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Science and Technology

System Commissioning and Decommissioning, NWSPD 80-2

SYSTEM COMMISSIONING PROCESS

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Signed

10/03/02

John McNulty

Date

Director, Office of Operational
Systems

System Commissioning Procedure

Table of Contents: Page

- 1. Introduction 3
- 2. Definitions 3
- 3. Commissioning Plans 3
- 4. Commissioning Phases 3
 - 4.1 Pre-commissioning Phase 3
 - 4.1.1 Commissioning Software 4
 - 4.1.2 System Testing 4
 - 4.1.3 System Monitoring and Support 4
 - 4.1.4 NWS Customer Awareness/Notification 4
 - 4.1.5 Physical and Configuration Audits 4
 - 4.1.6 Archive Capability 4
 - 4.1.7 Policies, Plans, and Handbooks 5
 - 4.1.8 Technical Manuals 5
 - 4.1.9 Network Loading 5
 - 4.2 Commissioning Evaluation Phase 5
 - 4.2.1 Support to NWS Services 5
 - 4.2.2 Training and Proficiency 5
 - 4.2.3 Maintenance and Monitoring 6
 - 4.2.4 Critical Documentation 6
 - 4.2.5 System Interfaces 6
 - 4.2.6 Logistics Support 7
 - 4.2.7 System and Security Functions 7
 - 4.2.8 Backup Functions 7
 - 4.3 System Commissioning 7
 - 4.3.1 Commissioning Work-Arounds and Notes 7
 - 4.3.2 Completing the Commissioning Report 8
 - 4.3.3 Commissioning Recommendation 8
 - 4.3.4 Commissioning Approval Process 8
 - 4.3.5 Implementation of Commissioning Decision 9
 - 4.3.6 Archival of Approved Report 9
 - 4.4 Legacy System Decommissioning 9
- 5. Roles and Responsibilities 9
 - 5.1 Commissioning Manager 9
 - 5.2 Regional/Center Commissioning Focal Points 10

Appendices

A. Commissioning Report Cover Page, Recommendation/Approval Form, and Checklist . . . A-1

1. Introduction. This instruction supports the National Weather Service (NWS) System commissioning policy established in NWS Policy Directive 80-2. These procedures establish the methodology and processes supporting the decision for system equipment located at an operational site to be used in an official capacity in the conduct of appropriate NWS service operations.

2. Definitions.

Acceptance is the demonstration by a contractor with confirmation by the Government that a procured system fulfills the requirements and specifications of the contract. This includes, but is not limited to, the fulfillment of technical and operational specifications and capabilities of (a) the hardware and software and system support functions, (b) the delivery of appropriate documentation, and (c) the provision of adequate training aids. System Acceptance occurs prior to the deployment of the first system, usually after a systems test, and Site Acceptance occurs after the system has been installed onsite and has met the established criteria.

Activation is the point in time when a system has been accepted by the Government and is now in use by Government personnel.

Determination of Operational Readiness (DOR) is the period of time, after acceptance and before its commissioning, when the system is in use for purposes of operator and maintenance personnel training and familiarization, and for its evaluation against established commissioning evaluation criteria.

Field unit comprises the Weather Forecast Offices (WFO) and associated adjunct offices, River Forecast Centers (RFC), and National Centers for Environment Prediction (NCEP).

3. Commissioning Plans. The NWS will produce commissioning plans for any system to be commissioned. The commissioning process (**Figure 1**) provides the framework for this plan.

4. Commissioning Phases.

There are four commissioning phases consisting of (a) pre-commissioning, (b) commissioning evaluation, (c) system commissioning and implementation, and (d) decommissioning of the legacy system (refer to NWSI 80-202 on decommissioning of NWS legacy systems). Each phase will be delineated in the commissioning plan as applicable to the system being commissioned. Some aspects of each phase may not be applicable because the function is not a part of the specific technology.

