NATIONAL WEATHER SERVICE INSTRUCTION 80-307
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Office Planning & Programming for Service Delivery
Systems Engineering
OPERATIONAL TEST & EVALUATION PROCESS

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SUMMARY OF REVISIONS: This instruction replaces and supersedes National Weather Service Instruction 30-302, *Operational Test and Evaluation Process*, dated July 30, 2007. Changes were made to reflect the NWS Headquarters reorganization effective April 1, 2015. It includes the following changes:

- Updated the names of certification and approving officials to reflect personnel changes
- Updated all sections to include new re-organization division name (Office of Planning and Programming for Service Delivery, OPPSD) and the branch name (Systems Engineering Integration and Testing, SEIT).
- Added Section 3.3 for System Acceptance Test (SAT) for new systems, including the use of the SAT acronym, wherever appropriate, throughout the whole document.
- Updated Section 4 to update list of major systems and removed Section 4.2 for excluded systems.
- Updated Section 5.3.1 to define TRG Chair also as the OT&E test team lead.
- Updated Section 6 to include required OT&E milestones.
- Updated Section 6.4.1 to put Impact and Priority designations in a table, including syncing the Impact and Priority levels with what is actually used by tracking software.
- Removed the previous Appendix A.
- Updated Appendix B and C for simplified test plan and reports sample outlines.
- Updated Appendix D for simple test procedure sample.

Signed 1/29/2020
Kevin C. Cooley Date
Director, Office of Planning & Programming for Service Delivery

Operational Test and Evaluation Process

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Operational Test and Evaluation Process

1. Introduction

This instruction supports National Weather Service Policy Directive 80-3, Systems Engineering, by delineating the process and procedures followed during Operational Test and Evaluation (OT&E). The tests described herein are administered by the Systems Engineering Integration and Test Branch (SEIT) of the National Oceanic and Atmospheric Administration (NOAA), National Weather Service (NWS), Office of Planning and Programming for Service Delivery (OPPSD). This instruction describes the development, conduct, and reporting of the OT&E.

2. References

a. National Weather Service Policy Directive 80-2, System Commissioning and Decommissioning
b. National Weather Service Policy Directive 80-3, Systems Engineering
c. National Weather Service Instruction 80-201, System Commissioning Process
d. National Weather Service Instruction 10-101, Change Management Process
e. National Weather Service Policy Directive 60-7, Information Technology Security Policy
f. National Weather Service Instruction 30-1203, Configuration Management for Operational Systems
g. National Weather Service Instruction 80-305, Master Test and Evaluation Plan

3. Definitions

The following definitions apply for the purposes of this instruction.

3.1 Operational Test and Evaluation

An OT&E is a formal evaluation of a System-Under-Test that is conducted in an operational environment. An OT&E is conducted to evaluate the general fitness of the System-Under-Test for use in NWS field operations and to ensure that specific technical objectives have been met. An OT&E is conducted in coordination with Weather Service Headquarters, Regional Headquarters, Field Offices, and other Federal, state, and local agencies as required to fully evaluate the System-Under-Test. An OT&E considers all aspects of life cycle management of the system including: installation, documentation, performance, training, reliability, communications, information technology security, logistics, and maintenance support. An OT&E is performed after the successful completion of a System Acceptance Test (SAT) or System Test (ST). The OT&E is included in the Operations Validation Stage of the NWS systems engineering lifecycle model (see Figure 1). An OT&E must be successfully completed prior to national deployment of the System-Under-Test.

32 System Acceptance Test

A System Acceptance Test is a formal evaluation of a System-Under-Test that is conducted in a simulated and controlled environment for all new systems not already deployed and/or commissioned. NWS test bed facilities may be used to simulate the conditions encountered at operational field sites. If the System-Under-Test does not allow simulation, limited deployment of the system to selected field sites may be authorized. A SAT is conducted to evaluate the general fitness of the System-Under-Test for use in NWS field operations and to ensure that specific technical requirements have been met prior to use of the system at selected NWS operational sites for OT&E. A SAT must be successfully completed prior to an OT&E. The Program Office is responsible for the planning, conduct, and reporting of SATs.

