



Advanced Weather Interactive Processing System

Operational Build 11

Operational Test and Evaluation Plan

Version 2.4

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Revision History

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2.1	Sanford Garrard	3/4/11	Update on Field Test Entrance Criteria
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2.3	Sanford Garrard	4/11/11	Update to Risk Chart, Site Checklist, miscellaneous items

2.4	Sanford Garrard / David Plummer	5/13/11	Update to Appendix F, Delta process, installation order and dates
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Executive Summary

This document describes the methods employed by the National Weather Service (NWS) in the Operational Test and Evaluation (OT&E) of the Advanced Weather Interactive Processing System (AWIPS) Migration Software¹, herein referred to as Release 11 (OB11)². The entrance criteria, objectives, evaluation criteria, methods, management, and test schedule for the OT&E are presented.

OT&E is an independent evaluation of the OB11 software and is conducted by the NWS, Office of Operational Systems. The OT&E is a formal evaluation of the AWIPS system conducted in both a simulated and actual operational environment. This OT&E is conducted to ensure the operational readiness of OB11 software. This will be accomplished by demonstrating the operation of the OB11 software meets or exceeds the performance, functionality, and stability of the current software in use by AWIPS sites and by demonstrating the current support systems continue to provide the same level of service.

The OT&E will be overseen by a Test Review Group (TRG) comprised of NWS National Headquarters personnel, NWS AWIPS Regional Program Managers, a representative of the NWS Employee Organization, and site focal points.

OT&E will begin with a System Test Phase 1 Readiness Review (STRR) on May 10, 2010, to confirm the Phase 1 entrance criteria have been satisfied. Prior to entering OT&E, the last major development task order (Task Order 11) must be completed by Raytheon and accepted by the government. The STRR is attended by the members of the TRG, Subject Matter Experts (SME) and other stakeholders to assess the readiness of the OB11 software for use in NWS operations. The OT&E Director will review the entrance criteria and the SMEs will certify the entrance criteria have been met. The decision to proceed with OT&E is based on the consensus opinion of the voting members of the TRG.

OT&E has two distinct parts: System Test and Field Test. The System Test is divided into two phases, with testing and evaluation of Phase 1 strictly limited to the lab environment. Sites in Phase 2 of the System Test consist of regional and national headquarters sites and NWS Training Center sites. The Field Test will consist of a representative number of Weather Forecast Offices, River Forecast Centers, and National Centers for Environmental Prediction. Phase 1 of the System Test will start on May 10, 2010 and is projected to end on February 2, 2011. Phase 2 of the System Test is projected to start on February 2, 2011 and is estimated to last five months. Sites in the Field Test are operational AWIPS field sites in all six regions of the NWS. Field Test will begin after the successful completion of Phase 2 of the System Test and is estimated to last four months. Trouble Tickets (TT) and Discrepancy Reports (DR) will be submitted during OT&E to document system defects and other recommendations.

The TRG will meet regularly during the OT&E to review, clarify and classify DRs and track the System Test and Field Test objectives. At the conclusion of the Field Test, the

¹ AWIPS Migration has also been referred to as AWIPS II.

² OB11 is the name of the first release of the AWIPS Migration software, based on the proposed release names in the AWIPS governance. The 11 refers to the calendar year of the release. Subsequent delta releases during the OT&E are named OB11.1, OB11.2, etc.

TRG will review the results of testing, including the status of all DRs, and will recommend to the NWS Corporate Board whether the OB11 software should be deployed in support of NWS operations. The OT&E Director will report the recommendation at the Gate 4 meeting of the Operations and Service Improvement Process (OSIP) project entitled AWIPS Evolution. The final decision of the deployment of the OB11 software will be made by the NWS Corporate Board. An OT&E Report will be prepared following the conclusion of tests.

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1 Introduction

This plan describes the National Oceanic and Atmospheric Administration's National Weather Service (NWS) Operational Test and Evaluation (OT&E) for the "Advanced Weather Interactive Processing System (AWIPS) Migration"³ software, henceforth described as Release 11 (OB11)⁴. The OT&E will be conducted by the Office of Operational Systems. The NWS Policy Directive, *30-3 Operational Test and Evaluation*, dated, November 17, 2006, states that the Office of Science and Technology (OST) will transfer testing responsibility to the Office of Operational Systems (OOS) for operational test and evaluation. OOS will coordinate, conduct, and report on this OT&E.

The OOS will conduct a formal OT&E to ensure the operational readiness of OB11 software prior to national deployment. The OB11 software will be tested and evaluated at select NWS sites covering many aspects of NWS operations. The overall requirement is that the operation of the OB11 software shall meet or exceed the performance, functionality and stability of the current software in use by AWIPS sites. Validation that the OB11 software meets or exceeds current operational software builds will ensure the continuation of the NWS core mission of protecting life and property.

A glossary of terms and acronyms used in the plan is included in Appendix A.

1.1 OT&E Plan Organization

This OT&E Plan is comprised of seven sections:

- Section 1 – Introduction. This section contains the introductory material. Specifically, it describes the organization of the plan; provides background information about the software and events leading up to the OT&E for OB11, and states the purpose and scope of the OT&E. In addition, the introduction provides a list of assumptions, limitations, and risks going into the OT&E and the current and planned software architecture and communications. Finally, this section provides the reader with the overarching structure for the Test Cases and evaluation and upgrades that will be used during the OT&E to validate system, communication, and service operations using OB11 and contact information for test support if assistance is needed during this OT&E.
- Section 2 – Test Management. This section contains information of the management of the testing activities. It defines the main body that coordinates and conducts the OT&E, the Test Review Group (TRG), which is independent, but does not exclude development organizations. The various personnel and responsibilities of the TRG are described along with problem adjudication when discrepancies are discovered.
- Section 3 - Pre-OT&E Activities. This section gives a brief description of actions that will occur prior to the OT&E to ensure a smooth transition of testing and evaluation activities.

³ AWIPS Migration has also been referred to as AWIPS II.

⁴ OB11 is the name of the first release of the AWIPS Migration software, based on the proposed release names in the AWIPS governance. The 11 refers to the calendar year of the release. Subsequent delta releases during the OT&E are named OB11.1, OB11.2, etc.

- Section 4 – System Test Phase 1. This section contains information specific to Phase 1 activities. It includes Entrance Criteria needed for Phase 1 as well as the activities to be conducted during this period.
- Section 5 - System Test Phase 2. This section contains information specific to the Phase 2 activities. It includes the Entrance Criteria needed to enter Phase 2 and Test Objectives to evaluate during the test. It includes the list of sites and the test strategy as well as the test conduct and schedule. Finally, the roles and responsibilities of those participating in the System Test are listed.
- Section 6 - Field Test. This section contains information specific to the Field Test activities. It includes the Entrance Criteria needed to enter the Field Test and Test Objectives to evaluate during the test. It includes the list of sites and the test strategy as well as the test conduct and schedule. Finally, the roles and responsibilities of those participating in the Field Test are listed.
- Section 7 – OT&E Recommendations and Report. At the conclusion of the Field Test, the TRG will meet to determine the recommendation of the readiness of the software for deployment. A final report will be completed after the OT&E has completed.

Included in the OT&E plan are 11 appendices:

- Appendix A contains a glossary of terms and acronyms used in the plan.
- Appendix B contains diagrams of system architecture.
- Appendix C contains the Data Flow Diagram for Test Cases.
- Appendix D contains the Data Flow Diagram for Trouble Tickets.
- Appendix E contains the Data Flow Diagram for Discrepancy Reports.
- Appendix F contains the field site level of effort estimates during the OT&E.
- Appendix G contains the readiness checklist that System Test sites will use to prepare for OB11 installation.
- Appendix H contains the readiness checklist that Field Test sites will use to prepare for OB11 installation.
- Appendix I contains the list of risks and proposed mitigation as it relates to the OT&E.
- Appendix J contains stability criteria used in the OT&E.
- Appendix K a Problem Adjudication Chart that TRG members will use to classify problems discovered during the OT&E.

1.2 Background

In 2004, the Office of Science and Technology (OST) conducted an analysis of the components of AWIPS in preparation for the re-compete of the AWIPS 10-year prime support contract. OST evaluated performance, management and control, security, operations and maintenance, product improvement plans, documentation, requirements,

funding, and cost effectiveness. The conclusion from the analysis was AWIPS had a solid hardware and communications baseline, but the software was architecturally challenged to meet the increasing data volumes, collaborative requirements, and responsiveness to add new science and functionality. All bidders on the re-compete contract proposed their own solutions to address the conditions described in the analysis. The re-compete resulted in an award to Raytheon Technical Services Company (Raytheon) in August 2005 under contract DG133W-05-CQ-1067. Execution of the Continuous Technology Refresh (CTR) option to improve AWIPS software architecture began in March 2006.

The initial software re-architecture work is being accomplished under an overall Operations and Service Improvement Process (OSIP) project entitled AWIPS Evolution. AWIPS Evolution is executed in three distinct phases. The first and most critical phase of the AWIPS Evolution project is the delivery of the OB11 software. The software consists of the current baseline functionality through the latest deployed release, currently Operational Build 9.4 (OB9.4), which has been migrated into a new Service Oriented Architecture. The new software will deliver current functionality within the framework of a much more robust and extendable architecture. Raytheon is accomplishing this first phase by approaching the baseline application migration as a near black box conversion, ensuring that the end-user (e.g., field site personnel) functions are equivalent to those in the current AWIPS system, while the system capabilities change significantly. This approach is described by Raytheon within their [Product Improvement Plan \(Version 4\)](#), dated February 24, 2009.

Throughout the development process, the software was subjected to numerous tests from both Raytheon and government personnel. Final planned development activities and associated tests for the OB11 software are incorporated within Task Order 11 (TO11). Once these activities are complete and verified, the OT&E can begin.

1.3 Purpose

The purpose of this OT&E is to assess if the OB11 software meets the operational requirements to support the NWS mission. Given that the operational requirements are not completely documented in any one location and the approach of a black box conversion, this OT&E will focus on comparison between the new software and legacy software. OT&E is the final test of the OB11 release and is required prior to national deployment of the software to all NWS sites.

OT&E is used to determine if specified minimum acceptable operational performance requirements have been satisfied. This plan defines the test objectives, test organization, and test methodology for accomplishing the OT&E.

1.4 Scope

OT&E has two distinct parts: System Test and Field Test. Both phases of the System Test must be successfully completed prior to entering the Field Test, and the Field Test must be successfully completed prior to the conclusion of OT&E. Once the OT&E is successfully completed, the software will be recommended for deployment to all sites.

The following test components will be performed during the OT&E:

- Software Installation - Will verify software installation is accurate and complete. Will also verify that a site can revert to the latest deployed version of OB software.
- Basic Functionality - Will verify the basic operational functionality is working properly, especially the functionality used in an operational environment.
- Performance and Stability - Will verify the performance meets or exceeds current performance benchmarks and also that the system continues to be as stable and reliable as the current system.
- Communications - Will verify data transfer through internal and external interfaces continues to function and is received by external users.
- Operational Use - Will verify the software, including support for local applications, continues to meet or exceed current operational needs in order to sustain the operational mission. It will also verify training materials, along with operator and maintenance documentation, are equivalent to or exceed levels currently in use.
- Support – Will validate that sufficient support resources are in place prior to national deployment to meet operational requirements over the system's life cycle.

1.5 Assumptions, Limitations and Risks

The OT&E Plan is based on a number of assumptions and limitations. In addition, there are a number of risks along with an associated mitigation strategy pertaining to the operation of the OT&E.

1.5.1 Assumptions

The following list provides assumptions for this OT&E:

1. There are no planned major hardware upgrades during the Field Test period. Any hardware upgrades during OT&E will be identified and scheduled prior to the start of the Field Test.
2. AWIPS Program Office in OST will discharge all of its responsibilities as defined in the O&M and product improvement portions of the contract.
3. Installations (including deltas) do not wipe out a previously configured system, including localizations, customizations and historical databases such as climate, Event Tracking Numbers (ETN), etc.
4. OT&E sites have ported all of their critical applications prior to their initial installation.
5. Government organizations will continue to support government supplied applications, such as NWRWAVES, LAPS, MSAS, NMAP, FXNET, FXC, WES, FSI, etc.
6. AWIPS Security Assessment and Authorization (A&A) recertification activities will not affect OT&E. The OB11 software will not create any new vulnerability and will maintain at least the current level of security in use at sites.
7. NEXRAD recertification activities will not affect OT&E.

8. There are no planned major changes to conops immediately prior to or during the Field Test period.

1.5.2 Limitations

The following list provides some limitations for this OT&E:

1. Operational concerns/activities take precedence over testing or other OT&E activities and could limit testing at times.
2. Due to the highly configurable nature of AWIPS, not all hardware/software configurations/equipment will be available during the OT&E.
3. Not all weather conditions can be tested during the OT&E. However, at least one severe weather and/or winter weather warning event is anticipated to occur during the testing period.
4. The only National Centers for Environmental Prediction (NCEP) system participating prior to field testing is the NCEP test bed system. Testing on the test bed will be completed and validated prior to the operational NCEP centers' participation in the Field Test.
5. Sites that have extreme weather conditions, extended hardware outages or site location moves may not be able to fully participate in testing activities.

1.5.3 Risks

The development of the OB11 software is a complex project requiring careful oversight and planning to complete. Project risks have been monitored and actions to mitigate these risks have been actively pursued from the outset.

Similarly, the risks associated with testing (i.e., risks to AWIPS sites due to testing activities and risks that might compromise the quality and integrity of the OT&E) have been actively monitored in planning the OT&E, and will be monitored throughout the execution of the OT&E. The risks associated with the OT&E and the actions taken to mitigate risk are described in Appendix H, Risks.

1.6 System Configurations

AWIPS is a technologically advanced information processing, display, and telecommunications system that is the cornerstone of NWS operations. AWIPS is an interactive computer system that integrates meteorological and hydrological data, enabling forecasters to prepare forecasts and issue warnings. It includes a full suite of satellite imagery, radar data, surface observations, and numerical model guidance.

The AWIPS equipment at the sites is basically configured to support Weather Forecast Office (WFO), River Forecast Center (RFC) operations or NCEP center operations. In the operations area, all sites have workstations (LX) with three monitors, workstations (XT) with one monitor and printers connected to the AWIPS Local Area Network. In the equipment room, a number of servers and other devices are incorporated into the system including: preprocessors (PX), data servers (DX), communication processors (CPSBN),

River Ensemble Processors (REP)⁵, Archive servers (AX), Local Data Acquisition and Dissemination servers (LDAD), Network Attached Storage (NAS), modems and a Direct Attached Storage (DAS) database storage system. Appendix B includes a software architecture diagram on standard WFO hardware.

All AWIPS sites are connected to the Network Control Facility (NCF) located at the National Headquarters building in Silver Spring, Maryland, by a point-to-multipoint Satellite Broadcast Network (SBN) and a dedicated terrestrial telecommunications network using point-to-point and multipoint-to-point data transmission. Most of the AWIPS data flow is from the NWS Telecommunication Gateway (NWSTG) and the National Environmental Satellite, Data, and Information Service (NESDIS) through the NCF to the AWIPS sites. The sites directly access a myriad of local data sources such as Weather Surveillance Radar - 88 Doppler (WSR-88D), Radiosonde Replacement System (RRS), Automated Surface Observation System (ASOS), and mesonets both directly and through the LDAD servers, which incorporates a firewall to protect the AWIPS network.

1.7 Hardware Refresh

As part of the CTR option, various hardware components of the AWIPS System are being replaced with equivalent or enhanced hardware on a routine basis. During the OT&E, the hardware refresh activities will be minimized, but a number of major hardware projects are expected to be completed prior to the beginning of the Field Test. At the time of OT&E plan development, the LX workstations, Local Area Network Switches, the DX servers, NAS Tape Backup, Rack Consolidation, Modem replacement, Communications Processors (CPSBN) and Direct Attached Storage (DAS) replacement are required to be installed at a site before OB11 installation.

1.8 Test Cases

Since the OB11 software is based on a black box conversion, the OT&E will use Test Cases to compare and evaluate the AWIPS system with the OB11 software against the latest deployed version of the OB software. Test Cases include weather scenarios and performance metrics, and will be provided as a collaborative effort from the NWS and Raytheon.