4.1 Pre-commissioning Phase. The pre-commissioning phase is the period of time prior to the commissioning of the initial systems, during which system-related problems and issues are being resolved. The intent of this phase is to focus attention on those aspects of the system requiring

corrective actions before the first systems can be commissioned. In addition, System Acceptance, Activation, and Site Acceptance activities are completed. Various types of system testing are also conducted during this phase. When the Site Acceptance is successfully completed, a Government representative signs the Facilities DD Form 250. For the purpose of initiating the commissioning process, Site Acceptance must be complete, meaning all critical open items must have been satisfactorily resolved. The following sections are principal NWS pre-commissioning activities, to be performed prior to commissioning the new technology.

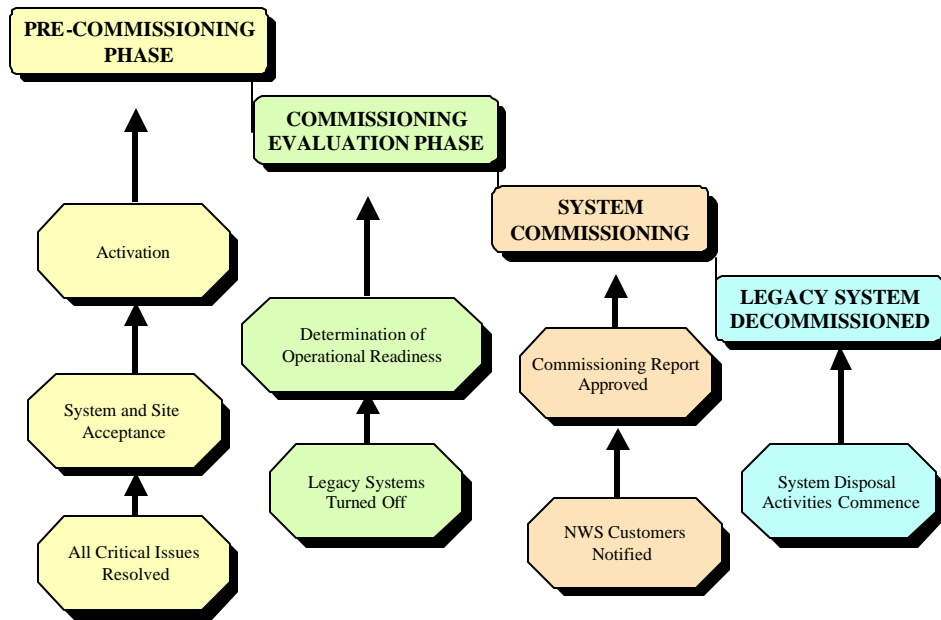


Figure 1. Commissioning Phases.

4.1.1 Commissioning Software. A software revision number or the date of the software load, release, or build will be used to identify the commissioning software. This load, release, or build is defined as the minimum software required to meet the commissioning criteria and replace any legacy system.

4.1.2 System Testing. Successful testing of the system, sensor, and associated software, including interfaces to other NWS systems, are conducted during this phase.

4.1.3 System Monitoring and Support. Successful demonstration of the system monitoring and support capabilities are conducted.

4.1.4 NWS Customer Awareness/Notification. The user community (external users as well as users within the NWS) will be informed with regard to the change in technology or new products.

4.1.5 Physical and Configuration Audits. Configuration management staff may perform either or both of these audits during the pre-commissioning phase in order to establish the initial system baseline.

4.1.6 Archive Capability. Archive data/products for legal and data retention purposes as well as the National Climatic Data Center's ability to process data/products must be demonstrated before commencing commissioning.

4.1.7 Policies, Plans, and Handbooks. Relevant policies, plans, and station duty and related handbooks will be updated to incorporate changes related to the implementation of the system and finalized.

4.1.8 Technical Manuals. Contractor-supplied technical manuals will be finalized and approved by the Government before commissioning begins.

4.1.9 Network Loading. The impact on the telecommunications network of products being generated by the new technology, primarily large-size products, will be determined to be acceptable before commissioning begins.