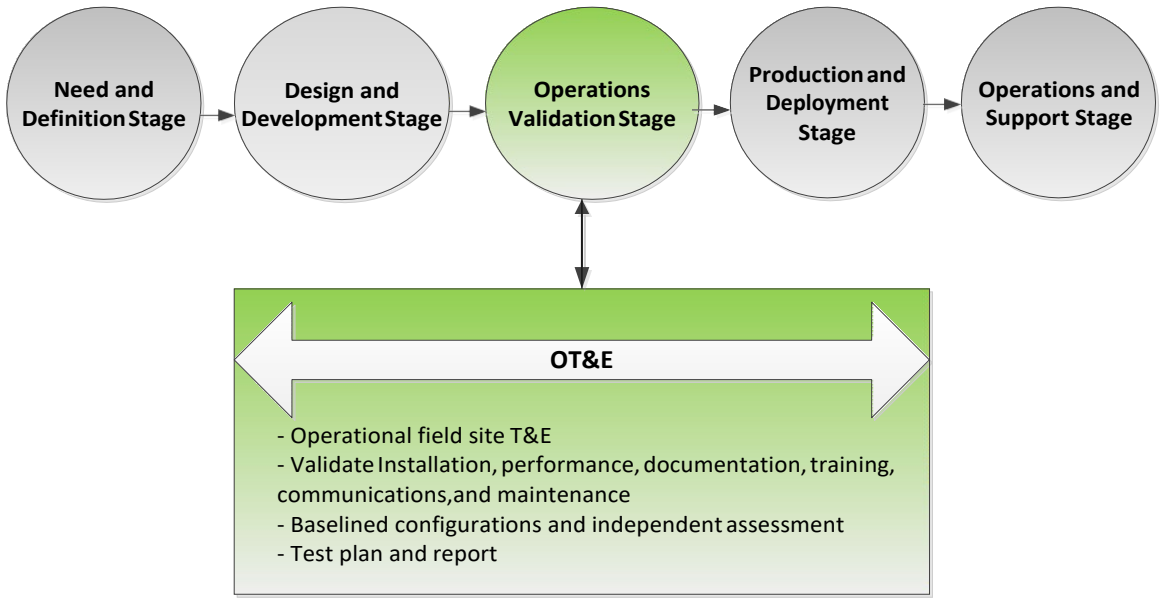


Figure 1 - Operations Validation Stage

33 System Test (ST)

A System Test is a formal evaluation of a System-Under-Test that is conducted in a simulated and controlled environment for all systems that are already deployed and that NWS currently maintains. NWS test bed facilities may be used to simulate the conditions encountered at operational field sites. If the System-Under-Test does not allow simulation, limited deployment of the system to selected field sites may be authorized. A ST is conducted to evaluate the general fitness of the System-Under-Test for use in NWS field operations and to ensure that specific items included in the request for change have been met prior to use of the system at selected NWS operational sites for OT&E. A ST must be successfully completed

prior to an OT&E. SEIT is responsible for the planning, conduct, and reporting of STs.

3.4 System-Under-Test

A System-Under-Test may be a major NWS operational system (see Section 4.1), or any subsystem or component thereof.

4. Scope

Major operational systems are maintained by the NWS for the collection, distribution, and dissemination of meteorological, climatologic, and hydrologic data. OPPSD performs OT&Es for new systems for operational readiness or evaluate proposed changes in the baseline configuration of existing major operational systems, as a prerequisite for national deployment of the System-Under-Test. Major operational systems that undergo operational test and evaluation include, but not limited to:

- Automated Surface Observing System (ASOS)
- Radiosonde Replacement System (RRS)
- NOAA Weather Radio All Hazards (NWR)
- Advanced Weather Interactive Processing System (AWIPS)

4.1 Program/Project Critera for Conducting an OT&E

An OT&E should be conducted on a system based on one or more of the following criteria:

- By direction of the OPPSD Director or Chief Engineer.
- By an approved Program/Project Plan (for new systems or products) or Request for Change (modification of existing system) that identifies OT&E as a required activity approved by Programs or Projects.

4.2 Major Operational Systems Covered by this Instruction

SEIT personnel perform OT&E for the following systems: ASOS; RRS; NWR, and specific software and/or hardware systems installed or configured within AWIPS including the Broadcast Message Handler (BMH) and the Geostationary Operational Environmental Satellite R-Series (GOES-R). The procedures described in this instruction may also be applied to other systems as assigned by the SEIT Branch Chief.

5. Roles and Responsibilities

A description of the major authorities for management of OT&E follows.

5.1 Change Management Process

OT&E may be authorized by a Request for Change (RC) under the Change Management

Process. The Change Management Process is administered by the Program Manager or Program Management Committee and the Configuration Control Board.

5.1.1 Program Manager

A Program Manager may have overall responsibility for management of an NWS operational system including the authorization of changes in the baseline configuration of an existing operational system and the national deployment of a system, subsystem, or component thereof.

5.1.2 Program Management Committee

A Program Management Committee (PMC) may have overall responsibility for management of an NWS operational system including the authorization of changes in the baseline configuration of an existing operational system and the national deployment of a system, subsystem, or component thereof. The PMC is comprised of senior NWS managers and representatives of other Federal agencies.

5.1.3 Configuration Control Board

The Configuration Control Board (CCB) is subordinate to the Program Manager or PMC, as appropriate. The CCB reviews proposed changes to the baseline configuration of an existing operational system and authorizes any RC for the system. The CCB may stipulate in the RC the successful completion of a System Test and OT&E as conditions for national deployment of the System-Under-Test. The CCB is typically chaired by the Program Manager.