The Test Cases are intended to provide a comprehensive evaluation of all user interfaces, communication system interfaces, operational modes, and system performance parameters. Completion of Test Cases at each site will help identify issues, variances or potential defects that need attention. Additional Test Cases will be created and executed by the end users during the OT&E.

1.8.1 Test Case Types

Three types of Test Cases will be used during the OT&E to provide an overall evaluation of the functionality and performance of the OB11 software. These types include Procedures (or steps), Scenarios, and Supplemental tests. All three will provide a concise look at the functionality and performance of the OB11 software through different avenues of approach.

⁵ Also referred to as RP, e.g., RP1 and RP2 for the two servers in the AWIPS Rack at RFC sites.

The following provides a definition of each of the test case types that will be used during the OT&E:

- Procedures – A set of defined actions in a step by step sequence, producing a predicted result.
- Scenarios – Rather than a sequence of defined actions as provided in procedures, the environment is established (e.g. Tornado Life Cycle event) and then the users will apply individual methodologies to achieve a predicted result.
- Supplemental – Supplemental testing is an unscripted test where the user provides their skill sets and experience to evaluate the system. A Supplemental Test Case will become a documented procedure or scenario test case if a problem or issue is discovered and verified.

1.8.2 Development

Test Cases are developed through the efforts of the Office of Climate, Water and Weather Services (OCWWS), Office of Hydrologic Development (OHD), OST, OOS, Global Systems Division, Raytheon and field sites. Each of the Test Cases covers a spectrum of system-wide functionality within the AWIPS domain that includes those in the following main areas:

Test cases are developed with three main areas of interest involved, including:

- **System**
 - NCF support functions
 - Data display and analysis
 - Product preparation
 - Site system stability, system backup, and system performance
 - Load Test
 - Failure Test
 - Service records retention
 - Local applications
 - Alarms/Alerts, monitoring, and verification
 - Data management
 - Localization
- **Communication**
 - SBN
 - Wide Area Network (WAN)
 - Messaging through the NWSTG
 - Radar

- RRS
- ASOS
- All Hazards Emergency Message Collection System (HazCollect)
- Console Replacement System (CRS)
- Family of Services
- Center Weather Service Unit (CWSU) AWIPS Remote Display (ARD)
- Emergency Managers Weather Information Network (EMWIN)
- LDAD interfaces
- Other AWIPS interfaces
- **Products and Services**
 - Public and Fire Weather Services
 - Hydrologic Services
 - Marine and Coastal Services
 - Aviation Services
 - Climate Services
 - Drought Services
 - Dissemination Services
 - Tropical Services
 - Observing Services

1.8.3 Evaluation Methodology

During the OT&E, the Test Case Manager will assign Test Cases to OT&E site testers. An example Test Case is provided on the AWIPS Migration developer collaboration portal https://collaborate.nws.noaa.gov/trac/am_OTE/wiki/TestCase.

Test Cases performed during the OT&E will be evaluated and assigned a Pass or Fail rating. Additionally, each step of a Test Case must be successful to receive a Pass rating for that Test Case. All Test Cases associated with a specific function of software (i.e. Systems, Communications, and Products and Services) must receive a “PASS” to be considered operationally ready for the field.

The Test Case Manager will provide status reports to the Test Review Group (TRG) concerning the progress and discretion of each of the test cases being performed at each of the OT&E sites.

If a Test Case fails, the tester will open a Trouble Ticket (TT), reference the Test Case and provide steps on how the problem was encountered. The TT will be analyzed by a development organization and will be assigned a DR if applicable. The TRG will review and prioritize all problems for resolution as described in section 2.1. Once the problem has been resolved, the Test Case will be reassigned for evaluation.

A process flow chart describing the step-by-step flow of how Test Cases are processed during the OT&E is provided in Appendix C. The off page connector indicates input or output provided for the process. The connector labeled Appendix D is the TT portion of the TT/DR process. The connector labeled Appendix E is the DR process.

1.8.4 Test Track Pro

The utility Test Track Pro will be used to manage and assign Test Cases to each of the OT&E site testers. Test Track Pro is a Commercial Off the Shelf (COTS) software utility that is configurable to the needs of the user/developer. A user guide is available (https://collaborate.nws.noaa.gov/trac/am_OTE/wiki/UserGuide) that focuses on use of the software for the OT&E.

Test Cases will be completed to evaluate the design and performance of the software. The testers will input their findings into the Test Track Pro database, where routine reports can be generated to track the progress of the OT&E.

Test Cases are developed by end users and Subject Matter Experts (SME). The developed Test Cases are included as a Microsoft Word document for each Test Track Pro database record. These Test Case documents will be downloaded by each of the designated OT&E site testers, appropriately filled out with the results of the test outlined in the document, and then uploaded back to the Test Track Pro database.

The Test Case Manager will have access to all of the feedback information included in the uploaded Test Case documents. During the process of administering Test Cases, if the tester opens up a TT due to a system or software bug, the tester may be required to create or modify a Test Case as needed. The new Test Case will be loaded back into the Test Track Pro database where it will be available for use in testing and documentation purposes.

1.9 Delta Upgrade Process

As in previous operational software testing for AWIPS, incremental builds (delta releases) will be provided on a routine basis during the testing period. A delta release provides only the content that was updated, instead of delivering a full software release. The process during the OT&E will generally follow the guidelines in the Raytheon document Alpha-Beta Delta Release Process, Version 4.8, which is available on the Dimensions server.

1.10 Test Support Help

Test Support is available by several different methods. In general, issues or suspected problems with the software shall be directed to the NCF. Issues or questions with specific Test Cases or other general questions about the O&E should be directed to the Test Case Manager, the OT&E Manager or the *awips-test* list server.

1.10.1 NCF

The NCF Help Desk can be reached at (301) 713-9344.

1.10.2 List Server

An *awips-test* list server has been created for questions, concerns and other discussions pertaining to the OT&E project. Users may subscribe to the *awips-test* list by going to the All Forums list server page, http://infolist.nws.noaa.gov/read/all_forums/, and then click on the Subscribe link on the *awips-test* row.

1.10.3 Other

For specific questions regarding the Test Cases or its administration, contact the Test Case Manager John Tatum (john.tatum@noaa.gov or 301 713-0069 x 158).

Any other specific questions regarding the OT&E project, contact the OT&E Manager Sanford Garrard (sanford.garrard@noaa.gov or 301 713-0069 x 167).

2 Test Management

This section will provide descriptions of the Test Review Group, including test management responsibilities of other OT&E personnel.

2.1 Test Review Group (TRG)

The TRG will be established as an independent body to coordinate and conduct the OT&E. The TRG comprises operational user representatives and is supported by SMEs. Based on a “user” perspective, the TRG will provide its recommendation on whether to proceed with national deployment of the OB11 release.

The TRG will hold an initial meeting prior to the projected start date of the OT&E. The TRG will also meet to verify all entrance criteria are met in a System Test Readiness Review (STRR) prior to commencement of the System Test portion of the OT&E, and will conduct a Field Test Readiness Review (FTRR) prior to commencement of the Field Test portion of the OT&E to verify all entrance criteria have been met for operational installation and use at field sites.

The TRG will generally meet weekly during the OT&E. However, additional meetings may be scheduled as needed. The TRG meetings will be conducted by teleconference calls and will be managed by the TRG Moderator, who is appointed by the OT&E Director. Due to the complexity of the project, at least 50 percent of the voting members of the TRG (or their designate) must attend in order to conduct new business or adjudicate DRs. The members of the TRG, including the designated voting members, are listed in Table 1.

Meetings of the TRG are conducted to review, clarify, and adjudicate deficiencies documented by TT/DRs and recommend corrective action for other issues associated with the OT&E. The TRG will evaluate each DR and assign an Impact and Priority according to the criteria provided in Section 2.3. The TRG will work to resolve validated deficiencies in the performance, stability, and functionality of the OB11 software along with other test-related issues, and may recommend corrective actions to Raytheon and the OB11 Project Manager.

The TRG will authorize tests of the OB11 software at the OT&E sites and may suspend these tests at any time, especially if any DR is assigned an Impact 1 (See Section 2.3). The TRG may also direct one or more sites to implement the rollback capability (section

2.4) to restore operations. In the unlikely event of a lapse in appropriations, the OT&E will immediately be suspended. If OT&E tests are suspended, the TRG will authorize the resumption of tests when the appropriate corrective actions have been taken or appropriations have been restored. The TRG may recommend additional regression tests prior to the resumption of the OT&E.

The TRG may make recommendations outside the scope of the AWIPS migration project to fully support the needs of operational NWS. For example, there might be a recommendation to improve the layout of the display for warning operations. However, any changes outside the scope of the AWIPS migration project will not cause the OT&E to fail.

Following the successful completion of the tests, the TRG will convene to review the findings of the OT&E and vote to recommend whether to proceed with national deployment of the OB11 software. The decisions of the TRG are based on consensus among the voting members. Dissenting opinions will be recorded and reported in the test report. If consensus cannot be reached, the issue may be elevated to the AWIPS Technology Infusion Leadership Committee (TiLC) or the NWS Corporate Board for additional guidance.

Table 1 - Test Review Group Members

Name	Organization	Function	Voting Member
Neal DiPasquale	OOS	OT&E Director	Yes
Sanford Garrard	OOS	OT&E Manager	
John Tatum	OOS	Test Case Manager	
Tom Piper	OST	AWIPS Migration Project Manager	
Ronla Henry	OST	Deputy Program Manager for Product Improvement	Yes
Kevin Woodworth / Jason Taylor	OCWWS	TRG Moderator / OCWWS Representative	Yes
LeRoy Spayd	OCWWS	NWS Training Division	
Shannon White / Marty Mullen / Jason Wright	NWSEO	Bargaining Unit Representative	Yes
David Plummer	NCEP	National Centers Program Manager	Yes
Bill Gery / Greg Noonan	CRH	Central Region Program Manager / Remote Test Case Manager	Yes
Josh Watson	ERH	Eastern Region Program Manager	Yes
Eric Howieson	SRH	Southern Region Program Manager	Yes
Eric Lau / Duane	PRH	Pacific Region Program Manager	Yes

Carpenter			
Carven Scott / Gene Petrescu	ARH	Alaska Region Program Manager	Yes
Ulysses Davis / Andy Edman	WRH	Western Region Program Manager	Yes
Test Site Manager	Field Sites	Manages Testing activities at sites	

A partial list of SMEs who will assist the TRG is listed in Table 2.

Table 2 - Subject Matter Experts

Name	Organization	Expertise
OT&E Test Team	Various	Includes but not limited to Tom Piper, Alissa Thomas, Bill Gery, Beraq Azeem, Mike Moss, Jim Stenpeck, Jae Lee
Mike Rega	OPS21	WarnGen
Baoyu Yin	OPS21	Graphical Forecast Editor
Mike Magsig	WDTB	Radar, radar tools, decision assistance tools
Jeff Zeltwanger	NWSTC	Training
Wayne Martin	OPS21	Performance
Wufeng Zhou	OST	Performance
Cindy Woods	OCWWS	NWS Policy
Jim Calkins	OST	Master Deliverable Matrix
Jim Williams	OST	Systems
Ashley Kells	OST	Site Migration
John Olsen	OST	Local Application Migration
Liz Cooper	OST	AWIPS Information Technology Security Officer
James Washington	Raytheon/NCF	Mission Assurance Manager
Ben Brinkley / Gary Charles	Raytheon/NCF	Trouble Tickets / Installation
Matt Howard / Randy Beaver	Raytheon/ASM	Trouble Tickets
Scott Risch / Lee Venable / Ron	Raytheon / Omaha	Service-Oriented Architecture of AWIPS

Anderson / Frank Griffith		
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2.2 Test Personnel and Responsibilities

OT&E Director - Chairs the TRG and works to ensure problems identified during the OT&E are resolved. The OT&E Director chairs the meetings of the TRG and works with the OT&E Manager to ensure tests are conducted efficiently.

At the conclusion of testing, the OT&E Director will convene a final TRG meeting. The OT&E Director will review the activities conducted to date including: a summary of TT/DRs found, a summary of test results, other findings, and recommendations. The Director will report the recommendations of the TRG to the AWIPS TiLC.

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

OT&E Manager - Coordinates the meetings of the TRG including the preparation and dissemination of meeting minutes; and manages the day-to-day collection of data required for OT&E including the development, collection, and analysis of surveys.

The OT&E Manager oversees the TT/DR submission and investigation process and presents TT/DRs to the TRG for adjudication and classification. The Manager also issues weekly status reports of OT&E activities and provides liaison with Raytheon in the resolution of defects reported in the performance, design, and functionality of the AWIPS migration software.

The OT&E Manager is a non-voting member of the TRG.

Test Case Manager - Works with various end users, SMEs and the Local Applications Team Leader to develop, modify and validate Test Cases to evaluate baseline and local applications. The Test Case Manager maintains a repository for all Test Cases and works closely with Products and Services, Systems and Communications Focal Points to develop and administer the Test Cases. The Test Case Manager oversees the administration of the Test Cases, including the preparation of Test Cases, assignments, and the analysis and reports of test results. The Test Case Manager also ensures all assigned Test Cases are properly completed and the status and results of testing are documented and reported to the TRG.

The Test Case Manager is a non-voting member of the TRG.

AWIPS Migration Project Manager – Works with the OT&E Director and OT&E Manager to ensure problems identified during the OT&E are resolved. Recruits a number of key support personnel to serve as SMEs and support OT&E activity. The Migration Manager also works to ensure proper support is given to the sites for site migration activities and to efficiently resolve incompatibilities in non-baseline AWIPS applications.

TRG Moderator - Responsible for scheduling the TRG calls, reserving rooms and phone lines, organizing and distributing agendas for the meetings and creating summaries and reports for the results of these meetings as needed.

OT&E Test Team – Includes several support personnel to ensure the OT&E runs smoothly. Activities include setting the overall test schedule, coordinating testing logistics and traveling to the test sites to support the installation and initial tests of the software as required. The team provides government oversight of TT database, including the collection and validation of all TT/DRs and presents validated TT/DRs to the OT&E Manager. The team also ensures reported problems are properly identified as baseline or local and ensures proper support is given to the sites to allow efficient resolution of incompatibilities in non-baseline AWIPS applications.

Deputy Program Manager for Product Improvement - Coordinates all AWIPS security A&A recertification activities for AWIPS migration and reports the status to the TRG. It should be noted the AWIPS A&A recertification is separate from OT&E; however, since Information Technology security is critical to AWIPS requirements, A&A activities will be coordinated with the OT&E. The Deputy Program Manager also coordinates all program office related responsibilities in support of the OT&E including providing sufficient funding for OT&E activities.

The Deputy Program Manager is a voting member of the TRG.

National Weather Service Employees Organization (NWSEO) Bargaining Unit Representative - Provides input to the OT&E Director on working conditions at NWS field sites to ensure the OB11 software is consistent with NWS policies regarding work force management.

The NWSEO Representative is a voting member of the TRG.

NWS Regional Headquarters/National Centers Program Managers - Act as the liaison for sites to the TRG, including monitoring the status of activities at their respective test sites during OT&E. Regional Focal points will participate in the meetings of the TRG, review plans and interim reports during the OT&E, coordinate issues and work to resolve any problems discovered during tests. Regional Focal Points will also assist in testing at the RHQ sites and generate TTs and Test Cases during the OT&E as required.

The Regional/National Centers Program Managers are voting members of the TRG (one vote per program manager).

Test Site Manager – The Test Site Manager (TSM) coordinates all testing activity at the local site. The manager ensures the test site completes the site checklist (Appendix G) and coordinates the initial installation of OB11 and delta installations. The manager also ensures the site opens TTs to document problem and coordinates Test Case activities with the OT&E Test Case Manager. For any TT that is opened at the site, the TSM will send steps to replicate (using the Test Case template) to the Test Case Manager. The TSM may request and implement the rollback capability (section 2.4) for the site at any time.

The TSM will submit periodic status reports to the Test Case Manager and their regional focal point during OT&E. Status reports cover the following areas:

Tests conducted since the last reporting period;

The outcome of completed tests;

Planning activities for future testing; and

Problems and comments, including rescheduled or delayed testing, critical problems found, and a summary of less serious problems found.

