with none assigned

VLHR Developed Standards

Capability	**Standard**
A storable table adequate for two passengers between VIP 1 and 2, with access to secure and nonsecure phones and a computer data port.	1.Table area >6 sqft: Size of the storable table 2. Y/N: Table can be stored and retrieved in flight 3. Y/N: A drink set on the table will not move during all phases of flight 4. Y/N: The table is useable during all phases of flight 5. Y/N: Secure voice communication access is within 3 ft of the VIP seat 6. Y/N: Nonsecure voice communication is within 3 ft of the VIP seat 7. Y/N: Computer data port is within 3 ft of the VIP seat

OT&E Framework
Stand-Alone OT Planning Step Eight
Devise Test Method

Input: Capabilities matrix, mission – subtask list, conditions, standards

Determine Test Method

For each capability:

- Analyze test objectives to gather measure/criteria information
- Define conditions that impact test performance
- Define methods of information gathering

Output: Capabilities-to-test method matrix

Example of VLHR Capabilities to Test Method Matrix

VLHR Test Method

Capability	Standards	Test Method
The VLHR shall be able to carry internally the mission payload under standard and operational day conditions (T) [Increment 1]; high hot day (O) [Increment 2].	Carry crew of 4@225 lb, 10 PAX at 200 lb each, a 25-lb carry-on bag per PAX, and 400 lb of mission equipment (totaling wt of 3,550 lb), aircraft weight with the fuel load that would be at the beginning of task 1.1 on standard, operational day conditions	Perform a hover-in-ground- effect (HIGE) @10 ft and climb to altitude and then descend and HOGE @100 ft (task 1.1.5.1, 1.1.5.2, 1.1.5.4)
The VLHR must provide seating for 10 passengers (T/KPP) [Increment 1].	>10 PAX @200 lb + @25 lb carry-on per PAX	Seat 10 PAX in crashworthy seats with seatbelts fastened and carry-on stowed (task 1.1.4.3)

OT&E Framework
Stand-Alone OT Planning Step Nine
Derive Data Requirements

Input: Capabilities matrix, mission – subtask list, conditions, standards,

Determine Data Requirements

For each capability:

- Select quantitative and qualitative data points to assess standards
- Allocate data elements to appropriate measurement media

Output: Capabilities-to-Data matrix

Example of the VLHR Capabilities-to-Data Matrix

VLHR Data Requirements

Capability	Standards	Test Method	Data Requirements
The VLHR shall be able to carry internally the mission payload under standard and operational day conditions (T) [Increment 1]; high hot day (O) [Increment 2].	Carry crew of 4@225 lb, 10 PAX at 200 lb each, a 25-lb carry-on bag per PAX, and 400 lb of mission equipment (totaling of 3,550 lb), aircraft wt with the fuel load that would be at the beginning of task 1.1 on standard, operational day conditions	Perform a HIGE @10 ft and climb to altitude and then descend and HOGE @100 ft (task 1.1.5.1, 1.1.5.2, 1.1.5.4)	Environmental data includes wind speed, wind direction, OAT, DA, PA; aircraft data includes A/C gross wt (A/C wt, fuel wt, crew wt, & mission payload) , fuel wt at each task; instrument data includes engine torque, gas turbine temp, gas turbine speed, rotor speed, fuel flow, engine oil pressure, free turbine speed, and vertical speed indication
The VLHR must provide seating for 10 passengers (T/KPP) [Increment 1].	>10 PAX @200 lb + @25 lb carry-on per PAX	Seat 10 PAX in crashworthy seats with seatbelts fastened and carry-on stowed (task 1.1.4.3)	Number of PAX seated and strapped in, number of bags stowed, survey opinion of capability of PAX to perform work while seated

OT&E Framework
Stand-Alone OT Planning Step Ten
Vignette – Task & Vignette - Condition Matrices

Input: Conditions directory, Task matrix, Informational view template of task activities

Develop Vignette Matrices

- Review conditions that impact task performance
- Perform analysis to eliminate condition descriptors that do not impact task performance
- Arrange subtasks into logical/ convenient groupings
- Develop vignettes with the different condition descriptors