5.2 Information Technology Security

NWS Information Technology (IT) resources and systems must comply with the NWS security policies established by NDS 60-7. Compliance with NWS security policies is established through Assessment and Authorization (A&A) of the system. System Assessment and Authorization is overseen by the NWS Chief Information Officer (CIO) and is separate from OT&E. The PM or PMC may designate an Information System Security Officer (ISSO) for each corresponding major operational systems listed in Section 4, they manage as appropriate. The designated ISSO coordinates the activities required to complete system A&A. The ISSO may participate in the OT&E and/or coordinate A&A activities with the OT&E as required.

5.3 Test Review Group

A Test Review Group (TRG) is established as an independent body to oversee the execution of the OT&E. The TRG is comprised of operational user representatives and subject matter experts. The TRG must authorize the commencement of field tests at operational field sites: The TRG conducts a Test Readiness Review (TRR) prior to the commencement of field tests to review the status of the System-Under-Test and to ensure that all test prerequisites have been satisfied (see Section 6.2.2). The TRG may authorize field tests upon the satisfactory review of the System-Under-Test. The TRG meets periodically during OT&E to review test results and to prioritize any deficiencies discovered. The TRG reports to the Program Manager and recommends, based on a “user” perspective, whether to proceed with national deployment of the

System-Under-Test, at the conclusion of OT&E.

The composition of the TRG is selected to ensure a thorough evaluation of the System-Under-Test. The TRG is comprised of a Chair, Regional Focal Points, Other Agency Focal Points, the OT&E Director, and members of the Test Team. Membership in the TRG is open to the ISSO; the Program Manager; National Weather Service Employee Organization (NWSEO); and other NOAA agency representatives.

The recommendations of the TRG are based on input provided by the voting members. The voting members of the TRG may only include user representatives: the OT&E Director, Regional Focal Points, and the designated NWSEO representative. Other agency focal points may be voting members of the TRG if actively participating in the OT&E. The ISSO is a voting member if the System-Under-Test is an NWS information system or may impact an NWS information system. Stakeholders who are responsible for producing the System-Under-Test and/or services supporting the System-Under-Test may not be voting members of the TRG.

5.3.1 Test Review Group Chair

The TRG is chaired by the SEIT Branch Chief, SEIT Group Lead, or designated representative. The Chair convenes the meetings of the TRG and works with the OT&E Director and the members of the TRG to ensure that tests are conducted efficiently. The TRG Chair works as the test team lead to resolve any issues that may arise during the conduct of the OT&E.

The Chair is a non-voting member of the TRG except in the case of a tied vote. The TRG Chair casts the deciding vote in the event of a tie.

5.3.2 Operational Test and Evaluation Director

The OT&E Director manages the development of the OT&E Plan, oversees the conduct of tests, and manages the development and coordination of the OT&E Report. The OT&E Director is the primary point of contact for the OT&E. The OT&E Director coordinates the timely delivery of all hardware, software, and documentation required for the OT&E. The OT&E Director reports to the TRG Chair. The OT&E Director prepares and disseminates the minutes of TRG meetings in a timely manner, typically within 24 hours following the meeting.

The OT&E Director is a voting member of the TRG.

5.3.3 Program Manager

The Program Manager serves as the primary focal point for the System-Under-Test. The Program Manager may present the recommendations of the TRG to the Program Management Committee, as input to their deliberations regarding national deployment of the System-Under-Test.

The Program Manager may be a member of the TRG, but is however a non-voting member of the TRG.

5.3.4 Test Team

The Test Team is typically comprised of NWS staff members from SEIT and other organizational units within NWS. Members of the OT&E Test Team conduct the tests, help develop and review the OT&E Plan, document and track deficiencies, help record the minutes of TRG meetings, ensure appropriate technical experts analyze the test results, and help develop the OT&E Report. The OT&E Director may solicit support from other organizational units within NOAA, other Federal agencies, and/or the user community to serve on the Test Team and satisfy the objectives of the OT&E. Members of the Test Team may be required to travel to field sites to fully assess the System-Under-Test.

Test Team members are non-voting members of the TRG.

5.3.5 National Weather Service Headquarters Test Support

The organizational units within National Weather Service Headquarters (WSH) responsible for software and hardware development provide the OT&E Director with all requisite system components, e.g., field modification kits (FMK), draft installation procedures, draft operations user and hardware maintenance documentation, including support related to potential issues with operational requirements and procedures. The OT&E Director may solicit support from the National Weather Service Training Center (NWSTC), as required to satisfy the training criteria objectives of the OT&E.

National Headquarters personnel are non-voting members of the TRG.

5.3.6 Information System Security Officer

The ISSO, or other designated authority, may be required to participate in the TRG if the System-Under-Test is an information system or if the System-Under-Test might impact NWS information systems. The OT&E Director may solicit support from the ISSO, or other designated authority, as required to meet the technical objectives of the OT&E.

