SOFTWARE TEST PLAN

for the

Advanced Weather Information Processing System Project

Contract # DG133W-05-CQ-1067

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This sheet is a record of each issue of this document.

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1 Scope

1.1 Identification

This document establishes the Software Test Plan (STP) for Task Orders 8 through 11 under the Advanced Weather Interactive Processing System (AWIPS) Software Continuous Technology Refresh (SW CTR). These Task Orders (TO) will coalesce into AWIPS II Release 1.0. This document, updated throughout each Task Order, is a narrative and tabular description of the overall plan and methodology used to verify requirements for AWIPS at the Omaha AWIPS Test facility described in section 2.1. The STP includes information on the general test environment, testing objectives, test schedule, and the Raytheon TE methodologies that are used to achieve this goal within the limitations of the Omaha AWIPS Test facility. This document includes a description of the test cases for TO8. Test cases beyond TO8 will be added within the corresponding TO. Test cases and procedures will be delivered to the Raytheon AWIPS Program Management Office (PMO) for coordination with the National Weather Service (NWS) and approval approximately 6 weeks prior to beginning formal testing.

1.2 System Overview

TO8 delivers the first in a series of migrated end-user functions extending from the software capabilities delivered under the AWIPS CTR Re-Architecture initiative and the AWIPS Development Environment (ADE) Release 1.0. The primary functionality delivered in TO8 is equivalent to functionality found in the legacy D2D. Not all D2D functionality is developed within this (interim delivery) TO as subsequent TOs will deliver additional pieces of D2D functionality. Graphical Forecast Editor (GFE) and Hydrology GUIs and risk reduction applications may be included in the TO8 delivery and demonstrated/discussed in a Risk Reduction Demonstration (RRD) / Briefing. The list of items extending the capabilities of ADE 1.0 can be found in Table 1 (Task Order 8 Work Items/Activities) of the Task Order 8 Proposal. The Raytheon AWIPS Team prototypes and tests these capabilities with samples of end-user functionality.

The overall test engineering (TE) and software engineering (SWE) activities deliver on NWS program requirements throughout the life cycle of the Raytheon AWIPS SW CTR project. The AWIPS SW CTR project will migrate the current AWIPS system architecture to the new architecture of AWIPS II, while the functionality of the existing system is maintained.

1.3 Document Overview

This document identifies and describes the organization, resources, activities, methods, and procedures used during Pre-Delivery Testing (PDT) and Delivery Testing (DT). The sections incorporated in this STP include:

- Section 1: Scope – Provides an introduction to this document, its purpose, and identifies

the system under test.

- Section 2: Software Verification and Validation – Identifies the facility in which the test activities are to take place, the software and hardware items used throughout the test cycle, the personnel involved in the test process, and overall verification and validation approach.
- Section 3: System Verification and Validation – Describes the test process.
- Section 4: Test Identification – Describes the test cases and the objectives of each test.
- Section 5: Test Schedule – Lists the testing activities. The schedule for each activity is in the Integrated Master Schedule (IMS).
- Section 6: Notes
- Appendix A: Acronyms – Lists the definitions of acronyms used in this document.
- Appendix B: Regression Test Cases – Describes the regression test process.

2 Software Verification and Validation

The AWIPS CTR test facility is the AWIPS Test Lab located within the Scott Technology Center (STC), Raytheon Office, Omaha, NE. The AWIPS Test Lab supports the software development, integration, and DR testing for each TO. In addition, the development of test cases and test procedures that satisfy the derived requirements listed in the Requirements Traceability Matrix (RTM) occur using the lab. The lab is the site for formal PDT for each TO. PDT is conducted internally by Raytheon test engineer(s) and witnessed by Omaha Raytheon Mission Assurance. Results are documented internally. DRs are opened as necessary and, if critical, fixed prior to DT. Ideally, all system deficiencies are detected and resolved prior to PDT. Testing throughout TO8 is accomplished primarily using live data ingested through NOAAPort. However, canned-static datasets may be substituted for data types not available over NOAAPort. The following figure outlines the Raytheon verification and validation process.