2.3 Problem Adjudication

The TRG will classify DRs, and in some cases TTs, to indicate impacts to the OT&E and priority for resolution.

The following guidance is used when classifying the reports in terms of priority and impact:

Priority

Critical - A repeatable problem that prevents or compromises the delivery of products or services. No alternate solution is available.

High - A repeatable problem that prevents or compromises the delivery of products or services. A temporary workaround is available, but is too cumbersome or workload intensive to sustain operations.

Major - A repeatable problem that prevents or compromises the delivery of products or services. A workaround is available to allow continuation of operations, however, the workaround is not acceptable for national deployment.

Moderate - A repeatable problem that might prevent or compromise the delivery of products or services. Depending on the impact, the workaround may be acceptable for national deployment.

Low - Minor issues (such as typographical errors) and potential enhancements.

Watch - Issues that prevent or compromise the delivery of products or services which occur infrequently or with no discernable pattern. The item that is classified as a Watch will be revised if the problem becomes repeatable.

Impact

1 - Stop using current version of software and suspend OT&E. Site will implement the rollback capability to return to a previous working version or revert to the latest deployed version of the OB software. If a resolution is available and can be verified, OT&E may resume with additional time added to recover lost testing and/or installation time.

2 - No additional installations until resolved. Site may implement the rollback capability to return to a previous working version of the software. Limited testing may continue if possible. OT&E will be extended to recover any lost testing time.

3 - Testing can proceed in unrelated areas, but additional installations may be delayed. OT&E may extend to recover lost installation or test time.

4 - Testing and installations can continue. If the solution is not available until the near end of scheduled testing, OT&E may extend to completion.

5 - Testing and installations can continue.

6 - No impact to OT&E. Issue may be sent to DR Team for classification outside of OT&E process.

7 - Undetermined impact.

Based on the delta release schedule during the OT&E, the following table provides guidance on the priority, impact and actions expected for each issue that is classified.

Table 3 - Priority and Impact

Priority Category	Impact Range	Action
Critical	1 to 3	Immediate action is required. All appropriate resources should be assigned to resolve the problem.
High	2 to 4	Include in the next delta release. Available resources should be re-directed to resolve the problem as allowed.
Major	3 to 5	Include in a future delta release. Available resources are directed to resolve the problem.
Moderate	4 to 6	Depending on the impact, include before national deployment. Resources should be allocated as needed to resolve the problem.
Low	5 to 6	Resolve if resources are not dedicated to higher priority items. Otherwise, item will be considered in a future release after national deployment.
Watch	7	No action required while in this category.

The TT process is outlined in Appendix C and the DR process is outlined in Appendix D.

2.4 Rollback Capability

The OB11 software is designed to allow a rollback capability (un-installation) to a previous delta release or even a return to the latest deployed OB release. The TSM, in coordination with their site manager, can request a rollback at any time. The TRG may also direct a rollback at sites if a DR is classified with an Impact of 1. Once the condition that caused the need for the rollback has been resolved, the site will schedule an installation of the latest delta or full installation and resume testing.

2.5 Testing Interruptions

As stated in the Limitations (section 1.5.2), operational concerns/activities take precedence over testing or other OT&E activities and could limit testing at times. Also, if a site implements the rollback capability, additional testing would be limited while the site is on the older release. These conditions are expected to be temporary and the site should be able to resume testing after the concerns have been addressed.

Under some conditions, a site may request to leave the OT&E for a period of time or indefinitely. These conditions include site relocations, short-staffing or extended weather events such as extensive flooding, earthquakes, or hurricanes. The TRG will review any request and determine the length of time the site will be suspended from the OT&E. Any site that has suspended testing may request approval from the TRG to resume testing. A TRG member may also recommend a replacement site, and the TRG must approve the

replacement site. However, it will become more difficult to replace a site as the OT&E period progresses, due to the training requirements and local application conversion needed at the site.

3 Pre-OT&E Activities

Prior to the release of the OB11 software for OT&E, the software is still in the development phase. Development activities are led by OST with various pieces of the software delivered as part of Task Orders (TO) from Raytheon. The final piece, TO11, is scheduled to be completed before OT&E begins. OST is coordinating testing activities related to TO11 including Independent Verification and Validation (IV&V), User Functional Testing/Side-by-Side (UST), System Integration Testing (SIT), Forecaster Initial Testing (FIT) and testing associated with the Master Test Plan (MTP).

While OT&E functions are not directly involved with the TO11 testing activities, there are some actions that will occur prior to the OT&E start date to ensure a smooth transition of testing and evaluation.

3.1 Establish TRG

The TRG will hold the initial kickoff meeting around March 3, 2010, which is approximately two weeks before the planned System Test Readiness Review date and after the milestone to check-in development DRs classified as Fix Before System OT&E (FBSO).

3.2 Review DRs

OST is classifying DRs that will be corrected before the start of OT&E (FBSO) according to the following criteria listed in Table 4.

Table 4 - FBSO Criteria

Criterion	Description
0	The defect would block OT&E System Test activity and/or render the system incapable of testing major areas of application functionality and no acceptable workaround is available.
1	System install scripts must work with no major problems.
2	Infrastructure/interfaces necessary to support local application migration must function (with acceptable workarounds)
3	Performance must be at an acceptable level to allow complete testing (not an operational standard)
4	Localization/customization is possible with acceptable workarounds
5	Software is stable enough to allow testing (doesn't crash often and/or recovery is not difficult or overly time consuming)
6	All baseline data ingest stream are working and stable

7	Rollback capability should work with no major problems
8	WAN Communications should be stable with incoming and outgoing data functioning at least between System OT&E sites.
9	All functionality (including the necessary data and infrastructure) in the MDM should work to allow complete testing of major areas of application functionality or acceptable workaround is available.
10	External interfaces are functional or simulated with no major problems.
11	Interoperability should work with no major problems.

DRs that remain open at the beginning of OT&E will initially be assigned a priority of Major and an impact of 3. The TRG will review open DRs and may reassign a higher priority and impact if applicable. The TRG will also review all approved variances from the black box conversion. The TRG will hold the STRR before the start of OT&E.

3.3 Testing Preparation

The Test Case Manager will collect all available Test Cases into the Test Track Pro system and will ensure participants of the OT&E have accounts and are familiar with the software. The Test Case Manager will provide a Web-Ex demonstration of Test Track Pro to participants and will use that application to assign Test Cases to the OT&E sites. The Test Case Manager will also prepare a more specific OT&E [testing plan](#) that describes the specific testing activities and schedules during the System Test and Field Test.

The OT&E Test Team will establish a benchmark for ingest storage, user interface and dissemination performance of the latest deployed version of the OB software at the System Test sites.

3.4 Testing Support Preparation

The NCF is preparing to support the operational testing through the use of TT and updating the Standard Operating Procedures (SOP) as necessary for resolving and/or escalating TT associated with the OB11 software.

Raytheon is preparing to use the Dimensions configuration management server to write DRs and track the life cycle of the DR for each OB11 DR. The Dimensions server is currently used to write and track OB DRs. The same Dimensions server will be used, but the OB11 DRs will be in a separate database from the current suite of DRs so that the DRs will not be mixed. The use of Dimensions for OB11 DRs is scheduled to begin on or before the start of the Field Test.

3.5 OT&E Readiness Review

The STRR will confirm the Entrance Criteria for the OT&E have been satisfied. The STRR is convened by the OT&E Director and is attended by the members of the TRG,

SMEs and other personnel. The OT&E Director will review the entrance criteria and the SMEs will provide information on whether the entrance criteria have been met. If the entrance criteria have not been met, the TRG will identify which specific criterion remain and will establish a new STRR date after the remaining items have been addressed. The decision to proceed with OT&E is based on completion of the entrance criteria and the consensus opinion of the voting members of the TRG. Any dissenting opinions will be recorded and noted in the final report.

4 System Test Phase 1

The System Test is a formal evaluation of the OB11 software conducted in a simulated operational environment. However, due to the projected status of the software at the end of TO11, additional development, DR corrections and testing will be needed. During Phase 1, software installations will be restricted to lab and/or test systems only.

4.1 Entrance Criteria

The entrance criteria are based on the acknowledgement that substantial development of the software is complete with TO11, although considerable effort may remain before proceeding to testing outside of a lab environment.

The following is a list of entrance criteria, which will be reviewed and approved by the TRG as part of the STRR:

1. Successful exit of TO11.
2. Concurrence on the Phase 1 / Phase 2 approach of System Test.
3. The NWSTD shall have a draft version of variance training available to Field Test personnel participating in System Test activities.
4. AWIPS Program will ensure the Remedy database and Dimensions database in Silver Spring is able to create, escalate, adjudicate TTs and DRs and perform all associated functions to be used for the OB11 software.
5. AWIPS Program shall ensure that, within two weeks after the start of OT&E, the Dimensions database contains all known open DRs and continues to track the DRs through the process.

4.2 Test Objectives and Evaluation Criteria

Under Phase 1, the main objective is to prepare the system for operational testing outside of a strict lab environment.

4.3 Test Sites

The sites selected for Phase 1 are strictly limited to a lab environment and are not involved with any day-to-day WFO/RFC/NCEP operations. The sites consist of National Headquarters lab systems and Raytheon lab systems.

As discussed in the limitations, the individual Phase 1 sites do not contain all of the external interfaces and configurations that are used in normal operations. These elements will be evaluated later in the OT&E.

National Headquarters

The NHDA system, located in Silver Spring, MD, is configured as a WFO platform with the exception of the AX. The AX on NHDA is the equivalent of an RFC archive server. NHDA is typically localized to WFO Sterling, VA, with the exception of the Graphical Forecast Editor, which is localized to WFO Albany, NY to support Intersite Coordination activities. However, testing activities may require other localizations.

The NMTR system, located in Silver Spring, MD, is configured as an RFC system. NMTR is typically localized as the West Gulf RFC, although testing activities may require other localizations.

Raytheon Test Labs

The Raytheon test lab systems (TBDW, TBDR, TBW3, TBW4), located in Silver Spring, MD, are configured as WFO and RFC systems to support testing and development.

4.4 Test Strategy

Since the Phase 1 sites do not issue operational products, much of the time spent in this phase will be used to validate the system is ready for more in-depth operational testing. As was used during pre-OT&E activities, field forecasters will be invited to Silver Spring to provide input and feedback on the progress of the system, while other SMEs will identify, verify corrections and provide feedback on issues.

4.4.1 Forecaster Initial Test Sessions

An important part of the strategy for Phase 1 is to invite selected site personnel from the operational sites to participate in testing at the lab. These Forecaster Initial Test (FIT) sessions will allow the personnel an opportunity to use the software, validate corrections and provide feedback to the developers in order to better prepare the system for operational use. NWS Headquarters (NWSHQ) staff members will also be dispatched to witness the installations, conduct initial tests of the software, and assist in the timely completion of the assigned Test Cases. The dates of the test sessions will be coordinated through the AWIPS Program Office and will generally occur in one week periods, with three to four days of activities during the session.

4.4.2 Side-by-Side Comparison

One overarching objective of the OB11 project is to provide a black box conversion of the current AWIPS software (i.e., the OB11 software is intended to provide the exact functionality, operability, and the look and feel of the latest deployed version of the OB software, currently OB9.4). The lab systems in Silver Spring have multiple AWIPS systems and will provide the opportunity for direct, side-by-side comparison of the OB9.4 and the OB11 systems. Personnel traveling to these System Test sites will be able to run Test Cases on both OB9.4 and OB11 systems, which will allow comparison on both the functionality and the science of the baseline applications.

Table 5 - OB9.4 Sites for Side by Side Comparison in Phase 1

Region	ID	Description	Location	Type
HQ	TBDW	Raytheon lab system	Silver Spring, MD	WFO

HQ	NMTW	7 th Floor SSMC2	Silver Spring, MD	WFO
HQ	NHOR	7 th Floor SSMC2	Silver Spring, MD	RFC

4.5 Schedule and Test Conduct

Phase 1 is scheduled to begin on May 10, 2010, preceded by a successful STRR. The duration of Phase 1 is projected to last six months. However, actual duration could be shorter or longer based on the progress of the completion of the items listed in the Phase 2 entrance criteria.

4.5.1 System Test Readiness Review

The STRR will confirm the Entrance Criteria for the OT&E have been satisfied. The STRR is convened by the OT&E Director and is attended by the members of the TRG, SME and other personnel. The OT&E Director will review the entrance criteria and the SMEs will provide information on whether the entrance criteria have been met. The decision to proceed with OT&E is based on completion of the entrance criteria and the consensus opinion of the voting members of the TRG. Any dissenting opinions will be recorded and noted in the final report.

4.5.2 Installation

Members of the OT&E Test Team will be on site at the lab systems to observe some of the installation/un-installations and operations of the systems. It is anticipated that installation procedures will be in the process of evolving and improving during this phase, so actual development of modification notes will not begin until Phase 2.

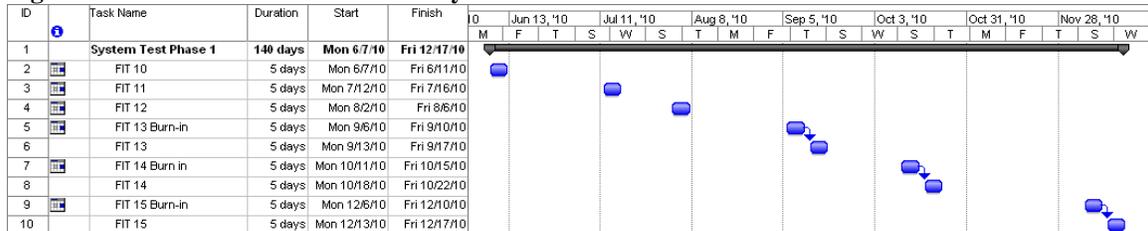
4.5.3 Software Updates

During this phase, it is anticipated that a number of software changes, some perhaps significant, may be needed and could significantly alter the installation process. Therefore, software updates may require an un-installation of the previous software version and full installation of the new package.

4.5.4 FIT Sessions

FIT Sessions are generally planned to occur once a month, following a release of an updated software version. The specific dates of the FITs are based on the schedule listed in Figure 1.

Figure 1 - FIT Sessions for Phase 1 of System Test



4.6 Phase 2 Readiness Review

The Readiness Review will confirm the Entrance Criteria for Phase 2 has been satisfied. The meeting is convened by the OT&E Director and is attended by the members of the TRG, SMEs and other personnel. The OT&E Director will review the entrance criteria and the SMEs will provide information on whether the entrance criteria have been met. If the entrance criteria have not been met, the TRG will identify which specific criterion remain and will establish a new Readiness Review date to allow the remaining items to be addressed. The decision to proceed with Phase 2 is based on completion of the entrance criteria and the consensus opinion of the voting members of the TRG. Any dissenting opinions will be recorded and noted in the final report.

4.7 Roles and Responsibilities in Phase 1

This section describes the roles and responsibilities for personnel during Phase 1.

OT&E Test Team Members of the OT&E Test Team will support the installation and initial tests of the software. The team oversees the administration of the Test Cases, including the preparation of Test Cases, assignments, and the analysis and reports of test results. The Team also oversees the TT/DR submission and investigation process and provides a liaison with the Raytheon developers in the resolution of defects reported in the OB11 software.

TRG - The TRG will meet at least weekly during Phase 1, to monitor progress, and to review and clarify issues as well as classify DRs for resolution.

Regional Program Managers - The regional program managers will coordinate testing representatives at their respective sites. They will also assist in local application conversion/development for local applications created in their region.

Site Representatives - The site representatives from selected field sites will travel to Silver Spring to participate in Phase 1 activities. The participants will complete Test Cases, verify corrected DRs, and review approved variances and other applicable training. They will also work on customization, localization and configuration, as well as verify local applications and perform other associated testing activities.

5 System Test Phase 2

Phase 2 of the System Test is a formal evaluation of the OB11 software conducted in a simulated operational environment. Phase 2 will evaluate the general fitness of the OB11 software for use in NWS field operations and ensure specific objectives have been met prior to use of the software at selected NWS operational sites during the Field Test.

5.1 Entrance Criteria

The following is a list of entrance criteria, which will be reviewed and approved by the TRG as part of the Phase 2 Readiness Review.