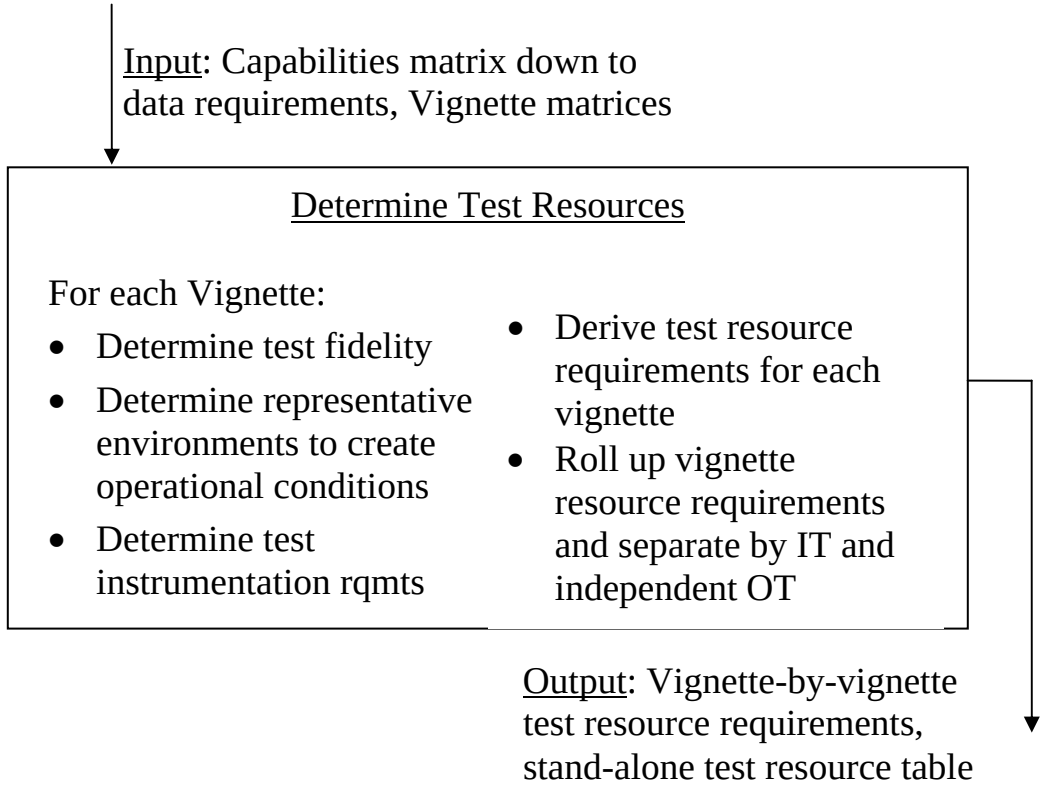
Output: Vignette – Task Matrix, Vignette – Condition Matrix

An example of the VLHR Vignette – Condition Matrix

Administrative Lift Operations
Vignette Number-to-Conditions Matrix

		Conditions				
Vignette Number	**Subtask**	**Profile**	**Light**	**LZ**	**Temp**	**Location**
OP1-1	System 1.1		Day	Austere		
OP1-2	System 1.1		Night	Normal		
OP1-3	System 1.1	A	Day	Small		
OP1-4	System 1.1	C	Day	Norfolk		
OP1-5	System 1.1	B	Day	Denver		
IT 1-1	Planning 1.1.1					Overseas
IT 1-2	Planning 1.1.1					Any
IT 1-3	Maintenance 1.1.2					Overseas
IT 1-4	Maintenance 1.1.2					Any
IT 1-5	Transit Fl 1.1.3		Day	Austere		
IT 1-6	Transit Fl 1.1.3		Night	Normal		

OT&E Framework
Stand-Alone OT Planning Step Eleven
Determine Test Resources



OT&E Framework

The OT&E Framework consists of four sections and several appendices that provide the details of the separate OT planning completed by the OT team. This OT&E Framework not only supports OT integration with DT and CT, it also provides the objectives that define successful completion of OT for that system or increment/spiral.

This enclosure provides an outline of the contents of the framework document. For additional detail, the OTD can review other frameworks as they are developed. As a new document, changes to this format are inevitable and will be incorporated as they are identified and approved.

OT&E Framework Format

Title Page
The title page will identify the system and increment or spiral being tested.

Section 1 — Introduction
This section provides essential details concerning the system being tested.

1. Introduction
Briefly describe the IT process (include figure 1 from enclosure (1) of this PIN) as it relates to the program.

2. System Description
This should be a cut and paste from program documentation.

3. Background
This section briefly describes the genesis of the program, including reference to key documents such as CONOPS or initial capabilities document.

4. Program Classification
This section denotes the classification of the program and provides the appropriate details from the program classification guide.

Section 2 — Mission Analysis
This section provides an overview of the mission analysis for the system under test. Include the full mission analysis breakdown as appendix B.

1. Purpose
Include a brief description of the purpose of the mission breakdown. OTD may highlight here any significant issues concerning this analysis.

2. Mission COIs
Describe the mission areas for the system derived from the analysis and provide the COIs relating to those mission areas. Also, list any references that supported the analysis.

