NATIONAL IMPLEMENTATION PLAN FOR THE MODERNIZATION AND ASSOCIATED RESTRUCTURING OF THE NATIONAL WEATHER SERVICE

Fiscal Year 1991 Annual Update

Department of Commerce

National Oceanic and Atmospheric Administration

June 1991

THE SECRETARY OF COMMERCE
Washington, D.C. 20230

JUN 26 1991

In accordance with Section 407 (b) of Public Law 100-685, I am transmitting the fiscal year 1991 annual update of the National Implementation Plan for the Modernization and Associated Restructuring of the National Weather Service for consideration by the Congress. This modernization of our Nation's weather warning and forecast program will provide improved services to the public and save lives and property.

Sincerely,

Robert A. Mosbacher

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EXECUTIVE SUMMARY

Thunderstorms and lightning, tornadoes, hurricanes, blizzards, and floods pose serious hazards to life and property. Hundreds of lives and billions of dollars are lost every year from these ravages of nature. Weather and flood conditions also affect the entire economy in many direct and indirect ways. Some of the most destructive weather events are short-lived, relatively local disturbances. Until now, the operations of the National Weather Service (NWS) have focused on more slowly changing, larger-scale features of the atmosphere. The impetus for major changes in NWS are twofold. First, the existing technological base for weather observations, information processing and communication is obsolete and highly costly to maintain. Second, new scientific and technological breakthroughs provide, for the first time, the opportunity to analyze and predict the most destructive weather patterns -- a clear mandate for substantial service improvements.

Modernization and associated restructuring of NWS will usher in a new era for severe weather and flood warning and forecast services in the United States. Important advances in the science of meteorology, coupled with major new technological capabilities for observing and analyzing the atmosphere, will provide unprecedented weather service improvements in the next decade. The NWS of the 1990s will operate one of the most advanced hydrometeorological warning and forecast systems in the world.

As described in the Strategic Plan for National Weather Service Modernization and Associated Restructuring, the NWS of the 1990s will consist of 115 Weather Forecast Offices (WFO), 13 River Forecast Centers (RFC) and the National Centers. The WFOs will replace the current field structure to provide a uniform level of warning and forecast services. WFOs will be responsible for issuing watches, warnings, and forecasts, and will concentrate meteorological expertise to provide quick analysis, accurate forecasts of mesoscale weather phenomena, and rapid dissemination of products. Improved coordination and integration of meteorological information into hydrologic products and services will be essential. As a result, RFCs will have to update hydrologic guidance and information for use in WFO flash flood procedures more frequently than today. Operational coordination with other water resource agencies is another critical dimension of RFC functions. The emphasis on short range and local area forecasting in

the WFOs will require that National Centers provide improved guidance on long range and large area forecasts to the WFOs.

Transition to the modernized NWS will be driven by service requirements and accomplished in two distinct stages. This staging is associated with the period of time between the deployment of new observational systems such as the Next Generation Weather Radar (NEXRAD) and the Automated Surface Observing System (ASOS), and that of the new information processing and communications system, the Advanced Weather Interactive Processing System (AWIPS). This staging provides a stabilization period to allow field offices to adjust to, and gain familiarity with the new doppler radar and high resolution surface observation data. The first stage, Stage 1, will be characterized by an improvement in severe weather detection capability. This will result from professional interpretation of new and enhanced observational data made available by the deployment of the new observational technologies. The second stage, Stage 2, will be characterized by operation of a reliable predictive warning program. The forecaster will have all the tools to assist in acquiring, integrating, analyzing, and interpreting all the various data sets, and rapidly disseminating products. For the first time, the NWS will have the ability to reliably forecast severe weather events with lead times of tens of minutes and increased geographical specificity.

The National Weather Service has never undertaken a systematic modernization and associated restructuring effort of the magnitude described in this National Implementation Plan (NIP). Virtually every NWS activity will change in some way during the transition period. The overall management approach to the transition will be to organize, plan, schedule, execute, monitor, and report on the essential activities necessary to effect modernization and associated restructuring of the NWS. All NWS organizational units will be involved in the planning, execution, reporting, and management of transition activities. Because changes required for modernization and associated restructuring are so far reaching, transition management will be unavoidably and necessarily an integral part of day-to-day NWS management at all levels.

As a matter of policy, the NWS has adopted a management philosophy for the transition that has two important features: 1) to the maximum extent possible, the existing organizational structure and management authority of NWS will be utilized to plan and implement all transition activities; and 2) transition planning and implementation must maintain operations and service delivery without disruption. Public Law 100-685 imposes a certification requirement to ensure operations and services are not degraded during the transition. This National

Implementation Plan describes how the NWS will comply with this certification requirement.

Transition planning must recognize the fact that the service improvement objectives and productivity and efficiency targets described in the Strategic Plan for National Weather Service Modernization and Associated Restructuring are goals based on expected systems capabilities and operational concepts that have yet to be demonstrated in the field environment. A Modernization and Associated Restructuring Demonstration (MARD) will be conducted to demonstrate the WFO concept and to evaluate possible additional organizational efficiencies. Actual system performance and the results of demonstrations of various aspects of modernized operations will force a periodic re-examination and possible adjustment of these end targets. Results of ongoing hydrometeorological research programs within the National Oceanic and Atmospheric Administration (NOAA), the academic community and other Government agencies will provide for the transfer of scientific and technological advances to the NWS modernization program. Plans for transition must therefore be incremental in nature, focusing on near-term events that are fairly certain, e.g., NEXRAD implementation. This does not mean the end goals of full modernization and associated restructuring will be forgotten; far from it. No planning efforts can be undertaken without the end goals of full modernization and associated restructuring firmly in mind. Plans must be flexible and updated frequently as longer-range events become more certain.

Transition plans will be tiered in an hierarchal arrangement with this document, the National Implementation Plan as the top level plan. Based on the Strategic Plan, the NIP is a broad guidance document for both internal and external use, and describes major objectives to be accomplished over the next three years. However, the NIP is not intended to be a stand-alone document in the sense that it will contain all the numerous details one needs to know about transition, but rather it is intended to be the top level guidance document supported by much more detailed transition planning and implementation activities carried on throughout all levels of the entire agency.

The fundamental transition strategy that will be used is an integrated, incremental step-by-step, office-by-office approach. The changes in operations and services related to modernization and associated restructuring are the ultimate guiding force of the transition. Future services will define the system outputs, the staffing type and mix of an office, and the field structure needed to efficiently provide these services. These, in turn, set requirements for training and education, facility preparation, and guide a myriad of other dimensions of the modernization and associated restructuring. A realistic view of technology

capabilities, schedules and the NWS environment will help shape the scope and pace of service changes.

The breadth of future operations and services is bounded by the agency mission, science and technologic capability. The transition strategy recognizes and incorporates these factors and must retain sufficient flexibility to respond to these dynamics. The approach acknowledges that plans for future operations and services may well require adjustments as implementation proceeds. The NWS must be able to accommodate and capitalize upon the new knowledge and understanding that it will acquire throughout the transition period.

The agency must acquire both internal and external support by fully informing all affected individuals and organizations of the goals and objectives of NWS modernization and associated restructuring, and the changes that are planned, and by providing a demonstration of the capability to attain these goals. This can only be accomplished through careful planning, good management, and close coordination between all levels of staff and users.

1.0 INTRODUCTION

As the National Weather Service enters its second century as a civilian agency, a new era will begin for severe weather and flood warning and forecast services in the United States. Important advances in the science of meteorology, coupled with major new technological capabilities for observing and analyzing the atmosphere, will provide unprecedented weather service improvements in the next ten years. The NWS of the 1990s will operate one of the most advanced hydrometeorological warning and forecast systems in the world.

This document, the National Implementation Plan, is required by Public Law 100-685 and provides the basic framework for modernization and associated restructuring of NWS. The transition from today's mode of operation to the modernized NWS of the 1990s will ultimately require a complete transformation of the entire agency. Systematic retooling of all major systems, staffing changes at all field stations, and implementation of a new service and product line that focuses on the mesoscale level of meteorology will be accomplished by the end of the transition. During the entire transition period the NWS must maintain its public service responsibilities.

1.1 NWS Mission Statement

The mission of the National Weather Service is:

> **To provide weather and flood warnings, public forecasts and advisories for all of the United States, its territories, adjacent waters and ocean areas, primarily for the protection of life and property. NWS data and products are provided to private meteorologists for the provision of all specialized services.**

In accordance with its mission, the National Weather Service in the 1990s must fulfill the following requirements associated with weather services in the United States:

- As the principal civilian agency responsible for hydrometeorological weather services in the federal government, the NWS will coordinate its programs with other federal agencies involved with meteorology and hydrology to attain maximum cost effectiveness (for example, aviation safety or forest fire prevention and management);

- Cooperation between the NWS and the private hydrometeorological community will continue to provide a spectrum of weather services;

- The NWS data and products will continue to be provided to the private sector;

- The NWS will continue to rely heavily on the mass media as its major method of dissemination of weather and flood warnings and forecasts to the public;

- The NWS will continue to fulfill all its international hydrometeorological obligations; and

- The NWS will maintain a continuing program of applied research in cooperation with other agencies and the external scientific community to improve warnings and forecasts based upon scientific and technological advances.

1.2 Improved Service Mandate

Thunderstorms and lightning, tornadoes, hurricanes, blizzards, and floods pose serious hazards to life and property. Hundreds of lives and billions of dollars are lost every year from these ravages of nature. Weather and flood conditions also affect the entire economy in many direct and indirect ways.

Some of the most destructive weather events are short-lived, relatively local disturbances. Until now, the operations of the NWS have focused on more slowly changing, larger-scale features of the atmosphere. This emphasis on the synoptic scale of weather is a reflection of the fundamental limitations of the operational systems currently employed to routinely observe atmospheric characteristics and the current state of scientific understanding of the atmosphere. Moreover, the forecaster has had only rudimentary technological systems to assimilate, analyze and communicate complex weather information on a near real-time basis. In fact, the basic NWS mission of providing public warnings of severe weather or flash floods is now accomplished in most cases after actual detection of these events or after a collection of reports of visual sightings, i.e., the current warnings are reactionary. Prediction of small scale violent weather has been very difficult, and lead times for warnings are correspondingly short.

Looking to the 1990s, the impetus for major changes in NWS are twofold. First, the existing technological base for weather observations, information processing and communication is obsolete and highly costly to maintain. Second, new scientific and technological breakthroughs provide, for the first time, the opportunity to analyze and predict the most destructive weather patterns -- a clear mandate for substantial service improvements.

Experimental applications of new observational and information processing systems for weather prediction have demonstrated that current services can be improved. The results of these experimental applications have yielded new operational concepts for the NWS of the 1990s. These new operational concepts require restructuring of all NWS field offices. For the first time, all warnings and forecasts will be prepared by meteorologists and hydrologists based on new, sophisticated data assimilation and prediction processes. The new prediction process has several distinct features.

First, forecasters on duty at a field office will be better able to integrate knowledge from meteorology and hydrology. Prediction of severe storms and flood probabilities must be based upon knowledge of both disciplines. Second, forecasters working with assistance from technical staff will focus on meteorological and hydrological events developing within the next 36-hour time frame. Warning and forecast products will be prepared in an integrated mode of

operation. This contrasts with the current approach in which responsibilities are divided among forecasters for various programs such as public warnings, aviation weather, etc. Third, each field office will have timely and rapid access to all sources of meteorological and hydrological data pertinent to that office.

As a result of advances in technology and substantial development efforts over the last 10 years, new hydrometeorological observation, information processing and collection systems will provide data and the tools required by the forecaster of the future. The following new systems will become interlocking components of the NWS in the 1990s:

- Next Generation Weather Radar A network of advanced Doppler radars to measure the motion of the atmosphere responsible for severe weather such as tornadoes, to detect heavy rainfall, and to increase lead times for predictions of severe weather events.

- Automated Surface Observing System An automated electronic sensor instrument system to replace manual weather observations now taken at 250 NWS sites.

- Advanced Weather Interactive Processing System/NOAAPORT An advanced computer/telecommunication system to help the forecasters integrate all sources of weather data at field offices, to assist them in analyzing fast breaking storms, and to aid in the timely preparation and dissemination of warnings and forecasts. The NOAAPORT component of the system will provide the direct broadcast link between the national guidance center and NWS field offices, and will be the source of NWS data and information to external, private sector users.

- Satellite Upgrades A new series of geostationary meteorological satellites to provide higher spatial and temporal resolution imagery and data to aid shorter-range warnings and forecasts; a new series of polar orbiting meteorological satellites to provide improved, all-weather atmospheric data to assist in longer-term forecasting.

- National Center Computer Upgrades Introduction of new super computers to allow more complex numerical modeling of the atmosphere that will improve national guidance for short-range warnings and forecasts, as well as more reliable guidance for medium and long-range forecasts.

1.3 General Approach to Transition Planning

Transition planning must recognize the fact that the service improvement objectives and productivity and efficiency targets described in the Strategic Plan for National Weather Service Modernization and Associated Restructuring are goals based on expected systems capabilities and operational concepts that have yet to be fully demonstrated in the field environment. Actual system performance and the results of demonstrations of various aspects of modernized operations will force a periodic re-examination and possible adjustment of these end targets. Plans for transition must therefore be incremental in nature, focusing on near-term events that are fairly certain, e.g., NEXRAD implementation. And these planning efforts will be under-

taken with the end goals of full modernization and associated restructuring firmly in mind. Plans must be flexible and updated frequently as longer-range events become more certain.

The incremental planning for transition will be accomplished through a sliding time window concept consisting of a series of long, medium, and short-range views taken in parallel. The long-range outlook covering a 6-year time window will provide a broad prospective look at full modernization and associated restructuring targets with appropriate recognition of where the greatest uncertainties lie. The medium-range projection covering a 3-year time window will be a more detailed view at events that will occur with much greater certainty. The medium-range projection will form the basis for the short-range action plans. The short-range action plan detailing the immediate 1-year time frame will list specific activities based on known events. As required by Public Law 100-685, details on activities planned for the next three years are documented in Section 6 of this National Implementation Plan.

Overall transition planning and implementation activities will be depicted in a Master Transition Schedule (MTS) which the Deputy Assistant Administrator for Modernization and the Transition Director will prepare and maintain. The MTS will be the official vehicle used by the agency to assess and report progress on transition to the modernized NWS. The MTS is described in more detail in Section 5.3 and contained in Appendix A.

1.4 Hierarchy of Transition Plans

Transition plans will be tiered hierarchically with this document, the National Implementation Plan as the top level plan. The Deputy Assistant Administrator for Modernization and the Transition Director have the responsibility for preparing and updating the National Implementation Plan annually, and coordinating it with the rest of the agency.

The National Implementation Plan is a broad guidance document for both internal and external use, and is based on the Strategic Plan for National Weather Service Modernization and Associated Restructuring. Internally, the National Implementation Plan will be used to guide the entire agency in planning for and then accomplishing the transition to the modernized NWS of the 1990s by:

- setting forth the fundamental goals and objectives;
- providing a planning framework and general strategies for accomplishing the transition; and
- establishing the basic transition management principles that will be used throughout the entire transition period.

The National Implementation Plan is not intended to be a stand-alone document in the sense that it will contain all the details about transition, but rather it is intended to be the top level guidance document supported by much more detailed transition planning and implementation activities carried on throughout all levels of the entire agency.

Externally, the National Implementation Plan will initially be used to provide the Executive Branch, Congress, cooperating agencies, users and the public with both an overview of what modernization and associated restructuring is, and how NWS will accomplish the transition to it. Eventually, the National Implementation Plan will be used as one means to provide routine progress reports to these external parties.

The next tier in the planning hierarchy is the Regional Transition Plan (RTP). These transition plans provide management flexibility and recognize both the decentralized nature of NWS, and the Regions' responsibility to maintain ongoing operations throughout the transition period. The RTP must set a course that will ultimately achieve the modernization and associated restructuring goals/objectives set forth in the National Implementation Plan, while taking into account differences between the Regions and the unique conditions at each site within a Region. Each NWS Region has responsibility for preparing and updating their RTP annually. RTPs are approved by the Transition Director.

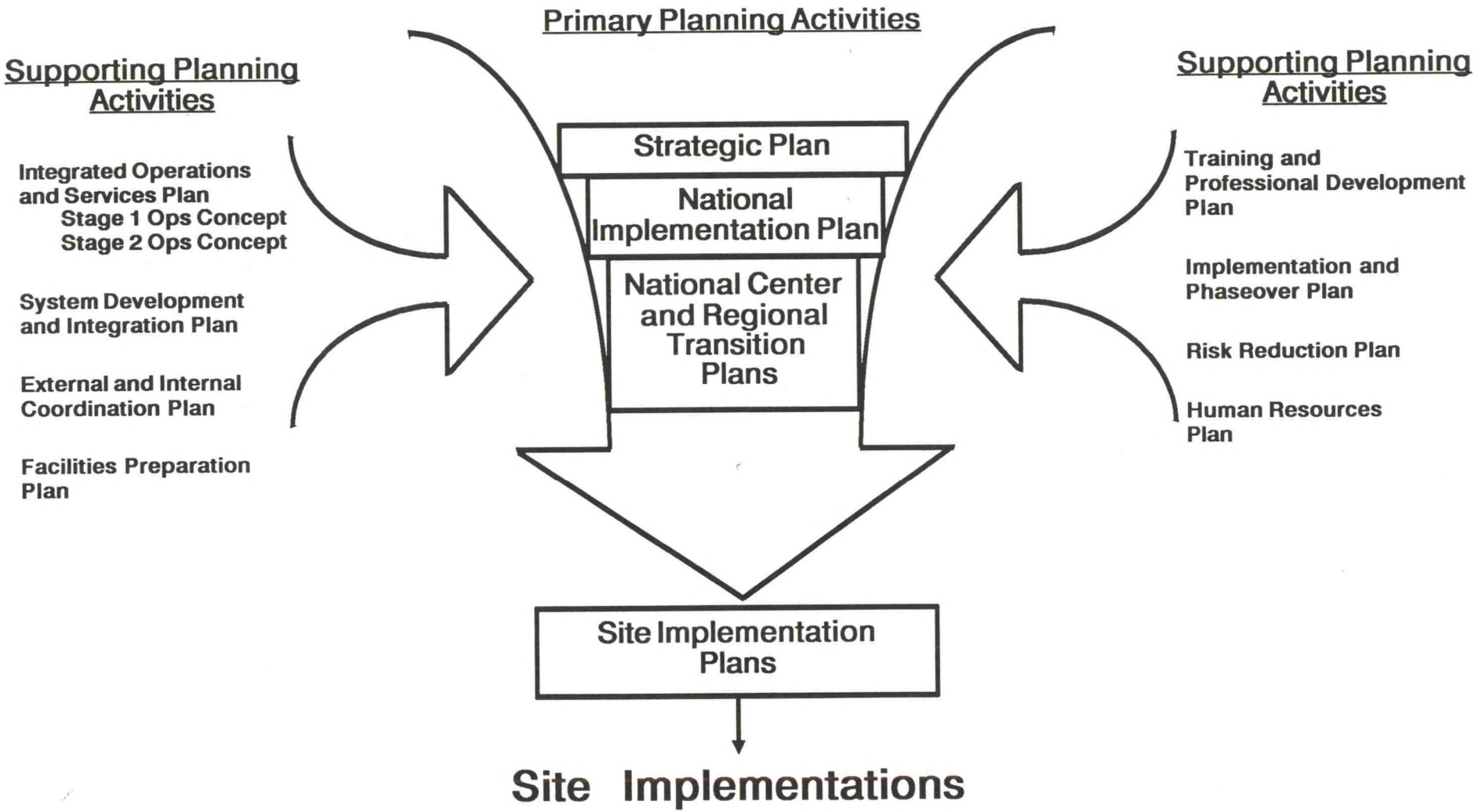
The final tier in the planning hierarchy is the Site Implementation Plan (SIP) which contains specific, detailed actions and schedules for accomplishment. The SIP is subordinate to, and set within the framework of the RTP, and more generally, the National Implementation Plan. A separate SIP will be prepared for each planned WFO or WFO/RFC, and will address transition of all sites in its area of responsibility. Individual SIPs may require modification to accommodate the requirements and timing of activities in other SIPs. Site implementation plans will be approved by the cognizant Regional Director and contained in the appropriate RTP. Standardized outlines for Regional transition and site implementation plans are provided in Appendix B.

A similar transition planning hierarchy will be used by the National Centers. A National Centers Transition Plan will be prepared by the National Meteorological Center (NMC) as a counterpart to the RTP. Site implementation plans for each of the individual National Centers: NMC, National Hurricane Center (NHC), National Severe Storms Forecast Center (NSSFC), etc. will address detailed transition activities and schedules for accomplishment, and will be embodied in the National Centers Transition Plan.

National, Regional/National Center and site level plans form the primary planning path, and, as depicted in Figure 1 at the end of this section, integrate the results of supporting planning efforts that focus on specific functional areas of NWS operations such as future operations and services, training and professional development, staffing, system development and integration, implementation and phaseover, etc. Appendix C provides a more detailed list of related transition planning documents that support the primary planning path.

Other specific information pertinent to transition planning, such as WFO, NEXRAD and ASOS locations are provided in Appendix D.

Figure 1:
HIERARCHY OF TRANSITION PLANS



2.0 MODERNIZATION GOALS AND OBJECTIVES

The Department of Commerce has set an ambitious goal for the National Oceanic and Atmospheric Administration's agency, the National Weather Service:

> **To modernize the NWS through the deployment of proven observational, information processing and communications technologies, and to establish an associated cost effective operational structure. The modernization and associated restructuring of NWS shall assure that the major advances which have been made in our ability to observe and understand the atmosphere are applied to the practical problems of providing weather and hydrologic services to the Nation.**

Within this context, more specific goals of the NWS modernization and associated restructuring can be broadly stated as:

- Operational realization of a predictive warning program focusing on mesoscale meteorology and hydrology;
- Advancement of the science of meteorology and hydrology;
- Development of NWS human resources to achieve maximum benefit from recent scientific and technological advances;
- User acceptance and support of NWS modernization and associated restructuring service improvement objectives;
- Strengthening cooperation with the mass media, universities, the research community and the private hydrometeorological sector to collectively fulfill the nation's weather information needs from provision of severe weather warnings and general forecasts for the public as a whole, which is a Government responsibility; to provision of detailed and customer specific weather information, which is a private sector responsibility;
- Achievement of productivity gains through automation and replacement of obsolete technological systems; and
- Operation of the optimum NWS warning and forecast system consistent with service requirements, user acceptability, and affordability.

Transition to the modernized NWS will be driven by service requirements and accomplished in two distinct stages. This staging is associated with the period of time between the deployment of new observational systems such as ASOS and NEXRAD, and that of the new information processing system, AWIPS. This staging provides a stabilization period to allow

field offices to adjust to, and gain familiarity with the new doppler radar and high resolution surface observation data.

The first stage, Stage 1, will be characterized by an improvement in severe weather detection capability. This will result from meteorological interpretation of new and enhanced observational data made available by the deployment of NEXRAD, ASOS, etc.

The second stage, Stage 2, will be characterized by operation of a reliable predictive warning program. The forecaster will have the tools necessary to integrate, analyze, and interpret all the various data sets, and rapidly disseminate products. For the first time, the NWS will have the ability to forecast severe weather events with lead times of tens of minutes and increased geographical specificity.

2.1 Stage 1 Goals and Objectives

During Stage 1 there will be an immense increase in both the quantity and quality of data available to NWS. The primary goal of Stage 1 is to take advantage of this enhanced data and improve detection of severe weather events to the greatest extent possible in the absence of all the new technologies and other changes planned as part of Stage 2.

In Stage 1, NWS will continue its two-tier field office structure with state-wide forecast responsibility carried out by the 52 Weather Service Forecast Offices (WSFO), and severe weather warnings provided by the WSFOs and NEXRAD Weather Service Offices (NWSO). Hydrologic guidance will continue to be provided by the 13 RFCs. National level guidance and numerical modeling products will continue to be the responsibility of the National Centers. System support for NWS field offices is a critical factor in maintaining reliable warning and forecast operations 24 hours a day. This support involves the entire spectrum of hardware and software systems.

More specific Stage 1 objectives are given below for the various categories of field offices and centers. This is not an all inclusive list of office types, but represents the preponderance of NWS offices. Specific Stage 1 objectives for office types not listed below such as Tsunami Warning Centers, the Nuclear Support Office, etc. are detailed in the appropriate Regional Transition Plan.

<u>NEXRAD Weather Service Forecast Offices</u>

- Continue all current programs;
- Increase the number of meteorologists (see Table 1 at the end of this section) and provide training to enable all staff to more fully utilize the new technologies and the new observational data;
- Participate in the individual site calibration of the NEXRAD;

- Support station program of radar coded and data interpretation messages;
- At selected locations, accept or transfer responsibility for observational and other programs;
- Utilize the new technologies to improve detection of severe weather and to produce effective and timely warnings and forecasts for assigned area of responsibility; and
- Prepare for Stage 2.

NEXRAD Weather Service Offices

- Continue all current programs;
- Increase the number of meteorologists (see Table 2 at the end of this section) and provide training to enable all staff to more fully utilize the new technologies and the new observational data;
- Participate in the individual site calibration of the NEXRAD;
- Support station program of radar coded and data interpretation messages;
- At selected locations, accept or transfer responsibility for observational and other programs;
- Utilize the new technologies to improve detection of severe weather and to produce effective and timely warnings and forecasts for assigned area of responsibility; and
- Prepare for Stage 2.

Weather Service Offices (WSO)

- Automate the surface observation program using ASOS;
- Support the planning and smooth transfer of assigned warning and forecast responsibility as well as the upper air, local warning radar, NOAA Weather Radio (NWR), and other programs to designated WSFOs and NWSOs;
- Adjust staffing as required to operate community preparedness, liaison and other local community support programs.

Weather Service Meteorological Observatories (WSMO)

- Automate or transfer observing functions.

Weather Service Contract Meteorological Observatories (WSCMO)

- Automate or transfer observing functions.

River Forecast Centers

- Continue all current programs;
- Establish Hydrometeorological Analysis and Support (HAS) Groups at each colocated WFO/RFC facility to facilitate integration of meteorological information into hydrologic products and services, and vice versa (see Table 3 at the end of this section);
- Utilize NEXRAD and ASOS data to enhance products and services to the greatest extent possible given the limitations of staff as well as existing information processing systems; and
- Prepare for Stage 2.

National Centers

- Continue all current programs;
- Assume responsibility for high seas forecast program as follows:
  - NMC will have an area of responsibility in the Atlantic Ocean west of 35 degrees west longitude between 30 and 60 degrees north latitude, and in the Pacific Ocean east of 160 degrees east longitude between 30 and 60 degrees north latitude
  - NHC will have an area of responsibility in the Atlantic Ocean west of 35 degrees west longitude between 3 and 30 degrees north latitude, and in the Pacific Ocean east of 140 degrees west longitude between the equator and 30 degrees north latitude
  - WSFO Honolulu's area of responsibility in the Pacific Ocean will remain unchanged
- Prepare and disseminate national NEXRAD products; and
- Prepare for Stage 2.

Center Weather Service Units (CWSU)

- Continue support to Federal Aviation Administration (FAA) Air Route Traffic Control Centers and prepare for Stage 2.

2.2 Stage 2 Goals and Objectives

The primary goal of Stage 2 is to take advantage of all the new technologies and a trained staff to operate a fully modernized NWS, and deliver improved warning and forecast services nationwide.

As described in the Strategic Plan for National Weather Service Modernization and Associated Restructuring, the NWS of the 1990s will consist of 115 WFOs, 13 RFCs and the National Centers. The WFOs will replace the current structure of WSFOs and NWSOs to provide a uniform level of warning and forecast services. WFOs will be responsible for issuing watches, warnings, and forecasts. A WFO will concentrate meteorological expertise to provide products and services for its assigned area of responsibility. A WFO will provide quick analysis, accurate forecasts of mesoscale weather and flood phenomena and rapid dissemination of warnings and forecasts.

In Stage 2, operations of the RFCs will change in several ways. The WFO flash flood procedures will be considerably more sophisticated than the manual approach taken today. Improved coordination and integration of meteorological information into hydrologic products and services will be essential. As a result, RFCs will have to update hydrologic guidance and information for use in WFO flash flood procedures more frequently than today. Operational coordination with other water resource agencies is another critical dimension of RFC functions. The emphasis on short range and local area forecasting in the WFOs will require that National Centers provide improved guidance on long range and large area forecasts to the WFOs.

During Stage 2, several factors will shift system support toward a greater degree of centralization. With the new systems of the modernized NWS, more consistency in hardware and software in the field offices will exist. This greater consistency of systems will permit increased uniformity and standardization of technical support procedures. The major goal in the system support area is obtaining maximum cost effectiveness through utilization of the most efficient integrated maintenance and logistics support concepts and achieving the most appropriate mix of Government and private industry system support.

More specific Stage 2 objectives are given below for the various categories of field offices and centers. This is not an all inclusive list of office types, but represents the preponderance of NWS offices. Specific Stage 2 objectives for office types not listed below such as Tsunami Warning Centers, the Nuclear Support Office, etc. are detailed in the appropriate Regional Transition Plan.

<u>Weather Forecast Offices</u>

- Operate a reliable predictive warning program, and issue all watches, warnings and forecasts;

- Deliver warning and forecast services at an improved level over that provided currently;

- Operate the WFO with staff (see Table 4 at the end of this section) trained in mesoscale meteorology and in the application of the new technologies;

- Prepare warning and forecast products using the integrated forecast mode of operation;

- Achieve more effective means for rapid warning dissemination in cooperation with the media;

- Cooperate with emergency agency officials and municipalities to anticipate and conduct weather-related disaster response operations for public safety;

- Provide effective management of observational data networks operated by cooperators and volunteers; and

- Ensure modernized NWS warning and forecast products and services meet public and user needs.

Weather Service Offices

- Automate non-NEXRAD WSOs, consistent with program and service needs, technological capabilities and certification requirements.

Data Collection Offices (Alaska)

- Convert all existing upper air WSOs in Alaska to Data Collection Offices to continue observation programs and provide local service outlets at Barrow, Bethel, Cold Bay, Ketchikan, King Salmon, Kodiak, Kotzebue, McGrath, Nome, St. Paul Island, and Yakutat.

River Forecast Centers

- Supplement staffing to provide nominal 16 hour a day RFC operations (see Table 5 at the end of this section);

- Implement improved hydrologic models made possible by increased computational power and enhanced data collection and assimilation capabilities;

- Provide hydrologic guidance to WFOs more frequently; and

- Improve analysis and forecasting of hydrometeorological phenomena.

National Centers

- Provide improved guidance products through use of the latest numerical weather prediction models run on advanced super computers;
- Produce digital forecast data bases for use by WFOs in preparing forecasts for time periods of 36 hours and beyond;
- Utilize data available from advanced geostationary and polar orbiting satellites as direct input for numerical weather prediction models, as guidance for high seas and aviation forecasts, and for interpretation and forecasting of hurricanes;
- Provide national severe weather guidance products and issue advisories to WFOs; and
- Improve hurricane forecasts through the use of better numerical models of the atmosphere combined with better atmospheric observations.

Center Weather Service Units

- Provide improved aviation products and services through the use of the FAA provided Meteorologist Weather Processor and high resolution mesoscale data available from the WFOs.