1. All Critical Impact 1 through 3 DRs and High Impact 2 DRs for the WarnGen and GFE applications as identified in the November 2010 System OT&E Schedule and Test Areas slide are corrected and verified.
2. Critical local applications for System Test Sites are successfully migrated.

3. Radar Interface Certification Test is successfully completed.
4. Radiosonde Replacement System (RRS) interface test successfully completed.
5. Performance and Stability must be at acceptable levels for at least 12 consecutive days.
6. Operating System Upgrade beta test has started and is a prerequisite for installation at the 5 RHQ System Test sites.
7. NCF is ready to support transition from TTRs to TT.
8. Hardware: LAN Switch installation completed at System Test sites.
9. Hardware: LX installation completed at System Test sites.
10. Hardware: DX1/DX2/PV installation completed at System Test sites.
11. Hardware: DX3/DX4 installation completed at System Test sites.
12. Hardware: Rack Consolidation/Modem Nest installation OT&E test has started and is a prerequisite for installation at the 5 RHQ System Test sites.
13. Updated draft of localization, SMM and variance training documentation.
14. Draft installation instructions that are suitable to begin mod note development.
15. Support Task Order for Phase 2 must be approved and in place.
16. ITSO provides Status update on Certification and Accreditation activities, including providing Authority to Operate at RHQ.
17. The software must be able to be localized and configured for RFC operations.

5.2 Test Objectives and Evaluation Criteria

The approach for Phase 2 is to use Test Cases to verify the five test components (software installation, basic functionality, performance and stability, communications, and operational use) identified in the scope (Section 1.4). This includes the following specific objectives:

Table 5 - System Test Objectives and Evaluation

Objective	Evaluation
Verify the installation instructions and scripts for the OB11 software.	The instructions and scripts are complete, accurate and can be executed in six hours or less.
Verify the rollback capability to a previous OB11 version.	The instructions and scripts are complete, accurate and can be executed in sixty minutes or less.
Validate the rollback capability to the previous architecture release (i.e.OB9.3).	The instructions and scripts are complete, accurate and the previous release can be restored in six hours or less.
Validate the draft User Manual, SMM, and	The draft documentation does not contain

Release Notes.	major errors or omissions.
Verify training.	Participants have completed the training courses.
Resolve all critical problems/issues discovered during System Test.	All critical TT/DR as rated by the TRG will be closed (i.e. fixed and implemented).
Evaluate AWIPS Contractor Support.	The contractor continues to provide timely (SLA) support to all AWIPS sites.
Verify external interfaces.	Confirm data flow to and from the external interfaces continues to function normally.
Verify system configurability.	The system is configurable for local site use, similar to OB9.3 capabilities.
Verify warning and routine products.	All warning and routine products are accurately and correctly created.
Verify Test Mode.	Products can be accurately created and issued with appropriate "Test" wording.
Verify Practice Mode.	Products can be accurately created, stored and followed up without being transmitted.
Verify failover/recovery operations (cluster configuration).	Failover/recovery activities (such as software package switch to another hardware device) work similar to OB9.3 capabilities.
Verify applications, modules, and user interfaces.	Applications, modules and user interfaces contain the same functionality as the latest deployed version of the OB software.
Verify archive capability.	Weather and hydrological data sources being archived in OB9.3 can be archived in OB11.
Verify service backup.	One site can assume control of another site's area of responsibility.
Verify ingest storage, user interface and dissemination performance of the software.	The OB11 software meets or exceeds the most recent established OB benchmarks .
Verify local applications.	Local applications can be installed and run.
Verify ingest storage, retrieval and manipulation of data types.	All data types are accurately and efficiently stored, retrieved and manipulated.

Test Cases will be used to evaluate the above listed objectives. For additional information on the specific Test Cases, refer to the [Master Deliverable Matrix](#) or [Test Track Pro](#) repository.

5.3 Test Sites

The sites selected for System Test are not directly involved with day-to-day WFO/RFC/NCEP operations, i.e., non-operational sites. The sites consist of National Headquarters test systems, NWS Training Center systems, Regional Headquarters systems and the NCEP test bed system (NTBN).

As discussed in the limitations, the individual System Test sites do not contain all of the external interfaces and configurations that are used in normal operations. However, the group as a whole will cover most instances.

National Headquarters

The NHDA system, located in Silver Spring, MD, is configured as a WFO platform with the exception of the AX. The AX on NHDA is the equivalent of an RFC archive server. NHDA is typically localized to WFO Sterling, VA, with the exception of the Graphical Forecast Editor, which is localized to WFO Albany, NY to support Intersite Coordination activities.

The NMTR system, located in Silver Spring, MD, is configured as an RFC system. NMTR is typically localized as the West Gulf RFC.

NWS Training Center

The NTCA, NTCB and NTCD systems, located in Kansas City, MO, are configured as WFO systems and are typically localized to WFO Pleasant Hill, MO.

The NTCC system is configured as an RFC system and is typically localized as the Missouri Basin RFC.

Regional Headquarters

The EHU system, located in Ft Worth, TX, is configured as a WFO system with the exception of a Console Replacement System (CRS) and a dedicated radar connection. EHU is localized to WFO Ft Worth, TX.

The BCQ system, located in Kansas City, MO, is configured as a WFO system with the exception of a CRS and a dedicated radar connection. BCQ is localized to WFO Pleasant Hill, MO.

The VUY system, located in Bohemia, NY, is configured as a WFO system with the exception of a CRS and a dedicated radar connection. VUY is localized to WFO New York City, NY.

The VHW system, located in Salt Lake City, UT, is configured as a WFO system with the exception of a CRS and a dedicated radar connection. VHW is localized to WFO Salt Lake City, UT.

The PBP system, located in Honolulu, HI, is configured as a WFO system with the exception of a CRS and a dedicated radar connection. PBP is localized to WFO Honolulu, HI.

NCEP Test Bed

The NTBN system, located in Camp Springs, MD, is configured as a standard NCEP system.

Table 6 - System Test Sites

Region	ID	Description	Location	Type	Estimated Install Date
NWSHQ	NHDA	7th Floor SSMC2	Silver Spring, MD	WFO	1/18/11
NWSHQ	NMTR	7th Floor SSMC 2	Silver Spring, MD	RFC	1/19/11
NWSHQ	NTCB	NWS Training Center	Kansas City, MO	WFO	1/19/11
NCEP	NTBN	NCEP Headquarters	Camp Springs, MD	NCEP	1/31/11
NWSHQ	NTCA	NWS Training Center	Kansas City, MO	WFO	2/14/11
Southern	EHU	Southern Region Headquarters	Fort Worth, TX	WFO	2/22/11
Central	BCQ	Central Region Headquarters	Kansas City, MO	WFO	2/8/11
NWSHQ	NTCC	NWS Training Center	Kansas City, MO	RFC	4/12/11
HQ	NTCD	NWS Training Center	Kansas City, MO	WFO	4/29/11
Eastern	VUY	Eastern Region Headquarters	Bohemia, NY	WFO	5/4/11
Western	VHW	Western Region Headquarters	Salt Lake City, UT	WFO	5/11/11
Pacific	PBP	Pacific Region Headquarters	Honolulu, HI	WFO	6/29/11

5.4 Test Strategy

Phase 2 will use Test Cases to conduct a systematic evaluation of the integrated AWIPS, which is comprised of the OB11 software, baseline communications systems and interfaces, and baseline AWIPS hardware in comparison to the system at the latest deployed OB release. Phase 2 will be conducted by NWS staff at Government facilities to provide an independent evaluation of the performance, functionality, and stability of the OB11 software prior to installation of the software at operational NWS field sites.

The AWIPS sites selected for Phase 2 are not normally used in forecast and warning operations. The reason for this selection choice is to reduce the risk to NWS operations during the initial evaluation of the OB11 software at operational NWS field sites during the Field Test. To the extent possible, the OB11 software will be tested under conditions that simulate actual conditions likely to be encountered during NWS operations including: normal weather, severe weather, flooding, seasonal weather conditions, and

regional weather conditions. SOP for opening TTs through the NCF and/or DRs through Dimensions will continue to apply.

Since the System Test sites, in general, do not issue products on a routine basis, an important part of the strategy for the System Test is to invite selected site personnel from the Field Test sites to participate in testing at some of the System Test sites. This will allow the Field Test personnel an opportunity to use a full AWIPS system to conduct testing using side-by-side comparison and also attempt validation of local applications. NWSHQ staff members will also be dispatched to some of the System Test sites to witness the installation, conduct initial tests of the software, and assist in the timely completion of the assigned Test Cases.

5.4.1 Side-by-Side Comparison

One overarching objective of the OB11 project is to provide a black box conversion of the current AWIPS software (i.e., the OB11 software is intended to provide the exact functionality, operability, and the look and feel of the latest deployed version of the OB software, currently OB9.4). Some of the sites selected for the System Test (NWSHQ and the NWSTC) have multiple AWIPS systems on campus and will provide the opportunity for direct, side-by-side comparison of the OB9.4 and the OB11 systems. Personnel traveling to these System Test sites will be able to run Test Cases on both OB9.4 and OB11 systems, which will allow comparison on both the functionality and the science of the baseline applications.

Table 7 - OB9.4 Sites for Side by Side Comparison in System Test

Region	ID	Description	Location	Type
HQ	NMTW	7 th Floor SSMC2	Silver Spring, MD	WFO
HQ	NHOR	7 th Floor SSMC2	Silver Spring, MD	RFC

5.4.2 Local Application Validation

Since the system architecture is changing for this release, it is anticipated that many local applications will need to be modified in order to work in the OB11 version. Personnel traveling to the Phase 2 sites are expected to bring and validate local applications on a complete system.

5.5 Schedule and Test Conduct

The OT&E System Test Phase 2 is scheduled to begin on February 2, 2011, preceded by a successful Phase 2 Readiness Review. The duration of Phase 2 is projected to last five months. However, actual duration could be shorter or longer based on the progress of the completion of the Test Objectives.

5.5.1 System Test Readiness Review

The Phase 2 readiness review will confirm the Entrance Criteria have been satisfied. The readiness review is convened by the OT&E Director and is attended by the members of the TRG, SME and other personnel. The OT&E Director will review the entrance criteria and the SMEs will provide information on whether the entrance criteria have been met.

The decision to proceed with OT&E is based on completion of the entrance criteria and the consensus opinion of the voting members of the TRG. Any dissenting opinions will be recorded and noted in the final report.

5.5.2 Installation and Checkout

Members of the OT&E Test Team will be on-site to observe the installation and initial operation of the system at several sites. The OT&E Test Team will meet with site management staff to coordinate on-site Phase 2 activities. Before departure, the OT&E Test Team will brief site management to ensure site personnel understand their roles and responsibilities during the remainder of the OT&E.

National Headquarters WFO and RFC Systems. The NHDA system was used for testing during the pre-OT&E period. Any installations will be rolled back to the latest deployed release prior to OB11 installation. Installation of the OB11 release is planned to be conducted during the week of January 18 using the latest set of installation instructions. Installation on the NMTR system in the days following depending on the number of updates required from the NHDA install. Members of the OT&E Test Team will participate in both installations and also participate with the initial checkout Test Cases.

NWSTC Systems. Any test installations on the NWSTC systems will be rolled back to the latest deployed release prior to OB11 installation. Initial installation of the OB11 release is planned to be conducted during the week of January 18 using the latest set of installation instructions. Members of the OT&E Test Team will travel to participate in the installation and also participate with the initial checkout Test Cases.

Regional Headquarters. Installation of the OB11 release will be completed during the first half of the System Test. Members of the OT&E Test Team will travel to participate in several installations at the regional headquarters sites.

NCEP Test Bed. Installation of the OB11 release will be completed early in the System Test. Raytheon personnel will perform the installation on the test bed system.

5.5.3 Testing and Software Updates

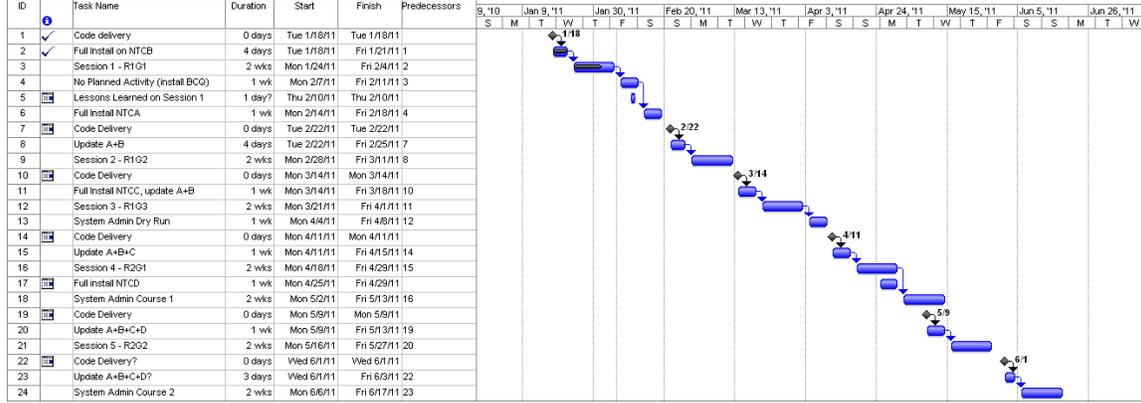
Testing will be conducted using Test Cases at both the side-by-side sites and the regional headquarters. During the course of the testing, it is expected to have routine software updates (delta releases) based on the DRs discovered.

5.5.3.1 Side-by-Side Testing and System Administration Course

Representatives from the Field Site test sites will participate in side-by-side testing at the NWSTC (10 seats) in Kansas City and at National Headquarters in Silver Spring (5 seats) as part of the System Test. The participants are generally divided into three groups with each group participating in up to two rounds of testing. The sessions are planned to last two weeks each and will include running Test Cases, validating local applications, verifying DRs, working on customization, configuration, localizations and other testing activities. The testing coordinator at the site (Bill Gery – Kansas City, John Tatum – Silver Spring) will report on testing and evaluation activities to the OT&E Manager and/or at the TRG meetings.

Two System Administration residence course (30 seats each) will be held at the NWSTC in May and June. The training is for Field Site System Administrators to gain experience with a full functioning system prior to installation at their respective sites. The planned schedule is shown in Figure 1.

Figure 2 - Planning Schedule for Side-by-Side Testing and System Administration Course



More specific test activities and schedules are included in the OT&E Testing Plan, which is located on the AWIPS Migration developer collaboration portal https://collaborate.nws.noaa.gov/trac/am_OT&E/wiki/OperationalTestAndEvaluationDoc

5.5.3.2 Regional Headquarters Testing

The Test Case Manager will assign Test Cases to the Regional Headquarters sites during the System Test. Representatives from the respective regions will participate in testing activities at the site including running Test Cases, validating local applications, working on customization, configuration, localizations and other testing activities.

The site focal point will report on testing and evaluation activities to the OT&E Manager and/or the TRG meetings.

5.5.3.3 Delta Upgrades

It is expected during testing that DRs will be discovered and classified to be corrected during the OT&E period. Delta upgrades will be provided to the System Test sites, as needed. It is anticipated that the frequency of delta upgrades would be once every two weeks. These delta installations will be installed according to the Raytheon delta release plan and schedule. A list of the specific DRs that are corrected will be provided to the sites.

5.5.4 In-Process Review

An In-Process Review (IPR) may be held to evaluate the progress in completing the test objectives for the System Test. The IPR is convened by the OT&E Director and is attended by the members of the TRG and SMEs. The OT&E Director will review the Test Objectives and Evaluation Criteria and SMEs will report the progress of the testing. If all of the objectives have been met, then Phase 2 will be completed and a Field Test Readiness Review (FTRR) will be scheduled to propose a Field Test start date. If the objectives have not been met, the operational staff side-by-side testing will continue. The

TRG will determine the next IPR date to review the Phase 2 objectives. The decision to proceed to FTRR is based on the consensus opinion of the voting members of the TRG.

5.6 Roles and Responsibilities in System Test

This section describes the roles and responsibilities for personnel during the System Test.

OT&E Test Team Members of the OT&E Test Team will travel to selected test sites for the testing kickoff meetings and to support the installation and initial tests of the software. The team oversees the administration of the Test Cases, including the preparation of Test Cases, assignments, and the analysis and reports of test results. The Team also oversees the TT/DR submission and investigation process and provides a liaison with the Raytheon developers in the resolution of defects reported in the OB11 software.

