



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

OPTEVFORINST 5000.1D
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OPTEVFOR INSTRUCTION 5000.1D

From: Operational Test and Evaluation Force

Subj: USE OF MODELING AND SIMULATION IN OPERATIONAL TEST

Ref: (a) DoDI 5000.61CH-1
(b) 10 U.S.C. § 2399
(c) DoDI 5000.02
(d) DoDI 5000.89
(e) SECNAVINST 5000.2F
(f) OPNAVINST 3960.15B
(g) OPNAVINST 3811.1F
(h) SECNAVINST 5200.46
(i) MIL-STD-3022 CHG-1
(j) COMOPTEVFORINST 3980.2J
(k) COMOPTEVFOR Cyber Survivability Test and Evaluation Handbook

1. Purpose. This instruction provides guidance on using Modeling and Simulation (M&S) in Operational Test and Evaluation (OT&E). This instruction is a complete revision and should be reviewed in its entirety.

2. Cancellation. COMOPTEVFORINST 5000.1C.

3. Scope and Applicability. This instruction is applicable to all Navy acquisition programs intending to use M&S in support of OT&E. This includes Developmental Test (DT) M&S data used in Operational Testing (OT) reports.

4. Background. M&S is the discipline that comprises the development and/or use of models, simulations, and associated data. A model is defined as a physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process (reference (a)). A model replicates a system's key feature important to a Specific Intended Use (SIU), to improve the understanding of how the system will work. A simulation is a method for implementing a model to examine how a system performs over time (reference (a)). M&S is used often throughout the acquisition life cycle to inform decision makers and manage risk. This instruction provides guidance on using M&S specific to Navy OT&E.

a. M&S and OT&E. OT&E is an important component of the overall acquisition process. It provides stakeholders with an independent assessment of system Effectiveness, Suitability, and

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Cyber Survivability (CS). M&S may be used in addition to live-test events to support these assessments. Table 1 provides a summary of general M&S implementation types. In practice, the models and simulations in question may be a combination or extension of the types listed in table 1.

Table 1: Common simulation environments used to support Operational Testing		
Simulation Environment	Acronym	Description
Digital Simulation	DSIM	A completely digital representation of the system and intended operational environment (constructive).
Hardware in-the-Loop	HITL	A simulation environment that includes actual system hardware.
Software in-the-Loop	SITL	A simulation environment incorporating actual system software and logic.
Operator in-the-Loop	OITL	A simulation environment that includes inputs and decisions from at least one operator (virtual).
Land-Based Test Site	LBTS	A simulation environment, constructed on an open range, which incorporates various aspects of DSIM, HITL, SITL, OITL, and/or live-test assets.
Laboratory /Chamber	LAB	A facility allowing for the stimulation via DSIM, HITL, SITL, and/or OITL, of various aspects of an operational system in a closed secure environment.
Threat Representation	TR	Any engineering representation (physical or digital) of a threat system which will be used in place of an actual threat system.
C4I System Integration Environments and Facilities	C4IEF	A C4I environment, that operates external to the SUT / SoS, and provides the capability to test system function and interoperability.
Reliability Simulation	RSIM	A simulation that provides reliability predictions for the SUT in live/captive carry/chamber or DSIM to represent the SUT.
Federation	FED	A distributed system of interacting models, simulations, and a supporting infrastructure that are based on a common understanding of the objects portrayed in the system of systems.
Federate	N/A	An individual system within a Federation, such as a simulation, a tool or an interface to live systems.
Notes: C4I – Command, Control, Communications, Computers, and Intelligence SUT – System Under Test SoS – System of Systems		