Table 1:
STAGE 1 NEXRAD WSFO STAFFING TARGETS

CURRENT STAFFING PLUS:	NO.	PROPOSED GRADE	REPORT
Science and Operations Officer	1*	13	7 Mo. Prior to NEXRAD Delivery
Warning Coordination Meteorologist	1*	13	7 Mo. Prior to NEXRAD Delivery
Core Meteorologists (shift)	1-2*	12	4 Mo. Prior to NEXRAD Delivery
Service Hydrologist	1**	13	4 Mo. Prior to NEXRAD Delivery
Data Acquisition Program Manager	1	12	6 Mo. Prior to NEXRAD Delivery

*** Number of meteorologists to be added dependent on whether a WSFO already has a Warning Coordination Meteorologist. At network radar WSFOs, three existing positions will be reprogrammed into three meteorologist positions (including a Science and Operations Officer and a Warning Coordination Meteorologist.**

**** As assigned; some WSFOs already have this position.**

Table 2:
STAGE 1 NEXRAD WSO STAFFING TARGETS

	NO.	PROPOSED GRADE	REPORT
Meteorologist-In-Charge (MIC)	1	13/14	12 Mo. Prior to NEXRAD Delivery
Science and Operations Officer	1	13	7 Mo. Prior to NEXRAD Delivery
Warning Coordination Meteorologist	1	13	7 Mo. Prior to NEXRAD Delivery
Core Meteorologists (shift)	5	11/12	4 Mo. Prior to NEXRAD Delivery
Service Hydrologist	1*	13	4 Mo. Prior to NEXRAD Delivery
Data Acquisition Program Manager	1	12	6 Mo. Prior to NEXRAD Delivery
Hydrometeorological Technicians (shift)	5**	9/11	On Station
Electronics Systems Analyst	1	12	9 Mo. Prior to NEXRAD Delivery

*** As assigned.**

**** Most NEXRAD WSOs have these positions on station; if not, these positions will be added by the time of NEXRAD delivery.**

Table 3:
STAGE 1 RFC STAFFING TARGETS

COMMON BASE STAFF FOR RFCs IN THE CONTERMINOUS 48 STATES

	NO.	PROPOSED GRADE	REPORT
Hydrologist-In-Charge (HIC)	1	14	[N/A - Existing]
Development and Operations Hydrologist	1*	13	[N/A - See footnote]
Hydrologists/Hydrometeorologists	5-10**	12/13	[N/A - Existing]
Secretary and/or Technician	1-2	5/6, 7/8	[N/A - Existing]
Hydrometeorologists (HAS)	3	12/13	6 Mo. Prior to NEXRAD PUP Delivery
TOTAL	11-16		

*** Existing Deputy HIC position will be eliminated and replaced with a Development and Operations Hydrologist six months prior to Stage 2.**

**** One to two hydrologists on shift. Number of staff performing the non-real-time operations will depend on the number of hydrologists per shift and total RFC staff.**

Table 4:
STAGE 2 WFO STAFFING TARGETS

	NO.	PROPOSED GRADE
Meteorologist-In-Charge (MIC)	1	14/15
Science and Operations Officer	1	13/14
Warning Coordination Meteorologist	1	13/14
Core Meteorologists (shift)	8*	12/13/14
Data Acquisition Program Manager	1	12
Hydrometeorological Technicians (shift)	5	9/11
Electronic Systems Analyst	1**	12/13
TOTAL	18***	

* Actual number of meteorologists may vary depending on WFO responsibilities.

** Most WFOs will also have one Electronics Technician. Total electronic technician staffing will be based on the most cost effective mix of contractor and Government maintenance.

*** Some WFOs will have additional base staff (i.e., Service Hydrologist, Secretary).

Table 5:
STAGE 2 RFC STAFFING TARGETS

COMMON BASE STAFF FOR RFCs IN THE CONTERMINOUS 48 STATES

	NO.	PROPOSED GRADE
Hydrologist-In-Charge (HIC)	1	15
Development and Operations Hydrologist	1	14
Hydrologists/Hydrometeorologists	8-13*	12/13
Secretary and/or Technician	1-2	5/6, 7/8
Hydrometeorologists (HAS)	3	12/13
TOTAL	14-19	

* Augment staff with one to four additional hydrologists six months prior to Stage 2, for extended 16 hr/day operations (nominal) with one to two hydrologists on shift. The number of staff on non-real-time operations will depend on the number of hydrologists per shift and total RFC staff at individual sites.

3.0 TRANSITION STRATEGY

This section defines the general transition strategy that will be used to effect the modernization and associated restructuring of NWS. Transition strategies for Stage 1 and Stage 2 are presented. This section introduces the terms risk reduction and demonstration as forms of internal and external validation, respectively. The importance of risk reduction activities and demonstration programs as key ingredients in ensuring a successful transition are emphasized. The process that will be utilized to comply with the certification requirement of Public Law 100-685 is described in this section.

3.1 General Transition Strategy

The fundamental transition strategy is an integrated, incremental step-by-step, office-by-office approach. The changes in operations and services related to modernization and associated restructuring are the ultimate guiding force of the transition. Future services will define the system outputs, the staffing type and mix of an office, and the field structure needed to efficiently provide these services. These, in turn, set requirements for training and education, facility preparation, and guide a myriad of other dimensions of the modernization and associated restructuring. A realistic view of technology capabilities, schedules and the NWS environment will help shape the scope and pace of service changes.

The breadth of future operations and services is bounded by the agency mission, science and technologic capability. The transition strategy recognizes and incorporates these factors and must retain sufficient flexibility to respond to these dynamics. The approach acknowledges that plans for future operations and services may well require adjustments as implementation proceeds. The NWS must be able to accommodate and capitalize upon the new knowledge and understanding that it will acquire throughout the transition period.

Restructuring of the NWS field organization, offices, and staff can best be realized through both internal and external support. The agency will acquire this support by fully informing all affected individuals and organizations of the goals and improvements sought within the modernization and associated restructuring. Support from staff and users requires a knowledge of the ultimate goals of modernization and associated restructuring and a demonstration of the capability to attain these goals. This can only be accomplished through careful planning, good management, and close coordination between all levels of staff and users. A comprehensive external and internal coordination program is being planned to:

- Ensure users are made aware of changes in a timely manner;
- Provide continuous information regarding the progress of modernization:

- Establish external and internal communications and maintain them for the duration of the transition;
- Delineate realistic and substantial improvements in weather services; and
- Exchange attitudes and expectations for the implementation of the modernization program.

The generalized Stage 1 and Stage 2 transition strategies described in the following sections address primarily WSFOs, WSOs and meteorological observatories. While these form the preponderance of the offices, the absence of transition strategies for other types of offices is not meant to imply that RFCs, National Centers, etc. will not be undergoing substantial changes during the transition period. Indeed, related transition activities will also be taking place concurrently at RFCs, National Centers, Tsunami Warning Centers, CWSUs, future Data Collection Offices in Alaska, and other types of field offices. Transition activities for these offices are detailed in the appropriate National Center transition, Regional transition, and site implementation plans.

3.2 Stage 1 Transition Strategy

Stage 1 targets the efficient use of NEXRAD technology at RFCs, WSFOs, and NWSOs. These offices will undergo a transformation in the first stage of modernized operations. Services and operations will be the impetus for this transformation. The transition of offices to Stage 1 will be paced, primarily, by delivery schedules of systems needed to support those services and operations. The timing of staffing changes and training also will be based on the delivery schedules with the goal of providing the necessary people on site, prepared to do the job when the systems are ready for operation.

NEXRAD offices will generally require additional staff to perform Stage 1 operations. To the extent possible, these additional positions must be drawn from WSOs not scheduled to receive NEXRAD, without degrading current services. The transformation of non-NEXRAD offices will be carried out in a step-wise fashion. First, programs in these WSOs will be automated and transferred. Freed resources will then be used in the development of NEXRAD offices. Secondly, any further WSO reduction will occur when a NEXRAD office(s) assumes operational responsibility for the area formerly served by the WSO. Any reduction or transfer of programs, and reallocation of staff will be dependent upon NWS service requirements.

It is expected that staffing at NEXRAD offices generally cannot be supplemented by positions coming from non-NEXRAD WSOs in the area the NEXRAD office will serve, because NEXRAD coverage may be a prerequisite for WSO draw-down. This factor suggests that ASOS and NEXRAD deployment schedules can be used to optimize personnel assignments and moves. Regions will have to undertake feasibility studies for reducing non-NEXRAD WSOs. At the same time, for example, non-NEXRAD WSOs with surface observation and/or local warning radar programs can not have their staffs reduced below minimum levels required to carry out these programs until ASOS is commissioned at the site and/or NEXRAD coverage has proved satisfactory for the WSO's area of responsibility. In any reduction of a WSO's

responsibilities, the Region must make every effort possible to ensure that community leaders and affected organizations are kept informed of significant changes, as well as show that warning services and required observations will not be degraded.

National oversight will be maintained during transition to Stage 1, but extensive planning and close Regional management will be required. A successful transition requires assurance that services will continue during transition to Stage 1, and that offices will be fully capable of performing all Stage 1 operations and services. This assurance will be in the form of a confirmation of operational capabilities. A list of activities necessary to effect transition to Stage 1 is given below, followed by a checklist of operational capabilities that must be confirmed. These lists are not all inclusive, but provide a representative sampling of the major preparatory activities and conditions that must be met for Stage 1 operations. The complete list of preparatory activities will be contained in site implementation plans, and will be derived from various transition plans for future operations and services, systems development and integration, training and professional development, implementation and phaseover, etc. National standards will be developed to define all the operational capabilities that must be confirmed. Regions will ensure these national standards are met through a confirmation of operational capabilities program.

Stage 1 Preparation Activities

- Non-NEXRAD WSO Activities
  - Automate surface observations
  - Coordinate with external users
  - Transfer programs:
    - Upper Air
    - Local Warning Radar
    - Warnings
    - NOAA Weather Radio
    - Local Forecasts
    - Other
  - Reallocate staff/positions consistent with maintaining current service levels
- NEXRAD Site Activities
  - Add Stage 1 staff
  - Provide training
  - Deploy NEXRAD, ASOS and other systems
  - Calibrate NEXRAD specifically for each site
  - Accept responsibility for programs transferred from non-NEXRAD WSOs
- RFC Activities
  - Phase-in HAS Group
  - Provide training (including Hydromet)
  - Implement NEXRAD data procedures
  - Implement Hydromet products and procedures

- Implement verification procedures
- Conduct on-site model execution (PROTEUS sites only)

- Deploy Automation of Field Operations and Services (AFOS) System Z
- Decommission network and local warning radars
- Decommission WSMOs and WSCMOs

Stage 1 NEXRAD Site Operational Capabilities Checklist

- Facility preparation completed;
- Stage 1 staff on site;
- System training and hydrometeorological training and education completed;
- Stage 1 technologies commissioned;
- System support mechanisms in place and maintenance training completed;
- Operations directives and procedures in place;
- Staff and office have demonstrated capability of providing defined Stage 1 operations and services; and
- Coordination with external cooperators and users has been accomplished.

Stage 1 RFC Operational Capabilities Checklist

- Facility preparation completed;
- Stage 1 staff on site;
- System training and hydrometeorological training and education completed;
- Stage 1 technologies commissioned;
- System support mechanisms in place and maintenance training completed;
- Operations directives and procedures in place;
- Staff and office have demonstrated capability of providing defined Stage 1 operations and services; and
- Coordination with external cooperators and users has been accomplished.

3.3 Stage 2 Transition Strategy

This stage of operations and services is based on full attainment of modernization and associated restructuring goals. This includes complete restructuring to WFO and modernized RFC operations, deployment of the full suite of new technologies, and complete integration of systems and operations. The transition strategy does continue to treat this as a fully defined goal, but it may need to be adjusted to reflect changes in resources, schedules, technology capabilities, and/or the supporting sciences.

Transition to Stage 2 will generally follow the same strategy outlined above for Stage 1. The final resolution of Stage 1 and work accomplished in that stage will be directed toward the attainment of Stage 2 goals. WFO operations and WSO program changes will be synchronized with system acquisition, deployment, and commissioning. The important elements of staff allocation and training will be timed and adjusted to the goal of having NWS personnel in place and prepared to use the new technologies when they are available. Future operations and services will again be the impetus for Stage 2 transition planning.

At the outset of Stage 2, WFOs and RFCs will be operating with systems that will have been deployed with an initial operating capability (IOC). This portion of Stage 2 will be referred to as Initial Stage 2. Deferred capabilities, i.e., system capabilities not included in the IOC, but required to achieve the full benefits of the modernization, will be part of an integrated systems upgrade required for full Stage 2 operations. This phased introduction of system capabilities will provide the opportunity to assess system maturity and allow sufficient time for development and validation of the deferred capabilities, while the forecaster is becoming familiar with operational use of the new systems.

As with Stage 1, national oversight will be maintained during transition to Stage 2, but extensive planning and close Regional management will be required. A successful transition requires assurance that services will continue during transition to Stage 2, and that offices will be fully capable of performing all Stage 2 operations and services. This assurance will be in the form of a confirmation of operational capabilities. A list of activities necessary to effect transition to Stage 2 is given below, followed by a checklist of operational capabilities that must be confirmed. These lists are not all inclusive, but provide a representative sampling of the major preparatory activities and conditions that must be met for Stage 2 operations. The complete list of preparatory activities will be contained in site implementation plans, and will be derived from various transition plans for future operations and services, systems development and integration, training and professional development, implementation and phaseover, etc. National standards will be developed to define all the operational capabilities that must be confirmed. Regions will ensure these national standards are met through a confirmation of operational capabilities program.

<u>Stage 2 Preparation Activities</u>

- WFO Activities
  - Adjust staffing levels
  - Deploy AWIPS

- Provide AWIPS training

- RFC Activities
  - Supplement staff
  - Establish 16 hr/day operations
  - Deploy AWIPS
  - Provide AWIPS training

- Decommission AFOS System Z

Stage 2 WFO Operational Capabilities Checklist

- Facility preparation completed;
- Stage 2 staff on site;
- System training and hydrometeorological training and education completed;
- Stage 2 technologies commissioned;
- System support mechanisms in place and maintenance training completed;
- Operations directives and procedures in place;
- Staff and office have demonstrated capability of providing defined Stage 2 operations and services; and
- Coordination with external cooperators and users has been accomplished.

Stage 2 RFC Operational Capabilities Checklist

- Facility preparation completed;
- Stage 2 staff on site;
- System training and hydrometeorological training and education completed;
- Stage 2 technologies commissioned;
- System support mechanisms in place and maintenance training completed;
- Operations directives and procedures in place;
- Staff and office have demonstrated capability of providing defined Stage 2 operations and services; and
- Coordination with external cooperators and users has been accomplished.

3.4 Site Transition Model

The Site Transition Model, shown in Figure 2 at the end of this section, depicts the chronological order in which events are expected to occur at non-NEXRAD WSOs and NEXRAD sites for both Stage 1 and Stage 2. Not all events need occur in the order given. For example, some sites may receive NEXRAD before ASOS. There are, however, specific events that must occur before others. A facility must be completed before the staff and the new technology arrive. ASOS must be available at non-NEXRAD WSOs before surface observations can be automated, programs can be transferred, and staff reallocated.

3.5 Risk Reduction

The NWS modernization and restructuring requires the accomplishment of Stage 1 and 2 objectives without degrading services to users. To a great extent, the future service programs rely on new systems developed near the leading edge of science and technology. The capabilities and applications of these systems are being refined and updated, even as the transition begins. Some of the new operational concepts for the 1990s have had only limited operational testing. This is recognized in the system acquisition plan for AWIPS which allows for staged development. At each stage of development, opportunities exist for incorporation of new scientific understanding and the latest NWS requirements. On the other hand, systems such as NEXRAD, are based on known and existing technology, well supported by theory, and, in some cases, have undergone extensive field testing.

The risks involved with bringing the major new systems on line are obvious. To mitigate these risks and uncertainties extensive testing, development, and demonstration will be pursued. For example, some areas of risk are currently being addressed by the joint NWS and Environmental Research Laboratory's (ERL) Denver AWIPS Risk Reduction and Requirements Evaluation (DARE) project in Colorado; the development of a prototype WFO at Norman; and the Prototype RFC Operational Test, Evaluation and User Simulation (PROTEUS) project. It is expected that additional risk reduction projects will be needed throughout the entire transition period, and even beyond. To date, risk reduction efforts have primarily been directed to questions concerning technology. Other questions remain unanswered in equally critical areas. These range from appropriate staffing levels at Stage 1 and Stage 2 offices, to the feasibility of totally integrating all warning and forecast functions in future WFOs.

The early stage of modernized operations and the transition process itself will certainly reveal other areas where risk can be mitigated. Well defined risk reduction projects are critical to a successful transition. This transition strategy calls for agency support and response to significant risk reduction activities and their associated results.

3.6 Demonstration

The modernization and associated restructuring of NWS will provide improved services through the effective and efficient use of new technologies operated by trained staff. Aspects of this objective imply significant change both internally and externally. Active participation

by NWS and external users is imperative for a successful transition. Support will follow if there is an understanding of what changes are planned and why these changes are needed. Clear demonstrations of the service improvements that will result from changes are a critical element in obtaining user support.

Demonstrations of improved capabilities and services will take place through a wide range of activities. The Modernization and Associated Restructuring Demonstration will be the centerpiece for demonstrating the fully modernized NWS of the 1990s.

Modernization and Associated Restructuring Demonstration

An operational demonstration of service delivery from weather service offices equipped with the technological systems of the 1990s will serve as a model for transition to national operations of the modernized and restructured NWS.

The operational MARD must involve the application of new technologies and techniques, and the conversion of existing offices into Weather Forecast Offices. Some WFOs will be collocated with a River Forecast Center. Hydrologic Analysis and Support groups will be implemented in each RFC to facilitate hydrometeorological support and interactions and to ensure continuity in hydrologic forecasts across WFO boundaries. The RFCs will reap the benefits of the new technologies for main stem river flooding forecasts and flash flood guidance and to provide full support to WFOs.

The proposed demonstration area and the overall design of MARD are responsive to Public Law 100-685. The MARD is a cost effective approach to verify the service improvements expected in the Strategic Plan without restructuring the entire country. The participating field offices are shown in Figure 3 at the end of this section. This area was chosen for its high probability of severe weather and also because of the advanced scientific and technological capabilities at facilities in Denver/Boulder, Kansas City, and Oklahoma City/Norman. Valuable experience with the current demonstration of the new ASOS technology in the state of Kansas is also an important factor in the selection of this region.

Several basic criteria must be met to test the new operating configuration. These criteria include the integration of NEXRAD coverage from several contiguous sites, not just the data from a single NEXRAD collocated with a WFO; inclusion of a sufficient number of WFO and RFC offices to test the coordination and interactive support functions in realistic situations; involvement of a sufficient number of WFOs and RFCs to test the implementation of new hydrometeorological support and forecasting operations; involvement of a sufficient number of offices to test a true communications network; and provision of warning and forecast services over a major area that encompasses important geographical entities, i.e., here, at least two complete states.

In order to ensure a successful Modernization and Associated Restructuring Demonstration, a number of preparatory activities must be accomplished prior to the actual demonstration. MARD offices will be staffed with meteorologists and hydrologists that have received scientific education on the interpretation of new data sources such as doppler radar, and mesoscale

forecasting techniques. In addition, the new technology systems must be deployed, integrated with not only each other, but also existing systems at the MARD offices, and commissioned to ensure each performs its unique, but complementary role in supporting modernized operations. After a stabilization period, including initial testing and evaluation of the new operations, adjustments necessary to begin the MARD will be accomplished. Based on the current scheduled deliveries of NEXRAD and the availability of AWIPS, the selected offices will be configured for the operational demonstration during 1991, 1992 and 1993. MARD will begin during the latter part of 1994. The schedule for MARD is shown in Figure 4, Principal Path for Modernization, at the end of this section.

In the process of preparing for, and conducting the operational demonstration, the NWS will:

- Deploy and commission new technologies and integrate them into modernized operations;
- Staff the restructured offices with the proper number and mix of personnel;
- Develop and apply operational procedures related to warnings and forecasts in the modernized and restructured environment;
- Train the staff to fully use the new technologies and scientific advances in order to provide improved services;
- Restructure selected NWS field offices into WFOs, and realign geographical areas of service responsibilities in close coordination with emergency management organizations and other groups; and
- Evaluate service performance and responses of users.

A formal MARD evaluation program will be planned, and include provisions for an independent evaluation of the results. MARD evaluation will take place in parallel with the formal demonstration in order to provide results for the certification process. The Secretary of Commerce must certify that no service degradation will occur in areas served by offices that are to be consolidated as part of national implementation of modernization and associated restructuring. As specified in Public Law 100-685, the results of MARD will provide critical evidence for this certification.

3.7 Certification Process

Public Law 100-685 requires that the Secretary of Commerce certify to the Congress that closure, consolidation, automation, or relocation of any WSFO or WSO pursuant to implementation of the Strategic Plan will not result in degradation of services to the affected area. Such certification shall include:

- a detailed comparison of the services provided to the affected area and the services to be provided after such action;

- any recent or expected modernization of National Weather Services operations which will enhance services in the affected area; and

- evidence, based upon operational demonstration of modernized National Weather Service operations, which supports the conclusion that no degradation in services will result from such action.

This National Implementation Plan is the vehicle for informing Congress and users of agency services what the certification process will be and when certification will occur. Additionally, all users of agency services will be informed of the certification process in accordance with the National Weather Service External and Internal Coordination Plan to be published separately.

The annual National Implementation Plan will include a consolidation of inputs from the NWS Regions. The Meteorologist-In-Charge of offices that will become WFOs will provide the following information to National Weather Service Headquarters through their respective Regional Directors:

- Notification of Significant Events to National Weather Service operations which will result from modernization during the following three years. Significant Events fall into five basic areas:
  - Facilities
  - New Systems: commissioning
  - Existing Systems: relocation or decommissioning
  - Staffing: position transfers
  - Service Programs: changes and reassignments

- Notification of Intent to Certify services to areas which will be affected by Weather Service Offices or Weather Service Forecast Offices which will be closed, consolidated, automated, or relocated during the following three years. This Notification will include:
  - the source for evidence from demonstrations which supports the conclusion that no degradation in services will result from modernization. This evidence will be defined in the MARD Implementation and Evaluation Plan;
  - a list of Site Implementation Plans which contain a detailed comparison of services provided to the affected area(s) before and after such action; and
  - a list of Site Implementation Plans which contain the list of modernization of National Weather Service operations which will enhance services in the affected area(s).

When all necessary actions have been completed, but prior to the actual closure, consolidation, automation, or relocation of a WSFO or WSO previously identified in the National Implementation Plan, the Meteorologist-In-Charge of the WFO will prepare a Certification Statement for endorsement by the Regional Director and Assistant Administrator for Weather Services. The Assistant Administrator for Weather Services will submit the Certification Statement to the Secretary of Commerce for approval and submission to Congress.

Figure 2:
SITE TRANSITION MODEL

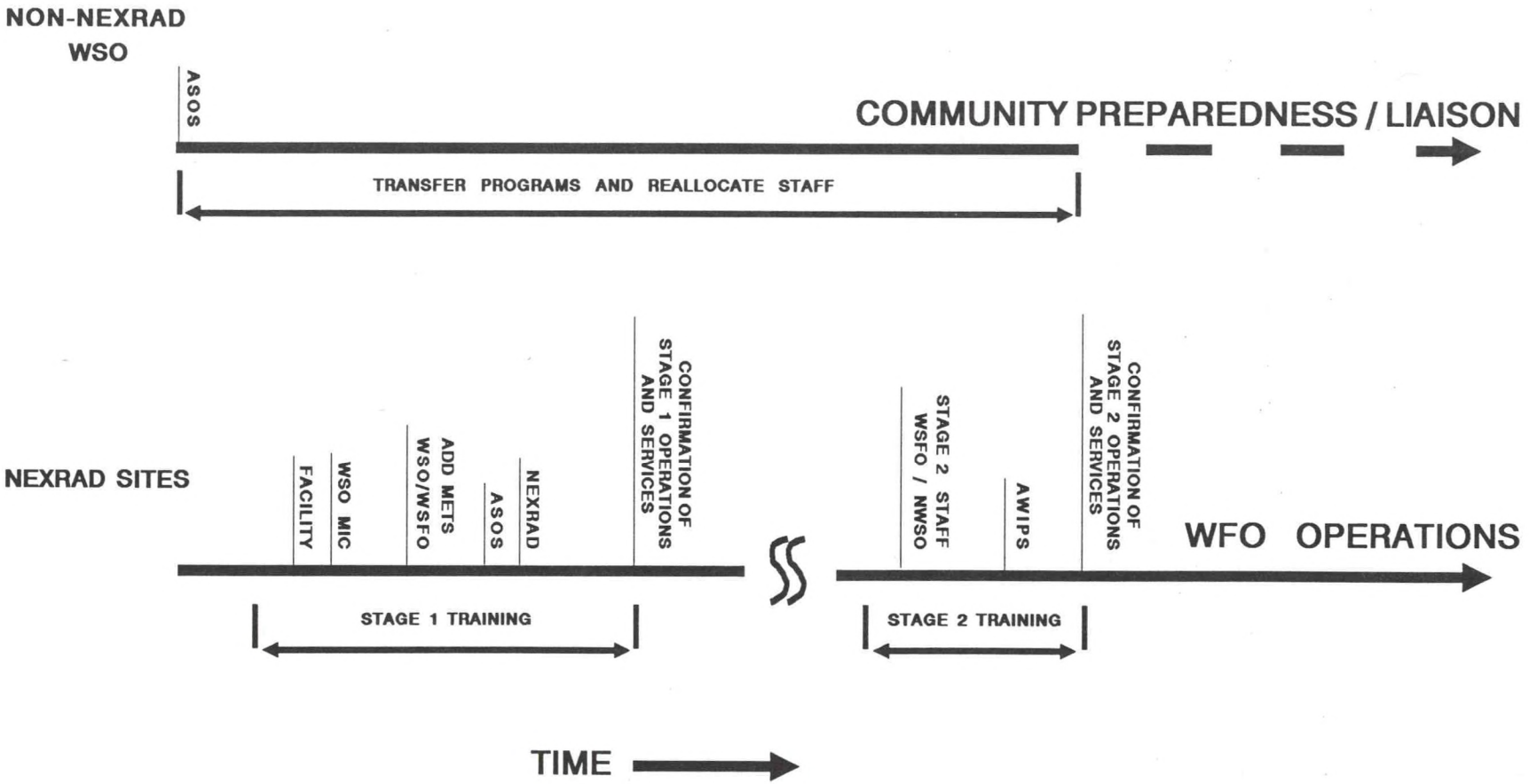
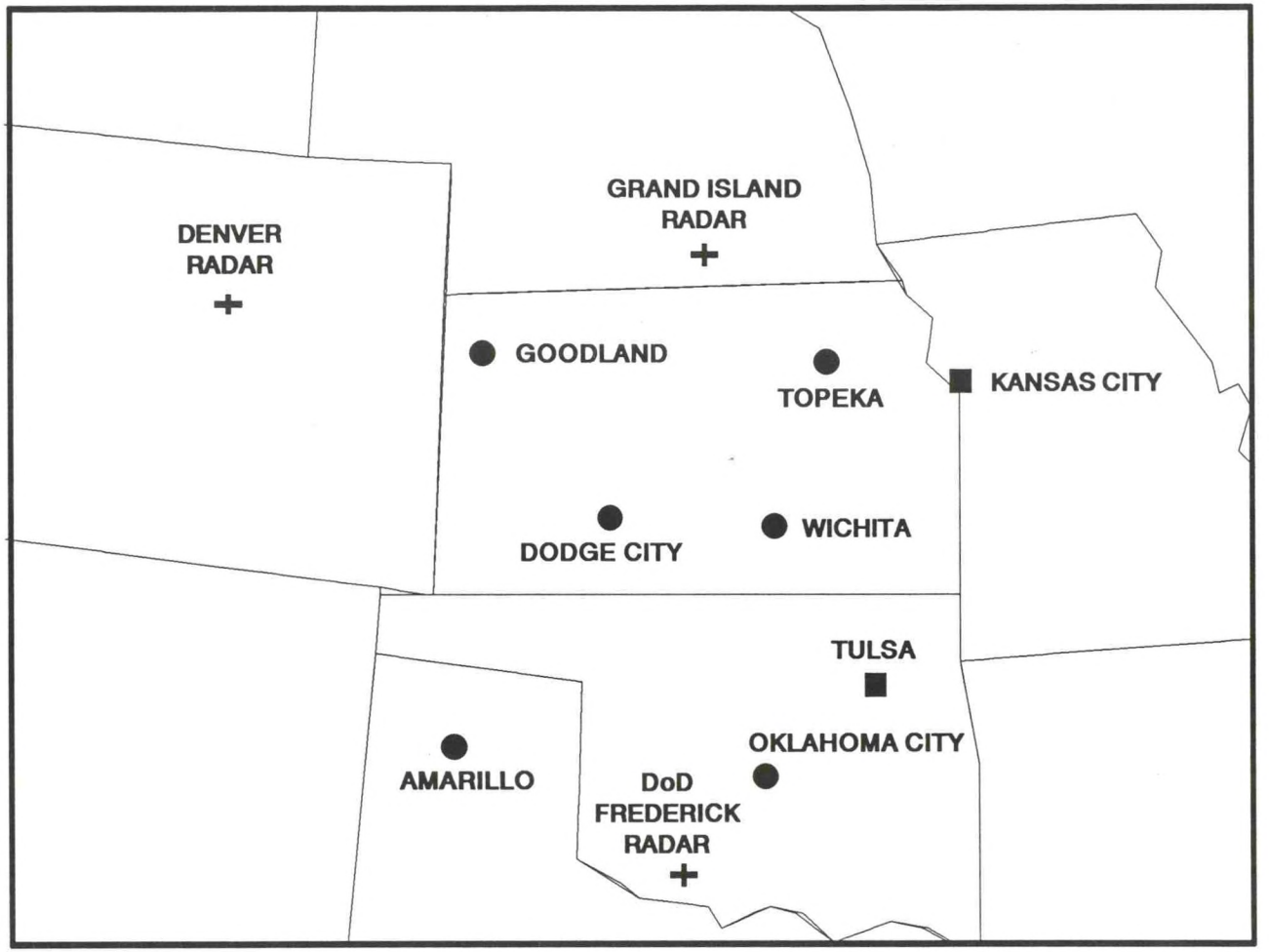


Figure 3:
MODERNIZATION AND ASSOCIATED RESTRUCTURING DEMONSTRATION AREA



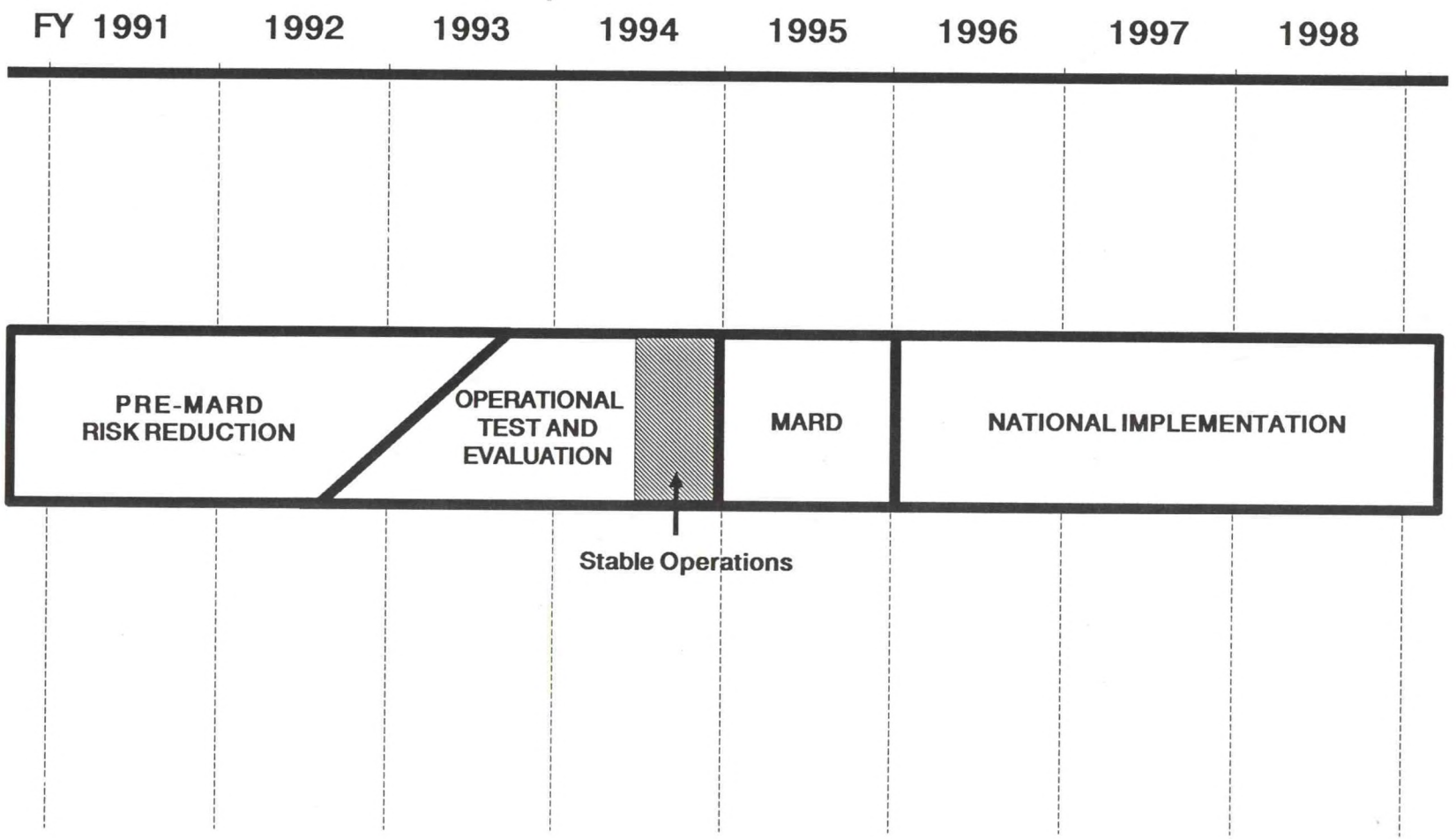
● WFO

■ WFO/RFC

✚ NEXRAD

CENTRALLY PREPARED GUIDANCE WILL BE PROVIDED BY THE NATIONAL CENTERS.

