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Operational Systems

Operational Test and Evaluation NWSPD 30-3

SYSTEM TEST PROCESS

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signed 9/16/14
Deirdre R. Jones Date
Acting Director, Office of Operational Systems

System Test Process

<u>Table of Contents:</u>	<u>Page</u>
1. Introduction.....	2
2. References.....	2
3. Definitions.....	2
3.1 System Test.....	2
3.2 Test Bed	3
3.3 System-Under-Test	3
4. Scope.....	3
4.1 Major Operational Systems.....	3
4.2 Systems Excluded	3
5. Roles and Responsibilities	4
5.1 Program Management Committee	4
5.2 Configuration Control Board	4
5.3 System Program Manager.....	4
5.4 Operations Program Manager.....	4
5.5 Test Review Group	4
5.6 System Test Director.....	5
5.7 Test Team.....	5
5.8 National Headquarters Test Support.....	5
5.9 Regional Headquarters Test Support	5
5.10 Field Office Test Support	6
5.11 NOAA Test Support	6
5.12 Other Agency Test Support	6
5.13 NWSEO Test Support	6
6. System Test Process.....	6
6.1 Test Commencement	6
6.1.1 Prerequisites	6
6.1.2 Field Modification Kit	7
6.2 Test Conduct.....	7
6.2.1 Purpose and Objectives	7
6.2.2 Test Procedures	7
6.2.3 Methodology.....	8
6.3 Trouble Reporting.....	8
6.3.1 Test Trouble Report.....	8
6.3.2 Classification of Test Trouble Reports.....	8
6.4 The Conclusion of the System Test	10
7. Tools	10
7.1 Test Archive.....	10
7.2 Deficiency Status Tracking and Archive	10

7.3 Data Analyses10
7.4 Dissemination10
8. Documentation11
8.1 System Test Plan.....11
8.2 System Test Report11

Appendices

- A. Consensus Decision Making

Attachments

- A. Example-Test Readiness Review Checklist
- B. Example-System Test Plan Outline (Short Form)
- C. Example-System Test Plan Outline (Long Form)
- D. Example-System Test Report Outline (Short Form)
- E. Example-System Test Report Outline (Long Form)
- F. Example-Test Procedure
- G. Example-Daily Status Report
- H. Example-Test Review Group Minutes Outline
- I. Example-Test Trouble Report Form

1. Introduction. This instruction supports the National Weather Service Policy Directive, 30-3 (NWSPD 30-3), *Operational Test and Evaluation* [1], by delineating the process and procedures followed during a System Test (ST). NWSPD 30-3 stipulates new or enhanced systems be first tested in a simulated operational environment and then at a representative sample of field sites affected by the change(s) as a condition for national deployment. An ST is a test of a new or enhanced system conducted in a simulated operational environment. The tests described herein are administered by the Test and Evaluation Branch (OPS24) of the National Oceanic and Atmospheric Administration (NOAA), National Weather Service (NWS), Office of Operational Systems (OPS), Field Systems Operations Center (FSOC). This instruction describes the development, conduct, and reporting of an ST.

2. References.

- a. National Weather Service Policy Directive 30-3, Operational Test and Evaluation
- b. National Weather Service Instruction 30-302, Operational Test and Evaluation Process
- c. National Weather Service Instruction 10-1203, Configuration Management for Operational Systems
- d. National Weather Service Instruction 10-101, Change Management Process

3. Definitions. The following definitions apply for the purposes of this instruction.

3.1. System Test. An ST is a formal evaluation of a System-Under-Test that is conducted to evaluate system functions, stability, and life cycle support. The NWS maintains Test Bed

facilities that may be used to simulate the conditions encountered at operational field sites; and an ST is conducted in a simulated operational environment whenever possible. Some systems do not, however, allow simulation; completion of the ST in this case may require limited deployment of the System-Under-Test to select prototype sites. A successful ST is a prerequisite for the Operational Test and Evaluation (OT&E) [2], which is conducted at NWS field sites. The ST is performed after a successful Systems Integration Test by the developer and when the NWS program management determines life cycle support mechanisms (e.g., logistics, training, system documentation, and maintenance) are in place. A successful ST and OT&E are conditions leading to national deployment of the System-Under-Test. OPS24 is responsible for the planning, conduct, and reporting of STs.

3.2. Test Bed. A Test Bed is any system configured for explicit use in the conduct of an ST. A Test Bed may be comprised of hardware, software, communications interfaces, and system documentation. The Test Beds evaluated should be representative of the systems that are affected by the new or enhanced system. If resources do not allow testing all configurations, the most commonly used configurations should be evaluated. Those configurations that cannot be replicated in a Test Bed should be included among the sites selected for the OT&E [2] whenever possible. Changes in the configuration of the Test Bed are not allowed during an ST without the explicit approval of the ST Director (see Section 5.5).