b. Laws and Guidance. Using M&S as the only basis for making evaluations in Initial Operational Test and Evaluation (IOT&E) or Follow-on Operational Test and Evaluation (FOT&E) is strictly prohibited under reference (b). Thus, every OT must have some form of live testing to evaluate Effectiveness and Suitability. In this context, “live” testing refers to testing that employs the actual System Under Test (SUT) in the intended operational environment. In addition to U.S. Code, Department of Defense and service component guidance has been provided to the acquisition community in references (c), (d) and (e). Reference (e) states M&S may be used to augment or supplement developmental, operational, and/or live-fire testing to achieve confidence in performance assessments, represent conceptual systems that do not exist, or explore performance in environments that cannot be tested due to resource limitations or

personnel and equipment safety restrictions. References (f) and (g) require analysts from the Office of Naval Intelligence (ONI), Defense Intelligence Agency (DIA), or another appropriate intelligence agency to participate as an Integrated Product Team (IPT) member to develop and review validation reports. This will ensure the validity and accuracy of threat descriptions, threat performance, tactical employment (including profiles), and associated capabilities emulated by the threat representation (TR).

c. Accreditation. The use of M&S to supplement OT&E is not automatic and requires accreditation by the Operational Test Agency (OTA). Accreditation is defined as the official certification that a model or simulation and its associated data are acceptable for use for a specific purpose (reference (a)). Reference (a) also states that models, simulations, and associated data used to support Department of Defense (DoD) processes, products, and decisions will be accredited for an intended use. The intended use describes the problem the M&S will address, including the system or process being represented, and the role it plays in the overall program. Reference (h), states OPTEVFOR will serve as the Accreditation Authority (AA) for models, simulations, and associated data used in support of OT&E, and will accredit models, simulations, and associated data (i.e., test resources) intended to support OT&E per reference (d) and (e).

(1) Existing M&S developed for other programs or test phases including Developmental Test (DT) may be reused, but each intended use, or SIU, of the M&S must be accredited by the OTA in order to include data obtained from it in an OT report (reference (e)). This pertains to all M&S data to be used for OT, regardless of the source.

(2) According to reference (b), for programs under the Director of OT&E (DOT&E) Oversight, the use of M&S in support of OT&E must be approved by DOT&E. During this M&S approval process, the role of DOT&E is to:

(a) Agree/concur with the M&S SIU(s) through participation in the Mission Based Test Design (MBTD) process, which produces the Integrated Evaluation Framework (IEF).

(b) Agree/concur with the Accreditation Plan (AP) through participation in the M&S Working-level Integrated Product Team (WIPT) or Operational Test and Evaluation Force (OPTEVFOR)-led working group used to develop the OT AP. AP disagreements will be resolved using the Running Comment Resolution Matrix (RCRM) process prior to OPTEVFOR approval. AP development should be started as early as possible once the M&S SIUs have been identified.

(c) Approve the use of M&S with approval of the test plan and the Test and Evaluation Master Plan (TEMP), which also identifies the validation strategy, timelines, and V&V resourcing.

d. Verification and Validation (V&V). The accreditation decision is based on results of

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V&V efforts. V&V provides the rigorous testing and analysis necessary to support a subsequent OT accreditation. Verification is the process of determining that a model or simulation implementation and its associated data accurately represent the developer's conceptual description and specifications (reference (a)), which should address the representation of conditions and the amount, precision, and accuracy of data to be produced as outputs. Validation is the process of determining the degree to which a model or simulation and its associated data are an accurate representation of the real world from the perspective of the SIUs of the M&S (reference a). The Program Manager (PM) is required to complete a V&V Plan and the V&V Report, prior to an accreditation decision by the OTA (reference (i)).

(1) The V&V Plan defines the PM's strategy to fulfill the OTA's accreditation requirements as defined in the OTA-approved AP.

(2) The V&V Report details the efforts expended to V&V the model (with specific attention to deviations from the V&V Plan), results of V&V traced to each Acceptability Criteria (AC) with an assessment of its impact to accreditation ability and an overall recommendation on accreditation of the model.

e. Verification, Validation, and Accreditation (VV&A) Stakeholders. VV&A requires a collaborative effort amongst all stakeholders. The stakeholders involved in the overall VV&A process, and therefore affected by this instruction, are as listed:

(1) AA: The organization or individual, who approves using M&S for a particular intended use. The AA represents the M&S user's interests. The AA is a government entity. OPTEVFOR is the AA for all M&S used to support any OT phase to include but not limited to Early Operational Assessment (EOA), Operational Assessment (OA), Operational Demonstration, Quick Reaction Assessment (QRA), IOT&E, FOT&E, and Verification of Correction of Deficiencies (VCD).