Figure 4:
PRINCIPAL PATH FOR MODERNIZATION



4.0 RESEARCH PROGRAMS

A wide range of research programs are in place, within the NOAA organization and in cooperation with academic communities and other agencies of the federal government, that provide for the transfer of scientific and technological knowledge to the NWS modernization program. These research programs cover a spectrum of activities that include, on one end of the scale, fundamental research in the atmospheric and hydrologic sciences, and on the other end of the scale, the development of specific products and techniques for direct use at NWS field offices in support of the warnings and forecast programs. Research programs are also playing important roles in developing techniques for assimilating data from the diverse observational systems that are coming into operational use, both on a national scale as input to numerical prediction scales and on the local level for short-term mesoscale forecasting at NWS field offices. The bulk of the NOAA research program that supports the NWS modernization is concentrated within three components of the organization - the Environmental Research Laboratory, the National Weather Service, and the National Environmental Satellite, Data and Information Service (NESDIS). Budgets for research programs associated with NWS modernization and restructuring are addressed in Section 6 of this National Implementation Plan. Research program activity schedules are shown, along with schedules for the other major components of modernization and restructuring, in a series of figures at the end of Section 6.

4.1 Environmental Research Laboratory Research Programs

ERL provides fundamental research to develop technology and improve NOAA services to the public. ERL provides this support through dedicated laboratory facilities across the nation. Programs include research on observational systems, modeling and prediction, severe storms, hurricanes, clouds and precipitation processes, and synoptic and mesoscale meteorology.

Forecast Systems Laboratory

The ERL Forecast Systems Laboratory, located in Boulder, Colorado is one of the major contributors to the NWS modernization program through its Program for Regional Observing and Forecasting Services (PROFS) project. The PROFS mission is to improve operational weather services by testing and transferring advances in science and technology to the NWS. One of the principal PROFS activities has been support to the DARE risk reduction programs. Personnel from PROFS participate in the planning, design, implementation and support of the advanced interactive forecaster workstation to provide NWS with a system requirements test-bed for many of the functional capabilities to be provided by AWIPS. The first phase of the DARE program, DARE-I, was completed at the end of fiscal year 1989, and an expanded program, DARE-II, to cover all phases of the Denver forecast and warning operations, began in early fiscal year 1990.

The PROFS program also includes the evaluation of new observational technology that will be available to the NWS forecaster of the future. New and improved forecast products are being developed that include algorithms for Doppler radar data, atmospheric sounding data from geostationary satellites, and vertical wind data from ground based atmospheric profilers.

In addition, PROFS has under development two data assimilation prediction programs that are scheduled to be transferred to the NWS for operational forecasting use when the development efforts have been successfully completed. These efforts address the incorporation of diverse observational data sets, such as radar, satellite, and profiler data, on the regional and local scale. The Mesoscale Analysis and Prediction System (MAPS) provides frequent and highly detailed analyses of meteorological parameters and very short term numerical forecasts in support of aviation and local forecast and warning services. MAPS is designed to run on medium-sized computers in national center environments. The initial phase of the MAPS system, the objective analysis program, was transported to NMC in May 1990 and the forecast code was implemented at NMC in September 1990. Testing and evaluation of the MAPS system in the operational NMC environment is scheduled to begin in early fiscal year 1991 to support the forecast and warning services of the modernized NWS.

In addition PROFS has under development the Local Analysis and Prediction System (LAPS) that is primarily designed for local NWS office use on AWIPS workstations. LAPS is designed to use local data networks, NEXRAD wind data, and profiler output, to provide very high-resolution three dimensional hourly analyses of winds, temperature, and moisture. These hourly fields would then feed diagnostic and predictive models to enhance short range forecasting at NWS field offices. The target date for completing development of an operational version of the LAPS system is the mid-1990s.

Research programs to develop ground based sensors to provide observations of vertical profiles of the atmosphere have been conducted at ERL's Wave Propagation Laboratory for a number of years. As a result of this successful effort, a demonstration network of vertical wind profilers is being installed across the central part of the nation. The responsibility for managing this demonstration program lies with the Profiler Program Office of the Forecast Systems Laboratory. A total of 25 profiler systems will be installed and become operational during fiscal year 1991 and the wind data from these systems will be made available to NWS offices on an hourly basis and as often as every six minutes for use in providing short range forecasts when the AWIPS systems are installed and operational. Research on thermodynamic profilers continues.

National Severe Storms Laboratory

The mission of the National Severe Storms Laboratory (NSSL) located in Norman, Oklahoma, is to develop improved means for observing and forecasting severe weather through studies of storm processes, numerical and conceptual modeling of storm phenomena, and applications of new technologies in remote sensing. Recent studies have drawn heavily on observations by Doppler radar and lightning mapping systems and have resulted in the development of innovative methods to utilize this data at NWS field offices.

The successful NSSL results in the field of Doppler radar were important precursors to the NEXRAD program and NSSL continues to support that program in critical ways. NSSL has developed, refined, and improved a number of algorithms planned for use in NEXRAD. NSSL also prepares studies on mesocyclones in attempts to discriminate between tornadic and non-tornadic mesocyclones. Output from these efforts will feed into the development of enhanced algorithms for the NEXRAD system to improve severe weather forecasting performance at NWS offices.

Atlantic Oceanographic and Meteorological Laboratory

ERL's Atlantic Oceanographic and Meteorological Laboratory (AOML) is organized to pursue basic and applied research in oceanography and tropical meteorology. Hurricane research conducted at AOML supports the hurricane forecasting program carried out by the National Hurricane Center of NWS. To achieve improvement over existing operational hurricane prediction models, the Hurricane Research Division of AOML is engaged in the development of complex hurricane models using high resolution movable grids. Models with fine-scale resolution down to the 10 kilometer scale are under development. AOML also supports NHC through its research and development activities to improve the performance of hurricane tracking models. Revised tracking models that demonstrated improvements were developed and provided to NHC. AOML continues to support the hurricane forecasting services through ongoing studies that include an examination of precipitation features in mature hurricanes, hurricane air-sea interaction, and mesoscale structure of landfalling hurricanes.

4.2 NWS Research Programs

Research supporting the modernization program within the NWS is concentrated in three groups - the Hydrologic Research Laboratory (HRL) of the Office of Hydrology, the Development Division of the National Meteorological Center and the Techniques Development Laboratory of the Office of Systems Development.

Hydrologic Research Laboratory

The Hydrologic Research Laboratory of the NWS Office of Hydrology serves as the nucleus for applied hydrologic research and development activities, and works in cooperation with the OH Hydrologic Operations Division and River Forecast Centers. A significant amount of these activities are underway to capitalize on the new data collection and analysis technologies of the modernized era. Significantly more emphasis will be placed on hydrometeorology, a hybrid science dealing with interrelationships between hydrology and meteorology. NEXRAD, ASOS, and other automated sensors will greatly increase the volume of available hydrometeorological data, and AWIPS will provide enhanced computational power for hydrologic modeling and data management. In direct support of the NWS modernization, the PROTEUS project is underway to reduce the risk associated with implementation of these new technologies. The critical components of PROTEUS include data handling and quality control procedures, NEXRAD precipitation processing algorithms, and an on-site interactive

version of the NWS River Forecast System (NWSRFS). Other NWSRFS enhancements include improved snow melt and rainfall-runoff models and river mechanics procedures.

While considerable efforts are underway to develop an initial operating capability for hydrometeorological operations, efforts will continue in the 1990s to capitalize on the new technologies. The next generation of extended streamflow models will be developed and implemented. New emphasis will be placed on simulating the transfer of soil moisture to the atmosphere for use in both short-range numerical weather prediction models and long-range global climate models, and on predicting the impacts of global climate change on water resources. At the other end of the time scale, the new NWS emphasis on improved forecasts and warnings for mesoscale events highlights the need to develop and implement hydrologic forecasting tools for smaller areas such as flash flood prone watersheds and urban areas. Significant efforts will be undertaken to implement technologies such as geographical information systems and distributed hydrologic models.

National Meteorological Center

The Development Division of NMC conducts research and development in the techniques of numerical weather prediction. Activities include refining the atmospheric models already in operational use and constructing new and better models. To support these objectives, research is concentrated in three major areas: global modeling, regional modeling, and marine products. Specifically, global modeling research includes program areas such as: 1) four-dimensional data assimilation of satellite and conventional observations (including quality control), 2) advanced numerical techniques for modeling the atmosphere and the ocean, 3) and extended range prediction. The research in the area of regional modeling includes: 1) regional four-dimensional data assimilation using satellite, conventional, and high frequency ground based observational systems, 2) advanced numerical techniques for providing short-range regional and mesoscale forecasts, and 3) applied research studies to evaluate the potential improvement in forecast skill using advanced satellite and ground based observing systems. The marine products research includes the assimilation of satellite ocean surface wind data into the operational global data assimilation systems and prediction models and the development of global and regional wave forecasts.

In conducting research in the above areas, the NMC Development Division focuses its efforts on forecasting in the short range (12 to 72 hours) both over limited domains, such as regional and hurricane prediction models, and over global domains. The medium range (3 to 10 days) is concerned with the entire globe while the extended period (10 to 30 days) deals with regional, hemispheric and global domains. The development programs to support these activities concentrate on utilizing the diverse data sources of new observing systems in more complex and sophisticated atmospheric models to improve forecast performance. These observing systems include operational systems, such as NEXRAD, ASOS, and the Geostationary Operational Environmental Satellite (GOES), and also will integrate data from experimental satellite cloud and oceanographic sensing programs. The target system for the operational use of these prediction model enhancements is the advanced super computer system.

Office of Systems Development

The Techniques Development Laboratory of the NWS Office of Systems Development conducts applied research aimed at developing techniques that have promise in application to weather forecasting and analysis. Techniques are developed for objectively forecasting basic weather elements used in public and aviation forecasts, such as clouds, temperature, and visibility. Also emphasis is given to marine related forecasts, to those forecasts associated with mesoscale processes, and to techniques targeted for implementation at AWIPS equipped NWS field offices. The supporting research at the Techniques Development Laboratory covers areas of synoptic scale weather prediction, mesoscale weather prediction, marine environmental prediction, and local field office forecast applications. The synoptic and mesoscale activities are directed towards procedures to be run on centralized computer systems in contrast to local applications designed for use at the modernized NWS field offices. Mesoscale weather prediction efforts include techniques for the prediction of short lived thunderstorms, severe local storms, and heavy precipitation forecasting. Short term forecasting techniques involve the application of sensor produced data, such as from NEXRAD, the GOES satellites, and the experimental profiler system, to develop thunderstorm forecasting procedures and specialized radar algorithms.

The marine prediction activities support NWS field offices, the NHC, and local emergency management officials during the hurricane season. A numerical model was developed by the Techniques Development Laboratory that produces forecasts for oceanic flooding over coastal areas during hurricane landfall situations. This storm surge model has been implemented operationally at NHC and provides critical guidance on expected flooding in advance of the hurricane. The program has also been used extensively as a tool for hurricane evacuation planning through the use of a series of computer simulations of hypothetical hurricanes that delineate areas of potential flooding.

4.3 NESDIS Research Programs

NESDIS research programs are carried out by its Office of Research and Application. Programs are directed toward the improvement of meteorological prediction capabilities to support the modernization of the NWS. The focus of this activity is directed towards providing information derived from satellite sensors to support all levels of NWS analysis and prediction models. These satellite applications span the spectrum of NWS observational and forecast needs ranging from the lower levels of the atmospheric boundary layer to the tracking and monitoring of synoptic and mesoscale systems for estimating precipitation rates. Numerical weather prediction efforts at NESDIS have concentrated on developing enhanced moisture products, wind fields, and three dimensional vertical soundings of temperature and moisture. Support to the NWS warning and forecast program includes research and development work on rapidly deepening storms, tropical storms, clear air turbulence, wind downbursts and microbursts, improved detection of nighttime fog over oceanic and land areas, and quantitative precipitation estimates in support of flash flood warnings.

5.0 TRANSITION PROGRAM MANAGEMENT

The National Weather Service has never undertaken a systematic modernization and associated restructuring effort of the magnitude described in this National Implementation Plan. Virtually every NWS activity will change in some way during the transition period. Management of the transition will be complex, involving all levels of the NWS.

An Office of the Deputy Assistant Administrator for Modernization has been established in the National Weather Service Headquarters. Reporting to the Assistant Administrator for Weather Services, the Deputy Assistant Administrator for Modernization's responsibility is to provide a sustained organizational focus on the Modernization and Associated Restructuring Program for the entire transition period. Supporting the Deputy Assistant Administrator for Modernization is a Transition Director and transition program staff. As an extension of the Transition Director, Transition Representatives have been designated in each Headquarters Office and Region. These representatives provide a focus for transition activities within their organizational unit.

The following subsections present the management philosophy that has been adopted for the transition. They describe in detail the management aspects of the systematic transition.

5.1 Introduction

As a matter of policy, the NWS has adopted a management philosophy for the transition that has two important features:

- to the maximum extent possible, the existing organizational structure and management authority of NWS will be utilized to plan and implement all transition activities; and

- transition planning and implementation must maintain operations and service delivery without disruption.

The Assistant Administrator for Weather Services and Deputy Assistant Administrator for Modernization already have extensive statutory and procedural authority. Procedures for budgeting, staffing, field office modification, etc. already exist. Every action required to modernize the NWS can, in theory, be accomplished by existing mandated procedures. In practice, certain approvals such as a particular field office status change in the context of the annual appropriations process may be difficult to achieve. However, the service improvements of the modernization and associated restructuring provide substantial leverage on a case-by-case basis in establishing the merits of proposed changes.

5.2 Transition Work Breakdown Structure

The overall management approach to the transition is to organize, plan, schedule, execute, monitor, and report on the essential activities necessary to effect modernization and associated restructuring of the NWS. All NWS organizational units are involved in the planning, implementation/execution, reporting, and management of transition activities. A formal work breakdown structure (WBS) is used to systematically plan and manage all of these activities. The major elements comprising the Transition Work Breakdown Structure are shown in Figure 5 at the end of this section.

The elements of the work breakdown structure represent different aspects of the overall transition program that pertain to activities such as planning, execution or implementation, project management and control, and reporting. Not all elements are presented for the same purpose, nor is the assignment of lead office responsibilities necessarily fully consistent with normal organizational responsibilities. The work breakdown structure is designed to facilitate coordination and cross fertilization in work planning and implementation, afford management insight in the monitoring of major activities during the implementation process. The complete Transition Work Breakdown Structure description document and dictionary is available for reference.

5.3 Master Transition Schedule

The Master Transition Schedule is the official vehicle that is used by the agency to assess and report progress on transition to the modernized NWS. The Master Transition Schedule is maintained by the Transition Director and uses the Transition Work Breakdown Structure as the reporting framework.

The Master Transition Schedule takes the form of a Program Evaluation and Review Technique (PERT) chart. The PERT chart (also called a PERT network) shows the major transition activities and their dependencies to each other plotted against time. The critical path on the Master Transition Schedule determines the total duration of the transition. The Master Transition Schedule is also the means by which any proposed schedule changes are evaluated. The evaluation determines how the proposed change impacts the critical path. Approval of any change is dependent on its impact on the critical path.

The current Master Transition Schedule is provided in Appendix A.

5.4 Transition Program Monitoring and Control System

A transition program monitoring and control system has been established to provide a concise, accurate, and timely transition status information. The following modes of communication are used to disseminate transition status information throughout the agency and to external audiences.

- Regular transition program reviews are conducted by the Transition Director with the Assistant Administrator, Deputy Assistant Administrators for Modernization and Operations, and Office Directors, as well as with the Transition Representatives;

- Periodic progress and technical reports are published and distributed throughout the agency to provide all NWS employees with transition information;

- Semi-annual Transition Management Meetings conducted by the Transition Director involving the Assistant Administrator, Deputy Assistant Administrators for Modernization and Operations, and Office/Regional Directors are devoted entirely to transition related matters; and

- Transition progress reports are a standard agenda item for the Spring and Fall Directors' Conferences.

A transition program status room has been established and is maintained in NWS Headquarters by the Transition Director to display the latest version of the Master Transition Schedule and other more detailed transition information so progress can be reported to NWS management and visitors. The heart of the program monitoring and control system is a computer based project management system. The information contained in this project management system is accessible to all parts of the agency. Appropriate security measures have been instituted to restrict access to sensitive data. The complete Transition Program Monitoring and Control System description and procedures document is available for reference.

5.5 Transition Change Management

Transition to the modernized NWS consists of a complex series of separable, but tightly interrelated activities. Once plans are approved and actions set in motion, requests to amend plans and the need to adjust implementation actions will be the rule rather than the exception. Such requests for change must be handled in a disciplined and coordinated manner. The Transition Change Management process is the official vehicle for systematically dealing with proposed changes that have transition impact. The Transition Director operates the Transition Change Management process with support from the Transition Representatives in each Headquarters Office and Region.

The Transition Change Management process has the following features:

- evaluation of the impact on all areas potentially affected by proposed transition changes;

- considerations of implementation, schedule, and cost aspects in evaluating the merits of proposed transition changes;

- maximum utilization of existing agency change/configuration management systems for screening and evaluating proposed transition changes;

- appropriate organizational levels of approval: changes with major impact are approved by the Deputy Assistant Administrator for Modernization after concurrence by the Transition Change Management Board which consists of the Transition Director and Office/Regional Directors; changes with minor impact are approved by the cognizant Office/Regional Director or Program Manager; and

- documentation and communication of the disposition of all change requests, as well as status reporting on change requests while they are under evaluation or implementation.

The complete Transition Change Management policy document is available for reference.

5.6 Transition Management Meetings

An integral part of the transition management process will be Transition Management Meetings that will be organized and conducted by the Transition Director, and attended by the Assistant Administrator, Deputy Assistant Administrators for Modernization and Operations, and all Office and Regional Directors. These meetings are devoted exclusively to transition related matters and are held semi-annually, in addition to the Spring and Fall Directors' Conferences.

Standard agenda items for the transition management meetings are to:

- review transition progress;

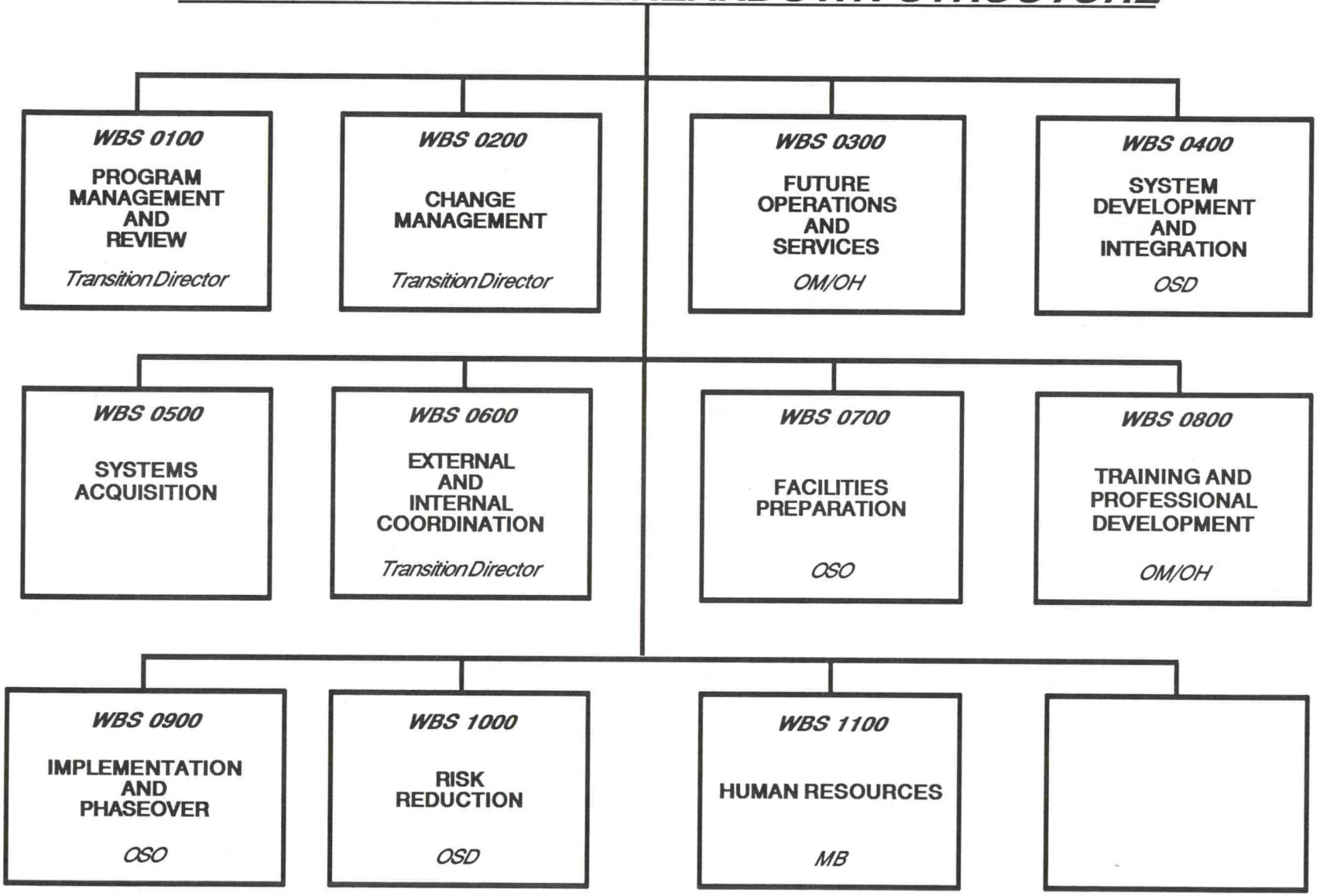
- focus on specific transition problems/issues;

- review/approve transition change proposals; and

- define/adjust 3-year outlooks and 1-year action plans, setting the agency's course for the coming year.

Figure 5:

TRANSITION WORK BREAKDOWN STRUCTURE



6.0 TRANSITION PROGRAM STATUS AND OUTLOOK

This section of the National Implementation Plan addresses the status and outlook of the transition program. The section first addresses the status of the program as of the end of fiscal year 1990, then proceeds with discussions of plans for fiscal years 1991, 1992 and 1993. Detailed budgets for fiscal years 1991 and 1992, and the budgetary planning ceilings for fiscal year 1993 for each of the major components of the modernization and restructuring program are shown in Table 6 at the end of this section. Table 6 is not intended to portray the total cost of the modernization and associated restructuring program. Programmatic schedules for each of the major components are shown in Figures 6 through 16 at the end of this section.

6.1 Current Status of the Transition Program

During the past year, significant accomplishments have been achieved by the NWS toward the transition program. Much of the effort has been directed toward development of integrated program plans to ensure that the transition is coordinated throughout the NWS and with the end users of the products and services. Specifically, the following describes the status of the transition program as of the end of fiscal year 1990.

Funding Status

The NWS modernization and associated restructuring is primarily funded through the modernization technology programs which have received cumulative appropriations through fiscal year 1990 of $237 million for NEXRAD, $43 million for ASOS, and $65 million for AWIPS/NOAAPORT. Modernization and associated restructuring elements not funded through these major technology programs are funded through the MARDI program budget, which to date has been $3.4 million.

Transition Program Management

Transition program management is the responsibility of the Transition Director in the Office of the Deputy Assistant Administrator for Modernization. The tools described in earlier parts of this plan, including the hierarchy of plans, the Transition Work Breakdown Structure, the Master Transition Schedule, and a program monitoring and control system have been developed.

Regional Transition Plans are currently being developed by each of the NWS regions. Four of the six regional offices have completed their first drafts of their respective Regional Transition Plans. Site Implementation Plans covering all field offices are being prepared.

Schedules have been developed for completion of all the Site Implementation Plans by the end of fiscal year 1991.

The MARD Implementation and Evaluation Plan has been drafted. The MARD Plan will be the baseline for all MARD activities. It will reference the Site Implementation Plan for each of the participating field offices. The plan will also address the involvement of the National Meteorological Center and the National Severe Storms Forecast Center.

NWS has designed and is developing the management tools and techniques necessary to effectively manage the transition. The program monitoring and control system has been designed and implementation has begun. An electronic mail/bulletin board system to facilitate exchanges of transition information is operational for National and Regional Headquarters and for all NWS field offices. Systematic reviews of all transition activities are being conducted through bi-weekly transition meetings, semi-annual Transition Management Meetings and Directors' Conferences, and periodic program reviews in the various Offices and Regions.

The National Weather Service has obtained the support of the National Academy of Sciences/National Academy of Engineering to study NWS Modernization and Associated Restructuring. A contract was signed in December 1989 with the National Research Council which is the operating body of the National Academy of Sciences/National Academy of Engineering. The study will be conducted under the auspices of the National Research Council's Commission on Engineering and Technical Systems through the establishment of an NWS Modernization Committee. The NWS Modernization Committee will have two broad areas of responsibility: 1) to help ensure the most cost-effective levels of technical systems and services by assessing the availability, applicability and timing of appropriate underlying technological and scientific capabilities; and 2) to help ensure the successful demonstration and acceptance of the modernized and restructured NWS operations by reviewing test, demonstration and certification plans, and by independently reviewing the data collection and interpretation process. This study will continue into national implementation of the new technology and the phase over to the new NWS operating structure.

Transition Change Management

A Transition Change Management process has been established within the NWS. The process ensures an orderly transition by instituting procedures by which NWS management can carefully consider and evaluate all proposed changes to NWS policies, plans, and schedules which impact the modernization. During fiscal year 1990, three Site Implementation Plans were approved through the Change Management process. Preliminary versions of seven additional Site Implementation Plans and draft versions of four Regional Transition Plans were completed. The National Centers Transition Plan was approved through the Transition Change Management process.

Future Operations and Services

The NWS Office of Meteorology established the Services Planning and Implementation Group to assist in development of the integrated plans for this area of the transition. The Office of Meteorology and the Office of Hydrology will continue development of the Integrated Operations and Services Plan which will identify the services and products to be generated during the Modernization and Associated Restructuring Demonstration and Stage 2 operations. Initial drafts of eight service plans have been prepared and internal review has begun.

System Development and Integration

The ASOS Preproduction Development contract was awarded to competing industrial sources in April 1988. The release of the Request for Proposals for the Production and Deployment Phase of the ASOS contract occurred in June 1989. The field test and evaluation program was completed for the preproduction version of ASOS.

A NEXRAD prototype unit was delivered to the NEXRAD Operational Support Facility in December 1988. The Initial Operational Test and Evaluation program was completed in July 1989. The NEXRAD program exercised the contract option for full-scale production in January 1990. One limited production unit was delivered to WSFO Oklahoma City in May 1990.

The AWIPS program is in the second year of the Definition Phase activity. Contracts were awarded to two industrial groups in November 1988 to participate in this effort. The Final Technical Progress Reviews were conducted with both contractors in December 1989. A MARD functional bench mark demonstration was completed in April 1990. The Request for Proposals for the Development, Deployment and Operations Phases was issued in October 1990.

A contract was signed with Cray Research Corporation in December 1989, and a Cray YMP8/832 computer was delivered to NMC in February 1990. Initial operational usage began in April 1990. Complete conversion was accomplished in September 1990.

Wind profilers were installed at two sites of the 25 station demonstration network.

External and Internal Coordination

A national plan to design, execute, monitor and evaluate a systematic NWS program to provide for communications exchange and technical coordination with both the internal and external communities either affected by, or interested in, modernization activities has been drafted.

National activities in fiscal years 1989 and 1990 focused on awareness and orientation regarding the transition program. Activities included developing materials, obtaining contract

support, scheduling meetings and events with key parties, and coordinating Congressional, Constituent and Public Affairs activities.

In July 1990, the first National Implementation Plan was sent to all NWS field offices, other federal agencies, all members of Congress and their district offices, all state governors, selected universities, professional scientific organizations, private meteorological companies, and the media.

A calendar of opportunities for speaking engagements and events for senior DOC and NOAA management was drafted and will be augmented as opportunities arise.

The first issues of the employees technical report, the "Critical Path," were produced in December 1989, and March, June and September 1990. It addresses timely issues and concerns and provides a feedback mechanism for NWS employees.

An NWS Field Managers Meeting was held in March 1990, in Boulder, Colorado to discuss modernization plans and concerns.

NWS managers briefed Congressional delegations from over forty states on modernization plans for their respective states.

Facilities Preparation

Transition facilities activities have been in progress for some time in order to accommodate the delivery and installation of NEXRAD systems. Construction of future WFOs continued at a number of NWS sites; as of the end of fiscal year 1990, nine future WFO facilities had been completed. The NEXRAD equipment was installed at Twin Lakes, OK. The training facility was completed in spring of 1990, and NEXRAD equipment delivered so that the maintenance training can begin in October 1990. Site requirements and economic analyses are well underway with approximately thirty packages complete.

The ASOS program has completed over five hundred equipment site surveys for NWS, FAA and Navy installations of ASOS systems.

During 1990, installation site surveys for AWIPS systems were completed for NMC and NSSFC.

Training and Professional Development

The initial draft of the Training and Professional Development Plan has been prepared by the Office of Meteorology's Training Coordinator and internally reviewed, and is currently being edited to incorporate the review comments.

A Cooperative Agreement to implement the Cooperative Program for Operational Meteorology Education and Training (COMET) Center was initiated between NOAA and the Univer-

sity Corporation for Atmospheric Research. The purposes of this agreement are: to support professional development of the nation's operational forecasters; to enhance basic and applied research that has potential for furthering the effective application of new technologies to forecasting; and to ensure effective use of new insights into the behavior of stormscale meteorological systems in operational forecasting.

Initial NEXRAD operations training for NWS meteorologists and hydrologists began at Norman in September 1990, as part of a multi-year effort.

Implementation and Phase Over

The NWS Office of Systems Operations established the Implementation and Phase Over Committee to prepare an overall Implementation and Phase Over Plan to provide guidance on implementation of NEXRAD, ASOS, and AWIPS systems in an operational environment. The plan was completed in September 1990. Initial drafts of subelement plans were completed in April 1990.

The Policy for Systems Commissioning and Confirmation of Operational Capabilities was issued as a Weather Service Operations Manual chapter in August 1990. Working groups on ASOS and NEXRAD commissioning were formed in August 1990.

Risk Reduction

Three major transition risk reduction projects are currently ongoing within NWS:

DARE - The Denver AWIPS Risk Reduction and Requirements Evaluation project, a joint effort between NWS and the NOAA Office of Atmospheric Research, was started in 1986. The objective of this project is to demonstrate and test fundamental AWIPS systems and operations concepts. The DARE-II program began in April 1990. DARE-II involves multiple work stations, as opposed to the single work station used in DARE-I, and involves all aspects of the Denver warning and forecast services.

PROTEUS - The Prototype River Forecast Center Operational Test, Evaluation and User Simulation project is designed to demonstrate enhanced computer hardware and software required by RFCs to operate in the AWIPS environment. The PROTEUS project has implemented PRIME computers at RFCs in Harrisburg, PA; Salt Lake City, UT; Kansas City, MO; and Tulsa, OK for operational testing of the baseline system for hydrologic forecasting. PROTEUS operations began at Tulsa during 1990, augmenting activities already under way at the other RFCs. The Tulsa program focusses on precipitation processing using NEXRAD data and on enhanced hydrometeorological operations in support of warning and forecast processes at WFOs. The Tulsa operation will be integrated into the Norman risk reduction program.