3.3. System-Under-Test. A System-Under-Test may be any new or enhanced major 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, processing, and dissemination of meteorological, climatologic, and hydrologic data and derived products. Operational, maintenance, and logistical support for these critical services is provided by the NWS, Office of Operational Systems. The major operational systems under management of the Office of Operational Systems [3] include:

- Automated Surface Observing System (ASOS).
- Radiosonde Replacement System (RRS).
- NOAA Weather Radio all Hazards (NWR).
- Advanced Weather Interactive Processing System (AWIPS).
- Weather Surveillance Radar (WSR)-1988 Doppler (NEXRAD).
- Ocean Data Buoy Sensors.

4.1. Major Operational Systems Covered by this Instruction. The following systems are covered by this instruction: ASOS; AWIPS hardware and communications; RRS; and NWR including the Console Replacement System (CRS), Voice Improvement Processor (VIP), and radio transmitters. The procedures described in this instruction may be applied to additional systems assigned by the Director, OPS.

OPS24 is responsible for the administration of STs for the above listed systems. OPS24 may accept responsibility for testing additional systems through the coordination and approval of a Program Management Responsibility Transfer (PMRT) plan.

4.2. Major Operational Systems Excluded from this Instruction. The following systems are excluded from this instruction: AWIPS Software, Ocean Data Buoy Sensors, and NEXRAD. The

AWIPS Support Branch (OPS21) is responsible for testing AWIPS software. The OPS, National Data Buoy Center (NDBC) is responsible for testing Ocean Data Buoy Sensors. The OPS, Radar Operation Center (ROC) is responsible for testing NEXRAD.

5. Roles and Responsibilities. Changes in the baseline configuration of the major operational systems listed in Section 4 are administered through the Planned Product Improvement process. An ST may be authorized by an Engineering Change Request (ECR) through the Change Management Process [4]. A description of the major authorities for management of an ST follows.

5.1. Program Management Committee. Where appropriate, a Program Management Committee (PMC) is established with overall responsibility for system management including the authorization of changes in the baseline configuration of the system and the national deployment of a system, subsystem, or component thereof. The PMC may be comprised of NWS Office and Regional Directors and representatives of other Federal agencies.

5.2. Configuration Control Board. The Configuration Control Board (CCB) is subordinate to the PMC. The CCB administers the Planned Product Improvement process for a major operational system. The CCB reviews proposed changes in the baseline configuration of the system and authorizes any ECR. The CCB may stipulate in the ECR the successful completion of a Systems Integration Test, ST, and Operational Test and Evaluation as conditions for national deployment of the System-Under-Test. The CCB is chaired by the System/Operations Program Manager.

5.3. System Program Manager. The System Program Manager serves as the primary focal point for a major operational system during the development of the system. Major operational systems typically undergo an initial developmental phase leading to national deployment of the system to NWS operational sites. The lead responsibility for systems development is typically delegated to the Office of Science and Technology (OST). The transition of the system from development to operations is managed through coordination and approval of a PMRT. The System Program Manager may also serve as the primary focal point for the administration of the Planned Product Improvement process for the system. The System Program Manager reports to the PMC and may chair the CCB. The System Program Manager is a member of the Test Review Group (TRG) and presents the recommendations of the TRG to the CCB. The System Program Manager is typically an OST staff member.

5.4. Operations Program Manager. The Operations Program Manager serves as the primary focal point for a major operational system following the initial deployment of the system. The Operations Program Manager reports to the PMC and may chair the CCB. The Operations Program Manager is a member of the TRG and presents the recommendations of the TRG to the CCB. The Operations Program Manager is typically an OPS staff member.

5.5. Test Review Group. A TRG is established as an independent body to oversee the conduct of an ST. The TRG may conduct a Test Readiness Review (TRR), see Section 6.1, prior to the commencement of tests to review the status of the System-Under-Test and to ensure the test prerequisites have been satisfied. The TRG authorizes the commencement of the ST upon the satisfactory review of the System-Under-Test at the TRR meeting. The TRG meets periodically during the ST to review test results and to prioritize any deficiencies discovered.

The TRG may suspend the ST at anytime upon the discovery of a critical defect. The TRG may authorize the resumption of tests upon the satisfactory resolution of the problem. The TRG reports to the CCB through the System/Operations Program Manger and recommends whether to proceed with field tests at the conclusion of the ST.

The TRG is chaired by the ST Director and may be comprised of the System/Operations Program Manager, Regional Focal Points, National Weather Service Employee Organization (NWSEO) Representative, members of the Test Team, representatives from the NWS user community, and Other Agency Focal Points, as appropriate.

The recommendations of the TRG are based on consensus among the members. A discussion of the consensus decision making process is provided in Appendix A.