(2) Accreditation Agent: The individual, group, or organization, designated by the AA, to conduct an accreditation assessment of any model or simulation. In OT, the accreditation agent is the cognizant OPTEVFOR division director (A-code).

(3) M&S Developer: The individual, group, or organization, responsible for developing or modifying a simulation, per a set of design requirements and specifications.

(4) M&S Proponent: The organization (typically the Program Office), who has primary responsibility for M&S planning and management to include funding, development, V&V, configuration management, maintenance, and use of models and/or simulations.

(5) M&S User: The individual, group, or organization, who uses the results or products from a specific application of M&S. The M&S User is a government entity. In OT,

OPTEVFOR, DOT&E, and the Fleet are M&S Users. Similarly, for DT a program's PM is an M&S User.

(6) Subject Matter Expert (SME): An individual who, by virtue of education, training, or experience, has a thorough understanding of a particular technical or operational discipline, system, or process.

(7) V&V Agent: The individual, group, or organization, designated by the M&S Proponent, to verify and validate M&S.

(8) Intelligence Production Center (IPC): The agency designated to provide a threat model containing IPC validated representation of the advisory threat.

(9) DOT&E Action Officer: The individual representing DOT&E in the VV&A process to ensure adequacy of test and availability of data for independent DoD evaluation are addressed for oversight programs.

5. Policy. Policies on using M&S, V&V evidence, and documentation are as follows:

a. In addition to the formal M&S document processes described below, OPTEVFOR warfare divisions will proactively socialize M&S requirements and processes as early as possible with all appropriate M&S stakeholders. They will maintain frequent and open communications throughout the system development and test processes to anticipate and resolve issues as they arise.

b. The OPTEVFOR Operational Test Director (OTD), or designated representative, will participate on all M&S WIPTs, and will clearly and proactively articulate OPTEVFOR positions on V&V plans, results, and emergent issues.

(1) The M&S Proponent is encouraged to establish an M&S WIPT that includes, at a minimum, the stakeholders listed in paragraph 3e as soon as feasible in the acquisition process.

(2) OPTEVFOR will attend M&S WIPTs with all stakeholders to include the program office, technical support staff, and management oversight during development of the AP and V&V Plan.

(3) The OTD will collaboratively develop the Acceptability Criteria (AC) for the AP with all of the M&S WIPT stakeholders to include the appropriate system SMEs. Unresolved AP issues will be resolved using the RCRM prior to AP approval.

c. Once the AP is approved and the M&S Proponent has determined the model is mature and stable, the M&S Proponent may elect to execute V&V runs. In addition to those identified in the V&V Plan for system characterization or sensitivity analysis, V&V runs may include runs from

either the Design of Experiment (DOE) (identified in the IEF) or OT Runs for Record (RFR) matrix (identified in the approved Test Plan) to support accreditation. Once the M&S is accredited, V&V runs conducted for accreditation may be scored for use to fulfill OT RFR. V&V runs scored for use as OT RFR do not need to be repeated during OT. This shift left supports both early problem identification and timely analysis to inform the execution of costly live-fire OT events before they occur.

d. OPTEVFOR may withhold an accreditation decision until all referent data has been collected and V&V runs have been analyzed. Referent data is defined as the data that provides the baseline to which M&S results are compared to validate the M&S. When Integrated Test (IT) and/or OT live fire events are required as referent data in the accreditation process, the OT M&S Accreditation will not be complete before the Operational Test Readiness Review (OTRR). No M&S results will support OT&E evaluation in an OT report (EOA, OA, Operational Demonstration, QRA, IOT&E, FOT&E, or VCD) without an OTA accreditation.