The ISSO, or other designated authority, is a voting member of the TRG if participation is required.

5.3.7 Regional Headquarters Test Support

Personnel from NWS Regional Headquarters may serve as Regional Focal Points for the OT&E. Focal Point(s) are typically selected from each of the Regional Offices. Regional Focal Points are typically selected from the System Operations Division; however, Meteorological and Hydrological Services Division personnel may also be selected as required to support the technical objectives of the OT&E. The Regional Focal Points provide input regarding issues that impact site operations. Regional Focal Points are the primary liaison between WSH and the Regional Headquarters and coordinate the support required for the OT&E with their respective Field Offices.

Regional Focal Points are voting members of the TRG.

5.3.8 Field Office Test Support

Field sites, including national centers are selected for OT&E in coordination with the Regional Headquarters. Field Office staff members may be selected to participate in the OT&E. Field Office Test Support typically includes the Meteorologist-in-Charge (MIC) or Hydrologist-in-Charge (HIC) and subject matter experts, such as the Electronic Systems Analyst (ESA), Operations Program Leader (OPL), and program focal points, as required to meet the technical and management objectives of the OT&E. Field Office Support personnel may report to the TRG and/or participate in meetings of the TRG at the request of their respective Regional Headquarters.

Field Office Test Support personnel will coordinate with their designated Regional Focal Point(s) so each field site and their corresponding region can consolidate their vote at the end of the OT&E.

5.3.9 NOAA Test Support

The OT&E Director may invite staff members from other organizational units within NOAA, such as the National Centers for Environmental Information (NCEI), Ashville, NC, to participate in the OT&E as required to meet the technical and operational objectives of the OT&E.

NOAA agency representatives are voting members of the TRG if actively participating in the OT&E.

5.3.10 NWSEO Test Support

TRG membership is open to representatives of the NWSEO. NWSEO representation is sought to provide input on working conditions at NWS field sites and to avoid any negative impact on working conditions.

The NWSEO representative is a voting member of the TRG.

5.3.11 Other Agency Support

Several of the major operational systems listed in Section 4 are managed in cooperation with other Federal agencies. Membership in the TRG is open to user representatives and subject matter experts from other Federal agencies when applicable.

Other Agency Focal Points are voting members of the TRG if actively participating in the OT&E and representing their users.

6. Operational Test and Evaluation Process

The OT&E is formally requested by the Program Office at the beginning of a project to facilitate required preparations leading to the actual test. Prior to the actual conduct of the OT&E, the OT&E test group (TRG Chair, OT&E Test Director, OT&E Test Team) performs the following activities including:

- Attendance and participation in project working group/technical interchange meetings
- Generation of the OT&E Test Schedule
- Generation of the OT&E Test Plan, signed by the SEIT Branch Chief
- Generation of the OT&E Test Procedures and other supporting documentation
- Selection of OT&E test sites based on formal criteria. After the test sites are confirmed per regional focal point recommendations, the test team coordinates with the selected sites for additional information (e.g., site configuration, field focal points, and availability for testing, schedule updates)
- Setup of problem tracking mechanism (e.g., TestTrack Pro, Redmine) for use during the test
- Participation in any pre-OT&E SAT testing activities

The OT&E Test Schedule will encompass all of the above activities and including the actual OT&E test conduct.

6.1 Test Conduct

Tests conducted at NWS operational field sites require the full consent and cooperation of the agency responsible for the site. The operation of the field site should be carefully monitored at all times during tests. The MIC or HIC retains full authority for the operation of the site during the OT&E: the MIC or HIC may suspend tests at any time and return the site to its initial configuration if he or she believes that continuing the OT&E may jeopardize critical site operations. The MIC or HIC should notify the OT&E Director as soon as practical if field tests are suspended. The site MIC or HIC will approve all decisions affecting site operations during the OT&E including the schedule for installations and site staff assignments.

System installation is performed by field site staff members with support of other development organizations as required using the draft installation instructions. Tests are conducted as described in the OT&E Plan.

6.2 Test Commencement

The OT&E formally begins with a TRR.

6.2.1 Test Readiness Review

The TRR is held to confirm that all prerequisites for the OT&E have been properly satisfied prior to the start of the OT&E tests. The TRR is convened by the TRG Chair and is attended by the members of the TRG, hardware and software developers, the OT&E Director, the System Test Director, and other subject matter experts as required to fully assess the readiness of the System-Under-Test. The OT&E Director will provide a checklist of prerequisites for the OT&E (see Appendix A for an example) and coordinate presentations by subject matter experts to verify the status of the System-Under-Test. A decision to proceed to OT&E is based on the majority opinion of the voting members of the TRG. The minutes of the TRR are prepared by the OT&E Director and disseminated to the members of the TRG and other stakeholders.