4.2 Commissioning Evaluation Phase. The DOR is conducted during this phase based upon commissioning criteria. **Figure 2** illustrates the major categories to be evaluated during the DOR. As part of the commissioning process, the system is evaluated to demonstrate that it meets the following major criteria:

- a. NWS forecast and national centers are ready to use the system in routine operations, having been trained to operate and maintain the system.
- b. It can be used in the operational setting as the *primary system* by the field unit for the preparation of weather forecasts, guidance products, or data acquisition.
- c. It can reliably transmit weather products over NWS telecommunications. NWS customers of these products and services have been notified in advance to allow them sufficient time to make modifications to their systems.
- d. It can replace the legacy system and any adjunct equipment.

Any time these factors cannot be satisfied, the commissioning of additional systems may cease until the problem(s) have been corrected.

4.2.1 Support to NWS Services. The field unit verifies through everyday experience and, in some cases, actual procedures to be performed, the new technology's ability to support the warning and forecast mission of each office type, i.e., WFO/RFC/NCEP. This category covers a wide range of support, such as technical coordination with the office community, evaluation of the system in everyday operations over a significant period of time to determine "system reliability," transmission of weather products using NWS telecommunications in a test mode, and scientific validation of applications and map backgrounds as they pertain to the system.

4.2.2 Training and Proficiency. The familiarization and proficiency training period begins at Site Acceptance. Members from the office staff may attend a course offered at the NWS Training Center or training may be performed onsite. This requires office staff members to be trained to operate and administer the system through course work. Staff must also be proficient in the use of the system in performance of their duties. In some cases, a test or checklist may be required to verify proficiency.

