AWIPS Evolution

IV&V Test Plan
for
Task Order 8

National Weather Service

Apr, 2008
# Revised History

<table>
<thead>
<tr>
<th>Rev. No.</th>
<th>Date</th>
<th>By</th>
<th>Description of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>3/13/08</td>
<td>Cliff Wong</td>
<td>Initial Draft</td>
</tr>
<tr>
<td>0.2</td>
<td>3/18/08</td>
<td>Cliff Wong</td>
<td>Incorporate comments and added additional test cases for SEC Support Branch</td>
</tr>
<tr>
<td>0.3</td>
<td>4/21/08</td>
<td>Cliff Wong</td>
<td>Remove TO8_0004 test case per GSD. Revised test objective for TO8_9001, TO8_9002, and TO8_9003.</td>
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AE TO-8 IV&V Test Plan

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1 General Information

1.1 Purpose:
This document describes the test objects, the test objectives, the test strategy, the test types, the test resources, and the tools and automation of the test process for project AWIPS Evolution.

1.2 Scope
This document establishes the Software Test Plan (STP) for Task Order 8 (TO-8) deliverable of the AWIPS Development Environment (ADE) for the Advanced Weather Information Processing System (AWIPS).

1.3 System Overview
The Verification and Validation (V&V) is considered to be a life cycle process based on the principle that detecting problems early in the project will cost less than if they are detected later. Early detection allows more time for correction and allows more degrees of freedom for corrective actions.

For TO-8, the AWIPS ADE extends the ADE capabilities delivered under TO-6 AWIPS Continuous Technology Refresh (CTR) Re-Architecture initiative. The capabilities of ADE 1.0 provide the services support required for end-user applications.

This document describes the IV&V methodologies that are used to verify the above capabilities. It shall be used to assess that the coding is of sufficient quality, contains sufficient internal documentation, responds correctly to commands provided by the user, carries out the mathematical calculations to the required accuracy, and meets the performance requirements when applicable.

2 Reference Documents

- AWIPS Software Product Improvement Plan
- Task-order 8 proposal by Raytheon
- Internal Software Test Plan by Raytheon

3 Acronyms and Abbreviations
The following list of the acronyms and abbreviations are used in this document:

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADE</td>
<td>AWIPS Development Environment</td>
</tr>
<tr>
<td>AWIPS</td>
<td>Advanced Weather Interactive Processing System</td>
</tr>
<tr>
<td>CAPE</td>
<td>Convective Available Potential Energy</td>
</tr>
<tr>
<td>CAVE</td>
<td>Common AWIPS Visualization Environment</td>
</tr>
<tr>
<td>CCB</td>
<td>Configuration Control Board</td>
</tr>
<tr>
<td>CIN</td>
<td>Convective Inhibition</td>
</tr>
<tr>
<td>CM</td>
<td>Configuration Management</td>
</tr>
<tr>
<td>CTR</td>
<td>Continuous Technology Refresh</td>
</tr>
<tr>
<td>DR</td>
<td>Discrepancy Reports</td>
</tr>
<tr>
<td>Acronym</td>
<td>Definition</td>
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<tr>
<td>---------</td>
<td>------------</td>
</tr>
<tr>
<td>EDEX</td>
<td>Enterprise Data Exchange</td>
</tr>
<tr>
<td>FTD</td>
<td>Functional Test Driver</td>
</tr>
<tr>
<td>FTP</td>
<td>File Transfer Protocol</td>
</tr>
<tr>
<td>GRIB</td>
<td>GRidded Binary</td>
</tr>
<tr>
<td>GSD</td>
<td>Global Systems Division</td>
</tr>
<tr>
<td>I&amp;T</td>
<td>Integration and Test</td>
</tr>
<tr>
<td>IV&amp;V</td>
<td>Independent Verification and Validation</td>
</tr>
<tr>
<td>MDL</td>
<td>Meteorological Development Laboratory</td>
</tr>
<tr>
<td>METAR</td>
<td>Meteorological Aviation Routine Weather Report</td>
</tr>
<tr>
<td>N-AWIPS</td>
<td>National Centers AWIPS</td>
</tr>
<tr>
<td>NCEP</td>
<td>National Centers for Environmental Prediction</td>
</tr>
<tr>
<td>NSHARP</td>
<td>National Centers Sounding Hodograph Analysis Research Program</td>
</tr>
<tr>
<td>NWS</td>
<td>National Weather Service</td>
</tr>
<tr>
<td>OHD</td>
<td>Office of Hydrologic Development</td>
</tr>
<tr>
<td>OPS</td>
<td>AWIPS Support Branch</td>
</tr>
<tr>
<td>OST</td>
<td>Office of Science and Technology</td>
</tr>
<tr>
<td>RTM</td>
<td>Requirements Traceability Matrix</td>
</tr>
<tr>
<td>SEC</td>
<td>System Engineering Center</td>
</tr>
<tr>
<td>STD</td>
<td>Software Test-Case Document</td>
</tr>
<tr>
<td>STP</td>
<td>Software Test Plan</td>
</tr>
<tr>
<td>TO</td>
<td>Task Order</td>
</tr>
<tr>
<td>TP</td>
<td>Test Procedure</td>
</tr>
<tr>
<td>V&amp;V</td>
<td>Verification and Validation</td>
</tr>
<tr>
<td>WFO</td>
<td>Weather Forecast Office</td>
</tr>
</tbody>
</table>
4 Test Objects

