



**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
**NATIONAL WEATHER SERVICE**

MEMORANDUM FOR: Distribution

FROM: W/OPS2 — John Van Kuren/s/ 05/31/2007

SUBJECT: Operational Test and Evaluation (OT&E) Plan for the Advanced Weather Interactive Processing System (AWIPS) Local Data Acquisition and Dissemination (LDAD) Replacement.

Attached for your information is a copy of the subject plan, which describes field tests of the AWIPS LDAD replacement servers undertaken to validate the readiness of the system for national deployment.

The OT&E is scheduled to begin on May 31, 2007, and to conclude on September 30 2007, and will be conducted at the National Weather Service Regional Headquarters, five River Forecast Centers, and eleven Weather Forecast Offices.

Comments and questions concerning the OT&E plan may be directed to the OT&E Director, Mary Buckingham (W/OPS24) at 301-713-0326 x137, e-mail [mary.buckingham@noaa.gov](mailto:mary.buckingham@noaa.gov) or Ken Stricklett (W/OPS24) at 301-713-0326 x113, e-mail [ken.stricklett@noaa.gov](mailto:ken.stricklett@noaa.gov).

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# AWIPS LDAD REPLACEMENT OPERATIONAL TEST AND EVALUATION PLAN

June 2007

U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Weather Service, Office of Operational Systems  
Field Systems Operations Center, Test and Evaluation Branch



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## Acronyms

ASOS	Automated Surface Observing System
AWIPS	Advanced Weather Interactive Processing System
CLS	Consolidated Logistics System
CRH	NWS Central Region Headquarters
FMK	Field Modification Kit
FSOC	Field Systems Operations Center
HIC	Hydrologist-In-Charge
HP	Hewlett Packard
ISSO	Information System Security Office
IT	Information Technology
ITSO	Information Technology Security Office
LDAD	Local Data Acquisition and Dissemination
LF	Lead Forecaster
MIC	Meteorologist-In-Charge
NCEP	National Centers for Environmental Prediction
NOAA	National Oceanic and Atmospheric Administration
NLSC	National Logistics Supply Center
NWS	National Weather Service
OT&E	Operational Test and Evaluation
OCIO	Office of the Chief Information Officer
OOS	Office of Operational Systems
OPS24	Office of Operational Systems, Test and Evaluation Branch
OST	Office of Science and Technology
OST31	Office of Science and Technology, Analysis Branch
POC	Point-of-Contact
RFC	River Forecast Center
RRS	Radiosonde Replacement System
RTS	Raytheon Technical Services
SEC	System Engineering Center
SOP	Standard Operating Procedures
SST	Systems Support Team
TRG	Test Review Group
WFO	Weather Forecast Office
WSH	National Weather Service Headquarters

## Executive Summary

This Plan 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) Local Data Acquisition and Dissemination (LDAD) replacement servers, herein referred to as the OT&E. The objectives, methods, management, resource requirements, and schedule of the OT&E are presented. The roles and responsibilities of the NWS personnel participating in the OT&E are also identified.

The tests described herein are undertaken to inform NWS management of the performance of the proposed AWIPS LDAD servers. The OT&E will examine all aspects of the operational use of the new servers including installation, maintenance, documentation, and reliability; and is the final test undertaken prior to national deployment of the system. The OT&E will be conducted between May and September 2007. The AWIPS sites selected for the OT&E include the Regional Headquarters, five River Forecast Centers, and eleven Weather Forecast Offices.

The AWIPS LDAD replacement will be completed in three Phases: Installation of the replacement servers will be completed during Phase I, migration of LDAD applications to the new servers will be completed in Phase II, and, finally, the old LDAD server will be removed and the physical configuration of the new servers will be finalized in Phase III. This OT&E plan only considers Phases I and II. Phase III will be covered by a separate OT&E or as a follow-on to this test.

Three operational modes will be employed in Phase II. In operational Mode A, the new servers will be installed and running, however, site operations will continue to be performed on the existing LDAD server. Sites will complete offline testing of the new servers in Mode A. In operational Mode B, sites may use either the new LDAD servers or the existing server. This mode of operation will allow sites to systematically test, migrate, and implement local applications and configurations on the new servers. In operational Mode C, all baseline and local LDAD applications will be transferred to the new LDAD servers and the old server will be decommissioned.

Standard operating procedures will be followed throughout the OT&E: Users will log problems and contact the AWIPS Network Control Facility for problem resolution.

The OT&E will be overseen by a Test Review Group (TRG) composed of user representatives and experts in AWIPS operations and communications. The TRG will meet periodically during the OT&E to review test results and adjudicate any problems discovered. The TRG will review all test results at the conclusion of field tests and recommend whether to proceed with national deployment of the new LDAD servers.

The NWS Office of Science and Technology (OST), Systems Engineering Center (SEC) will manage the AWIPS LDAD replacement project. The NWS Office of Operational Systems (OOS), Test and Evaluation Branch (OPS24) will coordinate the OT&E.

# AWIPS LDAD Replacement

## Operational Test and Evaluation Plan

### 1. Introduction

This Plan 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) Local Data Acquisition and Dissemination (LDAD) replacement servers, herein referred to as the OT&E. The OT&E will evaluate the AWIPS LDAD replacement servers proposed for use in NWS operations through field tests conducted at operational AWIPS sites and is the final test undertaken prior to national deployment of the system.

