

Real-Time Weather Processor (RWP) Prototype Test and Evaluation (PT&E) Plan

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16. Abstract The Real-Time Weather Processor (RWP) is a data processing subsystem that will provide hazardous and operationally significant weather information for use by National Weather Service (NWS) Center Weather Service Unit (CWSU) meteorologists, Air Traffic Control Specialists (ATCS), pilots and other users. This plan outlines the Federal Aviation Administrations (FAA) evaluation of the RWP prototype subsystem. The FAA will conduct the evaluation of the RWP prototype at the Jet Propulsion Laboratory (JPL) located in Pasadena, California. The RWP Prototype Test and Evaluation (PT&E) will be conducted in two parts each having a different approach. There will be an operational evaluation of the features, functions and documentation, and a demonstration of the RWP to Next Generation Weather Radar (NEXRAD) interface. Data will be collected via questionnaires completed by CWSU meteorologists and FAA system maintainers. The results of the evaluation will be used to make any necessary changes to the RWP production specification.					
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EXECUTIVE SUMMARY

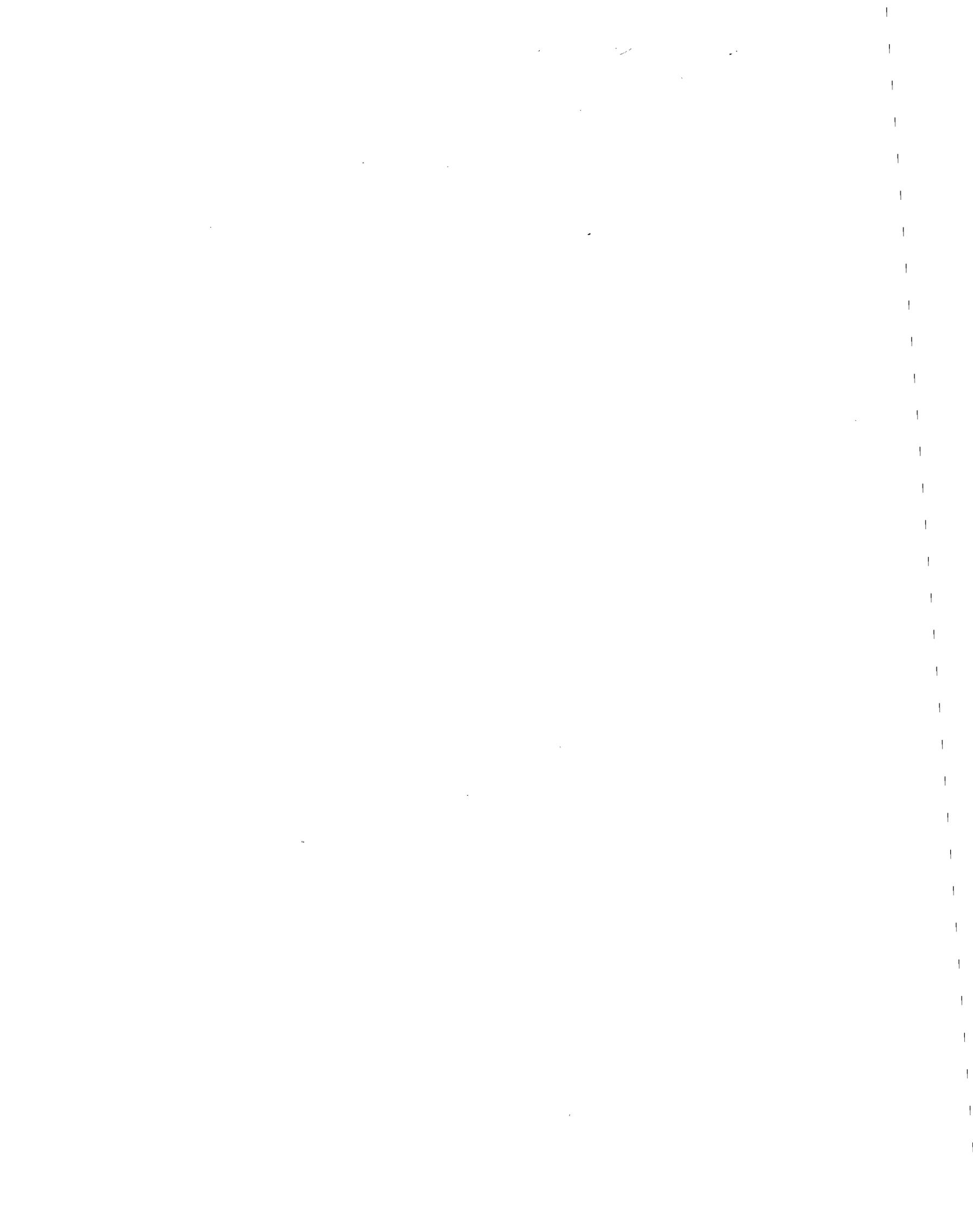
The Department of Transportation (DOT), Federal Aviation Administration (FAA) will conduct the Prototype Test and Evaluation (PT&E) of the Jet Propulsion Laboratory (JPL) prototype of the Real-Time Weather Processor (RWP). The PT&E will evaluate the RWP features and functions, along with demonstrating the Next Generation Weather Radar (NEXRAD) interface. The operational effectiveness and suitability of the RWP prototype subsystem will be assessed in order to identify any necessary changes to the RWP specification required prior to solicitation for an RWP production contract.

The RWP PT&E plan provides the overall philosophy and approach for the evaluation and demonstration of the RWP prototype subsystem. This document addresses the necessary operational requirements/statements, which will be assessed and evaluated, along with the NEXRAD interface requirements to be demonstrated, to determine the operational suitability and interoperability of the RWP.

The primary information contained within this plan consists of the following:

1. The RWP operational requirements/statements to be assessed/evaluated.
2. The NEXRAD interface requirements to be demonstrated.
3. Evaluation categories.
4. Evaluation Verification Requirements Traceability Matrix (VRTM).
5. NEXRAD Demonstration Traceability Matrix (DTM).

The Weather and Remote Maintenance Monitoring Systems Branch, ACN-250, along with its support contractors, have the responsibility for the development of the RWP PT&E plan and procedures. The plan and procedures will be used to assess/evaluate the specified operational requirements/statements, and to demonstrate the NEXRAD interface for the RWP prototype subsystem. JPL's Formal System Acceptance Test (FSAT) will provide the means by which all of the RWP System Specification (FAA-E-2737A) requirements will have been tested and verified prior to the PT&E activity.



1. INTRODUCTION.

The Real-Time Weather Processor (RWP) production subsystem will be an integral part of the overall end-state National Airspace System (NAS). The RWP is a data processing subsystem that will provide hazardous and operationally significant weather information for use by National Weather Service (NWS) Center Weather Service Unit (CWSU) meteorologists, Air Traffic Control Specialists (ATCS), pilots, and other users. The RWP will receive weather data from a number of sources, such as the Next Generation Weather Radar (NEXRAD) and the NWS. The RWP will process the received data to generate weather products that are easy to interpret and will transmit these products to the Area Control Computer Complex (ACCC) for use by air traffic control (ATC) personnel. The RWP will also transmit a subset of its weather products to the Data Link Processor (DLP) for uplink to the pilots via data link, and to the Weather Message Switching Center Replacement (WMSCR) for distribution to other users. In addition to processing of meteorological data received at the RWP, the RWP will provide the CWSU meteorologist with a workstation capability to display, create, and manipulate the weather products (e.g., weather radar products) in its data base. The RWPs will be deployed at all Area Control Facilities (ACF), the Federal Aviation Administration (FAA) Academy, and the FAA Technical Center.

Prior to procuring an end-state production RWP subsystem, the FAA has sponsored the Jet Propulsion Laboratory (JPL) to develop and test the RWP prototype subsystem. The development of a prototype will provide such benefits as (1) actual software to be furnished to the production contractor, (2) definition of detailed system engineering requirements, (3) establishment of user requirements, (4) production risk assessment, (5) user validation, (6) demonstration of the RWP/NEXRAD interface, and (7) consideration of workstation and human factors requirements.

A Prototype Test and Evaluation (PT&E) will be conducted on the RWP prototype subsystem at JPL. The PT&E will be conducted in two parts, each having a different approach. There will be an operational evaluation of the features, functions and documentation, and a demonstration of the RWP to NEXRAD interface. The operational evaluation will allow the two groups of RWP users, CWSU meteorologists and System Maintenance Service (ASM) system operators, the opportunity to assess the features and functions on the RWP workstations. To facilitate the evaluation of the features and functions, the requirements from the RWP system specification have been utilized as a framework by which the evaluation portion will be conducted.

1.1 PURPOSE/SCOPE.

The purpose of this plan is to describe the evaluation of the RWP features and functions, and the demonstration of the RWP/NEXRAD interface.

This plan will further define the overall planning, personnel, coordination, and related evaluation and demonstration activities identified in the RWP Master Test Plan (MTP). The plan will also identify the demonstration and evaluation roles, along with responsibilities of support personnel that will be required to participate in PT&E.

This plan contains two matrices. The RWP specification requirements listed in the Evaluation Verification Requirements Traceability Matrix (VRTM), appendix A, will be used only as the framework for evaluating the RWP features and functions. Each requirement listed in the VRTM will be utilized in the evaluation to ensure that no feature or function is overlooked by the RWP users in their assessment of the system. Verification of these specification requirements will have taken place during Formal System Acceptance Testing (FSAT), which is conducted by JPL prior to PT&E. Appendix B contains the NEXRAD Demonstration Traceability Matrix (DTM). These requirements will be demonstrated during the PT&E.

This plan specifically defines the overall activities of the RWP PT&E personnel required to evaluate and demonstrate the requirements identified in the VRTM and DTM. The utilization of this plan will provide multiple benefits which include:

- a. Identification of those RWP requirements to be evaluated or demonstrated.
- b. Definition of the scope of the evaluation to be performed by the FAA, during the PT&E phase.
- c. Definition of the scope of the NEXRAD interface demonstration during PT&E.
- d. Identification of the resources and activities to be coordinated in preparation for, and support of PT&E evaluation and demonstration. This includes identification of the RWP prototype equipment and any other hardware or software necessary to support this evaluation, also identification of the activities requiring the support from organizations other than the FAA.
- e. Guidance and direction for the development of detailed NEXRAD Interface demonstration procedures and evaluation questionnaires.

1.2 AUTHORITY TO CHANGE.

This plan has been produced by the Weather and Remote Maintenance Monitoring Systems Branch, ACN-250, at the FAA Technical Center. Subsequent approval/revisions of this plan shall result from coordination with the Weather Processors Program Office, ANW-130.

Modifications/revisions to this plan after initial release/approval shall be proposed to the program office in writing through the FAA Technical Center, Communications/ Navigation/Surveillance Division (ACN-200). The proposal shall clearly document the section number of the plan, the information currently contained in the plan, and the proposed modification. The reason for the proposed modification shall also be defined. Upon receipt of this information, the program office shall evaluate the proposed change and approve/reject the modification. The program office shall then render its decision in writing to the FAA Technical Center, ACN-250 branch office for disposition. The ACN-250 branch office will maintain a record of all dispositions and subsequent revisions to the plan.

2. APPLICABLE DOCUMENTS.

This section lists the applicable documentation and reference materials which relate to the contents of this plan, or upon which this plan was based.

2.1 GOVERNMENT DOCUMENTS.

SPECIFICATIONS:

FAA-E-2737A Real-Time Weather Processor (RWP)

STANDARDS:

FAA-STD-024a Preparation of Test and Evaluation Documentation, August 17, 1987

FAA-STD-028 Standard for Contract Training Program

MILITARY:

MIL-STD-1472-C Human Engineering Design Criteria for Military Systems, Equipment, and Facilities

OTHER DOCUMENTS:

FAA:

FAA Order 1810.4A FAA NAS Test and Evaluation Program

(TBD) Real-Time Weather Processor (RWP) Master Test Plan, Draft, January 09, 1990

NAS-SS-1000 NAS System Specification

NAS-MD-110 Test and Evaluation (T&E) Terms and Definition for the National Airspace System, March 27, 1987

Non-FAA:

R400-SP301 NEXRAD Technical Requirements (NTR), January 1, 1986, NEXRAD Joint System Program Office (JSPO)

2.2 NONGOVERNMENT DOCUMENTS.

JPL 5405-35 Next-Generation Weather (NEXRAD) to Real-Time Weather Processor (RWP) Interface Control Document, September 25, 1989

JPL 5405-41 Real-Time Weather Processor Software Design Document, June 16, 1989

JPL 5405-53 System Integration and Test Plan (Rev A/3), March 20, 1989

JPL 5405-54	System Integration and Test Description (Draft 3), June 16, 1989
JPL 5405-80	Real-Time Weather Processor Training Concept Report, September 15, 1989
JPL 5405-81	Computer Resources Integrated Support Document
JPL 5405-82	Real-Time Weather Processor Computer System Operator's Manual, June 16, 1989
JPL 5405-83	Real-Time Weather Processor Workstation Operator's Manual, July 7, 1989
JPL 5405-84	Real-Time Weather Processor Adaptation Description Document, July 7, 1989
JPL	Informal Job-Task Analysis, June 15, 1989
	Documents/Drawings from Vendor Off-The-Shelf Hardware
UNISYS 1208304D	UNISYS - Next-Generation Weather Radar, Radar Product Generation/Associated, Principal User Processor, Interface Control Document, March 1, 1988
UNISYS 120837C	UNISYS - Next-Generation Weather Radar, Product Specification, Interface Control Document, May 29, 1987

3. RWP PT&E PHILOSOPHY.

The PT&E conducted by ACN-250 will evaluate the features and functions associated with the RWP prototype subsystem, and demonstrate the NEXRAD interface. The results of the evaluation and demonstration will be used to identify any needed enhancements and/or changes for the production RWP.

The PT&E has been separated into two distinct parts: (1) evaluation of features, functions, and documentation; and (2) the demonstration of the NEXRAD interface. The requirements to be assessed in the evaluation portion have been categorized to facilitate the evaluation. There are four evaluation categories: (1) Category A, Human Factors; (2) Category B, Site Adaptation Data; (3) Category C, Training; and (4) Category D, Documentation Review. The VRTM, appendix A, details the breakdown of requirements to evaluation categories. The requirements to be demonstrated, as part of the NEXRAD interface, have been grouped into Category E, NEXRAD interface demonstration, and are detailed in the DTM (appendix B).

The evaluation portion of the PT&E effort will utilize operational personnel (NWS CWSU meteorologists and FAA ASM system operators) to evaluate and assess the RWP prototype subsystem from a hands-on perspective. The primary tool for the evaluations by the users will be questionnaires designed to elicit their assessment of all the RWP features, functions, and operational documentation. There will be separate questionnaires for evaluation categories A, B, and D and for each of the two types of users. The evaluation of the RWP training provided by JPL will be conducted by the FAA Academy. The evaluation of the RWP features, functions, documentation, and training will determine the prototype's operational effectiveness and suitability as well as identify enhancements and/or changes required prior to solicitation for a production RWP. Recommended enhancements may result in the development of new operational procedures, defining new specification requirements and/or enhancements to software, training, logistics, and personnel requirements.