Norman - The primary objective of the Norman, OK risk reduction project is to measure the capability of a WFO to provide required services, to develop interfaces to the new observing

systems, particularly NEXRAD, and to validate the capability to ingest centralized data streams into the advanced work station system installed at Norman.

Human Resources

Staffing issues for the modernized and restructured NWS will continue to be resolved in accordance with the guidance provided by the DOC advisory committee for human resources issues. Position descriptions for all positions to be filled during the modernization and associated restructuring were completed.

6.2 Outlook for Fiscal Year 1991

Major objectives for fiscal year 1991 include continuing facilities preparations at the MARD sites, completing delivery of ASOS systems to the MARD sites, beginning the commissioning of these ASOSs, and continuing delivery of limited production NEXRADs. Other fiscal year 1991 activities will be directed toward completion, review, and approval of the transition plans started in fiscal year 1989 and implementation of long lead activities.

Funding Requirements for Fiscal Year 1991

Resources for fiscal year 1991 will support continuing technology development and production, risk reduction activities and preparations for MARD.

Funding will be allocated to the NWS share of the tri-agency NEXRAD production contract. Fiscal year 1991 funding will be used for NWS to continue land acquisition, engineering design, and radar/communication site and user facility construction to ensure readiness for acceptance of scheduled NEXRAD equipment deliveries. Funding will also be used to initiate logistics support activities to establish Central Depot repair capabilities. NEXRAD field personnel operations and maintenance training will continue.

Fiscal year 1991 funding will support beginning the installation of ASOS limited production systems and will fund the NWS share of the ASOS full-scale production contract. Funds will be used to prepare sites for installation; to produce systems, initial spares, and depot spares; to provide communications for data transmission and archiving; and to install and maintain ASOS systems.

Maintenance costs associated with the Cray YMP8/832 computer installed at NMC during fiscal year 1990 will be funded in fiscal year 1991.

The MARD concept has been developed to ensure the viability of the NWS modernization and associated restructuring. In order to proceed as scheduled, funds in fiscal year 1991 will be used to:

- Continue the two AWIPS Definition Phase contracts.

- Continue preparations for the AWIPS Development Phase to meet the schedules for software development and delivery of AWIPS pre-production prototypes to the MARD sites. Site preparations that will be needed include minor changes such as moving vents and cable conduits, and the removal of AFOS.

- Continue risk reduction efforts to derive critical information needed to define, analyze and assess technical trade-offs and impact on operations and service from activities conducted in collaboration with the Office of Oceanic and Atmospheric Research and NESDIS at Boulder/Denver, CO; Norman, OK; Kansas City, MO; and NOAA central facilities in the Washington, DC area. These activities are the planned extension of in-house development and risk reduction activities on-going since fiscal year 1988. They will provide essential input to Government decisions on NWS modernization efforts and in the determination of the final characteristics of the AWIPS production units that will be deployed nationwide following the Development Phase.

- Increase NWS current communications capability in order to handle the increased data generated by new observing technologies.

- Perform RFC prototyping and precipitation processing risk reduction activities.

- Supplement MARD office staffs with additional meteorologists.

- Develop a formal MARD evaluation program.

Fiscal year 1991 funding will support continued development of scientific education on the interpretation of new data sources such as doppler radar and mesoscale forecasting techniques which must be provided for meteorologists and hydrologists at NWS field offices. NWS will purchase computer based learning equipment for all future WFOs so that training can be accomplished on a continuing basis at each field station.

Because of the magnitude of the modernization and associated restructuring program, there will be an increase in the number of office and personnel relocations over that which NWS normally experiences; therefore, funding is required to cover these increased costs.

Transition Program Management

Preparation of the remaining Site Implementation Plans will be completed in fiscal year 1991. The plan preparation guidelines have been disseminated, and each plan will be reviewed and approved by the cognizant Regional Director.

The MARD Implementation and Evaluation Plan will be completed, coordinated within the agency, approved by the Assistant Administrator for Weather Services, and implementation will begin.

Work on the transition program monitoring and control system, including the development and implementation of the National Transition Database will be sustained during fiscal year 1991.

Transition Change Management

The Transition Change Management will continue to support the planning and implementation of the modernization.

Future Operations and Services

All Future Operations and Services plans will be reviewed to establish that they remain consistent with modernization and associated restructuring goals. Schedules will be developed for the implementation of services.

System Development and Integration

The ASOS production contract will be awarded in early fiscal year 1991. Delivery and installation of the limited production ASOS systems will begin in March 1991.

Limited production NEXRAD systems will be installed at Melbourne, FL; St. Louis, MO; and Baltimore/Washington (Sterling, VA).

External and Internal Coordination

Office and Regional Directors will submit their strategies to the Transition Director for internal and external communication on the regional, state, and local levels. They will begin implementing regional, state, and local activities and reporting on their progress.

A comprehensive briefing package describing modernization goals and their positive impacts on NWS products and services will be provided to all NWS field managers to help them in explaining the modernization to local, county, and state users.

Facilities Preparation

Site selection, land acquisition and facilities construction will continue during fiscal year 1991 to accommodate installation of NEXRAD systems. Up to twenty additional WFOs will be under construction; an equal amount of design work will be in progress; and all economic analyses to determine the most cost effective facilities alternatives will be completed.

Training and Professional Development

Training plans will be reviewed to ensure that they remain consistent with modernization and associated restructuring goals. NEXRAD field personnel operations and maintenance training will begin. ASOS on-site training at the MARD sites will be completed. Development of computer-based training modules will continue.

Implementation and Phase Over

The Implementation and Phase Over Plan will be completed. Drafts of all subelement plans will be completed for internal NWS coordination. Plans for ASOS and NEXRAD commissioning will be completed. An overall system decommissioning and disposal policy will be developed.

Risk Reduction

DARE - The DARE-II will continue through 1991.

PROTEUS - The PROTEUS program will continue to develop and test advanced algorithms to enhance the precipitation and flood forecasting support operations at both WFOs and RFCs.

Norman - The Norman risk reduction project will commence full-scale operations in July 1991.

Sterling - The risk reduction program at Sterling, VA will commence with the installation of ASOS. This effort will deal with the risk in developing data products from complementary data sensing systems to augment the ASOS observations.

Cincinnati RFC - These operations are designed to measure risks associated with the establishment of a Hydrometeorological Analysis and Support operation at the Cincinnati RFC.

Human Resources

Staffing issues for the modernized and restructured NWS will continue to be resolved in accordance with the guidance provided by the DOC advisory committee for human resources issues.

Notification of Significant Events for Fiscal Year 1991

As part of the certification process described in section 3.7, Notification of Significant Events will be provided in the annual submission of this National Implementation Plan. The significant events for the next three years are shown on a state by state basis in Figures 17 through 68 at the end of this section. For each state, all Significant Events affecting that state

are indicated, including NEXRAD coverage that will be provided from nearby and out-of-state locations.

Notification of Intent to Certify for Fiscal Year 1991

As part of the certification process described in section 3.7, Notification of Intent to Certify will be provided in the annual submission of this National Implementation Plan. No office certifications are planned for fiscal year 1991.

6.3 Outlook for Fiscal Year 1992

Major objectives for fiscal year 1992 include awarding the contract for the AWIPS development, deployment and operations phases, completing commissioning of ASOSs at MARD sites, delivering NEXRADs to MARD sites, beginning commissioning of MARD NEXRADs, continuing MARD systems training and scientific education, beginning the Operational Test and Evaluation at MARD sites, and acquisition of an advanced super computer for NMC.

Funding Requirements for Fiscal Year 1992

Fiscal year 1992 funding will be required to continue covering NOAA's pro rata share of funding for the NEXRAD tri-agency production contract to maintain scheduled deliveries for this economic quantity buy. NWS will continue with modification and construction of NEXRAD user facilities to meet scheduled contractual commitments for site readiness. Funding will also be required to continue establishment of initial Central Depot repair capabilities.

Fiscal year 1992 funding will be required to continue the full-scale production contract for ASOS and to cover the NWS share of the central depot maintenance support operations and logistics.

Fiscal year 1992 funding will be required to award the contract for AWIPS development, deployment and operations phases in October 1991 and initiate AWIPS development phase activities. These include all contractor support for MARD operations, such as installing AWIPS at the MARD sites, and providing training to NWS staff. Funding will also provide for the central communications, including the network monitoring center, and for integrated maintenance and logistics support.

Risk reduction activities at Boulder, CO; Norman, OK; and Sterling, VA will need continued funding. NWS will continue the test and development of functional capabilities deferred from the Initial Operating Capability.

RFC prototyping and precipitation processing risk reduction activities will need continuing funding in fiscal year 1992.

Fiscal year 1992 resources will be required to continue the scientific education of the NWS field personnel.

Temporary augmentation of staff will be needed in order to proceed through the transition without disruption of current services.

Office and personnel relocation costs must be funded in fiscal year 1992 as the NWS continues with preparations for national implementation of the Modernization and Associated Restructuring program.

Each WFO will be responsible for about twice the number of NWR consoles as current field offices are; therefore, funding in fiscal year 1992 will be needed to remote the consoles from a fewer number of offices to their transmitters. Additional funding will be needed for development of a console replacement system which will replace the old manual technology with automated digital-to-voice technology.

Fiscal year 1992 funding will continue to support MARD preparation activities and development of operational procedures and evaluation guidelines.

Funding in fiscal year 1992 will be required for contractor support to conduct user surveys concerning NWS service quality, and to develop and present materials that will aid in interfacing and coordinating with the user community--the general public, state and local governments, the Congress, the media, special users groups, cooperating agencies, and private sector meteorologists.

Notification of Significant Events for Fiscal Year 1992

As part of the certification process described in section 3.7, Notification of Significant Events will be provided in the annual submission of this National Implementation Plan. The significant events for the next three years are shown on a state by state basis in Figures 17 through 68 at the end of this section. For each state, all Significant Events affecting that state are indicated, including NEXRAD coverage that will be provided from nearby and out-of-state locations.

Notification of Intent to Certify for Fiscal Year 1992

As part of the certification process described in section 3.7, Notification of Intent to Certify will be provided in the annual submission of this National Implementation Plan. No office certifications are planned for fiscal year 1992.

6.4 Outlook for Fiscal Year 1993

Major objectives for fiscal year 1993 include completing commissioning of MARD NEXRADs, completing delivery of AWIPS MARD prototypes, and beginning deployment of

NWR console replacement systems. Field systems training continues and field site education begins. The Operational Test and Evaluation at the MARD sites will continue.

Funding Requirements for Fiscal Year 1993

Fiscal year 1993 funding will be required to continue the NEXRAD tri-agency production contract to maintain scheduled deliveries for this economic quantity buy. NWS will continue with modification and construction of NEXRAD user facilities to meet scheduled contractual commitments for site readiness. Funding will also be required to continue establishment of initial Central Depot repair capabilities.

Fiscal year 1993 funding will be required to continue the full-scale production contract for ASOS and to cover the NWS share of the central depot maintenance support operations and logistics.

Fiscal year 1993 funding is required to continue the AWIPS development phase contract.

RFC prototyping and precipitation processing risk reduction activities will need continuing funding in fiscal year 1993.

Fiscal year 1993 resources will be required to continue the scientific education of the NWS field personnel.

Temporary augmentation of staff at a higher level than in fiscal year 1992 will continue in order to proceed through the transition without disruption of current services.

Office and personnel relocation costs must be funded again in fiscal year 1993 as the NWS continues with preparations for national implementation of the Modernization and Associated Restructuring program.

Funding in fiscal year 1993 will support the completion of development and the initial production and installation in NWS field offices of the NWR console replacement system.

Fiscal year 1993 funding will continue to support MARD preparation activities.

Continued coordination with the user community in preparation for certification of services following completion of the MARD will required fiscal year 1993 funding.

Notification of Significant Events for Fiscal Year 1993

As part of the certification process described in section 3.7, Notification of Significant Events will be provided in the annual submission of this National Implementation Plan. The significant events for the next three years are shown on a state by state basis in Figures 17 through 68 at the end of this section. For each state, all Significant Events affecting that state

are indicated, including NEXRAD coverage that will be provided from nearby and out-of-state locations.

Notification of Intent to Certify for Fiscal Year 1993

As part of the certification process described in section 3.7, Notification of Intent to Certify will be provided in the annual submission of this National Implementation Plan. No office certifications are planned for fiscal year 1993.

Table 6:

MODERNIZATION BUDGETS (Fiscal Year 1991- 1993)

	FY 91	FY 92	FY 93
MODERNIZATION INITIATIVES ($M)			
NEXRAD (INCLUDES FACILITIES)	114.4	118.2	101.1
ASOS	12.5	13.9	13.9
AWIPS/NOAAPORT	20.0	54.5	32.9
SATELLITE UPGRADE	109.1	148.7	113.3
NATIONAL CENTER COMPUTER UPGRADE	7.3	23.2	2.3
MARDI	10.0	11.7	11.7
HUMAN RESOURCES (FTE)			
NWS BASE	4782	4673	4673
STAFFING AUGMENTATION	38	158	198
RESEARCH ($M)			
ERL	25.1	24.3	24.3
NWS	9.0	9.0	9.0
NESDIS	8.2	8.2	8.2

Figure 6:
FACILITIES PREPARATION SCHEDULE

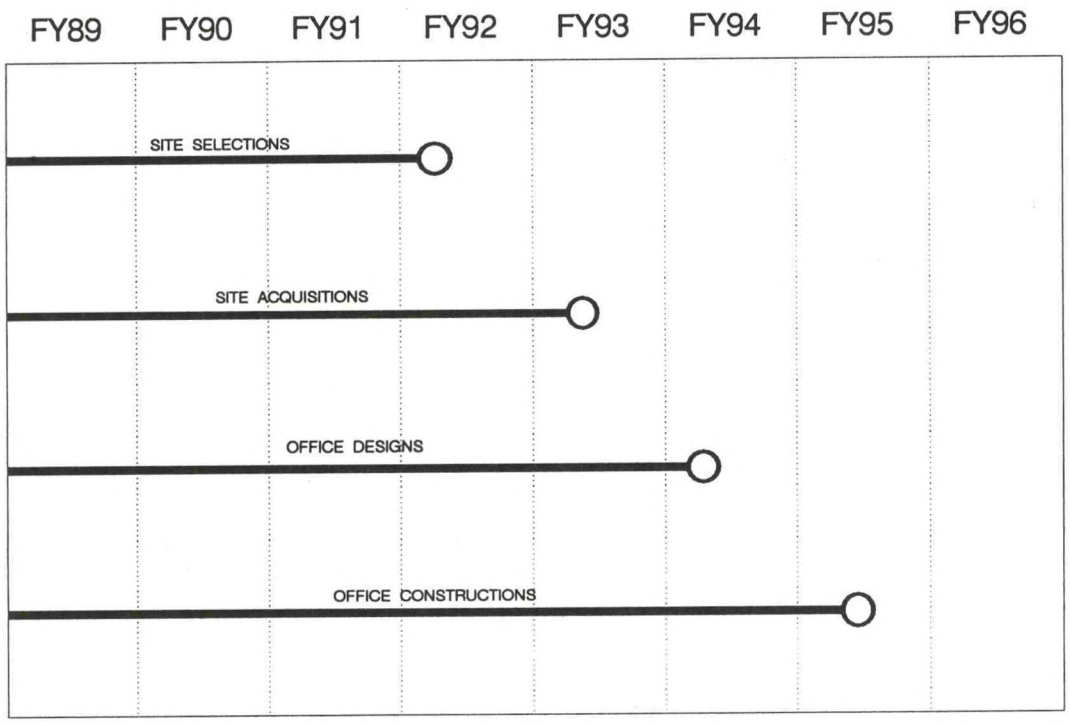


Figure 7:
NEXRAD SCHEDULE

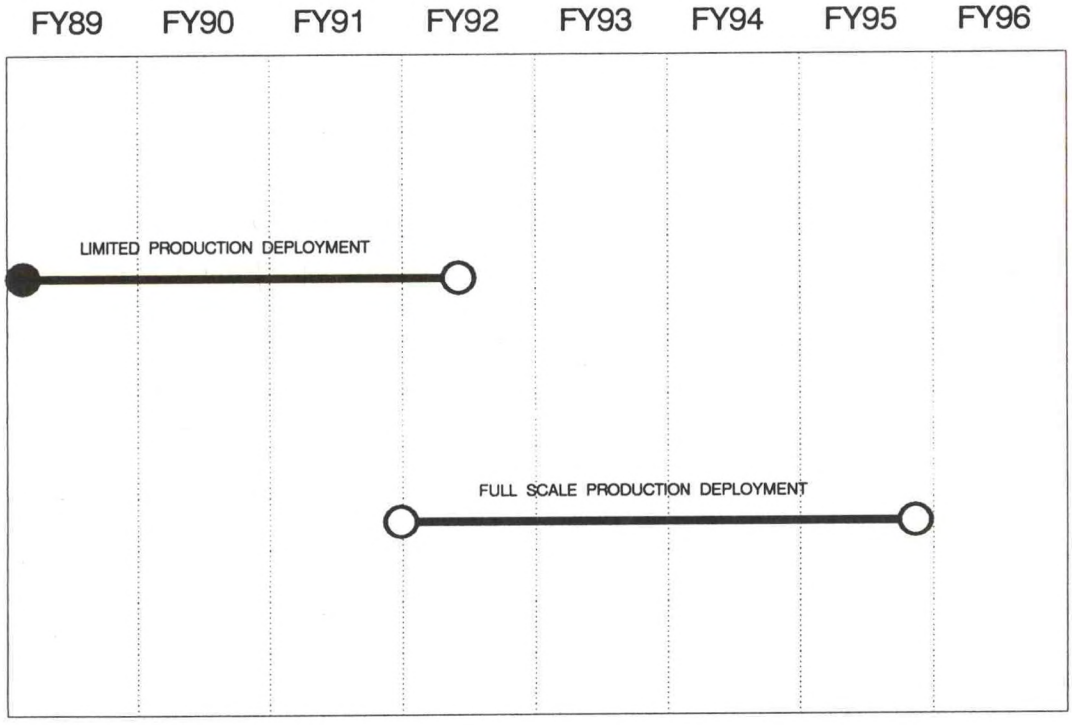


Figure 8:

ASOS SCHEDULE

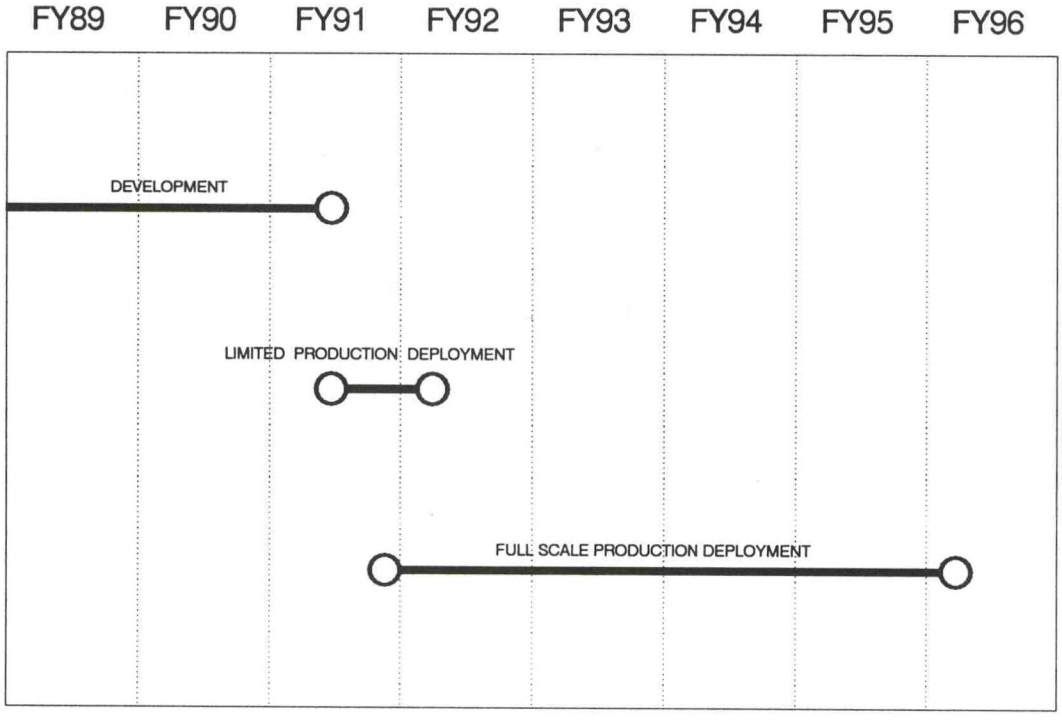


Figure 9:

AWIPS/NOAAPORT SCHEDULE

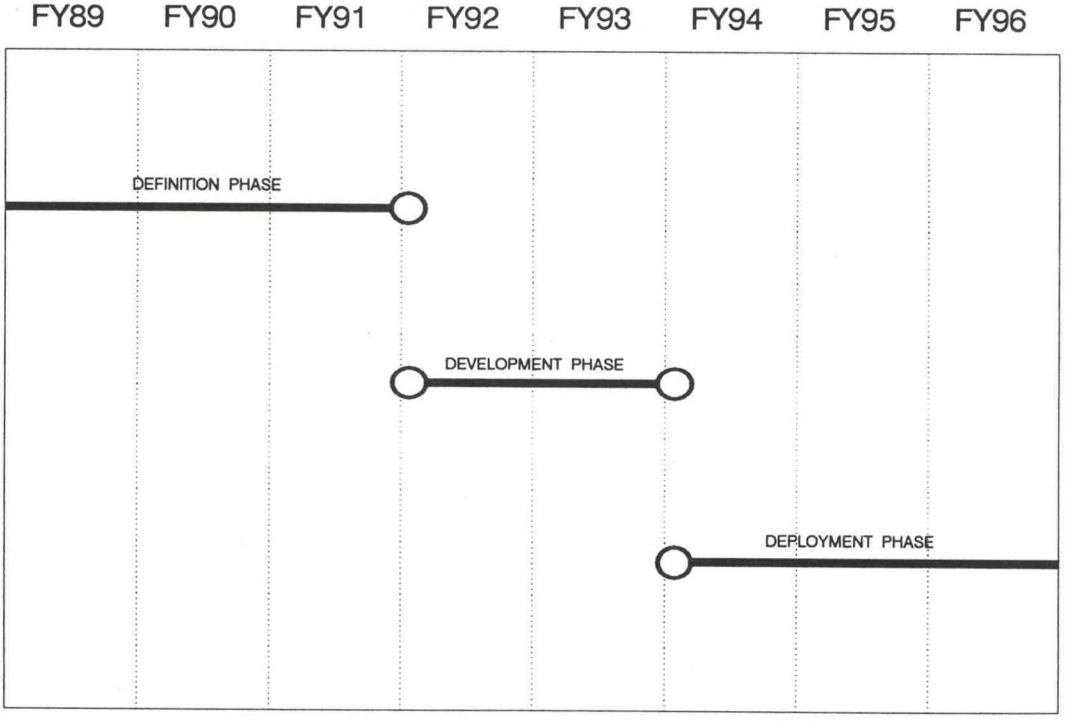


Figure 10:

SATELLITE UPGRADE SCHEDULE

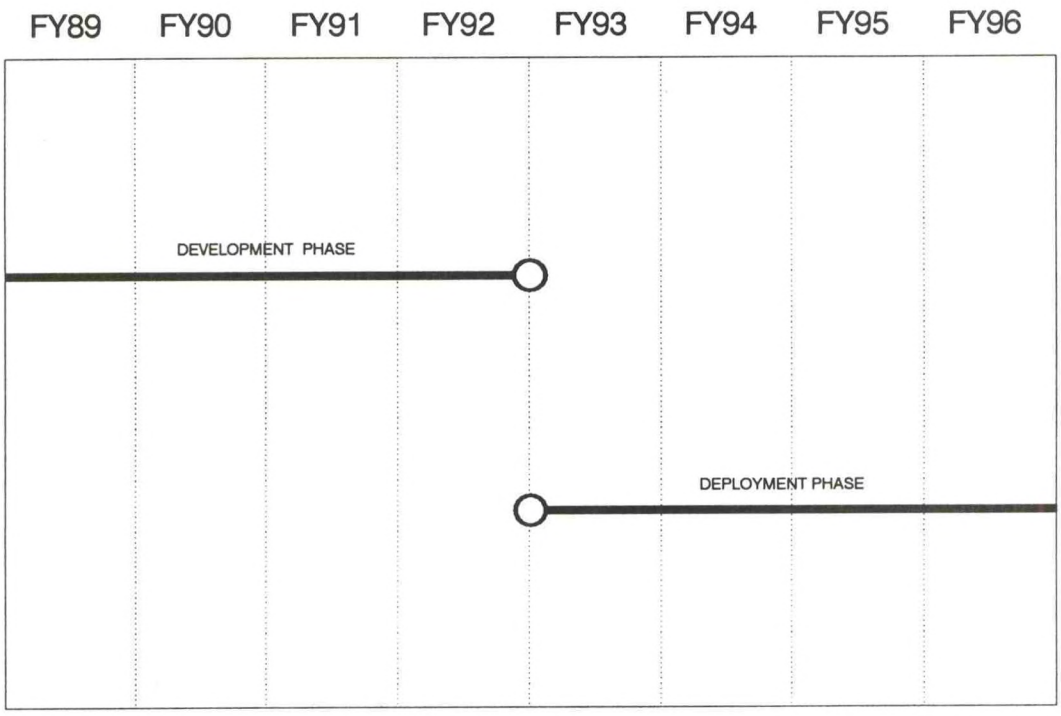


Figure 11:

NATIONAL CENTER COMPUTER UPGRADE SCHEDULE

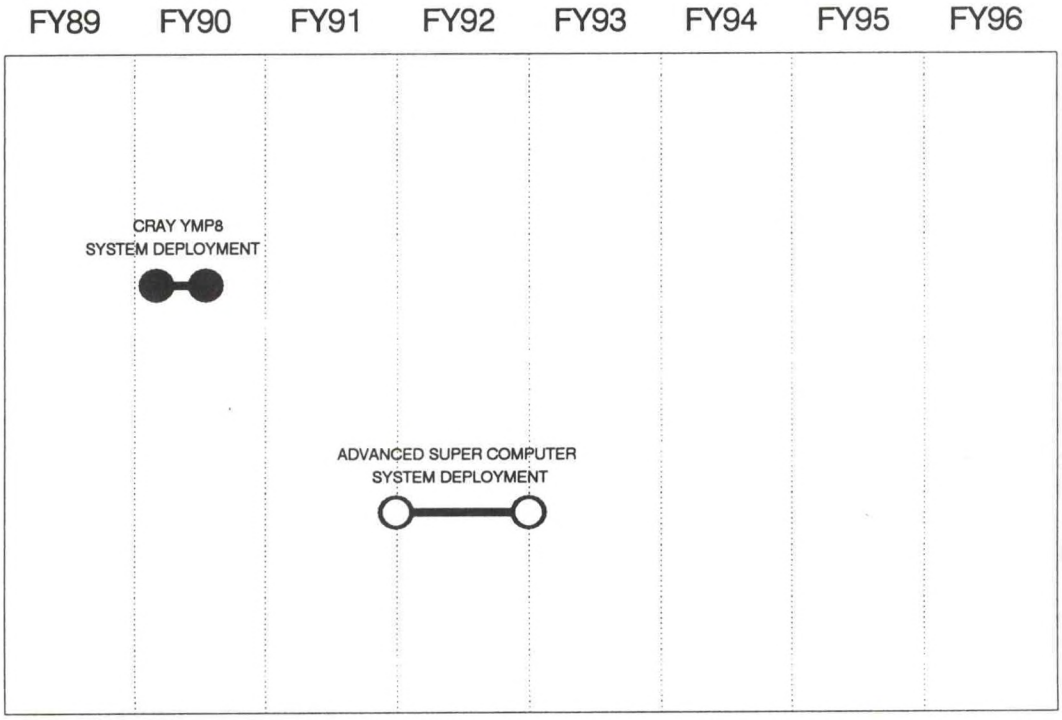


Figure 12:
SCIENTIFIC EDUCATION AND PROFESSIONAL DEVELOPMENT SCHEDULE

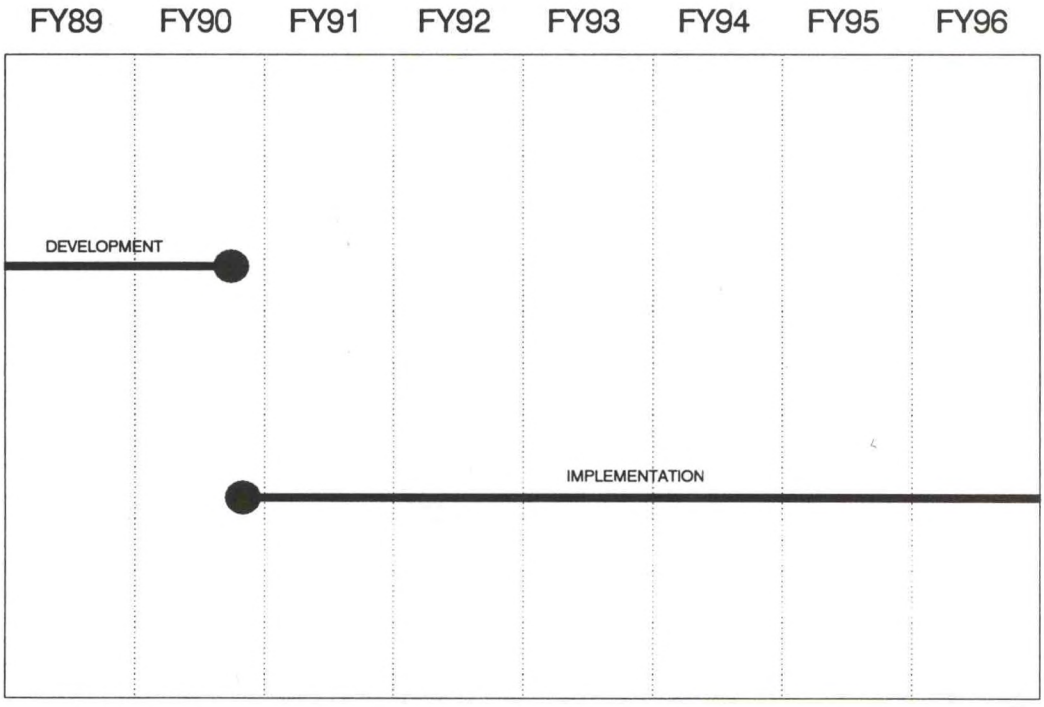


Figure 13:
MARD SCHEDULE

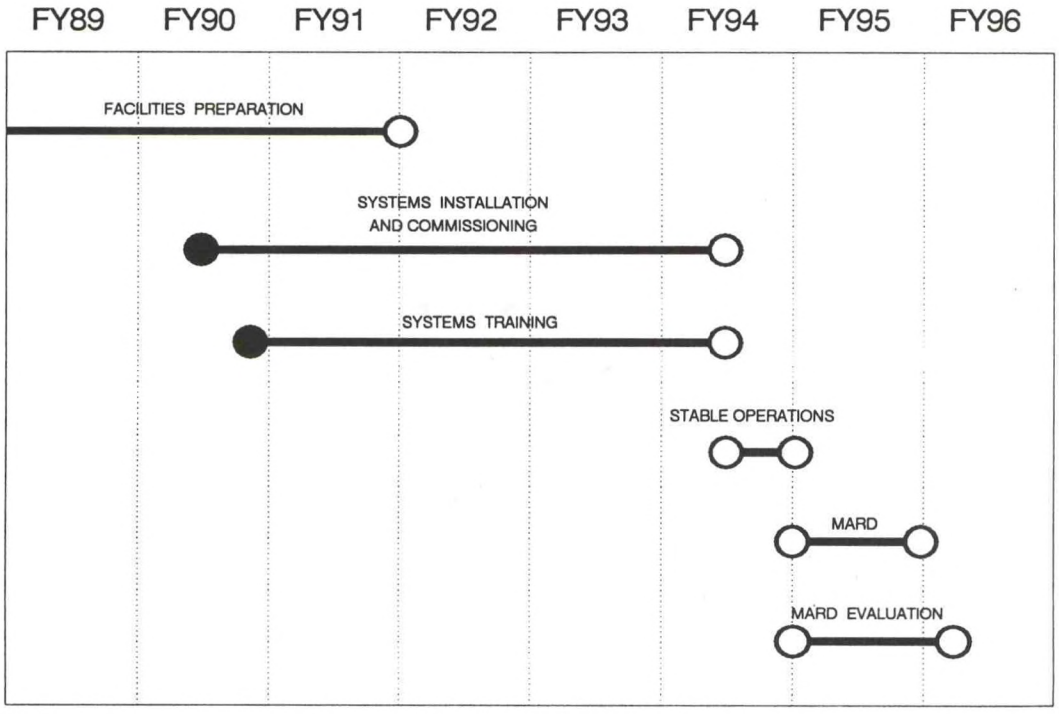


Figure 14:
ERL RESEARCH PROGRAM SCHEDULE

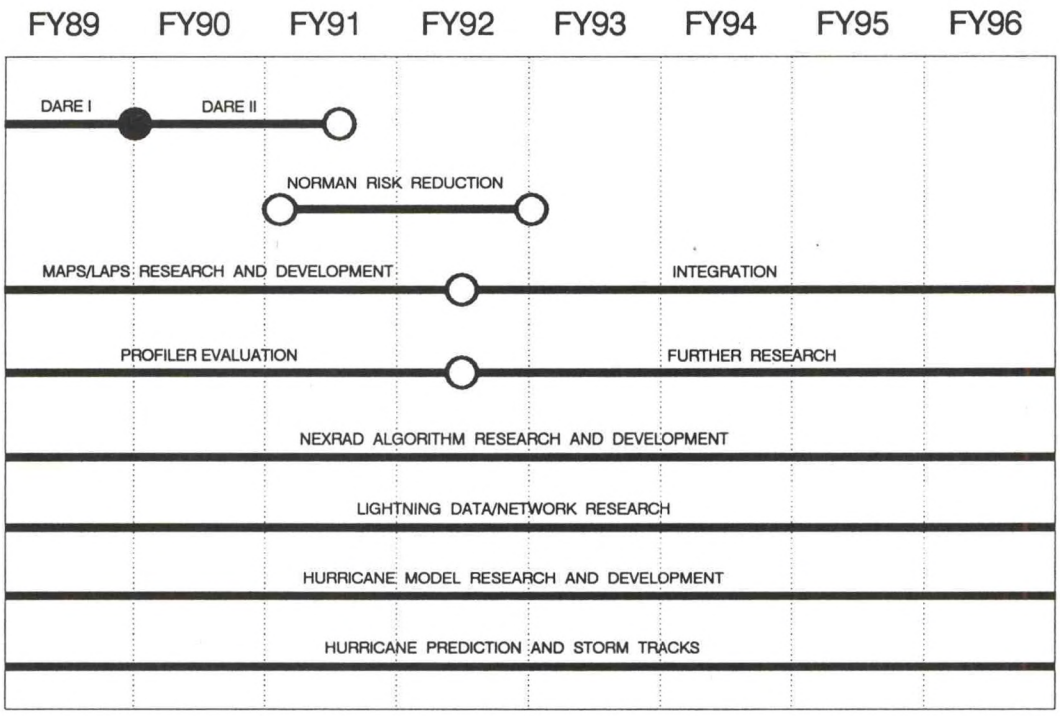


Figure 15:
NWS RESEARCH PROGRAM SCHEDULE

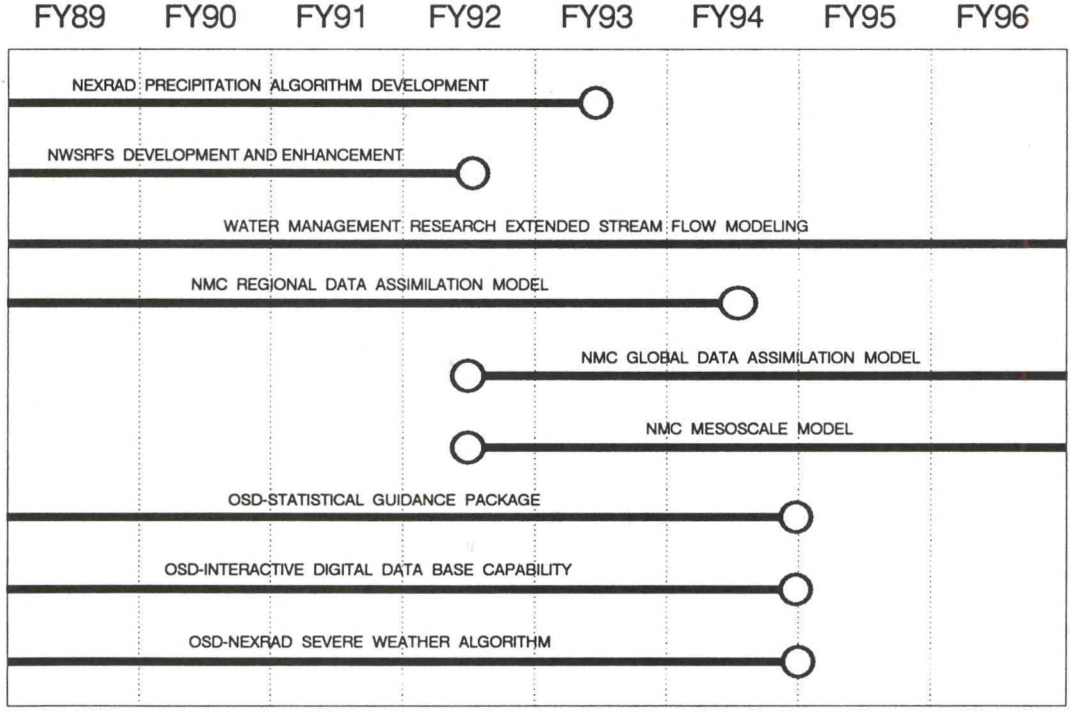


Figure 16:

NESDIS RESEARCH PROGRAM SCHEDULE

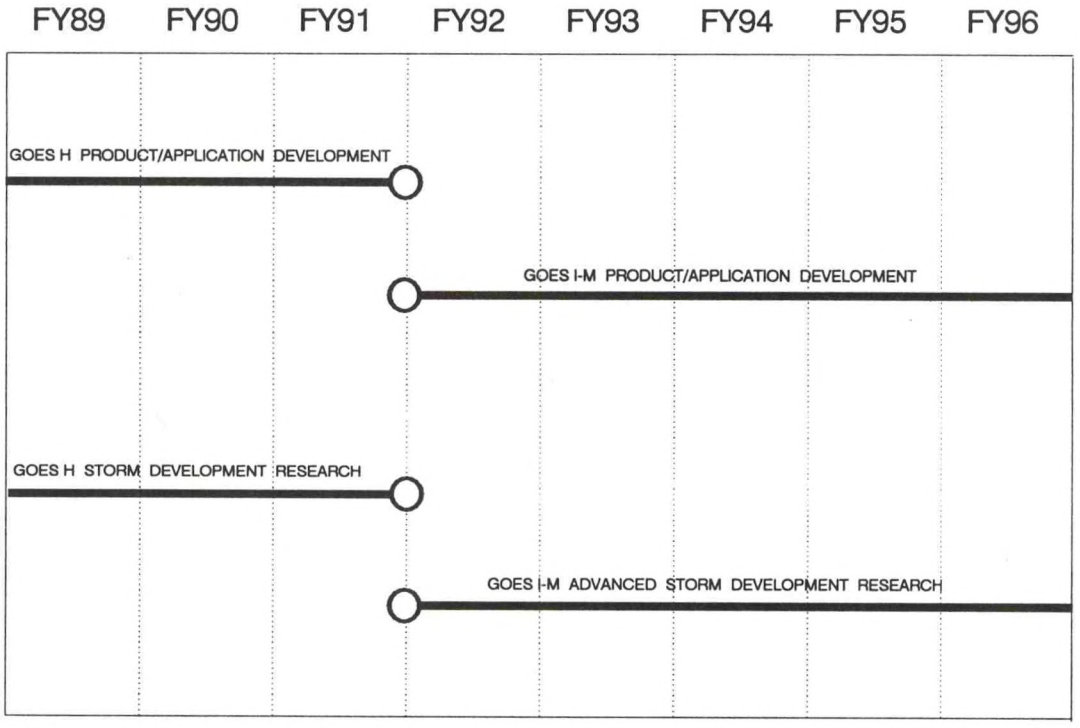


Figure 17:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF ALABAMA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		**4 FAA**	**2 NWS**
BIRMINGHAM			
FACILITY			**X**
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			**X**
SERVICES			
MOBILE			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
EAST ALABAMA, AL			**X** (DOD)
FT. RUCKER, AL			
NW FLORIDA, FL		**X** (DOD)	

Figure 18:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF ALASKA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			**14 FAA**
ANCHORAGE			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
FAIRBANKS			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
JUNEAU			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 19:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF ARIZONA
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		1 NWS, 3 FAA	5 FAA
TUCSON			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
PHOENIX			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
FLAGSTAFF			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 19:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF ARIZONA
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993

NEARBY NEXRADs
PROVIDING COVERAGE:

YUMA, AZ
LAS VEGAS, NV

Figure 20:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF ARKANSAS

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		**1 NWS, 5 FAA**	
LITTLE ROCK			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
JACKSON, MS			X
MEMPHIS, TN			X
SHREVEPORT, LA			
TULSA, OK			X

Figure 21:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF CALIFORNIA
(1 of 3)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		**2 NWS, 7 FAA**	**3 NWS, 46 FAA**
EUREKA			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
LOS ANGELES			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
SACRAMENTO			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 21:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF CALIFORNIA
(2 of 3)

WFO/EVENT	FY 1991	FY 1992	FY 1993
SAN DIEGO			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
SAN FRANCISCO BAY AREA			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
SAN JOAQUIN VALLEY			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 21:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF CALIFORNIA
(3 of 3)

WFO/EVENT	FY 1991	FY 1992	FY 1993
NEARBY NEXRADs PROVIDING COVERAGE:			
BEALE AFB, CA			
EDWARDS AFB, CA			
MARCH AFB, CA			
VANDENBURG, CA			X (DOD)
LAS VEGAS, NV			
MEDFORD, OR			
PHOENIX, AZ			
RENO, NV			

Figure 22:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF COLORADO
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		**4 NWS, 3 FAA**	**6 FAA**
DENVER			
FACILITY			
NEW SYSTEMS			
NEXRAD		X	
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
GRAND JUNCTION			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
PUEBLO			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 22:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF COLORADO
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
NEARBY NEXRAD PROVIDING COVERAGE:			
GOODLAND, KS			X

Figure 23:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF CONNECTICUT

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			1 NWS, 6 FAA

NEARBY NEXRADs
PROVIDING COVERAGE:

ALBANY, NY
BOSTON, MA
NEW YORK CITY, NY

Figure 24:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF DELAWARE

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			**1 NWS, 1 FAA**
NEARBY NEXRADs PROVIDING COVERAGE:			
DOVER AFB, DE			**X**(DOD)
PHILADELPHIA, PA			**X**

Figure 25:
NOTIFICATION OF SIGNIFICANT EVENTS
DISTRICT OF COLUMBIA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			
BALTIMORE, MD/ WASHINGTON, DC			
FACILITY			
NEW SYSTEMS			
NEXRAD		X	
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 26:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF FLORIDA
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		**2 NWS, 7 FAA**	**9 FAA**
JACKSONVILLE			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
MELBOURNE			
FACILITY			
NEW SYSTEMS			
NEXRAD	X		
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
MIAMI			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			

Figure 26:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF FLORIDA
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
TALLAHASSEE			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
TAMPA BAY AREA			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
KEY WEST, FL			
NW FLORIDA, FL		X (DOD)	
MOBILE, AL			

Figure 27:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF GEORGIA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		4 FAA	5 NWS, 6 FAA
ATLANTA			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			

NEARBY NEXRADs PROVIDING COVERAGE:

MOODY AFB, GA
ROBINS AFB, GA
BIRMINGHAM, AL
CHARLESTON, SC
COLUMBIA, SC
JACKSONVILLE, FL
TALLAHASSEE, FL

Figure 28:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF HAWAII

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			
HONOLULU			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 29:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF IDAHO

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			6 FAA
BOISE			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
POCATELLO/ IDAHO FALLS			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
MISSOULA, MT			
SPOKANE, WA			

Figure 30:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF ILLINOIS

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		**2 NWS**	**2 FAA**
CENTRAL ILLINOIS			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
CHICAGO			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
PADUCAH, KY			
QUAD CITIES, IA			
ST. LOUIS, MO		X	

Figure 31:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF INDIANA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			3 NWS, 3 FAA
INDIANAPOLIS			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
GRISSOM AFB, IN			
CHICAGO, IL			X
CINCINNATI, OH			
GRAND RAPIDS/MUSKEGON, MI			
LOUISVILLE, KY			X
PADUCAH, KY			

Figure 32:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF IOWA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			1 NWS, 6 FAA
DES MOINES			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
QUAD CITIES			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
LA CROSSE, WI			
OMAHA, NE			
SIOUX FALLS, SD			

Figure 33:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF KANSAS
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		6 NWS, 15 FAA	
DODGE CITY			
FACILITY			
NEW SYSTEMS			
NEXRAD		X	
AWIPS			
EXISTING SYSTEMS			
STAFF	X		
SERVICES			
GOODLAND			
FACILITY			
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF	X		
SERVICES			
TOPEKA			
FACILITY			
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 33:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF KANSAS
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
WICHITA			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
NEARBY NEXRAD PROVIDING COVERAGE:			
KANSAS CITY, MO		X	

Figure 34:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF KENTUCKY

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			3 NWS, 1 FAA
LOUISVILLE			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
PADUCAH			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
FT. CAMPBELL, KY			
CINCINNATI, OH			
KNOXVILLE, TN			
CHARLESTON, WV			X

Figure 35:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF LOUISIANA
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		**2 FAA**	**1 NWS**
LAKE CHARLES			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
NEW ORLEANS/ BATON ROUGE			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
SHREVEPORT			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 35:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF LOUISIANA
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
NEARBY NEXRADs PROVIDING COVERAGE:			
ENGLAND AFB, LA			
JACKSON, MS			X

Figure 36:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF MAINE

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			
PORTLAND			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
NEARBY NEXRAD PROVIDING COVERAGE:			
LORING AFB, ME			

Figure 37:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF MARYLAND

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			**1 NWS, 1 FAA**
NEARBY NEXRADs PROVIDING COVERAGE:			
BALTIMORE, MD/WASHINGTON, DC		X	
NORFOLK/RICHMOND, VA			
PHILADELPHIA, PA			X
PITTSBURGH, PA			X

Figure 38:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF MASSACHUSETTS

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			16 FAA
BOSTON			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
NEARBY NEXRAD PROVIDING COVERAGE:			
ALBANY, NY			

Figure 39:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF MICHIGAN
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		**2 NWS, 1 FAA**	**4 FAA**
ALPENA			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
DETROIT			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
GRAND RAPIDS/ MUSKEGON			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 39:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF MICHIGAN
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
MARQUETTE			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
NEARBY NEXRAD PROVIDING COVERAGE:			
CHICAGO, IL			X

Figure 40:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF MINNESOTA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			**2 NWS, 2 FAA**
DULUTH			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
MINNEAPOLIS/ST. PAUL			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			

NEARBY NEXRADs
PROVIDING COVERAGE:

FARGO/GRAND FORKS, ND
LA CROSSE, WI
SIOUX FALLS, SD

Figure 41:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF MISSISSIPPI

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		**2 FAA**	**3 NWS, 1 FAA**
JACKSON			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
COLUMBUS AFB, MS			
KEESLER AFB, MS		X (DOD)	
MEMPHIS, TN			X
MOBILE, AL			
NEW ORLEANS/BATON ROUGE, LA			X

Figure 42:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF MISSOURI
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		**2 NWS, 3 FAA**	**2 FAA**
KANSAS CITY			
FACILITY	X		
NEW SYSTEMS			
NEXRAD		X	
AWIPS			
EXISTING SYSTEMS			
STAFF	X		
SERVICES			
SPRINGFIELD			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
ST. LOUIS			
FACILITY			
NEW SYSTEMS			
NEXRAD		X	
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 42:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF MISSOURI
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993

NEARBY NEXRAD
PROVIDING COVERAGE:

PADUCAH, KY

Figure 43:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF MONTANA
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		**2 NWS**	**7 FAA**
BILLINGS			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
GLASGOW			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
GREAT FALLS			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			

Figure 43:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF MONTANA
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
MISSOULA			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			

Figure 44:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF NEBRASKA
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		2 NWS, 5 FAA	2 FAA
GRAND ISLAND			
FACILITY	X		
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF	X		
SERVICES			
NORTH PLATTE			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
OMAHA			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			

Figure 44:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF NEBRASKA
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993

NEARBY NEXRADs
PROVIDING COVERAGE:

CHEYENNE, WY
SIOUX FALLS, SD

Figure 45:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF NEVADA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			**3 NWS, 3 FAA**
ELKO			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
LAS VEGAS			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
RENO			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			

Figure 46:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF NEW HAMPSHIRE

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			5 FAA
NEARBY NEXRADs PROVIDING COVERAGE:			
BOSTON, MA			
PORTLAND, ME			

Figure 47:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF NEW JERSEY

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			1 NWS, 5 FAA
NEARBY NEXRADs PROVIDING COVERAGE:			
NEW YORK CITY, NY			
PHILADELPHIA, PA			X

Figure 48:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF NEW MEXICO

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			6 FAA
ALBUQUERQUE			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
CANNON AFB, NM			
HOLLOMAN AFB, NM			

Figure 49:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF NEW YORK
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			3 NWS, 10 FAA
ALBANY			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
BINGHAMTON			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
BUFFALO			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			

Figure 49:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF NEW YORK
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
NEW YORK CITY			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
GRIFFISS AFB, NY			
BURLINGTON, VT			

Figure 50:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF NORTH CAROLINA
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		4 FAA	4 FAA
MOREHEAD CITY			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
RALEIGH/DURHAM			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
WILMINGTON			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 50:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF NORTH CAROLINA
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993

NEARBY NEXRADs
PROVIDING COVERAGE:

COLUMBIA, SC
KNOXVILLE, TN
NORFOLK/RICHMOND, VA
ROANOKE, VA

Figure 51:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF NORTH DAKOTA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			**1 NWS, 3 FAA**
BISMARCK			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
FARGO/GRAND FORKS			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
NEARBY NEXRAD PROVIDING COVERAGE:			
MINOT AFB, ND			

Figure 52:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF OHIO

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			**4 NWS, 13 FAA**
CINCINNATI			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
CLEVELAND			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
CHARLESTON, WV			X
INDIANAPOLIS, IN			X
PITTSBURGH, PA			X

Figure 53:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF OKLAHOMA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		**2 NWS, 12 FAA**	
OKLAHOMA CITY			
FACILITY			
NEW SYSTEMS			
NEXRAD	X		
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
TULSA			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
FREDERICK, OK		X (DOD)	
VANCE AFB, OK			
AMARILLO, TX			X

Figure 54:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF OREGON
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			
MEDFORD			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
PENDLETON			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
PORTLAND			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			

Figure 54:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF OREGON
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
NEARBY NEXRAD PROVIDING COVERAGE			
BOISE, ID			

Figure 55:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF PENNSYLVANIA
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			4 NWS, 9 FAA
CENTRAL PENNSYLVANIA			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
PHILADELPHIA			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
PITTSBURGH			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			

Figure 55:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF PENNSYLVANIA
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
NEARBY NEXRADs PROVIDING COVERAGE:			
BINGHAMTON, NY			X
CLEVELAND, OH			X

Figure 56:
NOTIFICATION OF SIGNIFICANT EVENTS
PUERTO RICO

WFO/EVENT	FY 1990	FY 1991	FY 1992
ASOS			
SAN JUAN			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 57:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF RHODE ISLAND

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			2 FAA
NEARBY NEXRAD PROVIDING COVERAGE:			
BOSTON, MA			

Figure 58:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF SOUTH CAROLINA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		5 FAA	
CHARLESTON			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
COLUMBIA			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			

NEARBY NEXRAD PROVIDING COVERAGE:

WILMINGTON, NC

Figure 59:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF SOUTH DAKOTA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			1 NWS, 4 FAA
ABERDEEN			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
RAPID CITY			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
SIOUX FALLS			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			

Figure 60:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF TENNESSEE

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			1 FAA
KNOXVILLE			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
MEMPHIS			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
NASHVILLE			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 61:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF TEXAS
(1 of 4)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS	1 FAA	2 NWS, 16 FAA	
AMARILLO			
FACILITY			
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF	X		
SERVICES			
AUSTIN/SAN ANTONIO			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
BROWNSVILLE			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 61:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF TEXAS
(2 of 4)

WFO/EVENT	FY 1991	FY 1992	FY 1993
CORPUS CHRISTI			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
DALLAS/FT.WORTH			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
EL PASO			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 61:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF TEXAS
(3 of 4)

WFO/EVENT	FY 1991	FY 1992	FY 1993
HOUSTON/GALVESTON			
FACILITY			
NEW SYSTEMS			
NEXRAD		X	
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
LUBBOCK			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
MIDLAND			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 61:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF TEXAS
(4 of 4)

WFO/EVENT	FY 1991	FY 1992	FY 1993
SAN ANGELO			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
CENTRAL TEXAS, TX			**X** (DOD)
DYESS AFB, TX			
LAUGHLIN AFB, TX			
LAKE CHARLES, LA			
OKLAHOMA CITY, OK	**X**		
SHREVEPORT, LA			

Figure 62:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF UTAH

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			**7 FAA**
SALT LAKE CITY			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
CEDAR CITY, UT			
GRAND JUNCTION, CO			

Figure 63:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF VERMONT

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			4 FAA
BURLINGTON			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
NEARBY NEXRAD PROVIDING COVERAGE:			
ALBANY, NY			

Figure 64:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF VIRGINIA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			3 FAA
NORFOLK/RICHMOND			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
ROANOKE			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
BALTIMORE, MD/WASHINGTON, DC		X	
CHARLESTON, WV			X
KNOXVILLE, TN			

Figure 65:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF WASHINGTON

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			
SEATTLE/TACOMA			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
SPOKANE			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
MEDFORD, OR			
PENDLETON, OR			

Figure 66:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF WEST VIRGINIA

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			1 NWS
CHARLESTON			
FACILITY		X	
NEW SYSTEMS			
NEXRAD			X
AWIPS			
EXISTING SYSTEMS			
STAFF		X	
SERVICES			
NEARBY NEXRADs PROVIDING COVERAGE:			
BALTIMORE, MD/WASHINGTON, DC		X	
PITTSBURGH, PA			X
ROANOKE, VA			

Figure 67:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF WISCONSIN
(1 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS		**1 NWS**	**10 FAA**
GREEN BAY			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
LA CROSSE			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			
MILWAUKEE			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Figure 67:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF WISCONSIN
(2 of 2)

WFO/EVENT	FY 1991	FY 1992	FY 1993

NEARBY NEXRADs
PROVIDING COVERAGE:

DULUTH, MN
MINNEAPOLIS/ST. PAUL, MN
QUAD CITIES, IA

Figure 68:
NOTIFICATION OF SIGNIFICANT EVENTS
STATE OF WYOMING

WFO/EVENT	FY 1991	FY 1992	FY 1993
ASOS			**2 NWS, 10 FAA**
CHEYENNE			
FACILITY			X
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			X
SERVICES			
RIVERTON			
FACILITY			
NEW SYSTEMS			
NEXRAD			
AWIPS			
EXISTING SYSTEMS			
STAFF			
SERVICES			

Appendix A

MASTER TRANSITION SCHEDULE

The Master Transition Schedule (MTS) is the official document for review and evaluation of progress of the transition to the modernized NWS. It shows the schedules for major activities and events identified in the transition work breakdown structure, and their interdependencies. In addition to the major systems acquisition phases, such as the preproduction and production phases of NEXRAD and the production development and production phases of ASOS, the MTS shows related activities in future operations and services, training and professional development, facilities preparation, implementation and phaseover, human resources, etc., as defined by the Work Breakdown Structure (WBS). Changes to the MTS will be controlled through the transition change management process.

The current approved Master Transition Schedule is attached. An explanation of the symbols used on the MTS and description of the activities depicted on the MTS follows.

Explanation of MTS Symbols

The MTS is a Program Evaluation and Review Technique chart, also called a PERT network, and shows the duration of various transition activities that must be accomplished against a time scale as well as the logical order in which these activities must occur.

The basic elements that comprise the MTS are shown in Figure A1. Each activity is shown as a horizontal rectangular box with an activity title below it. The vertical lines connecting activities together represent linkages, also called dependencies between activities. In Figure A1, Activity B is dependent on Activity A. That is, Activity A must be completed before Activity B can start. This is called a "finish-to-start" type dependency. Activities may also be linked as "start-to-start" (which means that the start of one activity triggers the start of another,) and "finish-to-finish" (which means that two activities must be completed at the same time). The numbers on the left and right side of Figure A1 are reference line numbers for locating activities.

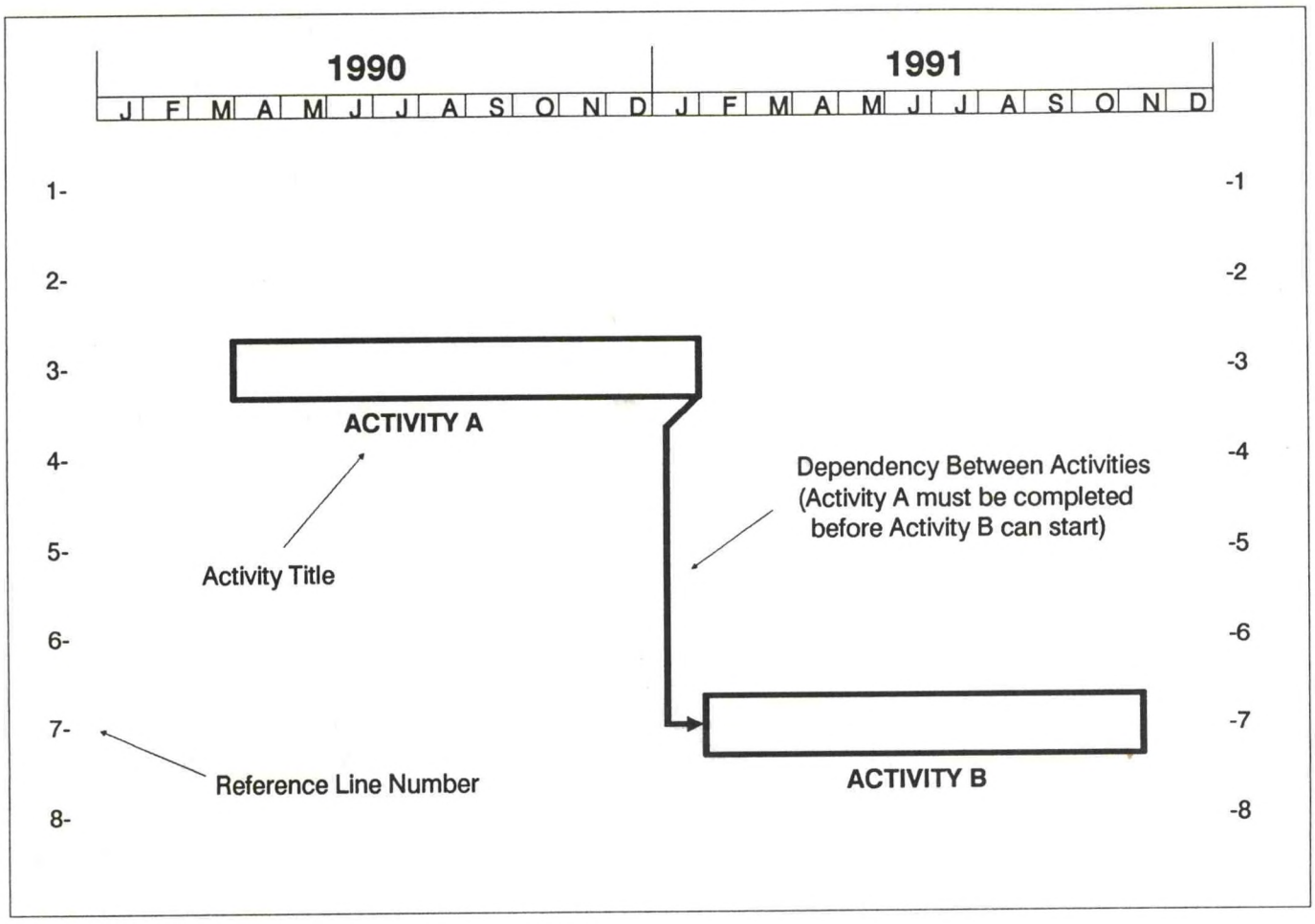


Figure A1

Figure A2 illustrates the concept of float. The start of Activity B is dependent on completion of both Activity A and C. Since Activity C is scheduled to be completed before Activity A, the period of time between the scheduled completion of Activity C and the scheduled completion of Activity A is called "float." Float represents an allowance for slippage of scheduled completion of an activity that does not affect the overall time it takes to complete the set of activities. Thus in Figure A2, completion of Activity C could slip until the completion of Activity A without increasing the total time to complete all three activities.

The longest path in time through all the activities in the network is called the "critical path" and represents the total time required to complete the entire project. Any schedule slippage in an activity on the critical path will delay completion of the overall project correspondingly.

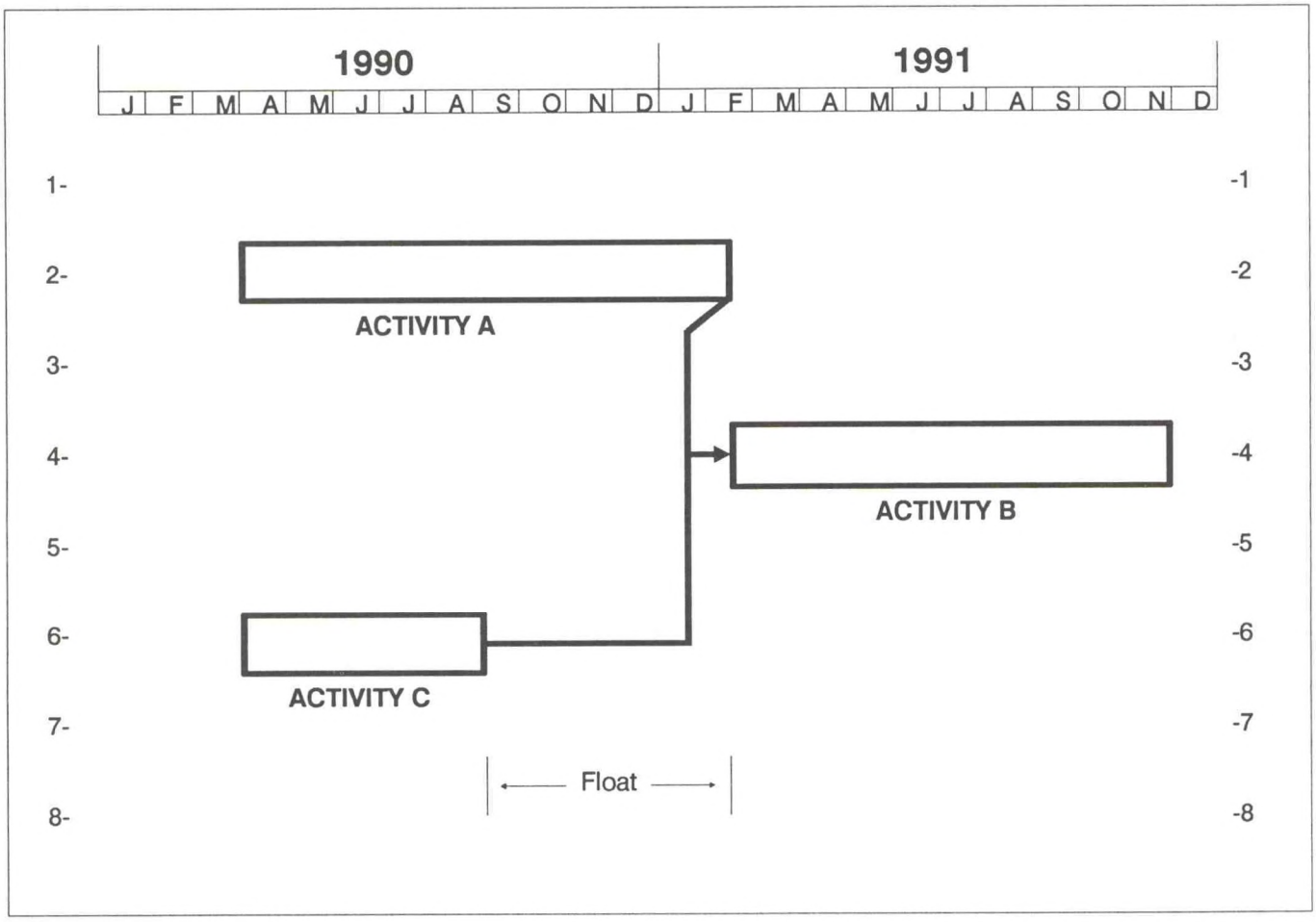


Figure A2

Description of the Activities Depicted on the MTS

The activities shown on the MTS comprise the major steps in transition to the modernized and restructured National Weather Service. These activities fall into logical groupings and are described below. Reference line numbers are given to help locate the various activities on the MTS.