6.2.2 Test Prerequisites

Typical prerequisites for an OT&E include:

a. A successful SAT/ST

A SAT or ST must be successfully completed before the OT&E may begin. Successful completion of the SAT/ST stipulates that:

- No critical problems may remain unresolved at the conclusion of the SAT/ST
- Any problems resolved by workaround are properly noted and incorporated into the draft release notes and other system documentation. All workarounds must be acceptable for normal field operations

b. Hardware and software certification

System hardware engineers certify that the hardware delivered for the OT&E is representative of the hardware that will be deployed to operational sites. System software engineers certify that the software delivered for the OT&E is the latest revision and that all fixes implemented as a result of the System Test have been properly incorporated.

c. IT security Assessment and Authorization

If performed, the ISSO must report the status of the IT security Assessment and Authorization. The NWS CIO or other designated official must authorize the use of the system at selected NWS operational sites for OT&E.

d. Maintenance logistics

If required, an initial issue FMK may be distributed through the National Logistics Support Center (NLSC). If support from the NLSC cannot be arranged prior to commencing field tests, the Program Manager must ensure that all required FMKs and draft installation procedures are delivered to the OT&E sites.

e. System documentation

Draft versions of system documentation must be available for the OT&E. System documentation includes: NWS engineering handbooks, user/operator manuals, system administration manuals, maintenance manuals, release notes, installation instructions and/or modification notes.

f. Training

Appropriate training must be provided for all personnel participating in the OT&E so that they can properly operate and maintain the system in the OT&E environment. This is done so that Government OT&E personnel can perform OT&E operationally, as well as validate installation and maintenance procedures. It is also done so that the Government can validate the training itself as a prerequisite for obtaining OT&E approval. Other Federal agencies may be required to provide training for their personnel.

g. OT&E documentation
The OT&E Plan, including any Test Procedures (see Section 6.3.4), must be approved and authorized by the SEIT Branch Chief prior to commencing field tests.

In the event that prerequisites are not met and the Program Office recommends the OT&E to proceed, the Program Office must waive unmet requirements and document the waivers for reference. Additionally, the Program Office will accept all operational risks involved with proceeding with the OT&E with all of the documented waivers or workarounds.

6.3 Test Methodology

The testing strategy is fully documented in the OT&E Plan. The test should, to the extent possible, ensure that all installation materials and new functions are validated for both normal and service backup operations using normal and backup system configurations. System configurations not evaluated during the SAT/ST should be included among the sites selected for field tests whenever possible. Test site selection must encompass all pertinent site configurations and risks to operations presented by the change.

6.3.1 Purpose and Objectives

The OT&E verifies that the System-Under-Test supports operations. An OT&E is conducted, in general, to verify that the System-Under-Test meets or exceeds the technical specifications, is reliable, and that all associated documentation and logistical support required to for operating and maintaining the system is available prior to national deployment. Specific test objectives should be developed by SEIT personnel in coordination with NWS subject matter experts. The test objectives must address each critical system characteristic and all affected major operational concerns and must be clearly stated in the OT&E Plan.

6.3.2 Evaluation Criteria

Evaluation criteria must be provided in the OT&E Plan for each test objective. Evaluation criteria must be testable and clearly stated in the OT&E Plan.

6.3.3 Installation

Field tests begin with installation of the System-Under-Test. The System-Under-Test is installed by field site personnel using the draft installation procedures and any required FMKs. Test Procedures included in the OT&E Plan should be completed immediately following installation, if appropriate. Members of the Test Team may witness the system hardware and/or software installation and the initial operation of the system. If Test Team members are dispatched to the field sites, the Team should provide a status report to the OT&E Director before departing the site.

6.3.4 Test Procedures

The OT&E Plan usually includes a master list of test procedures, as required to fully evaluate the System-Under-Test, which references specific test objectives. Test procedures are typically

separate documents that exercise specific critical functions that are used infrequently during normal field operations. Test procedures may also test for compliance with current NWS policies for IT security. Each test procedure should contain a description of the testing scenario, the objectives of the test, and the criteria for a successful outcome. Each test procedure should provide step-by-step instructions. The expected outcome should be indicated and a pass/no pass check-off should be provided for each step. Space should be provided for comments and the tester should be encouraged to annotate the procedure both as a record of the test and for improvements to the procedure. An example of a typical test procedure is provided in Appendix D. A list of completed test procedures is included in the OT&E Report, and is part of the official test record. All test procedures that were referenced in the OT&E Plan must be completed.

6.3.5 Operational Testing

An OT&E will typically run from a period of 30 to 90 days to verify system performance, stability, reliability, and communications. During this period, site personnel perform their normal service operations using the System-Under-Test. Specific test procedures may be completed immediately following installation or during operational tests, as appropriate. Test procedures may include affected critical or major operational concerns.