The NEXRAD interface demonstration will demonstrate the RWP to NEXRAD interface. Procedures will be developed to conduct this demonstration.

When completed, this plan and associated detailed procedures will:

- a. Evaluate the RWP's operational requirements.
- b. Demonstrate RWP/NEXRAD interface capability.
- c. Provide early detection of Man-Machine Interface (MMI) design problems.
- d. Minimize the risks associated with proceeding to the next project milestone.

4. RWP PT&E APPROACH AND CONCEPT.

In order to accomplish the two goals of the PT&E effort (1) assessment of the RWP prototype features, functions, and documentation by the system users, and (2) prototype demonstration of the NEXRAD interface, the PT&E has been divided into two parts. The evaluation of the RWP by the users will address the operational effectiveness and suitability. The demonstration of the NEXRAD interface will demonstrate the NEXRAD to RWP interface. The requirements that will be evaluated or demonstrated have been identified in appendices A and B. Each requirement has been assigned to an evaluation or demonstration category.

The following assumption has been made prior to the commencement of RWP PT&E:

Upon the successful completion of the JPL FSAT, all mechanical and electrical interfaces have been inspected and are in accordance with the design specification. This includes, but is not limited to, the FAA-accepted Test Data Generator (TDG), interface connectors, electrical printout connections, data and control circuits, and all applicable Interface Control Documents (ICDs) which are specified in this plan.

The RWP end-state configuration, as shown in figure 4-1, will interface with the ACCC, Coded Time Source (CTS), the Maintenance Processor Subsystem (MPS), the Data Link Processor (DLP), NEXRAD, the Automated Weather Observing System (AWOS) Data Acquisition System (ADAS), the WMSCR, the Meteorologist Weather Processor (MWP), the RWP Adaptation Compiler (RAC), and the CWSU Meteorologist. Differences between the end-state configuration and the actual equipment used for PT&E at JPL are shown in figure 4-2, RWP PT&E configuration.

During PT&E, all of the actual systems that the production RWP will interface with will not be available. The FAA-approved TDG will simulate these systems.

4.1 EVALUATION APPROACH FOR CATEGORIES A, B, C, AND D.

The evaluation of the features and functions of the RWP will primarily be conducted within Categories A and B. Two separate questionnaires will be designed to elicit information from the meteorologists regarding their interaction with the Meteorologist Interface Processor Console (MIPC) and from the system operators regarding their interaction with the Computer Operator Terminal Console (COTC). To accomplish these evaluations by the meteorologists and system operators, questionnaires will be developed to address all of the requirements assigned to these categories and listed in the VRTM.

The questionnaires will be completed by eight meteorologists and eight system operators that have been trained on the RWP by JPL. The questionnaires will be designed to elicit the users level of agreement with statements regarding each feature or function. (See section 10.1 for an example.) They will also serve as a checklist to ensure that the users execute each available feature or function.

The analysis of the completed questionnaires will be conducted to determine the group rating for each feature or function, along with separate overall assessments for each category by the meteorologists and the system operators. If the mean group rating for a feature or function is two or lower, the item will be tagged as unacceptable. Also, questionnaire items that have a large variance in the ratings will be noted. There will be no pass/fail rating as the intent is to obtain an assessment of the RWP versus testing requirement compliance.

The Categories A and B evaluations will take place at the JPL facility in Pasadena, CA. Eight meteorologists and eight system operators will spend a total of 1 week on the hands-on evaluations. (See detailed schedule 9.0.)

The Category C training evaluation will be conducted by the FAA Academy utilizing their standard training evaluation approach. The Documentation Review, Category D, will be conducted by both ACN-250 and ASM-420. ACN-250 will utilize questionnaires to obtain an assessment of operator manuals from the meteorologists and system operators. The design and analysis will be similar to the Categories A and B evaluations. ASM-420 will review pertinent hardware and software documentation as tasked by ANW-130.

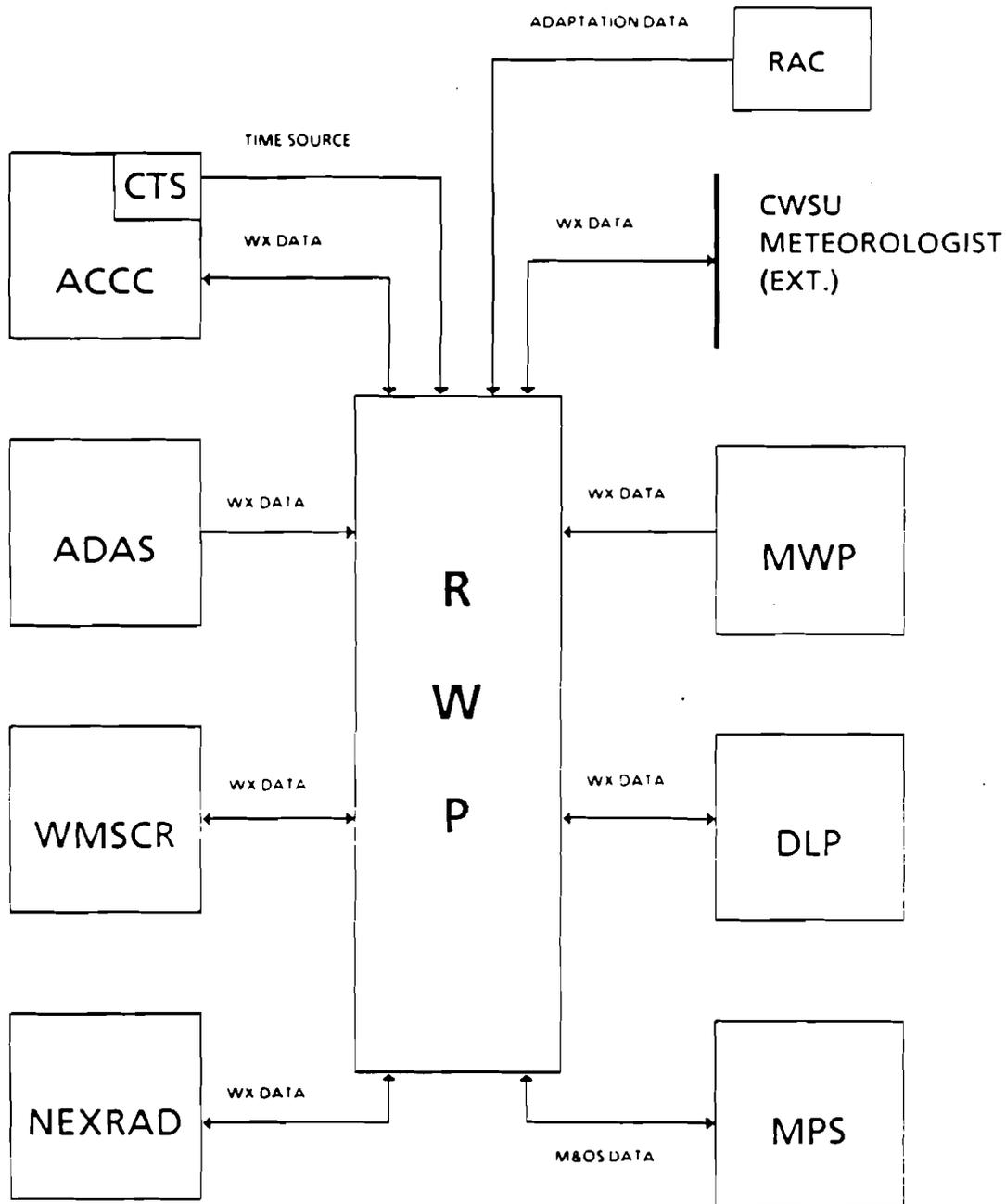


FIGURE 4-1. RWP END-STATE CONFIGURATION

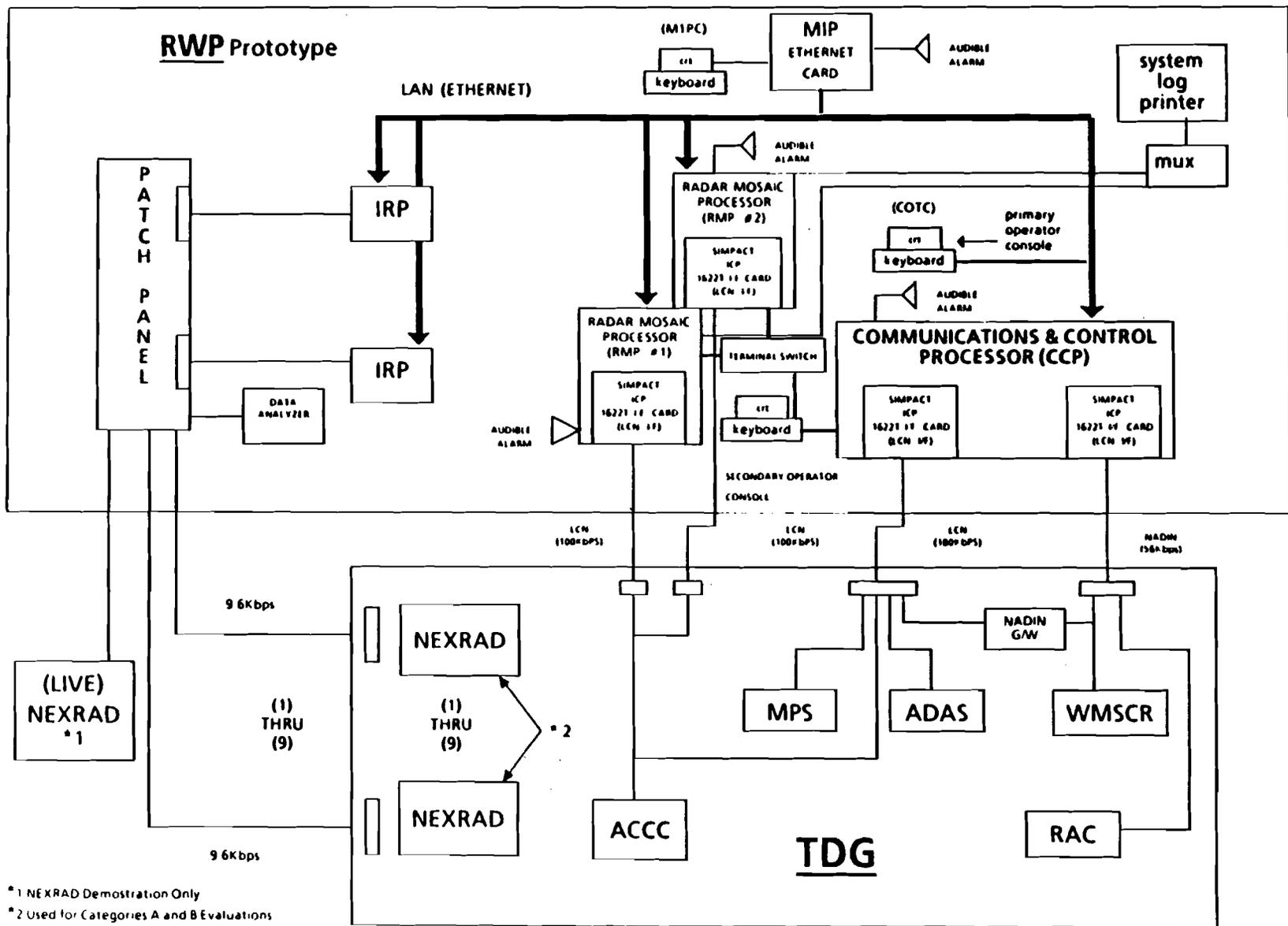


FIGURE 4-2. RWP PT&E CONFIGURATION

4.2 DEMONSTRATION APPROACH FOR CATEGORY E.

The demonstration of the RWP prototype subsystem NEXRAD interface will be conducted in a well documented, step-by-step process. Demonstration procedures will be developed to demonstrate each requirement. The NEXRAD interface demonstration will demonstrate the interface capabilities of the Build 3 RWP development. Data will be transmitted/received across the RWP/NEXRAD interface while utilizing a data analyzer to monitor the RWP/NEXRAD interface demonstration. Actual results will be compared to the expected results as outlined in the demonstration procedures. After completion of the NEXRAD interface demonstration, all applicable outputs (data analyzer output, observer notes, etc.) will be collected and analyzed to determine the demonstration results.

4.3 VERIFICATION METHODS.

Three verification methods will be applied in the RWP PT&E conducted at JPL on the RWP prototype subsystem. The methods of verification, which will be used during the PT&E, are from NAS-SS-1000 and are as follows:

4.3.1 Demonstration.

Demonstration (D) is a method where qualitative determination of properties is made for an end-item, including software and/or the use of technical data and documentation. The items being verified are observed, but not quantitatively measured, in a dynamic state.

4.3.2. Inspection.

Inspection (I) is a method of verification to determine compliance without the use of special laboratory appliances, procedures, or hardware, software and/or the technical data and documentation.

4.3.3. Analysis.

The analysis (A) method of verification consists of comparing hardware or software design with known scientific and technical principles, procedures, and practices to estimate the capability of the proposed design to meet the mission and system requirements.

4.4 RWP PT&E PROGRAM FLOW DESIGN.

The sequence of the RWP PT&E program conducted by ACN-250, as well as the overall flow of the RWP test program, is presented in figure 4.4-1, the RWP PT&E Program Flow Diagram.

Figure 4.4-1 depicts the overall flow of testing that is related to the RWP prototype subsystem. This figure indicates that JPL will perform System Integration and Test (SI&T) testing on the subsystem at their facility. During this time, ANW-130 and ACN-250 will monitor these activities. JPL will provide test reports/data to ANW-130 and ACN-250 upon the completion of their activities. A pre-T&E review will be conducted and an overall assessment of the availability and completeness of the test resources will be discussed prior to the start of PT&E. This review will be conducted by ACN-250.