5.6. System Test Director. The OPS24 ST Group Leader or her/his designated representative serves as the ST Director. The ST Director manages the development and coordination of the ST Plan, oversees the conduct of tests, chairs the TRG, and manages the development and coordination of the ST Report. The ST Director is the primary point of contact for the ST. The ST Director coordinates the timely delivery of hardware, software, and documentation required for the ST. The ST Director prepares and disseminates daily status reports during the conduct of the ST, see Attachment F. The ST Director prepares and disseminates the minutes of TRG meetings in a timely manor, typically within 24 hours following each meeting. The ST Director prepares and disseminates daily status reports during the conduct of the ST, see Attachment G. The ST Director reports to the CCB through the System/Operations Program Manger.

5.7. Test Team. The Test Team may be comprised of NWS staff members from OPS24 and other organizational units within the NWS as required. OPS24 is organized into an ST Group and an OT&E Group; the OPS24 Branch Chief may designate staff members from either group to participate in the Test Team. Members of the ST Group typically develop the ST Plan, document and track deficiencies, record the minutes of TRG meetings, ensure appropriate technical experts analyze the test results, and develop the ST Report. The ST Director may solicit support from other organizational units within the NWS, other organizational units within NOAA, other Federal agencies, state and local governmental agencies, private or public institutions, professional organizations, the private sector, and/or the NWSEO to serve as members of the Test Team as required to satisfy the technical and operational objectives of the ST.

5.8. National Headquarters Test Support. The organizational units within National Weather Service Headquarters (WSH) responsible for software and hardware development provide the ST Director with all requisite system components, the associated Version Description Document (VDD), and draft installation procedures prior to commencement of the ST. The appropriate operations support and maintenance organizations provide draft operations user and hardware maintenance documentation prior to commencement of the ST. The ST Director may solicit test support from the National Weather Service Training Center (NWSTC).

5.9. Regional Headquarters Test Support. Personnel from NWS Regional Headquarters may serve as Regional Focal Points for the ST. 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 ST. The

Regional Focal Points are the primary liaison between WSH and Regional Headquarters and coordinate any support required for the ST with their respective field offices.

5.10. Field Office Test Support. The ST Director may invite field office staff members to participate in the ST as required to meet the technical objectives of the ST. Field Office Support typically includes the Meteorologist-in-Charge or Hydrologist-in-Charge and other subject matter experts as required. 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 staff assignments must be coordinated with the respective Regional Focal Point and approved by Regional Headquarters.

5.11. NOAA Test Support. The ST Director may invite staff members from other organizational units within NOAA, such as the National Center for Environmental Prediction (NCEP) and the National Center for Data Collection (NCDC), to participate in the ST as required to meet the technical and operational objectives of the ST.

5.12. Other Agency Test 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 subject matter experts from other Federal agencies.

5.13. NWSEO Test Support. Membership in the TRG is open to representatives of the National Weather Service Employee Organization (NWSEO). NWSEO representation is sought to ensure safe and effective working conditions for NWS employees.

6. System Test Process. A description of the process followed during the conduct of an ST follows.

6.1. Test Commencement. The ST formally begins with a TRR. The TRR is convened by the ST Director and is attended by the members of the TRG, hardware and software developers, and other subject matter experts as required to fully assess the readiness of the System-Under-Test. The TRR is held to confirm that the prerequisites for the ST have been properly satisfied. The ST Director will provide a checklist of prerequisites for the ST (see Appendix A for an example) and coordinate presentations by subject matter experts as needed to fully establish the status of the System-Under-Test. The minutes of the TRR are prepared and distributed to the members of the TRG and other stakeholders. A decision to proceed with the ST is based on consensus among the members of the TRG.

6.1.1. Prerequisites. Typical prerequisites for an ST follow:

- a. Systems Integration Test: The CCB may stipulate that a Systems Integration Test be successfully completed prior to the ST. The CCB will review the results of the Systems Integration Test and determine whether the System-Under-Test is free of critical defects and ready for the ST. Any problems found during the Systems Integration Test must be fully documented in the VDD and provided to the ST Director.
- b. Hardware and software certification: System hardware engineers certify that the hardware delivered for the ST is representative of the hardware that will be deployed to operational sites. System software engineers certify that the software delivered for

the ST is the latest revision, that the software is free of critical defects, and that all fixes implemented as a result of the Systems Integration Test have been properly incorporated and documented.

6.1.2. Field Modification Kit. The System Program Manager will ensure any required Field Maintenance Kit (FMK), including draft installation instructions, is available for the ST. The initial issue Field Maintenance Kit may be distributed through the National Logistics Support Center (NLSC), Kansas City, MO; however, this is not required.