#### 1.1 Test Plan Organization

This OT&E Plan is comprised of four sections:

Section 1. contains introductory materials describing the purpose of the test, the testing strategy, the test objectives, and the prerequisites for the OT&E;

Section 2. contains background information on the LDAD replacement servers;

Section 3. discusses the management of the OT&E, including the roles and responsibilities of the personnel participating in the OT&E; and

Section 4. describes the process and procedures employed during the OT&E including the schedule and test related activities performed at National Weather Service Headquarters (WSH), the Regions, and the OT&E sites. The conditions for a recommendation for national deployment of the LDAD replacement servers and preparation of an OT&E Report are also discussed.

#### 1.2 Purpose

The OT&E is being undertaken (1) to validate the instructions provided for installation of the AWIPS LDAD replacement servers, migration of LDAD applications, configurations, and data flow to the new servers, and decommissioning the old server; and (2) to evaluate the performance of the proposed LDAD replacement servers under operational conditions. The OT&E will examine all aspects of the operational use of the LDAD servers including installation, maintenance, performance, and the reliability of the new hardware and software. The results of these tests will inform NWS management regarding the readiness of the system for use in NWS operations.

#### 1.3 Testing Strategy

OT&E activities will follow the AWIPS LDAD project plan to a large extent. The LDAD replacement project will be completed in three phases: Phase I includes the installation of the system hardware and baseline software; Phase II encompasses the migration of local applications, configurations, and data flow to the new servers and decommissioning the old LDAD servers; and Phase III includes the removal of the old LDAD servers and the final physical configuration of the LDAD servers. This OT&E plan only considers Phases I and II; Phase III will be covered by a separate OT&E or as a follow-on to this test.

Table 1: OT&amp;E sites.

Site ID	Site	AWIPS OB
<b>Eastern Region</b>		
VUY	Eastern Region Headquarters, Bohemia, NY	OB8.1
CTP	WFO State College, PA	OB7.2
CLE	WFO Cleveland, OH	OB7.2
TIR	Ohio RFC, Wilmington, OH	OB7.2
RHA	Middle Atlantic RFC, State College, PA	OB7.2
<b>Southern Region</b>		
EHU	Southern Region Headquarters, Fort Worth, TX	OB8.1
JAX	WFO Jacksonville, FL	OB7.2
SHV	WFO Shreveport, LA	OB7.2
ALR	Southeast RFC, Peachtree City, GA	OB7.2
<b>Central Region</b>		
BCQ	Central Region Headquarters, Kansas City, MO	OB8.1
BIS	WFO Bismark, ND	OB7.2
JKL	WFO Jackson, KY	OB7.2
KRF	Missouri Basin RFC, Pleasant Hill, MO	OB7.2
<b>Western Region</b>		
VHW	Western Region Headquarters, Salt Lake City, UT	OB7.2
TWC	WFO Tucson, AZ	OB7.2
PQR	WFO Portland, OR	OB7.2
STO	WFO Sacramento, CA	OB7.2
RSA	California-Nevada RFC, Sacramento, CA	OB7.2
<b>Pacific Region</b>		
PBP	Pacific Region Headquarters, Honolulu, HI	OB7.2
HFO	WFO Honolulu, HI	OB7.2
<b>Alaska Region</b>		
VRH	Alaska Region Headquarters, Anchorage, AK	OB7.2
AFC	WFO Anchorage, AK	OB7.2

Three operational modes will be employed in Phase II. In operational Mode A, the new servers will be installed and running, however, site operations will continue to be performed on the existing LDAD server. Sites will complete offline testing of the new servers in Mode A. In operational Mode B, sites may switch between the new servers and the existing server. This mode of operation will allow sites to systematically test and migrate their local applications, configurations, and data flow to the new servers. In operational Mode C, all baseline and local LDAD applications, configurations, and data flow will be transferred to the new LDAD servers and the old server will be decommissioned.

AWIPS standard operating procedures (SOP) will be followed throughout the OT&E: site personnel will report problems to the AWIPS Network Control Facility (NCF) Help Desk; and the NCF will open trouble tickets for discrepancies and track their resolution.

The sites selected for the OT&E are listed in Table 1 and include the Regional Headquarters, five River Forecast Centers (RFCs), and eleven Weather Forecast Offices (WFOs). The OT&E sites include systems operating with AWIPS OB7.2 and OB8.1. AWIPS sites within and outside of the continental United States (CONUS and OCONUS) are included among the OT&E sites. The National Centers for Environmental Prediction (NCEP) do not currently have LDAD servers. Installation of LDAD servers at the NCEP is not considered here and will be evaluated in a separate OT&E.

## 1.4 Test Objectives

The specific objectives of the OT&E follow:

- Verify the instructions for installation of the LDAD servers; migration of applications, configurations, and data flow to the new servers; and decommissioning the old server are complete and accurate;
- Validate the FMK;
- Verify the new LDAD servers perform reliably and fully support all NWS operational requirements;
- Verify the backup operation of the LDAD servers; and
- Verify logistical support of the new LDAD servers is fully implemented.