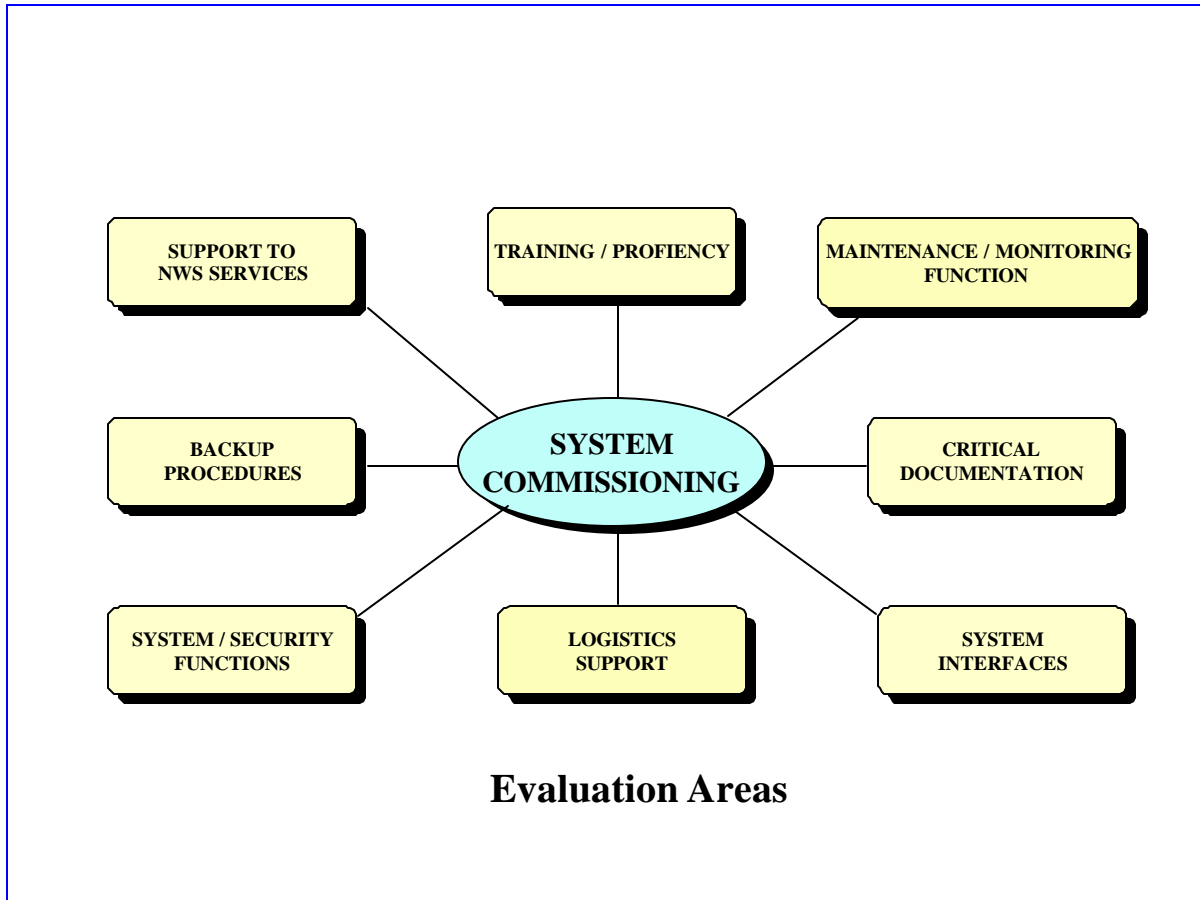


Figure 2. Evaluation Areas for the Commissioning Criteria.

4.2.3 Maintenance and Monitoring. Maintenance and monitoring capabilities for the hardware, software, and telecommunications components of the system must be functional before a system can be commissioned. Maintenance documentation, diagnostic techniques, etc., must be in place and function at the time of the first commissioning. Each site performing a commissioning evaluation will verify all the required aspects of the maintenance function during the evaluation phase.

4.2.4 Critical Documentation. Critical documentation under consideration may include: user manuals, system administration manuals, technical documentation for local applications development, operations and maintenance manuals, and NWS Directives System (NDS) updates impacting field operations with the introduction of the new technology.

4.2.5 System Interfaces. Systems requiring interfaces with the new technology need to be validated through established procedures. The reconfiguration of communication networks also needs to be validated as part of the commissioning process. Examples of systems to be interfaced include: Automated Surface Observing System (ASOS), Weather Surveillance Radar- 1988 design Doppler (WSR-88D), NOAA Weather Wire Service (NWWS), Mesoscale Observation Networks (MESONET), Limited Automated Remote Collectors (LARC) and Automated Remote Collectors (ARC), Automated Local Evaluation in Real Time (ALERT) System, Flood Observing and Warning System (FLOWS), and Microcomputer-based Automated Radio Theodolite (MicroART).

4.2.6 Logistics Support. Logistics support in terms of depot spares, onsite spares, and the requisite reconditioning and repair activities must be in place before a system is commissioned. Likewise, some systems may be supported through national support contracts, in which case, the contract must be finalized and implemented in time for the first commissioning.

4.2.7 System and Security Functions. This category is specific to system functions such as validating localization of the system to site conditions; archiving; validating of product routing through NWS telecommunications, as well as data/product routing to other locations; and ensuring the new technology is secure to outside users in accordance with NWS policy and procedure. For commissioning purposes, the frequency and timeliness of NWS products being produced by the system will be established.

4.2.8 Backup Functions. This category consists of both the system and service components using a building block process. If an office experiences system or service backup during the evaluation period and it worked properly, no further checkout is required. If the office is forced into a backup scenario and the procedure failed, a remedy needs to be developed for future failure episodes. If none was experienced during this period, a formal checkout procedure may be invoked.

4.3 System Commissioning. The commissioning of a system at a site is predicated on completing the Commissioning Report, recommending and approving the report, and designating when the commissioning will be implemented.

4.3.1 Commissioning Work-Arounds and Notes. When commissioning criteria cannot be satisfied, and a component from a legacy system is required to remain in operation, a “work-around” must be invoked. The work-around applies only to those elements applicable to the new technology. When commissioning criteria/elements are not being satisfied, one of two paths will be followed:

- a. Commissioning will be suspended for the site, or if the problem is widespread, a general halt is applied to all sites under commissioning evaluation.
- b. The site will be offered a temporary solution until the new system can perform the function or until the requirement is eliminated. Temporary solutions fall into two categories, commissioning work-arounds and commissioning notes. Work-arounds and

notes allow the commissioning process to continue without adversely impacting the system commissioning. These must be tracked by the NWS for eventual closure.

