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

MEMORANDUM FOR: Distribution

FROM: W/OPS2 — John Van Kuren/s/ 07/23/2007

SUBJECT: Follow-on Operational Test and Evaluation (OT&E) Plan for the Advanced Weather Interactive Processing System (AWIPS) Multi-Protocol Label Switching (MPLS) Wide Area Network (WAN).

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

The OT&E is scheduled to begin on or about Thursday, July 5, 2007 and to conclude on Thursday, August 30, 2007, and will be conducted at the following National Weather Service sites:

- Weather Forecast Office (WFO) Indianapolis, IN (IND);
- WFO Paducah, KY (PAH);
- Ohio River Forecast Center (RFC), Wilmington, OH (TIR);
- North Central RFC, Chanhassen, MN (MSR);
- Aviation Weather Center, Kansas City, MO (AWC); and
- AWIPS Network Control Facility, Silver Spring, MD (NCF).

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

Attachment

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FOLLOW-ON OPERATIONAL TEST AND EVALUATION PLAN for the AWIPS MPLS WAN

July 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

AWIPS	Advanced Weather Interactive Processing System
CE	Customer Edge
CRH	NWS Central Region Headquarters
FMK	Field Modification Kit
FR	Frame Relay
FSOC	Field Systems Operations Center
HIC	Hydrologist-In-Charge
IT	Information Technology
ITSO	Information Technology Security Office
LF	Lead Forecaster
MHS	NCF Message Handling System
MIC	Meteorologist-In-Charge
MNS	Sprint Managed Network Services
MPLS	Multi-Protocol Label Switching
NCEP	National Centers for Environmental Prediction
NOAA	National Oceanic and Atmospheric Administration
NOAAnet	NOAA Network
NOC	NOAAnet Operational Center
NWS	National Weather Service
NWSTG	NWS Telecommunication Gateway
NWSnet	NWS Network
OAT	Operational Acceptance Test
OCIO	Office of the Chief Information Officer
OPS24	Office of Operating Systems, Test and Evaluation Branch
OST	Office of Science and Technology
OST31	Office of Science and Technology, Analysis Branch
OT&E	Operational Test And Evaluation
PAMS	Product Availability Monitoring System
PE	Provider Edge
POC	Point-of-Contact
PVC	Permanent Virtual Circuits
RFC	River Forecast Center
RTMS	AWIPS Real Time Monitoring System
SEC	System Engineering Center
SLA	Service Level Agreement
SOP	Standard Operating Procedures
TOC	Telecommunication Operations Center
TRG	Test Review Group
TTR	Test Trouble Report
VRF	Virtual Routing and Forwarding
VPN	Virtual Private Network
WAN	Wide Area Network
WFO	Weather Forecast Office
WSH	NWS National Headquarters

Executive Summary

This plan describes Government tests conducted during the Follow-on Operational Test and Evaluation (OT&E) of the Advanced Weather Interactive Processing System (AWIPS) Multi-Protocol Label Switching (MPLS) Wide Area Network (WAN), herein referred to as the OT&E. The OT&E is being undertaken to validate the readiness of the AWIPS MPLS WAN for national deployment.

Initial field tests of the MPLS WAN revealed critical deficiencies including:

- The loss and/or degradations of services to AWIPS sites during planned maintenance outages of the firewalls and edge routers;
- The apparent lack of standard operating procedures (SOP) to ensure the high port availability requirements of AWIPS sites is satisfied during planned maintenance outages and/or the lack of adequate oversight to ensure that SOP are strictly followed; and
- The need to field test the revised AWIPS System Modification Notes and Field Modification Kits at Weather Forecast Office, River Forecast Center, and National Center for Environmental Prediction sites.

The OT&E will verify the remedial actions taken to correct these deficiencies fully satisfy AWIPS operational requirements.

The OT&E is scheduled to begin on or about Thursday, July 5, 2007 and to conclude on Thursday, August 30, 2007, and will be conducted at the following National Weather Service sites:

- Weather Forecast Office (WFO) Indianapolis, IN (IND);
- WFO Paducah, KY (PAH);
- Ohio River Forecast Center (RFC), Wilmington, OH (TIR);
- North Central RFC, Chanhassen, MN (MSR);
- Aviation Weather Center, Kansas City, MO (AWC); and
- AWIPS Network Control Facility, Silver Spring, MD (NCF).