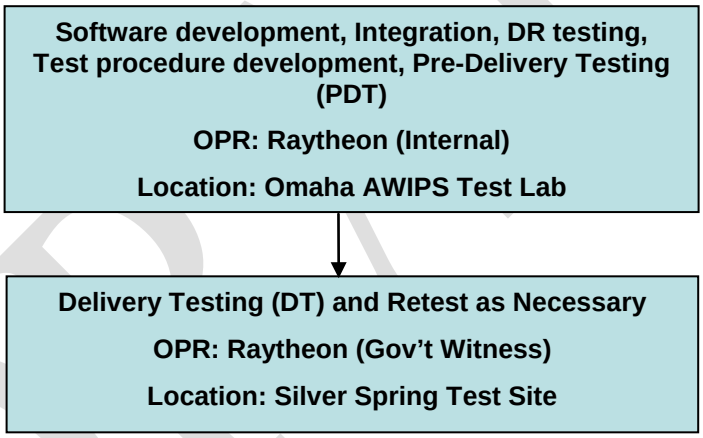

Figure 2-1 Software Verification and Validation Process

2.1 Omaha Test Site

The Omaha test site uses a NOAAPort data feed for live data. The NOAAPort hardware configuration is detailed in figure 2-2. Two workstations running AWIPS II software are configured to access the data base. A workstation with VPN access to an AWIPS I test bed is also located in the test lab for software development and testing.

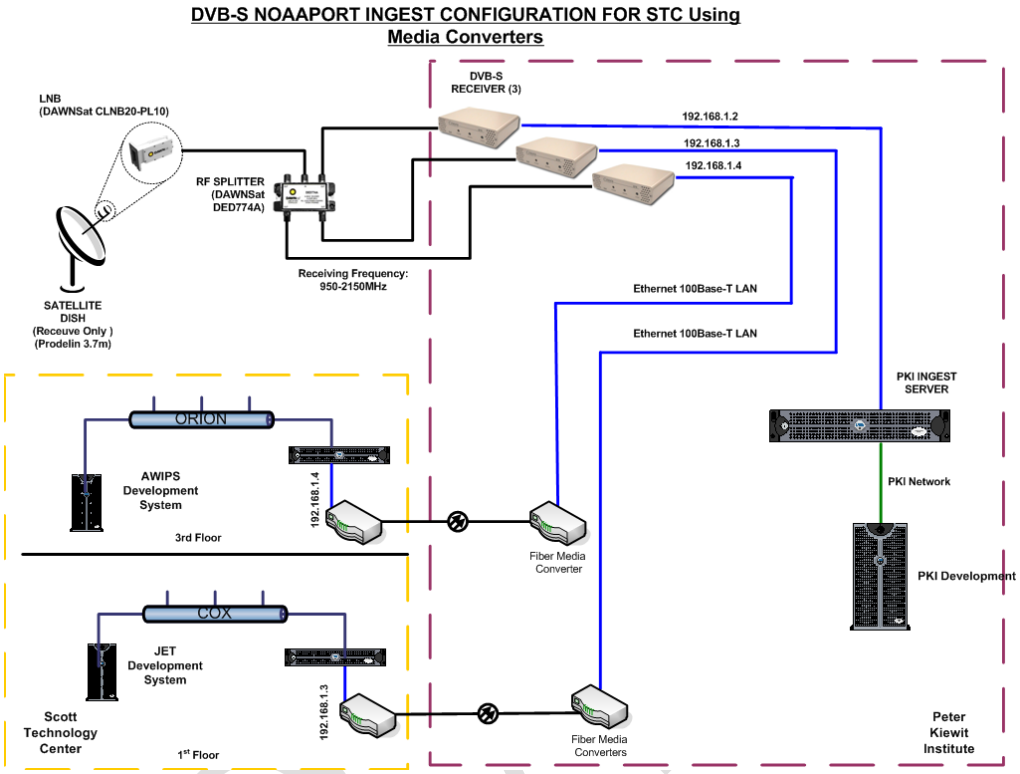

Figure 2-2 NOAAPort Ingest Configuration

2.1.1 Software (SW) Items

The software configuration for the test computer:

- Windows
  - Windows Professional XP Service Pack 2
- Linux
  - Red Hat Enterprise Linux (RHEL) 4.4

The components of the Runtime Environment used for both operating systems are listed in the Software Version Description (SVD) document AWIPS2_TO8_SVD.

2.1.2 Hardware (HW) Items

The following hardware items comprise the Omaha AWIPS test bed configuration.

- AWIPS Integration Server Configuration
  - Two Dell 2950 Servers
  - 2 Quad Core Xeon E5320 Processors running at 1.86GHz
  - 4GB RAM
  - 140 GB Hard drive space
  - RedHat Linux 4 Release 4
- AWIPS Database Server Configuration
  - One Dell 2950 Server
  - 2 Quad Core Xeon E5320 Processors running at 1.86 GHz
  - 4GB RAM
  - 140 GB Hard drive space
  - RedHat Linux 4 Release 4
- AWIPS Network Attached Storage Server Configuration
  - One Dell 2950 Server
  - 1 Quad Core Xeon E5320 Processors running at 1.86 GHz
  - 4GB RAM
  - 1.4TB Hard drive space
  - RedHat Linux 4 Release 4
- NOAAPort Hardware
  - Dell 2550
  - Pentium III 1.1GHz
  - 4GB RAM
  - 60GB Hard drive
  - Fedora Core 6 OS
    - Refer to figure 2-2
- Windows Workstation
  - Computer: Dell Precision 380
  - Processors: Dual Pentium D 3.0GHz