## 1.5 Evaluation Criteria

The evaluation criteria to be used for the OT&E follow:

- Demonstrate successful, trouble-free installation of the LDAD server hardware and baseline software;
- Demonstrate successful migration of all existing functionality, including local applications, configurations, and data flow, from the old LDAD server to the new servers;
- Demonstrate successful, trouble-free decommissioning of the old LDAD server;
- Demonstrate stable and reliable operation of the new LDAD servers during NWS operations;
- Successful completion of all Test Case Procedures (Attachment D) at each of the LDAD OT&E sites; and
- Demonstrate the new LDAD servers are entered into the Consolidated Logistics System (CLS), stocked, and fully supported by the National Logistics Supply Center (NLSC).

## 1.6 Prerequisites, Assumptions, and Risks

### 1.6.1 OT&E Prerequisites

The prerequisites for the OT&E follow:

- The contractor, Raytheon Technical Services (RTS), must provide the FMK, installation scripts, and baseline software required for the full functioning of the system in the form intended for national deployment to NWS sites;
- All preliminary tests of the AWIPS LDAD servers, FMK, installation scripts, and baseline software must be successfully completed: no critical problems may be unresolved prior to the OT&E;
- The OT&E Plan must be complete and authorized by the Director, Office of Operational Systems (OOS), Field Systems Operations Center (FSOC);
- The AWIPS Information System Security Office (ISSO) must report the status of system Accreditation and Certification;
- The OT&E sites must be in receipt of the required FMK and all draft system documentation;
- The contractor, RTS, must present an acceptable plan for updating the software, hardware, and installation scripts for all test sites as problems are found during the OT&E.

### 1.6.2 Assumptions

The OT&E assumes the following:

- Special training of the OT&E site staff members is not required for installation, operational use, and maintenance of the LDAD servers;
- OT&E sites will receive 24×7 support for baseline AWIPS and LDAD functionality from the NCF Help Desk throughout the OT&E;
- The Phase II, migration will be completed solely as a Weather Service activity and will not be supported by contract services. Sites are free to procure help with this activity from RTS, however, the cost of these services will be borne by the site. WSH will not pay for additional help outside of the scope of the current AWIPS contract; and
- AWIPS NCF will document and track all problems with trouble tickets.

### 1.6.3 Risks

The LDAD server is required for AWIPS data acquisition and for dissemination of messages and products and must provide timely display and manipulation of products in an operational environment.

There is a risk of a loss of data during operational Mode B. OT&E sites may be required to coordinate with a backup AWIPS site to recover lost data, re-poll data sets, and/or complete tests during calm weather conditions to reduce the impact on site operations.

There is a risk of a loss of data when switching between Mode A and Mode B. OT&E sites may be required to coordinate with a backup AWIPS site to recover lost data, re-poll data sets, and/or schedule Mode changes to avoid data loss.

The sites are required to migrate their local applications, configurations, and data flow to the new LDAD servers with only limited support from WSH. There is a risk that the sites may not have adequate resources to complete this task in a timely manner.

The migration of local applications and configurations is scheduled to be completed in a relatively short period of time. There is a risk that required seasonal applications and configurations may not be properly migrated to the new servers.

## 2. Background

The existing LDAD servers have reached the end of their service life; and replacement servers are being implemented to ensure continued reliable operation of AWIPS. In addition to replacing aging hardware, the proposed servers incorporate several system enhancements: NWS has implemented a strategy of migrating all AWIPS servers and applications to Linux based technologies. The proposed new LDAD servers are Linux based and replace the Hewlett Packard (HP) D270 server, which uses the HPUX operating system. The LDAD replacement servers enable the use of secure transfer protocols, i.e., scp, ssh, and sftp, and thus enable conformance with NWS Information Technology (IT) security guidelines. Finally, the new server architecture implements redundant servers thus eliminating a single point-of-failure, i.e., the LS1 server, and enhancing the system reliability.

## 2.1 LDAD Server Description and Configuration

Two HP ProLiant DL320 G4p servers are being evaluated to replace the current LDAD server. Key specifications of the new servers are provided in Table 2.

Table 2: LDAD Server Specifications.

Component	Description
Processor:	Single, Intel Xeon 3060, Dual Core, 3.4 GHz
Memory:	1 GB
Hard drive:	2×72 GB RAID 1 (cold swap only)
Optical drive:	DVD-ROM
Floppy drive:	3 1/2 in
Form factor:	rack mounted, 1U height
Network interface:	four port Digiboard
Power supply:	Single, 420 Watt
Service:	3 year warranty

## 2.2 LDAD Baseline Software

The baseline LDAD software is listed in Table 3.

Table 3: LDAD Baseline Software.

Description	Old Software	New Software
Web Services	Netscape Fast Track	Apache
FTP Services	WU_ftp	WU_ftp
Radius Services	Merit Radius	Free Radius
Fax Services	Hylafax	Hylafax
Virtual TTY Services	csportd	csportd
File Synchronization	N/A	rsync
Secure Shell	SSH	openSSH
RSH Server	rsh	rsh-server
Heartbeat Failover	N/A	heartbeat
Utilities	expect	expect
Utilities	Perl	Perl
Utilities	N/A	HP Proliant Support Pack

## 3. Test Management

A description of the major roles and responsibilities of test personnel follows.