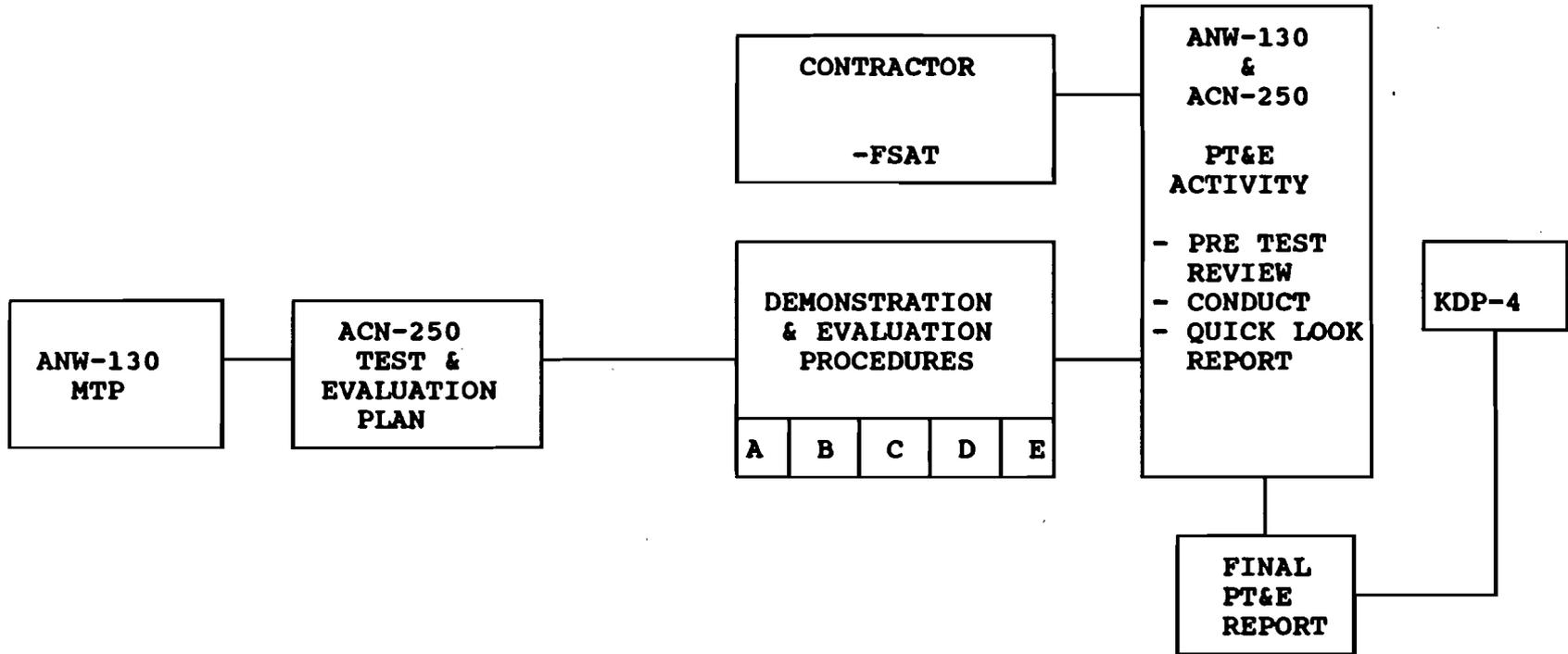


FIGURE 4.4-1. RWP PT&E PROGRAM FLOW DIAGRAM

Two PT&E reports will be produced; the first will be a Quick Look, documenting briefly the results of the evaluations and demonstration, and the second will be a final that formally documents the PT&E results.

5. RWP PT&E DEMONSTRATION AND EVALUATION CATEGORIES.

The RWP PT&E activity is centered around evaluation and demonstration categories as discussed in section 4 of this plan. This section defines each category.

The requirements of the VRM and DTM, discussed in section 10, have been logically grouped. These requirement groups relate to specific evaluation or demonstration categories. Each category corresponds to a PT&E area of evaluation or demonstration. For each evaluation or demonstration category defined, the following information will be specified: evaluation objectives, descriptions, success criteria, support software, special test equipment, data analysis, documentation, etc., that will be required for their assessment or demonstration.

The categories addressed within section 5 and their sequence are as follows:

- Category A Human Factors Evaluation
- Category B Site Adaptation Data Evaluation
- Category C Training Evaluation
- Category D Documentation Review
- Category E NEXRAD Interface Demonstration

5.1 OPERATIONAL EVALUATION: GENERAL.

The evaluations in this general category are a series of assessments conducted to determine the degree to which the RWP prototype subsystem meets the operational requirements of the system users.

5.1.1 Evaluation Category A: Human Factors.

5.1.1.1 Evaluation Description.

The evaluations in this category will provide the two RWP operators (CWSU meteorologists and ASM system operators) with the opportunity to evaluate the physical and functional MMI of the RWP prototype subsystem. The evaluations will assess the suitability of the RWP displays, adequacy of functions, and ease of use for both the MIPC and COTC.

The CWSU meteorologists and ASM system operators will assess the RWP prototype subsystem at the JPL RWP facility in Pasadena, CA. The users will exercise each feature and function detailed in the questionnaires. The users will also be allowed hands-on free time with the system. After utilizing each feature and function, the users will be able to rate its effectiveness and operational

suitability as it relates to their own operational experience. There will be separate questionnaires and evaluations for the meteorologists and system operators to assess their specific workstations. The evaluations will take approximately 4 hours per user. The meteorologist and system operator evaluations will run concurrently.

5.1.1.2 Evaluation Objectives.

There are three objectives associated with Category A, Human Factors. These objectives are the following:

a. To assess the operational suitability of the RWP prototype MIPC physical and functional MMI, when utilized by CWSU meteorologists to perform weather briefing functions;

b. To assess the operational suitability of the RWP prototype COTC physical and functional MMI, when utilized by the ASM system operators to operate the system;

c. To identify new requirements or changes to existing requirements for inclusion in the production specification, in order to enable the production RWP to meet the operational needs of the CWSU meteorologists and ASM system operators.

5.1.1.2.1 VRTM Requirements.

Evaluation Category A: Human Factors will be based on the following requirements as described in the VRTM and listed below by identification number (ID):

1005 to 1020, 1030 to 1065, 1075 to 1255, 1275 to 1415, 1425 to 1670, 1680, 1690 to 1790, 1820 to 1960, 1990 to 2000.

5.1.1.3 Evaluation Criteria.

The evaluation criteria for Category A will be based on the acceptability/nonacceptability of each feature and function listed in the VRTM for this evaluation category. The users will rate each statement about a specific feature or function on a scale of one to five, one being strongly disagree and five strongly agree. The statements are worded in a positive mode and the questionnaire seeks the users level of agreement with each statement. (See section 10.1 for an example of the statements.) A mean rating of two or lower by the eight users would tag the feature or function as unacceptable. Also, questionnaire items that show a large variance in the rating would be noted for further analysis to determine whether the questionnaire item was written poorly or the feature/function was, in fact, difficult to use.

The group rating for each feature and function will be provided so that there can be traceability back to the RWP specification for any changes that may be necessary. There is no pass/fail rating as the intent is to provide a user assessment of the prototype. The users will also be requested to provide free-form comments on the system.

5.1.1.4 Evaluation Configuration.

The configuration for Category A, Human Factors Evaluation, will consist of a fully configured RWP prototype subsystem, consisting of a complete set of default adaptation data for the Washington Air Route Traffic Control Center (ARTCC), connected to the MIPC and COTC. Figure 4-2 is a diagram of the evaluation configuration.

5.1.1.5 Support Equipment.

The JPL TDG is required to simulate the RWP interfaces necessary for the evaluation environment.

The support software required for the evaluation will consist of the complete set of default adaptation data, developed by ACN-250 for JPL for the Washington ARTCC configuration. The evaluation data will be formatted in accordance with the RWP Software Design Document (SDD), appendix I.

5.1.1.6 Evaluation Support Personnel.

The evaluation will require eight NWS CWSU meteorologists to serve as the evaluators of the RWP MIPC, physical, and functional MMI. It is desirable that these eight meteorologists receive NEXRAD training from the NWS. RWP training will be provided by JPL. The meteorologist should represent the Washington ARTCC and a cross-section of the other NWS regions, in addition to having CWSU operational experience.

Eight system operators from ASM will evaluate the MMI of the COTC. The system operators should be operationally current at ARTCCs and be representative of eight of the nine FAA regions. The system operators will receive the JPL RWP system operator training.

Other evaluation personnel are as stated in section 6 of this plan.

5.1.1.7 Data Reduction and Analysis.

The Human Factors evaluation results will be analyzed to assess whether the RWP prototype subsystem requirements for the physical and functional MMI meet the operational needs of the users. Numerical values will be assigned to the questionnaire responses, then analyzed to determine the mean response from the group and the standard deviation. Those questionnaire items with a mean of two or lower will be rated as unacceptable. Items with a large standard deviation will be noted for further analysis to determine if the feature or function was a problem or if the questionnaire item was poorly worded. These items will be discussed with the meteorologists and system operators to better understand the problem. Suggestions and free-form comments will be analyzed using content analysis. These responses will be categorized and quantified to provide additional user feedback. There is no pass/fail rating. The intent is to provide an assessment of the RWP prototype from the user's perspective and to use the input from the assessment to make any necessary changes to the production specification.

The evaluation report will reflect separate assessments of the RWP by the meteorologists and system operators, along with suggestions for inclusion into the RWP production specification.

5.1.1.8 Evaluation Support Documentation.

The support documentation for Category A, Human Factors evaluation is listed below:

- a. JPL 5405-82 RWP Computer System Operator Manual, JPL, "Build 3"
- b. JPL 5405-83 RWP Workstation Operator Manual, JPL, "Build 3"
- c. MIL-STD-1472-C Human Engineering Design Criteria for Military Systems, Equipment, and Facilities
- d. JPL Informal Job-Task Analysis, June 15, 1989

5.1.2 Evaluation Category B: Site Adaptation Data Evaluation.

5.1.2.1 Evaluation Description.

The evaluations in this category will provide the CWSU meteorologist and the ASM system operators with the opportunity to evaluate, assess, and comment on each feature and function that allows them to access, change, and modify the RWP security and site adaptation data parameters that are under their control. These evaluations will assess the suitability of each adaptation feature and function, and the ease of their use at both the MIPC and COTC. In addition, the system operators will evaluate and assess the features and functions by which the site adaptation data is successfully loaded, updated, and activated at the MIPC and the COTC.

This evaluation will take place at the JPL facility in Pasadena, CA, and use the site adaptation data for the Washington ARTCC configuration.

The users will exercise each feature and function that accesses the security and site adaptation data detailed in the questionnaires. The users will also be allowed hands-on free time with the system. After utilizing each feature and function that accesses the security and site adaptation data, the users will be able to rate its effectiveness and operational suitability as it relates to their own operational experience. There will be separate questionnaires and evaluations for the meteorologists and system operators to assess each feature and function that accesses the security and site adaptation data at their specific workstation. Each evaluation will consist of eight evaluators (CWSU meteorologists and ASM system operators) and will take approximately 3 hours per user. The meteorologist and system operator evaluations will be run concurrently.

5.1.2.2 Evaluation Objective.

There are five objectives associated with the Category B, Site Adaptation Data Evaluation. These objectives are:

- a. To have the meteorologists evaluate and assess each function and feature that allows them to access, change, and modify the RWP site adaptation parameters that are under their control at the MIPC.
- b. To have the meteorologist evaluate and assess each security feature and function of the user access adaptation at the MIPC.

c. To have the system operator evaluate and assess the features and functions that allows them to access, change, and modify the RWP site adaptation parameters that are under their control at the COTC.

d. To have the system operators evaluate and assess each security feature and function of the user access adaptation at the COTC.

e. To have the system operators evaluate and assess the features and functions by which the site adaptation data is successfully loaded and updated at the MIPC and COTC.

5.1.2.2.1 VRTM Requirements.

The Category B, Site Adaptation Data Evaluation, will be based on the following requirements as described in the VRTM and listed below by ID number:

1025, 1070, 1260, 1265, 1420, 1675, 1685, 1795 to 1819, 2015 to 2200.

5.1.2.3 Evaluation Criteria.

The evaluation criteria for Category B will be based on the acceptability or nonacceptability of each feature and function listed in the VRTM for this evaluation category. The users will rate each statement about a specific feature or function, used to access, change or modify the security and site adaptation data (on a scale of one to five); one being strongly disagree and five strongly agree. The statements will be worded in a positive mode and the questionnaires will be designed to seek the users level of agreement with each statement. (See section 10.1 of this plan for an example of the statements.) A mean rating of two or lower by the eight users would tag the feature or function as unacceptable. Also, any questionnaire item that shows a large variance in the rating would be noted for further analysis to determine whether the questionnaire item was poorly written or the feature/function was difficult to use.

The group rating for each feature and function, used to access, change, or modify the security site adaptation data, will be provided so that there can be traceability back to the RWP specification for any changes that may be recommended. There is no pass/fail rating, as the intent is to provide a user assessment of the feature and function used to access, change, or modify the security, and site adaptation data of the RWP prototype subsystem. The users will also be requested to provide free-form comments.

5.1.2.4 Evaluation Configuration.

The configuration for Category B, Site Adaptation Data Evaluation will consist of a fully configured RWP prototype subsystem, consisting of the complete set of default adaptation data for the Washington ARTCC, connected to two COTCs and two MIPCs. Figure 4-2 is a diagram of this configuration.

5.1.2.5 Support Equipment.

The JPL TDG is required to simulate the RWP interfaces necessary for the evaluation environment.

The support software required for this evaluation will consist of the complete set of default adaptation data for the Washington ARTCC configuration. This data was developed by ACN-250 for JPL. The evaluation data will be formatted in accordance with appendix I of the RWP SDD.

5.1.2.6 Evaluation Support Personnel.

The evaluation support personnel for this category will consist of eight NWS CWSU meteorologists and eight FAA ASM system operators.

The CWSU meteorologists will serve as the evaluators of the RWP prototype subsystems features and functions used to access, change, or modify the security and site adaptation data, as presented to them at the MIPC. It is desirable, that these eight CWSU meteorologists receive NEXRAD training from the NWS. RWP training will be provided by JPL. These meteorologists should represent the Washington ARTCC and a cross-section of other NWS regions and have CWSU operational experience.

The eight system operators from ASM will evaluate the features and functions used to access, change, or modify the security and site adaptation data used for system monitoring and control, as presented at the COTC. In addition, these system operators will evaluate the features and functions by which the site adaptation data is loaded, and updated at both the COTC and MIPC. The system operators should be operationally current at the ARTCCs and should represent a cross-section of the FAA regions. The system operators will receive the JPL system operator training.

Other evaluation personnel are as stated in section 6 of this plan.

5.1.2.7 Data Reduction and Analysis.

The Site Adaptation Data evaluation results will be analyzed to assess whether the RWP prototype subsystem requirements for each function and feature used to access, change, or modify security and site adaptation data, meet the operational needs of the users.

Numerical values will be assigned to the questionnaire responses, then analyzed to determine the mean response from the group and the standard deviation. Those questionnaire items, with a mean of two or lower, will be rated as unacceptable. Items with a large standard deviation will be noted for further analysis to determine if the feature or function was a problem, or if the questionnaire item was poorly worded. These items will be discussed with the meteorologists and system operators to better understand the problem. Suggestions and free-form comments will be analyzed using content analysis. These responses will also be categorized and quantified to provide additional user feedback.

There is no pass/fail rating. The intent is to provide an assessment of each function and feature used to access, change, or modify the security and site adaptation data of the RWP prototype subsystem from the user's perspective. It is also the intent to use the input from the assessment to make any necessary changes to the RWP production specification.