- Memory: 2 Gigabyte RAM
- Hard Drive: Two 140 Gigabyte Hard Drives in Raid-0 Configuration
- Video Card: NVIDIA Quadro FX with 256 Megabytes RAM
- Monitor: Dual 21” LCD Monitors

- Linux Workstation
  - Computer: HP Workstation XW 6200
  - Processors: Intel Xeon 2.8GHz
  - Memory: 2 Gigabyte RAM
  - Hard Drive: 32 Gigabyte SCSI
  - Video Card: G Force 7600 GT with 256 Megabytes RAM
  - Monitor: Dual 21” LCD Monitors

2.2 Silver Spring Test Site

The Silver Spring Test Site is the location of DT. Configuration management baseline AWIPS II software for the applicable TO being tested will be loaded on test bed hardware. Test procedures will then be dry run prior to commencing DT.

2.2.1 Software Items

The software configuration for the test bed used for DT should match as closely as possible the configuration used in the Omaha Test Lab, and remain consistent (as configured by the Raytheon team) throughout the DT and SW Delivery / Outbrief period.

2.2.2 Hardware Items

The hardware configuration should match as closely as possible the configuration used in the Omaha Test Lab, and remain consistent throughout the DT and SW Delivery / Outbrief period.

2.3 Test Data

The canned-static dataset is defined by TE and controlled by Software Configuration Management (SCM) throughout the test process. Test data is defined within the Software Test Description (STD) documents and controlled to ensure the test can be reproduced. The test dataset may be refined through the design and integration phases. Data ingested via a live NOAAPort feed shall be used for test cases that do not require inspection of the ingest process, and for performance and stability testing.

2.4 Other Materials

A copy of the AWIPS program installation instructions, test cases, test procedures, Requirements Traceability Matrix (RTM) and test data files are supplied to SCM for configuration control before the start of PDT. Changes to the test documentation during PDT are documented and supplied to SCM for configuration control.

2.5 Installation, Testing and Control

SCM is responsible for software installation in accordance with the AWIPS program installation instructions. Plans for the control and maintenance of the AWIPS program software are detailed in the AWIPS program Project Management Plan (PMP).

TE is responsible for the initialization of the test data in the AWIPS program test computers.

Mission Assurance (MA) monitors software installations and data initialization.

2.6 Participating Organizations

The following roles are defined for organizations involved in the test activities during PDT and DT.

- Test Engineer
  - Performs integration, regression and DR testing
  - Develops test plans and procedures
  - Executes PDT and DT
  - Responsible for successful, safe and efficient conduct of the test
- Mission Assurance
  - Witnesses PDT
  - Oversees the test process including the quality of documentation.
- Software Configuration Management
  - Responsible for controlling the baseline configuration
- Raytheon AWIPS PMO
  - Approves test plans, verification requirements, and the RTM prior to testing;
  - Coordinates with NWS to identify and reserve an appropriate test environment (e.g., servers, workstations) and facility to conduct DT;
  - Interfaces/coordinates with NWS on all matters concerning test and integration

2.7 Tests Performed

The software developed throughout TO8 is verified in accordance with the applicable tests listed in section 4.

2.8 Verification Methods

System requirements are tested using verification methods. Each requirement is traced to one or more of the verification methods listed below. The test method(s), test requirement, and traceable reference to the test case are recorded in the RTM. If a change in the RTM is necessary, an AWIPS team member may open a locally generated Change Request (CR) report to request the change. The request is reviewed during Configuration Control Board (CCB) meetings. The verification methods and descriptions include:

- Demonstration: The operation of the software product, or a part of the software product, that relies on observable functional operation not requiring the use of instrumentation, special test equipment, or subsequent analysis.
- Inspection: The visual examination of software product code, documentation, etc.
- Analysis: The processing of accumulated data obtained from other Verification methods. Examples include the reduction, interpretation, or extrapolation of test results.
- Test: The operation of the software product, or a part of the software product, using instrumentation or other special test equipment to collect data for later analysis.
- Similarity: Used only if it can be shown that the article under test is similar to another article that has already been verified to equivalent or more stringent requirements.
- Program: These requirements are assumed to be verified and successfully accomplished with satisfactory execution of the program according to specifications outlined in the contract description or task order.
- General: These requirements are considered verified after successful completion of system testing or acceptance of program deliverables. Normally, these are high-level requirements that can be met by successful testing of lower level, more specific requirements, or successful completion of program milestones. No specific verification method is employed.
- Special Verification methods: Any special Verification methods for the software product, such as special tools, techniques, procedures, facilities, and acceptance limits.