TRG - The TRG will meet weekly during the System Test, to monitor progress, and to review and clarify issues as well as classify DRs for resolution.

Regional Program Managers - The regional program managers will coordinate any supplemental testing activities at their respective sites. They will also assist in local application conversion/development for local applications created in their region.

Site Representatives - The site representatives from the Field Test OT&E sites will travel to either Silver Spring or Kansas City to participate in the System Test activities. The participants will complete Test Cases, review approved variances and applicable training. They will also work on customization, localization and configuration, as well as verify local applications and perform other associated testing activities. As issues are discovered, the participant will open a TT with the NCF and create a Supplemental Test Case describing the problem encountered.

The Field Test site's Electronic Systems Analyst (ESA) and/or Information Technology Officer (ITO) will attend a two-week residence course on System Administration training.

Test Support Personnel

The NCF will document issues through TTs, and escalate issues per SOPs.

The Raytheon software support team will work to analyze and resolve escalated TTs and DRs, and implement solutions in delta releases.

The System Test site's System Administrator will ensure system availability during the testing period and resolve or escalate system-related problems. They will also coordinate the delta installation upgrades to the OB11 software as the release is available.

6 Field Test

The Field Test is a formal evaluation of the OB11 software conducted at operational NWS field sites. The Field Test will evaluate the general fitness of the OB11 software for use in NWS field operations and ensure specific objectives have been met. The Field Test will follow after the successful completion of Phase 2 of the System Test.

The Field Test sites were primarily selected to achieve a representative sampling of the variations of weather and operations across the NWS. It includes sites from all six regions and the national centers.

6.1 Entrance Criteria

The Field Test is the final phase of the OT&E. The following criteria are required to be met prior to the start of the Field Test, which will be reviewed and approved by the TRG as part of the Field Test Readiness Review (FTRR).

1. AWIPS Program shall provide an updated list of open source project versions (qpid, etc) including how long they have been included in OB11.
2. AWIPS Program shall provide updates on government supplied documentation as requested by the NWSTD.
3. AWIPS Program shall provide updated draft versions of the UM, SMM and Release Notes (including variances) that are considered acceptable for field use as part of the Field Test.
4. Installation instructions and rollback procedures must be considered acceptable for field use as part of the Field Test.
5. The AWIPS Program shall ensure the two residence pilot courses for System Administration provided for the Field Test System Administration personnel have been successfully conducted/completed.
6. The NWSTD shall have draft versions of the Application Focal Point training available to Field Test participants that are considered acceptable for field use as part of the Field Test.
7. The NWSTD shall provide an updated draft version of variance training for Field Test personnel, including newly approved variances during the System Test.
8. Rack Consolidation/Modem Nest installation completed at all leading Field Test sites and is scheduled for all middle and trailing sites.
9. CPSBN replacement installation completed at all leading Field Test sites and is scheduled for all middle and trailing sites.
10. OB9.4 installation completed at all leading Field Test sites and is scheduled for all middle and trailing sites.
11. AWIPS Program has tested, verified and implemented an acceptable solution in support of CWSU operations.
12. All leading Field Test sites shall certify that they have completed the site readiness checklist.
13. AWIPS Program shall ensure that applicable changes from all AWIPS releases up to OB9.4 are incorporated into the OB11 software. (OB9.5 content should be incorporated as quickly as possible into the OB11 software during the Field Test.)
14. Performance must be at acceptable levels.
15. Stability must be at acceptable levels for at least 21 consecutive days.

16. Radar Interface Certification Test has been successfully completed.
17. All TTR/TT/DR submitted during the System Test shall be adjudicated by the TRG.
18. All DRs that are classified as Impact 1, 2, or 3 by the TRG four weeks prior to the FTRR are resolved. (The FTRR is currently scheduled for July 6, 2011).
19. For all DRs that are classified as impact 1, 2 or 3 by the TRG after the cutoff date (4 weeks prior to the FTRR), AWIPS Program will provide an acceptable resolution plan.
20. All critical local applications at leading Field Test sites have been migrated. (All critical local applications at middle and trailing sites must be migrated before installation.)
21. The NCEP system test has been successfully completed.
22. All test objectives and assigned Test Cases for the System Test shall be successfully completed.
23. AWIPS Program shall certify the OB11 software is ready for operational testing, and all of the operational functionality is there and works as expected.

6.2 Test Objectives and Evaluation Criteria

The objective of the Field Test is to use Test Cases to verify the five test components (software installation, basic functionality, performance and stability, communications, and operational use) identified in the scope (Section 1.4). This includes the following specific objectives:

Table 8 - Test Objectives and Evaluation

Objective	Evaluation
Verify the installation instructions and scripts for the OB11 software.	The instructions and scripts are complete, accurate and can be installed in six hours or less.
Verify the rollback capability to a previous OB11 version.	The instructions and scripts are complete, accurate and can be installed in sixty minutes or less.
Validate the rollback capability to the previous architecture release (i.e., OB9.4).	The instructions and scripts are complete, accurate and the previous release can be restored in six hours or less.
Validate the draft User Manual, SMM, Release Notes, SSDD.	The draft documentation is comparable in quality and completeness to the OB9 documentation.
Verify training.	Participants have completed all training courses.
Evaluate AWIPS Contractor Support.	The contractor continues to provide timely support to all AWIPS sites according to applicable Service Level Agreements in

	place.
Verify external interfaces.	Confirm data flow to and from the external interfaces continues to function normally.
Verify system configurability.	The system is configurable for local site use, similar to OB9.4 capabilities.
Verify warning and routine products.	All warning and routine products are accurately and correctly created and disseminated.
Verify Test mode.	Products can be accurately created and issued with appropriate "Test" wording.
Verify Practice mode.	Products can be accurately created, stored and followed up without being transmitted.
Verify failover/recovery operations (cluster configuration).	Failover/recovery activities work as documented in the SMM.
Verify applications, modules, and user interfaces.	Applications, modules and user interfaces contain the same functionality as the latest deployed version of the OB software.
Verify archive capability.	Weather and hydrological data sources being archived in OB9.4 can be archived in OB11 in approximately the same amount of time, and they can be successfully reingested and displayed in OB11 through the Weather Event Simulator (WES-II Bridge).
Verify service backup.	One site can assume control of another site's area of responsibility using the three scenarios (OB11-OB11, OB11-OB9.4, OB9.4-OB11).
Verify site interoperability.	Verify ISC grids can be transferred and displayed at both OB11 and OB9.4 sites.
Verify ingest storage, user interface and dissemination performance of the software.	The OB11 software meets or exceeds the most recent established OB benchmarks.
Verify system stability.	Field Test sites are stable for a period of not less than 30 days.
Verify local applications.	Local applications can be installed and executed.
Verify ingest storage, retrieval and manipulation of data types.	All data types are accurately and efficiently stored, retrieved and manipulated.
Resolve all high impact problems/issues	All TT/DR rated with an Impact of 1, 2, 3

discovered during Field Test.	or 4 by the TRG are closed (i.e. fixed and implemented).
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Test Cases will be used to evaluate the objectives listed above. For additional information on the specific Test Cases, refer to the [Master Deliverable Matrix](#) or [Test Track Pro](#) repository.

6.3 Test Sites

Field Test sites were primarily selected to achieve a representative sampling of the variations of weather and operations across the NWS. These sites are operational and are actively supporting the mission of the NWS. The sites include WFOs, RFCs, NCEP, and Alaska Region headquarters supporting the Anchorage CWSU operations.

Under the current architecture at release OB9.4, systems are configured either as a WFO system or RFC system and include additional service backup localizations for primary, secondary, and catastrophic support.

Regional Headquarters

The VRH system, located in Anchorage, AK is configured as a WFO system with the exception of a CRS and a dedicated radar connection. However, it also contains two extra PX servers (PX3 and PX4) to support the dual domains of the Aleutian Islands and mainland Alaska. The only other sites that include the extra PX servers in this configuration are WFO Anchorage and the Raytheon testbed system TBW3. VRH is typically localized to WFO Anchorage, AK.

Weather Forecast Offices

WFOs Fairbanks (AFG), Omaha (OAX), Boulder/Denver (BOU), Blacksburg/Roanoke (RNK), Raleigh, (RAH), Norman/Oklahoma City (OUN), Salt Lake City (SLC), Huntsville (HUN), Houston/Galveston (HGX), Portland (PQR), Grand Rapids (GRR), Taunton/Boston (BOX), Guam (GUM), and Honolulu (HFO) are fully operational WFO systems providing warnings, forecasts and associated weather information for their respective areas.

River Forecast Centers

RFC Systems Northwest (PTR), Middle Atlantic (RHA) and Arkansas-Red Basin (TUA) are fully operational systems providing river forecasts and associated information for their respective areas.

National Centers for Environmental Prediction (NCEP)

NCEP sites are specialized with analyses, forecasts and watch/warning/advisory responsibilities that cover both national and international areas. In addition to the software change, the NCEP sites have also received an entirely new set of hardware. This new set of hardware is planned to become the standard hardware configuration for all NCEP sites.

NCEP Headquarters located in Camp Springs, MD, has two new systems, HPCN and OPCN. These two systems are shared between three National Centers:

Hydrometeorological Prediction Center (HPC); Ocean Prediction Center (OPC); and Climate Prediction Center (CPC) as well as the NCEP Central Operations (NCO) Senior Duty Meteorologist (SDM) Desk and NESDIS Operations.

The following systems are also configured as NCEP systems: The AWCN system, at the Aviation Weather Center in Kansas City, MO; the NHCN system, at the National Hurricane Center in Miami, FL; and the SPCN system, at the Storm Prediction Center in Norman, OK.

Table 9 - Field Test Sites

Region	ID	Description	Location	Type	Install Time
Central	OAX	Omaha	Valley, NE	WFO	Leading
Western	PTR	Northwest	Portland, OR	RFC	Leading
Southern	OUN	Oklahoma City	Norman, OK	WFO	Leading
Eastern	RNK	Blacksburg/Roanoke	Blacksburg, VA	WFO	Leading
Central	BOU	Boulder/Denver	Boulder, CO	WFO	Leading
Western	SLC	Salt Lake City	Salt Lake City, UT	WFO	Leading
Eastern	RAH	Raleigh	Raleigh, NC	WFO	Leading
Alaska	VRH	Alaska Region Headquarters	Anchorage, AK	RHQ	Leading
Alaska	AFG	Fairbanks	Fairbanks, AK	WFO	Middle
Southern	HUN	Huntsville	Huntsville, AL	WFO	Middle
Western	PQR	Portland	Portland, OR	WFO	Middle
Eastern	RHA	Middle Atlantic	State College, PA	RFC	Middle
Southern	HGX	Houston/Galveston	Houston, TX	WFO	Middle
Southern	TUA	Arkansas-Red Basin	Tulsa, OK	RFC	Middle
National	AWCN	Aviation Weather Center	Kansas City, MO	NCEP	Middle
National	OPCN	Ocean Prediction Center	Camp Springs, MD	NCEP	Middle
National	HPCN	Hydrometeorological Prediction Center	Camp Springs, MD	NCEP	Middle
National	SPCN	Storm Prediction Center	Norman, OK	NCEP	Middle
Eastern	BOX	Boston	Taunton, MA	WFO	Trailing
Central	GRR	Grand Rapids	Grand Rapids, MI	WFO	Trailing
National	NHCN	National Hurricane Center	Miami, FL	NCEP	Trailing
Pacific	HFO	Honolulu	Honolulu, HI	WFO	Trailing

Pacific	GUM	Guam	Barrigada, GU	WFO	Trailing
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The sites are divided into three groups based on projected installation time. Table 11 indicates the general order of installation, starting with WFO Omaha. Specific installation dates are not projected since the beginning of Field Test is content driven rather than schedule driven. The sites in the Leading category will be the first sites to install during the first month of Field Test. The Middle group will generally follow the Leading group and install by the second month of Field Test. The Trailing sites will be the last sites to install.

6.4 Test Strategy

The majority of sites selected for the Field Test currently use the software in an operational environment to support the mission of the NWS. Thus, the strategy during the Field Test will include the use of Test Cases along with standard use of the software in support of operations.

The Test Cases will be conducted to evaluate system performance; stability, data ingest and display; message handling; the generation and dissemination of watches, warnings, and other official NWS products and services; and OB11 functionalities for data display and data processing. The Test Cases are intended to provide a comprehensive evaluation and comparison against the latest deployed version of the OB9 software.

Operational or standard use of the software will be conducted in a routine manner once the installation is complete. If problems are encountered during the use of the software, sites will continue to follow SOP by opening a TT with the NCF. However, the site will also provide a new/updated Test Case that documents the particular issue so that it may be used to independently validate the problem and/or verify the solution.

The Field Test will be conducted by NWS staff at Government facilities to provide an independent evaluation of the performance, functionality, and stability of the OB11 software prior to regular deployment of the software at the remaining NWS field sites. NWSHQ staff members may also be dispatched to some of the Field Test sites to witness the installation, conduct initial tests of the software and assist in the timely completion of the assigned Test Cases.

One additional strategy under consideration for the Field Test is to invite selected site personnel from the neighboring Field Test sites to participate in testing at Field Test sites. This strategy would allow personnel from the neighboring sites to gain some experience with the software and allow some possible evaluation of local applications.

6.4.1 Side-by-Side Comparison

One overarching objective of the OB11 project is to provide a black box conversion of the current AWIPS software (i.e., the OB11 software is intended to provide the exact functionality, operability, and the look and feel of the latest deployed version of the OB software, currently OB9.4). Some of the sites selected for the Field Test (NCEP centers) have multiple AWIPS systems on campus and will provide the opportunity for direct, side-by-side comparison of the OB9.4 and the OB11 systems. Personnel at the NCEP

sites will be able to run Test Cases on both OB9.4 and OB11 systems, which will allow comparison on both the functionality and the science of the baseline applications.

Table 10 - OB9.4 Sites for Side-by-Side Comparison in Field Test

Region	ID	Description	Location	Type
National	NHCR	National Hurricane Center	Miami, FL	NCEP
National	NHCW	National Hurricane Center	Miami, FL	NCEP
National	WNAR	Aviation Weather Center	Kansas City, MO	NCEP
National	WNAW	Aviation Weather Center	Kansas City, MO	NCEP
National	WNOR	Ocean Prediction Center	Camp Springs, MD	NCEP
National	WNOW	Hydrometeorological Prediction Center	Camp Springs, MD	NCEP
National	SPCW	Storm Prediction Center	Norman, OK	NCEP

6.4.2 Local Application Validation

Due to the large number of local applications in use at field sites, it is anticipated that many local applications will need to be modified or rewritten in order to work in the OB11 version. Operational personnel will continue to work, validate and share local applications with other Field Test sites.

6.5 Schedule and Test Conduct

The OT&E Field Test is scheduled to begin after the objectives in the System Test have been completed. The duration of the Field Test is projected to last four months.

However, actual duration will be based on the completion of the objectives in the Field Test.

6.5.1 Field Test Readiness Review

The FTRR will be held after a successful IPR, to confirm the Entrance Criteria for the Field Test have been satisfied. The FTRR is convened by the OT&E Director and is attended by the members of the TRG, designated SMEs and other stakeholders. The OT&E Director will review the entrance criteria and the SMEs will provide information regarding the entrance criteria. The decision to proceed with Field Test is based on the consensus opinion of the voting members of the TRG. Dissenting opinions will be noted and provided in the final report.

6.5.2 Installation and Checkout

Members of the OT&E Test Team will be on-site to observe the installation and initial operation of the system at several sites. The OT&E Test Team will meet with site

management staff to coordinate on-site Field Test activities. Before departure, the OT&E Test Team will brief site management to ensure site personnel understand their roles and responsibilities during the remainder of the OT&E.

The first Field Test site to install the release is planned to be WFO Omaha, NE. The OT&E Test Team will coordinate installation dates with all Field Test sites at least two weeks in advance. If the OT&E Test Team is not traveling to participate in the install and checkout, the team will provide the latest set of instructions and initial checkout cases and will track the installation activity.

6.5.3 Testing and Software Updates

Testing will be conducted using Test Cases and through operational use. During the course of the testing, it is expected to have routine software updates (delta releases) based on the DRs discovered.