The team will perform the following NWS defined tests in addition to selected planned tests performed at the Raytheon Omaha test facility. This is intended for verifying tests carried out by Raytheon.

4.1 Raytheon test cases

The Raytheon test cases for TO-8 are mainly focused around TO-8 capabilities. The test cases are divided into subsystem (EDEX and CAVE) or nonfunctional (CM/Build/Deploy Pattern, ADE, Common, and General/Non-Functional) categories as outlined in the Requirements Traceability Matrix (RTM).

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Test location(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3_5_Panel_Display_1.0</td>
<td>GSD, MDL, NCEP, OHD, SEC</td>
</tr>
<tr>
<td>ColorMap_Editor_1.0</td>
<td>GSD, MDL, NCEP, OHD, SEC</td>
</tr>
<tr>
<td>Database_1.0</td>
<td>GSD, MDL, NCEP, OHD, SEC</td>
</tr>
<tr>
<td>Map_Service_1.0</td>
<td>GSD, MDL, NCEP, OHD, SEC</td>
</tr>
<tr>
<td>Meteogram_1.0</td>
<td>GSD, MDL, NCEP, OHD, SEC</td>
</tr>
<tr>
<td>Plot_Model_Maintenance_1.0</td>
<td>GSD, MDL, NCEP, OHD, SEC</td>
</tr>
<tr>
<td>Radar_Display_1.0</td>
<td>GSD, MDL, NCEP, OHD, SEC</td>
</tr>
<tr>
<td>Screen_Capture_1.0</td>
<td>GSD, MDL, NCEP, OHD, SEC</td>
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<td>Skew_T_1.0</td>
<td>GSD, MDL, NCEP, OHD, SEC</td>
</tr>
<tr>
<td>SOA_Plugins_1.0</td>
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<td>Text_Display_Edit_1.0</td>
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<td>Vectors_1.0</td>
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<td>Volume_Browser_1.0</td>
<td>GSD, MDL, NCEP, OHD, SEC</td>
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<td>WarnGen_1.0</td>
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<td>Workstation_Bundles_History_1.0</td>
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<td>Workstation_Localization_1.0</td>
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<td>WorkstationModes_1.0</td>
<td>GSD, MDL, NCEP, OHD, SEC</td>
</tr>
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</table>

Table 4-1 Raytheon Test Cases

4.2 NWS Test Cases

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Location(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TO8_0001</td>
<td>GSD</td>
</tr>
<tr>
<td>TO8_0002</td>
<td>GSD</td>
</tr>
<tr>
<td>TO8_0003</td>
<td>GSD</td>
</tr>
<tr>
<td>TO8_0005</td>
<td>GSD</td>
</tr>
<tr>
<td>TO8_0006</td>
<td>GSD</td>
</tr>
</tbody>
</table>
4.2.1 GSD Test Cases

Assumptions:
- Performance testing of TO8 will be conducted on both gwar and the new AWIPS II hardware. The gwar testing will allow comparison to TO6 performance.
- Both live and sample data will be used for testing.