Principal Path - The Principal Path, described in Section 3.6 of the National Implementation Plan, consists of Pre-MARD Risk Reduction Programs (reference line #4); an Operational Test & Evaluation period for MARD (reference line #4); the MARD - Modernization and Associated Restructuring Demonstration (reference line #3); and Initial Stage 2 Service Implementation nationwide (reference line #4). At the end of the Operational Test & Evaluation period is a MARD Sites Stable Operations Period (reference line #4). A MARD Evaluation activity (reference line #5) runs in parallel with the MARD. First PL-100-685 Certification (reference line #3) represents the first opportunity to certify no degradation of services and consolidate offices, and occurs at the end of the MARD. Subsequent opportunities to certify offices are shown in Site Certifications (reference line #5). The Principal Path activities are dependent on the other major sets of transition activities described below.

Transition Planning - Planning activities include: completion of the Strategic Plan (not shown) and initial National Implementation Plan (not shown) which were submitted to Congress in March 1989 and March 1990 respectively; completion of the next annual update to the National Implementation Plan (reference line #3); completion of Regional Transition and Site Implementation Plans (reference line #1); and completion of the MARD Implementation and Evaluation Plan (reference line #2).

Facilities Preparation - Facilities activities in the first several years consist of Site Design for the MARD sites (completed, not shown); Construction of the MARD offices (reference line #15); and Office BOD - Beneficial Occupancy Date (reference line #16) which is defined as availability of the MARD site offices for occupancy.

Risk Reduction - Risk reduction activities in the first several years include: ISPAN - Information Stream Project for AWIPS and NOAAPORT (reference line #9); the Norman project (reference lines #3, 8, 11, 12 and 14); the PROTEUS project (reference line #10); and the DARE II project (reference line #13).

Research Programs - Research activities shown include: Profiler Production and Assessment Phases I and II (reference lines #22, 24 and 26); and MAPS - Mesoscale Analysis and Prediction System Research & Development and Technology Transfer to NMC (reference lines #12 and 25).

New Technologies - Activities associated with implementation and commissioning of the various new technologies required for the MARD include: ASOS installation, checkout and commissioning for the MARD sites (reference line #18); NEXRAD installation, checkout and commissioning for the MARD sites (reference line #19); AWIPS installation, checkout and commissioning for the MARD sites (reference line #22); and installation of the Cray YMP8 computer system (completed, not shown) and the advanced super computer system for NMC (reference line #24). Activities associated with implementation and commissioning of the various new technologies required for modernization nationwide include: ASOS installation, checkout and commissioning (reference line #15); NEXRAD installation, checkout and commissioning (reference line #21); and AWIPS installation, checkout and commissioning (reference line #17).

Staffing, Training and Professional Development - Staffing for the MARD sites (reference line #7) is followed by both MARD and NEXRAD Training & Professional Development (reference lines #5 and 20) for the personnel at the MARD sites, and subsequent Validation of the MARD Training & Professional Development (reference line #6).

Services - Activities associated with operational services include: NMC Full Capability (reference line #23) which is provision of centrally prepared guidance products to field offices; Stage 1 Service Implementation (reference line #8); Initial Stage 2 Service Implementation (reference line #4); and Validation and Verification (reference line #2) of services.

1990 1991 1992 1993 1994 1995 1996 1997

O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

1 REGIONAL TRANSITION & SITE IMPLEMENTATION PLANS

2 MARD IMPLEMENTATION & EVALUATION PLAN

2 VALIDATION AND VERIFICATION

3 VALIDATE NORMAN RISK REDUCTION TRAINING

3 NATIONAL IMPLEMENTATION PLAN NEXT UPDATE

3 MARD

3 FIRST PL-100-685 CERTIFICATION

4 PRE-MARD RISK REDUCTION PROGRAMS

4 OPERATIONAL TEST & EVALUATION FOR MARD

4 MARD SITES STABLE OPERATIONS PERIOD

4 INITIAL STAGE 2 SERVICE IMPLEMENTATION

5 MARD TRAINING & PROFESSIONAL DEVELOPMENT

5 MARD EVALUATION

5 SITE CERTIFICATIONS

6 VALIDATE MARD TRAINING & PROFESSIONAL DEVELOP.

7 STAFFING FOR MARD

8 NORMAN RISK REDUCTION TRAINING

8 STAGE 1 SERVICE IMPLEMENTATION

9 ISPAN

10 PROTEUS RISK REDUCTION EVALUATION

11 NORMAN RISK REDUCTION SYSTEMS & TECHNOLOGY

12 MAPS TECHNOLOGY TRANSFER TO NMC

12 NORMAN SERVICES & RESTRUCTURING

13 DARE II RISK REDUCTION

14 NORMAN RISK REDUCTION HARDWARE DELIVERY

15 CONSTRUCTION (MARD SITES)

15 ASOS PRODUCTION INSTALL, CHECKOUT, COMMISSION

16 OFFICE BOD (MARD SITES)

17 ASOS CONTRACT AWARD

17 ASOS COMMISSIONING STARTS STAGE 1

17 LAST MARD NEXRAD COMMISSIONED

17 AWIPS PRODUCTION INSTALL, CHECKOUT, COMMISSION

18 ASOS INSTALL, CHECKOUT, COMMISSION MARD SITES

18 AWIPS FULL PRODUCTION DECISION

18 AWIPS COMMISSIONING STARTS INITIAL STAGE 2

19 NEXRAD INSTALL, CHECKOUT, COMMISSION MARD SITES

20 NEXRAD TRAINING & PROFESSIONAL DEVELOPMENT

21 NEXRAD PRODUCTION INSTALL, CHECKOUT, COMMISSION

22 PROFILER ASSESSMENT (PHASE I)

22 AWIPS DEVELOPMENT CONTRACT AWARD

22 AWIPS INSTALL, CHECKOUT, COMMISSION MARD SITES

23 NMC FULL CAPABILITY

24 PROFILER PRODUCTION PHASE

24 ADVANCED SUPER COMPUTER INSTALLATION AT NMC

25 MAPS TESTING AT NMC

26 PROFILER ASSESSMENT (PHASE II)

Activity Bar/Early Dates
description
Critical Activity

ACTIVITY TYPE
THE PRINCIPAL PATH
ASOS PROGRAM
AWIPS PROGRAM
NEXRAD PROGRAM

NWS
MASTER TRANSITION SCHEDULE
MTS VERTICAL PAGE PATTERNED FILL

Planning Unit Week

Project Start : 28DEC87
Project Finish: 40CT98
Data Date: 26JAN91
Plot Date: 28MAR91

MASTER TRANSITION SCHEDULE

Date	Revision	Checked	Approved
4/1/91			
4/4/91			

Appendix B

OUTLINES FOR REGIONAL TRANSITION AND SITE IMPLEMENTATION PLANS

This appendix provides detailed outlines for use by the Regions in preparing Regional Transition Plans and Site Implementation Plans. Attached are the following:

REGIONAL TRANSITION PLAN OUTLINE

SECTION 1 INTRODUCTION

1.1 Purpose and Scope of RTP
1.2 Relationship of RTP to NIP and SIPs

SECTION 2 REGION LEVEL ACTIVITIES

2.1 Responsibility
2.1.1 Regional Transition Plan Updates
2.1.2 Site Implementation Plans and Updates
2.1.3 Internal and External Coordination
2.1.4 Establish Operational Readiness
2.1.5 Certification
2.2 Personnel Actions
2.2.1 What
2.2.2 When
2.3 Strategies
2.3.1 Office operations
2.3.2 Staffing
2.3.3 Technology
2.3.4 Programs
2.3.5 Internal & External Coordination
2.3.6 Establishing Operational Readiness
2.3.7 Certification Process
- Notification of Significant Events
- Notification of Intent to Certify
- Certification

2.4 Guidance
2.4.1 Stage 1 ROMLS for WSOM Chapter - When
2.4.2 Stage 2 ROMLS for WSOM Chapter - When

SECTION 3 OFFICE RESOURCES INVENTORY

(3.1 to 3.n; n = Offices in Region)
3.1 Office
3.1.1 Staff: Number/Type - Date/Update
3.1.2 Technology: Type - Date/Update
3.1.3 Programs: Type - Date/Update
3.1.4 Dissemination
3.1.5 Communications

SECTION 4 OFFICE SCHEDULES

(4.1 to 4.n; n = Offices in Region)

4.1	Office
4.2	Facility: Completion Date (Build/Renovate)
4.3	Technology Schedules
4.3.1	System Z: Delivery Date
4.3.2	ASOS: Delivery Date
4.3.3	NEXRAD: Delivery Date
4.3.4	Profiler: Delivery Date
4.3.5	AWIPS: Delivery Date
4.3.6	...
4.4	SIP Schedule: Due Date
4.5	Coordination schedule: Internal: Date required External: Date required
4.6	Program Change Schedule:
4.6.1	Warnings: What - Where - When
4.6.2	Public: What - Where - When
4.6.3	Aviation: What - Where - When
4.6.4	Marine: What - Where - When
4.6.5	Applied Services: What - Where - When
4.6.6	Hydrology: What - Where - When

SECTION 5 OFFICE IMPLEMENTATION AND PHASEOVER

(5.1 to 5.n; n = Offices in Region)

5.1	Office
5.2	Risk Reduction: What/When
5.3	Stage 1
5.3.1	Staffing: Increase/Decrease - Who/When
5.3.2	Training: Type - Who/When
5.3.3	Technology: Type - Add/Transfer - From/To/When
5.3.4	Programs: Type - Add/Transfer - From/To/When
5.3.5	Stage 1: Commissioning/Decommissioning - When
5.4	Stage 2
5.4.1	Staffing: Increase/Decrease - When
5.4.2	Training: Type - When
5.4.3	Technology: Type - Add/Transfer - From/To/When
5.4.4	Programs: Type - Add/Transfer - From/To/When
5.4.5	Stage 2: WFO Commissioning - When

SITE IMPLEMENTATION PLAN OUTLINE

SECTION 1 INTRODUCTION

1.1 Purpose of the Site Implementation Plan

The National Weather Service is engaged in the Modernization and Associated Restructuring (MAR) of the agency. The accomplishment of this goal requires a major transition from current to MAR operations while maintaining an adequate level of services. The bulk of this transition will occur at the NWS field offices. This document will identify the specific activities, schedules, and procedures required to accomplish transition at the NWS field offices in future WFO _____'s area of responsibility. This document will also provide site level information for the agency, new technology contractors, and service certification.

1.2 Relationship of the Site Implementation Plan to the National Implementation Plan and the Regional Transition Plan

This plan employs the strategies developed in the National Implementation Plan and refined in the Regional Transition Plan to implement transition at the field offices in WFO _____'s area of responsibility. Specific activities and schedules included in the plan are obtained from the Transition Work Breakdown Schedule, defined in the National Implementation Plan, the Regional Transition Plan, and from the actual field offices.

1.3 Scope of Site Implementation Plan

This document includes all the activities required to achieve full modernization and associated restructuring at the field offices in WFO _____'s area of responsibility. These offices include;

WFO _____,
RFC _____,
(if the WFO has a colocated RFC)
CWSU _____,
(if there is a CWSU in WFO's area of responsibility)
Other _____,
(if there is some "other" type office in WFOs area)
WSOs _____, _____, etc..,
WSMOs _____, _____, etc.., and
WSCMOs _____, _____, etc...

1.4 Major Site Transition Milestones

SECTION 2 OFFICE RESOURCES INVENTORY

2.1	WSFO/NEXRAD-WSO
2.1.1	Staff
2.1.2	Technology
2.1.3	Programs
2.1.4	Dissemination
2.1.5	Communications
2.1.6	Applications Software
2.2	RFC
2.2.1	Staff
2.2.2	Technology
2.2.3	Programs
2.2.4	Dissemination
2.2.5	Communications
2.2.6	Applications Software
2.3	CWSU
2.3.1	Staff
2.3.2	Technology
2.3.3	Programs
2.3.4	Dissemination
2.3.5	Communications
2.3.6	Applications Software
2.4	Other Offices
2.4.1	Staff
2.4.2	Technology
2.4.3	Programs
2.4.4	Dissemination
2.4.5	Communications
2.4.6	Applications Software
2.5	WSO/WSMO/WSCMO
2.5.1	Staff
2.5.2	Technology
2.5.3	Programs
2.5.4	Dissemination
2.5.5	Communications

SECTION 3 OFFICE TRANSITION ACTIVITIES

3.1	Site (WSFO/NWSO - WFO)
3.1.1	Facility
3.1.1.1a	New Facility Pre-Stage 1 Activities
	Access
	Completion Date
	Acceptance Date
	Occupancy Date
	Office and Equipment Layout

	Floor Plan Design
	Install and Accept Signal and Power Runs
	Utility Requirements
	Water and Sewer
	Electric
	Auxiliary/Emergency Power
	Furniture Acquisition
	Acquire Mailing Address
	Facility Maintenance
3.1.1.1b	New Facility Pre-Stage 2 Activities
	Upgrades for AWIPS
3.1.1.2	Existing Facility
	Modifications
	Lease Termination/Modification
3.1.1.3	Upper Air Inflation Building
	Design
	Design Approval
	Prepare SOW
	Let Contract
	Begin Construction
	Acceptance
3.1.2	Staffing
3.1.2.1	Staff Changes Pre-Stage 1
	WSFO
	Meteorologists - 3
	WCM
	Service Hydrologists
	Other
	NEXRAD-WSO
	MIC
	Training/Evaluation Met
	WCM
	Service Hydrologists
	Meteorologists - 5
	Met Techs - 6
	Electronics Technician
	Other
3.1.2.2	Staff Changes Pre-Stage 2
	WSFO
	Meteorologists (+/-)
	Met Techs (+/-)
	ETs (+/-)
	Other
	NEXRAD-WSO
	Meteorologists (+)
3.1.3	Training and Professional Development
3.1.3.1	T & PD Pre-Stage 1

	NEXRAD
	ASOS
	Maintenance
	Met. Tech.
	Other
3.1.3.2	T & PD Pre-Stage 2
	AWIPS
	Other
3.1.4	Technology
3.1.4.1a	Existing Technology Pre-Stage 1
	Surface Observing Equipment
	HO-83
	F-420
	LBC
	Sunshine Switch & Recorder
	Special Use Equip (Solirad, etc)
	Other Observing Systems
	Radar
	Upper Air
	Helium/Hydrogen Contracts
	AFOS
	ABT
	RADID/KAVOURIS/RAPID II/ICRAD
	Other
3.1.4.1b	Existing Technology Pre-Stage 2
	AFOS
	ABT
	SWIS
	Other
3.1.4.2a	New Technology Pre-Stage 1
	System Z
	ASOS
	Micro-ART
	NEXRAD
	NWR Upgrade
	Other
3.1.4.2b	New Technology Pre-Stage 2
	AWIPS
	Other
3.1.5	Programs
3.1.5.1	Program Changes Pre-Stage 1
	Warnings
	Public
	Radar Responsibility
	Aviation
	PWB Certification
	Marine

Applied Services
Hydrological Services
Observations
Surface
Radar
Upper Air
Climatological Services

3.1.5.2 Program Changes Pre-Stage 2
Warnings
Public
Aviation
Marine
Applied Services
Hydrological Services
Observations
Surface
Radar
Upper Air
Climatological Services

3.1.6 Dissemination

3.1.6.1 Dissemination Pre-Stage 1 Activities
NWR Consoles
NWWS
Other

3.1.6.2 Dissemination Pre-Stage 2 Activities
Additions
Changes

3.1.7 Communications

3.1.7.1 Communications Pre-Stage 1 Activities
Telephone Systems
Office Phone System
Telephone Recording Devices
WATTS Lines
NAWAS
RDC/SDC Communications
S-140
Alert Systems
IFLOWS
ROSA
FAA Electrowriter
Communications Lines
Type
Disconnect/Connect/Transfer

3.1.7.2 Communications Pre-Stage 2 Activities
Communications Lines
Type - Disconnect/Connect/Transfer

3.1.8 Maintenance

3.1.8.1	Maintenance Pre-Stage 1 Changes
3.1.8.2	Maintenance Pre-Stage 2 Changes
3.1.9	Coordination
3.1.9.1a	Internal Pre-Stage 1
	Union
3.1.9.1b	Internal Pre-Stage 2
	Union
3.1.9.2a	External Pre-Stage 1
	Congressional
	State
	County
	Local Community
	Media
	Federal Agencies
	Federal Cooperators
	Private Meteorologists
3.1.9.2b	External Pre-Stage 2
	Congressional
	State
	County
	Local Community
	Media
	Federal Agencies
	Federal Cooperators
	Private Meteorologists
3.1.10	Other Changes
3.1.10.1	Other Changes Pre-Stage 1
3.1.10.2	Other Changes Pre-Stage 2
3.1.11	Station Duty Manual
3.1.11.1	Stage 1 Station Duty Manual
3.1.11.2	Stage 2 Station Duty Manual
3.1.12	Site Operational Readiness
3.1.12.1	Establish Stage 1 Operational Readiness
3.1.12.2	Establish Stage 2 Operational Readiness
3.2	River Forecast Center (RFC)
3.2.1	Facility
3.2.1.1a	New Pre-Stage 1 Activities
	Office and Equipment Layout
	Floor Plan Design Coordinate with WFO
	Utility Requirements Coordinate with WFO
	Furniture Acquisition
	Acquire Mailing Address
	Facility Maintenance Coordinate with WFO
3.2.1.1b	New Pre-Stage 2 Activities
	AWIPS Modifications
3.2.1.2	Old
	Lease Termination

	Office Furniture/Equipment Dispose/Move
	Utilities
3.2.2	Staffing
3.2.2.1	Staff Changes Pre-Stage 1
	Hydrologists - No.
	Hydrometeorologists
	Other
3.2.2.2	Staff Changes Pre-Stage 2
	Hydrologists (+/-)
	Hydrometeorologists (+/-)
	Other (+/-)
3.2.3	Training and Professional Development
3.2.3.1	T & PD Pre-Stage 1
	NEXRAD
	Other
3.2.3.2	T & PD Pre-Stage 2
	AWIPS
	Other
3.2.4	Technology
3.2.4.1a	Existing Technology Pre-Stage 1 Activities
	AFOS
	Other
3.2.4.1b	Existing Technology Pre-Stage 2 Activities
	AFOS
	Other
3.2.4.2a	New Technology Pre-Stage 1 Activities
	PUP
	Other
3.2.4.2b	New Pre-Stage 2 Activities
	AWIPS
	Other
3.2.5	Programs
3.2.5.1	Pre-Stage 1 Changes
3.2.5.2	Pre-Stage 2 Changes
3.2.6	Dissemination
3.2.6.1	Pre-Stage 1 Changes
3.2.7	Communications
3.2.7.1	Communications Pre-Stage 1 Activities
	Telephone Systems
	Communications Lines Type
3.2.8	Maintenance
3.2.8.1	Pre-Stage 1 Changes
3.2.8.2	Pre-Stage 2 Changes
3.2.9	Coordination
3.2.9.1a	Internal Pre-Stage 1
	Union
3.2.9.1b	Internal Pre-Stage 2

	Union
3.2.9.2a	External Pre-Stage 1
	Congressional
	State
	County
	Local Community
	Media
	Federal Agencies
	Federal Cooperators
3.2.9.2b	External Pre-Stage 2
	Congressional
	State
	County
	Local Community
	Media
	Federal Agencies
	Federal Cooperators
3.2.10	Other Changes
3.2.10.1	Pre-Stage 1
3.2.10.2	Pre-Stage 2
3.2.11	Station Duty Manual
3.2.11.1	Stage 1 Station Duty Manual
3.2.11.2	Stage 2 Station Duty Manual
3.2.12	Site Operational Readiness
3.2.12.1	Establish Stage 1 Operational Readiness
3.2.12.2	Establish Stage 2 Operational Readiness
3.3	CWSU
3.3.1	Facility Changes
3.3.1a	Pre-Stage 1
3.3.1b	Pre-Stage 2
3.3.2	Staffing
3.3.2a	Pre-Stage 1
3.3.2b	Pre-Stage 2
3.3.3	Training and Professional Development
3.3.3a	T & PD Pre-Stage 1
	NEXRAD
	Other
3.3.3b	T & PD Pre-Stage 2
	CWSU Workstation
	Other
3.3.4	Technology
3.3.4.1a	Old Pre-Stage 1
	Decommission/Dispose
3.3.4.1b	Old Pre-Stage 2
	Decommission/Dispose
3.3.4.2a	New Pre-Stage 1
3.3.4.2b	New Pre-Stage 2

	CWSU Workstation
	Other
3.3.5	Programs
3.3.5.1	Pre-Stage 1 Changes
3.3.5.2	Pre-Stage 1 Changes
3.3.6	Dissemination
3.3.6.1	Pre-Stage 1 Changes
3.3.6.2	Pre-Stage 2 Changes
3.3.7	Communications
3.3.7.1	Pre-Stage 1 Changes
3.3.7.2	Pre-Stage 2 Changes
3.3.8	Maintenance
3.3.8.1	Pre-Stage 1 Changes
3.3.8.2	Pre-Stage 2 Changes
3.3.9	Coordination
3.3.9.1a	Internal Pre-Stage 1
	Union
3.3.9.1b	Internal Pre-Stage 2
	Union
3.3.9.2a	External Pre-Stage 1
	FAA
3.3.9.2b	External Pre-Stage 2
	FAA
3.3.10	Other Changes
3.3.10.1	Pre-Stage 1
3.3.10.2	Pre-Stage 2
3.3.11	Station Duty Manual
3.3.11.1	Stage 1 Station Duty Manual
3.3.11.2	Stage 2 Station Duty Manual
3.3.12	Site Operational Readiness
3.3.12.1	Establish Stage 1 Operational Readiness
3.3.12.2	Establish Stage 2 Operational Readiness
3.4	Other Offices (AWSC, NSO, TWS, Etc.)
3.4.1	Facility
3.4.1.1	Pre-Stage 1 Facility Changes
3.4.1.2	Pre-Stage 2 Facility Changes
3.4.2	Staffing
3.4.2.1	Pre-Stage 1 Staff Changes
3.4.2.2	Pre-Stage 2 Staff Changes
3.4.3	Training and Professional Development
3.4.3.1	T & PD Pre-Stage 1
3.4.3.2	T & PD Pre-Stage 2
3.4.4	Technology
3.4.4.1a	Old Pre-Stage 1
3.4.4.1b	Old Pre-Stage 2
3.4.4.2a	New Pre-Stage 1
3.4.4.2b	New Pre-Stage 2

3.4.5	Programs
3.4.5.1	Pre-Stage 1 Program changes
3.4.5.2	Pre-Stage 2 Program changes
3.4.6	Dissemination
3.4.6.1	Pre-Stage 1 Dissemination Activities
3.4.6.2	Pre-Stage 2 Dissemination Activities
3.4.7	Communications
3.4.7.1	Pre-Stage 1 Communication Activities
3.4.7.2	Pre-Stage 2 Communication Activities
3.4.8	Maintenance
3.4.8.1	Pre-Stage 1 Maintenance Changes
3.4.8.2	Pre-Stage 2 Maintenance Changes
3.4.9	Coordination
3.4.9.1a	Internal Pre-Stage 1
3.4.9.1b	Internal Pre-Stage 2
3.4.9.2a	External Pre-Stage 1
3.4.9.2b	External Pre-Stage 2
3.4.10	Other Changes
3.4.11	Station Duty Manual
3.4.11.1	Stage 1 Station Duty Manual
3.4.11.2	Stage 2 Station Duty Manual
3.4.12	Site Operational Readiness
3.4.12.1	Establish Stage 1 Operational Readiness
3.4.12.2	Establish Stage 2 Operational Readiness
	(3.5 to 3.n; n = No. Offices in WFO area)
3.5	Office (WSO, WSMO, WSCMO)
3.5.1	Facility
3.5.1.1	Pre-Stage 1 Facility Activities
	Lease Termination/Modification
	Office Furniture/Equipment
	Utilities
3.5.1.2	Pre-Stage 2 Facility Activities
	Lease Termination/Modification
	Office Furniture/Equipment
	Utilities
3.5.2	Staffing
3.5.2.1	Pre-Stage 1 Staff Changes
	OIC/MIC
	Met Techs
	Interns
	ETs
	Other
3.5.2.2	Pre-Stage 2 Staff Changes
	OIC/MIC
	Met Techs
	Interns
	ETs

Other
3.5.3 Training and Professional Development
3.5.3.1 Enroute New Assignment Pre-Stage 1
3.5.3.2 Enroute New Assignment Pre-Stage 2
3.5.4 Technology
3.5.4.1a Current Technology Pre-Stage 1 Activities
Surface Observing Equipment
HO-83
F-420
LBC
Sunshine Switch & Recorder
Special Use Equip (Solirad, etc)
Other Observing Systems
Radar
Upper Air
Helium/Hydrogen Contract
AFOS
3.5.4.1b Current Technology Pre-Stage 2 Activities
AFOS
3.5.4.2a New Technology Pre-Stage 1 Activities
ASOS
3.5.4.2b New Technology Pre-Stage 2 Activities
3.5.5 Programs
3.5.5.1 Pre-Stage 1 Program Changes
Observations
Surface
Radar
Upper Air
Climatological Services
Warnings
County
Winter Storm
Public
Local
Aviation
PWB
Marine
Coastal
Applied Services
Agricultural
Forestry
Hydrological
Collect/Disseminate
Climatological Services
Other
3.5.5.2 Pre-Stage 2 Program Changes
Observations

Surface
Radar
Upper Air
Climatological Services
Warnings
County
Winter Storm
Public
Local
Aviation
PWB
Marine
Coastal
Applied Services
Agricultural
Forestry
Hydrological
Collect/Disseminate
Climatological Services
Other

3.5.6 Dissemination
3.5.6.1 Pre-Stage 1 Dissemination Activities
NWR Consoles
Remove/Transfer
3.5.6.2 Pre-Stage 2 Dissemination Activities
NWR Consoles
Remove/Transfer
3.5.7 Communications
3.5.7.1 Pre-Stage 1 Communications Activities
Telephone Systems
Telephone Recording Devices
Communications Lines
3.5.7.2 Pre-Stage 2 Communications Activities
Telephone Systems
Telephone Recording Devices
Communications Lines
3.5.8 Maintenance
3.5.8.1 Pre-Stage 1 Maintenance Changes
3.5.8.2 Pre-Stage 2 Maintenance Changes
3.5.9 Coordination
3.5.9.1a Internal Pre-Stage 1
Union
3.5.9.1b Internal Pre-Stage 2
Union
3.5.9.2a External Pre-Stage 1
Congressional
State

	County
	Local Community
	Media
	Federal Agencies
	Federal Cooperators
	Private Meteorologists
3.5.9.2b	External Pre-Stage 2
	Congressional
	State
	County
	Local Community
	Media
	Federal Agencies
	Federal Cooperators
	Private Meteorologists
3.5.10	Other Changes
3.5.10.1	Pre-Stage 1
3.5.10.2	Pre-Stage 2
3.5.11	Station Duty Manual
3.5.11.1	Stage 1 Station Duty Manual
3.5.11.2	Stage 2 Station Duty Manual
3.5.12	Site Deactivation
3.5.12.1	Stage 1
3.5.12.2	Stage 2

SECTION 4 RISK REDUCTION

4.1	Future WFO
4.2	Other Office (RFC, CWSU, WSO, etc.)

Appendix C

RELATED TRANSITION PLANNING DOCUMENTS

In order to ensure an orderly transition to the modernized NWS, a number of transition planning documents and associated publications are required. Given below is the current list of related transition planning documents along with their effective date. A blank date indicates the plan or document is still under development.