### 3.1 Test Review Group

The OT&E will be overseen by a Test Review Group (TRG) comprised of user representatives and subject-matter experts selected from NWS Headquarters (WSH), NWS Regional Headquarters, RFCs, and WFOs. The members of the TRG are listed in Attachment C.

Field tests of the LDAD replacement servers at operational NWS field service sites must be authorized by the TRG; and field tests may be suspended by the TRG at anytime, should the performance of the LDAD replacement servers be found unacceptable. If field tests are suspended, the TRG will authorize the resumption of tests when appropriate corrective actions have been taken. The TRG may recommend that additional diagnostic tests be completed prior to the resumption of field tests.

The TRG meets periodically during the conduct of field tests to review, clarify, and validate deficiencies documented by NCF trouble tickets. The TRG will evaluate each trouble ticket and assign an Impact and Priority according to the criteria provided in Section 4.6.2. The TRG works to resolve deficiencies and other test-related issues, and may recommend corrective actions to the AWIPS Point-of-Contact (POC). The regularly scheduled meetings of the TRG are listed in Attachment A. The TRG may also meet irregularly or on an emergency basis, as needed. Meetings of the TRG are coordinated by the OT&E Director. Teleconference access is provided to the meetings of the TRG.

Following the completion of the Phase I field tests, the TRG will convene to review the findings of the OT&E and to recommend whether to proceed with national deployment of the LDAD replacement servers.

The decisions of the TRG are based on consensus among the voting members listed in Attachment C.

### **3.2 Test Review Group Chair**

The TRG is chaired by the Chief, Test and Evaluation Branch (OPS24), or his designated representative. The Chair works to ensure that tests are conducted efficiently and to resolve any issues that may arise during the conduct of the OT&E.

The TRG Chair is a non-voting member of the TRG.

### **3.3 OT&E Director**

The OT&E Director ensures tests are performed as described in the OT&E Plan. The OT&E Director coordinates the meetings of the TRG, collects and presents NCF trouble tickets to the TRG for classification, and ensures all trouble tickets documented and classified during the OT&E are forwarded to the proper WSH branch for resolution.

The OT&E Director prepares and distributes status reports summarizing trouble tickets, operational issues, and completed tests. Following the completion of field tests, the OT&E director briefs the TRG on the status of the tests conducted, summarizes the trouble tickets submitted, and reports any other test related issues. The OT&E Director ensures the results of the OT&E are properly documented in an OT&E Report.

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

### **3.4 AWIPS POC**

The AWIPS POC is the LDAD Replacement Project Leader. The AWIPS POC ensures that all required hardware, software, and documentation are available for the OT&E. The AWIPS POC participates in the meetings of the TRG and other informal meetings as required, reviews problems, and coordinates their resolution. The AWIPS POC also reviews the OT&E Plan and the OT&E Report.

The AWIPS POC is a voting member of the TRG.

### 3.5 AWIPS ISSO

The AWIPS Information System Security Officer (ISSO) reports the status of system Certification and Accreditation to the TRG prior to the commencement of field tests, and reviews the OT&E Plan and OT&E Report.

The AWIPS ISSO is a voting member of the TRG.

### 3.6 Systems Support Team Focal Point

The Systems Support Team (SST) Focal Point provides support for migration of local applications, configurations, and data flow; and is the primary point of contact for the LDAD list serve, see Section 4.8.

The SST Focal Point is a voting member of the TRG.

### 3.7 Systems Support Team

The Systems Support Team (SST) is comprised of experts on LDAD applications, configurations, and data flow selected from each of the Weather Service Regions. The SST assists sites in the migration of local applications to the new LDAD servers, i.e., during Phase II.

The SST members are non-voting members of the TRG.

### 3.8 Test Team

The Test Team is comprised of subject-matter experts selected from WSH. Members of the Test Team perform test support duties as assigned and provide technical advice to the OT&E Director.

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

### 3.9 AWIPS Regional Focal Points

AWIPS Regional Focal Points provide liaison between the AWIPS sites and WSH. The Regional Focal Points participate in meetings of the TRG, review plans and interim reports, coordinate issues, and classify and work to resolve problems identified during the OT&E.

The AWIPS Regional Focal Points are voting members of the TRG.

### 3.10 Site Focal Points

Site Focal Points plan and coordinate OT&E activities with their respective AWIPS Regional Focal Points, plan and coordinate the installation of the LDAD servers, participate in meetings of the TRG, review plans and interim reports, and contact the AWIPS NCF Help Desk to report problems discovered during the OT&E. The site focal point will coordinate the completion of all Test Case Procedures and report the test results to the OT&E Director.

The Site Focal Points are non-voting members of the TRG.

#### 4. Test Conduct

The site Meteorologist-in-Charge (MIC) or Hydrologist-in-Charge (HIC) retains full authority for the operation of the site and must approve all decisions affecting site operations during the OT&E including: the schedule for installation of hardware, AWIPS operations, and site staff assignments.

##### General Guidelines for the Conduct of the OT&E:

- The operational requirements of the sites have precedence over the OT&E. Sites may request the OT&E be delayed or rescheduled due to operational requirements, such as severe weather.
- The OT&E will be conducted in a manner to reduce the risk of a degradation of services and to pose no undue risk to field operations.