The OT&E Plan may include provisions for monitoring and reporting product availability and reliability if network communications might be affected. In general, product availability and reliability for the System-Under-Test should be equal to or greater than the current system performance.

The OT&E Plan may include provisions for testing compliance with NWS IT security policies during field tests. Such tests will typically be conducted by the ISSO under guidance of the NWS CIO and/or other responsible authorities.

6.3.6 Surveys and Questionnaires

The OT&E Plan may contain surveys and/or questionnaires to solicit comments from field forecasters, electronic technicians, and other staff members. Surveys and questionnaires may be considered by the TRG in developing its recommendations. An example of a typical survey, using Google Forms, is provided in Appendix E.

6.4 Trouble Reporting

A Test Trouble Report (TTR), or other suitable report, must be completed and submitted to the OT&E Director for each deficiency discovered during the OT&E. The TTR should include a complete description of the defect including any supporting data. A TTR may also be used to suggest enhancements to the system that are beyond the scope of the OT&E. A sample TTR form is provided in Appendix F. TRG meetings are periodically convened during the OT&E to review and classify TTRs. The OT&E Director coordinates the collection and dissemination of TTRs to the members of the TRG for adjudication.

6.4.1 Classification of Test Trouble Reports

TTRs may be assigned numerical scores to indicate the severity of the defect, i.e., the Impact and the Priority. A typical assignment scheme for Impact is described in **Table 1 Impact Descriptions.**

Table 1- Impact Descriptions

Impact	Type	Action
Impact 1	**Critical**: A repeatable problem that prevents or compromises the full delivery of products or services. No workaround exists for the problem.	The TRG may recommend the immediate suspension of OT&E and the System-Under-Test is turned over to the system developers to resolve the problem. The OT&E may be resumed at the recommendation of the TRG after an appropriate fix or workaround has been developed. The TRG may recommend that tests be resumed under the existing OT&E Plan; or, if significant re-coordination and re-planning are required, the TRG may recommend that the OT&E Plan be amended or that a separate Follow-On OT&E Plan be prepared and that tests continue under the new plan. The Test Team may repeat selected test procedures or develop new test case procedures to fully evaluate the proposed solution.
Impact 2	**Major**: A repeatable problem that prevents or compromises the full delivery of products or services. An acceptable workaround has been developed that allows national deployment to proceed.	The TRG may recommend that the OT&E continue with an approved workaround in place until an appropriate fix is developed. If a fix becomes available during the OT&E, the TRG may recommend immediate implementation of the fix. The test team may develop new Test Procedures and/or repeat selected test procedures to fully evaluate the proposed fix. A follow-on OT&E may be required to verify the proposed fix.
Impact 3	**Routine**: A repeatable problem that does not prevent or compromise the full delivery of products and services.	The OT&E may continue at the discretion of the TRG. An approved workaround may be authorized until the problem is fixed, but this is not mandatory. Routine deficiencies are documented and prioritized by the proper authority for future fixes.

Impact	Type	Action
Impact 4	**Watch Item**: Infrequent or poorly documented behavior of the System-Under- Test that might prevent or compromise the delivery of products or services.	The TRG may recommend that the OT&E continue. The test team may develop new test procedures and/or repeat selected test procedures in an attempt to reproduce the problem. Any further observations are documented and submitted to the TRG for review.
Impact 5	**Minimal to no impact. Potential Enhancement**: An item identified by the TRG as low to no impact or for consideration as a new system requirement.	The TRG forwards the recommended change to the Program Manager for consideration under the Configuration Management process.
Impact 6	**Undetermined**: The Impact has not been determined.	The TRG will temporarily set Impact as Undetermined until more information is received and/or resolution is appropriate. All TTRs with Impact set as Undetermined need to be adjudicated to the proper Impact before the end of the OT&E.

The Priority addresses how the problem is to be resolved. A typical assignment scheme for the Priority is described in Table 2 Priority Descriptions.

Table 2- Priority Descriptions

Priority	Type	Action
Priority 1	**Urgent**: Need immediate fix	All appropriate resources are directed to resolve the problem.
Priority 2	**High**: Include before national deployment.	The available resources are directed to promptly resolve the problem.
Priority 3	**Routine:** Include in the next build after deployment.	Resources are directed to resolve the problem as allowed.
Priority 4	**Low:** Include in a future build.	The item is deferred to future system improvements
Priority 5	**Undetermined**: The Priority has not been determined.	The TRG will temporarily set Priority as Undetermined until more information is received and/or resolution is appropriate. All TTRs with Priority set as Undetermined need to be adjudicated to the proper Priority before the end of the OT&E.

6.5 Conclusion of Testing

The TRG Chair will convene an OT&E Wrap-up meeting following the successful completion of

field tests. The OT&E Director will review the activities conducted to date including a summary of TTRs and their disposition, and any other findings and/or recommendations.