The OT&E will be completed with oversight of a Test Review Group. The Test Review Group reviews OT&E activities, coordinates issues, classifies problems identified during the OT&E, and works to resolve problems discovered. Upon the completion of field tests, the Test Review Group recommends whether to proceed with national deployment of the MPLS WAN for AWIPS communications.

Follow-on
Operational Test and Evaluation Plan
for the AWIPS MPLS WAN

1. Introduction

This plan describes Government tests conducted during the Follow-on Operational Test and Evaluation (OT&E) of the Advanced Weather Interactive Processing System (AWIPS) Multi-Protocol Label Switching (MPLS) Wide Area Network (WAN), herein referred to as the OT&E.

The National Weather Service (NWS) information technology (IT) networking services are currently procured, managed, and operated on a distributed basis. While the Telecommunication Operations Center (TOC) leads these activities, the individual headquarters operate, perform diagnostics, and respond to user issues on their own or in concert with the TOC when appropriate. Similarly, the NWS Regional Headquarters and National Centers operate independent networks to support their mission requirements. Other major programs, such as AWIPS, procure, operate, and manage the "operational" network infrastructure, once again independent of other IT infrastructure elements. The National Oceanic and Atmospheric Administration (NOAA) Line Offices also independently procure and manage their own IT infrastructure.

Extensive cost and feature analysis have been conducted to evaluate candidate technologies for a NOAA-wide IT infrastructure. All indications are a carrier-provided MPLS network isolated from the Internet would satisfy the system requirements: The NWS successfully implemented a small backbone network based on MPLS technology, NWSnet, in FY05 interconnecting the NWS National and Regional Headquarters. Further design work in conjunction with the Backup NWS Telecommunication Gateway's (NWSTG's) Critical Infrastructure Protection project was based on an MPLS network solution. The NOAA Enterprise Target Architecture (ENTA) business case also arrived at this technology as a solution for consolidating NOAA IT infrastructure. Most NOAA IT network services are projected to be consolidated under a single agency-wide network, NOAAnet. Under this proposal, the existing Frame Relay WAN currently employed for the AWIPS Communications Network would be superseded by the use of NOAAnet.

A Pilot Demonstration was conducted between August, 2006, and February, 2007, to evaluate the performance of a MPLS network for AWIPS communications and to develop strategies for transferring the AWIPS Communications Network to NOAAnet. An Operational Acceptance Test (OAT) was conducted in parallel with the Pilot Demonstration to further evaluate the impact of the proposed changes on site operations. The results of these initial field tests of the MPLS WAN revealed critical deficiencies:

- The loss and/or degradations of services to AWIPS sites during planned maintenance outages of the firewalls and edge routers;
- The apparent lack of standard operating procedures (SOP) to ensure the high port availability requirements of AWIPS sites is satisfied during planned maintenance outages and/or the lack of adequate oversight to ensure that SOP are strictly followed; and
- The need to field test the revised AWIPS System Modification Notes and Field Modification Kits at Weather Forecast Office (WFO), River Forecast Center (RFC), and National Center for Environmental Prediction (NCEP) sites.

The OT&E will verify the remedial actions taken to correct these deficiencies fully satisfy AWIPS operational requirements.

The results of the intial field tests of the AWIPS MPLA WAN are discussed in an Interim MPLS OAT Report, March 2007. The inital MPLS OAT Plan and Interim Report may be obtained from the Test and Evaluation Branch web site:
http://www.weather.gov/ops2/ops24/documents/awips_docs.htm.

1.1 Test Plan Organization

This OT&E Plan is comprised of three 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. discusses the management of the OT&E including the roles and responsibilities of the personnel participating in the OT&E; and

Section 3. describes the process and procedures employed during the OT&E including the test schedule and test related activities performed at NWS National Headquarters (WSH) and the OT&E sites. The conditions for a recommendation for national deployment of the MPLS WAN and preparation of an OT&E Report are also discussed.

1.2 Purpose

This OT&E is undertaken to validate the procedures for installation of NOAAnet hardware and to verify documentation and support services are adequate for use of NOAAnet for AWIPS network communications.

1.3 Testing Strategy

The OT&E will be conducted at operational NWS AWIPS sites. The AWIPS sites selected for the OT&E are listed in Table 1 and include two Weather Forecast Offices (WFO), two River Forecast Centers (RFC), one National Center for Environmental Predication (NCEP), and the AWIPS Network Control Facility (NCF). The OT&E will be completed in two Phases: Phase 1 will evaluate the installation of the NOAAnet hardware; and Phase 2 will evaluate the transition of AWIPS communications to NOAAnet and AWIPS SOP for scheduled maintenance outages and for unscheduled outages.