4.3.1.1 Work-Arounds. A work-around is a temporary solution requiring a portion of a legacy system to remain in operation or requiring a temporary procedure due to a limitation of the new technology's functionality. Note: If the entire legacy system is required to remain, then this must be viewed as a critical limitation and the new technology cannot be commissioned. Neither can all system limitations invoke a work-around. For example, if the map background registrations were off on a new processing or display system by 75 to 100 miles, it would not make sense to use this system for issuing forecasts/warnings with such a deficiency. Therefore, a work-around must be logical in its description when invoked in the Commissioning Report. If a work-around is not logical, a correction to the problem is the only reasonable solution. Work-arounds are documented in the Commissioning Report with a specific number assigned to each one and standard verbiage describing what the work-around solution is and any conditions associated with it.

4.3.1.2 Notes. Commissioning notes, unlike work-arounds, document temporary solutions that use the new technology as the primary system but do not depend on a legacy system to remain in operation. The temporary solution becomes part of the baseline configuration until the new technology has been upgraded to perform a similar function. For example, a commissioning note might describe the interfacing of single- or multi-function personal computers as a work-around to perform specific functions a new technology does not yet provide. When the new technology is able to replace this functionality, the legacy PCs would be removed. The note would mention the reason why the functionality is required and some expectation as to when it might be removed.

4.3.2 Completing the Commissioning Report. Any deficiencies encountered during the DOR are addressed through action coordinated at the local, regional, and National Weather Service Headquarters (WSH) levels. As the evaluation is completed (any deficiencies having been resolved or addressed via approved work-arounds or commissioning notes as specified in Section 4.3.1), a **Commissioning Checklist** (see example in Appendix A) is used to record the results. Official use of the system in the conduct of appropriate NWS service operations may begin during the DOR and continue through the day of commissioning. In some cases, the actual use of official weather products generated from the system may not occur until the day of commissioning.

When the DOR is over and the commissioning criteria have been satisfied, along with any approved work-arounds or commissioning notes, the official-in-charge of the site [meteorologist-in-charge (MIC), hydrologist-in-charge (HIC), or National Center Director (NCD)] is responsible for preparing the Commissioning Report. The local office may assign a commissioning focal point, called an Evaluation Official (EO), for completing the assessment and preparing the report. The completed checklist is then incorporated, by the EO, into a *System Commissioning Report* (see example report cover page in Appendix A) and sent for management review and recommendation as specified in Section 4.3.3. This begins the Recommendation/Approval/Implementation processes.

4.3.3 Commissioning Recommendation. The MIC/HIC/NCD recommends commissioning of the system to their respective Region or Center. The recommendation is made by signing and dating the recommendation block of the Commissioning Recommendation/Approval Form (see example in Appendix A). Anyone acting for the official-in-charge can also sign the report.

4.3.4 Commissioning Approval Process. The decision to commission a given system is the responsibility of the Regional or Center Director. Initiation of the commissioning approval process is through transmittal of a completed Commissioning Report, which has been recommended by the local official-in-charge. The Regional or Center Director signs and dates the approval block of the Commissioning Recommendation/Approval Form (see example in Appendix A). At this point the system is deemed ready for commissioning. The appropriate Regional Director or Center Director will ensure any coordination with other sites and/or regions affected by the commissioning has taken place. The Regional or Center Director may delegate this responsibility to the MIC/HIC/NCD level. In this case, there would not be any recommendation required.

4.3.5 Implementation of Commissioning Decision. Implementation of the commissioning decision should be coincident with one of several events:

- a. Upon the signature of the approving official.
- b. At a predetermined date and time scheduled ahead of the commissioning approval.
- c. At a scheduled date and time coordinated after the commissioning approval.