#### 4.1 Resource Requirements

**Hardware:** The FMK includes two pre-imaged HP DL320 G4p servers, control cables, fanout cables, console cables, Ethernet cables, rack cover plates, and labels. A comprehensive packing list for the FMK can be found in Mode Note 36.

**Software:** A list of the baseline LDAD software is provided in Table 3. The scripts required to install and configure the new servers will be provided by RTS in final form, i.e., in the form intended for national deployment, prior to the commencement of field tests.

**Documentation:** Documentation supporting the installation of the LDAD servers and baseline software will be shipped to OT&E sites prior to the commencement of field tests. Documentation supporting the migration of LDAD applications, configurations, and data flow will be shipped to OT&E sites prior to the commencement of Phase II. Reference to these documents may be made as required throughout the test. Documentation supporting the OT&E includes:

- (Draft) Engineering Handbook 13, Section 13, AWIPS System Modification Note 36 describing hardware and baseline software installation (OPS12);
- (Draft) Appendix to Mod Note 36 describing the migration of LDAD applications (OPS12);
- (Draft) Test Case Procedures (OPS24); and
- OT&E Plan (OPS24).

The organizational unit responsible for preparation of each document is shown in parentheses.

The OT&E Plan will also be available in electronic form on the OPS24 web site at:

[http://www.weather.gov/ops2/ops24/documents/awips\\_docs.htm](http://www.weather.gov/ops2/ops24/documents/awips_docs.htm).

The documents listed are also available on the `ldad_x` list server at:

<http://infolist.nws.noaa.gov>.

## 4.2 Pre-OT&E Activities

### 4.2.1 National Weather Service Headquarters

WSH staff will complete the following actions prior to field tests:

- Prepare and distribute the OT&E Plan (OPS24);
- Prepare and distribute the draft Mod Note (OPS12);
- Deliver the FMK to the OT&E sites (OST31);
- Ensure the contractor (RTS) provides a fully functional FMK and installation software for the OT&E (OST31);
- Ensure the contractor (RTS) has an acceptable plan in place to address problems and fixes applied to the system hardware, software, and installation scripts during the conduct of the OT&E (OST31); and
- Conduct preliminary tests of the FMK, baseline software, and installation scripts delivered by the contractor (RTS) for national deployment to NWS sites (OPS31).

### 4.2.2 OT&E Sites

OT&E site staff will complete the following actions prior to commencement of field tests:

- Inventory the local applications and data flow running on the LDAD server.

## 4.3 Test Readiness Review

The TRG Chair will convene a Test Readiness Review on or about May 31, 2007, to verify the prerequisites for OT&E have been met. The prerequisites listed in Section 1.6.1 are entrance criteria for OT&E and must be satisfied prior to commencement of field tests. The TRG will review the materials presented and recommend whether to proceed with tests of the LDAD replacement servers at operational field sites.

## 4.4 Phase I: Installation

The OT&E will begin by assessing the installation of the replacement servers at each site. Site personnel will install the required hardware and baseline software according to the provided Mod Note, review the Mod Note and FMK, and report any discrepancies to the OT&E Director.

The dates scheduled for installation of the LDAD hardware are listed in Attachment A. The MIC, HIC, ESA, or Site Focal Point will notify the OT&E Director at the earliest opportunity, if operational concerns require departure from the dates shown.

Before Phase I is complete, successful testing at all sites of the failover capability and switching from Mode A to Mode B and back will be demonstrated. The site will verify the old LDAD continues to operate unaffected by the new installation.

The risk to site operations at the completion of Phase I is consider low since the old LDAD will continue to support site operations. The goal for Phase I is to get the Mod Note ready for deployment of the hardware to all sites as quickly as possible to allow more time for sites to work on Phase II.

Table 4: Site visits.

Site ID	Site	Date
VUY	Eastern Region Headquarters, Bohemia, NY	06/05–06/06
CTP	WFO State College, PA	06/12–06/13
PQR	WFO Portland, OR	06/12–06/13
RHA	Middle Atlantic RFC, Wilmington, OH	06/26–06/27
STO	California-Nevada RFC, Sacramento, CA	06/26–06/27

#### 4.4.1 National Weather Service Headquarters

Test team members will visit the OT&E sites listed in Table 4 on or about the dates indicated to observe the installation of the LDAD servers and to review the Mod Note and FMK with the site personnel. The visiting team will meet with the site personnel upon arrival at the site to discuss the OT&E Plan, see Attachment B. The Mod Note and FMK will be revised as required prior to further system installations.

#### 4.4.2 OT&E Sites

Site personnel will install the system only when authorized by the OT&E Director. The site Focal Point will coordinate system installation with the site MIC or HIC. Site personnel will install the new AWIPS LDAD servers using the Mod Note provided. The site personnel will evaluate the FMK and draft Mod Note and forward any comments to the OT&E Director.

The site focal point will coordinate the completion of all Test Case Procedures and report the test results to the OT&E Director.