4.2.1.1 TO8_0001
- Test objective: Determine the adequacy of the documentation and training for TO8 testing.
- The type of information to be recorded: product name, scale.
- Test Level: Conducted at the system level.
- Test type or class: Human Factors.
- Qualification/Verification Method: Demonstration, Inspection, Similarity.

4.2.1.2 TO8_0002
- Test objective: Determine whether TO8 software can be successfully installed with the accompanying documentation/instructions.
- Type of information to be recorded: product name, scale, number of seconds.
- Test Level: Conducted at the system level.
- Test type or class: Human Factors.
- Qualification/Verification Method: Demonstration, Inspection, Similarity.
4.2.1.3 TO8_0003
- Test objective: Determine whether Raytheon test procedures and results can be replicated at GSD using both real-time and supplied static data.
- The type of data to be recorded: product names in order of selection, scale, total number of seconds.
- Test Level: Conducted at the system level.
- Test type or class: Demonstration, Similarity.

4.2.1.4 TO8_0005
- Test objective: Compare TO8 performance with TO6 performance for test procedures that can be run on both builds.
- Type of information to be recorded: action, elapsed time.
- Test Level: Conducted at the system level.
- Test Type/Class: Regression & Performance Testing.
- Qualification/Verification Method: Test, Analysis.

4.2.1.5 TO8_0006
- Test Objective: Compare TO8 test procedures with same procedures run on an AWIPS build (i.e. side-by-side comparison). Look at user interface, performance, etc.
- Type of information to be recorded: Raytheon test procedure checklists
- Test Level: Conducted at the system level.
- Test Type/Class: Regression & Functional Testing.
- Qualification/Verification Method: Demonstration, Inspection, Test

4.2.1.6 TO8_0007
- Test Objective: Once we see exactly what is in the build, conduct additional tests that will utilize the system based on our knowledge of operational use.
- Type of information to be recorded: TBD
- Test Level: Conducted at the subsystem level.
- Test Type/Class: Functional Testing.
- Qualification/Verification Method: Demonstration

4.2.1.7 TO8_0008
- Test objective: Determine flexibility of Purger
- The type of data to be recorded: extract purger events from logs, inspect CAVE inventories.
- Test Level: Conducted at the subsystem level.
- Test Type/Class: Data Acquisition & Functional Testing
- Qualification/Verification Method: Demonstration, Inspection

4.2.1.8 TO8_0009
- Test objective: Add a new localization.
- The type of data to be recorded: visual comparison to D2D scales, local warning displays, WarnGen environment, Sunrise/Sunset default settings, etc.
- Test Level: Conducted at the subsystem level.
- Test Type/Class: Functional & Human Factors Testing.
- Qualification/Verification Method: Demonstration, Inspection

4.2.1.9 TO8_0010
- Test objective: Determine data integrity.
- The type of data to be recorded: visual comparison, data sampling, listings of text-based data, others TBD.
- Test Level: Conducted at the subsystem level.
- Test Type/Class: Data Acquisition & Functional Testing.
- Qualification/Verification Method: Inspection, Analysis.
4.2.2 MDL Test Cases

4.2.2.1 TO8_2001
• Test Objective: To verify TO8 functionality of the “Time of Arrival/Lead Time” tool in CAVE. The tester will be required to:
  o Load the application.
  o Use the application to track a feature over time, using each of the three display modes (point, polyline, circular front).
  o Compare the time of arrival estimation for consistency with the lead time.
  o Compare the time of arrival and lead time estimations with for reasonable agreement with the information from the Distance/Speed tool.