- a. System Documentation: Draft versions of all system documentation must be available for the ST. System documentation includes: NWS engineering handbooks, user/operator manuals, system administration manuals, maintenance manuals, release notes, and installation instructions.
- b. Training: Appropriate operations and maintenance training must be provided to all personnel participating in the ST.
- c. System Test Documentation: ST documentation includes the ST Plan together with any associated Test Case Procedures, see Sections 6.2.2 and 8.1. The ST Plan is coordinated for signature of the OPS24 Branch Chief in advance of the TRR.

6.2. Test Conduct. Tests are conducted as described in the ST Plan. The system installation is performed by the Test Team with the support of other development organizations as required using the draft installation instructions.

6.2.1. Purpose and Objectives. An ST is conducted, in general, to verify that the System-Under-Test meets or exceeds the technical specifications, that the system is stable and reliable, and that all associated documentation and logistical support required to operate and maintain the system is available prior to national deployment. Specific test objectives may be developed by OPS24 staff members in coordination with subject matter experts from NWS and other Federal agencies. Specific test objectives together with the evaluation criteria for each objective should be clearly stated in the ST Plan. The specific test objectives and evaluation criteria should be based on documented system requirements whenever possible.

6.2.2. Test Case Procedures. The ST Plan includes Test Case Procedures as required to fully evaluate the System-Under-Test. Test Case Procedures are developed by the Test Team to evaluate the full functionality and operability of the System-Under-Test and may be designed to examine: system hardware, system software, communications, and/or operations. Test Case Procedures fall into two general classes: 1) they may test a new capability, functionality, or fix; or 2) they may be used to ensure that the functionality and operability of the system is consistent with the established system specifications, i.e. regression tests. Each Test Case Procedure should contain a cover sheet with a description of the test scenario, the purpose of the test, the test objectives, the estimated time required to complete the procedure, and the criteria for a successful outcome. Each Test Case Procedure should provide step-by-step instructions to be followed in completing the test. The expected outcome should be indicated and a pass/fail 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 future improvements to the procedure. An example of a typical Test Case Procedure is provided in

Appendix D. The completed Test Case Procedures are included in the ST Report and are part of the official test record. All Test Case Procedures included in the ST Plan must be completed.

6.2.3. Methodology. The testing strategy is documented in the ST Plan. The test should ensure that all new functions are validated for both normal and service backup operations using normal and backup system configurations.

The ST may include provisions for monitoring and reporting product availability and reliability if network communications may be affected. The Product Availability and Monitoring System (PAMS), Section 7.3, may be used to collect, analyze, and report these data. In general, product availability and reliability for the System-Under-Test should be equal to or greater than the current system performance.

The stability of the system should be verified during the ST; and the duration of the ST should be sufficiently long to adequately evaluate the stability. The ST may include a second phase of testing where the System-Under-Test is used operationally for an extended period of up to 30 days to verify the system performance, stability, reliability, and communications.

6.3. Trouble Reporting.

6.3.1. Test Trouble Report. Test Trouble Reports (TTR) must be completed for each deficiency discovered during the ST. 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 ST. A sample TTR form is provided in Appendix E. TRG meetings are periodically convened during the ST to review and classify TTRs. The ST Director coordinates the collection and dissemination of TTRs to the TRG for adjudication.

6.3.2. 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 five point grading system is typically used with 1 being the most severe and 5 being the least severe.

A typical assignment scheme for Impact follows:

Impact 1. Critical: A repeatable problem, with no workaround, that prevents or may compromise the full delivery of products or services.

Action: The TRG recommends the immediate suspension of ST, and the System-Under-Test is turned over to the system developers to resolve the problem. The ST may be resumed at the recommendation of the TRG after an appropriate fix or workaround has been developed. The Test Team may develop new Test Case Procedures and/or repeat selected Test Case Procedures to fully evaluate the proposed solution.

Impact 2. Urgent: A repeatable problem, with an acceptable workaround, that prevents or may compromise the full delivery of products or services.

Action: The TRG may recommend that the ST continue with an approved workaround in place until an appropriate fix is developed. If a fix becomes

available during the ST, the TRG may recommend the immediate implementation of the fix. The Test Team may develop new Test Case Procedures and/or repeat selected Test Case Procedures to fully evaluate the proposed fix.

Impact 3. Routine: A repeatable problem that does not prevent or compromise the full delivery of products and services.

Action: The ST 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 4. Watch Item: Infrequent or poorly documented behavior of the System-Under-Test that may prevent or compromise the delivery of products or services.

Action: The TRG may recommend that the ST continue. The Test Team may develop new Test Case Procedures and/or repeat selected Test Case Procedures in an attempt to reproduce the problem. Any further observations are documented and submitted to the TRG for review.

Impact 5. Potential Enhancement: An item identified by the TRG for consideration as a new system requirement.

Action: The TRG forwards the recommended change to the System Program Manager for consideration under the Configuration Management process.

The Priority addresses how the problem is to be resolved. A typical assignment scheme for the Priority follows:

Priority 1. Urgent: Immediate emergency action is required.