1.3.1 WFO, RFC, and NCEP

Phase 1: The OT&E will begin by assessing the installation of the NOAAnet hardware. Sprint, the network service provider, will install the connection to local exchange carrier and a modem for out-of-bandwidth access to the customer edge (CE) router(s). Site personnel will install the field modification kit (FMK) comprised of the CE router(s), NetScout Probe, and NetScout Tap Kit according to the provided AWIPS System Modification Note (Mod Note). Site staff will report any problems discovered during the hardware installation, and the Mod Note will be revised as required prior to subsequent installations.

The CE router will be connected to the NOAAnet and OCIO staff will test the circuit(s) for a period of not less than 72 hours to ensure the lines are "clean." NOAAnet will initially be used to support management and enterprise traffic. OCIO staff will monitor network traffic over NOAAnet; and site and OCIO staff will report any problems discovered during the initial operation of the system to the NOAAnet Operations Center (NOC).

Table 1: Sites selected for the OT&E.

Site	Site ID
WFO Indianapolis, IN	IND
WFO Paducah, KY	PAH
Ohio RFC, Wilmington, OH	TIR
North Central RFC, Chanhassen, MN	MSR
Aviation Weather Center, Kansas City, MO	AWC
AWIPS Network Control Facility, Silver Spring, MD	NCF

Phase 2: Site personnel will execute a second Mod Note and Field Modification Kit (FMK), following the completion of all prerequisites for deployment of the AWIPS MPLS WAN, in coordination with the NCF and OCIO to install the cables interconnecting AWIPS routers 1 and 2 and the CE router(s). NCF and OCIO will coordinate the transfer of AWIPS communications to NOAAnet. NCF and OCIO staff members will monitor NOAAnet traffic during the transition and as part of ongoing support services. NCF, OCIO, and site staff members will complete the test case procedures for scheduled maintenance outages and for unscheduled outages contained in Attachments E through L. NCF, OCIO, and/or site personnel will report any problems discovered during the cabling installation, during the tests of SOP, and/or during the operation of NOAAnet to the AWIPS NCF Help Deck.

1.3.2 NCF

Phase 1: OCIO staff will coordinate the installation of fully redundant routers and circuits at the primary NCF and at the backup NCF. Fully redundant routers must be in place and successfully tested at both the primary NCF and the backup NCF prior to transferring AWIPS communications to NOAAnet.

Phase 2: OCIO and NCF will coordinate the completion of the test case procedures of the AWIPS standard operating procedures (SOP) for scheduled maintenance outages and for unscheduled outages contained in Attachments E through L. OCIO and NCF staff will report any problems discovered during the installation of the routers and circuits, during the tests of SOP, and/or during the operation of the NOAAnet.

1.4 Test Objectives

The specific objectives of the OT&E follow:

- Validate the instructions for installation of NOAAnet hardware;
- Validate the FMKs; and
- Verify that the services provided by NCF, OCIO, and the network service provider fully support AWIPS requirements.

1.5 Evaluation Criteria

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

- The Mod Notes provide complete and accurate instructions for installation of NOAAnet hardware;

- The FMKs contain all required cables, labels, and associated hardware for installation of NOAAnet hardware;
- The test case procedures for the AWIPS SOP for planned maintenance outages and unplanned outages are successfully completed at each site; and
- Test Trouble Reports (TTRs) assigned Impact 1 or 2 are closed, and all workarounds are fully documented.

1.6 Prerequisites, Assumptions, and Risks

1.6.1 Prerequisites

Phase 1 prerequisites—deployment of NOAAnet hardware:

- **System documentation:** Draft Mod Note to support equipment racking at each AWIPS site type (i.e., WFO, RFC, and NCEP);
- **OT&E documentation:** An approved OT&E Plan including draft test case procedures;
- **Critical Design Review:** Complete a Critical Design Review (CDR) of the AWIPS MPLS WAN;
- **Accreditation and Certification:** The AWIPS Information System Security Office (ISSO) must report the status of system Accreditation and Certification; and
- **Hardware:** FMKs delivered to the AWIPS sites; and
- **Network services:** The availability of NOAAnet services to the OT&E sites.