e. OPTEVFOR will require notification of any and all changes to the M&S components, systems, or software during V&V and OT and must provide approval to continue the V&V and OT.

f. OPTEVFOR reserves the right to invalidate V&V runs if modifications to the M&S are judged to alter the operational representation. In such cases, additional M&S V&V runs will be required to support accreditation/re-accreditation.

g. For multiservice OT, M&S will be conducted in conformance with the Lead OTA's guidelines and policies. Analysis and accreditation of M&S will be a collaborative effort of all OTAs involved.

h. The use of M&S must be identified in the OPTEVFOR IEF, TEMP, and Test Plans.

i. When new M&S requirements or new SIUs for previously defined M&S are discovered during the Test Planning process, the test team will engage the Accreditation process.

(1) New SIUs may be addressed using an Accreditation Plan/Accreditation Letter addendum.

(2) New M&S requirements may be addressed using a new Accreditation Plan/Accreditation Letter.

(3) In all cases, appropriate V&V documentation must be provided by the M&S Proponent and referenced in the new Accreditation Letter or addendum to support an Accreditation decision.

j. The VV&A process will be properly documented, to include specific intended usage and proposed M&S articles. The Defense Modeling and Simulation Coordination Office developed reference (i) to establish templates to support the M&S VV&A process. Reference (i) should be consulted by all stakeholders during the VV&A documentation process. The core documentation associated with the OPTEVFOR VV&A process is as follows:

(1) Integrated Evaluation Framework: This document formalizes the overall data requirements, test design, and the subset of M&S resources necessary to resolve Critical Operational Issues (COI). This is the first formal acknowledgement that M&S will be used in OT to supplement live-test events. OPTEVFOR is responsible for developing and disseminating this document. The IEF is discussed in reference (j). Specific M&S information contained in this document includes:

(a) Description of all M&S anticipated to support OT, including all forms of simulation/environments listed in table 1.

(b) OPTEVFOR OT M&S SIUs.

(c) Definitions and run matrix for OT DOE to be executed by M&S to support the operational effectiveness evaluation.

(d) Description of OT live fire demonstrations that support the M&S VV&A and the operational effectiveness evaluation.

(e) Critical OT measure(s) the M&S will be used to evaluate.

(f) List of non-critical measure(s) expected to support V&V data collection for each critical OT measure(s) the M&S will be used to evaluate.

(2) M&S Requirements Letter (MSRL): This document defines the M&S SIU(s), and summarizes the capabilities the M&S must possess to satisfy the OT intended use(s). OPTEVFOR is responsible for developing and disseminating this document. It is a formal letter from the OPTEVFOR warfare division director to the M&S Proponent, communicating the intent to use M&S for OT.

(a) The requirements letter will be provided to the program office no later than 14 days after the completion of the In-Progress Review-2 (IPR-2) step of the OPTEVFOR MBTD Process. The IPR-2 meeting finalizes the description of the M&S used to supplement live test events.

(b) If M&S is supporting a program's CS OT&E strategy, the CS M&S Requirements Letter should include an additional risk reduction section to assess the impacts of testing tactics, techniques, and procedures that ensure no adverse effects on the system. Further details on the CS M&S Requirements Letter are discussed in reference (k).

(c) The M&S Proponent should start development/modifications of the M&S to support the SIUs as identified in the requirements letter.

(3) M&S Accreditation Plan: This document defines the scope of the accreditation associated with V&V efforts by specifying the AC and methodologies to be used during the accreditation assessment. Additionally, the AP establishes a configuration management plan and identifies issues associated with performing the accreditation assessment.

(a) The overall resource requirements needed to perform the accreditation assessment and conduct of OT are determined as part of the MBTD Process. The resource requirements are documented in the IEF and the associated AP. While OPTEVFOR is responsible for approving the AP, it should be collaboratively developed using a M&S WIPT or OPTEVFOR led working group.