The following conditions must be satisfied for the system to receive a positive recommendation:

- All test procedures must be successfully completed.
- All test objectives provided in the OT&E Plan must be met.
- All TTRs submitted during the OT&E must be adjudicated by the TRG.
- The System-Under-Test must be free of critical deficiencies, i.e., all TTRs assigned Impact 1 or 2 must be resolved. Non-critical deficiencies, i.e., TTRs assigned Impact 3-5, may be present; any workarounds for these impacts must be approved and authorized by the TRG. The workaround must be fully documented in the system release notes and/or other system documentation as appropriate.
- All draft documentation (e.g., installation, operations, system administration, support, and maintenance) must be acceptable for use in field operations.

The TRG will review the materials presented and vote to recommend whether to proceed with national deployment of the System-Under-Test. The decisions of the TRG are based on a simple majority vote among the voting members. In the event of a tie, the TRG Chair casts the deciding vote. Dissenting opinions should be recorded and reported in minutes and reports. The TRG Chair reports the recommendation of the TRG to the Program Manager or other designated authority.

The OT&E Report is prepared following the conclusion of testing (see Section 8.2).

7. Tools

SEIT maintains tools specific to the management of test projects, including product availability and monitoring (e.g., PAMS, etc.)

7.1 Test Archive

Test documents are kept on file for at least 5 years. Test documents include: the OT&E Plan and the OT&E Report, and including test procedures, data results and analyses, TRG meeting minutes, interim reports, and other supporting records of the test. Documentation is stored on the government maintained shared file server where scheduled backups are performed.

7.2 Deficiency Status Tracking and Archive

SEIT maintains a problem t racking software, Test Track Pro, that is used for TTR entry and reporting. SEIT personnel are granted user and administrator rights to the program as required.

7.3 Data Analyses

SEIT performs product availability and monitoring software, on a per project basis, to measure the reliability and availability of network communications.

7.4 Dissemination

Dissemination of OT&E Plans and Reports, and other OT&E related documentation are either included in email messages for select recipients as attachments or links to files stored on the government maintained remote file storage (e.g., Google Drive).

8. Documentation

The official record of an OT&E is comprised of the OT&E Plan and the OT&E Report.

8.1 Operational Test and Evaluation Plan

The OT&E Plan describes the actual conduct of tests. The Plan will typically include an introduction, purpose, objectives, evaluation criteria for each objective, test strategy, test management, test conduct, methods for deficiency adjudication, test focal points, and contact information. A typical outline for an OT&E Plan is provided in Appendix B. The test plan must include references to all the test procedures and a TTR Form as appendices and may include user surveys and/or questionnaires as appropriate. The OT&E Plan is developed in coordination with WSH, Regional Headquarters, test sites, and other Federal, state, and local agencies. The OT&E Plan should be reviewed by the members of the TRG and other subject matter experts as appropriate. The OT&E Plan must be approved and signed by the SEIT Branch Chief prior to commencing the OT&E.

8.2 Operational Test and Evaluation Report

After the completion of the OT&E, the OT&E Report is generated to document the test results, including the results of the TRG voting for recommendations to deployment. The OT&E Report includes an introduction, purpose, test objectives and verification; description of how the testing was conducted; a summary of the test results including a listing of all TTRs and their disposition; and the test conclusions and final recommendation. A typical outline for an OT&E Report is provided in Appendix C. The OT&E Report should describe any follow-on testing that may be required as a result of problems found during the OT&E. The draft OT&E Report should be reviewed by the members of the TRG and other subject matter experts as appropriate. The OT&E Report must be approved and signed by the SEIT Branch Chief.

Appendix A – Test Readiness Review Checklist

- OT&E Plan completed.
- The System Acceptance Test/System Test was successfully completed.
- All critical Test Trouble Reports closed.
- All OT&E site personnel trained.
- Request for Change for test approved.
- All draft documentation is available.
- All OT&E site configurations are complete and verified.
- All operationally acceptable workarounds are fully documented

Appendix B – Example - Operational Test and Evaluation Plan Outline

Executive Summary
Acronyms

PART I: INTRODUCTION
- Test Plan Organization
- Purpose
- Prerequisites
- Test Objectives and Evaluation Criteria
- Assumptions, Limitations, and Risks
- Background
- System Description and Configuration
- Test Strategy

PART II: TEST MANAGEMENT
- Test Review Group
- Test Personnel and Responsibilities

PART III: TEST CONDUCT
- Test Sites
- Resource Requirements
- Pre-OT&E Activities
- Readiness Review Meeting
- Test Conduct
- Test Reporting and Analysis
- Schedule
- Help During the OT&E
- Post-OT&E Activities

PART IV: TEST RECOMMENDATION AND REPORT

ATTACHMENTS
- Test Review Group List
- Test Procedures List & Descriptions
- Test Sites / Contacts List
- Resource Requirements List
- OT&E Schedule
- OT&E Questionnaire
- EMRS Form Sample