Phase 2 prerequisites—deployment of the AWIPS MPLS WAN:

- **System documentation:** Draft Mod Note to support cabling installation at each AWIPS site type (i.e., WFO, RFC, and NCEP); and fully documented AWIPS SOP for planned maintenance outages and unplanned outages at AWIPS sites;
- **OT&E documentation:** The test case procedures for AWIPS SOP must be in final form;
- **Network services:** Fully redundant routers and circuits must be in place and successfully tested at both the primary NCF and the backup NCF prior to transferring AWIPS communications to NOAAnet; and
- **Support services:** The NOC must be fully staffed to provide 24×7 support for NOAAnet services and NOC staff members must be fully proficient in AWIPS SOP to support scheduled maintenance of NOAAnet hardware and circuits and provide timely response to unscheduled outages of NOAAnet hardware and circuits.

1.6.2 Assumptions

The OT&E assumes the following:

- Special training of WFO, RFC, and NCEP staff members is not required for installation and operational use of NOAAnet.

- The CE router will be located in the adjacent site for co-located NCEP sites and equipment racking at co-located NCEP sites is not required. The configuration of AWIPS at the stand alone NCEP sites is similar to WFO sites and it is assumed that the Mod Notes and FMKs developed for WFO sites are adequate for the stand alone NCEP sites.
- The throughput performance of the MPLS WAN (i.e., the average product success rate and latency) was evaluated during the initial OAT and was found to meet or exceed the performance of the current Frame Relay WAN; it is assumed therefore that further evaluation of the throughput performance of the MPLS WAN is not required.

1.6.3 Risks

The AWIPS communications network is required for delivery of NWS products and services; and the OT&E will be conducted in a manner to reduce the risk of a degradation of network services or to pose undue risk to field operations.

Test case procedures for the AWIPS SOP for scheduled maintenance outages and for unscheduled outages will be completed after AWIPS traffic has been transferred to NOAAnet. NCF, OCIO, and OPS24 personnel will coordinate these tests with the site MIC, HIC, or Branch Chief and the Lead Forecaster to ensure site conditions allow such tests. If possible, these tests will be completed while FR WAN services are still available to the sites.

General Guidelines for the Conduct of the OT&E:

- The operational requirements of the sites have precedence over the OT&E;
- AWIPS SOP will be followed whenever possible;
- Sites will continue to receive 24×7 support from the NCF during the OT&E; and
- The NCF will continue to have the authority to make key decisions regarding network configuration and communications in a timely manner.

2. Test Management

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

2.1 Test Review Group

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

The Phase 1 activities, i.e., installation and testing of the NOAAnet hardware at operational NWS field sites, and the Phase 2 activities, i.e., transferring AWIPS communications to NOAAnet, must be authorized by the TRG. The OT&E may be suspended or delayed to satisfy site conditions or due to critical deficiencies in the system. If the OT&E is suspended, the TRG will authorize the resumption of the OT&E when appropriate corrective actions have been taken and/or conditions allow. The TRG may recommend additional diagnostic tests be completed prior to the resumption of the OT&E.

The TRG meets periodically during the OT&E to review, clarify, and validate deficiencies documented by Test Trouble Reports (TTRs). The TRG will evaluate each TTR and assign an Impact and Priority according to the criteria provided in Section 3.6.2. 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. Teleconference access will be provided to the meetings of the TRG. Meetings of the TRG are coordinated by the OT&E Director.

Following the completion of field tests, the TRG will convene to review the findings of the test and to recommend whether to proceed with national migration of AWIPS network communications to NOAAnet.

The decisions of the TRG are based on a simple majority of the voting members listed in Attachment D. Any dissenting opinions will be properly documented it the OT&E Report.

2.2 Test Review Group Chair

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

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

2.3 AWIPS POC

The AWIPS POC ensures all required hardware, software, and documentation are available for the OT&E; participates in the meetings of the TRG and other informal meetings as required; reviews problems documented and classified during the OT&E; and coordinates the resolution of problems. The AWIPS POC also reviews the OT&E Plan and the OT&E Report.

The AWIPS POC is a voting member of the TRG.

2.4 OCIO Focal Point

The OCIO Focal Point plans and coordinates OT&E activities with OCIO staff members. OCIO staff will test each NOAAnet circuit for a period of not less than 72 hours to ensure the lines are clean; monitor network traffic using the NetScout Probes; interact with Sprint regarding network services; and coordinate the completetion of the test case procedures for AWIPS SOP. The OCIO Focal Point participates in the meetings of the TRG and reviews plans and reports during the OT&E.