(b) The signed AP should be provided to the M&S Proponent to support development of the V&V plan prior to OT Test Plan signature. The AP must be approved not later than the Operational Test Readiness Review for IOT&E/FOT&E. The OT M&S RFR approved in the Test Plan are based on the RFR matrix developed and agreed to in the IEF which is considered to be the minimum but adequate number of runs required to resolve the associated COIs.

(c) The scope of the AP will be tailored to match each unique simulation environment. For a federation of models, a single AP will be developed that covers the assumptions, limitations, capabilities, interdependencies and interfaces, and AC for the overall federation and each model component or federate. Developing a single AP is more effective and efficient than creating individual APs for each federate.

(d) OPTEVFOR will require the following information from the M&S Proponent to support AP development:

1. Schematic diagrams of the conceptual simulation architecture and individual simulations.

2. Listing of all assumptions and limitations associated with all model federates (if any) and the overall federation of models.

3. Identification of all referent data to be used for validation.

4. Details on the program's M&S configuration management plan.

5. Listing of all significant input parameters and a quantification of input parameter uncertainty.

(e) Additional information to be included in the Accreditation Plan:

1. Updates or recommended changes to OT SUIs from those listed in the MSRL.
2. Descriptions of the factors that describe the operational envelope.
3. OT measures of interest.

(f) AC development for all federated models, and some complex stand-alone models, may require inputs from the M&S WIPT, composed of SMEs from DT, OT, DOT&E, the M&S Proponent, the M&S Developer, and the V&V Agent (if one has been identified). While CS M&S does not require a separate AP, CS M&S AC must address the deltas between the CS M&S configuration and the fielded system and identify key differences as discussed in reference (k).

(g) In many cases, live end-to-end testing of all possible threat systems and/or operational conditions is not feasible due to operational security concerns, resource constraints, and/or schedule restrictions. When limitations in end-to-end testing arise, a segmented live testing approach can be used to cover major portions or gaps in the end-to-end scenario. The SIU(s) and associated limitations to test must be clearly described in the IEF, TEMP, and AP when taking a segment testing approach.

(4) V&V Plan: This document defines the methodology for scoping the V&V effort to the application and the AC. It defines the V&V tasks that will produce the information needed to support the accreditation assessment. It also defines the resources needed to perform the V&V, the V&V schedule, and identifies issues associated with performing V&V.

(a) The M&S Proponent is responsible for the development, approval, and dissemination of this document. V&V planning will normally commence when the PM has received a signed MSRL.

(b) This document is required for all M&S environments listed in table 1.

(c) The V&V Plan is approved after the inclusion of all requirements identified in the approved AP.

(d) V&V Plans executed prior to approval of the AP may require the collection of additional data in the approved AP required for accreditation not previously identified in the V&V Plan.

(5) OT M&S RFR Data Analysis Package: M&S outputs, like all OT data, will be organized into a data analysis package. The M&S Proponent is responsible for the data analysis package to include the associated data wrangling/summarizing/organizing needed for a final tabular product.

(a) The data will be summarized and organized into an excel spreadsheet, or likewise tabular .csv readable file, where all data required for statistical analysis is presented in a single table (OT critical Response Variable (RV), controlled conditions (factors), and recordable conditions, and associated runs from the Test Plan RFR and/or IEF DOE run matrix).

(b) Additional information (not on the same table/page as the tabular RFR results) may include qualitative observations that might help guide the statistical analysis, unique observations and notes from the modelers, and any potentially invalid runs and/or data to include the associated explanation/rationale.

(6) V&V Report(s): The M&S Proponent is responsible for developing and disseminating this report to support the Accreditation decision.

(a) This document focuses on:

1. Meeting the AC identified in the AP, and a discussion of the impact on the program's accreditation recommendation for each AC that was not achieved.

2. While the V&V report follows the same format as the V&V plan, all sections of the V&V report will reflect the results of the validation efforts. For example, the AC table in the AP is updated to include a results column.