5.1.2.8 Evaluation Support Documentation.

The support documentation for Category B, Site Adaptation Data Evaluation, is listed below:

- a. RWP ADD RWP Adaptation Description Document, JPL,
 "Build 3"
- b. RWP CSOM RWP Computer System Operator Manual, JPL,
 "Build 3"
- c. RWP WOM RWP Workstation Operator Manual, JPL,
 "Build 3"

5.1.3 Evaluation Category C: Training.

The evaluation of the RWP training, provided by JPL, will be conducted by the FAA Academy, AAC-909 and AAC-940. The FAA Academy has been tasked with the Contracting Officer Technical Representative (COTR) duties in the area of training for the RWP program. These duties include the reviewing of the prototype training material for technical and instructional content, and ensures that all previously identified changes were made in accordance with contract provisions. AAC instructors will attend the prototype classes to assess the content and conduct of the classes and the contractor's performance in teaching it. The COTR notifies the contracting officer about the status of the material and the impact that remaining requirements will have on the training. The COTR makes a recommendation to the contracting officer on whether or not to accept the initial training materials as submitted.

The FAA Academy Training COTR will be included in the evaluation of the RWP. The Training COTR will be provided the opportunity to become technically familiar with the requirements and operation of the equipment. This will allow the AAC personnel to evaluate any training concerns or issues, and to obtain a firsthand look at the meteorologists and system operators utilizing the system.

5.1.4 Evaluation Category D: Documentation Review.

This evaluation will be conducted to review the operational effectiveness of the RWP prototype subsystem support documentation. ACN-250 and ASM-420 will have concurrent responsibility with their specific tasks being conducted independently.

5.1.4.1 Evaluation Description - ASM-420.

ASM-420 will conduct an independent review of the hardware and software documentation as described in the VRTM (appendix A) and present the results of their review to the RWP program office (ANW-130).

5.1.4.2 Evaluation Description - ACN-250.

ACN-250 has the responsibility to review the documentation specified in paragraph 5.1.4.2.2. The evaluations in this category will provide the CWSU meteorologists and the ASM system operators with the opportunity to evaluate, assess, and comment on the operational documentation of the RWP prototype.

The user evaluation will be conducted at the JPL facility in Pasadena, CA. An evaluation questionnaire will be developed to evaluate the acceptability of the documentation. The questionnaire will be completed by the meteorologists and the system operators after they have had the opportunity to use the system and documentation during the Categories A and B evaluations. The evaluation will take approximately 1 hour per person.

5.1.4.2.1 Evaluation Objectives - ACN-250.

The objectives of this evaluation are to assess the following:

a. The capability of the information in the documents to provide the users, in their operational environment, with the necessary information to operate the subsystem.

b. The technical accuracy of the documents with respect to the users' ability to select and retrieve the appropriate features and functions.

5.1.4.2.2 VRTM Requirements - ACN-250.

The Category D, Documentation Review, conducted by ACN-250 will evaluate the following documents as described in the RWP Prototype Evaluation VRTM (appendix A) and listed below:

- | | | |
|----|----------|--|
| a. | RWP CSOM | RWP Computer System Operator's Manual (CSOM),
"Build 3" |
| b. | RWP WOM | RWP Workstation Operator's Manual (WOM),
"Build 3" |
| c. | RWP ADD | RWP Adaptation Description Document (ADD),
"Build 3" |

5.1.4.2.3 Evaluation Criteria - ACN-250.

The evaluation criteria for Category D will be based on the acceptability/nonacceptability of each of the three documents. The users will rate each statement concerning the documents on a scale of one to five; one being strongly disagree and five being strongly agree. Users will be requested to add their free-form comments. The questionnaire will provide a mean level of agreement among the users in the operational effectiveness of the documentation. Upon examination of the users' scores, a mean rating of one or two would deem the related documentation nonacceptable.

Each document will be evaluated/assessed independently by the users (meteorologists and system operators). A listing of problems, and/or areas of concern for those items not acceptable, with recommendations for solutions/revisions, as necessary, will be prepared.

5.1.4.2.4 Evaluation Support Personnel - ACN-250.

The evaluation will require the eight CWSU meteorologists and eight ASM system operators who participate in the Categories A and B evaluations, to complete the questionnaires.

Other support personnel required for this category are specified in section 6.

5.2 CATEGORY E: NEXRAD INTERFACE DEMONSTRATION.

5.2.1 Demonstration Description.

The NEXRAD Interface Demonstration will demonstrate the functional interface between the RWP prototype subsystem and a NEXRAD. In order to perform the NEXRAD Interface Demonstration, procedures will be developed to evaluate the NEXRAD interface's ability to make requests and display weather products from NEXRAD at the MIPC position.

Prior to the demonstration, live weather radar data will be captured (or simulated) and stored for later playback during the NEXRAD Interface Demonstration by the Operational Support Facility (OSF) personnel at Norman, Oklahoma. Capturing or simulating weather radar data earlier will allow a controlled test environment.

After both the RWP prototype subsystem and NEXRAD have been powered on and the correct protocols and communication connections have been established, system engineers at the NEXRAD OSF will load the live weather radar data tape that is to be used for this demonstration. From this point, system operators at the RWP prototype subsystem will use the developed demonstration procedures to execute commands for requesting and displaying weather radar data products as outlined in the demonstration procedures.

The NEXRAD Interface Demonstration will be performed in two sessions. Session One will exercise the commands used to make requests, and to display all Request/Reply Products (RRPs) and Routine Individual Products (RIPs) available in Build 3 from the MIPC. Session Two will further exercise commands to request/display RRP's and RIP's, and in addition, exercise the interface's ability to detect and handle anomalies injected into interface.

5.2.1.1 Demonstration Objectives.

The objectives of the NEXRAD Interface Demonstration are as follows:

- a. To assess the operational suitability of the RWP prototype physical and functional interface.
- b. To demonstrate that the RWP prototype can communicate correctly with a "live" NEXRAD, and that the NEXRAD interface provides the RWP prototype with adequate and accurate interface data.

5.2.1.1.1 DTM Requirements.

The NEXRAD Interface Demonstration will checkout and evaluate the following requirements as described in the DTM in appendix B and listed below by ID number:

4000, 4005, 4010, 4015, 4020, 4025, 4030, 4040, 4045, 4050, 4055, 4060.

5.2.1.2 Evaluation Criteria.

The evaluation criteria for Category E will be based on the checkout and evaluation of each requirement listed in the DTM. System engineers will access the "live" NEXRAD interface and send data to and from the RWP prototype subsystem with the data analyzer setup to monitor the results. Each result obtained shall match the expected result specified in the NEXRAD Interface Demonstration

Procedures in order to consider the requirement as being successfully checked out and evaluated. If any one of the requirements allocated to this demonstration fails to checkout successfully, then it must be properly documented and will have a bearing on the success of the overall demonstration. All demonstration data sheets will be analyzed and evaluated for the RWP PT&E Report.

5.2.1.3 Demonstration Configuration.

The NEXRAD Interface Demonstration configuration will consist of a RWP prototype subsystem connected to a "live" NEXRAD via a 9600 bits per second (bps) phone line. A data analyzer with printer capabilities will be hooked up to the RWP prototype subsystem to monitor input/output. Figure 4-2 is a diagram of this configuration.

5.2.1.4 Support Equipment.

The support hardware for the NEXRAD Interface Demonstration will consist of an Atlantic Research Corporation (Interview 7500 series) Data Analyzer with a printer.

The support software required for testing will consist of the RWP NEXRAD software (version 2.x). No special equipment is required for completion of this demonstration except the hardware and software noted above.

5.2.1.5 Demonstration Support Personnel.

The NEXRAD Interface Demonstration support personnel will consist of the RWP PT&E team described in section 6 of this plan. In addition, the Test Director (TD) will coordinate with other FAA organizations and JPL, as appropriate, to ensure that the "live" NEXRAD site, and the data analyzer are ready and available for use when required. Special support personnel for this category will consist of system engineers who will assist in the execution and in the collection, recording, and analysis of data. System engineers will be assigned to specific activities during demonstration by the test manager.

5.2.1.6 Data Reduction and Analysis.

The NEXRAD Interface Demonstration results will be analyzed for proper checkout and evaluation of the requirements specified in the DTM (appendix B). Data analysis for this demonstration will be accomplished by comparison of the actual data and collected data sheets to the expected results presented in the NEXRAD Interface Demonstration Procedures.

The data analysis strategy for the Category E demonstration is to have a system engineer monitor, via the use of a data analyzer, the RWP Prototype Subsystem communications to/from the "live" NEXRAD site, and report their conclusions of the demonstration.

Their comments on the demonstration data sheets will include statements about the confidence levels of the demonstration results.

NWS	Provides eight CWSU meteorologists to participate in the assessment of the RWP.
NEXRAD OSF	Provides operational support to the NEXRAD Interface Demonstration.
Support Contractors	Support ACN-250 in developing plans, and questionnaires for PT&E. Provides support to the test director in the implementation of this plan in conducting, and observing/witnessing testing activities, as required. Assists in the preparation of logs, analyses of results, and preparation of the PT&E reports.
System Engineering and Integration Contractor (SEIC)	Supports ACN-250 in PT&E scheduling and planning. Provides support in preparation of NEXRAD procedures and conduct of NEXRAD demonstration. Supports the preparation of reports documenting NEXRAD demonstration results.
JPL	As directed by the project manager and the contract, JPL will support ACN-250 during PT&E. JPL will provide maintenance support, assistance, and corrective action in the event of system malfunction; provide TDG and system operator support, operational scenarios, and command files.

6.2 ROLES.

This section defines the following RWP PT&E Team roles:

- a. Test Director (TD)
- b. Test and Evaluation (T&E) Managers
- c. Test and Evaluation (T&E) Monitor/Observers
- d. Test and Evaluation (T&E) Operators

The above group constitutes the PT&E team. Personnel resources for each test and evaluation category are shown in figure 6.2-1.

6.2.1 Test Director (TD).

The TD is responsible for the overall management of the RWP PT&E efforts and may provide management guidance through the T&E managers. The TD authority and responsibilities have been delegated to ACN-250 for the RWP PT&E efforts.

The TD is responsible for the overall RWP PT&E coordination to ensure that individual evaluation and demonstration areas are properly structured and mission objectives are accomplished. The TD will schedule the required facilities and training, assign duties to the T&E managers, and hold pretest and post-test reviews. The TD will assist the managers in the resolution of problems, recommend remedial action, and provide general support. Duties include the coordination of evaluation results into the Quick Look report and writing the final report.

RWP PT&E TEST EVALUATION CATEGORIES				
A	B	C	D	E
1 T&E Manager 8 NWS CWSU Meteorologists 8 FAA ASM System Operators 1 JPL REP 1 T&E Monitor/Observer 1 JPL Computer Operator	1 T&E Manager 8 NWS CWSU Meteorologists 8 FAA ASM System Operators 1 JPL REP 1 T&E Monitor/Observer 1 JPL Computer Operator	Personnel required for training evaluation will be determined by the Academy	1 T&E Manager ASM-420 personnel 8 NWS CWSU Meteorologists 8 FAA ASM System Operators 1 T&E Monitor/Observer	1 T&E Manager 1 T&E Monitor/Observer 1 JPL System Analyst 1 Computer Operator JPL

NOTE: THE NUMBER OF PERSONNEL INDICATED IN THIS TABLE ARE MINIMUMS REQUIRED FOR EACH CATEGORY.

FIGURE 6.2-1. RWP PT&E PERSONNEL RESOURCES

6.2.2 Test and Evaluation (T&E) Managers.

There will be one T&E manager assigned to each evaluation or demonstration category. The T&E manager's duties include planning, organizing, conducting, and supervising the actual conduct and collection of demonstration or evaluation data. The T&E managers will also be responsible for data reduction and analysis, associated documentation required for each evaluation or demonstration, and associated sections in the final report.

6.2.3 Test and Evaluation (T&E) Monitor(s)/Observer(s).

The T&E monitor/observer's responsibilities will normally be assigned to a single team member. The T&E monitor/observer will be responsible for ensuring that scenarios and procedures are being followed by each T&E operator. The T&E monitor/observer will report to the T&E manager and will be required to maintain and complete a set of monitor/observer notes. Technically qualified observers will be assigned to observe and record activities for specific RWP PT&E activities and provide assistance in manning the T&E positions.

6.2.4 Test and Evaluation (T&E) Operator(s).

The T&E operators will be personnel assigned to the test positions during a particular evaluation or demonstration. They will be expected to follow the order of the demonstration and complete the questionnaires. For the conduct of these evaluations, the T&E operator will be under the direct supervision of the T&E manager. The CWSU and ASM personnel will function as T&E operators during the evaluation of their assigned areas. They will operate the RWP workstations in order to assess the operational effectiveness.

7. RWP PT&E DOCUMENTATION REQUIREMENTS AND CONTROL.

This section identifies the documentation, reports, and reviews that are necessary for PT&E conducted by ACN-250.

7.1 EVALUATION AND TEST CONDUCT DOCUMENTATION.

The required documents for planning, conducting, and reporting the RWP PT&E activities are presented below. Figure 7.1-1, RWP PT&E Documentation Flow, illustrates the sequence of documentation preparation.

7.1.1 Evaluation Documentation.

7.1.1.1 Evaluation Questionnaires.

There will be five questionnaires developed to obtain the input from the RWP users on their assessment of the RWP prototype in Evaluation Categories A, B, and D. Two separate questionnaires will be developed for meteorologists and system operators in Categories A and B in order to obtain assessments on each workstation. The completed questionnaires from all categories will serve as the evaluation records.