Action: All appropriate resources are directed to resolve the problem.

Priority 2. High: Include in the next interim release.

Action: The available resources are directed to promptly resolve the problem.

Priority 3. Routine: Include in a future interim release.

Action: Resources are directed to resolve the problem as allowed.

Priority 4. Low: Consider for the next major release.

Action: The item is deferred to future system improvements.

Priority 5. Undetermined: The Priority has not yet been assigned.

Action: None.

6.4. The Conclusion of the System Test. The ST Director will convene an ST Wrap-up meeting following the successful completion of all Test Case Procedures. The ST Director will review the activities conducted to date including: a summary of the TTRs and their disposition, and any other findings and/or recommendations. The TRG will review the materials presented and recommend whether to proceed with tests of the system at operational field sites.

The following conditions must be satisfied to recommend the system for tests at operational field sites:

- All Test Case Procedures must be successfully completed.
- All test objectives provided in the ST Plan must be met.
- All TTRs submitted during the ST must be adjudicated by the TRG.
- The System-Under-Test must be free of critical deficiencies. Non-critical deficiencies may be present; however a suitable workaround must be authorized prior to national deployment.
- All draft documentation (e.g., installation, operations, system administration, support, and maintenance) must be acceptable for use in field operations.

The System/Operations Program Manager reports the recommendation of the TRG to the CCB or other designated authority.

The ST Report is prepared following the conclusion of testing, see Section 8.2.

7. Tools. OPS24 maintains tools specific to the management of STs.

7.1. Test Archive. Test documents are kept on file for not less than 5 years. Both hard and soft copies of the test documents are kept whenever feasible. Test documents include the ST Plan together with any Test Case Procedures and the ST Report, and may include test data, the results of data analysis, minutes of TRG meetings, interim reports, and any other supporting records.

OPS24 maintains a shared file server to store electronic copies of test documents. Hard copies of test documents are locally filed and maintained.

7.2. Deficiency Status Tracking and Archive. OPS24 maintains a database program, Test Track Pro, for tracking TTRs.

7.3. Data Analyses. OPS24 has developed a Product Availability and Monitoring System (PAMS) to measure the reliability and availability of network communications.

7.4. Dissemination. OPS24 maintains a website, <http://www.nws.noaa.gov/ops2/ops24/>, for the dissemination ST Plans and ST Reports. Interim reports, minutes, and other correspondence may be sent by electronic mail, fax, or mail, as appropriate.

8. Documentation. The official record of an ST is comprised of two documents: the ST Plan and the ST Report.

8.1. System Test Plan. The ST Plan describes the actual conduct of tests. The Plan will typically include an introduction, purpose, objectives, evaluation criteria for each objective, test system configurations, test materials, test methodology, methods for deficiency adjudication, test focal points, and contact information. Typical outlines for an ST Plan are provided in Appendices B and C. The test plan will include all Test Case Procedures and a TTR Form as appendices. The ST Plan is developed by OPS24 in coordination with WSH, Regional Headquarters, Weather Forecast Offices, and other Federal agencies. The ST Plan should be reviewed by the members of the TRG and other subject matter experts as appropriate. The ST Plan must be approved by the Chief, Test and Evaluation Branch (OPS24), prior to commencing the ST.

8.2. System Test Report. The ST Report should include a purpose, introduction, test objectives, a description of how the test was conducted, a summary of the test results including a listing of all TTRs and their disposition, and the test conclusions and final recommendation. Typical outlines for an ST Report are provided in Appendices D and E. The ST Report should describe any follow-on testing that may be required as a result of problems found during the ST. The draft ST Report should be reviewed by the members of the TRG and other subject matter experts as appropriate. The ST Report is forwarded to the Chief, Test and Evaluation Branch (OPS24), for signature.

Appendix A - Consensus Decision Making

1. Introduction.

Consensus is a process for group decision making. It is a method by which an entire group of people can come to an agreement. The input and ideas of all participants are gathered and synthesized to arrive at a final decision acceptable to all. Through consensus, we are not only working to achieve better solutions, but also to promote the growth of community and trust.

With consensus people can and should work through differences and reach a mutually satisfactory position. It is possible for one person's insights or strongly held beliefs to sway the whole group. No ideas are lost, each member's input is valued as part of the solution.

Consensus does not mean everyone thinks the decision made is necessarily the best one possible, or are sure it will work. What it does mean is, in coming to a decision, no one felt their position on the matter was misunderstood or wasn't given a proper hearing. Hopefully, everyone will think it is the best decision; this often happens because, when it works, collective intelligence does come up with better solutions than could individuals.

2. Guidelines.

- Trust each other. This is not a competition; everyone must not be afraid to express their ideas and opinions.
- Make sure everyone understands the topic/problem. While building a consensus make sure everyone is following, listening to, and understanding each other.
- All members should contribute their ideas and knowledge related to the subject.
- Stay on the task.
- You may disagree—disagreement is acceptable and healthy. However, you must be flexible and willing to give something up to reach an agreement.
- Separate the issue from the personalities. This is not a time to disagree just because you don't like someone.