• Test Level: Conducted at the system level.
• The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.
• Special requirements: None

4.2.2.2 TO8_2002
• Test objective: To validate that the data and format in the plot models of various station report types (METARS, synoptic, buoys, ship reports, and MAROBS) is consistent with the D-2D’s display format. Issues to be examined will include:
  o Presence of fundamental display parameters (temperature, wind speed, dewpoint weather, etc.)
  o Plotting of conditional data (e.g., wind gusts, present weather). Note that the plot models are highly configurable in CAVE, but MDL will try to ensure that the default setup is the same as D-2D’s.
  o Comparisons of the plot model data to the raw observation from cursor sampling, to verify that the data is being displayed accurately.
  o Ad hoc comparisons of live data values in CAVE and D-2D, to verify reasonable agreement between the two displays (taking into consideration that information in the displays may differ due to varying station lists, update times, handling of specials/corrections, etc.)

• Test Level: Conducted at the system level.
• Special requirements: Live data feeds for METARs, maritime reports, synoptic reports, and MAROBS.
• The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.
• Qualification method: Compare output values for consistency. Compare performance.

4.2.3 NCEP Test Cases

NCEP strategy is to run a suite of tests that test capabilities that are of particular relevance to NCEP requirements.

Assumptions:
• External grid datasets can be imported into ADE for testing purposes.
• External raw METAR datasets can be imported into ADE.
• Numerical grid values can be output from ADE for comparison purposes.
• ADE will allow dumping of raw and decoded METAR data.

4.2.3.1 TO8_4201 - Global Grid Ingest, Decode and Display Test
• Test objective: Verify proper ingest and decoding and display of GFS ½ degree global grid.
  • Verify that ingest and decoding complete without errors
  • Compare decoding of grid is correct by comparing select grid values to NAWIPS decoded values for same grids.
  • Verify that global grid displays properly across geographic boundaries
• Verify that CAVE can properly display all GFS forecast times
• Verify that CAVE can properly load and display more than one set of GFS forecast times using D2D pane mechanism
• Verify that CAVE contour and image fill work properly and perform acceptably
• Qualification method: Compare output values for consistency.
• Special requirements: N-AWIPS shall be used for comparison.
• The type of data to be recorded: Entries, results, and a pass/fail grade of each test step

4.2.3.2 TO8_4202 - NDFD Ingest, Decode and Display Tests
• Test objective: Verify proper ingest, decode, and display of full domain NDFD datasets.
• Verify that ingest and decoding complete without errors
• Verify that CAVE can properly display all forecast times in CAVE
• Compare decoding of grid is correct by comparing select grid values to NAWIPS decoded values for same grids.
• Qualification method: Compare output values for consistency.
• Special requirements: N-AWIPS shall be used for comparison.
• The type of data to be recorded: Entries, results, and a pass/fail grade of each test step

4.2.3.3 TO8_4203 - Ingest, Decode and Display Grids with Bitmaps/Missing Data
• Test objective: Verify proper ingest, decode, and display of grid datasets with bitmaps and/or missing data
• Verify that ingest and decoding complete without errors
• Compare decoding of grid is correct by comparing select grid values to NAWIPS decoded values for same grids.
• Verify that CAVE can properly display all forecast times in CAVE
• Qualification method: Compare output values for consistency.
• Special requirements: N-AWIPS shall be used for comparison.
• The type of data to be recorded: Entries, results, and a pass/fail grade of each test step

4.2.3.4 TO8_4301 - METAR Decode and Display Test
• Test objective: Verify proper ingest, decode, and display of METAR data
• Verify that ingest and decoding complete without errors
• Compare decoded values in ADE with decoded values in N-AWIPS for consistency
• Verify that CAVE can properly display decoded data
• Qualification method: Compare decoded values in ADE to corresponding values in N-AWIPS for consistency.
• Special requirements: N-AWIPS shall be used for comparison.
• The type of data to be recorded: Entries, results, and a pass/fail grade of each test step

4.2.3.5 TO8_4302 – TAF Decode and Display Test
• Test objective: Verify proper ingest, decode, and display of TAF data.
• Verify that ingest and decoding complete without errors.
• Compare decoded values in ADE with decoded values in N-AWIPS for consistency.
• Verify that CAVE can properly display decoded data.
• Qualification method: Compare decoded values in ADE to corresponding values in N-AWIPS for consistency.
• Special requirements: N-AWIPS shall be used for comparison.
• The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.