3. Tasks
Describe the tasks for each mission area developed from the analysis.

4. Subtasks
Show the subtask breakdown for each task. The temporal view templates may be useful in depicting the breakdown. The indentured hierarchical numbering system for the mission-to-subtask breakdown should be provided here.

5. Conditions
Show the established conditions. The informational view templates provide a useful depiction of these as they relate to each subtask. Indicate the sources of the conditions (UNTL, CD, and user) and refer to the conditions directory in appendix C for more detail.

6. Subtasks-To-Capabilities Correlation
Briefly describe the process used to create the matrix and populate it down to the subtask level with applicable standards. Refer to appendix E for the actual matrix.

Section 3 — OT&E Scope
This section provides the results of the separate OT planning effort.

1. General
Provide a brief overview of the test concept, including number of phases (IT and independent OT). Also, indicate who will be participating in the IT effort as OPTEVFOR's agent (VX).

2. COIs
List all effectiveness and suitability COIs and refer to appendix A for the MOEs and MOSs.

3. Test Periods
List each test period (or phase) and describe the plan for testing during this period, including scope of testing, data collection, data analysis, reporting, and any known limitations to test.

4. Vignette-to-Conditions Matrix
In this section, the vignettes required to evaluate each mission or task are listed (tabular format) and the scrubbed list of conditions with a brief explanation of their relevance to the particular task/subtask.

5. Detailed Vignettes
Refer to appendix D for the actual matrix and describe the process used to create the vignettes.

6. Vignette-to-Task-to-Capabilities Correlation
This refers to appendix E with all of the information now incorporated that will be necessary for integration with DT and CT.

7. OPEVAL
This section describes the plan for independent OPEVAL and refers to the vignettes specifically designated for that purpose in appendix D.

Section Four — Resources
List of resources required to conduct the testing described in section 3. The format is the same as the current test plan format.

Appendix A — Measures of Effectiveness and Suitability
MOE/ MOS table from the CD or TEMP.

Appendix B — Mission Analysis
Product of the mission analysis effort. Provide the entire product, even if some portions are repeated from section 2.

Appendix C — Conditions Directory
Provide the conditions and all the variables associated with those conditions as defined in the mission analysis effort.

Appendix D — Task-To-Vignette Relationship
Detailed vignette descriptions as well as their relationship to tasks and subtasks. Vignettes are numbered or marked in a manner that indicates whether they are candidates for IT or are independent OT vignettes.

Appendix E — Capability-to-Subtask Matrix
Final OT capability matrix that was started in the mission analysis phase. It contains all the information required to begin the integration process with DT and CT.

Appendix F – Event Record and Survey Sheet Examples
Includes only those event records and survey sheets that are required for the independent OT phase/OPEVAL.

Appendix G — Acronyms and Abbreviations

Appendix H – References

THIS PAGE INTENTIONALLY LEFT BLANK

IT&E Terms and Definitions

Terms	Definitions
Condition	Conditions are variables of the environment that affect the performance of tasks 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).
COI	The critical aspects of a system's operational effectiveness and operational suitability that are intended for resolution during OT&E.
Evolutionary Acquisition	An acquisition strategy whereby a basic capability is fielded with the intent to procure and field additional capabilities in the form of modifications to the basic capability already fielded.
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.
IT	IT is a cooperative approach to T&E where CT, DT, and OT entities work to blend or integrate the T&E requirements throughout the defense acquisition process. Integration of CT, DT, and OT does not involve the analysis and reporting aspects of T&E, which remain solely under the purview of the respective CT, DT, or OT organization.
Low Rate Initial Production	The production of a system in limited quantity to provide articles for T&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.
Matrix	The arrangement of specific elements into rows and columns to indicate interdependence or correlation.
Mission	The task, together with the purpose, that clearly indicates the action to be taken and the reason therefore.
Mission Analysis	Careful analysis of an assigned mission to arrive at a set of mission-based requirements. These requirements are then expressed in terms of the essential tasks to be performed, the conditions under which these tasks will be performed, and the standards to which these tasks must be performed.
OT&E Framework	The primary document for defining adequate OT for the system under test 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 OPEVAL requirements.
PM	The designated individual with responsibility for and authority to accomplish program objectives for development, production, and sustainment to meet the user's operational needs.
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. It is defined by the CD or assigned by OPTEVFOR and consists of measures and criteria. Measure - Provides the basis for describing varying levels of task performance. Criteria - Defines acceptable levels of performance.
Subtask	The further breakdown of a task into the discrete events or actions required to complete the task.

Terms	Definitions
Synergy	Interaction of discrete agents or conditions such that the total effect is greater than the sum of the individual effects.
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 in and/or organizations. Encl (4)
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.
UNTL	A list of Navy tasks considered essential to the accomplishment of an assigned or anticipated mission. OPNAV Instruction 3500.38A applies.
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.