3. Forming the Consensus.

During discussion a proposal for resolution is put forward. It is amended and modified through more discussion, or withdrawn if it seems to be a dead end. During this discussion period it is important to articulate differences clearly. It is the responsibility of those who are having trouble with a proposal to put forth alternative suggestions.

When a proposal seems to be well understood by everyone, and there are no new changes asked for, the ST Director can ask if there are any objections or reservations. If there are no objections, there can be a call for consensus.

Consensus exists within a group when each member of the group can say:

- I have had the opportunity to voice my opinions.
- I believe the group has heard me.
- I can actively support the group's decision as the best possible at this time, even if it

- is not my first choice.
4. Polling for Consensus. Upon a call for consensus the following standard responses are suggested to convey a member's position.
- “Approve”—Agree and support the proposal as stated.
 - “Approve with reservation” or “Abstain”—No position on approving or disapproving the proposal, or, do not whole heartedly support the proposal but can live with a decision to approve the proposal. This may include the following rationales:
 - Non-support (“I don’t see the need for this, but I’ll go along.”)
 - Reservations (“I have reservations regarding the proposal, but I can live with it.”)
 - Standing aside (“I have no stake, interest, or opinion about the outcome of this proposal, and won’t stop others from approving it.”)
 - “Motion to block”—I cannot support this or allow the group to support this. This blocks consensus. Any single TRG member can block consensus.
5. Consensus Decision. After consensus is reached, the decision should be clearly restated, as a check that everyone is clear on what has been decided. Before moving away from the subject, the TRG should be clear on who is taking on the responsibility for implementing the decision.
6. Alternatives. When consensus cannot be reached, the TRG must decide on the appropriate course of action. Alternatives are to either disapprove the proposal or raise the proposal to a higher level of authority for consideration and decision.

Attachment A – Example-Test Readiness Review Checklist

The purpose of this checklist is to document that the various hardware subsystems and software are functioning, and all required documentation is available to support the System Test. System Test is scheduled to begin **MO/DAY/YR**. The items below are required to be completed by **MO/DAY/YR**.

Entries should be made below to identify hardware serial number(s), firmware versions, Version Description Documents (VDD), test procedures, etc. required to identify the equipment configuration to be tested. Contract Officer’s Representatives (COR) and their Branch Chiefs need to certify that the subsystems have been checked out and ready for ST. The RRS Project Manager will certify that the System is ready to be turned over to the System Test Director.

1. Hardware: Branch Chief (ORG code) (Name) _____ Date: _____

1.1 TRS (System 6)	TRS (System 7)
Hardware: (Serial No.) _____	Hardware: (Serial No.) _____
Firmware: (Version No.) _____	Firmware: (Version No.) _____
VDD: (Attachment?) (Y/N) _____	Date: _____
Checkout Procedure: (Attached?) (Y/N) _____	Date: _____
COR: (Signature) _____	Date: _____

1.2 SPS (System 6)	SPS (System7)
Hardware: (Serial No.) _____	Hardware: (Serial No.) _____
Firmware: (Version No.) _____	Firmware: (Version No.) _____
VDD: (Attachment?) (Y/N) _____	Date: _____
Checkout Procedure: (Attached?) (Y/N) _____	Date: _____
COR: (Signature) _____	Date: _____

1.3 GPS Repeater (Building 16)	
Hardware: (Serial No.) _____	Hardware: (Serial No.) _____
Checkout Procedure: (Attached?) (Y/N) _____	Date: _____
COR: (Signature) _____	Date: _____

1.4 SPS Base Antenna (System 6)	SPS Base Antenna (System 7)
Hardware: (Serial No.) _____	Hardware: (Serial No.) _____
Checkout Procedure: (Attached?) (Y/N) _____	Date: _____
COR: (Signature) _____	Date: _____

1.5 RSOIS (System 7)	
Hardware: (Serial No.) _____	Hardware: (Serial No.) _____
Checkout Procedure: (Attached?) (Y/N) _____	Date: _____
COR: (Signature) _____	Date: _____

1.6 Workstation (System 6)	Workstation (System7)
Hardware: (Serial No.) _____	Hardware: (Serial No.) _____

Checkout Procedure: (Attached?) (Y/N) _____ Date: _____
COR: (Signature) _____ Date: _____

1.7 Radiosondes (100 available)

CONEXANT GPS Module: (Serial No.) _____
NAVMAN GPS Module: (Serial No.) _____
COR: (Signature) _____ Date: _____

1.8 PDB (System 7)

Hardware: (Serial No.) _____
Checkout Procedure: (Attached?) (Y/N) _____ Date: _____
COR: (Signature) _____ Date: _____