2.9 Entry and Exit Criteria

To define success during each phase of the test process, specified criteria is set that allows TE to progress to the next test stage. Table 2-1 outlines the various phases that Raytheon follows and

defines the entry/exit criteria for each phase.

Phase	Entry Criteria	Exit Criteria
Test Planning	Task Order awarded	Completed STP and updated RTM
Software Integration	Completion of each build	Draft Test Procedures (TP). All builds tested.
Dry Runs	Software Integration completed. Test Plan completed. Draft test procedures completed.	Final Draft STD. No locally derived priority 1 or 2 DRs without a risk/closure plan accepted by the CCB.
Pre-Delivery Testing	Dry Runs completed. All priority 1 DRs closed. Open priority 2 and 3 DRs have acceptable work around approved by Raytheon AWIPS PMO	All formal testing conducted locally (Omaha, NE Test Lab). All SRS and System level requirements verified. Final STD. No locally derived priority 1 or 2 DRs. Derived priority 3 DRs have a workaround or an acceptable closure plan.
Delivery Testing	Pre-Delivery testing completed.	All formal testing conducted in Silver Spring. All System level requirements and SRS-level requirements specified in the Government approved test cases verified. No locally derived priority 1 or 2 DRs. Derived priority 3 DRs have a workaround or an acceptable closure plan.

Table 2-1 Entry/Exit Criteria

Discrepancy Reports (DRs) uncovered during the integration phase, Dry Runs, and PDT, are documented in the AWIPS Problem Tracking Database. DRs are assigned a priority number (1 through 5) and assigned to the appropriate personnel to be resolved. Table 2-2 provides a definition for each priority.

DR Priority	Definition
1	• Prevents the accomplishment of an operational or mission essential capability • Jeopardizes safety, security, or other requirements designated “critical”
2	• Adversely affects the accomplishment of an operational or mission essential capability; no work around solution • Adversely affects technical, cost or schedule risks to the project or to life cycle support of the system; no work around solution

3	• Adversely affects the accomplishment of an operational or mission essential capability; work around solution exists • Adversely affects technical, cost or schedule risks to the project or to life cycle support of the system; work around solution exists
4	• Results in user/operator inconvenience or annoyance; does not affect an operational or mission essential capability • Results in inconvenience or annoyance for development or support personnel; does not prevent the accomplishment of those responsibilities
5	• No operational or safety impacts; an enhancement

Table 2-2 Discrepancy Report Priority Definitions

3 System Verification and Validation

3.1 System Validation Strategy

Not applicable.

3.2 System Documentation Validation

Not applicable.

3.3 System Validation Planning

Not applicable.

3.4 Conduct PDT Testing and Engineering Dry Runs

The purpose of formal dry runs is to create and solidify a verification approach for formal PDT and DT.

3.5 Readiness Review

After the formal dry runs are complete (immediately prior to commencing PDT), TE holds a TRR. The TRR establishes the readiness of the software and test documentation, ensuring all components are in place to begin PDT. The following groups are required to be represented at this meeting: Program Manager (PM), Lead Engineer (LE), test engineer, SCM, and MA. This review includes risk assessment for PDT and concludes with a go/no-go decision by the required participants of the review. The TRR includes:

- Test procedures completed and verified against requirements
- Verification that dry runs are complete
- Verification of the quality of the software
- The test facility is set for test activities
- The test support team is available for PDT

3.6 Conduct Incremental Software Integration Testing

The components of the system are integrated into a product based on the TO's build plan. Following each scheduled TO build and installation, the product is tested via test procedures to ensure successful DR and software integration and to verify requirements from the RTM delivered in the build.

Following testing of the last TO build, the formal test procedure (TP) dry run phase begins. The

TPs by which requirements are tested may be redlined during the formal dry run phase. The AWIPS team reviews the revised TPs to confirm they properly verify the intended requirement(s) and the customer's needs. Any defects identified locally during the dry run phase are recorded in the AWIPS Problem Tracking Database as a DR. DRs include the test case that failed and cite the problem, the test steps taken, the failed result, and the name of the used data file. This information may be necessary when the SW developer and test engineer repeat the test after the defect has been resolved.

To enter the dry run phase, the following criteria are established:

- The RTM is updated or complete
- The final copy of the STP submitted
- Draft TPs are 85% completed
- There are no Priority 1 or Priority 2 DRs
- HW/SW installation audited to ensure bonded baseline
- Test data audited to ensure bonded baseline

The PL, LE, and test engineer determine whether to proceed with formal dry runs or postpone the onset of this activity until the above criteria are achieved. Dry runs are executed in Omaha using the AWIPS II test bed by the Omaha TEs.