### 4.5 Phase II: Migration

The OT&E sites will follow AWIPS SOP during the OT&E: site personnel will log and report problems with the LDAD servers to the NCF Help Desk. Site personnel should also notify the OT&E Director of problems by e-mail. Problems discovered by NCF personnel or reported to the NCF Help Desk will be analyzed by NCF staff members. Problem resolution will be coordinated with an OT&E site representative, if necessary. The NCF will generate trouble tickets to document and track problems discovered during the OT&E. The OT&E Director will report any problems to the TRG. The TRG will adjudicate the reported problems and may suspend the OT&E should any problem be deemed critical.

The LDAD servers are covered by a 3 year warranty and will be stocked and fully supported by the NLSC prior to national deployment. However, the Consolidated Logistics System (CLS) will not be fully implemented for the new LDAD servers prior to the OT&E. The AWIPS POC will coordinate any required software and hardware repairs with the contractor (RTS) in the interim. If a unit is found to be defective, the site will retain the unit until notified the CLS is in place and the NLSC is prepared to receive the unit.

#### 4.5.1 Operational Mode A

The new servers will be installed and running, however, site operations will continue to be performed on the existing LDAD server. Sites will complete offline testing of the new servers in Mode A.

### 4.5.2 Operational Mode B

Operational Mode B will allow sites to systematically test and migrate their local applications and configurations on the new servers. Sites may switch between the new servers or the existing server in this mode of operation. There is, therefore, a risk of data loss while operating with the new servers in Mode B. Sites should perform tests of the new servers during periods when data loss can be tolerated or be prepared to to recover lost data.

The Mod Note will be revised to include guidance for migrating local applications to the new servers.

Many of the configurations, scripts, and applications running on the LDAD server are considered to be "local applications." The migration of local applications to the new LDAD servers will be completed solely as a Weather Service activity. Support for this activity is not included in the contract for services with RTS. Sites may make separate arrangements for support in the migration of local applications with RTS and may contact the NCF for the procedures to do this. However, the cost of these services will be borne by the site. WSH will not pay for any additional help outside the AWIPS contract.

The baseline applications and data flows are listed in Attachment D all other applications, configurations, and data flows are considered to be local applications.

### 4.5.3 Operational Mode C

The old LDAD server will be decommissioned and powered down in Mode C. All baseline and local LDAD applications, configurations, and data flow will be transferred to the new LDAD servers and verified to run correctly prior to moving to operational Mode C. Site personnel will monitor the performance of the new servers and report any problems discovered.

## 4.6 Reporting and Analysis

### 4.6.1 Trouble Tickets

Sites will follow AWIPS SOP and contact NCF Help Desk regarding problems during the OT&E. The NCF will file a trouble ticket for each problem reported. The OT&E Director will review the NCF trouble tickets and provide them to the TRG for adjudication, see Section 3.1.

### 4.6.2 Trouble Ticket Analysis

Each trouble ticket is assigned an Impact and Priority.

The Impact ranks the severity of the problem and will be assigned as follows:

Impact 1 Severe degradation of services, no workaround available;

Impact 2 Severe degradation of services, acceptable workaround available;

Impact 3 Degradation of services;

Impact 4 Loss of minor capability; and

Impact 5 No impact.

Trouble Tickets assigned Impact 1 mandate the immediate suspension of the OT&E.

The Priority addresses how the problem is to be resolved and will be assigned as follows:

Priority 1 Immediate action required;

Priority 2 Expedite action;

Priority 3 Normally scheduled action;

Priority 4 Watch item; and

Priority 5 No action required.

#### 4.7 Schedule

The OT&E will be conducted in accordance with the schedule provided in Attachment A. Any required departure from the dates indicated should be brought to the immediate attention of the OT&E Director. The OT&E Director will notify the members of the TRG of any required schedule changes and coordinate the timely completion of the OT&E.

#### 4.8 Help During the OT&E

Questions regarding the OT&E should be directed to:

Mary Buckingham, OT&E Director  
phone: (301) 713-0326 x137  
fax: (301) 713-0912  
e-mail: Mary.Buckingham@noaa.gov

Questions regarding the LDAD servers and baseline LDAD applications should be directed to:

NCF Help Desk  
phone: (301) 713-9344

The NCF Help Desk is staffed 24×7.

A new LDAD list serve has been set up to facilitate the migration of local LDAD applications to the new servers. The LDAD list serve is the preferred method for posting comments and questions regarding the migration of local applications during Phase II. All sites are encouraged to sign up and participate on the LDAD list serve. Sites may sign up using the same process as for the AWIPInfo list.

URL: <http://infolist.nws.noaa.gov>  
List name: `ldad_x`  
User name: sign in using your government e-mail address user name  
Password: use your list serve password or change it as necessary

If you already subscribe to a list, log in with <http://infolist.nws.noaa.gov/read/login/>, select “All forums” in the “ldad x” entry, and click the “subscribe” link.

## 4.9 Post-OT&E Activities

### 4.9.1 Deployment Recommendation

The TRG Chair will convene an OT&E meeting on or about June 30, 2007 following the conclusion of the system installations at the OT&E sites. The OT&E Director will review the activities conducted to date including: a summary of NCF trouble tickets found, other findings, and recommendations. The TRG will review the materials presented and recommend whether to proceed with national deployment of the LDAD replacement servers. The AWIPS POC will report the recommendation of the TRG to the Office of Science and Technology (OST), System Engineering Center (SEC) and the AWIPS Program Officer (APO). The APO will make all final decisions regarding national deployment of the LDAD servers.