2. Tool Kit: Branch Chief (Org. Code) (Name) _____ Date: _____

POC: (Signature) _____ Date: _____

3. Software: Branch Chief (Org. Code) (Name) _____ Date: _____

RWS Application SW: (Version No.) _____ VDD: (Attached?) (Y/N) ___ Date: _____
Support Software: (Version No.) _____ VDD: (Attached?) (Y/N) ___ Date: _____
All Deliverable Media (e.g., CDs) (Attached?) (Y/N) ___ Date: _____
COR: (Signature) _____ Date: _____

4. Documentation

4.1 EHB-1 Updates: Branch Chief (Org. Code) (Name) _____ Date: _____
Manual: (Attached?) (Y/N) ___ Web Address: _____ Date: _____
(Signature) _____ Date: _____

4.2 EHB-4, EMRS Updates: Branch Chief (Org. Code) (Name) _____ Date: _____
Manual: (Attached?) (Y/N) ___ Web Address: _____ Date: _____
(Signature) _____ Date: _____

4.3 EHB-9, Technical Manual: Branch Chief (Org. Code) (Name) _____ Date: _____
Manual: (Attached?) (Y/N) ___ Web Address: _____ Date: _____
(Signature) _____ Date: _____

4.4 RRS Operator Training Guide: Branch Chief (Org. Code) (Name) _____ Date: _____
Manual: (Attached?) (Y/N) ___ Web Address: _____ Date: _____
(Signature) _____ Date: _____

4.5 WSOH-10, Rawinsonde Observations: Branch Chief (Org. Code) (Name) _____ Date: _____
Manual: (Attached?) (Y/N) ___ Web Address: _____ Date: _____
(Signature) _____ Date: _____

5. RRS Systems 6 and 7 installed, certified, and ready for ST IA.

System Project Manager (Org. Code)

(Signature) _____ Date: _____

Attachment B – Example-System Test Plan Outline (Short Form)

Table of Contents

Acronyms

1. Introduction

2. Objectives

3. System-Under-Test

4. Prerequisites

5. Test Facilities

6. Test Conduct

7. Analysis and Evaluation

8. Recommendations

Attachments

Attachment C – Example-System Test Plan Outline (Long Form)

Table of Contents

Acronyms

1. Introduction

- 1.1 Test Plan Organization
- 1.2 RRS Subsystems
- 1.3 Objectives
- 1.4 System Test Strategy
 - 1.4.1 ST Phase I
 - 1.4.1.1 ST Phase IA
 - 1.4.1.2 ST Phase IB
 - 1.4.2 ST Phase II
- 1.5 Test Review Group (TRG)
- 1.6 Prerequisites, Assumptions, and Risks
 - 1.6.1 Prerequisites
 - 1.6.1.1 System Test Phase I Prerequisites
 - 1.6.1.2 System Test Phase II Prerequisites
 - 1.6.2 Assumptions
 - 1.6.2.1 System Test Phase I Assumptions
 - 1.6.2.2 System Test Phase II Assumptions
 - 1.6.3 Risks

2. Method of Accomplishment

- 2.1 Schedule
- 2.2 Test Facilities
 - 2.2.1 WSH Hardware/Software (Phase I and II)
 - 2.2.2 SR&DC Hardware/Software (Phase I and II)
 - 2.2.3 National Weather Service Training Center (NWSTC) (Phase I and II)
 - 2.2.4 Baltimore, MD/Washington, DC Weather Forecast Office (WFO-LWX) Hardware/Software (Phase II)
- 2.3 Test Methodology
 - 2.3.1 Test Resources
 - 2.3.1.1 Support Documentation
 - 2.3.1.2 National Centers for Environmental Prediction (NCEP) Role
 - 2.3.1.2.1 Phase I Role
 - 2.3.1.2.2 Phase II Role
 - 2.3.1.3 National Climatic Data Center (NCDC) Role
 - 2.3.1.3.1 Phase I Role
 - 2.3.1.3.2 Phase II Role
 - 2.3.1.4 National Logistic Supply Center (NLSC)/National Reconditioning Center (NRC) Role
 - 2.3.1.5 Test Personnel and Responsibilities
 - 2.3.2 Installation
 - 2.3.3 Test Conduct

- 2.3.3.1 Test Cases
- 2.3.3.2 ST Phase I Conduct
- 2.3.3.3 ST Phase II Conduct
- 2.3.4 Reliability, Maintainability, and Availability (RMA) Data Collection
- 2.3.5 Post-ST Analysis, Test Recommendations, and Report
 - 2.3.5.1 Evaluation of Objectives
 - 2.3.5.2 Test Result Analysis
 - 2.3.5.3 Test Recommendations and Report

Tables

Figures

Attachments

Attachment D – Example-System Test Report Outline (Short Form)