Once dry runs are complete and the TRR conducted, testing is phased into PDT. During PDT the AWIPS program software is tested with documentation, software, and test environment under SCM control. The test procedures are tested and the results recorded with comments on the hard copy of each STD. Upon completion of a test, results are recorded in a Test Report. During PDT, TPs are again red lined appropriately for additional corrections or adjustments. The red lines are recorded on a Flag Form. Defects discovered during PDT are also flagged and then recorded in the AWIPS Problem Tracking Database. The repaired test procedures and defects are retested and validated per MA, and the Flag Forms closed. PDT is conducted in Omaha prior to DT using the AWIPS II test bed by the Omaha AWIPS TE and MA.

3.7 Evaluate Validation Results

Not applicable.

4 Test Identification

4.1 General Information

This section further describes the test process and contains the test descriptions for the TO's requirements listed in the RTM.

4.1.1 Test Levels

PDT, completed in Omaha by the Omaha AWIPS test team and mission assurance, and DT, done in Silver Spring, are completed at the system and subsystem levels to evaluate the performance and compliance of system and subsystem requirements. PDT focuses on both the system and subsystem level requirements. DT focuses primarily on system level requirements and those sub-system requirements necessary to test delivered capability. DT requirements are spelled out in the RTM. An on-site dry run period is conducted prior to beginning DT to ensure test system integrity (i.e., software installation, data flows, etc.). Following the successful conclusion of DT and delivery acceptance, the software is turned over to the customer for testing.

The following diagram describes the DT process.

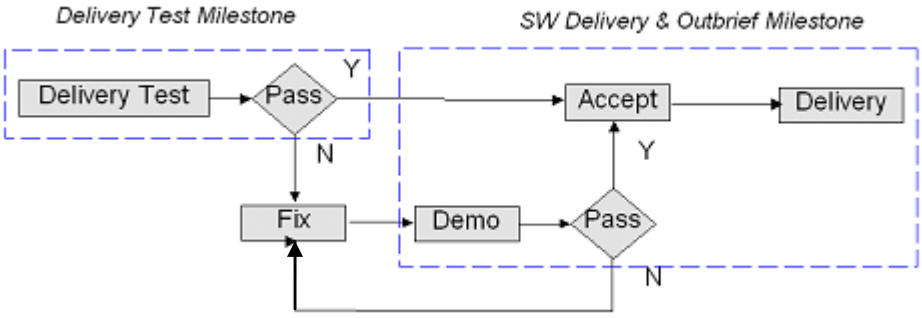

Figure 4-1 Delivery Test Process

Both System Level and Subsystem Level requirements will be tested during PDT. A more detailed level of testing will be accomplished during PDT. The PDT drills deeper and examines capabilities such as the database, meteo library, and stability/performance. DT will primarily test System Level requirements.

Test cases (and subsequent test procedures) are developed to demonstrate the capabilities and functionality of the system. The capabilities and functionality tested are intimately tied to the system requirements listed in the RTM. DT is intended to support NWS acceptance of the

software delivered under the Task Order, and is less detailed than the PDT. Test reports of PDT are delivered with the software for the customer to inspect.

4.1.2 Test Classes

One or more types of tests or test classes are implemented during test. The test type or test class is assigned to each tested requirement listed in the RTM. The test types or test classes include:

- Regression Testing: Exercises and checks the functionality of the upgraded software or system against a baseline software or system functionality to ensure that any existing system or software capabilities have not been adversely impacted
- Load/Stress Testing: Validates the limits of the system
- Stability Testing: Ensures the system remains operational for an extended period of time
- Performance Testing: Ensures the system can meet response time, throughput, and physical data transfer requirements
- Recovery Testing: Ensures the recovery procedures work properly (e.g., to recover from hardware failures)
- Human Factors Testing: Ensures the system is easy to use, manipulate, and understand by the users. The areas tested include the user interface, help facilities, ad-hoc commands, error handling, security, documentation, and ergonomics. For AWIPS II, this will entail testing to verify that the system replicates, as closely as feasible, the features incorporated into the existing AWIPS.
- Data Acquisition Testing: Validates the system's data acquisition and control capability by acquiring, processing, and manipulating data
- Output Generation Testing: Ensures all required outputs of the system are produced properly
- Functional Testing: Ensures the system meets the functional requirements of the RTM

4.1.3 General Test Conditions

Tests for the AWIPS program meet the following general test conditions:

- Regression testing is based on software or test changes generated throughout the TO and during PDT
- Tests may include valid and invalid data as appropriate
- Each ingest test uses a subset of static/canned data as ingested via NOAAPort or a live NOAAPort feed

4.1.4 Data Recording, Reduction, and Analysis

The following guidelines are used during testing:

- If a test case is discovered to be in error during PDT, the error is marked in red and documented on a Flag Form. The error is corrected in preparation for the next software release and the Flag Form signed to indicate the correction has been made. Additionally, prior to DT the test case will be updated.
- If the software fails when tested in accordance with a test case, the failure is documented on a Flag Form and the test step will be recorded as failed. The information entered contains the name of the failed test case, a complete description of the problem, the failed result, the test steps taken, and the name of the data file used with that test case. The error is corrected, the step(s) or test case retested, and the Flag Form signed to indicate the correction has been made.
- New DRs are documented in the AWIPS problem tracking system.
- DRs recorded in previous versions and fixed for this version are tested and their status in the AWIPS problem tracking system updated as needed. DR fixes are incorporated into the baseline.
- Test cases are written to verify all software requirements being tested.

4.2 Planned Tests

A regression test is executed when there has been an update to one or more software components in the run time environment as listed in the SVD, and/or coding has been re-factored. The regression tests are composed of test cases from previous task orders as well as current TO8 procedures. For TO8, the functionality from previous TOs is incorporated in the TO8 test cases. See Appendix B.

The initial set of test cases for each TO is derived from the Task Order Work Items/Activities Table found in the Task Order Proposal, or from the collection of the TO's requirements listed in the RTM. The RTM maps the Task Order Proposal requirements to test cases. The test cases for TO8 are mainly focused around D2D capabilities. The D2D Users Manual was used as a reference for deriving requirements tested in the TO8 test cases. Section 2.2 of the test cases contains a reference to the section(s) of the D2D Users Manual that apply.

The test cases are divided into applications or GUIs as outlined in the RTM. For the following test cases note:

- Just the T08 delivered capabilities will be tested in the referenced test cases
- PDT and DT Test Level: Conducted at the appropriate system and subsystem levels

- Test type or class: Listed in the RTM
- Verification method: Listed in the RTM
- The type of data to be recorded: Entries, results, and/or a pass/fail grade of each test step
- The assumptions and constraints are noted in each test procedure in the corresponding STD
- PDT Test Location: AWIPS Test Lab-Raytheon Omaha Office, STC
- DT Test Location: Raytheon AWIPS Program Management Office/Test Facility or NWS Headquarters in Silver Spring, MD (depending on the availability of test beds)

Table 4-1 contains the test cases. Changes to this table following delivery of this test plan will be coordinated with the Raytheon AWIPS PMO.

STP Paragraph Number	Test
4.3.1.1.1	ColorMap_Editor_1.0
4.3.1.1.2	Volume_Browser_1.0
4.3.1.1.3	Text_Display_Edit_1.0
4.3.1.1.4	Workstation_CAVE_1.0
4.3.1.1.5	Vectors_1.0
4.3.1.1.6	Meteogram_1.0
4.3.1.1.7	3_5_Panel_Display_1.0
4.3.1.1.8	Workstation_Modes_1.0
4.3.1.1.9	Workstation_Localization_1.0
4.3.1.1.10	Workstation_Bundles_History_1.0
4.3.1.1.11	WarnGen_1.0
4.3.1.1.12	Radar_Display_1.0
4.3.1.1.13	Skew_T_1.0
4.3.1.1.14	Plot_Model_Maintenance_1.0
4.3.1.2.1	Screen_Capture_1.0
4.3.2.1.1	Map_Service_1.0
4.3.2.2.1	SOA_PlugIns_1.0
4.3.2.3.1	Database_1.0
4.3.2.4.1	Stability_1.0
4.3.2.4.2	Performance_1.0

Table 4-1 Test Cases

4.3 TO8

4.3.1 System Level Test Cases (End User)

System Level Test Cases will be executed during DT. Test cases contain system level requirements developed from the TO8 proposal work items/activities (Table 1).

4.3.1.1 CAVE

4.3.1.1.1 ColorMap_Editor_1.0

- Test objective: This test case demonstrates the capability of CAVE to allow the user to edit, save and manipulate colors and display characteristics for satellite, grib, radar and map products. This test case also demonstrates the capability of CAVE to replace images in the large pane, automatically update when new images are received, and change the color and display characteristics of map backgrounds. This test case illustrates the use of the Utility Service through the Color Map Editor widget. The Utility Service allows the user to edit, save and recall a color map on the workstation.
- Related Test Cases:
  - Check_Out_4.1.6_ColorImage_Wu
  - D2D_Images
  - D2D_Prod_Disp_1.4.1.21

4.3.1.1.2 Volume_Browser_1.0

- Test objective: This test case demonstrates the capability of CAVE to display a representative sample of plan view, time series, time-height, variable versus height, cross section and sounding model products from available numerical models.
- Related Test Cases:
  - D2D_Prod_Load_1.4.1.22
  - Baseline_D2D_VB_Plan_1.4.1.2
  - Baseline_D2D_VB_Time_1.4.1.9_V2
  - Baseline_D2D_VB_T-Z_1.4.1.6
  - D2D_VB_XvsZ_1.4.1.7