Document Title	Effective Date
MARD Implementation and Evaluation Plan	
Operational Test & Evaluation Plan	
Integrated Operations and Services Plan	
Stage 1 Operations Concept (Draft)	Dec 88
Stage 2 Operations Concept	Jan 90
Public Services Plan	
Marine Services Plan	
Aviation Plan	
Fire Weather Operations and Services Plan	
Agriculture Plan	
Tsunami Warning Program Plan	
Air Pollution Plan	
Climatology Plan	
Hazardous Spills Plan	
Spaceflight Support Plan	
Hydrologic Services Plan	
National Backup Plan (Draft)	Dec 89
Forecast and Warning Verification Plan	
System Development and Integration Plan	Apr 89
ASOS Deployment Schedule	May 90
NEXRAD Deployment Schedule	Jan 90
AWIPS Deployment Schedule	
External and Internal Coordination Plan (Draft)	Jan 90
Facilities Preparation Plan	
Training and Professional Development Plan	
Implementation and Phaseover Plan	
Risk Reduction Plan	
Human Resources Plan	

Documents incorporated in NIP by reference:

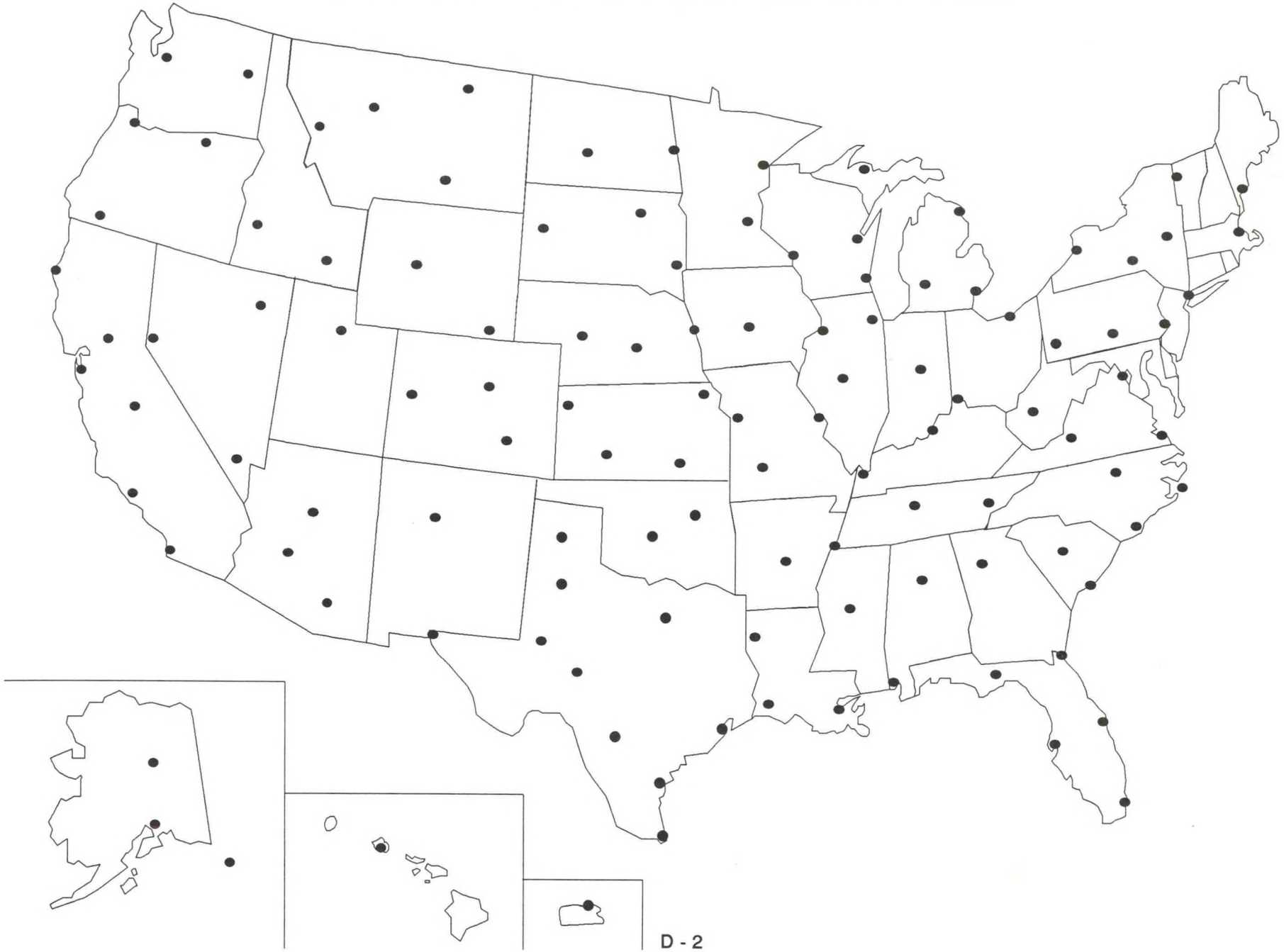
WBS Description Document and Dictionary ..... Jan 89
(Section 5.2)
Program Monitoring and Control System ..... Jul 88
Description Document (Section 5.4)
Transition Change Management Policy Document ..... Mar 89
(Section 5.5)

Appendix D

OTHER SPECIFIC INFORMATION

This appendix is intended to be an expandable appendix, and will be used to provide specific information concerning modernization and associated restructuring of NWS, as it becomes available for release. Attached are the following:

LOCATIONS OF THE WEATHER FORECAST OFFICES



LIST OF THE WEATHER FORECAST OFFICE LOCATIONS

Metropolitan Area	Proposed Office Location
Aberdeen, SD	Aberdeen Regional Airport
Albany, NY	State Univ of New York, Albany
Albuquerque, NM	Albuquerque International Airport
Alpena, MI	Green Township, Alpena County
Amarillo, TX	Amarillo International Airport
Anchorage, AK	Anchorage, AK
Atlanta, GA	Falcon Field, Peachtree City
Austin/San Antonio, TX	New Braunfels Municipal Airport
Baltimore, MD/Washington, DC	Sterling, VA
Billings, MT	Billings-Logan Int'l Airport
Binghampton, NY	Broome County Airport
Birmingham, AL	Shelby County Airport
Bismarck, ND	Bismarck Municipal Airport
Boise, ID	Boise Interagency Fire Center
Boston, MA	Taunton, MA
Brownsville, TX	Brownsville International Airport
Buffalo, NY	Batavia, NY
Burlington, VT	Burlington International Airport
Central Illinois, IL	Logan County Airport
Central Pennsylvania, PA	State College, PA
Charleston, SC	Charleston International Airport
Charleston, WV	Ruthdale, WV
Cheyenne, WY	Cheyenne Municipal Airport
Chicago, IL	Lewis University Airport
Cincinnati, OH	Wilmington, OH
Cleveland, OH	Cleveland-Hopkins Int'l Airport
Columbia, SC	Columbia Metropolitan Airport
Corpus Christi, TX	Corpus Christi Int'l Airport
Dallas/Fort Worth, TX	Fort Worth Spinks Airport
Denver, CO	Boulder, CO
Des Moines, IA	Acorn Valley Recreation Area
Detroit, MI	Indian Springs Metropark, Pontiac
Dodge City, KS	Dodge City Municipal Airport
Duluth, MN	Duluth International Airport
El Paso, TX	Santa Teresa Airport, NM
Elko, NV	Elko, NV
Eureka, CA	Eureka, CA
Fairbanks, AK	Fairbanks, AK
Fargo/Grand Forks, ND	Mayville, ND
Flagstaff, AZ	Pulliam Airport
Glasgow, MT	Glasgow International Airport

LIST OF THE WEATHER FORECAST OFFICE LOCATIONS
(continued)

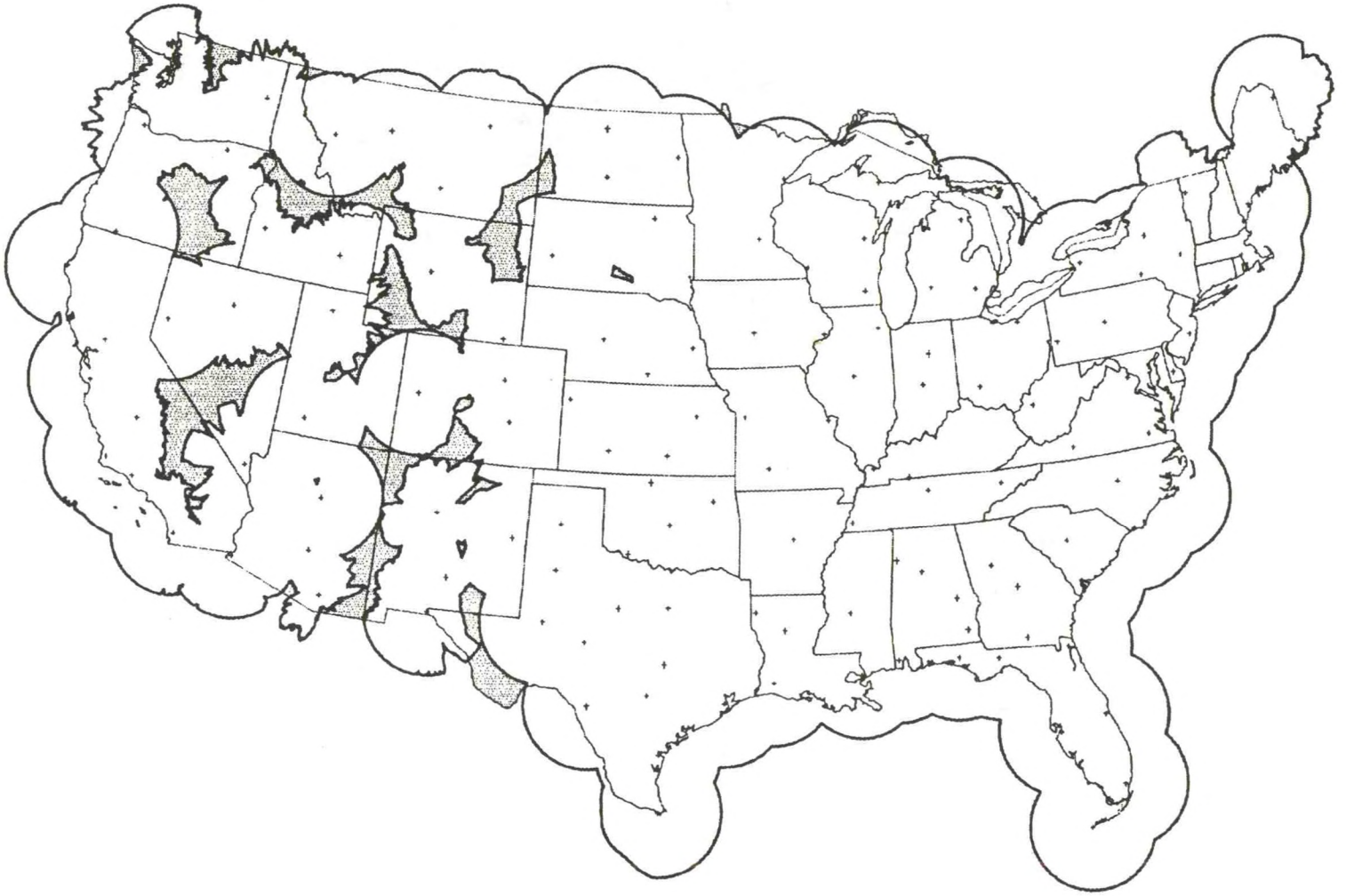
Metropolitan Area	Proposed Office Location
Goodland, KS	Goodland Municipal Airport
Grand Island, NE	Hastings, NE
Grand Junction, CO	Walker Field
Grand Rapids/Muskegon, MI	Kent County International Airport
Great Falls, MT	near Great Falls Int'l Airport
Green Bay, WI	Austin-Straubel Field
Honolulu, HI	(not yet determined)
Houston/Galveston, TX	League City, TX
Indianapolis, IN	Indianapolis International Airport
Jackson, MS	Jackson Municipal Airport
Jacksonville, FL	Jacksonville International Airport
Juneau, AK	Juneau, AK
Kansas City, MO	Pleasant Hill, MO
Knoxville/Tri Cities, TN	Morristown Airport Indus. District
La Crosse, WI	La Crosse Ridge, La Crosse County
Lake Charles, LA	Lake Charles Municipal Airport
Las Vegas, NV	Las Vegas, NV
Little Rock, AR	North Little Rock Airport
Los Angeles, CA	Oxnard, CA
Louisville, KY	Louisville, KY
Lubbock, TX	Lubbock International Airport
Marquette, MI	Marquette County Airport
Medford, OR	Medford-Jackson County Airport
Melbourne, FL	Melbourne Regional Airport
Memphis, TN	Memphis Agricenter Int'l Complex
Miami, FL	Coral Gables, FL
Midland/Odessa, TX	Midland International Airport
Milwaukee, WI	Sullivan Township, Jefferson County
Minneapolis/St. Paul, MN	Chanhassen Township
Missoula, MT	near Missoula County Airport
Mobile, AL	Mobile Municipal Airport
Morehead City, NC	Newport, NC
Nashville, TN	Old Hickory Mountain, TN
New Orleans/Baton Rouge, LA	Slidell Airport
New York City, NY	(not yet determined)
Norfolk/Richmond, VA	Wakefield, VA
North Platte, NE	Lincoln County
Oklahoma City, OK	Norman, OK
Omaha, NE	Mead, NE
Paducah, KY	Barkley Regional Airport
Pendleton, OR	Pendleton Municipal Airport

LIST OF THE WEATHER FORECAST OFFICES
(continued)

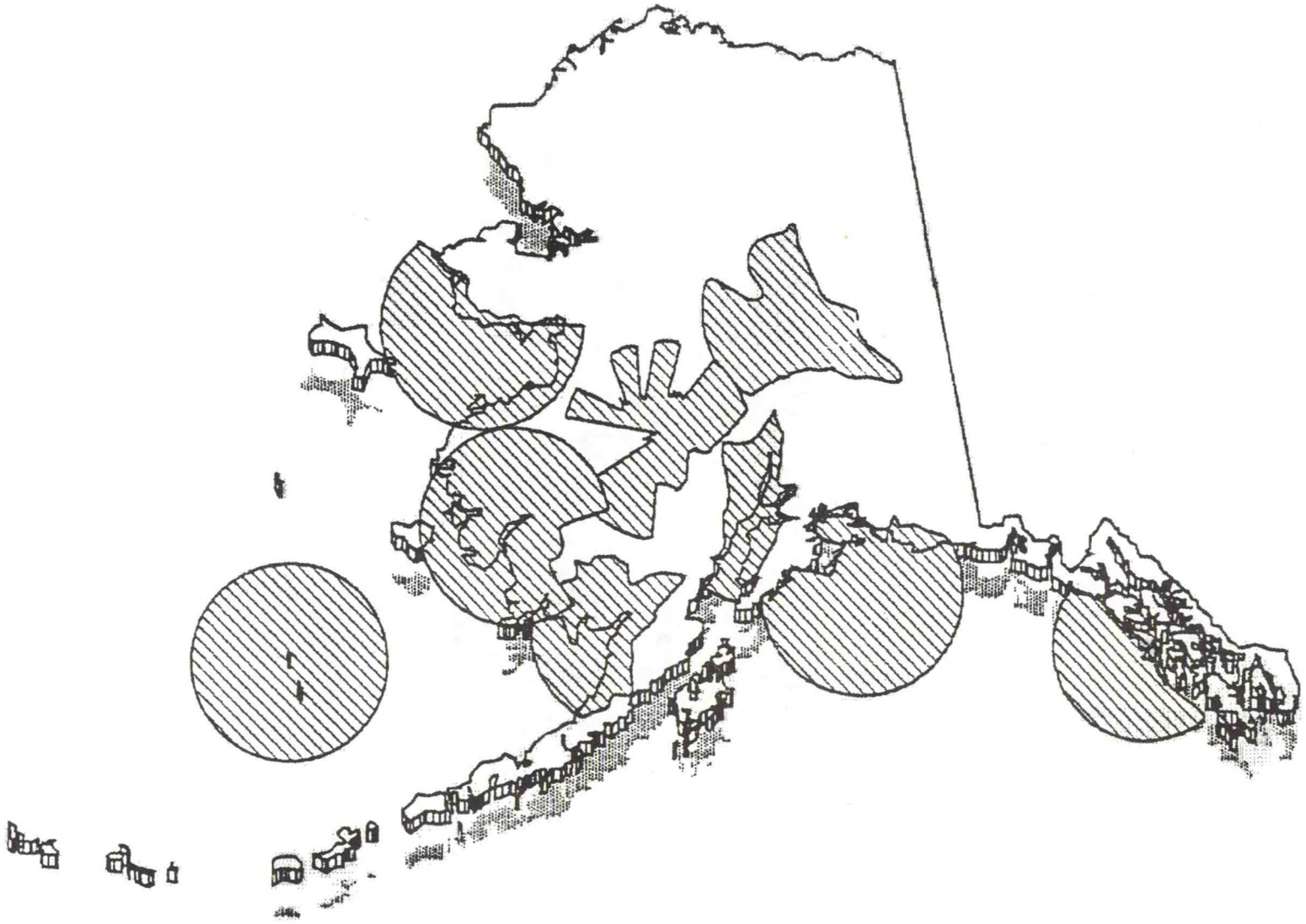
Metropolitan Area	Proposed Office Location
Philadelphia, PA	Mt. Holly, NJ
Phoenix, AZ	Phoenix, AZ
Pittsburgh, PA	Coraopolis, PA
Pocatello/Idaho Falls, ID	Pocatello, ID
Portland, ME	Portland Jetport
Portland, OR	Portland International Airport
Pueblo, CO	Pueblo Memorial Airport
Quad Cities, IA	Davenport Municipal Airport
Raleigh/Durham, NC	(not yet determined)
Rapid City, SD	New Underwood, SD
Reno, NV	Reno, NV
Riverton, WY	Riverton Regional Airport
Roanoke, VA	(not yet determined)
Sacramento, CA	Sacramento, CA
Salt Lake City, UT	Salt Lake City Int'l Airport
San Angelo, TX	San Angelo Municipal Airport
San Diego, CA	Miramar Naval Air Station
San Francisco Bay Area, CA	Monterey, CA
San Joaquin Valley, CA	Hanford, CA
San Juan, PR	Luis Munoz Marin Int'l Airport
Seattle/Tacoma, WA	Sand Point, WA
Shreveport, LA	Shreveport Regional Airport
Sioux Falls, SD	Sioux Falls Municipal Airport
Spokane, WA	Rambo Road, Spokane, WA
Springfield, MO	Springfield Regional Airport
St. Louis, MO	Research Park, St. Charles County
Tallahassee, FL	Tallahassee Regional Airport
Tampa Bay Area, FL	Ruskin, FL
Topeka, KS	Philip Billard Municipal Airport
Tucson, AZ	Tucson, AZ
Tulsa, OK	Tulsa International Airport
Wichita, KS	Wichita Mid-Continent Airport
Wilmington, NC	New Hanover County Airport

DEPICTION OF THE TOTAL COVERAGE (AT 10,000 FT ELEVATION) PROVIDED BY THE COMPLETED NATIONAL NEXRAD NETWORK.

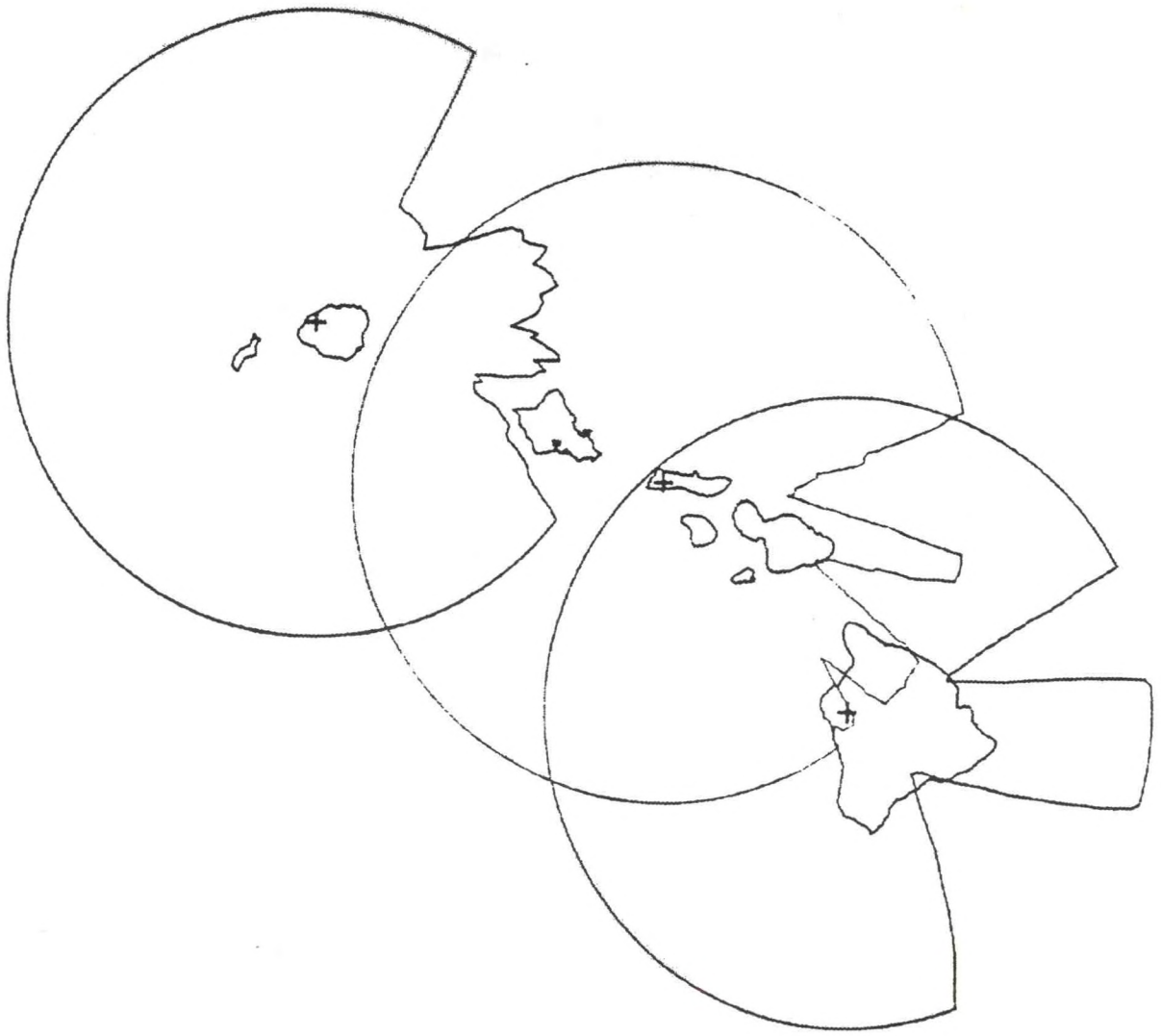
DARKENED AREAS OVER THE ROCKY MOUNTAINS ARE GAPS IN COVERAGE AT THE 10,000 FT LEVEL.



NEXRAD SITES AND ESTIMATED COVERAGE (AT 10,000 FT ELEVATION) FOR ALASKA.



NEXRAD SITES AND ESTIMATED COVERAGE (AT 10,000 FT ELEVATION) FOR HAWAII.



LIST OF THE NEXRAD LOCATIONS

National Weather Service NEXRADs:

Metropolitan Area	Proposed NEXRAD Location
Aberdeen, SD	Aberdeen Regional Airport
Albany, NY	Berne, NY
Albuquerque, NM	La Mesita Negra, Bernalillo County
Alpena, MI	Green Township, Alpena County
Amarillo, TX	Amarillo International Airport
Atlanta, GA	Falcon Field, Peachtree City
Austin/San Antonio, TX	New Braunfels Municipal Airport
Baltimore, MD/Washington, DC	Sterling, VA
Billings, MT	Alkali Creek Rd, Yellowstone County
Binghampton, NY	Broome County Airport
Birmingham, AL	near Shelby County Airport
Bismarck, ND	Bismarck Municipal Airport
Boise, ID	Wild Horse Corral, Ada County
Boston, MA	Taunton, MA
Brownsville, TX	Brownsville International Airport
Buffalo, NY	Batavia, NY
Burlington, VT	Burlington International Airport
Cedar City, UT	Blowhard Mountain, Iron County
Central Illinois, IL	Logan County Airport
Central Pennsylvania, PA	Moshannon State Forest
Charleston, SC	Sheldon, SC
Charleston, WV	Ruthdale, WV
Cheyenne, WY	Cheyenne Municipal Airport
Chicago, IL	Lewis University Airport
Cincinnati, OH	Wilmington, OH
Cleveland, OH	Cleveland-Hopkins Int'l Airport
Columbia, SC	Columbia Metropolitan Airport
Corpus Christi, TX	Corpus Christi Int'l Airport
Dallas/Fort Worth, TX	Fort Worth Spinks Airport
Denver, CO	Front Range Airport
Des Moines, IA	Acorn Valley Recreation Area
Detroit, MI	Indian Springs Metropark
Dodge City, KS	Dodge City Municipal Airport
Duluth, MN	Duluth International Airport
El Paso, TX	Santa Teresa Airport, NM
Elko, NV	Sheep Creek Mountain, Lander County
Eureka, CA	Bunker Hill, Humboldt County
Fargo/Grand Forks, ND	Mayville, ND
Flagstaff, AZ	Anderson Mesa, Coconino County

LIST OF THE NEXRAD LOCATIONS
(continued)

Metropolitan Area	Proposed NEXRAD Location
Glasgow, MT	Glasgow International Airport
Goodland, KS	Goodland Municipal Airport
Grand Island, NE	Blue Hill, NE
Grand Junction, CO	Grand Mesa, Mesa County
Grand Rapids/Muskegon, MI	Kent County International Airport
Great Falls, MT	near Great Falls Int'l Airport
Green Bay, WI	Austin-Straubel Field
Houston/Galveston, TX	League City, TX
Indianapolis, IN	Indianapolis International Airport
Jackson, MS	Jackson Municipal Airport
Jacksonville, FL	Jacksonville International Airport
Kansas City, MO	Pleasant Hill, MO
Key West, FL	Key West International Airport
Knoxville/Tri Cities, TN	Morristown Airport Indus. District
La Crosse, WI	La Crosse Ridge, La Crosse County
Lake Charles, LA	Lake Charles Municipal Airport
Las Vegas, NV	Opal Mountain, Nelson, NV
Little Rock, AR	North Little Rock Airport
Los Angeles, CA	Sulphur Mountain, Ventura County
Louisville, KY	Fort Knox Military Reservation
Lubbock, TX	Lubbock International Airport
Marquette, MI	Marquette County Airport
Medford, OR	Mount Ashland, Jackson County
Melbourne, FL	Melbourne Regional Airport
Memphis, TN	Millington Naval Air Station
Miami, FL	Richmond Heights Naval Air Station
Midland/Odessa, TX	Midland International Airport
Milwaukee, WI	Sullivan Township, Jefferson County
Minneapolis/St. Paul, MN	Chanhassen Township
Missoula, MT	Pt. Six Mountain, Missoula County
Mobile, AL	Mobile Municipal Airport
Morehead City, NC	Newport, NC
Nashville, TN	Old Hickory Mountain, TN
New Orleans/Baton Rouge, LA	Slidell Airport
New York City, NY	(not yet determined)
Norfolk/Richmond, VA	Wakefield, VA
North Platte, NE	Smith Ranch, Logan County
Oklahoma City, OK	Twin Lakes Airport
Omaha, NE	Mead, NE
Paducah, KY	Barkley Regional Airport
Pendleton, OR	Pendleton Municipal Airport

LIST OF THE NEXRAD LOCATIONS
(continued)

Metropolitan Area	Proposed NEXRAD Location
Philadelphia, PA	Fort Dix, NJ
Phoenix, AZ	Williams Air Force Base
Pittsburgh, PA	Coraopolis, PA
Pocatello/Idaho Falls, ID	Springfield, ID
Portland, ME	(not yet determined)
Portland, OR	Dixie Mountain, Washington County
Pueblo, CO	Boone/Highland Roads, Pueblo County
Quad Cities, IA	Davenport Municipal Airport
Raleigh/Durham, NC	(not yet determined)
Rapid City, SD	New Underwood, SD
Reno, NV	Virginia Peak, Washoe County
Riverton, WY	Riverton Regional Airport
Roanoke, VA	Coles Knob, Floyd County
Sacramento, CA	(not yet determined)
Salt Lake City, UT	Promontory Point, Box Elder County
San Angelo, TX	San Angelo Municipal Airport
San Diego, CA	Miramar Naval Air Station
San Francisco Bay Area, CA	Mt. Umunhum, Santa Clara County
San Joaquin Valley, CA	Hanford Municipal Airport
Seattle/Tacoma, WA	(not yet determined)
Shreveport, LA	Shreveport Regional Airport
Sioux Falls, SD	Sioux Falls Municipal Airport
Spokane, WA	Rambo Road, Spokane, WA
Springfield, MO	Springfield Regional Airport
St. Louis, MO	Research Park, St. Charles County
Tallahassee, FL	Tallahassee Regional Airport
Tampa Bay Area, FL	Ruskin, FL
Topeka, KS	Wabaunsee County
Tucson, AZ	near Sahuarita, AZ
Tulsa, OK	Shreck Farm, Rogers County
Wichita, KS	Wichita Mid-Continent Airport
Wilmington, NC	Shallotte, NC
Yuma, AZ	near Yuma International Airport

LIST OF THE NEXRAD LOCATIONS
(continued)

NEXRADs in Alaska and Hawaii:

Metropolitan Area	Proposed NEXRAD Location
Anchorage, AK	(not yet determined)
Bethel, AK	(not yet determined)
Fairbanks, AK	(not yet determined)
Hawaii, HI	Hainoa site
Kauai, HI	Kokee Park site
King Salmon, AK	(not yet determined)
McGrath, AK	(not yet determined)
Middleton Island, AK	(not yet determined)
Molokai, HI	Amikopala West site
Nome, AK	(not yet determined)
St. Paul Island, AK	(not yet determined)
Sitka, AK	(not yet determined)

NOTE:

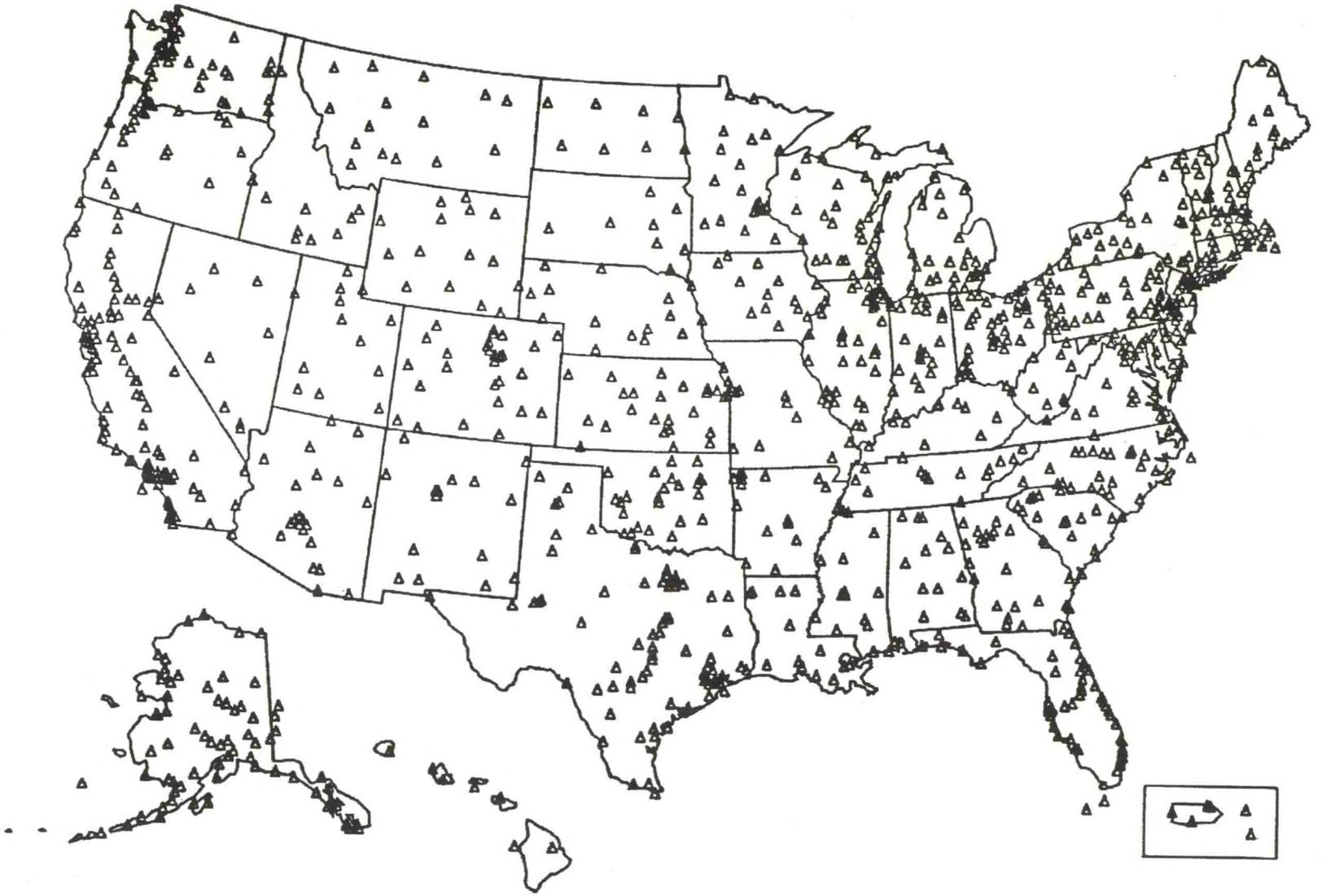
NEXRAD coverage will be provided for Puerto Rico.