1. Introduction
2. Objectives
3. Assumptions/Constraints
4. Test Conduct
5. Test Results
6. Conclusions
7. Recommendations

Attachments

Attachment E – Example-System Test Report Outline (Long Form)

Table of Contents

Executive Summary

Acronyms

1. Introduction
 - 1.1 Report Organization
 - 1.2 Test Strategy

Part I - ST Results and Recommendations

1. Functional Test Results
 - 1.1 Definitions
 - 1.2 Hardware Installation
 - 1.3 Software Installation
 - 1.4 Test Procedures

2. Post-ST Activities

3. Conclusions

4. Recommendations

Part II - ST Description

1. Background
 - 1.1 Test Objectives and Criteria
 - 1.2 Test Result Analysis Process
 - 1.3 Risks, Constraints, and Assumptions
 - 1.4 Software Enhancements and Modifications under Test
 - 1.5 Test System Configurations

2. ST Conduct

- 2.1 Problem Documentation and Classification
- 2.2 Deficiency Report Discussion

Tables

Attachments

Attachment F - Example-Daily Status Report

System Test Daily Status—Console Replacement System

Date: 9/31/06

Number of Completed Tests to Date: 32

Number of Tests Completed Today: 3

Tests On-Going/Pending: 1

New TTRs: 2

Test Procedures to be Updated: 4

Test Procedures Updated: 3

Miscellaneous (Comments): none

Attachment G – Example-Test Review Group Minutes Outline

- a. Meeting Title
- b. Meeting Location
- c. Date
- d. List of Attendees
- e. Purpose
- f. Issues Arising
- g. Corrections to the Minutes
- h. Review of Test Trouble Reports
- i. Discussion
- j. Action Items

Attachment H - Example—Test Procedure

TEST #430c Maximum Winds 132kts

Overall Outcome: Pass [] Fail []

TESTED BY: _____ **DATE:** _____ **ITERATION:** ____ **Time Start:** _____ **Time End:** _____

The purpose of this test is to verify RWS can detect the same anomalous weather conditions (defined in Federal Meteorological Handbook No.3) as the legacy system. This test will be conducted using the External Data Pump (XDP) to run data set (**1006.mal**) containing known problem/condition, maximum winds 132Kts, from real radiosonde flights collected by OPS22 personnel. OPS22 assistance may be required to identify specific condition. It is estimated 1 2 hours will be required to accomplish.

Step	Action	Expected Results	Comments	Pass/Fail	
1	Start XDP. Click Setup/configure button.	Step 1-Administrative Data Entry window opens.			
2	Select Sippican GPS (87) for Radiosonde Type, As-is for Simulation and click Next.	Parameters updated.	Make sure that the >Balloon Release sends an Event Marker from SPS= option is turned OFF.		
3	In the Configuration Data Entry window, click Browse button. Double click on :\\AtmosphenomDataCat on 10.201.. Double click on 1006 folder, select XDP-1006.mal and click Open button.	Step 2-Configuration Data Entry window is displayed. X:\\1006\\XDP-1006.mal is displayed in the All in field.			

Step	Action	Expected Results	Comments	Pass/Fail	
4	<p>At the bottom of Configuration Data Entry screen, click Browse button and select <i>Sippican.cfg</i> for RPX configuration.</p> <p>Click Finish to close window.</p>	<p>External Data Pump for PITS window is displayed.</p> <p><i>C:\RRSprojects\xdpPITS\Sippican.cfg</i> is displayed in <i>RPX Config</i> field.</p> <p>External Data Pump for PITS window closes.</p>			
5	<p>Click Start Pump button to start sending data to RWS.</p>				
6	<p>Login to RWS as an observer and select Run a live flight.</p>	<p>Hardware Status, Antenna Orientation/TRS Display, Administrative Display, and GPS Status windows are displayed.</p>			
7	<p>Run a live flight and terminate this flight at around 57 minutes.</p>	<p>Max winds 132kts; slant range 162 km.</p> <p>To verify wind speed, display the wind plot and check values at 24 minutes elapsed time</p>			
8	<p>Click Flight -> Terminate to terminate this flight.</p>	<p>Live flight is terminated.</p>	<p>NOTE: When flight is finished, click on the Stop Pump button on the XDP to discontinue data being sent to RWS.</p>		
9	<p>Click Flight -> Exit to close RWS application.</p>				
10	<p>End of manual procedure</p>				

Attachment I - Example—Test Trouble Report Form

RRS SYSTEM ISSUE REPORT (SIR) 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:	Ascension No./Release No.:
Date/Time of Flight (UTC): _____ Capture File: _____	

Please send by e-mail to samuel.cochran@noaa.gov and jae.lee@noaa.gov

Call Samuel Cochran at 301-713-0326 x112 or Jae Lee at 301-713-0326 x158 if you have any questions or comments.