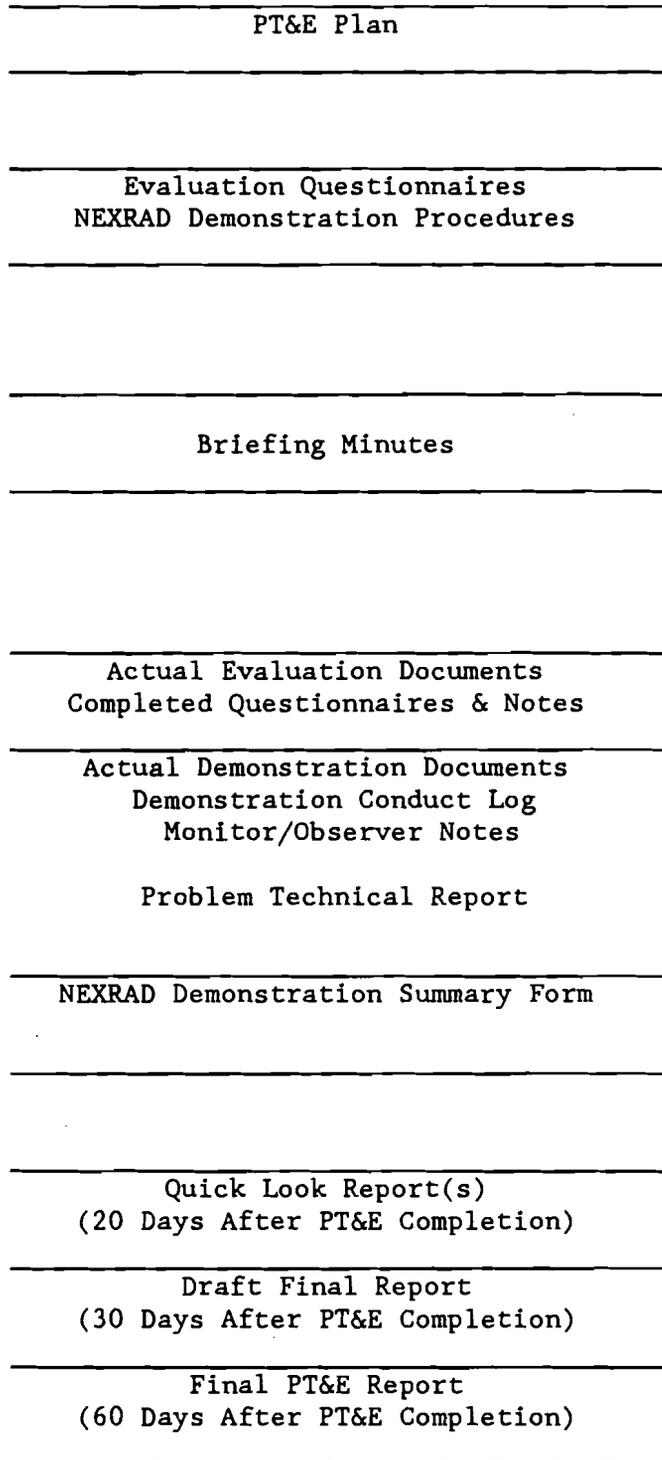


FIGURE 7.1-1. RWP PT&E DOCUMENTATION FLOW

7.1.2 NEXRAD Interface Demonstration Documents.

7.1.2.1 RWP PT&E Procedures.

The procedures will contain the step-by-step instructions for demonstrating the requirements in Category E. These procedures will be produced and demonstrated to determine whether the NEXRAD and RWP interface. The procedures will be written in accordance with FAA-STD-024a, appendix III.

7.1.2.2 NEXRAD Interface Demonstration Log.

Demonstration Conduct Logs (see C-1 of appendix C) will be used by each of the T&E monitors and operators to record events. A Conduct Log form will be included within each procedure. The T&E manager will be responsible for obtaining these logs at the conclusion of the demonstration.

7.1.2.3 T&E Monitor/Observer Notes.

The T&E monitor/observer notes will be used by each of the T&E monitor/observers to record all relevant events occurring during the demonstration (see C-2 of appendix C). This data will provide information that will contribute to the initial demonstration assessment.

7.1.2.4 NEXRAD Demonstration Problem Technical Report (PTR).

The T&E manager will ensure that all hardware or software discrepancies observed during the demonstration are documented on the PTR. (See C-3 of appendix C.)

7.1.2.5 NEXRAD Demonstration Summary Form.

In the post-test review, the demonstration summary forms will be completed by the T&E manager. (See C-4 Part 1 and 2 of appendix C.) During this time, a preliminary assessment of the demonstration will be discussed, as well as the anomalies and deviations that were noted during the demonstration.

7.2 EVALUATION AND TEST REPORTS.

The following subsections define the necessary reports that will be generated for RWP PT&E.

7.2.1 Quick Look Report.

For each demonstration and evaluation category, a Quick Look report will be produced by the T&E manager and will be provided to the TD within 20 working days after completion. The TD will combine the individual reports under a single cover for submittal to the program office. This report will give the early status information for the RWP prototype subsystem while the analysis process is still underway. The Quick Look will provide an immediate indication of the outcome of a demonstration or evaluation and highlight discrepancies noted during demonstration or evaluation, and their significance.

7.2.2 Final PT&E Report.

The RWP PT&E TD will be responsible for preparing a final report. A "Draft" report will be delivered to the ANW-130 project manager within 30 working days after the completion of PT&E. The final report will document the results of detailed analysis which will be used in identifying operational enhancements and/or changes required prior to solicitation for an RWP production contract. The status of problems identified previously in the Quick Look reports will be updated, a revised assessment made of their impact on the RWP, and the suggested corrective actions required. Any new problems discovered by detailed analysis will be identified and their impact on the subsystem will be described. The final report will be delivered to the program office 60 days after completion of PT&E.

7.3 REVIEWS.

The following subsections identify the reviews and meetings that will be conducted prior to, during, and after the RWP PT&E.

7.3.1 Test Schedule Status Review (TSSR) Meetings.

These reviews will serve to keep the RWP PT&E team advised of the status of PT&E activity. These meetings will be chaired by the TD. The TSSRs will serve as a forum in which technical interchange may take place and appropriate issues and concerns are discussed. The test plan, test procedures, scenarios, test conduct status, and problems will be addressed.

7.3.2 Pre-T&E Review.

This review chaired by the TD will be scheduled immediately prior to the start of the T&E and will be attended by all PT&E personnel. The review will include the status of prerequisites, software, and system equipment (RWP prototype subsystem and other systems and facilities). The pre-T&E briefing will also accomplish the following:

- a. Identify any needed changes and redline the procedures accordingly.
- b. Review the hardware and software configurations of the PT&E environment.
- c. Generate a record of the briefing minutes.

7.3.3 Post-T&E Review.

This review will be held upon PT&E completion. It will be chaired by the TD and attended by the full team. This meeting will review the results of the demonstration and evaluation activity. An assessment of the quality of the demonstration and evaluation, and the impact of problems encountered will be discussed during the review of the test manager's post-T&E briefing package.

8. RWP PT&E TRAINING.

The purpose of this section is to present the courses and objectives which need to be cited for the personnel participating in PT&E. This information is in accordance with the RWP Training Concept Report (JPL-5405-80) and contract.

The current formal contractor training schedule for PT&E participants is documented in the RWP Training Concept Report. The report calls for two types of training to be administered:

a. **Computer Systems Operator Course.** This course will provide training on the RWP operator functions, which include, but are not limited to, skills necessary to adapt, configure, monitor, manage, and diagnose the RWP prototype. This course will be attended by eight FAA system operators from ASM.

b. **Meteorologist User Course.** This course will train on the meteorologist user functions, which include, but are not limited to, skills necessary to perform designated configurations and meteorological responsibilities, as well as monitor, view, create radar, graphic, and alphanumeric weather products. This course will be attended by eight NWS CWSU meteorologists.

It is important to ensure that JPL's training schedules for the CWSU meteorologists and ASM system operators are officially scheduled prior to PT&E commencement. The formal training must be made available prior to PT&E to ensure efficiency and accuracy of the PT&E results.

9. RWP PT&E ACTIVITY SCHEDULES.

9.1 GENERAL.

The RWP PT&E activities are identified in figure 9.1-1 and flow upward into the RWP (prototype) Project Master Baseline Schedule (PMBS).

9.1.1 RWP PT&E Activities Schedules.

The RWP PT&E activities schedule is shown in figure 9.1-1. This schedule is developed, released, and controlled by the TD. The function of this schedule is to provide strategic schedule direction to all activities. It identifies the major tasks to be accomplished within a given area (e.g., plan development, procedure development, demonstration and evaluation execution, and reports) and identifies task durations, start-stop dates, and major performance measurement point between each.

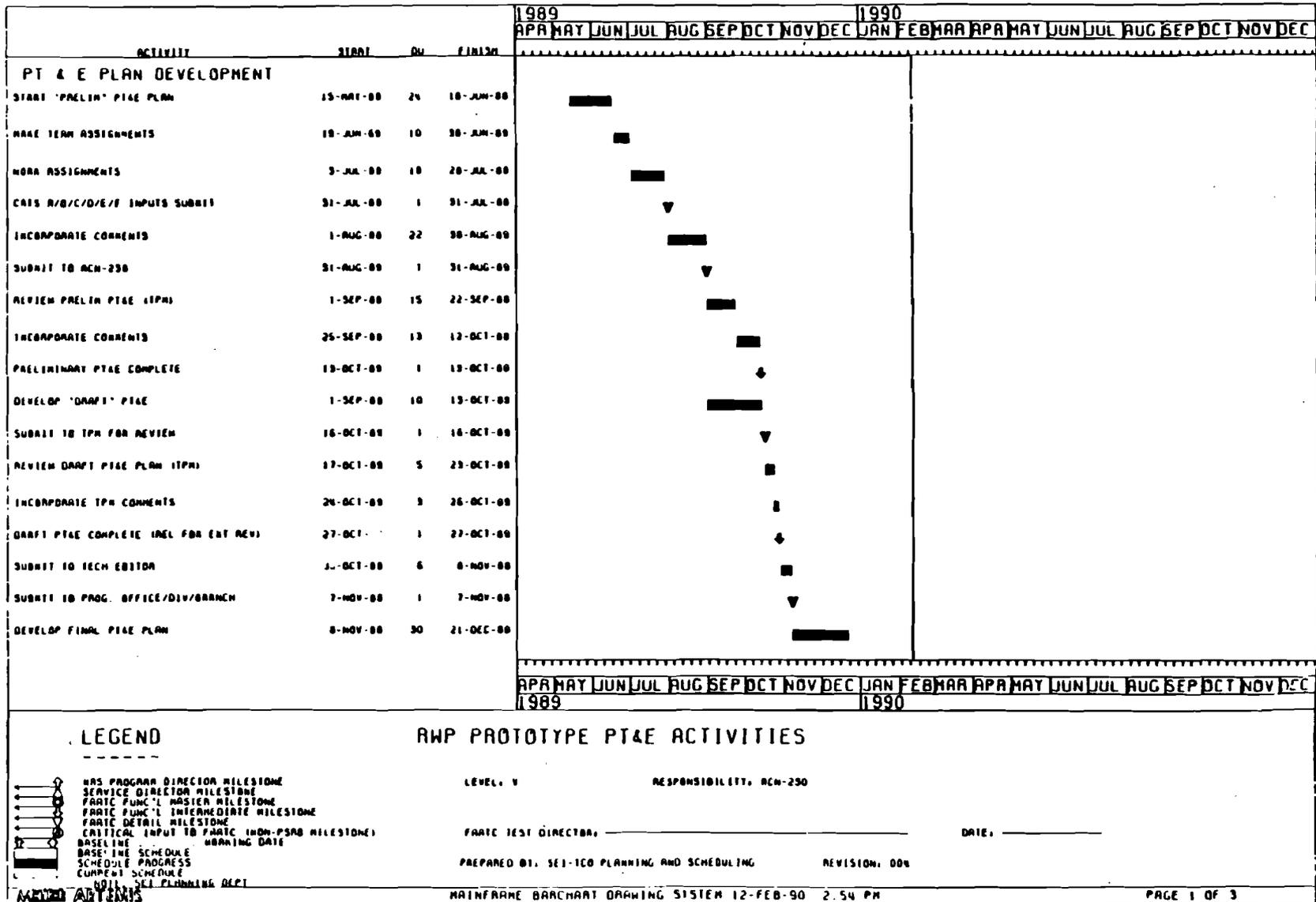


FIGURE 9.1-1. RWP PT&E SCHEDULE (SHEET 1 OF 3)

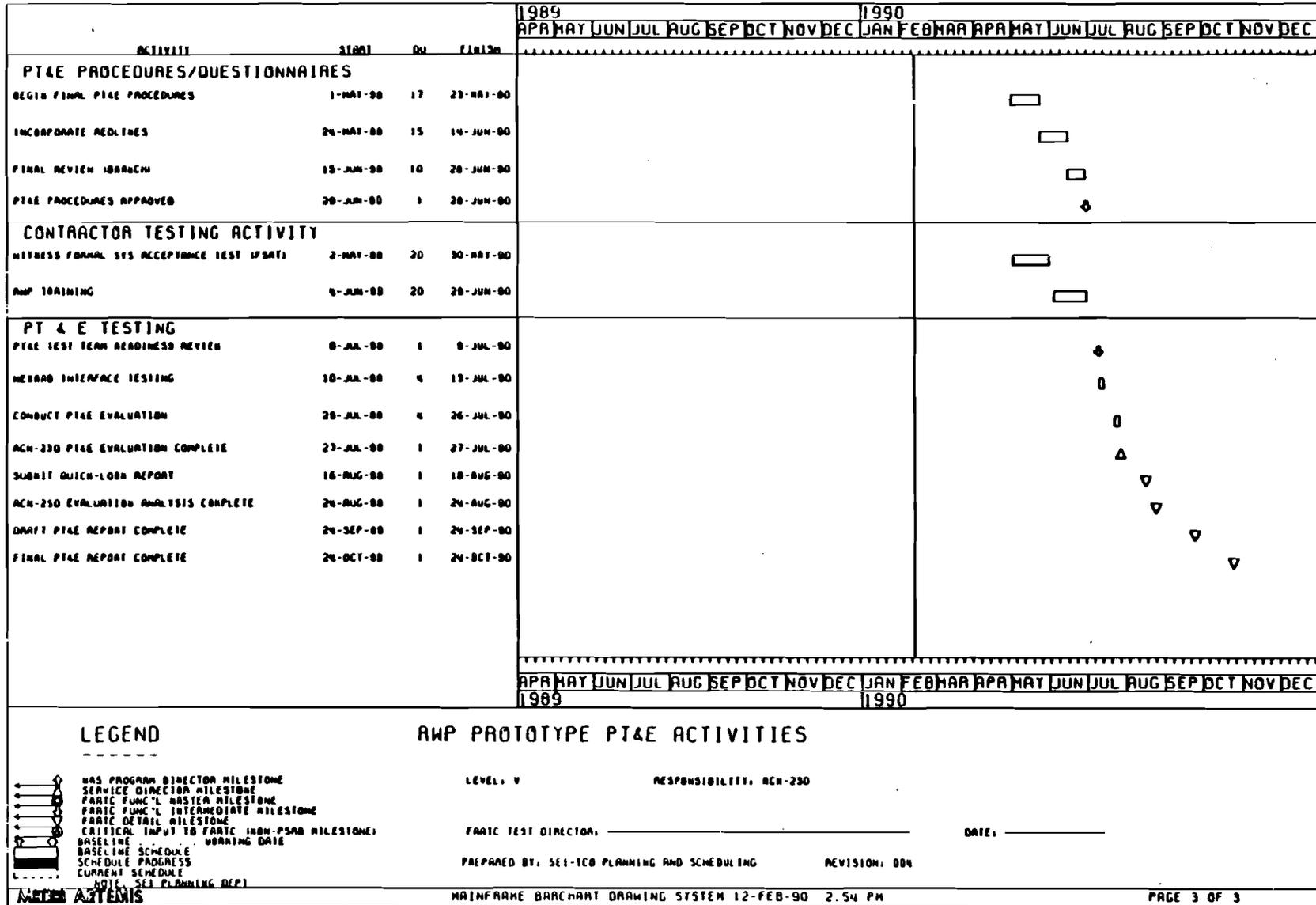


FIGURE 9.1-1. RWP PT&E SCHEDULE (SHEET 3 OF 3)

9.1.2 Personnel Resource Schedule for the Evaluation Portion of PT&E.

The PT&E personnel resource schedule is developed on the assumption that two COTCs and two MIPCs will be available for the duration of the evaluation portion of the PT&E activity. Meteorologists and system operator assessments will be run concurrently.