LIST OF THE NEXRAD LOCATIONS
(continued)

Department of Defense Supplemental NEXRADs:

Beale Air Force Base, CA
Cannon Air Force Base, NM
Central Texas (Granger), TX
Columbus Air Force Base, MS
Dover Air Force Base, DE
Dyess Air Force Base, TX
East Alabama (Carrville), AL
Edwards Air Force Base, CA
England Air Force Base, LA
Frederick, OK
Ft. Campbell, KY
Ft. Rucker, AL
Griffiss Air Force Base, NY
Grissom Air Force Base, IN
Holloman Air Force Base, NM
Laughlin Air Force Base, TX
Loring Air Force Base, ME
March Air Force Base, CA
Minot Air Force Base, ND
Moody Air Force Base, GA
Northwest Florida (Red Bay), FL
Robins Air Force Base, GA
Vandenberg Air Force Base, CA
Vance Air Force Base, OK

CANDIDATE NWS AND FAA ASOS LOCATIONS



LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)

AK	Akutan	FAA
AK	Anchorage	FAA
AK	Anchorage	NWS
AK	Annette	NWS
AK	Barrow	NWS
AK	Bethel	NWS
AK	Bettles	FAA
AK	Big Delta	FAA
AK	Cape Spencer	FAA
AK	Chevak	FAA
AK	Chicken	FAA
AK	Chignik Lake	FAA
AK	Cold Bay	NWS
AK	Cordova	FAA
AK	Deadhorse	FAA
AK	Fairbanks	NWS
AK	Farewell	FAA
AK	Galena	FAA
AK	Gulkana	FAA
AK	Homer	NWS
AK	Iliamna	FAA
AK	Juneau	FAA
AK	Kenai	FAA
AK	Ketchikan	FAA
AK	King Salmon	NWS
AK	Kodiak	NWS
AK	Kotzebue	NWS
AK	McGrath	NWS
AK	Minchumina	FAA
AK	Nabesna	FAA
AK	Nenana	NWS
AK	Nome	NWS
AK	Northway	FAA
AK	Palmer	FAA
AK	Portage Creek	FAA
AK	Prudhoe Bay	FAA
AK	Ptarmigan Pass	FAA
AK	Puntilla	FAA
AK	Sitka	FAA
AK	St Michael	FAA
AK	St Paul Island	NWS
AK	Talkeetna	NWS
AK	Tanana	FAA
AK	Whittier	FAA
AK	Yakutat	NWS
AL	Alabaster	FAA
AL	Anniston	FAA
AL	Birmingham	FAA
AL	Decatur	FAA
AL	Dothan	FAA
AL	Evergreen	FAA
AL	Huntsville	NWS
AL	Mobile	FAA
AL	Mobile	NWS
AL	Montgomery	NWS
AL	Muscle Shoals	FAA
AL	Ozark	FAA
AL	Selma	FAA
AL	Tuscaloosa	FAA
AR	Blytheville	FAA
AR	Camden	FAA
AR	De Queen	FAA
AR	El Dorado	FAA
AR	Fayetteville	FAA
AR	Fort Smith	NWS
AR	Harrison	FAA
AR	Hot Springs	FAA
AR	Jonesboro	FAA
AR	Little Rock	FAA
AR	Monticello	FAA
AR	Mountain Home	FAA
AR	North Little Rock	FAA
AR	Pine Bluff	FAA
AR	Russellville	FAA
AR	Texarkana	FAA
AR	West Memphis	FAA
AZ	Chandler	FAA
AZ	Coolidge	FAA
AZ	Douglas	FAA
AZ	Flagstaff	NWS
AZ	Gila Bend	FAA
AZ	Glendale	FAA
AZ	Goodyear	FAA
AZ	Grand Canyon	FAA
AZ	Kayenta	FAA
AZ	Kingman	NWS
AZ	Mesa	FAA
AZ	Nogales	FAA
AZ	Page	NWS
AZ	Phoenix	NWS
AZ	Phoenix-Deer Valley	FAA
AZ	Prescott	FAA
AZ	Scottsdale	FAA
AZ	St Johns	FAA
AZ	Tucson	NWS
AZ	Winslow	NWS
CA	Arcata	FAA
CA	Avalon	FAA
CA	Bakersfield	NWS
CA	Bishop	NWS
CA	Blythe	FAA
CA	Burbank	FAA
CA	Carlsbad	FAA
CA	Chico	FAA
CA	Chino	FAA
CA	Compton	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

CA	Concord	FAA
CA	Daggett	FAA
CA	El Monte	FAA
CA	Emigrant Gap	NWS
CA	Eureka	FAA
CA	Fair Oaks	FAA
CA	Fresno	FAA
CA	Fresno	NWS
CA	Fullerton	FAA
CA	Grass Valley	FAA
CA	Hanford	FAA
CA	Hawthorne	FAA
CA	Hayward	FAA
CA	Imperial	FAA
CA	La Verne	FAA
CA	Livermore	FAA
CA	Long Beach	NWS
CA	Los Angeles	FAA
CA	Los Angeles	NWS
CA	Madera	FAA
CA	Marysville	FAA
CA	Merced	FAA
CA	Modesto	FAA
CA	Monterey	FAA
CA	Mt Shasta	NWS
CA	Napa	FAA
CA	Needles	FAA
CA	Novato	FAA
CA	Oakland	FAA
CA	Oceanside	FAA
CA	Ontario	FAA
CA	Oroville	FAA
CA	Oxnard	FAA
CA	Palm Springs	FAA
CA	Palmdale	FAA
CA	Palo Alto	FAA
CA	Paso Robles	FAA
CA	Red Bluff	NWS
CA	Redding	NWS
CA	Rialto	FAA
CA	Riverside	FAA
CA	Sacramento	FAA
CA	Sacramento	FAA
CA	Salinas	FAA
CA	San Carlos	FAA
CA	San Diego	FAA
CA	San Diego	NWS
CA	San Diego	NWS
CA	San Diego (El Cajon)	FAA
CA	San Francisco	NWS
CA	San Jose	FAA
CA	San Jose	FAA
CA	San Luis Obispo	FAA
CA	Sandberg	NWS
CA	Santa Ana	FAA
CA	Santa Barbara	FAA
CA	Santa Maria	NWS
CA	Santa Monica	FAA
CA	Santa Rosa	FAA
CA	Santa Ynez	FAA
CA	South Lake Tahoe	FAA
CA	Stockton	NWS
CA	Thermal	FAA
CA	Torrance	FAA
CA	Upland	FAA
CA	Vacaville	FAA
CA	Van Nuys	FAA
CA	Watsonville	FAA
CO	Akron	FAA
CO	Alamosa	NWS
CO	Aspen	FAA
CO	Aurora	FAA
CO	Boulder	FAA
CO	Broomfield	FAA
CO	Burlington	FAA
CO	Colorado Springs	NWS
CO	Cortez	FAA
CO	Craig	FAA
CO	Denver	NWS
CO	Englewood	FAA
CO	Falcon	FAA
CO	Grand Junction	NWS
CO	Holyoke	FAA
CO	La Junta	FAA
CO	Lamar	FAA
CO	Limon	NWS
CO	Longmont	FAA
CO	Meeker	FAA
CO	Montrose	FAA
CO	Pueblo	NWS
CO	Rifle	FAA
CO	Telluride	FAA
CT	Bridgeport	NWS
CT	Danbury	FAA
CT	Groton	FAA
CT	Hartford	FAA
CT	Meriden	FAA
CT	New Haven	FAA
CT	Willimantic	FAA
CT	Windsor Locks	NWS
DC	Washington National	NWS
DE	Dover Cheswold	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

DE	Georgetown	FAA
DE	Wilmington	NWS
FL	Bartow	FAA
FL	Boca Raton	FAA
FL	Brooksville	FAA
FL	Bunnell	FAA
FL	Crestview	FAA
FL	Daytona Beach	NWS
FL	Deland	FAA
FL	Destin	FAA
FL	Fort Lauderdale	FAA
FL	Fort Lauderdale	FAA
FL	Fort Myers	FAA
FL	Fort Myers	FAA
FL	Fort Pierce	FAA
FL	Gainesville	FAA
FL	Hollywood	FAA
FL	Jacksonville	FAA
FL	Jacksonville	NWS
FL	Key West	NWS
FL	Lakeland	FAA
FL	Leesburg	FAA
FL	Marathon	FAA
FL	Marianna	FAA
FL	Melbourne	FAA
FL	Miami	FAA
FL	Miami	FAA
FL	Miami	NWS
FL	New Port Richey	FAA
FL	New Smyrna Beach	FAA
FL	Orlando	NWS
FL	Ormond Beach	FAA
FL	Panama City	FAA
FL	Pensacola	FAA
FL	Pompano Beach	FAA
FL	Punta Gorda	FAA
FL	Sanford	FAA
FL	Sarasota	FAA
FL	Sebastian	FAA
FL	St Petersburg	FAA
FL	St Petersburg	FAA
FL	Stuart	FAA
FL	Tallahassee	NWS
FL	Tampa	NWS
FL	Titusville	FAA
FL	Valkaria	FAA
FL	Vero Beach	FAA
FL	West Palm Beach	FAA
FL	West Palm Beach	NWS
FL	Winter Haven	FAA
GA	Albany	FAA
GA	Alma	FAA
GA	Athens	NWS
GA	Atlanta	FAA
GA	Atlanta	FAA
GA	Atlanta	NWS
GA	Augusta	FAA
GA	Augusta	NWS
GA	Brunswick	FAA
GA	Carrollton	FAA
GA	Cartersville	FAA
GA	Columbus	NWS
GA	Gainesville	FAA
GA	Macon	NWS
GA	Moultrie	FAA
GA	Peachtree City	FAA
GA	Savannah	NWS
GA	Stone Mountain	FAA
GA	Thomasville	FAA
GA	Tifton	FAA
GA	Valdosta	FAA
HI	Hilo	NWS
HI	Honolulu	NWS
HI	Kahului	NWS
HI	Kailua-Kona	FAA
HI	Kaunakakai	FAA
HI	Lanai City	FAA
HI	Lihue	NWS
IA	Ames	FAA
IA	Boone	FAA
IA	Burlington	FAA
IA	Cedar Rapids	FAA
IA	Davenport	FAA
IA	Des Moines	NWS
IA	Dubuque	NWS
IA	Estherville	FAA
IA	Iowa City	FAA
IA	Marshalltown	FAA
IA	Mason City	FAA
IA	Muscatine	FAA
IA	Newton	FAA
IA	Ottumwa	FAA
IA	Sioux City	NWS
IA	Spencer	FAA
IA	Waterloo	NWS
ID	Boise	NWS
ID	Burley	FAA
ID	Hailey	FAA
ID	Idaho Falls	FAA
ID	Jerome	FAA
ID	Lewiston	NWS
ID	Mullan Pass	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

ID	Pocatello	NWS
ID	Rexburg	FAA
ID	Twin Falls	FAA
IL	Alton	FAA
IL	Aurora	FAA
IL	Belvidere	FAA
IL	Bloomington	FAA
IL	Carbondale	FAA
IL	Centralia	FAA
IL	Champaign	FAA
IL	Chicago	FAA
IL	Chicago	FAA
IL	Chicago-Dupage	FAA
IL	Chicago-Meigs	FAA
IL	Chicago-Ohare	NWS
IL	Chicago/Schaumburg	FAA
IL	Danville	FAA
IL	Decatur	FAA
IL	East St Louis	FAA
IL	Galesburg	FAA
IL	Joliet	FAA
IL	Kankakee	FAA
IL	Lake in the Hills	FAA
IL	Lawrenceville	FAA
IL	Marion	FAA
IL	Mattoon	FAA
IL	Moline	NWS
IL	Pekin	FAA
IL	Peoria	FAA
IL	Peoria	NWS
IL	Plainfield	FAA
IL	Rockford	NWS
IL	Romeoville	FAA
IL	Springfield	NWS
IL	Urbana	FAA
IL	Waukegan	FAA
IN	Bedford	FAA
IN	Bloomington	FAA
IN	Columbus	FAA
IN	Elkhart	FAA
IN	Evansville	NWS
IN	Fort Wayne	FAA
IN	Fort Wayne	NWS
IN	Gary	FAA
IN	Goshen	FAA
IN	Griffith	FAA
IN	Indianapolis	FAA
IN	Indianapolis	FAA
IN	Indianapolis	FAA
IN	Indianapolis	FAA
IN	Indianapolis	NWS
IN	Jeffersonville	FAA
IN	Lafayette	FAA
IN	Muncie	FAA
IN	Plymouth	FAA
IN	Shelbyville	FAA
IN	South Bend	NWS
IN	Terre Haute	FAA
IN	Valparaiso	FAA
IN	Warsaw	FAA
KS	Chanute	FAA
KS	Coffeyville	FAA
KS	Concordia	NWS
KS	Dodge City	NWS
KS	Emporia	FAA
KS	Garden City	FAA
KS	Goodland	NWS
KS	Hill City	FAA
KS	Hutchinson	FAA
KS	Lawrence	FAA
KS	Manhattan	FAA
KS	Olathe	FAA
KS	Olathe	FAA
KS	Parsons	FAA
KS	Russell	FAA
KS	Salina	FAA
KS	Topeka	FAA
KS	Topeka	NWS
KS	Wichita	FAA
KS	Wichita	NWS
KS	Winfield	FAA
KY	Bowling Green	FAA
KY	Covington	NWS
KY	Frankfort	FAA
KY	Jackson	NWS
KY	Lexington	NWS
KY	London	FAA
KY	Louisville	FAA
KY	Louisville	NWS
KY	Owensboro	FAA
KY	Paducah	NWS
LA	Alexandria	FAA
LA	Baton Rouge	NWS
LA	De Ridder	FAA
LA	Houma	FAA
LA	Lafayette	FAA
LA	Lake Charles	NWS
LA	Monroe	FAA
LA	New Iberia	FAA
LA	New Orleans	FAA
LA	New Orleans	NWS
LA	Shreveport	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

LA	Shreveport	NWS
LA	Slidell	FAA
MA	Bedford	FAA
MA	Beverly	FAA
MA	Boston	NWS
MA	Chatham	FAA
MA	Fitchburg	FAA
MA	Hyannis	FAA
MA	Lawrence	FAA
MA	Marthas Vineyard	FAA
MA	Nantucket	FAA
MA	New Bedford	FAA
MA	North Adams	FAA
MA	Norwood	FAA
MA	Orange	FAA
MA	Pittsfield	FAA
MA	Plymouth	FAA
MA	Taunton	FAA
MA	Westfield	FAA
MA	Worcester	NWS
MD	Baltimore	NWS
MD	Hagerstown	FAA
MD	Middle River	FAA
MD	Ocean City	FAA
MD	Salisbury	FAA
ME	Augusta	FAA
ME	Bangor	FAA
ME	Caribou	NWS
ME	Frenchville	FAA
ME	Fryeburg	FAA
ME	Houlton	FAA
ME	Millinocket	FAA
ME	Portland	NWS
ME	Wiscasset	FAA
MI	Adrian	FAA
MI	Alpena	NWS
MI	Ann Arbor	FAA
MI	Battle Creek	FAA
MI	Bellaire	FAA
MI	Benton Harbor	FAA
MI	Detroit	FAA
MI	Detroit	NWS
MI	Detroit-Ypsalanti	FAA
MI	Flint	NWS
MI	Gaylord	FAA
MI	Grand Rapids	NWS
MI	Hancock	FAA
MI	Hillsdale	FAA
MI	Holland	FAA
MI	Houghton Lake	NWS
MI	Howell	FAA
MI	Iron Mountain	FAA
MI	Jackson	FAA
MI	Kalamazoo	FAA
MI	Lansing	NWS
MI	Muskegon	NWS
MI	Niles	FAA
MI	Pellston	FAA
MI	Plymouth	FAA
MI	Pontiac	FAA
MI	Saginaw	FAA
MI	Traverse City	FAA
MN	Alexandria	FAA
MN	Baudette	FAA
MN	Brainerd	FAA
MN	Duluth	NWS
MN	Hibbing	FAA
MN	International Falls	NWS
MN	Minneapolis	FAA
MN	Minneapolis	FAA
MN	Minneapolis	FAA
MN	Minneapolis	NWS
MN	Park Rapids	FAA
MN	Redwood Falls	FAA
MN	Rochester	NWS
MN	South St Paul	FAA
MN	St Cloud	NWS
MN	St Paul	FAA
MN	St Paul	FAA
MO	Cape Girardeau	FAA
MO	Columbia	NWS
MO	Grain Valley	FAA
MO	Jefferson City	FAA
MO	Joplin	FAA
MO	Kansas City	FAA
MO	Kansas City	FAA
MO	Kansas City	NWS
MO	Lees Summit	FAA
MO	Poplar Bluff	FAA
MO	Sedalia	FAA
MO	Springfield	NWS
MO	St Charles	FAA
MO	St Joseph	FAA
MO	St Louis	FAA
MO	St Louis	FAA
MO	St Louis	NWS
MO	Vichy	FAA
MO	West Plains	FAA
MS	Greenville	FAA
MS	Greenwood	FAA
MS	Gulfport	FAA
MS	Hattiesburg	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

MS	Jackson	FAA
MS	Jackson	NWS
MS	Madison	FAA
MS	McComb	FAA
MS	Meridian	NWS
MS	Olive Branch	FAA
MS	Pascagoula	FAA
MS	Tupelo	NWS
MS	Vicksburg	FAA
MT	Baker	FAA
MT	Billings	NWS
MT	Bozeman	FAA
MT	Butte	FAA
MT	Dillon	FAA
MT	Glasgow	NWS
MT	Great Falls	NWS
MT	Havre	NWS
MT	Helena	NWS
MT	Kalispell	NWS
MT	Livingston	FAA
MT	Miles City	FAA
MT	Missoula	NWS
MT	Wolf Point	FAA
NC	Asheville	NWS
NC	Beaufort	FAA
NC	Burlington	FAA
NC	Chapel Hill	FAA
NC	Charlotte	NWS
NC	Elizabeth City	FAA
NC	Fayetteville	FAA
NC	Gastonia	FAA
NC	Greensboro	NWS
NC	Greenville	FAA
NC	Hickory	FAA
NC	Kinston	FAA
NC	Lumberton	FAA
NC	Maxton	FAA
NC	Monroe	FAA
NC	New Bern	FAA
NC	Raleigh	NWS
NC	Roanoke Rapids	FAA
NC	Rockingham	FAA
NC	Rocky Mount-Wilson	FAA
NC	Wilmington	NWS
NC	Wilson	FAA
NC	Winston Salem	FAA
ND	Bismarck	NWS
ND	Dickinson	FAA
ND	Fargo	NWS
ND	Grand Forks	FAA
ND	Hettinger	FAA
ND	Jamestown	FAA
ND	Minot	FAA
ND	Williston	NWS
NE	Alliance	FAA
NE	Chadron	FAA
NE	Grand Island	NWS
NE	Hastings	FAA
NE	Lincoln	NWS
NE	McCook	FAA
NE	Norfolk	NWS
NE	North Platte	NWS
NE	Omaha	FAA
NE	Scottsbluff	NWS
NE	Sidney	FAA
NE	Tekamah	FAA
NE	Valentine	NWS
NH	Berlin	FAA
NH	Claremont	FAA
NH	Concord	NWS
NH	Jaffrey	FAA
NH	Lebanon	FAA
NH	Manchester	FAA
NH	Nashua	FAA
NH	Rochester	FAA
NH	Whitefield	FAA
NJ	Atlantic City	FAA
NJ	Atlantic City	NWS
NJ	Berlin	FAA
NJ	Caldwell	FAA
NJ	Cross Keys	FAA
NJ	Lincoln Park	FAA
NJ	Linden	FAA
NJ	Millville	FAA
NJ	Morristown	FAA
NJ	Mount Holly	FAA
NJ	Newark	NWS
NJ	Robbinsville	FAA
NJ	Somerville	FAA
NJ	Teterboro	NWS
NJ	Trenton	FAA
NM	Albuquerque	FAA
NM	Albuquerque	NWS
NM	Carlsbad	FAA
NM	Clayton	NWS
NM	Deming	FAA
NM	Farmington	FAA
NM	Gallup	FAA
NM	Hobbs	FAA
NM	Las Vegas	FAA
NM	Roswell	NWS
NM	Santa Fe	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

NM	Truth or Consequence	NWS
NM	Tucumcari	FAA
NV	Ely	NWS
NV	Las Vegas	FAA
NV	Las Vegas	NWS
NV	Lovelock	FAA
NV	Mercury	NWS
NV	Reno	NWS
NV	Tonopah	FAA
NV	Winnemucca	NWS
NY	Albany	NWS
NY	Binghamton	NWS
NY	Buffalo	FAA
NY	Buffalo	NWS
NY	Dansville	FAA
NY	Dunkirk	FAA
NY	Elmira	FAA
NY	Endicott	FAA
NY	Farmingdale	FAA
NY	Fulton	FAA
NY	Glens Falls	FAA
NY	Hornell	FAA
NY	Islip	FAA
NY	Ithaca	FAA
NY	Massena	FAA
NY	Montgomery	FAA
NY	Monticello	FAA
NY	New York JFK	NWS
NY	New York LGA	NWS
NY	Newburgh	FAA
NY	Penn Yan	FAA
NY	Plattsburgh	FAA
NY	Poughkeepsie	FAA
NY	Rochester	NWS
NY	Saranac Lake	FAA
NY	Schenectady	FAA
NY	Shirley	FAA
NY	Syracuse	NWS
NY	Utica	FAA
NY	Watertown	FAA
NY	Wellsville	FAA
NY	Westhampton Beach	FAA
NY	White Plains	FAA
OH	Akron	FAA
OH	Akron	NWS
OH	Ashtabula	FAA
OH	Batavia	FAA
OH	Bluffton	FAA
OH	Bryan	FAA
OH	Cincinnati	FAA
OH	Cincinnati	FAA
OH	Cleveland	FAA
OH	Cleveland	FAA
OH	Cleveland	NWS
OH	Columbus	FAA
OH	Columbus	FAA
OH	Columbus	NWS
OH	Dayton	FAA
OH	Dayton	NWS
OH	Defiance	FAA
OH	Delaware	FAA
OH	Elyria	FAA
OH	Fremont	FAA
OH	Galion	FAA
OH	Hamilton	FAA
OH	Kent	FAA
OH	Lancaster	FAA
OH	Lima	FAA
OH	Mansfield	NWS
OH	Marion	FAA
OH	Medina	FAA
OH	Middletown	FAA
OH	Mount Vernon	FAA
OH	New Philadelphia	FAA
OH	Newark	FAA
OH	Toledo	FAA
OH	Toledo	NWS
OH	Willoughby	FAA
OH	Wooster	FAA
OH	Youngstown	NWS
OH	Zanesville	FAA
OK	Ardmore	FAA
OK	Bartlesville	FAA
OK	Chattanooga	FAA
OK	Clinton	FAA
OK	Clinton (Burns Flat)	FAA
OK	Cushing	FAA
OK	Duncan	FAA
OK	Elk City	FAA
OK	Enid	FAA
OK	Frederick	FAA
OK	Gage	FAA
OK	Guthrie	FAA
OK	Hobart	FAA
OK	Lawton	FAA
OK	McAlester	FAA
OK	Muskogee	FAA
OK	Oklahoma City	FAA
OK	Oklahoma City	NWS
OK	Okmulgee	FAA
OK	Ponca City	FAA
OK	Stillwater	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

OK	Tulsa	FAA
OK	Tulsa	FAA
OK	Tulsa	NWS
OR	Albany	FAA
OR	Astoria	NWS
OR	Aurora	FAA
OR	Baker	FAA
OR	Bend	FAA
OR	Burns	NWS
OR	Eugene	NWS
OR	Hermiston	FAA
OR	Klamath Falls	FAA
OR	Mc Minnville	FAA
OR	Medford	NWS
OR	Mulino	FAA
OR	Ontario	FAA
OR	Pendleton	NWS
OR	Portland	FAA
OR	Portland	FAA
OR	Portland	NWS
OR	Roseburg	FAA
OR	Salem	NWS
OR	Scappose	FAA
OR	Sexton Summit	NWS
OR	The Dalles	FAA
PA	Allentown	FAA
PA	Allentown	NWS
PA	Altoona	FAA
PA	Beaver Falls	FAA
PA	Bradford	FAA
PA	Clearfield	FAA
PA	Downingtown	FAA
PA	Doylestown	FAA
PA	Erie	NWS
PA	Greenville	FAA
PA	Harrisburg	FAA
PA	Honesdale	FAA
PA	Johnstown	FAA
PA	Lancaster	FAA
PA	Meadville	FAA
PA	Middletown	FAA
PA	Monongahela	FAA
PA	Mt Pocono	FAA
PA	New Castle	FAA
PA	Philadelphia	NWS
PA	Philadelphia	NWS
PA	Philipsburg	FAA
PA	Pittsburgh	FAA
PA	Pittsburgh	NWS
PA	Pottstown	FAA
PA	Pottstown	FAA
PA	Reading	FAA
PA	Selinsgrove	FAA
PA	St Marys	FAA
PA	Wilkesbarre-Scranton	NWS
PA	Williamsport	NWS
PA	York/Thomasville	FAA
PR	Aguadilla	FAA
PR	Mayaguez	FAA
PR	Ponce	FAA
PR	San Juan	FAA
PR	San Juan	NWS
RI	Newport	FAA
RI	Providence	NWS
RI	Westerly	FAA
SC	Anderson	FAA
SC	Charleston	FAA
SC	Charleston	NWS
SC	Clemson	FAA
SC	Columbia	FAA
SC	Columbia	NWS
SC	Conway	FAA
SC	Florence	FAA
SC	Greenville	FAA
SC	Greenwood	FAA
SC	Greer	NWS
SC	Myrtle Beach North	FAA
SC	Orangeburg	FAA
SC	Rock Hill	FAA
SC	Spartanburg	FAA
SC	Sumter	FAA
SD	Aberdeen	NWS
SD	Huron	NWS
SD	Pierre	FAA
SD	Pine Ridge	FAA
SD	Rapid City	NWS
SD	Sioux Falls	NWS
SD	Watertown	FAA
SD	Winner	FAA
TN	Bristol	NWS
TN	Chattanooga	NWS
TN	Clarksville	FAA
TN	Crossville	FAA
TN	Jackson	FAA
TN	Knoxville	NWS
TN	Memphis	FAA
TN	Morristown	FAA
TN	Murfreesboro	FAA
TN	Nashville	NWS
TN	Smyrna	FAA
TX	Abilene	NWS
TX	Alice	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

TX	Amarillo	FAA
TX	Amarillo	NWS
TX	Angleton/L Jackson	FAA
TX	Arlington	FAA
TX	Austin	FAA
TX	Austin	NWS
TX	Beaumont	FAA
TX	Borger	FAA
TX	Brownsville	NWS
TX	Burnet	FAA
TX	Childress	FAA
TX	College Station	FAA
TX	Conroe	FAA
TX	Corpus Christi	NWS
TX	Corsicana	FAA
TX	Cotulla	FAA
TX	Dalhart	FAA
TX	Dallas	FAA
TX	Dallas	FAA
TX	Dallas	FAA
TX	Dallas	FAA
TX	Dallas/Fort Worth	NWS
TX	Del Rio	NWS
TX	Denton	FAA
TX	El Paso	NWS
TX	Fort Stockton	FAA
TX	Fort Worth	FAA
TX	Galveston	FAA
TX	Grand Prairie	FAA
TX	Harlingen	FAA
TX	Hondo	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	NWS
TX	Huntsville	FAA
TX	Kerrville	FAA
TX	La Porte	FAA
TX	Laredo	FAA
TX	Longview	FAA
TX	Lubbock	NWS
TX	Lufkin	FAA
TX	McAllen	FAA
TX	McKinney	FAA
TX	Mesquite	FAA
TX	Midland	FAA
TX	Midland	NWS
TX	Mineral Wells	FAA
TX	New Braunfels	FAA
TX	Odessa	FAA
TX	Palacios	FAA
TX	Pearland	FAA
TX	Plainview	FAA
TX	Port Arthur	NWS
TX	Port Isabel	FAA
TX	Roanoke	FAA
TX	Rockport	FAA
TX	San Angelo	NWS
TX	San Antonio	FAA
TX	San Antonio	NWS
TX	Sinton	FAA
TX	Spring	FAA
TX	Terrell	FAA
TX	Tyler	FAA
TX	Uvalde	FAA
TX	Victoria	NWS
TX	Waco	FAA
TX	Waco	NWS
TX	Wichita Falls	FAA
TX	Wichita Falls	NWS
TX	Wink	FAA
UT	Bryce Canyon	FAA
UT	Cedar City	FAA
UT	Logan	FAA
UT	Milford	NWS
UT	Moab	FAA
UT	Ogden	FAA
UT	Price	FAA
UT	Salt Lake City	NWS
UT	Vernal	FAA
VA	Abington	FAA
VA	Ashland	FAA
VA	Charlottesville	FAA
VA	Chincoteague	NWS
VA	Danville	FAA
VA	Leesburg	FAA
VA	Lynchburg	NWS
VA	Newport News	FAA
VA	Norfolk	NWS
VA	Richmond	NWS
VA	Roanoke	NWS
VA	South Boston	FAA
VA	Washington Dulles	NWS
VI	Charlotte Amalie	FAA
VI	Christiansted	FAA
VT	Barre-Montpelier	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

VT	Bennington	FAA
VT	Burlington	NWS
VT	Highgate	FAA
VT	Lyndonville	FAA
VT	Morrisville	FAA
VT	Newport	FAA
VT	Springfield	FAA
WA	Anacortes	FAA
WA	Auburn	FAA
WA	Bellingham	FAA
WA	Chehalis	FAA
WA	Deer Park	FAA
WA	Ellensburg	FAA
WA	Ephrata	FAA
WA	Everett	FAA
WA	Friday Harbor	FAA
WA	Hoquiam	FAA
WA	Moses Lake	FAA
WA	Olympia	NWS
WA	Omak	FAA
WA	Pasco	FAA
WA	Port Angeles	FAA
WA	Pullman	FAA
WA	Puyallup	FAA
WA	Quillayute	NWS
WA	Renton	FAA
WA	Richland	FAA
WA	Seattle	FAA
WA	Seattle-Tacoma	NWS
WA	Spokane	FAA
WA	Spokane	NWS
WA	Stampede Pass	NWS
WA	Tacoma	FAA
WA	Toledo	FAA
WA	Vancouver	FAA
WA	Vancouver	FAA
WA	Walla Walla	FAA
WA	Yakima	NWS
WI	Appleton	FAA
WI	Ashland	FAA
WI	Boscobel	FAA
WI	Burlington	FAA
WI	Fond Du Lac	FAA
WI	Green Bay	NWS
WI	Hayward	FAA
WI	Janesville	FAA
WI	Kenosha	FAA
WI	La Crosse	FAA
WI	Lake Geneva	FAA
WI	Lone Rock	FAA
WI	Madison	FAA
WI	Madison	NWS
WI	Marshfield	FAA
WI	Milwaukee	FAA
WI	Milwaukee	NWS
WI	Oshkosh	FAA
WI	Racine	FAA
WI	Rhinelander	FAA
WI	Sheboygan	FAA
WI	Waukesha	FAA
WI	Wausau	FAA
WI	West Bend	FAA
WI	Wisconsin Rapids	FAA
WV	Beckley	NWS
WV	Bluefield	FAA
WV	Charleston	NWS
WV	Clarksburg	FAA
WV	Elkins	NWS
WV	Huntington	NWS
WV	Lewisburg	FAA
WV	Martinsburg	FAA
WV	Morgantown	FAA
WV	Summersville	FAA
WV	Wheeling	FAA
WY	Big Piney	FAA
WY	Buffalo	FAA
WY	Casper	NWS
WY	Cheyenne	NWS
WY	Douglas	FAA
WY	Evanston	FAA
WY	Gillette	FAA
WY	Greybull	FAA
WY	Laramie	FAA
WY	Rawlins	FAA
WY	Riverton	NWS
WY	Saratoga	FAA
WY	Sheridan	NWS
WY	Torrington	FAA
WY	Worland	FAA

Appendix E

LIST OF ACRONYMS

AFOS	Automation of Field Operations and Services
AOML	Atlantic Oceanographic and Meteorological Laboratory
ASOS	Automated Surface Observing System
AWIPS	Advanced Weather Interactive Processing System
COMET	Cooperative Program for Operational Meteorology Education and Training
CWSU	Center Weather Service Unit
DARE	Denver AWIPS Risk Reduction and Requirements Evaluation
ERL	Environmental Research Laboratory
FAA	Federal Aviation Administration
GOES	Geostationary Operational Environmental Satellite
HAS	Hydrometeorological Analysis and Support
HRL	Hydrologic Research Laboratory
IOC	Initial Operating Capability
LAPS	Local Analysis and Prediction System
MAPS	Mesoscale Analysis and Prediction System
MARD	Modernization and Associated Restructuring Demonstration
MTS	Master Transition Schedule
NESDIS	National Environmental Satellite, Data and Information Service
NEXRAD	Next Generation Weather Radar
NHC	National Hurricane Center
NIP	National Implementation Plan
NMC	National Meteorological Center
NOAA	National Oceanic and Atmospheric Administration
NSSFC	National Severe Storms Forecast Center
NSSL	National Severe Storms Laboratory
NWR	NOAA Weather Radio
NWS	National Weather Service
NWSO	NEXRAD Weather Service Office
NWSRFS	National Weather Service River Forecast System
PERT	Program Evaluation and Review Technique

PROFS	Program for Regional Observing and Forecasting Services
PROTEUS	Prototype RFC Operational Test, Evaluation and User Simulation
RFC	River Forecast Center
RTP	Regional Transition Plan
SIP	Site Implementation Plan
WBS	Work Breakdown Structure
WFO	Weather Forecast Office
WSCMO	Weather Service Contract Meteorological Observatory
WSFO	Weather Service Forecast Office
WSMO	Weather Service Meteorological Observatory
WSO	Weather Service Office

* U.S. G.P.O.:1991-299-024:40706