The Commissioning Plan for each system will delineate the type of implementation required for the commissioning. A notification describing the changes to occur upon commissioning will be issued to NWS and external users prior to the commissioning date. Notifications may be issued months, weeks, or days in advance of the commissioning event, depending on how much time NWS customers may need to prepare for the transition to the new system.

4.3.6 Archival of Approved Report. The original, signed copy of the approved Commissioning Report will be maintained at the NWS headquarters by the Office of Operational Systems. Copies of the approved report will be maintained at the originating Regional Headquarters and National Center.

4.4 Legacy System Decommissioning. In most, if not all cases, one or more legacy systems will be decommissioned as a result of the system commissioning. In some cases, the legacy system must be removed before the new system can be deployed and commissioned. In these cases, the decommissioning event will occur prior to the system commissioning. In most cases, the legacy and new technology may reside side-by-side for a period of time before the legacy system is decommissioned after the new system is commissioned. The commissioning plan for each system will delineate the transition between the legacy and new technology.

5. Roles and Responsibilities.

The following roles and responsibilities are delineated in support of the commissioning processes.

5.1 Commissioning Manager. A System Commissioning Manager (SCM) will be designated by the Director, Office of Operational Systems for each system being commissioned. The SCM will have overall responsibility for the conduct of the commissioning process as delineated under this instruction. The Commissioning Manager in coordination with agency staff, will determine whether a component limitation can be worked around or is too obtrusive to warrant a work-around.

5.2 Regional/Center Commissioning Focal Points. For each system being commissioned, a Regional Commissioning Focal Point (RCFP) will be designated by the director of their respective organization. The RCFPs will support the SCM with the conduct of the commissioning process as delineated under this instruction and with the establishing of any work-arounds.

APPENDIX A - Commissioning Report Cover Page, Recommendation/Approval Form, and Example Checklist

Commissioning Report A-1
Commissioning Recommendation/Approval Form A-3
Commissioning Checklist A-5

Commissioning Report

(System Title)

(Month/Year)

Office Name:

Office ID (SID):

Office Type:

NWS Region/Center:

Approving Official:

Date Commissioned:

**U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Office of Systems Operations**

COMMISSIONING RECOMMENDATION/APPROVAL FORM	
1. Office SID:	2. Office Location (Name, State, Region):
3. SID:	4. Software Version:
5. Contract Line Item Numbers (CLIN) From DD Form 250	
6. Start of Evaluation (Date): Completion of Evaluation (Date):	
7. Evaluation Official (Name, Title, Phone Number): _____ _____ _____	
8. Evaluation Official Signature: _____ Date: _____	
OFFICE RECOMMENDATION FOR COMMISSIONING	
I, the undersigned, recommend this _____ be commissioned for official use by the National Weather Service.	
9. Office Manager Title: _____	
10. Manager's Name: _____	
11. Signature: _____	
Date: _____	

APPROVAL OF COMMISSIONING

As Regional/Center Director, I approve the commissioning of this _____ for official use by the National Weather Service.

12. Regional Director Name: _____

13. Signature: _____ Date: _____

IMPLEMENTATION OF COMMISSIONING APPROVAL

As NWS Commissioning Manager, I certify this system was commissioned on the date indicated below.

14. NWS Commissioning Manager Name: _____

15. NWS Commissioning Manager Signature: _____

16. Date of Signature: _____

17. Date of Commissioning: _____

AWIPS COMMISSIONING CHECKLIST		Satisfactory	Not-Applicable *	Work-Around # *
Location Name/State:				
ID:				
Evaluation Element				
1.	Successful Completion of Site Component Acceptance Test			
1a	Signed Acceptance Report DD250			
1b	Major Component Verification			
1c	Property Accounting			
1d	Initial Consumables			
2.	Adequate Availability of Trained Operations and Maintenance Personnel			
2a	CUT Training			
2b	OUT Training			
2c	WHFS Training			
2d	Operational Proficiency			
2e	UNIX Training			
3.	Satisfactory Performance of System Functions and Interfaces			
3a.1	LDAD Data Collection Platforms			
3a.2	ROSA			
3a.3	MESONET			
3a.4	Spotters			
3b.1	General LDAD Requirements			
3b.2	Text and graphics products			
3b.3	LDAD documentation			
3b.4	Internet			
3c	Hydrologic Systems			
3d	Upper-Air—MicroART			
3e	Coastal Marine Networks			