July 22	Travel day	All participants
July 23	8:00 a.m. - 9:00 a.m.	Introductory Briefing
	9:30 a.m. - 12:00 p.m.	RWP Training Refresher
	1:00 p.m. - 5:00 p.m.	Begin Evaluation - CAT-A
July 24	8:00 a.m. - 5:00 p.m.	CAT-A Evaluation Continues
July 25	8:00 a.m. - 12:00 p.m.	CAT-A Evaluation Complete
	12:00 p.m. - 5:00 p.m.	CAT-B Evaluation Begins
July 26	8:00 a.m. - 5:00 p.m.	CAT-B Evaluation Complete
July 27	8:00 a.m. - 12:00 p.m.	CAT-D Evaluation
	1:00 p.m. - 3:00 p.m.	Review Results W/Participants

10. RWP PT&E MATRIX OVERVIEW.

The following sections describe the two matrixes that will be utilized during the RWP PT&E activities. The first matrix, located in appendix A, is the RWP Prototype Evaluation VRTM and will be utilized to ensure traceability to evaluation Categories A, B, C, and D, discussed in section 4 and defined in section 5 of this document. The second matrix, located in appendix B, is the RWP PT&E NEXRAD DTM and will be utilized to ensure traceability of the NEXRAD demonstration requirements to test Category E discussed in section 3 and defined in section 5 of this document.

10.1 RWP PROTOTYPE EVALUATION VRTM.

The RWP Prototype Evaluation VRTM, located in appendix A, lists the applicable requirements from the RWP System Specification FAA-E-2737a that will be evaluated. These requirements will form the framework around which the evaluation will be conducted to ascertain the acceptability and usability of each function and feature. Compliance with the RWP system specification will not be verified during this evaluation.

Examples of the way the requirements form the framework for the evaluation are as follows:

1. REQUIREMENT STATEMENT #1100

"The monitor shall be capable of displaying 256 colors"

Sample Evaluation Items:

a. There are a sufficient number of colors available to code the desired WX products.

1	2	3	4	5
strongly disagree		neutral		strongly agree

b. The number of colors displayed does not create an overload of information.

1	2	3	4	5
strongly disagree		neutral		strongly agree

c. The effort required to select an available color is reasonable.

1	2	3	4	5
strongly disagree		neutral		strongly agree

2. REQUIREMENT STATEMENT #1025

"The mosaic area shall be an adaptable RWP area of interest"

Sample of Evaluation Items:

a. The RWP provides the meteorologist with an adequate area of interest.

1	2	3	4	5
strongly disagree		neutral		strongly agree

b. The meteorologist can easily locate the boundaries of the area of interest.

1	2	3	4	5
strongly disagree		neutral		strongly agree

10.2 RWP PT&E NEXRAD DTM.

The DTM contained in appendix B identifies the RWP PT&E NEXRAD requirements that will be demonstrated during the conduct of Category E.

The RWP PT&E DTM lists the applicable requirements from the RWP System Specification, FAA-E-2737A (Build 3). The requirements listed in this matrix will be demonstrated to ensure that the RWP and NEXRAD can interface.

Procedures will be developed for NEXRAD Category E, as discussed in section 4 and defined in section 5 of this plan.

11. ABBREVIATIONS AND ACRONYMS.

A	Analysis
AAC	FAA Academy
ACCC	Area Control Computer Complex
ACF	Area Control Facility
ACN	Engineering Test and Evaluation Service
ADAS	AWOS Data Acquisition System
ANW	Aviation NAS Weather
ADD	Adaptation Description Document
ARTCC	Air Route Traffic Control Center
ASM	System Maintenance Service
ATC	air traffic control
ATCS	Air Traffic Control Specialist
AWOS	Automated Weather Observing System
bps	bits per second
CAT	Category
COTC	Computer Operator Terminal Console
COTR	Contracting Officer's Technical Representative
CSOM	Computer System Operators Manual
CTS	Coded Time Source
CWSU	Center Weather Service Unit
D	Demonstration
DLP	Data Link Processor
DOT	Department of Transportation
DTM	Demonstration Traceability Matrix
FAA	Federal Aviation Administration
FSAT	Formal System Acceptance Test
I	Inspection
ICD	Interface Control Document
ID	Identification
IRP	Individual Radar Processor
JPL	Jet Propulsion Laboratory
KDP	Key Decision Point
LCN	Local Communication Network
MIPC	Meteorologist Interface Processor Console
MMI	Man-Machine Interface
M&OS	Maintenance and Operational Support
MPS	Maintenance Processor Subsystem
MTP	Master Test Plan
MWP	Meteorologist Weather Processor
NADIN	National Airspace Data Interchange Network
NAS	National Airspace System
NEXRAD	Next Generation Weather Radar
NWS	National Weather Service
OSF	NEXRAD Operational Support Facility
PMBS	Project Master Baseline Schedule
PT&E	Prototype Test and Evaluation
PTR	Problem Technical Report

RAC	RWP Adaptation Compiler
RIP	Routine Individual Products
RLTD SECTS	Related Sections
RRP	Request/Reply Products
RWP	Real-Time Weather Processor
SDD	Software Design Document
SEIC	System Engineering and Integration Contractor
SI&T	System Integration and Test
T&E	Test and Evaluation
TD	Test Director
TDG	Test Data Generator
TSSR	Test Schedule Status Review
VRTM	Verification Requirements Traceability Matrix
WMSCR	Weather Message Switching Center Replacement
WOM	Workstation Operator's Manual
WX	Weather

APPENDIX A

RWP PT&E EVALUATION VERIFICATION REQUIREMENTS TRACEABILITY MATRIX (VRTM)

1. INTRODUCTION.

This RWP Prototype Evaluation Verification Requirement Traceability Matrix (VRTM) is an essential part of the RWP PT&E evaluation process. It reflects all of the RWP PT&E evaluation requirements for Categories A,B,C, and D that will form the framework around which the evaluation will be conducted to ascertain the acceptability and useability of each function/feature. This RWP Prototype Evaluation VRTM will be maintained as required by ACN-250 until the evaluation is completed.

2. SCOPE.

The scope of this RWP Prototype Evaluation VRTM is to clearly define which requirements will be used as a framework for the evaluation. None of the requirements listed in the RWP Prototype Evaluation VRTM will be tested or verified.

3. COLUMN DEFINITIONS AND UTILIZATION.

The following information and definitions are provided for better user understanding:

ID - Unique requirement identification number, developed primarily for ease in referencing within section 5 or the RWP PT&E Plan.

REQUIREMENT STATEMENT - Requirement statements per RWP System Specification (FAA-E-2737A) or specified in the contractors Statement of Work (SOW).

EVAL MTHD - Evaluation Method Denoted by:

"D" for Demonstration

"I" for Inspection

"A" for Analysis

PT&E Plan Cross Ref CAT - Category A - Human Factors Evaluation
Category B - Site Adaptation Data Evaluation
Category C - Training Evaluation
Category D - Documentation Review

PT&E PLAN CROSS REF RLTD SECTS - The related sections column contains the section numbers where the requirement can be traced to throughout the RWP PT&E Plan.

TRACE PARAGRAPH - Primary paragraph number located in the RWP System Specification (FAA-E-2737A) where the requirement can be traced.

REMARKS - Clarifies the information depicted in the VRTM as required.