4.2.3.6 TO8_4303 – PIREP Decode and Display Test
• Test objective: Verify proper ingest, decode, and display of PIREP data.
• Verify that ingest and decoding complete without errors.
• Compare decoded values in ADE with decoded values in N-AWIPS for consistency.
Verify that CAVE can properly display decoded data.
Qualification method: Compare decoded values in ADE to corresponding values in N-AWIPS for consistency.
Special requirements: N-AWIPS shall be used for comparison.
The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.

4.2.4 SEC Test Cases

4.2.4.1 TO8_8001
- Test objective: Test the throughput and latency of text, satellite, grib and radar messages passing through the ESB layer.
- Test Level: Conducted at the ESB level.
- Test type or class: Performance.
- Qualification method: Inspection.
- Special requirements: NWS provided test driver ESB endpoints.
- The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.
- The assumptions and constraints are noted in each test procedure in the corresponding STD

4.2.4.2 TO8_8002
- Test objective: Test the latency of sending text messages with a large number of binary messages going across the ESB.
- Test Level: Conducted at the ESB level.
- Test type or class: Performance.
- Qualification method: Inspection.
- Special requirements: NWS provided test driver ESB endpoints.
- The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.
- The assumptions and constraints are noted in each test procedure in the corresponding STD

4.2.4.3 TO8_8003
- Test objective: Test all data ingested are correctly stored in the repository (DBMS/hdf5 metadata).
- Test Level: Conducted at the system level.
- Test type or class: Performance.
- Qualification method: Demonstration.
- Special requirements: NWS provided test driver ESB endpoints.
- The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.
- The assumptions and constraints are noted in each test procedure in the corresponding STD

4.2.4.4 TO8_0004
- Test objective: Selected Raytheon's OB8.1 System Integration Testing Test Cases (Table 4-3) to verify D2D, Volume Browser, Skew-T features in TO8.
- The type of data to be recorded: product name, decoder, number of seconds.
- Test Level: Conducted at the subsystem level.
- Test Type/Class: Data Acquisition & Functional Testing
4.2.4.5  TO8_8005
- Test objective: Test the throughput and latency for ingesting and storing text, satellite, grib and radar messages for the current WFO data volume and twice this load.
- Test Level: Conducted at the ESB level.
- Test type or class: Performance.
- Qualification method: Demonstration.
- Special requirements: NWS provided data sets based on operational WFO systems.
- The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.
- The assumptions and constraints are noted in each test procedure in the corresponding STD

4.2.4.6  TO8_8006
- Test Level: Conducted at the subsystem level.
- Test type or class: functional.
- Qualification method: Visual
- The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.

4.2.4.7  TO8_8007
- Test objective: Evaluate performance of the EDEX server-side while ingesting live OAX SBN data in cluster mode running on "baseline" Dell 2950 servers on a dedicated Gig-E network. Determine whether all ingested data is processed and stored in a "timely" fashion. Cluster configuration will be based on Raytheon's own recommendations. We will evaluate cluster performance using different NAS hardware (Netapp, StorageTek, etc). Two- and three-node clusters will be evaluated. The Dell 2950 hardware specifications will match the known hardware specs of Raytheon's proposed PX replacements (i.e., proposed "AWIPS II server hardware").
- Test Level: Conducted at the system level.
- Test type or class: Performance.
- Qualification method: Visual
- The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.

4.2.4.8  TO8_8008
- Test objective: Determine stability of the EDEX server-side while ingesting live OAX SBN data in cluster mode running on "baseline" Dell 2950 servers on a dedicated Gig-E network. This will
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focus on database and edex process stability over time (e.g., determine if postgres and hdf5 databases stay in sync over time, evaluate the effect of purging on database stability, etc).

- Test Level: Conducted at the system level.
- Test type or class: Stability.
- Qualification method: Visual
- The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.