The OCIO Focal Point is a non-voting member of the TRG.

2.5 OT&E Director

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

The OT&E Director prepares and distributes status reports summarizing TTRs, 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 TTRs 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.

2.6 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 (e.g., witness installations at designated OT&E sites); assist test sites in completing TTRs when problems are observed; and provide technical advice to the OT&E Director.

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

2.7 Regional Focal Points

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

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

2.8 Site Focal Points

Site Focal Points plan and coordinate OT&E activities with their respective NWS Regional Focal Points, plan and coordinate the installation of the NOAAnet hardware, complete the test case procedures of AWIPS SOP, participate in meetings of the TRG, review plans and reports during the OT&E, and complete and submit TTRs for all problems discovered during the OT&E.

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

2.9 Lead Forecaster

The Lead Forecaster is the primary point-of-contact for issues affecting site operations: NCF will notify the Lead Forecaster of any changes in network services that might affect site operations. The Lead Forecaster may direct NCF to delay changes in network services to accommodate site requirements, such as severe weather.

Lead Forecasters may participate in the meetings of the TRG as non-voting members.

2.10 NCF POC

The NCF POC will coordinate the migration of AWIPS communications to NOAAnet with NCF staff and will work to resolve any network problems discovered during the OT&E.

The NCF POC is a non-voting member of the TRG.

3. Test Conduct

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

3.1 Resource Requirements

Hardware: Two FMKs are required: FMK 1 contains the Juniper SSG 550 CE router(s), NetScout Probe, NetScout Tap Kit, and all required cables and associated hardware; and FMK 2 contains the cables used to interconnect AWIPS routers 1 and 2 and the Juniper router(s).

Network services: A local exchange connection will be installed each OT&E site by Sprint, the network service provider. The CE router(s) will be connected to NOAAnet.

Documentation: Documentation supporting the installation and operation of NOAAnet will be shipped to the OT&E sites 1 week prior to the commencement of field tests. Reference to these documents may be made as required throughout the test. The documentation supporting the OT&E includes:

- (Draft) Mod Note for NOAAnet hardware installation at a WFO, RFC, and NCEP (OPS12);
- (Draft) Mod Note for final cabling installation at WFO, RFC and NCEP (OPS12); and
- OT&E Plan (OPS24).

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

The OT&E Plan is available in electronic form on the OPS24 web site at:
http://www.weather.gov/ops2/ops24/documents/awips_docs.htm.

3.2 Pre-OT&E Activities

3.2.1 NWS National 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 Notes (OPS12);
- Coordinate with Sprint to ensure that the Provider Edge (PE) router and any other required network equipment is installed (OST31); and
- Deliver the FMKs together with all supporting documentation to the OT&E sites (OST31).

3.2.2 OT&E Sites

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

- Site Focal Points will assist CIO14 in determining cabling requirements; and
- Review and be familiar with the OT&E Plan.

3.3 Test Readiness Review

The TRG Chair will convene a Test Readiness Review on or about July 5, 2007 to verify the prerequisites for field tests of NOAAnet have been met, see Section 1.6.1 for a list of prerequisites. The TRG will review the materials presented and recommend whether to proceed with tests of NOAAnet at operational field sites.

3.4 Installation

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

3.4.1 NWS National Headquarters

The OPS24 and CIO14 staff will visit the Ohio RFC, Wilmington, OH (TIR) and the WFO Indianapolis, IN (IND) to observe the installation of the NOAAnet hardware and to review the Mod Note for equipment racking with the Site Focal Points. The visiting team will meet with the site personnel upon arrival at the site to discuss the OT&E Plan, see Attachment C, Agenda for OT&E Site Visit. The Mod Note will be revised as required prior to its release.

CIO14 will test each circuit for a period of not less than 72 hours to ensure the lines are "clean."

3.4.2 OT&E Sites

Site personnel are responsible for the execution of the Mod Notes and FMKs for equipment racking and cable installations. Site personnel will evaluate the draft Mod Notes and FMKs and forward any comments to the OT&E Director.

3.5 Operations

The transition of AWIPS communications to NOAAnet will be completed by NCF and OCIO.

The site MIC, HIC, Branch Chief, or Lead Forecaster may contact the NCF at anytime during the OT&E and request tests and/or other actions affecting the network be delayed or rescheduled to meet the operational requirements of the site.