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1005	The RWP shall provide the capability for the meteorologist to generate from the workstation alphanumeric products in accordance with the Manually Created Alphanumeric Product adaptation.	D	A	5.1.1	3.1.4.5.2	
1010	The capability to generate amendments or cancellations to previously generated products shall also be provided.	D	A	5.1.1	3.1.4.5.2	
1015	Generating an amendment to a product shall not modify the original product.	D	A	5.1.1	3.1.4.5.2	
1020	The RWP shall provide the meteorologist with the capability to compose alphanumeric products with the predefined message formats and quality criteria specified in appendix VII.	D	A	5.1.1	3.1.4.5.2.1	
1025	The mosaic area shall be an adaptable RWP area of interest.	D	B	5.1.2	3.1.4.1.5.2	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1030	The RWP shall provide the meteorologist with a full-screen text-editing capability for the entry of text fields in generating alphanumeric products.	D	A	5.1.1	3.1.4.5.2.2	
1035	The RWP shall provide the meteorologist with the capability to interactively create and edit from the workstation the graphic products in accordance with the Manually Created Graphic Products adaptation.	D	A	5.1.1	3.1.4.5.3	
1040	The RWP shall provide the meteorologist with the capability to recall meteorologist-generated graphic products and modify them to create new products.	D	A	5.1.1	3.1.4.5.3.1	
1045	Modification of the recalled products shall not alter the originally stored data.	D	A	5.1.1	3.1.4.5.3.1	
1050	The RWP shall provide the meteorologist with the capability to control the position of the cursor on the display.	D	A	5.1.1	3.1.4.5.3.2	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1055	The RWP shall provide for the capability for the meteorologist to enter graphic line segments.	D	A	5.1.1	3.1.4.5.3.3	
1060	The RWP shall provide the meteorologist with prompts for the selection of all graphic functions.	D	A	5.1.1	3.1.4.5.3.4	
1065	The RWP shall provide the meteorologist with the capability to add, delete, or relocate, legends or text annotation to any manually created graphic product.	D	A	5.1.1	3.1.4.5.3.5	
1070	The RWP shall provide automatic insertion of product identification, default addresses for dissemination, date/time, and RWP identification, within the created graphic product in accordance with the Manually Created Graphic Products adaptation.	D	B	5.1.2	3.1.4.5.3.6	
1075	The RWP shall provide the capability to access any MMI function through a menu sequence and, independently, through a direct command language.	D	A	5.1.1	3.1.4.5.1	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1080	The RWP shall display each of the alarm/alerts in section 3.1.4.1.6.1 at the RWP workstation within 15 seconds after receipt of the last bit of product or message causing the alarm/alert.	D	A	5.1.1	3.1.4.1.6.1.3	
1085	The RWP shall provide a workstation with interactive data entry and display capabilities for a single meteorologist.	D	A	5.1.1	3.1.4.5	
1090	The RWP product display shall contain a minimum of 640 addressable locations in the X direction and 480 addressable locations in the Y direction.	D	A	5.1.1	3.1.4.5.5.1	
1095	The diagonal dimension of the screen shall be a minimum of 19 inches.	D	A	5.1.1	3.1.4.5.5.1	
1100	The monitor shall be capable of displaying 256 colors.	D	A	5.1.1	3.1.4.5.5.1	
1105	The RWP shall distinguish between the letter "O" and the numeral zero, as well as between the lowercase letter "L" and the numeral one.	D	A	5.1.1	3.1.4.5.5.2	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1110	The RWP shall provide both the following capabilities for alphanumeric data display:			-	3.1.4.5.5.3	Lead-in
1115	Display new information on a cleared screen.	D	A	5.1.1	3.1.4.5.5.3.a	
1120	Retain the previously displayed information and display new information as a line-by-line fill on the remaining clear portion of the screen.	D	A	5.1.1	3.1.4.5.5.3.b	
1125	The RWP shall display all image and graphic products with a legend that contains date, time, and product name.	D	A	5.1.1	3.1.4.5.5.4	
1130	The date and time in the legend shall be as follows:			-	3.1.4.5.5.4	Lead-in
1135	For received products the legend shall contain the date and time received with the product.	D	A	5.1.1	3.1.4.5.5.4.a	
1140	For internally generated product the date and time displayed in the legends shall be as follows:			-	3.1.4.5.5.4.b	Lead-in
1145	For individual radar products, the date and time shall be the time of the observation as received with the source data.	D	A	5.1.1	3.1.4.5.5.4.b(1)	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1150	For radar point mosaics the date/ time block shall show the date and time of both the oldest and most recent GRIPs from which data was used in creating the mosaic.	D	A	5.1.1	3.1.4.5.5.4.b(2)	
1154	For radar image mosaics the date/ time block shall show the date and time of both the oldest and most recent TILE's from which data was used in creating the mosaic.	D	A	5.1.1	3.1.4.5.5.4.b(3)	
1155	For HZW graphic products that depict conditions over a range of time, the date and time blocks shall show the date and time of both the beginning and end of the range.	D	A	5.1.1	3.1.4.5.5.4.b(4)	
1160	The RWP shall provide the following capabilities to control the display of alpha- numeric products.			-	3.1.4.5.5.5	Lead-in
1165	Scroll up and down.	D	A	5.1.1	3.1.4.5.5.5.a	
1170	Page forward or background.	D	A	5.1.1	3.1.4.5.5.5.b	
1175	Erase the display.	D	A	5.1.1	3.1.4.5.5.5.c	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1180	The RWP shall provide the meteorologist with the capability to zoom all point graphic and image graphic products, when displayed separately and in any allowed overlay combination, including background maps.	D	A	5.1.1	3.1.4.5.5.6.1	
1185	The RWP shall provide the meteorologist with the capability to zoom point vector graphic and image products in integer steps from 1:1 to 7:1 magnification.	D	A	5.1.1	3.1.4.5.5.6.2	
1190	Zoom shall be allowed only within the product boundary.	D	A	5.1.1	3.1.4.5.5.6.3	
1195	When vector graphic products and background maps are zoomed, the vectors shall retain their original line width in pixels.	D	A	5.1.1	3.1.4.5.5.6.4	
1200	The RWP shall provide the meteorologist with the capability to pan zoomed point image graphic and vector graphic products.	D	A	5.1.1	3.1.4.5.5.7	
1205	The viewing window boundary shall not exceed the non-zoomed product boundary.	D	A	5.1.1	3.1.4.5.5.7	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1210	While staying within this limitation, the meteorologist shall have the capability to change the center of the viewing window to any pixel within the product boundary.	D	A	5.1.1	3.1.4.5.5.7	
1215	The RWP shall have the capability of displaying an overlay of any combination of up to three products, including at most one image product, at most one point product and at most one radar vector graphic product.	D	A	5.1.1	3.1.4.5.5.8.1	
1220	The RWP shall have the capability of displaying, in overlay, up to three sets of background maps, each set having a different color.	D	A	5.1.1	3.1.4.5.5.8.2	
1225	When products are overlaid, the legends for each product shall be separately discernible.	D	A	5.1.1	3.1.4.5.5.8.3	
1230	The RWP shall provide the capability for the meteorologist to select the colors in accordance with the Color Selection adaptation.	D	A	5.1.1	3.1.4.5.5.8.4	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1235	The RWP shall provide the capability for the meteorologist to delete individual products and background map sets from an overlaid display.	D	A	5.1.1	3.1.4.5.5.8.5	
1240	The RWP shall display overlays such that each product and background map that is displayed does not obstruct a product or background map that is higher in the following precedence list (ordered from highest to lowest):			-	3.1.4.5.5.8.6	Lead-in
1245	Point products.	D	A	5.1.1	3.1.4.5.5.8.6.a	
1246	Vector graphic products.	D	A	5.1.1	3.1.4.5.5.8.6.b	
1250	Background maps.	D	A	5.1.1	3.1.4.5.5.8.6.c	
1255	Image graphic products.	D	A	5.1.1	3.1.4.5.5.8.6.d	
1260	The RWP shall provide the capability for the meteorologist to select for display the background maps in accordance with the Background Map Definition adaptation.	D	B	5.1.2	3.1.4.5.5.9.1	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1265	The RWP shall automatically display one or more default maps for each weather product in accordance with the Individual Radar Product adaptation, the Manually Created Graphic Products adaptation, the GRIP Product adaptation, and the Mosaic Product Adaptation.	D	B	5.1.2	3.1.4.5.5.9.2	
1270	The RWP shall contain a reserved display area for each of the following:			-	3.1.4.5.5.10	Lead-in
1275	Message input.	D	A	5.1.1	3.1.4.5.5.10.a	
1280	Computer response messages.	D	A	5.1.1	3.1.4.5.5.10.b	
1285	Alarm/alerts.	D	A	5.1.1	3.1.4.5.5.10.c	
1290	UTC.	D	A	5.1.1	3.1.4.5.5.10.d	
1295	The RWP shall distinguish between the display of areas containing level-0 phenomena and areas for which there is no coverage.	D	A	5.1.1	3.1.4.5.5.11	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1300	When requested for display, all products that are received or generated by the RWP in text string format shall be displayed in the same text string format.	D	A	5.1.1	3.1.4.5.5.12	
1305	All products in section 40.2 through 40.5, shall be displayed as specified.	D	A	5.1.1	3.1.4.5.5.12	
1310	The RWP shall provide a hardcopy copy device that will accept standard industry size A and B paper that can be written on with a standard ink pen, felt tip pen or pencil and be of archival quality.	D	A	5.1.1	3.1.4.5.6	
1315	The RWP shall provide the capability to output hard copies of alphanumeric products.	D	A	5.1.1	3.1.4.5.6.1	
1320	The RWP shall provide the capability to make color hard copies of any display in a minimum of 16 colors, within a maximum of 3 minutes per display.	D	A	5.1.1	3.1.4.5.6.2	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1325	The RWP shall provide for visual and audiovisual notification of weather alarm/alert conditions that are detected by the RWP.	D	A	5.1.1	3.1.4.5.7.1	
1330	The display shall include, but not be limited to, the product id(s) of the product(s) responsible for the alarm/alert.	D	A	5.1.1	3.1.4.5.7.1	
1335	Alarm/alert indicators shall remain in effect until acknowledged by the meteorologist, or until the lapsed time that has established in accordance with the Alarm/Alert Tone/Duration Settings adaptation.	D	A	5.1.1	3.1.4.5.7.2	
1340	As part of the acknowledgment to an alarm/alert, the RWP shall provide an option to display the product(s) responsible for the alarm/alert.	D	A	5.1.1	3.1.4.5.7.3	
1345	The RWP shall display the product(s) upon meteorologist selection of the option.	D	A	5.1.1	3.1.4.5.7.3	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1350	The RWP shall provide the meteorologist with the capability of causing a NEXRAD to become unavailable.	D	A	5.1.1	3.1.4.5.8.1.1	
1355	The RWP shall provide the meteorologist with the capability of causing a NEXRAD which has been previously made unavailable by the meteorologist to become available.	D	A	5.1.1	3.1.4.5.8.1.2	
1360	The RWP shall provide the meteorologist with the capability of overriding the boundaries of any displayed image mosaic to display all of the data received from any NEXRAD for the product.	D	A	5.1.1	3.1.4.5.8.1.3	
1365	The RWP shall provide the meteorologist with the capability of displaying an image mosaic product with the unmask function cancelled.	D	A	5.1.1	3.1.4.5.8.1.4	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1370	The RWP shall provide the meteorologist with the capability of displaying the status of all connected NEXRADs, with an indication of which NEXRADs are available.	D	A	5.1.1	3.1.4.5.8.1.5	
1375	When the current mosaic is requested for display, the latest retained version shall be displayed.	D	A	5.1.1	3.1.4.5.8.1.6	
1385	The RWP shall provide the meteorologist with the capability of displaying all intensity levels present, or all intensity levels at or above a threshold value for all image products.	D	A	5.1.1	3.1.4.5.8.1.8	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1390	The RWP shall provide the capability for the meteorologist to request dissemination of any alphanumeric product in accordance with the Manually Created Alphanumeric Product adaptation.	D	A	5.1.1	3.1.4.5.8.2	
1395	The RWP shall provide the capability for the meteorologist to request dissemination of any HZW product in accordance with the Manually Created Graphic Product adaptation.	D	A	5.1.1	3.1.4.5.8.3	
1400	The RWP shall prevent dissemination of an HZW without a valid time period entered by the meteorologist.	D	A	5.1.1	3.1.4.5.8.3.1	
1405	The RWP shall provide the meteorologist with the capability to assign unique identifiers to those products generated at the workstation.	D	A	5.1.1	3.1.4.5.9.1	
1410	These IDs shall be available to the meteorologist to store and retrieve those products.	D	A	5.1.1	3.1.4.5.9.1	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1415	The RWP shall have the capability to display a directory of all retained weather products.	D	A	5.1.1	3.1.4.5.9.2	
1420	The RWP shall provide the meteorologist with the capability to examine and modify the dynamic adaptation parameters defined in Appendix VI for which he has authorization in accordance with each individual adaptation as defined in Appendix VI.	D	B	5.1.2	3.1.4.5.10	
1425	The RWP shall provide the meteorologist with the capability to retrieve and display any retained product in the RWP.	D	A	5.1.1	3.1.4.5.11	
1430	The RWP shall respond to meteorologist requests according to Tables II and III.	D	A	5.1.1	3.1.4.5.11.1	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1435	The RWP shall display a single alphanumeric product or multiple alphanumeric products via a single request from the meteorologist by requesting any combination of the following, except as restricted below:			-	3.1.4.5.11.2.1	Lead-in
1440	Product identification	D	A	5.1.1	3.1.4.5.11.2.1.a	
1445	Station(s) identifier(s)/ location/state	D	A	5.1.1	3.1.4.5.11.2.1.b	
1450	Time of product/time interval required	D	A	5.1.1	3.1.4.5.11.2.1.d	
1455	Version number	D	A	5.1.1	3.1.4.5.11.2.1.e	
1465	The RWP shall display individual graphic products when the following is selected by the meteorologist:			-	3.1.4.5.11.3	Lead-in
1470	Product identifier	D	A	5.1.1	3.1.4.5.11.3.a	
1475	A valid time	D	A	5.1.1	3.1.4.5.11.3.b	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1480	The RWP shall display individual radar products when the following is selected by the meteorologist:			-	3.1.4.5.11.4.1	Lead-in
1485	Product identifier	D	A	5.1.1	3.1.4.5.11.4.1.a	
1490	NEXRAD site	D	A	5.1.1	3.1.4.5.11.4.1.b	
1500	Version number/Product generation time	D	A	5.1.1	3.1.4.5.11.4.1.d	
1505	The RWP shall display or store individual RRP's when the following is selected by the meteorologist:			-	3.1.4.5.11.4.2	Lead-in
1510	Product identifier	D	A	5.1.1	3.1.4.5.11.4.2.a	
1515	NEXRAD site	D	A	5.1.1	3.1.4.5.11.4.2.b	
1520	Number of versions (for initial request only)	D	A	5.1.1	3.1.4.5.11.4.2.c	
1525	Store only or store/display	D	A	5.1.1	3.1.4.5.11.4.2.d	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1530	The RWP shall display mosaic products when the following is selected by the meteorologist:			-	3.1.4.5.11.4.3	Lead-in
1535	Product identifier	D	A	5.1.1	3.1.4.5.11.4.3.a	
1540	Version number/Product storage time	D	A	5.1.1	3.1.4.5.11.4.3.b	
1545	Upon selection by the meteorologist, the RWP shall automatically update the display of meteorologist selected radar products when new versions of the selected product are received from external sources or are updated internal to the RWP.	D	A	5.1.1	3.1.4.5.11.4.4	
1550	The RWP shall automatically display multiple retained versions of meteorologist selected radar products, upon a request from a meteorologist.	D	A	5.1.1	3.1.4.5.11.4.5	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1555	The RWP shall process requests for display of multiple radar products in sequence that contain at least the following:			-	3.1.4.5.11.4.5.1	Lead-in
1560	Product identifier	D	A	5.1.1	3.1.4.5.11.4.5.1.a	
1565	Number of versions	D	A	5.1.1	3.1.4.5.11.4.5.1.b	
1570	Length of time for each version to be displayed.	D	A	5.1.1	3.1.4.5.11.4.5.1.c	
1575	The RWP shall accept requests from the meteorologist to discontinue, pause, and resume the display of multiple radar products.	D	A	5.1.1	3.1.4.5.11.4.5.2	
1580	The RWP shall display wind direction, wind speed, and temperature, in any forecast period, for a meteorologist specified latitude-longitude location, altitude(s) and forecast time using the algorithms specified in appendix V.	D	A	5.1.1	3.1.4.5.11.5	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1585	The location of the requested data shall be limited to the area bounded by the received GRIded Binary data.	D	A	5.1.1	3.1.4.5.11.5	
1590	The forecast time shall be limited to the latest time in the received grided data.	D	A	5.1.1	3.1.4.5.11.5	
1595	The altitude(s) shall be limited to the height of the highest received forecast altitude.	D	A	5.1.1	3.1.4.5.11.5	
1600	The RWP shall display data from any AWOS station received from ADAS in alphanumeric form, upon request by the meteorologist.	D	A	5.1.1	3.1.4.5.11.6	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1610	The RWP shall provide a console to support System control, maintenance and monitoring activities performed by the System operator.	D	A	5.1.1	3.1.4.6.1	
1615	The RWP shall provide a command language that allows the System operator to request System control, maintenance, and monitoring functions.	D	A	5.1.1	3.1.4.6.2	
1620	The RWP shall respond to all fulfilled commands with an acknowledgement indicating successful completion.	D	A	5.1.1	3.1.4.6.2.1	
1625	The RWP shall respond to all unfulfilled commands with messages identifying syntax errors in these commands, and errors detected in the performance of these commands.	D	A	5.1.1	3.1.4.6.2.2	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1630	The RWP shall provide the System operator with the capability to perform an initialization from an initial System load using operator-specified computer-system configuration parameters.	D	A	5.1.1	3.1.4.6.3.1.1	
1635	The RWP shall provide the System operator with the capability to perform an initialization when the system is operational, using previously loaded software, data and computer-system configuration parameters.	D	A	5.1.1	3.1.4.6.3.1.2	
1640	The RWP shall display status messages at the console indicating start and completion of an initialization, including the date, and time.	D	A	5.1.1	3.1.4.6.3.1.3	
1645	The start message shall include identification of software version.	D	A	5.1.1	3.1.4.6.3.1.3	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1650	The RWP shall provide the system operator with the capability to perform a partial-system initialization of selected computer processor-based portions of the System.	D	A	5.1.1	3.1.4.6.3.1.5	
1655	The RWP shall provide the System operator with the capability to initiate a full System shutdown from the system console.	D	A	5.1.1	3.1.4.6.3.2.1	
1660	The RWP shall generate a system Alarm/Alert to notify the meteorologist that the system is beginning to shutdown a sequence after a system operator command initiates a shutdown.	D	A	5.1.1	3.1.4.6.3.2.4	
1665	The RWP shall provide the System operator with the capability to perform a partial-system shutdown of selected computer processor-based portions of the System.	D	A	5.1.1	3.1.4.6.3.2.5	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1670	The RWP shall monitor its current operational state.	D	A	5.1.1	3.1.4.6.4	
1675	The monitoring period shall be adaptable from 1 through 10 minutes, in 1 second increments in accordance with the System Monitoring adaptation.	D	B	5.1.2	3.1.4.6.4.1	
1680	The RWP shall display operational status at the system console upon operator command.	D	A	5.1.1	3.1.4.6.4.2	
1685	The RWP shall display, at the workstation and system console all system alarm/alerts in accordance with the system Alarm/Alert Messages adaptation and within 10 seconds of detection of the phenomena.	D	B	5.1.2	3.1.4.6.4.3	
1690	The RWP shall maintain a product dissemination log containing a separate entry for each product that has been disseminated to external destinations during the past 24 hours.	D	A	5.1.1	3.1.4.6.5.1	
1695	This log shall include identification of the product, UTC time of dissemination, destination designation, and the message acknowledgement status.	D	A	5.1.1	3.1.4.6.5.1	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1700	The RWP shall maintain a received product log containing a separate entry for each product that has been received from external systems during the past 24 hours.	D	A	5.1.1	3.1.4.6.5.2	
1705	This log shall include identification of the product, UTC time of receipt, and origination designation.	D	A	5.1.1	3.1.4.6.5.2	
1710	The RWP shall maintain a System operations log containing a separate entry for each of the following events that have occurred during the past 24 hours:			-	3.1.4.6.5.3	Lead-in
1715	User log-on or log-off, and unsuccessful log-on attempts except that unsuccessful attempts to log-on to the System operators console shall not be logged in the RWP System Operators Log.	D	A	5.1.1	3.1.4.6.5.3.a	
1720	Alarm/Alerts	D	A	5.1.1	3.1.4.6.5.3.b	
1725	System reconfiguration	D	A	5.1.1	3.1.4.6.5.3.c	
1730	Errors detected in hardware and software	D	A	5.1.1	3.1.4.6.5.3.d	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1735	For each event, the log shall contain the UTC time of detection, specific nature of the event, identification of the originator and, if applicable, additional diagnostic data.	D	A	5.1.1	3.1.4.6.5.3	Follow-on
1740	The log shall also contain an hourly summary for resource utilization in the RWP.	D	A	5.1.1	3.1.4.6.5.3	Follow-on
1745	The RWP shall provide the operator with the capability to enable and disable production of a hardcopy of some or all of the System log entries as they are created.	D	A	5.1.1	3.1.4.6.5.4	
1750	The RWP shall display all or part of the System logs at the System console in response to operator request.	D	A	5.1.1	3.1.4.6.5.5	
1755	The RWP shall have the capability to display current logs as they are produced in response to operator request.	D	A	5.1.1	3.1.4.6.5.5	
1760	The RWP shall produce a System summary report every 24 hours, at the time of day selectable by the operator.	D	A	5.1.1	3.1.4.6.6.2	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1765	The report shall contain:			-	3.1.4.6.6.2	Lead-in
1770	A statistical summary of external external interface utilization for the past 24 hours.	D	A	5.1.1	3.1.4.6.6.2.a	
1775	A statistical summary of on-line storage utilization for the past 24 hours.	D	A	5.1.1	3.1.4.6.6.2.b	
1780	A statistical summary of processor utilization for the past 24 hours.	D	A	5.1.1	3.1.4.6.6.2.c	
1785	A summary of SAAs generated in the past 24 hours, organized by component.	D	A	5.1.1	3.1.4.6.6.2.d	
1790	The RWP shall provide the capability to generate both audible and visual signals to notify the System operator and the meteorologist of SAA conditions.	D	A	5.1.1	3.1.4.6.6.3	
1795	The RWP shall provide the capability to display/modify a set of adaptation parameters that control System operational characteristics.	D	B	5.1.2	3.1.4.6.8	
1800	The RWP shall provide two types of adaptable parameters.	D	B	5.1.2	3.1.4.6.8.1	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1815	Each dynamic and Static A adaptable parameter shall be modifiable on-line via menu, or loaded via an off-line storage device.	D	B	5.1.2	3.1.4.6.8.4	
1819	Static B parameters shall be capable of being displayed. Included in the Adaptation Description Document shall be the location of each Static B parameter in the source code, this information shall not be displayed.	D	B	5.1.2	3.1.4.6.8.4	
1820	The RWP shall have off-line diagnostic functions that are invoked from the System console.	D	A	5.1.1	3.1.4.6.9	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1830	The RWP shall selectively output the results of off-line diagnostics on hard copy or at the System console upon command from the System operator.	D	A	5.1.1	3.1.4.6.9.1	
1835	Each off-line diagnostic shall be individually invoked and executed in accordance with the Diagnostic adaptation.	D	A	5.1.1	3.1.4.6.9.2	
1840	The RWP shall, by command, restore a copy of data to on-line storage that has been stored in off-line archive storage.	D	A	5.1.1	3.1.4.6.10.5	
1845	The RWP shall, by command, display selected data that has been recovered from off-line archive storage.	D	A	5.1.1	3.1.4.6.10.6	
1850	The RWP shall store any product or file in the data base to off-line storage by command through the system console.	D	A	5.1.1	3.1.4.6.11.1	
1855	The RWP shall, by command, restore a copy of data to on-storage that had been stored off-line.	D	A	5.1.1	3.1.4.6.11.2	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1860	Mount and dismount of off-line storage device media shall be performed under operator control.	D	A	5.1.1	3.1.4.6.11.3	
1865	The RWP shall display UTC at the System Console.	D	A	5.1.1	3.1.4.6.12.2	
1915	The RWP User/System Interface shall shall satisfy data entry, data display, interactive control, user interface prompting and feedback, and error management/data protection requirements as specified in MIL-STD-1472C.	D	A	5.1.1	3.2.9.3	
1960	The ability to abbreviate all direct command sequences shall be present, using default parameters where parameters are required.	D	A	5.1.1	3.2.9.3.2	
1980	Training. Contract Item.	D	C	5.1.3		SOW requirements