4.2.4.9 TO8_8009
- Test objective: Evaluate (remote) workstation performance and stability. The workstations will run CAVE only. The EDEX server-side will ingest live SBN data and run in cluster mode on "baseline" Dell 2950 servers. The workstations and cluster will reside on a dedicated Gig-E LAN. Evaluate response times for product call-up and display in CAVE. Attempt to load the network with several CAVE workstations and evaluate performance of the system.
- Test Level: Conducted at the system level.
- Test type or class: Performance.
- Qualification method: Visual
- The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.

4.2.4.10 TO8_8010
- Test objective: Determine data volume during live SBN ingest when the EDEX server-side is running in cluster mode on Dell 2950 servers (MB of data per hour and number of ingested files per hour). Determine average and peak data volume (over all the ingested data and according to data type).
- Test Level: Conducted at the system level.
- Test type or class: Performance.
- Qualification method: Visual
- The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.

4.2.4.11 TO8_8011
- Test objective: Experiment with ingesting other (non-OAX) SBN data. For example, ingest the normal LWX SBN load (as seen on NHDA or NMTW). Evaluate performance of the EDEX services. Determine average and peak data volumes of the ingested data.
- Test Level: Conducted at the system level.
- Test type or class: Performance.
- Qualification method: Visual
- The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.

4.2.5 OPS Test Cases

4.2.5.1 TO8_9001
- Test objective: Test the techniques typically used by forecasters in manipulating the WarnGen warning polygon on the CAVE graphics display. This includes moving back and forth in time on the CAVE display, adjusting the storm track location for each radar frame and adjusting the warning polygon. Verify the WarnGen "redraw box" functions, use the mouse buttons to add/remove/adjust polygon vertices and to add/remove counties and portions of counties. For each polygon adjustment, use "create text" to verify that the correct counties are included in the product.
- Test Level: Conducted at the subsystem level.
- Test type or class: Functional.
- Qualification method: Inspection.
- The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.

4.2.5.2 TO8_9002
- Test objective: Test the accuracy of county portion descriptions and cities included in WarnGen products. This includes changing the warning polygon and storm track to test various combinations of county/CWA boundaries, various proximities to rural areas, category one, two
and three WarnGen cities. For each polygon adjustment, use "create text" to verify that the correct county portions, cities and lat/lon coordinates are included in the product.

- Test Level: Conducted at the subsystem level.
- Test type or class: Functional.
- Qualification method: Inspection.
- Special requirements: None.
- The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.

4.2.5.3 TO8_9003
- Test objective: WFOs often customize WarnGen templates to meet local needs for the specific contents of short duration warning products. This test verifies that some of the most often customized items in WarnGen templates can be correctly customized. These include warning durations, portions of counties, including/excluding lists of cities, limiting the number of cities included, defining the distance of "over" or "near" a city, and modifying the Call to Action section.
- Test Level: Conducted at the subsystem level.
- Test type or class: Functional
- Qualification method: Inspection.
- The type of data to be recorded: Entries, results, and a pass/fail grade of each test step.

5 Test Resources

5.1 Team Members
The following organizations/ team members are involved in the IV&V:

- GSD – Joaane Edwards, Leigh Cheatwood, James Fluke
- MDL – Michael Churma, Cece Mitchell, Kenneth Sperow
- NCEP – David Plummer, Scott Jacob, Steve Gilbert
- OHD – XuNing Tan
- OST/SEC – Stowell Davison, Tom Kretz, Oanh Nguyen, Thomas McGuire, James Williams, Cliff Wong
- OPS – Mike Rega, Wayne Martin

5.2 Test Machines

5.2.1 Hardware
5.2.1.1 GSD
The following hardware items are configured as the test computer at GSD:

- AWIPS 2 Test Hardware
  - Computer: Dell Optiplex Gx270t
  - CPU: Intel 3.20 Ghz Piv (Single processor)
  - Hard Disk: Seagate Barracuda 120 Gigabyte Sata
  - CD-Writer Drive: Samsung 52/32/52x
  - Graphics Card: Nvidia Geforce Fx 5200 128 MB AGP 8x VGA/DVI
  - Memory: 2 Gigabyte RAM
  - Monitor: Dell Ultrasharp 19 Inch Flat Panel Color W/Dvi
  - Sound Card: Creative Labs Sound Blaster Live 5.1