3. Documenting M&S assumptions, capabilities, limitations, risks, and impacts,

4. Identifying unresolved issues associated with V&V implementation,

5. Documenting lessons learned during V&V.

(b) The V&V report must be provided to OPTEVFOR prior to the OT M&S accreditation decision by OPTEVFOR. This document is required for all M&S environments listed in table 1. The V&V report often requires OT data for validation, and in these cases, will not be submitted until after the start of OT. The V&V plan strategy, timelines and resources will be identified in the TEMP.

(c) The V&V report must include:

1. An accreditation recommendation from the PM.

2. V&V run analysis to support the Accreditation Letter.

3. A V&V data package to include the associated data wrangling/summarizing/organizing needed for the V&V run analysis.

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4. V&V reports for TR should include all configurations, profiles, or attack surfaces presented to the SUT during OT&E, taking into account target modifiers or payloads like Electronic Attack emitters, infrared emissions generators, or underwater acoustic noise generators.

5. For test targets where a completed V&V report exists from prior use in OT&E, a V&V report supplement to document the necessary data (as described above) for any novel profiles or configurations planned by the current program (the SUT and its associated SIUs will be the major factor in determining if a supplement is required).

6. For a federation of models, the task analysis and the M&S assumptions, capabilities, limitations, and risks for each federate and the overall federation of models.

(d) OPTEVFOR requires the M&S Proponent to provide a statistical analysis of the M&S results using appropriate methodologies, and include documentation of statistical results in the V&V report. Choice of analysis method(s) for the validation effort should be tailored to the SIU. Replication of live events and comparison of live events with a fitted empirical meta-model of M&S results (prediction intervals) are recommended whenever feasible. The analysis should address:

1. System Characterization: Statistically analyze the V&V runs, identify factor effects, and generate an empirical meta-model of the M&S predictions when possible. This system characterization identifies the driving factors and related trends in simulation predictions, which can then be reviewed by SME and compared against live referent data. It is important to note that even in cases with limited live referent data, this approach reduces risk by ensuring that subject matter expertise from all DoD components is included in an objective assessment and that the V&V considered the important operational scenarios, not just a limited number of test cases.

2. Sensitivity Analysis (Factor Excursions): Evaluate the relative effects of changes in factor inputs to the outputs of the model. If an empirical meta-model can be created, compare the factor terms to observed changes in the model outputs. Evaluate the effect size of each of the factors using SME expertise. Small input changes that have significant effects on outputs may help identify sources of error or uncertainty in results.

3. Impact Assessment: For each factor, assumption, or limitation identified in the model, discuss its effect on the model results as compared to live performance. A characterization of the model's prediction of the system's behavior as optimistic or conservative based on a set of factors can be used to determine the overall believability of the model or set expectations for how or under what circumstances the model may be useful.

(e) The M&S DOE and live fire resources required to support V&V are identified in the SUT IEF.

(7) Accreditation Memo: This document is optional, and focuses on OPTEVFOR's concurrence that the model is considered mature enough to recommend conducting the RFR for model validation. Post M&S accreditation scoring of the validation runs for use in OT RFR reporting will be conducted. Based on the level of resources required to conduct RFR, the M&S Proponent can request an accreditation memo from OPTEVFOR recommending the conduct of RFR.

(8) Accreditation Letter: This document summarizes the findings from the V&V Report(s) for each of the AC identified in the AP.