The following conditions must be satisfied for a recommendation of national deployment:

- No open NCF trouble tickets assigned Impact 1 or 2;
- Successful completion of all Test Case Procedures provided in Mode Note 36 at each OT&E site; and
- The new LDAD servers must be entered into the Consolidated Logistics System (CLS), stocked, and fully supported by the NLSC.

### 4.9.2 Final Recommendation

The TRG Chair will convene an OT&E Wrap Up meeting on or about September 30, 2007 following the conclusion of field tests. This is the last scheduled meeting of the TRG. The OT&E Director will review the activities conducted to date including: a summary of NCF trouble tickets found, other findings, and recommendations.

### 4.9.3 OT&E Report

The OT&E Report provides a complete record of the OT&E including: details of any trouble tickets, findings, and recommendations. The OT&E Report will be prepared following the completion of field tests and will be posted on the OPS24 website at:

[http://www.weather.gov/ops2/ops24/documents/awips\\_docs.htm](http://www.weather.gov/ops2/ops24/documents/awips_docs.htm).

Attachment A OT&E Schedule

Date	Action
05/15/07-09/30/07	<b>Phase I: Installation</b>
05/15/07-05/25/07	Test installations at WSH
05/31/07	Complete draft Mod Note (OPS12)
05/31/07	Complete the OT&E Plan (OPS24)
05/31/07	Test Readiness Review (OPS24)
05/31/07	Ship FMKs (OST31)
06/05/07-06/06/07	Site visit and installation Eastern Region Headquarters, Bohemia, NY (VUY) (OPS24 and OST31)
06/12/07-06/13/07	Site visit and installation WFO State College, PA (CTP) (OPS24 and OST31)
06/12/07-06/13/07	Site visit and installation WFO Portland, OR (PQR) (OPS24)
06/11/07-06/29/07	Installation at remaining Region Headquarters
06/26/07-06/28/07	Site visit and installation California-Nevada RFC, Sacramento, CA (RSA) and WFO Sacramento, CA (STO)(OPS24 and OST31)
07/09/07-07/26/07	Installations at balance of OT&E sites
07/26/07	TRG meeting
07/31/07	Finalize Mode Note and FMK
07/31/07	National deployment of the LDAD servers
09/30/07	Complete national deployment of the LDAD servers (NWS MILESTONE)
Install-09/30/07	<b>Phase II: Migration</b>
Install-09/30/07	Begin operational Mode B
09/30/07	OT&E Wrap Up meeting
09/30/07	Complete national transition to the LDAD replacement servers
	<b>Post OT&amp;E</b>
09/30/07-11/30/07	Prepare OT&E Report

## Attachment B OT&E Site Visit Agenda

- |  |                  |
|--|------------------|
| 1. Introductions   | Test Coordinator |
| 2. The Test Structure  | Test Coordinator |
| • Overview of the Operational Acceptance Test (OT&E)             |                  |
| • Test schedule  |                  |
| 3. Test Team Responsibilities                                    | Test Coordinator |
| • Hours working on-site  |                  |
| • Activities   |                  |
| 4. Site Management and Staff Responsibilities                    | Test Coordinator |
| • Site Focal Point Responsibilities                              |                  |
| • Reporting/documenting problems                                 |                  |
| 5. Test Team Office Needs  | Test Coordinator |
| • PC with Internet connection, copying, phones, work space, etc. |                  |
| 6. Discussion  | Site Management  |

Attachment C Test Review Group Members

Name/Organization	Role	Phone	Voting Member
<b>Weather Service Headquarters</b>			
Jerald Dinges (OPS24)	TRG Chair	(301) 713-0326 x160	
Mary Buckingham (OPS24)	OT&E Director	(301) 713-0326 x137	•
Ken Stricklett (OPS24)	Test Team Member	(301) 713-0326 x113	
Khien Nguyen (OPS24)	Test Team Member	(301) 713-0326 x177	
Wayne Martin (OPS21)	SST Focal Point	(301) 713-1724 x166	•
Jagdish Sharma (OPS12)	Mod Note Coordinator	(301) 713-1833 x128	
Jim Lane (OST31)	AWIPS POC	(301) 713-0211 x139	•
John R. Gordon (CIO)	AWIPS ISSO	(301) 713-1360 x122	•
<b>Central Region</b>			
<b>Central Region Headquarters, Kansas City, KS (BCQ)</b>			
William Gery	Regional Focal Point	(816) 268-3152	•
<b>WFO Bismark, ND (BIS)</b>			
Jim Meyer	MIC	(701) 250-4224	
Karl Venneberg	ESA	(701) 250-4224 x372	
Dave Derung	ITO	(701) 250-4224 x468	
Viggo Jensen	SOO	(701) 250-4224 x766	
Todd Hamilton	Site Focal Point	(701) 250-4224 x677	
<b>WFO Jackson, KY (JKL)</b>			
Shawn Harley	MIC	(606) 666-5636 x726	
Tim Stanley	ESA	(606) 666-5636 x372	
Buddy Whorrall	ITO	(606) 666-5636 x381	
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<b>Southern Region</b>			
<b>Southern Region Headquarters, Fort Worth, TX (EHU)</b>			
Eric Howieson	Regional Focal Point	(817) 978-7777 x132	•
<b>WFO Jacksonville, FL (JAX)</b>			
Steve Letro	MIC	(904) 741-4370	
Katherine Andolina	ESA	(904) 741-5186 x260	
Art Wildman	ITO	(904) 741-5186 x360	
Pete Wolf	SOO	(904) 741-5186	
Eric Zappe	Site Focal Point	(904) 741-5186	
<b>WFO Shreveport, LA (SHV)</b>			
Armando Garza	MIC	(318) 631-3669	
Michael Waddell	ESA	(318) 631-3669	
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List of TRG members continues on the next page