- Collaboration test Hardware
  - Computer: Dell Precision 690n
  - CPU: Intel Xeon 2 x 2.33 Ghz, Dual Core
  - Hard Disk: two Samsung 160 Gigabyte Sata
  - CD-Writer Drive: Samsung 52/32/52x
  - Graphics Card: Nvidia Quadro Fx 3450 with 256mb Video RAM, Dual VGA/DVI
  - Memory: 2 Gigabyte RAM
  - Monitor: Dell Ultrasharp 19 Inch Flat Panel Color W/Dvi
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- Sound Card: Integrated Intel Chipset

- AWIPS 1 Metrics Collection Hardware – Linux Data Server
  - Computer: dx: Dell Poweredge 2850 - Dual 3.2ghz w/ 4GB of RAM
  - Computer: px: Dell Poweredge 2650 - Dual 2.4ghz w/ 1GB of RAM

- AWIPS 1 Metrics Collection Hardware – Linux Workstation
  - Computer: HP Model EA322AV – XW6200 -- 2x 2.8ghz Xeon 64bit, 2mb cache
  - Hard Disk: Seagate Cheetah 36.7gb 15k RPM, 8mb cache, ultra320 scsi
  - CD Writer: Hitachi 48/24/48x
  - Ethernet Adaptor: Intel 10/100/1000
  - Graphics Cards: Nvidia Quadro Nvs 285 64mb Ddr Pci Vga/Dvi
    Nvidia Geforce 7600gt 256mb Ddr3
  - Memory: 4x 2 Gigabyte RAM
  - Monitor: 3x Samsung SyncMaster 191n, 19 inch LCD
  - Soundcard: Integrated (Intel chipset)

5.2.1.2 NWS HQ
The following hardware items are configured as the test computer at NWS HQ:
- Linux – Current AWIPS baseline
  - Computer: Dell Poweredge 2850
  - Processors: Dual Intel Xeon 3.2 GHz
  - Memory: 4 Gigabyte RAM
  - Hard Drive: 72 Gigabyte SCSI
  - Video Card: G Force 7600 GT with 256 Megabytes RAM
  - Monitor: Three 19” LCD Monitors

- Linux - server
  - Computer: Dell Poweredge 2950
  - Processors: Quad-Core Intel Xeon 2.33 GHz
  - Memory: 8 Gigabyte RAM
  - Hard Drive: 72 Gigabyte SCSI
  - Video Card: G Force 7600 GT with 256 Megabytes RAM
  - Monitor: Three 19” LCD Monitors

- Windows
  - Computer: Dell Precision 380
  - Processors: Dual Pentium D 2.4GHz
  - Memory: 1.5 Gigabyte RAM
  - Hard Drive: 100 Gigabyte IDE Hard Drives
  - Video Card: NVIDIA Quadro FX 5500 with 256 Megabytes RAM
  - Monitor: 19” LCD Monitors

5.2.2 Software
5.2.2.1 GSD
The following software items are configured as the test computer at GSD:
- Linux
  - Red Hat Enterprise Linux (RHEL) 4 u2
  - JAVA 1.6 update 1
  - AWIPS OB7.1

5.2.2.2 NWS HQ
- Linux
5.3 Test Facilities

5.3.1 GSD test site
The test facility for GSD (FSLC system) is located in Boulder, CO.

5.3.2 MDL / OHD / OPS test site
The test facility NHDA and NHOW is located in 7F, 14F respectively, SSMC-2, Silver Spring, MD.

5.3.3 NCEP test site
The test facility for NCEP is the NCEP facility, Camp Spring, MD.

5.3.4 OST/SEC test site
The OST/SEC test facility is located in the NAPO laboratory, 12F, SSMC-2, Silver Spring, MD.