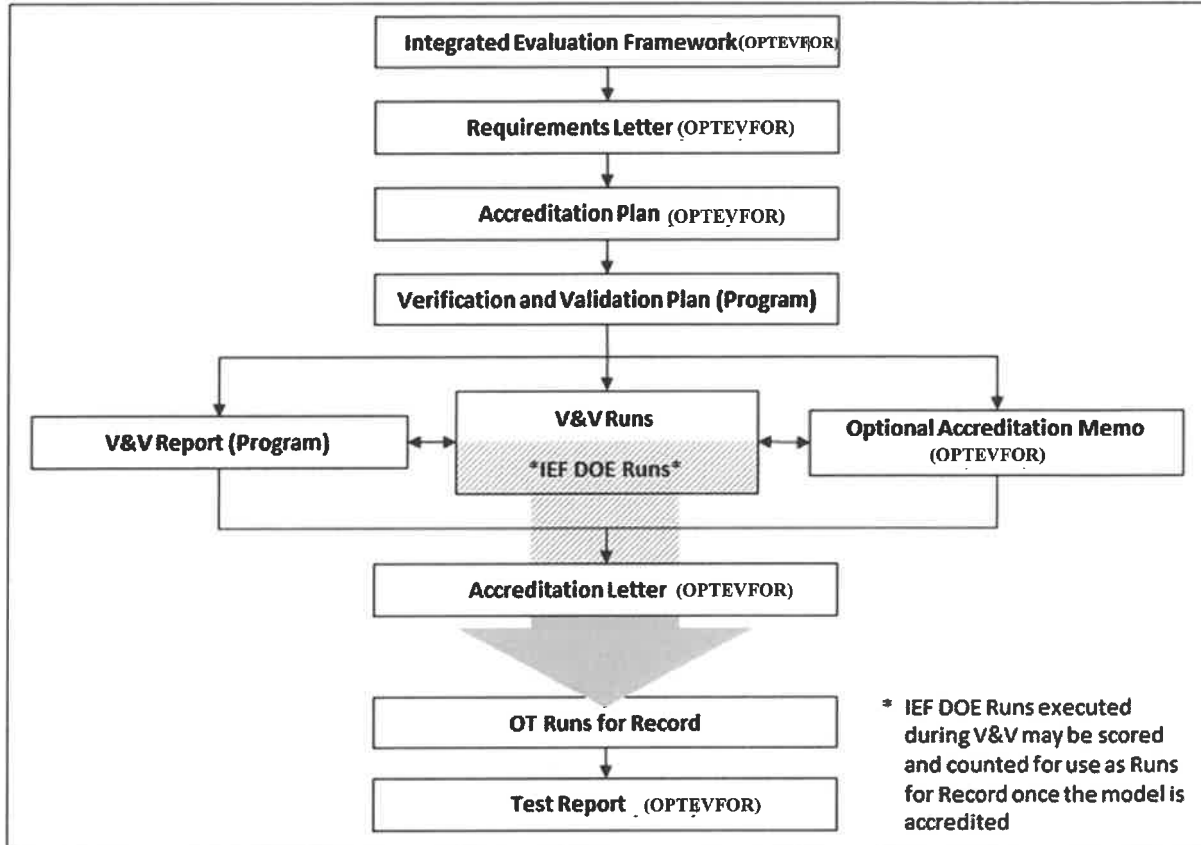
(a) The Accreditation Letter provides the final decision to:

1. Fully accredit.
2. Accredit with limitations, or
3. Not accredit the M&S in question to support the OT SIU(s).

(b) OPTEVFOR is responsible for developing and disseminating this document. This document is required for all M&S environments listed in table 1. The accreditation letter must be approved prior to including M&S results in any OT report (including, but not limited to EOA, OA, QRA, IOT&E, and FOT&E).

(c) Figure 1 illustrates the Verification, Validation, and Accreditation process discussed in paragraph 5h (1) through (8) above.

Figure 1. Verification, Validation, and Accreditation Process



k. Threat Representations: Per reference (f), an entity independent of the developing agency will manage the validation effort for TR and serve as the validation IPT lead and V&V Agent responsible for developing the validation report and coordinating data measurement efforts.

(1) A validation IPT should be composed of an IPT lead and SMEs from the M&S Developer, appropriate warfare centers, the intelligence and T&E communities, the resource sponsor, DOT&E, and the Test and Evaluation Threat Resource Activity (TETRA). Per reference (k):

(a) Analysts from ONI, or another appropriate intelligence agency, will participate as an IPT member in the development and review of validation reports to ensure the validity and accuracy of threat descriptions, threat data and associated capabilities emulated by the TR.