More specific test activities and schedules are included in the OT&E Testing Plan, which is located on the AWIPS Migration developer collaboration portal

https://collaborate.nws.noaa.gov/trac/am_OTe/wiki/OperationalTestAndEvaluationDoc

6.5.3.1 Regional Headquarters Testing

The Test Case Manager will assign Test Cases to the Regional Headquarters sites during the Field Test. Representatives from the respective regions will participate in testing activities at the site including running Test Cases, validating local applications, working on customization, configuration, localizations and other testing activities.

The site focal point will report on testing and evaluation activities to the OT&E Manager and/or the TRG meetings.

6.5.3.2 WFO/RFC Testing

The Test Case Manager will assign Test Cases to the WFO/RFC sites during the Field Test. The Test Site Manager (TSM) will coordinate testing activities at the site and report the status of the testing to the Test Case Manager and their regional AWIPS focal point. Site activities will include running Test Cases, validating local applications, working on customization, configuration, localizations and other testing activities.

The Warning Decision Training Branch is also planning to conduct a beta test of the WES-II Bridge using some of the sites during the Field Test period. One of the Field Test Objectives is to verify WFO/RFC archive capability, which will use the WES-II Bridge during the evaluation.

6.5.3.3 NCEP Testing (Includes Side-by-Side)

The Test Case Manager will assign Test Cases to the NCEP sites during the Field Test. With multiple systems on campus at those sites, additional Test Cases can be executed to compare results between the OB11 and the latest deployed version of the OB software, currently OB9.3). The TSM will coordinate testing activities at the site and report the status of the testing to the Test Case Manager and the NCEP AWIPS focal point. Site activities will include running Test Cases, validating local applications, working on customization, configuration, localizations and other testing activities.

6.5.3.4 Delta Upgrades

It is expected during testing that DRs will be discovered and classified to be corrected during the OT&E period. Delta upgrades will be provided to the Field Test sites, as needed. It is anticipated that the frequency of delta upgrades would be once every two weeks. These upgrades will be installed according to the Raytheon delta release plan and schedule. A list of the specific DRs that are corrected will be provided to the sites.

6.5.4 In-Process Review

An IPR will be held about three months after the start of the Field Test, to evaluate the progress in completing the test objectives. The IPR is convened by the OT&E Director and is attended by the members of the TRG, SMEs and other stakeholders. The OT&E Director will review the Test Objectives and Evaluation Criteria and SMEs will report the progress of the testing. If all of the objectives have been met, then the Field Test will be completed and a Deployment Readiness Review (DRR) will be scheduled. If the objectives have not been met, testing and evaluation activities will focus on the specific objectives that remain outstanding. The TRG will determine the next IPR date to review the Field Test objectives. The decision to proceed to DRR is based on the consensus opinion of the voting members of the TRG. Dissenting opinions will be recorded and noted in the final report.

6.6 Roles and Responsibilities in Field Test

This section describes the roles and responsibilities for personnel during the Field Test.

OT&E Test Team - Members of the OT&E Test Team will travel to selected test sites for the testing kickoff meetings and to support the installation and initial tests of the software. The team oversees the administration of the Test Cases, including the preparation of Test Cases, assignments, and the analysis and reports of test results. The Team also oversees the TT/DR submission and investigation process and provides a liaison with the Raytheon developers in the resolution of defects reported in the OB11 software.

TRG - The TRG will meet at least weekly during the Field Test, to monitor progress, and to review and clarify issues as well as classify DRs for resolution.

Regional/National Center Program Managers - The regional program managers will coordinate any supplemental testing activities at their respective sites. They will also assist in local application conversion/development for local applications created in their region.

Operational Personnel - Personnel supporting actual operations will use the software in operations during the OT&E to issue official and experimental real-time watches, warnings, advisories, and forecast products. They will execute assigned Test Cases and document problems arising from the use of the software by entering the information in the site log, and opening a TT and provide a Test Case describing the issue.

A level of effort estimate for operational personnel per site is included as Appendix F.

Test Support Personnel - The NCF will document issues through TTs, and escalate issues as necessary per SOPs.

The Raytheon software support team will analyze and resolve escalated TTs and DRs, and implement solutions in delta releases.

The Field Test site's System Administrator will ensure system availability during the testing period and resolve or escalate system-related problems. They will also coordinate the delta installation upgrades to the OB11 software as the release is available.

7 OT&E Recommendations and Report

Based on the successful completion of the objectives in the Field Test, a final meeting of the TRG will be held to determine the recommendation of the readiness of the software for deployment.

The DRR will be held after a successful Field Test IPR to determine the recommendation of the TRG. The DRR is convened by the OT&E Director and is attended by the members of the TRG, SMEs and other stakeholders. The OT&E Director will review the OT&E activities including a summary of DRs found and resolved, as well as other findings and recommendations. The TRG will review the materials presented and vote whether or not to recommend proceeding with national software deployment. The vote will be based on a consensus opinion of the voting members of the TRG, although dissenting opinions will be recorded and noted in the final report.

The Director will report the recommendations of the TRG at the Gate 4 meeting of the OSIP project entitled AWIPS Evolution. If necessary, the final decision of the deployment of the OB11 software will be made by the NWS Corporate Board.

A final report of the OT&E will be produced after the completion of the OT&E. The report will contain a complete list of all Test Cases run during the OT&E along with the status of each TT and DR that was opened during the period.

Appendix A - Glossary

A

A&A - Security Assessment and Authorization.

ADAM – AWIPS Data and Application Migration. The ADAM workstations will allow the sites to have an early version of the software available at the site in order to prepare local applications and customizations prior to the installation on the main AWIPS System.

AWIPS - Advanced Weather Interactive Processing System. AWIPS is a technologically-advanced information processing, display, and telecommunications system that is the cornerstone of the National Weather Service's operations. AWIPS is an interactive computer system that integrates meteorological and hydrological data, enabling forecasters to prepare forecasts and issue warnings. It includes a full suite of satellite imagery, radar data, surface observations, and numerical model guidance.

B

Black Box - A software conversion technique, selected by Raytheon, whereby the end user look and feel is equivalent to those in use by the current AWIPS System.

Raytheon is accomplishing this first phase by approaching the baseline application migration as a near black box conversion, ensuring that the end-user (e.g., field site personnel) functions are equivalent to those in the current AWIPS system, while the system capabilities change significantly. This approach is fully described within the Product Improvement Plan (Version 4), dated February 24, 2009.

C

CAVE - Common AWIPS Visualization Environment. CAVE is the new JAVA based client to the service oriented architecture.

CIO - Chief Information Officer.

CONUS - Contiguous United States.

Consensus – General agreement or concord; harmony.

CPC – Climate Prediction Center. One of the NCEP Centers primarily located at NCEP headquarters in Camp Springs, MD.

CTR – Continuous Technology Refresh

CWSU - Center Weather Service Unit.

D

Dimensions - The Configuration Management System for AWIPS located in Silver Spring, MD. The system has the capability to maintain separate databases between OB11 and the legacy software.

DOH - Development and Operations Hydrologist.

DR - Discrepancy Report.

DRR - Deployment Readiness Review.

E

EDEX_Ingest_ESB - Environmental Data Exchange. EDEX receives data from the Satellite Broadcast Network or Wide Area Network and sends it to the decoders over the Enterprise Service Bus (ESB) for decoding and storage.

EDEX_Request_ESB - Environmental Data Exchange. Data to be displayed in CAVE is requested from storage through the Enterprise Service Bus (ESB).

ESA - Electronic Systems Analyst.

F

FBSO - Fix Before System OT&E. Term created by OST to define development DRs that are required to be corrected prior to the start of operational testing.

FDTB - Forecast Decision Training Branch.

FIT - Forecaster Initial Testing.

FTRR - Field Test Readiness Review.

H

HDF5 - Hierarchical Data Format. HDF5 is the data storage format that replaces netCDF.

HIC - Hydrologist-in-Charge.

HMT - Hydrometeorological Technician.

HPC - Hydrometeorological Prediction Center. One of the NCEP Centers primarily located at NCEP headquarters in Camp Springs, MD.

I

IPR - In-Process Review.

ITO - Information Technology Officer.

ITSO - Information Technology Security Officer.

IV&V - Independent Verification and Validation.

L

LOE - Level of Effort.

M

MIC - Meteorologist -in-Charge.

Mission - The National Weather Service is responsible for providing weather service to the Nation. It is charged with responsibility for observing and reporting the weather and with issuing forecasts and warnings of weather and floods in the interest of national safety and economy. Enabling legislation provides for: public weather service; river and flood service; specialized services to aviation, agricultural, forestry, marine, and commercial interests; climatological service; and basic weather service, i.e., the

observing, communications, and processing activities needed to support the other services.

N

NCEP - National Centers for Environmental Prediction.

NCF - Network Control Facility.

NCO – NCEP Central Operations

NCLADT - National Core Local Applications Development Team.

NESDIS - National Environmental Satellite, Data, and Information Service.

NTBN - NCEP test bed system in Camp Springs, MD.

NWS - National Weather Service.

NWSEO - National Weather Service Employee Organization.

NWSHQ - National Weather Service Headquarters. The NWSHQ is located in Silver Spring, MD.

NWSI - NWS Instruction. Acronym referencing the NWS directives.

NWSTC - National Weather Service Training Center. The NWSTC is located in Kansas City, MO.

NWSTD - National Weather Service Training Division. The NWSTC is part of the NWSTD in OCWWS.

NWSTG - National Weather Service Telecommunication Gateway.

O

O&M COTR - Operations and Maintenance Contracting Officer's Technical Representative.

OB - Operational Build. The name of current software releases. The latest deployed OB version (currently OB9.4) is expected to be in place at AWIPS sites prior to the installation of the AWIPS migration software.

OB11 – Operational Build 11. OB11 is the name of the first release of the AWIPS Migration software, based on the proposed release names in the AWIPS governance. The 11 refers to the calendar year of the release. Subsequent delta releases during the OT&E are named OB11.1, OB11.2, etc.

OCP – Ocean Prediction Center. One of the NCEP Centers primarily located at NCEP headquarters in Camp Springs, MD.

OCIO - Office of Chief Information Officer. One of the offices located at the NWS headquarters in Silver Spring, MD.

OCONUS - Outside the Contiguous United States.

OCWWS - Office of Climate, Water and Weather Services. One of the offices primarily located at the NWS headquarters in Silver Spring, MD.

OHD - Office of Hydrologic Development. One of the offices located at the NWS headquarters in Silver Spring, MD.

OOS - Office of Operational Systems. One of the offices located at the NWS headquarters in Silver Spring, MD.

OPS21 - AWIPS Support Branch. OPS21 is part of the Field Systems Operations Center in OOS.

OSIP - Operations and Service Improvement Process. OSIP is the NWS requirements-based management process approved by the Corporate Board in June 2005.

OST - Office of Science and Technology. One of the offices located at the NWS headquarters in Silver Spring, MD.

OT&E - Operational Test and Evaluation. The AWIPS OT&E is a formal evaluation of the AWIPS system conducted in both a simulated and actual operational environment.

P

PAMS - Product Availability Monitoring System.

PDS - Product Dissemination System. A dissemination system used by NCEP centers.

Phase 1 – is an informal evaluation of the OB11 software conducted in a lab environment. Phase 1 will evaluate the general fitness of the OB11 software for use in simulated operations and ensure specific objectives have been met. Phase 2 will follow after the successful completion of Phase 1.

Phase 2 - is a formal evaluation of the OB11 software conducted in a simulated operational environment. Phase 2 will evaluate the general fitness of the OB11 software for use in NWS field operations and ensure specific objectives have been met prior to use of the software at selected NWS operational sites during the Field Test.

POC - Point of Contact.

R

R11 or OB11 - Release 11. OB11 is the name of the first release of the AWIPS Migration software, based on the proposed release names in the AWIPS governance. The 11 refers to the calendar year of the release. Subsequent delta releases during the OT&E are named OB11.1, OB11.2, etc.

RTS - Raytheon Technical Services Company.

Repeatable - An event is repeatable if it can be independently reproduced either in a lab or an operational environment.

RFC - River Forecast Center.

RHQ - Regional Headquarters.

S

SCAT - Standard Configuration for AWIPS II Testing. The SCAT platform is composed of CAVE installed on a workstation and EDEX installed on a server. This platform is no longer being used and has been replaced with the ADAM workstations.

SDM - Senior Duty Meteorologist.

SIT - System Integration Testing.

SLA - Service Level Agreement.

SOO - Science and Operations Officer.

SOP - Standard Operating Procedures.

SME - Subject Matter Experts.

SMM - AWIPS System Manager's Manual.

SSDD - AWIPS System Subsystem Design Description.

SST - Site Support Team.

Stability – The reliability of the system based on the users' perspective. It is based on data reliability, use of the system, product generation and dissemination. Additional information is provided in Appendix I.

STRR - System Test Readiness Review.

T

Test Track Pro - A Commercial Off the Shelf program used to manage and assign Test Cases as well as report results.

TiLC - AWIPS Technology Infusion Leadership Committee.

TO11 - Task Order 11.

TRG - Test Review Group.

TSM - Test Site Manager.

TT - Trouble Ticket.

U

UFE - User Functional Evaluation.

UM - AWIPS User Manual.

W

WES-II Bridge - The WES-II Bridge is the new Weather Event Simulator designed to work with OB11 software.

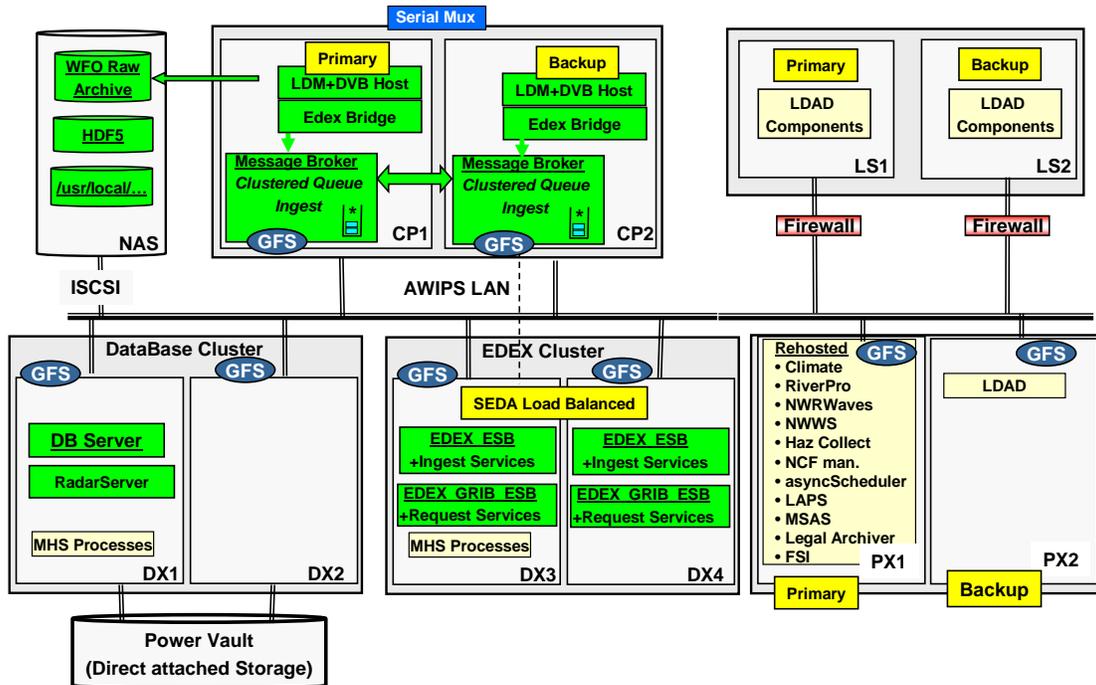
WDTB - Warning Decision Training Branch

WFO - Weather Forecast Office.