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<b>Eastern Region Headquarters, Bohemia, NY (VUY)</b>			
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<b>WFO State College, PA (CTP)</b>			
Bruce Budd	MIC	(814) 231-2422	
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Erik Pytlak	SOO	(520) 670-5156	
<b>WFO Portland, OR (PQR)</b>			
Steve Todd	MIC	(503) 326-2340 x222	
Bill Flieder	ESA	(503) 326-2340 x260	
Ron Beitel	ITO	(503) 326-2340	
Bill Schneider	SOO	(503) 326-2340 x223	
Russ Willis	Site Focal Point	(503) 326-2340	
<b>WFO Sacramento, CA (STO)</b>			
Elizabeth Morse	MIC	(916) 979-3041	
Doug Swann	ESA	(916) 979-3051	
John Juskie	SOO, Site Focal Point	(916) 979-3041	
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<b>California-Nevada RFC, Sacramento, CA (RSA)</b>			
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List of TRG members continues on the next page

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Bill Ward	Regional Focal Point	(808) 532-6415	•
<b>WFO Honolulu, HI (HFO)</b>			
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<b>Alaska Region</b>			
<b>Alaska Region Headquarters, Anchorage, AK (VRH)</b>			
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<b>WFO Anchorage, AK (AFC)</b>			
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<b>Alaska Pacific RFC, Anchorage, AK (ACR)</b>			
Robin Radlein Phil Mieczynski Larry Rundquist Jeff Perry	HIC ESA DOH Site Focal Point	(907) 266-5151 (907) 266-5128 (907) 266-5152 (907) 266-5158	



**INSTRUCTIONS**

1. Use the LS1 column to inventory all the items you have running on the old LDAD (LS1). Add anything not printed in the list to the bottom of the list. Cross out anything you don't have.
2. For each item, port the application or configuration to the new Linux LDAD server (LS2). Check mark the LS2 column when you are satisfied that the item is functioning correctly in LDAD Mode B.
  - a. Check the Quick Tips for help and suggestions for the best way to do things.
  - b. Check the `ldad_x` list serve for information updates and ask for help or share your experiences in the migration. This should be an ongoing conversation with WSH and other sites to facilitate the migration.
  - c. For the AWIPS baseline items, the NCF should provide help. The SST will help with all non-baseline items and the NCF should refer you to the SST help desk. Request this, if they don't offer.
  - d. Verify each item by switching to Mode B and testing the data flow. When done, switch back to Mode A.
    - i. On LS3 as root, type `switchmode` and when asked "Do you want to switch to operating mode B?," type `y`.
    - ii. Be aware when you switch to Mode B, whatever was on the old LDAD and hasn't been transmitted to its destination is not available on the new LS.
    - iii. Anything set to transmit through LDAD that has not been successfully ported may not make it through the new LDAD during your testing in Mode B.
    - iv. Have a recovery plan or only test when these risks don't matter.
    - v. Note that when running in Mode B, the name LS1 now points to the floater name for the two new LDAD servers and the old LDAD is not connected in the system.
    - vi. Repeat the `switchmode` command to go back to Mode A.
  - e. Ensure out-of-season items are ported over and tested.
3. Copy the verified item from LS2 to LS3 and check mark the LS3 column when complete.
4. Install any local configuration items into the heartbeat high availability scripts and test the failover to LS3 and back to verify the item works correctly when the system fails over to the surviving server. When verified, mark the Failover column.
  - a. The easiest way to force a failover is to disconnect the NIC1 LAN cable in the back of the LS2 server.
  - b. On LS3, type `watch hb_stat` to monitor the failover.
5. After each item has been completed and you are ready to permanently move your operations to the new LDAD, perform a final check of all your connections, applications and configurations.
  - a. Switch to Mode B, ensuring the old LDAD does not have anything pending at the time of the switch.
  - b. Verify each of your items, including the out-of-season items once again to ensure everything still works and works together. Mark the Mode C column when each item is verified the final time.
  - c. Fix anything that doesn't work correctly and copy it to LS3. Return to Mode A as needed.
  - d. When everything passes, you are ready to begin operations on the new LDAD which is operating Mode C.
    - i. Notify your AWIPS regional focal point and the NCF that you are now running in LDAD Mode C.
    - ii. Turn off the old LDAD server: As root on the old server (accessible only by the new LS in Mode B), type `shutdown -h now` and when it is down, turn the power switch off.
  - e. A future Mod Note and OT&E will remove the old LS and permanently install the new LDAD servers in the rack. Do not do anything with the old LDAD until the Mod Note is ready.