(b) For ACAT 1D programs requiring intelligence support, V&V reports must also be reviewed by analysts from the DIA.

(2) Validation reports will be reviewed and approved by the IPT lead, developing agency, appropriate intelligence agency, resource sponsor and TETRA. TETRA approval signifies independent oversight of the process and that the intelligence data was accurate, current, and derived from authorized sources. The Office of the Chief of Naval Operations, Deputy Director of Naval Intelligence (OPNAV N2N6I) will develop V&V reports for Navy threat targets and digital TRs, and OPTEVFOR representatives will participate in their review. This will ensure the validity and accuracy of threat descriptions, and the threat data and associated capabilities emulated by the TR.

(3) The M&S WIPT should serve as the validation IPT with the inclusion of the additional stakeholders as described in reference (f). ONI serves as the authoritative DoD and Navy source for data and assessments concerning foreign maritime threats (reference k), and is responsible for the validation of non-US forces and capabilities in models, simulations, and their associated data for threats (reference g). OPTEVFOR will review Navy threat validation reports for the purpose of accrediting TRs for use in OT&E (reference f).

(4) When an entity, not independent of the developing agency, is used to manage the validation effort and serve as the validation IPT lead, a Target Threat Validation Report (TTVR) is used in place of the validation report described above. The TTVR is a specific process utilized by Naval Sea Systems Command (NAVSEA). The TTVR is submitted by the M&S Developer (vice an independent agency), reviewed by the M&S Proponent/Program Office and OPTEVFOR, and approved by DOT&E. Note: Naval Air Systems Command (NAVAIR) utilizes an independent organization to validate TR models and the NAVSEA TTVR process does not apply.

(5) Family of Live Threat Surrogates. In some cases, target models are developed that do not directly correspond to a specific threat, but rather represent a general category or family of threats (e.g. subsonic anti-ship cruise missile defines a family of specific threats). Often, these family-of-threats can appropriately act as a surrogate in OT. The use of Family of Live Threat Surrogates in OT enables some level of evaluation where a gap in TR would otherwise exist. The M&S Proponent must include the Family of Live Threat Surrogate as a modeled threat in their V&V run matrix along with the other specific threats of interest, and limitations associated with the use of Family of Live Threat Surrogates must be documented in the IEF, TEMP, AP, and V&V Report.

1. Cyber Survivability M&S. CS M&S follows the same procedures outlined in this document. Further details on the CS M&S, including examples of CS M&S SIUs for OT, are discussed in reference (j).

6. Records Management

a. Records created as a result of this instruction, regardless of format or media, must be maintained and dispositioned for the standard subject identification codes 1000 through 13000 series per the records disposition schedules located on the Department of the Navy/Assistant for Administration (DON/AA), Directives and Records Management Division (DRMD) portal page at <https://portal.secnav.navy.mil/orgs/DUSNM/DONAA/DRM/Records-and-Information-Management/Approved%20Record%20Schedules/Forms/AllItems.aspx>.

b. For questions concerning the management of records related to this instruction or the records disposition schedules, please contact the local records manager or the DON/AA DRMD program office.

7. Review and Effective Date. Per OPNAVINST 5215.17A, the Test Director will review this instruction annually around the anniversary of its issuance date to ensure applicability, currency, and consistency with Federal, Department of Defense, Secretary of the Navy, and Navy policy and statutory authority using OPNAV 5215/40 Review of Instruction. This instruction will be in effect for 10 years, unless revised or cancelled in the interim, and will be reissued by the 10-year anniversary date if it is still required, unless it meets one of the exceptions in OPNAVINST 5215.17A, paragraph 9. Otherwise, if the instruction is no longer required, it will be processed for cancellation as soon as the need for cancellation is known following the guidance in OPNAV Manual 5215.1 of May 2016.



S. R. TEDFORD

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