Appendix B - System Architecture

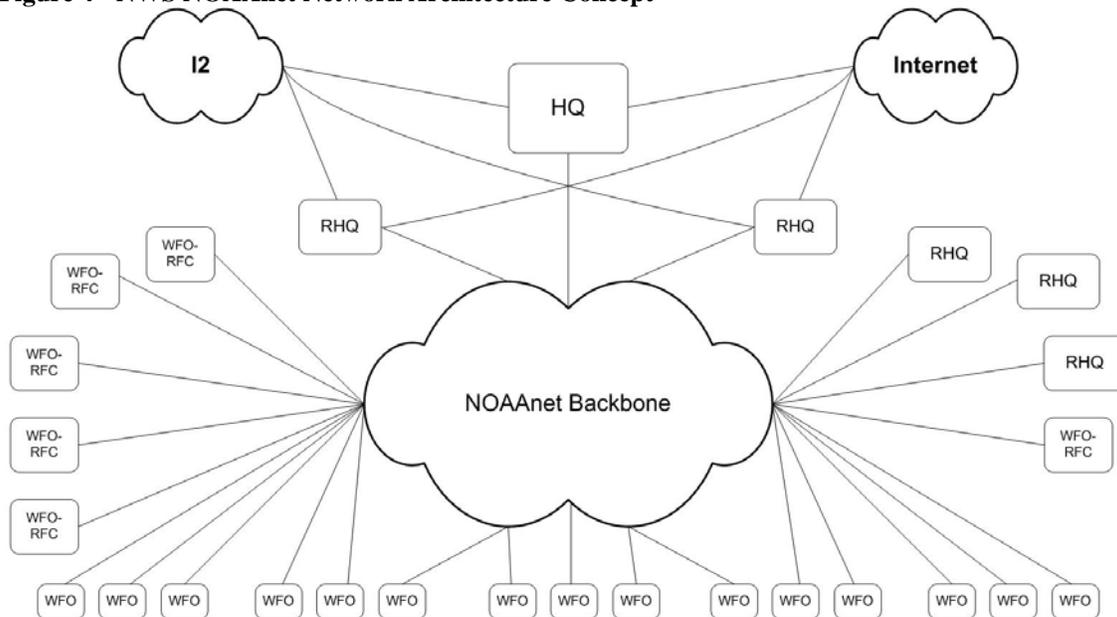
Figure 3 – System Architecture on Standard WFO Hardware

Deployment and Transition Planning Awips-II Deployed on Standard WFO hardware



DRAFT MATERIAL – SUBJECT TO CHANGE

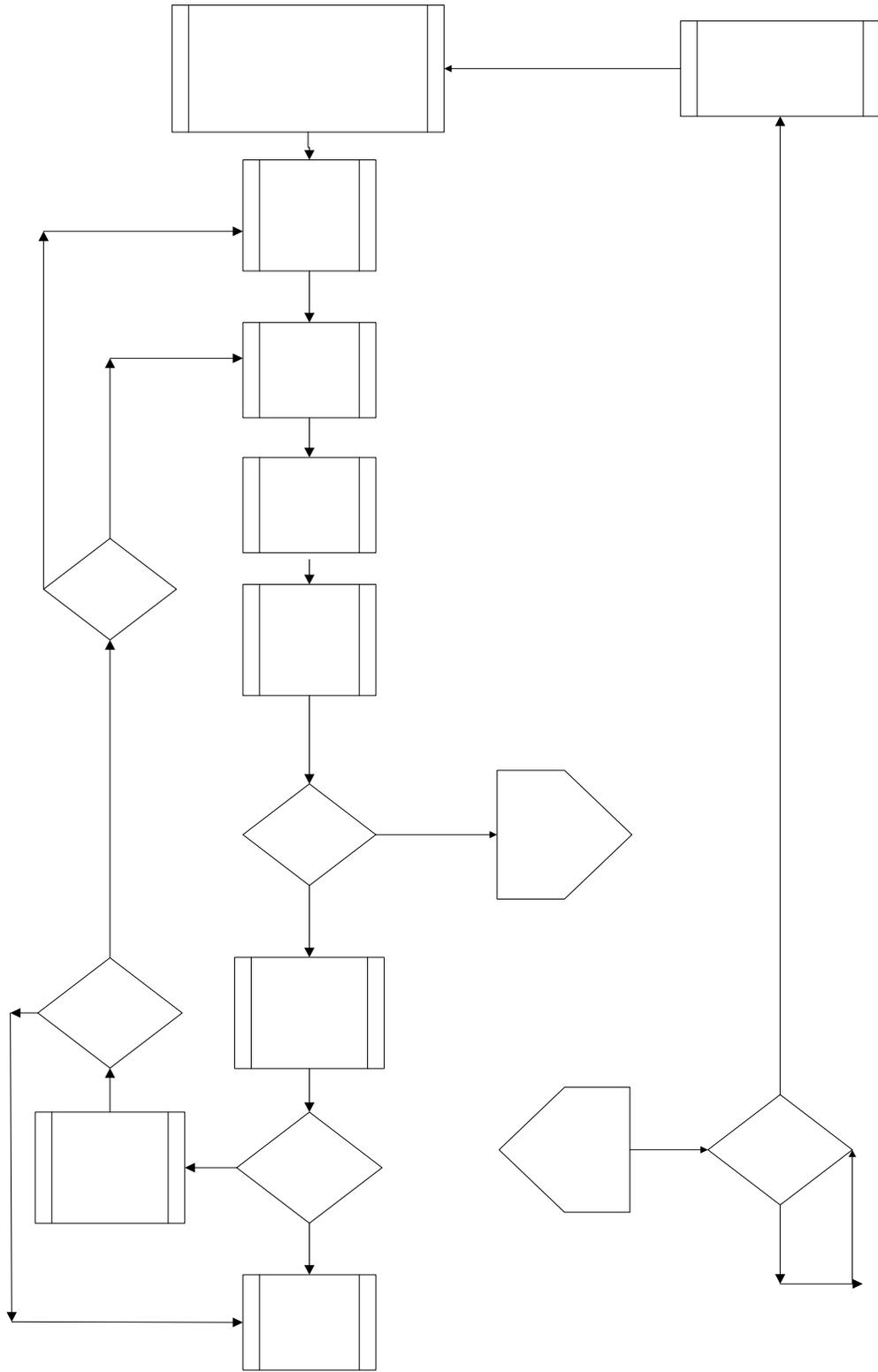
Figure 4 - NWS NOAAnet Network Architecture Concept



Drawing Title: NOAA/NWS PROPRIETARY VERSION 001 – NWS NOAAnet Network Architecture Concept
originator: Keith R. Myers | reviser: |
| origination date: 6.18.2006 | revision date:

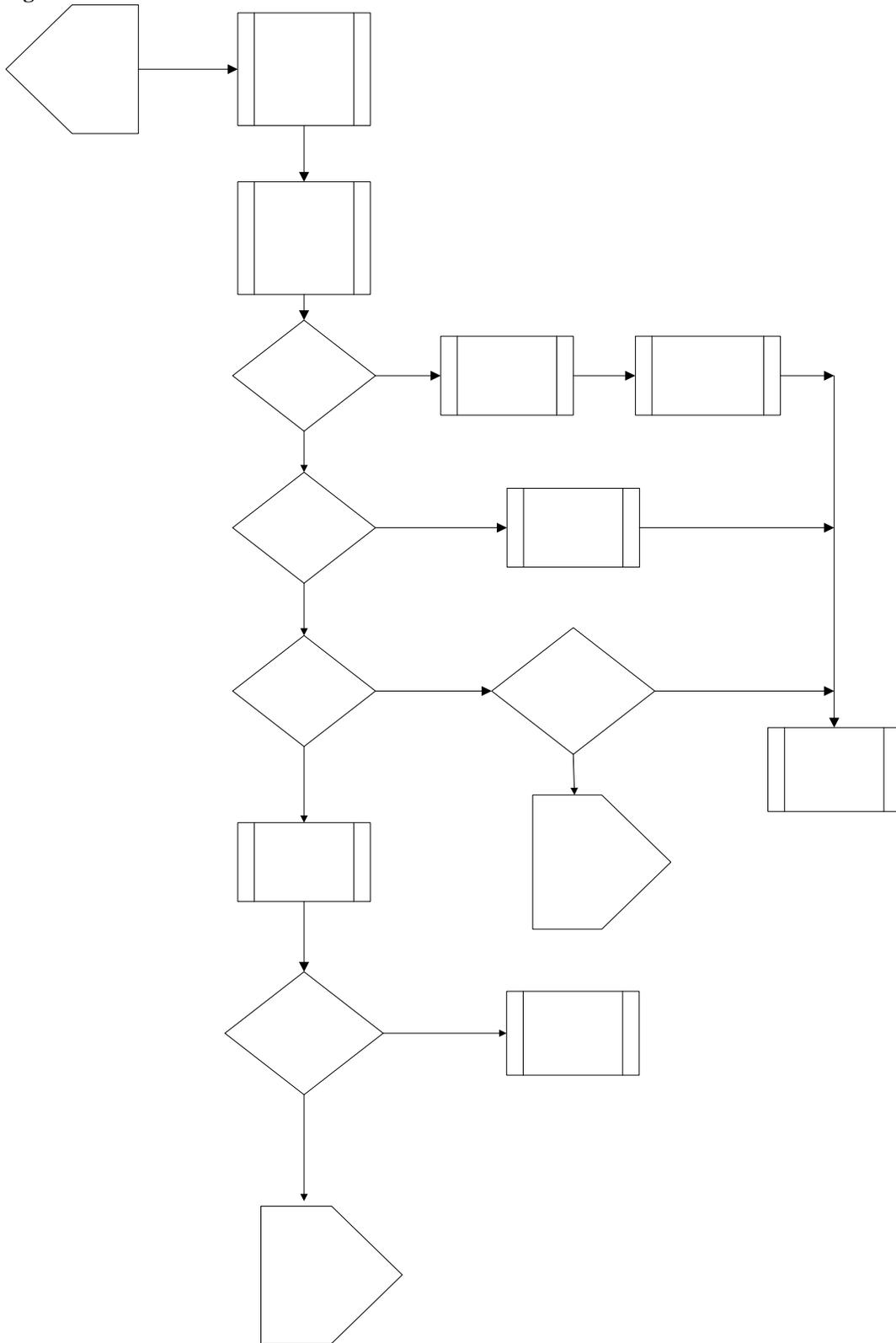
Appendix C - Data Flow Diagram for Test Cases

Figure 5 - Test Case Process Flow



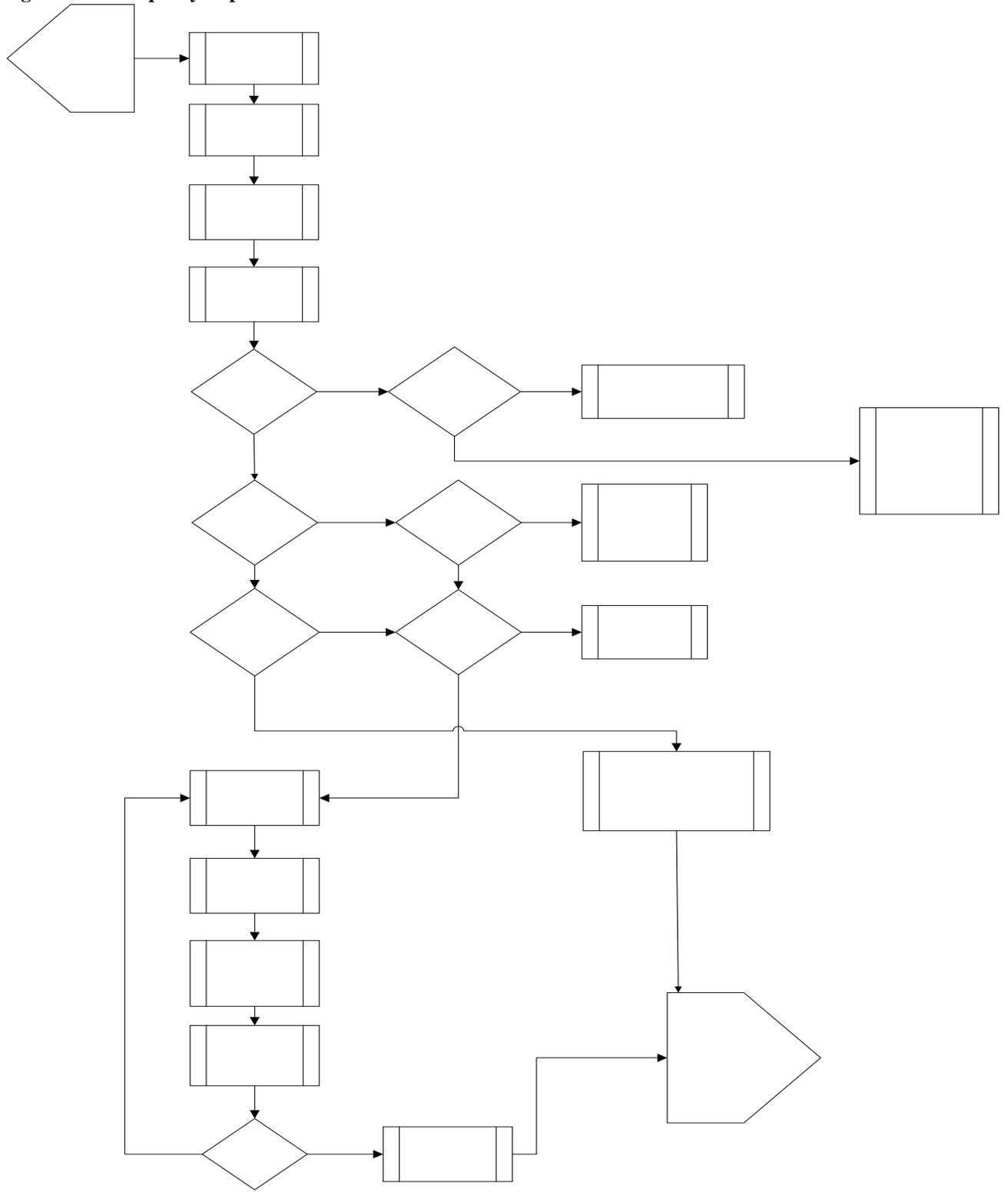
Appendix D - Data Flow Diagram for Trouble Tickets

Figure 6 - Trouble Ticket Process Flow



Appendix E - Data Flow Diagram for Discrepancy Reports

Figure 7 - Discrepancy Report Process Flow



Appendix F - Field Site Level of Effort Estimate during OT&E

The Level of Effort (LOE) estimates per site are based on six months for System Test and four months for Field Test. The final LOE will be dependent on the amount of testing required by the AWIPS software. Site personnel include ESAs, ITOs, Science Operations Officers (SOO), Development and Operations Hydrologists (DOH), Forecasters, Hydrometeorological Technicians (HMT), Interns, Meteorologists-in-Charge (MIC), and Hydrologists-in-Charge (HIC).