* Document significant Not-Applicable ratings and all Work-Arounds under Remarks

AWIPS COMMISSIONING CHECKLIST		Satisfactory	Not-Applicable *	Work-Around # *
Location Name/State:				
ID:				
Evaluation Element				
3f	Automated Surface Observing System/Other Surface Systems			
3g	WSR-88D Interface			
3h	Satellite Data			
3i	Console Replacement System/NOAA Weather Radio			
3j	NOAA Weather Wire Service			
3k	NCEP Systems			
3l	CWSU			
3m.1	Fire Weather			
3m.2	Local Government Computer Systems (through the AWIPS firewall)			
3m.3	SOO/SAC Workstations			
3m.4	Local LAN			
3m.5	Hydromet Workstation			
3m.6	FAA Interfaces			
3n	LDAD Dissemination			
3n.1	LETS/SETS			
3n.2	Emergency Managers			
3n.3	Bulletin Board			
3o	Local Single/Multifunction PCs			
3p	AFOS Switched to Receive-Only			
4.	Satisfactory Support of Associated NWS Forecast and Warning Services			
4a	General Requirements			
4b	Technical Coordination			
4c	Map Projections/Backgrounds			
4d	Grids/Plots/Graphics/Images			
4e	Display/Analysis of Data and Products			

AWIPS COMMISSIONING CHECKLIST		Satisfactory	Not-Applicable *	Work-Around # *
Location Name/State:				
ID:				
Evaluation Element				
4f	User-Defined Procedures			
4g	Parameters/Indices/Operations/Calculations			
4h	WFO Objective Analysis Techniques/Models/LAMP			
4i	Hydrologic Models			
4j	Hydrologic Service Area (HSA) Display/Analysis/Product Preparation			
4k	Public Product Preparation			
4l	Forecast Verification			
4m	Data Quality Control Checks			
5.	Proper Functioning of System and Service Backups			
5a	Workstation Failure Backup Procedure			
5b	AS/CP/DS Failure Backup Procedure			
5c	Primary RADAR Failure Backup Procedure			
5d.1	LDAD Failure Backup Procedure			
5d.2	ASOS			
5d.3	ROSA			
5d.4	MESONET			
5d.5	LETs/SETs			
5d.6	Internet			
5d.7	ALERT/IFLOWS			
5d.8	Spotters			
5d.9	Hydromet Workstations			
5d.10	Fire Weather			
5d.11	LARCs/ARCs/AMOS/RAMOS			
5e	WANFailure Backup Procedure			
5f	WFO Service Backup Procedure			

AWIPS COMMISSIONING CHECKLIST		Satisfactory	Not-Applicable *	Work-Around # *
Location Name/State:				
ID:				
Evaluation Element				
5g	WFO Service Backup Procedure			
5h	WFO Service Backup Procedure No. 2			
5k	River Forecast Center Computational Backup.			
6.	Adequate Documentation for Operations and Maintenance			
6a	System Documentation			
6b	Applicable WSOM Chapters			
6c	Station Duty Manual			
6d	Security Policy			
7.	System Functions and Security			
7a	Localization of Site-Specific Data			
7b	System Security			
7c	Firewall Security			
7d	Displays/Panels/Windows			
7e	Graphics/Images/Animation			
7f	Text/Graphics/Image Colors/Cursor			
7g	Decoders for Data Acquisition and Processing			
7h	Printers			
7i	Monitor & Control			
7j	Data Management			
7k	Archiving			
7l	System Message Handling			
7n	Product Availability			
7o	Local Applications Under AWIPS			