Appendix C – Example - Operational Test and Evaluation Report Outline

Executive Summary
Acronyms

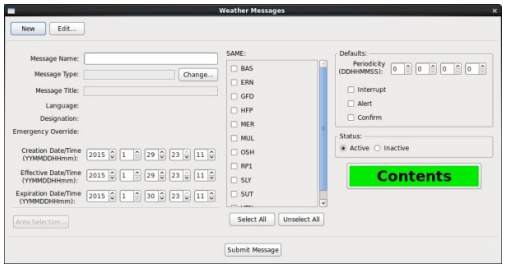
Introduction
Purpose
OT&E Objectives, Criteria, and Results
Conclusions
Lessons Learned/Recommendations

Attachments:

- Test Review Group Voting Results
- Detailed Test Results/Test Data
- Test Trouble Reports List/Details
- Questionnaire Responses

Appendix D – Example - Test Procedure

Test # 1007a	*Message Create*							Outcome:		☐ PASS	☐ FAILED
Tested by:		Iteration:		Date:		Time Start:		Time End:		Estimated Time:	
Purpose:	This test will confirm the NWR-BMH message create functionality.										

Step #	Operator/Equipment Action	Expected Results	Comments	Results Pass	Fail
1	From main menu, select **Messages->Weather Messages**	The **Weather Messages** window is displayed.			
2	On the **Weather Messages** window, create a text weather message with the following attributes: Select a message type scheduled for the current General Suite of a selected transmitter. Enter a meaningful name. Select listening area for the selected transmitter. No SAME tones, no alert tones, no periodicity, and not an interrupt. Create a text message contents. Please add “This is a test text message. This message is only a test.”	Message is created	 **Message Type:** _____ **Listening Area:** _____		

Step #	Operator/Equipment Action	Expected Results	Comments	Results Pass	Fail
	Set the message expiration date time to current + 10 minutes. **Use General Category suite products.** **DO NOT USE High or Exclusive suite products.**				
3	Submit the message.	Message is submitted.			
4	Check that the message created on Step 2 is scheduled on Broadcast Cycle window and subsequently broadcasted.	Message created is scheduled on Broadcast Cycle window and broadcasted.			
5	Confirm that the message automatically expires from the general category after about 10 minutes.	Message automatically expires after about 10 minutes.			
End of test					

Appendix E - Example – Survey

NWR-BMH OT&E

NWR-BMH OT&E

Your username (**bert.viloria@noaa.gov**) will be recorded when you submit this form. Not **bert.viloria**? Sign out
* Required

How Helpful was the Mod Note for the Installation of the NWR-BMH Hardware (DACs) and Software? *

1 2 3 4 5

Poor ○ ○ ○ ○ ○ Excellent

How helpful was the BMH Site Activation Guide in the installation of BMH during the 1st week of the OT&E? *

1 2 3 4 5

Poor ○ ○ ○ ○ ○ Excellent

How helpful were the A/B Switch Instructions (Dual Ingest) for the OT&E Sites? *

1 2 3 4 5

Poor ○ ○ ○ ○ ○ Excellent

Please rate your experience with the BMH system during the OT&E *

1 2 3 4 5

Poor ○ ○ ○ ○ ○ Excellent

Was the NWR-BMH OT&E successful? *

1 2 3 4 5

Poor ○ ○ ○ ○ ○ Excellent

If the BMH Help Desk was contacted during the OT&E, please rate your experience?

1 2 3 4 5

Poor ○ ○ ○ ○ ○ Excellent

Please rate your experience with the OT&E Team *

1 2 3 4 5

Poor ○ ○ ○ ○ ○ Excellent

☐ Send me a copy of my responses.

Submit

100%: You made it.

Appendix F – Example - Test Trouble Report Form

TEST TROUBLE REPORT (TTR) FORM					
Title/Summary:					
Originator:		**RWS Build:**		**Phone:**	
Location:		**Date/Time:**		**Email:**	

Priority		Impact		Operation Mode		Type of Issue		Frequency	
1. Immediate fix		**1.** Prevents successful observation; **NO WORKAROUND**		Live Flight		System malfunction		Always	
2. Include in the next build		**2.** Prevents successful observation; **REASONABLE WORKAROUND**		Rework		Modification of existing function/ design		Sometimes	
3. Include in a future build		**3.** Less critical degradation of data		Offline or Maintenance		New function or requirement		One-time occurrence	
4. Include in next major build		**4**. Degradation of system capabilities; **No data affected**		In-line Simulation		Not sure or indeterminate		See description	
5. Undetermined		**5**. Minimum to no impact; nice to have		Other				Unknown	
		6. Undetermined							

Problem Description:	

Please send by e-mail to first.last@noaa.gov

Call John Doe at 123-456-7890 if you have any questions or comments.