Tests of the SOP for planned maintenance outages and unplanned outages will be completed at each site type (i.e., WFO, RFC, NCEP, and the NCF) after AWIPS communications traffic has been migrated to

NOAAnet. OPS24 will monitor AWIPS communications during these tests using the Product Availability Monitoring System (PAMS) and the NetScout probes.

3.6 Test Reporting and Analysis

3.6.1 Trouble Reports

Site staff members will follow normal procedures and contact the NCF Help Desk regarding network 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 prepare OT&E Test Trouble Reports (TTRs) as required.

OT&E site staff may also submit TTRs directly to the OT&E Director. The OT&E Site Focal Point will coordinate the preparation and submission of TTRs with their respective staff members. The completed TTR form, Attachment B or the equivalent, together with any supporting documentation, should be submitted by e-mail or fax message to the OT&E Director at the address provided below, in Section 3.8.

3.6.2 TTR Analysis

The OT&E Director will collect the TTRs, maintain a database to track the status of each TTR, and provide the TTRs to the TRG for adjudication, see Section 2.1.

The database allows the assignment of an Impact and Priority to each TTR. The Impact ranks the severity of the problem and will be assigned as follows:

Impact 1 Severe degradation of communications, no workaround;

Impact 2 Severe degradation of communications, reasonable workaround;

Impact 3 Degradation of communications;

Impact 4 Loss of minor capability; and

Impact 5 No impact.

TTRs that are 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 (possible system enhancement).

3.7 Schedule

The OT&E will be conducted in accordance with the schedule provided in Attachment A, OT&E Schedule. Any required departure from the indicated schedule 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.

3.8 Help During the OT&E

Questions regarding the Follow-on OT&E should be directed to:

Ken Stricklett, MPLS OT&E Director
phone: (301) 713-0326 x113
fax: (301) 713-0912
e-mail: Ken.Stricklett@noaa.gov

Questions regarding the AWIPS network communications should be directed to:

NCF Help Desk
phone: (301) 713-9344

The NCF Help Desk is staffed 24×7.

Questions regarding NOAAnet services should be directed to:

NOC Help Desk
phone: (301) 713-0902

The NOC Help Desk is staffed 24×7.

3.9 Post-OT&E Activities

3.9.1 Final Recommendation

The TRG Chair will convene an OT&E Wrap Up meeting on or about August 30, 2007 following the conclusion of field tests. This is the final meeting of the TRG. The OT&E Director will review the activities conducted to date including: a summary of TTRs found, a summary of the network performance data, and other findings and recommendations. The TRG will review the materials presented and recommend whether to proceed with national deployment of NOAAnet for AWIPS communications. The AWIPS POC will report the recommendation of the TRG to the OST System Engineering Center (SEC). The SEC will make all final decisions regarding migration of AWIPS network communications to NOAAnet.

NOAAnet must meet the following criteria to be recommended for national deployment:

- All TTRs assigned Impact 1 or 2 must be resolved and closed;
- All problems resolved by a workaround must be properly documented;
- The test case procedures of the AWIPS SOP for planned maintenance outages and unplanned outages must be successfully completed at each OT&E site.

3.9.2 OT&E Report

The OT&E Report provides a complete record of the OT&E including: the details of any TTRs, 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.

Attachment A OT&E Schedule

The Follow-on OT&E Schedule:

Date	Action
04/12/07	Critical Design Review (CIO14)
07/25/07	Complete draft Mod Notes for equipment racking (CIO14)
07/25/07	TRG meeting, Test Readiness Review
07/27/07	Ship FMKs to Ohio RFC, Wilmington, OH (TIR) and WFO Indianapolis, IN (IND) (OST31)
07/31/07–08/01/07	Site visit and equipment racking Ohio RFC, Wilmington, OH (TIR) (OPS24 and CIO14)
08/07/07–07/08/07	Site visit and equipment racking WFO Indianapolis, IN (IND) (OPS24)
08/10/07	Ship FMKs to North Central RFC, Chanhassen, MN (MSR); and WFO Paducah, KY (PAH) (OST31)
08/13/07–08/24/07	Equipment racking North Central RFC, Chanhassen, MN (MSR); and WFO Paducah, KY (PAH)
08/31/07	Complete final draft of the Mod Note for hardware installation (CIO14)
09/28/07	Complete installation of fully redundant circuits and routers at the primary NCF and the backup NCF (NCF and CIO14)
09/28/07	Complete draft Mod Note for cable installation (Raytheon)
10/03/07	TRG meeting, Test Readiness Review
10/08/07–10/19/07	Execute second Mode Note and FMK at OT&E sites
10/26/07	Complete final draft Mod Note for cable installation (Raytheon)
10/26/07	Complete tests of SOP for a planned maintenance outage and for an unplanned outage
10/31/07	TRG meeting, OT&E Wrap Up
11/30/07	Complete OT&E Report