Leading Sites (7 WFO, 1 RFC)

System Test Period	Number	%	Time	LOE
Forecaster on site (KC/SS) Round 1	1 person	100%	2 weeks	2wk
Forecaster on site (KC/SS) Round 2	1 person	100%	2 weeks	2wk
ESA/ITO on site (KC) System Admin	2 people	100%	2 weeks	4wk
Forecaster remote training (variance)	~15 people	10%	4 weeks	6wk
Local app dev/site prep	1.5 people	15%	12 weeks	2.7wk
Field Test Period	Number	%	Time	LOE
Site Focal Point	1 person	50%	16 weeks	8wk
ITO	1 person	33%	16 weeks	5.28wk
ESA	1 person	25%	16 weeks	4wk
Forecaster	10 people	15%	16 weeks	24wk
SOO/DOH	1 person	10%	16 weeks	1.6wk
Other site personnel (HMT/Intern etc.)	~10 people	5%	16 weeks	8wk

Middle Sites (3 WFO, 2 RFC, 1 RHQ)

System Test Period	Number	%	Time	LOE
Forecaster on site (KC/SS) Round 1	1 person	100%	2 weeks	2wk
Forecaster on site (KC/SS) Round 2	1 person	100%	2 weeks	2wk
ESA/ITO on site (KC) System Admin	1 person	100%	2 weeks	2wk
Forecaster remote training (variance)	~15 people	10%	4 weeks	6wk
Local app dev/site prep	1 person	15%	12 weeks	1.8wk
Field Test Period	Number	%	Time	LOE
Site Focal Point	1 person	50%	12 weeks	6wk
ITO	1 person	33%	12 weeks	3.96wk
ESA	1 person	25%	12 weeks	3wk
Forecaster	10 people	15%	12 weeks	18wk
SOO/DOH	1 person	10%	12 weeks	1.2wk

Other site personnel (HMT/Intern etc.)	~10 people	5%	12 weeks	6wk
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Middle Sites (4 NCEP)

System Test Period	Number	%	Time	LOE
Forecaster on site Round 1	3 person	10%	1 weeks	.3wk
Forecaster on site Round 2	3 person	10%	1 weeks	.3wk
Forecaster remote training (variance)	~30 people	10%	1 weeks	3wk
Local app dev/site prep	4 person	15%	8 weeks	4.8wk
Field Test Period	Number	%	Time	LOE
Site Focal Point	1 person	20%	12 weeks	2.4wk
DTB Developers	3 person	10%	12 weeks	3.6wk
Forecaster	10 people	5%	12 weeks	18wk
SOO/DOH	1 person	10%	12 weeks	1.2wk

Trailing Sites (4 WFO)

System Test Period	Number	%	Time	LOE
Forecaster on site (KC/SS) Round 1	1 person	100%	2 weeks	2wk
Forecaster on site (KC/SS) Round 2 ⁶	1 person	100%	2 weeks	2wk
ESA/ITO on site (KC) System Admin	1 person	100%	2 weeks	2wk
Forecaster remote training (variance)	~15 people	10%	4 weeks	6wk
Local app dev/site prep	1 person	15%	12 weeks	1.8wk
Field Test Period	Number	%	Time	LOE
Site Focal Point	1 person	50%	8 weeks	4wk
ITO	1 person	33%	8 weeks	2.64wk
ESA	1 person	25%	8 weeks	2wk
Forecaster	10 people	15%	8 weeks	12wk
SOO/DOH	1 person	10%	8 weeks	0.8wk
Other site personnel (HMT/Intern etc.)	~10 people	5%	8 weeks	4wk

Training Sites (1 NCEP)

System Test Period	Number	%	Time	LOE
Forecaster on site Round 1	3 person	10%	1 weeks	.3wk
Forecaster on site Round 2	3 person	10%	1 weeks	.3wk
Forecaster remote training (variance)	~30 people	10%	1 weeks	3wk

⁶ May not be necessary if System Test objectives completed prior to scheduled start date.

Local app dev/site prep	4 person	15%	8 weeks	4.8wk
Field Test Period	Number	%	Time	LOE
Site Focal Point	1 person	20%	12 weeks	2.4wk
DTB Developers	3 person	10%	12 weeks	3.6wk
Forecaster	10 people	5%	12 weeks	18wk
SOO/DOH	1 person	10%	12 weeks	1.2wk

Rough estimate is 40 to 65 staff weeks per site, depending on when the site actually installs the software and completes the site migration.

Appendix G - System Test Site Readiness Checklist

Items in the checklist must be completed and verified as applicable prior to installation of the OB11 software.

Installation

- The LX workstation replacements are installed at least two weeks prior to OB11 installation.
- The LAN Switch replacement is installed at least two weeks prior to OB11 installation.
- The DX1 and DX2 server replacements are installed at least two weeks prior to OB11 installation.
- The latest deployed software release has been installed.
- The ADAM platform is installed.

Training

- ESA and/or ITO (or other applicable system administration personnel) have attended the Technical Interchange Meeting for the System Administration course in Kansas City.
- Users have completed the variance training job sheets.
- Site focal point (Test Site Manager) has completed the Test Track Pro training.

Testing

- Verify local maps.
- Verify local data.
- Verify LDAD interfaces (local model data)

Migration

- A subset of each of the items which will be needed for use immediately after installation
 - o Local applications migrated and tested.
 - o Smart tools migrated and tested.
 - o D2D procedures converted.
 - o Text Workstation Scripts converted.
 - o GFE local.config modified and tested.
 - o Customized WarnGen templates converted and tested.
 - o Customized RiverPro templates converted and tested.
- System Automation (Crons/Quartz, Triggers/Subscriptions)
- Cleanup of unnecessary files and objects

- Backup of critical data and objects

Verification

- The MIC/HIC or authorized personnel confirms the site is ready for installation.
- The AWIPS system is functioning normally with all hardware in service.

Appendix H - Field Test Site Readiness Checklist

Items in the checklist must be completed and verified prior to installation of the OB11 software.

Installation

- The Rack Consolidation/Modem replacements are completed.
- The Communication Processor (CPSBN) replacements are installed.
- The ADAM Workstation is installed.
- The OB9.4 software release has been installed.

Training

- ESA and/or ITO (or other applicable system administration personnel) have completed the residence System Administration course in Kansas City.
- Application focal points have completed the remote baseline and/or local application training courses.
- Users have completed the variance training job sheets.
- Site focal point (Test Site Manager) has completed the Test Track Pro training.

Testing

- At least one member of the site staff has participated in the side-by-side System Test rounds at Silver Spring or Kansas City.

ADAM Workstation

- Use the ADAM Workstation to verify each of the items which will be needed for use immediately after installation
 - o Local applications migrated and tested.
 - o Smart tools migrated and tested.
 - o D2D procedures converted.
 - o Text Workstation Scripts converted.
 - o GFE local.config modified and tested.
 - o Customized WarnGen templates converted and tested.
 - o Customized RiverPro templates converted and tested.
 - o Verify local maps.
 - o Verify local data.
 - o Verify LDAD interfaces (local model data)
- System Automation (Crons/Quartz, Triggers/Subscriptions)

- Cleanup of unnecessary files and objects
- Backup of critical data and objects

Verification

- The MIC/HIC or authorized personnel confirms the site is ready for installation.
- The AWIPS system is functioning normally with all hardware in service.

Appendix I - Risks

The risks for the OT&E are identified in the following chart. In general, the consequences to the risks are schedule slips. 1) No Slip, 2) 1 month, 3) 1 quarter, 4) 2 quarters, 5) more than 2 quarters. There are mitigations for most risks, although some are accepted.

Title	Description	Likelihood %	Consequences (1-5)	Status	Responsible	Mitigation Steps
Excessive/unexpected issues during testing	Excessive/unexpected issues during testing causes an inability to accurately test the OB11 software, leading to a schedule slip or failure.	60-80	2	Mitigate	Tatum	Implement checklists to will be run prior to each test session. Also, conduct readiness reviews prior to each session where developers and testers report on the status of the software.
Critical local applications can not be accommodated within the OB11 architecture/infrastructure	The changes to the infrastructure, architecture, and deployment configuration could be so significant that it could be impossible or impractical to convert some local applications. If there are local applications that can not be converted then the result is reduced operational capabilities of the individual sites that use those applications.	20-40	3	Mitigate	Olsen	NCLADT tasked to support local application migration during the OT&E. Local application developer rewrites the application to work in the new environment. Make awips2dev listserver available to all developers for development support.
Local site configurations could be difficult or impractical to implement.	There could be schedule slips or failure if the site is unable to mimic current functionality or make timely configuration changes.	40-60	3	Mitigate	Olsen/Kells	NCLADT and Site Migration Teams use Technical Interchange Meetings to exchange information and clarify operational usage. Use of ADAM system.
AWIPS OT&E sites will require a long amount of time and effort to convert from AWIPS to AWIPS Migration their existing <i>site specific</i> configurations such as procedures and GFE configurations	All AWIPS sites have created numerous procedures and configurations that allow them to simplify their daily duties. These procedures and configurations have been developed over time and represent a significant amount of development work.	40-60	3	Mitigate	Kells	Use ADAM platform to develop and test site specific configurations. Provide routine software updates to the ADAM platform to ensure it has the latest available software version. Add additional resources such as GSD to assist with procedure migration.
Individual users will require a long amount of time and effort to convert from AWIPS to AWIPS Migration their existing <i>user specific</i> configurations such as procedures and GFE configurations	Many AWIPS users have created numerous procedures and configurations that allow them to simplify their daily duties. These procedures and configurations have been developed over time and represent a significant amount of development work.	40-60	2	Mitigate	Kells	Use ADAM platform to develop and test user specific configurations. Provide routine software updates to the ADAM platform to ensure it has the latest available software version. Use GSD provided script to migrate procedures.
System testing discovers defects in software, system, or architecture that limit the ability to test critical pieces of software resulting in delay of Field testing.	If there are sections of the software that are not functioning completely or correctly during the system testing then the system tests could fail and delay. There are critical parts of functionality such as issuing warning products, service backup, Anchorage dual domain, and ingesting model data that could cause considerable delay in testing.	80-100	4	Mitigate Accept	Henry/Mandel	OST to verify full functionality via MDM verification and provide a report prior to System Test start date; Rollback capability will be provided to the site with specific instructions. Undiscovered issues will bring varying schedule slips based on severity.
Catastrophic software failures during field testing forcing temporary rollback of software to OB9.4 causing delays in OT&E.	When the software is being tested at field sites and the site is unable to perform its operational duties then the site may have to uninstall the software and revert to the original AWIPS.	20-40	2	Mitigate	Garrard	Use System Test period to install and test software at national headquarters, regional headquarters and training center systems. Rollback instructions to be provided to the sites with specific instructions.

Inadequate communication among stakeholders associated with OT&E activities could cause delays in testing.	Incomplete and accurate communication to all stakeholders (users and sponsors) could result in misconceptions of the level of completion and level of effort to implement the software causing delays in testing.	20-40	2	Mitigate	Garrard	Compile summaries of activities. Provide updates at TRG meetings, and establish awips-test list server.
Lack of resources to stay on top of government OT&E activities. For Example: 1) There are not sufficient HQ resources to perform the OT&E activities, such as develop and execute Test Cases and also to conduct performance, stability and regression testing. 2) There are not sufficient funds to task contractors to support OT&E activities, 3) There are not sufficient field resources to perform all necessary testing.	If the government is unable to free up adequate resources to support OB11 OT&E, including local applications migration, complete operational testing, site migration, deployment and installation, then the schedule and potentially the technical solution OB11 could be negatively impacted. The risk includes impacts from the following 1) Priorities of activities other than OB11, 2) Unable to reduce the workload (e.g. reducing the number of local applications to be migrated), 3) Unable to adequately test, 4) Unable to develop and execute adequate Test Cases.	80-100	3-4	Mitigate Accept	Mandel Hopkins Garrard	Consider using GSD for certain tasks. Add Overtime and after hours options to federal employees. If funding reduced or unavailable, accept schedule slips to accommodate within O&M support.
User may inadvertently send test products out through live connections	New software load may be missing some filters to keep test products from going out live.	20-40	2	Mitigate	Tatum	Include specific instructions on how to configure systems to not transmit live in testing plan.
Active Hurricane season limit NCEP testing	Field Test is scheduled to begin at the peak of hurricane season	40-60	2	Watch	Garrard	Establish procedure where site may suspend testing for a period of time.
Site Moves during testing	Site Moves may be scheduled to occur during the OT&E	0-20	2	Watch	Garrard	Establish procedure where site may suspend testing for a period of time.
Hardware Installs affects testing	Countinous Technology Refreshes could introduce new issues that could impact or delay testing.	60-80	2	Mitigate	Lane	Ensure that the hardware is installed on a Raytheon test system and fully evaluated prior to installing on regional headquarters and field test sites.
Training Materials not of acceptable quality	Training materials will be needed by each field site prior to their installation.	40-60	3	Mitigate	Henry	Coordinate with Training Diviision and Raytheon to evalate and provide feedback
Performance does not meet or exceed OB9.4		40-60	3	Mitigate	Mandel	Use Performance Working Group, develop metrics, track and monitor progress.
Stability does not meet or exceed OB9.4		40-60	3	Mitigate	Garrard	Develop stability criteria, track and monitor progress.

Appendix J - Stability Criteria

For the OT&E, the stability of the system is based on the users' perspective. It is divided into four areas: data reliability, use of the system, product generation and dissemination.

- **Data Reliability/Availability (Input):** Data availability in OB11 should be comparable to OB9.4. There should be no gaps that impact normal operations in following areas:
 - Model grids for both GFE and D2D -- GFS, NAM, RUC, ECMWF, Wave Models
 - Satellite data
 - Radar
 - Warnings/VTEC Products from National Centers and neighboring sites
 - ISC grids
 - Metar
- **Use of OB11 System:** Users should be able to use all applications to manipulate data and perform operations/services for continuous 3 weeks without unplanned human intervention (such as restarting Cave/EDEX) for following applications:
 - CAVE
 - Product display (D2D)
 - WarnGen
 - GFE/Service Backup
 - Radar
 - Hydro/RiverPro
 - AvnFPS
 - TextWS
 - Decision Assistance Applications
 - Climate/HWR
 - NWRWAVES
 - TextDB
 - LSR
- **Product Generation (Output):** Users should be able to generate products correctly with all applications without crashing, locking or other conditions that prevent users from generating certain products for following applications:
 - GFE text and digital products (ZFP, Hazard Products, Forecast Grids, ISC grids)
 - WarnGen products
 - Hydro/RiverPro
 - AvnFPS
 - Decision Assistance Applications
 - Climate/HWR
 - NWRWAVES
 - LSR

- Dissemination: Users should be able to transmit all products correctly to the end state in the correct format.
 - LDAD
 - CRS
 - MHS
 - NDFD
 - NWWS
 - Async Scheduler
- Log Files: Although not directly related to the users' perspective, log files can be used to further examine the stability of the system. EDEX and other application log files will be examined for issues that may impact data ingest, operation of the system, data manipulation/product generations, and database availability/integrity. These include:
 - edex-ingest-smartInit log
 - edex-request log
 - edex-ingest-unrecognized-files log
 - edex-ingest-satellite log
 - edex-ingestGrib log
 - edex-ingest-shef log
 - edex-ingest-shef-performance log
 - edex-ingest-gen_areal_ffg log
 - edex-ingest-gen_areal_qpe log
 - edex-ingest log
 - edex-ingestDat log
 - edex-ingest-radar log
 - edex-ingestDat log
 - velocity log
 - apsPilTrigger log

Appendix K - Problem Adjudication Chart

The TRG will classify DRs, and in some cases TTs, to indicate impacts to the OT&E and priority for resolution.

The following guidance is used when classifying the reports in terms of priority and impact:

Priority

Critical - A repeatable problem that prevents or compromises the delivery of products or services. No alternate solution is available.

High - A repeatable problem that prevents or compromises the delivery of products or services. A temporary workaround is available, but is too cumbersome or workload intensive to sustain operations.

Major - A repeatable problem that prevents or compromises the delivery of products or services. A workaround is available to allow continuation of operations, however, the workaround is not acceptable for national deployment.

Moderate - A repeatable problem that might prevent or compromise the delivery of products or services. Depending on the impact, the workaround may be acceptable for national deployment.

Low - Minor issues (such as typographical errors) and potential enhancements.

Watch - Issues that prevent or compromise the delivery of products or services which occur infrequently or with no discernable pattern. The classification will be revised if the problem becomes repeatable.

Impact

1 - Stop using current version of software and suspend OT&E. Site will implement the rollback capability to return to a previous working version or revert to the latest deployed version of the OB software. If a resolution is available and can be verified, OT&E may resume with additional time added to recover lost testing and/or installation time.

2 - No additional installations until resolved. Site may implement the rollback capability to return to a previous working version of the software. Limited testing may continue if possible. OT&E will be extended to recover any lost testing time.

3 - Testing can proceed in unrelated areas, but additional installations may be delayed. OT&E may extend to recover lost installation or test time.

4 - Testing and installations can continue. If the solution is not available until the near end of scheduled testing, OT&E may extend to completion.

5 - Testing and installations can continue.

6 - No impact to OT&E. Issue may be sent to DR Team for classification outside of OT&E process.

7 - Undetermined impact.

Based on the delta release schedule during the OT&E, the following table provides guidance on the priority, impact and actions expected for each issue that is classified.

Table 11 - Priority and Impact

Priority Category	Impact Range	Action
Critical	1 to 3	Immediate action is required. All appropriate resources should be assigned to resolve the problem.
High	2 to 4	Include in the next delta release. Available resources should be re-directed to resolve the problem as allowed.
Major	3 to 5	Include in a future delta release. Available resources are directed to resolve the problem.
Moderate	4 to 6	Depending on the impact, include before national deployment. Resources should be allocated as needed to resolve the problem.
Low	5 to 6	Resolve if resources are not dedicated to higher priority items. Otherwise, item will be considered in a future release after national deployment.
Watch	7	No action required while in this category.