- D2D_VB_Xsect_1.4.1.4
- Baseline_D2D_VB_Sound_1.4.1.8_V2
- ECMWF Medium Range_DCS3377-OB8.1

4.3.1.1.3 Text_Display_Edit_1.0

- Test objective: This test case demonstrates the capability of CAVE to receive, recall, display and edit text products.
- Related Test Cases:
  - Baseline_TextDB_OB8.1
  - Checkout_4.3.9_TextWorkstation_OB8.1
  - Checkout_Text_Message_OB8.1
  - Checkout_TextWorkstation_OB8.1
  - Baseline_TextWKS_1.3.12.1_V1-E
  - TextWks_1.3.12.1

4.3.1.1.4 Workstation_CAVE_1.0

- Test objective: This test case illustrates the capability of CAVE to display and manipulate static and animated images as well as associated map backgrounds. This test case also demonstrates a representative sample of functionality contained in each of the menus (Options, Tools, Volume, Obs, Upper Air, Satellite, koax and Maps).
- Related Test Cases:
  - D2D_Prod_View_1.4.1.11

4.3.1.1.5 Vectors_1.0

- Test objective: This test case demonstrates the display of contours for gridded data. This includes the ability to display contours and the gridded data simultaneously, or as a single product within the main panel. This test case also demonstrates the ability to adjust the density, line width, line style and line color of the contours.
- Related Test Cases:
  - None

4.3.1.1.6 Meteogram_1.0

- Test objective: This test case demonstrates the display of data on a meteogram display.
- Related Test Cases:
  - None

4.3.1.1.7 3_5_Panel_Display_1.0

- Test objective: This test case illustrates the display of data with CAVE using the 3 and 5 panel displays. This includes toggling between the main pane and the small panes and the resizing of the panes.
- Related Test Cases:
  - None

4.3.1.1.8 Workstation_Modes_1.0

- Test objective: This test case demonstrates the capability of CAVE to operate in normal, practice, and test modes. The full capability of demonstrating modes will require the ability to send out products. This test case also illustrates the use of a generalized time through the set time capability.
- Related Test Cases:
  - None

4.3.1.1.9 Workstation_Localization_1.0

- Test objective: This test case demonstrates the localization capability (base, site and user) to support local configuration of application capability in CAVE. This includes the capability for CAVE to work off-line or connected to services.
- Related Test Cases:
  - None

4.3.1.1.10 Workstation_Bundles_History_1.0

- Test objective: This test case illustrates how to create bundles, save, rename, delete and copy bundles from one procedure to another. This test case also demonstrates the capabilities of CAVE to record and display bundles used during operations recorded during the session within the History widget.
- Related Test Cases:
  - D2D_Procedures_1.4.1.5

4.3.1.1.11 WarnGen_1.0

- Test objective: This test case illustrates the warning software tool used to create and issue NWS short duration warnings: Tornado and Severe Thunderstorm. These warnings indicate severe weather is expected within the next few hours for locations in the warned area. This test case also illustrates the generation of VTEC coding associated with warning generation through WarnGen. The test includes verification of product content and format and will focus on a subset of product templates.
- Related Test Cases
  - Baseline_WarnGen_OB8.1
  - Checkout_WarnGen_OB8.1

4.3.1.1.12 Radar_Display_1.0

- Test objective: This test case demonstrates the capability of AWIPS to display different types of radar data available from the NOAAPort data feed. Storm motion and 4-Panel capabilities will also be tested.
- Related Test Cases
  - Baseline_D2D_Reg_RADAR_1.4.1.19
  - D2D_Loc_RADAR_1.4.1.18

4.3.1.1.13 Skew_T_1.0

- Test objective: This test case is to verify that local and model Skew-T displays load and are editable. This test case also demonstrates the interface and function with the Meteo Library by inference.
- Related Test Cases

- D2D_RAOB_1.4.1.1
- Check_out_4.1.2_Skew-T_OB8.1

4.3.1.1.14 Plot_Model_Maintenance_1.0

- Test objective: This test case demonstrates the display of surface plot data. This test case also demonstrates manipulating plot data via configuration files.
- Related Test Cases
  - None

4.3.1.2 Printing

4.3.1.2.1 Screen_Capture_1.0

- Test objective: This test case demonstrates the screen capture capability for the CAVE workstation. This includes capturing and saving images of the CAVE application. This test case also demonstrates the capability of CAVE to print the display.
- Related Test Cases
  - ScreenCaptureUtility
  - 7.1-Baseline_D2D_Capture_1.4.1.13_V2
  - Baseline_Printing_OB8.1