Attachment B MPLS Test Trouble Report Form

Site Focal Points should complete this form for each problem discovered during the OT&E. The completed form together with any supporting documentation should be submitted to Ken Stricklett, MPLS OT&E Director (FAX: 301-713-0912 or e-mail: Ken.Stricklett@noaa.gov).

OT&E TEST TROUBLE REPORT (TTR)
TTR No.:
Title/Summary:
Originator:
Location:
Date/Time Discovered:
Attachments:

Subsystem		**Frequency**		**Impact**		**Priority**	
Installation		Always		Severe degradation of communications; no workaround		Immediate action required	
Documentation		Sometimes		Severe degradation of communications; reasonable workaround		Expedite action	
Software		Rarely		Degradation of communications		Normally scheduled action	
Hardware		One-time event		Loss of minor capability		Watch item	
		Unknown		Minimal to no impact		No action required (potential enhancement)	

Reference ECRs/TTRs:	
Problem Description:	
Recommended Solution:	
Authorizing Signature:	**Date:**

Attachment C Agenda for OT&E Site Visit

1. Introductions — Test Coordinator
2. The Test Structure — Test Coordinator
   - Overview of the 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 D MPLS Test Review Group Members

Name/Organization	Role	Phone	Voting Member
Weather Service Headquarters			
Jerald Dinges (W/OPS24)	Test Review Group Chair	(301) 713-0326 x160	
Olga Brown-Leigh (W/OST31)	AWIPS POC	(301) 713-1570 x156	•
Phil Cragg (W/CIO14)	OCIO Focal Point	(301) 713-0984 x216	
Ken Stricklett (W/OPS24)	OT&E Director	(301) 713-0326 x113	•
Mary Buckingham (W/OPS24)	Test Team Member	(301) 713-0326 x137	
Jami Casamento (W/CIO14)	Test Team Member	(301) 713-0499 x211	
Randy Chambers (W/CIO11)	Test Team Member	(301) 713-0864 x161	
Jagdish Sharma (W/OPS12)	Test Team Member	(301) 713-1833 x128	
AWIPS Network Control Facility, Silver Spring, MD (NCF)			
James Washington	NCF POC	(301) 713-9344	
Jim Stamper	Site Focal Point	(301) 713-9362 x322	
Kim Hoang (W/CIO11)	Site Focal Point	(301) 713-9344	
Aviation Weather Center, Kansas City, MO (AWC)			
Clinton Wallace	NP62 Branch Chief	(816) 584-7200 x248	
Kolly Mars	Site Focal Point	(816) 584-7200 x247	
Ohio RFC, Wilmington, OH (TIR)			
Craig Hunter	HIC	(937) 383-0527	
Curtis Brooks (ESA)	Site Focal Point	(937) 383-0228	
North Central RFC, Chanhassen, MN (MSR)			
Dan Luna	HIC	(952) 361-6650 x442	
Bruce Aslesen (ESA)	Site Focal Point	(952) 361-6670 x372	
WFO Indianapolis, IL (IND)			
David Tucek	MIC	(317) 856-0361 x726	
Curtis Tweed (ESA)	ESA	(317) 856-0361 x372	
Eric Zimmerman (ITO)	Site Focal Point	(317) 856-0361 x372	
WFO Paducah, KY (PAH)			
Beverly Poole	MIC	(270) 744-6440 x642	
Shane Luecke (ESA)	Site Focal Point	(270) 744-6938	
Central Region			
William Gery	Regional Focal Point	(816) 268-3152	•
Southern Region			
Eric Howieson	Regional Focal Point	(817) 978-7777 x132	•
Eastern Region			
Joshua Watson	Regional Focal Point	(631) 244-0130	•
Western Region			
Shelia Deiotte	Regional Focal Point	(801) 524-5710 x265	•
Pacific Region			
Bill Ward	Regional Focal Point	(808) 532-6415	•
Alaska Region			
Phil Mieczynski	Regional Focal Point	(907) 271-4421	•