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
1985	RWP Meteorological Product Display Formats.			-	Appendix 40	Lead-in
1990	Surface Observations.	D	A	5.1.1	Appendix 40 40.2	
1995	Terminal Forecasts.	D	A	5.1.1	Appendix 40 40.3	
2000	Grid Wind and Temperature Forecasts.	D	A	5.1.1	Appendix 40 40.4	
2005	RWP Adaptation.			-	Appendix 60	Lead-in
2010	System Control Adaptation			-	Appendix 60 60.1	Lead-in
2015	System Monitoring.	D	B	5.1.2	Appendix 60 60.1.1	
2020	Diagnostics.	D	B	5.1.2	Appendix 60 60.1.2	
2025	Adaptation Parameters.	D	B	5.1.2	Appendix 60 60.1.3	
2030	Radar Adaptation.			-	Appendix 60 60.2	Lead-in

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
2035	NEXRAD Site Parameter.	D	B	5.1.2	Appendix 60 60.2.1	
2055	NEXRAD Global Processing Parameter.	D	B	5.1.2	Appendix 60 60.2.5	
2060	NEXRAD Mosaic Parameter.	D	B	5.1.2	Appendix 60 60.2.6	
2065	Product Adaptation.			-	Appendix 60 60.3	Lead-in
2070	Received Products.			-	Appendix 60 60.3.1	Lead-in
2075	Received Alphanumeric (A/N) Products.	D	B	5.1.2	Appendix 60 60.3.1.1	
2080	Individual Radar Products.	D	B	5.1.2	Appendix 60 60.3.1.2	
2085	GRIdded Binary Products.	D	B	5.1.2	Appendix 60 60.3.1.3	
2090	Received AWOS/ASOS Products.	D	B	5.1.2	Appendix 60 60.3.1.4	
2095	Internally Generated Products.			-	Appendix 60	Lead-in

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
2100	Manually Created A/N Products.	D	B	5.1.2	Appendix 60 60.3.2.1	Lead-in
2105	Manually Created Graphic Products.	D	B	5.1.2	Appendix 60 60.3.2.2	
2110	GRIP Product.	D	B	5.1.2	Appendix 60 60.3.2.3	
2115	Mosaic Product.	D	B	5.1.2	Appendix 60 60.3.2.4	
2120	Converted Gridded Binary Products.	D	B	5.1.2	Appendix 60 60.3.2.5	
2125	General Adaptation.			-	Appendix 60 60.4	
2130	User Access.	D	B	5.1.2	Appendix 60 60.4.1	
2135	External Addresses.	D	B	5.1.2	Appendix 60 60.4.2	
2140	RWP Area Definition.	D	B	5.1.2	Appendix 60 60.4.3	
2145	System Alarm/Alert Messages.	D	B	5.1.2	Appendix 60 60.4.4	
2150	Background Map Definition.	D	B	5.1.2	Appendix 60 60.4.5	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
2155	Projection Conversion Parameters.	D	B	5.1.2	Appendix 60 60.4.6	
2160	Meteorologist Adaptation.			-	Appendix 60 60.5	Lead-in
2165	Alarm/Alert Identification.			-	Appendix 60 60.5.1	Lead-in
2180	Product Type Alarm/Alert.	D	B	5.1.2	Appendix 60 60.5.1.3	
2185	NEXRAD Alarm/Alert.	D	B	5.1.2	Appendix 60 60.5.1.4	
2190	Urgent Pilot Report Alarm/Alert.	D	B	5.1.2	Appendix 60 60.5.1.5	
2195	Color Selection.	D	B	5.1.2	Appendix 60 60.5.2	
2200	Alarm/Alert Tone/Duration Settings.	D	B	5.1.2	Appendix 60 60.5.3	

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
	The following items will be reviewed by ASM-160:			-		Lead-in
2215	Software Design Document.	I/A	D	5.1.4		ASM-160 Review
2220	System Integration and Test Plan.	I/A	D	5.1.4		ASM-160 Review
2225	Computer Resources Integrated Support Document.	I/A	D	5.1.4		ASM-160 Review
2230	System Integration and Test Descriptions.	I/A	D	5.1.4		ASM-160 Review
2235	Computer System Operators Manual.	I/A	D	5.1.4		ASM-160 Review
2240	Software Test Report.	I/A	D	5.1.4		ASM-160 Review
2245	Software Product Specification.	I/A	D	5.1.4		ASM-160 Review
2250	System Integration and Test Report.	I/A	D	5.1.4		ASM-160 Review
2255	Operational Hardware Procurement Specification.	I/A	D	5.1.4		ASM-160 Review
2260	Version Description Document.	I/A	D	5.1.4		ASM-160 Review
2265	Hardware Procedure and Philosophy Documents.	I/A	D	5.1.4		ASM-160 Review

ID	FAA-E-2737A Requirement Statement	Eval Mthd	PT&E Plan Cross Reference		Trace Paragraph	Remarks
			Cat.	Related Sections		
2270	Documentation/Drawings from vendor Off The Shelf Hardware.	I/A	D	5.1.4		ASM-160 Review
2275	The following delivered documents shall be reviewed:			-		Lead-in
2280	RWP Workstation Operator Manual. Build 3	I/A	D	5.1.4		Meteorologists Review
2285	RWP Computer System Operators Manual. Build 3	I/A	D	5.1.4		System Operators Review
2290	RWP Adaptation Description Document. Build 3	I/A	D	5.1.4		System Operators Review.

APPENDIX B

RWP PT&E NEXRAD DEMONSTRATION TRACEABILITY MATRIX (DTM)



1. INTRODUCTION.

This RWP PT&E NEXRAD DTM is an essential part of the RWP PT&E NEXRAD demonstration process. It reflects all of the RWP PT&E NEXRAD requirements and will serve as a single tracking tool for all the NEXRAD demonstration requirements. This RWP PT&E NEXRAD DTM will be maintained as required by ACN-230 until the NEXRAD demonstration is complete, thus serving as a record and assurance to ANW-130 that the NEXRAD requirements have been demonstrated.

2. SCOPE.

The scope of this RWP PT&E NEXRAD DTM is to clearly define and break away the NEXRAD Requirements from the rest of the RWP PT&E evaluation. Only the requirements listed in the RWP PT&E NEXRAD DTM will be demonstrated.

3. COLUMN DEFINITIONS and UTILIZATION.

The following definitions and information is provided for better user understanding:

ID - Unique requirement identification number, developed primarily for ease in referencing within section 5.0 of the Draft RWP PT&E Plan.

REQUIREMENT STATEMENT - Requirement statements per RWP System Specification.

VERF MTHD - Verification Method. Denoted by:

" D " for Demonstration

PT&E PLAN CROSS REF CAT - Category E - NEXRAD Interface Demonstration.

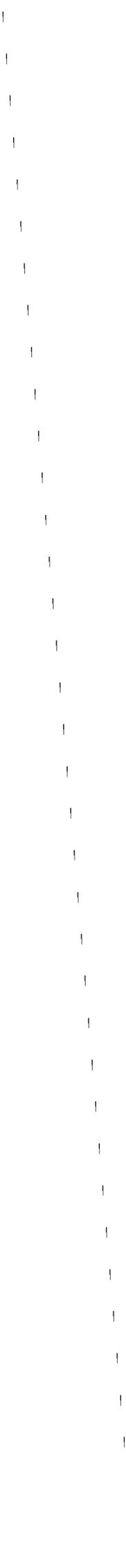
PT&E PLAN CROSS REF RLTD SECTS - The related sections column contains the section numbers where the requirement can be traced to throughout the Draft RWP PT&E Plan.

TRACE PARAGRAPH - Primary paragraph number located in the RWP System Specification (FAA-E-2737A) where the requirement can be traced.

REMARKS - Clarifies the information depicted in the DTM as required.

ID	FAA-E-2737A Requirement	Verf Mthd	PT&E Plan Cross Reference		Live or TDG Simld. NEXRAD Intrf.	Trace Paragraph	Remarks
			Cat.	Related Sections			
4000	The RWP shall acquire the RIPs in 30.1.1, Routine Individual Products, in accordance with the Routine Individual Radar Product adaptation as defined in 60.2.2.	T*	E	5.2.1	1 Live 9 Sim.	3.1.4.1.3.1	*Only one Live NEXRAD will be tested; others TDG.
4005	The RWP shall receive all free text status messages disseminated by NEXRAD in accordance with UNISYS 1208304D and UNISYS 1208378C.	T*	E	5.2.1	1 Live 9 Sim.	3.1.4.1.3.2	*Only one Live NEXRAD will be tested; others TDG.
4010	The RWP shall receive all free text messages disseminated by NEXRAD in accordance with UNISYS 1208304D and UNISYS 1208378C.	T*	E	5.2.1	1 Live 9 Sim.	3.1.4.1.3.3	*Only one Live NEXRAD will be tested; others TDG.
4015	The RWP shall transmit the adaptable product specification list to:	-	-	-	-	3.1.4.1.3.4	Lead-in
4020	All connected NEXRAD's at the initialization of radar communication functions.	T*	E	5.2.1	1 Live 9 Sim.	3.1.4.1.3.4.a	*Only one Live NEXRAD will be tested; others TDG.
4025	Any connected NEXRAD upon indication of a NEXRAD initialization.	T*	E	5.2.1	1 Live 9 Sim.	3.1.4.1.3.4.b	*Only one Live NEXRAD will be tested; others TDG.

ID	FAA-E-2737A Requirement	Verf Mthd	PT&E Plan Cross Reference		Live or TDG Simld. NEXRAD Intrf.	Trace Paragraph	Remarks
			Cat.	Related Sections			
4030	All connected NEXRAD's when the Individual Radar Product Specification List Adaptation is modified.	T*	E	5.2.1	1 Live 9 Sim.	3.1.4.1.3.4.c	*Only one Live NEXRAD will be tested; others TDG.
4040	The RWP shall determine and maintain a record of current operational status for each connected NEXRAD and each NEXRAD/RWP interface.	T*	E	5.2.1	1 Live 9 Sim.	3.1.4.1.3.5	*Only one Live NEXRAD will be tested; others TDG.
4045	The RWP shall generate a radar alarm/alert when a rejection message arrives from NEXRAD for a requested product.	T*	E	5.2.1	1 Live 9 Sim.	3.1.4.1.6.2.4	*Only one Live NEXRAD will be tested; others TDG.
4050	The RWP shall interface with NEXRAD in accordance with UNISYS 1208304D and UNISYS 1208378C.	T*	E	5.2.1	1 Live 9 Sim.	3.1.7.1.6	*Only one Live NEXRAD will be tested; others TDG.
4055	The RWP shall generate a radar alarm/alert upon receipt of any selected NEXRAD status messages.	T*	E	5.2.1	1 Live 9 Sim.	3.1.4.1.6.2.1	*Only one Live NEXRAD will be tested; others TDG.
4060	The RWP shall generate a radar alarm/alert upon receipt of any NEXRAD free-text messages.	T*	E	5.2.1	1 Live 9 Sim.	3.1.4.1.6.2.2	*Only one Live NEXRAD will be tested; others TDG.



APPENDIX C

SAMPLE FORMS



PROBLEM TECHNICAL REPORT

REPORT NO. DATE: TEST ID: REPORT BY:

CATEGORY OF PROBLEM: DEMONSTRATION:

DESCRIPTION OF DISCREPANCY:

DISPOSITION INSTRUCTIONS:

FINAL DISPOSITION:

APPROVALS:

Test Director _____

DEMONSTRATION SUMMARY FORM

DEMO NUMBER: _____

DATE: ____/____/____

DEMO TITLE: _____

PRELIMINARY ASSESSMENT OF TEST RESULTS:

ANOMALIES AND DEVIATIONS:

TEST MANAGER: _____

(PART 2)