4.3.2 Subsystem Level Test Cases (Behind-the-Scene)

4.3.2.1 Services

4.3.2.1.1 Map_Service_1.0

- Test objective: This test case illustrates the use of the Map Service through the display of topographic map data, gridded data for points and lines.
- Related Test Cases
  - None

4.3.2.2 Plug-In

4.3.2.2.1 SOA_PlugIns_1.0

- Test objective: This test case primarily demonstrates the capability of Service Oriented Architecture (SOA) plug-ins. A combination of the CAVE Volume Browser and CAVE drop down menus will be used to display applicable data types for each of the plug-ins. This test case demonstrates the decoding, ingesting, storing and displaying of data and metadata by displaying the data spelled out in the requirements. More detailed testing of each plug-in is contained in specific T08 test cases, specifically Radar, Volume Browser, Workstation Cave, Text Display Edit, Performance, and Plot Model Maintenance.
- Related Test Cases
    - None

4.3.2.3 Miscellaneous

4.3.2.3.1 Database_1.0

- Test objective: This test case verifies the existence of the Hydro and Text databases via inspection of the data repository.
- Related Test Cases
    - None

4.3.2.4 Stability and Performance

4.3.2.4.1 Stability_1.0

- Test objective: This test case demonstrates the stability of the software by running continuously with a KOAX filtered SBN live data flow while monitoring system resources for usage and log files for critical errors. This test case also involves running CAVE periodically checking for retrieval of current data. This test case is verified at the local Omaha test site on the test hardware prior to or during PDT. The test results are recorded in the Test Report. Stability issues exposed during the test, if any, are analyzed and required corrections determined. Corrections that cannot be applied prior to Delivery Testing are reported. As is the case of other tests, critical defects that prevent testing and evaluation of TO8 delivery functionality will be corrected prior to acceptance of the delivery. Non-critical defects (those for which a reasonable work around can be provided,

or which do not prevent subsequent testing; see "TO8 Acceptance CriteriaV9") will be corrected during TO9 or a subsequent Task Order as appropriate.

- Related Test Cases
  - None

4.3.2.4.2 Performance_1.0

- Test objective: This test case serves to document the performance of the TO8 software. There are no formal performance requirements in the TO8 proposal but a need exists to monitor performance for reference purposes. The following capabilities will be monitored for performance:
  - Data ingest performance: Will use the data collected during stability testing
  - CAVE data loading performance: Will use CAVE and EDEX logs
  - A Set of Operator interactions can be monitored using clock time and logs (Operator interactions have a subjective component which will be collected by tester comment if needed)

5 Test Schedule

The schedule for AWIPS program tests and reviews are listed in the Integrated Master Schedule (IMS). The test and reviews include:

- Dry Runs
- Test Readiness Review
- Pre-Delivery Testing
- Shipment Readiness Review (SRR)
- Delivery Testing

6 Notes

Appendix A Acronyms

Acronym	Definition
ADE	AWIPS Development Environment
AWIPS	Advanced Weather Interactive Processing System
CAVE	Common AWIPS Visualization Environment
CCB	Configuration Control Board
CTR	Continuous Technology Refresh
DR	Discrepancy Reports
DT	Delivery Testing
GFE	Graphical Forecast Editor
IMS	Integrated Master Schedule
LE	Lead Engineer
NWS	National Weather Service
PL	Program Lead
MA	Mission Assurance
PDT	Pre-Delivery Testing
PMP	Project Management Plan
RIS	Raytheon Information Systems
RRD	Risk Reduction Demo
RTM	Requirements Traceability Matrix
SAT	System Acceptance Testing
SCM	Software Configuration Manager
SRR	Shipment Readiness Review
STC	Scott Technology Center
STD	Software Test Description
STP	Software Test Plan
SWE	Software Engineering
TBD	To Be Determined
TE	Test Engineering
TO	Task Order

Acronym	Definition
TP	Test Procedure
TRR	Test Readiness Review
VPN	Virtual Private Network

Appendix B Regression Test Cases

B.1 TO 8 Build Testing

Because AWIPS II has entered into the migration phase with additional new requirements, test cases and procedures developed prior to TO8 may not be applicable without significant modifications. As a result, the functionality developed prior to TO8 will be incorporated into the TO8 test cases and procedures as applicable. Therefore, regression test cases used to test builds during TO8 will consist of applicable prior TO8 test cases as well as currently being developed TO8 test cases. Build testing will be conducted at the Omaha test facility.

B.2 DT Regression Testing

Significant DRs opened during DT may require regression testing. DT regression testing will consist of re-running existing TO8 DT test procedures as mutually determined between Raytheon and the Government.