ASOS Product Improvement Implementation Plan

(Addendum IV)

For

All Weather Precipitation Accumulation Gauge

August 1, 2003

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service/Office of Operational Systems
Field Systems Operations Center/Observing Systems Branch

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Executive Summary

With the completion of the full deployment of the Automated Surface Observing System (ASOS) at almost 1,000 National Weather Service (NWS), Federal Aviation Administration (FAA), and Department Of Defense (DOD) locations nationwide, a new phase of Planned Product Improvement (PPI) has begun. These planned improvements will bring even greater observing capability, processing and communications capacity, and reporting accuracy and consistency to the ASOS. The planned improvements for the ASOS include:

Processor Board Replacement,
Dew Point Sensor Replacement*,
All Weather Precipitation Accumulation Gauge*,
Ice Free Wind Sensor*,
Enhanced Precipitation Identification Sensor*,
Ceilometer Replacement*, and
Software Enhancements

Note: * These sensors are dependent on successful implementation of the new processor board

A series of implementation plans are needed for these improvements. This document describes the implementation plan for the ASOS All Weather Precipitation Accumulation Gauge (AWPAG). It describes the overall process and the factors which impact on the Operational Implementation (OI) of the new ASOS AWPAG.

A check list is provided to aid in monitoring progress in completing the necessary activities for the OI. The check list ensures that prerequisite government conducted testing (System Test (ST) and Operational Acceptance Test (OAT)) activities are completed prior to start of the OI. It then covers pre-OI planning actions involved in site identification, deployment strategy, maintenance and logistics planning, training, and user notification. The check list identifies the executable functions and deliverables needed for the implementation of the new AWPAG. Finally, any necessary post-OI activities are also covered.

Although the activities described in this plan are written well in advance, this plan is written from the time perspective of imminent OI. It assumes all necessary activities prior to OI were or will have been completed and that OI activities are about to begin.

List of Organizational Codes

Code	NWS Organization
CCx2	National Logistics Support Center
OPS11	Engineering & Acquisition Branch
OPS12	Maintenance Branch
OPS13	Configuration Branch
OPS14	Logistics Branch
OPS22	Observing Systems Branch
OPS23	Software Branch
OPS24	Test & Evaluation Branch
OPS31	Operations Support & Performance Monitoring Branch
CIO12	Telecommunication Gateway Operations Branch (AOMC)
OS12	Requirements & Change Management Branch
OS12	Requirements and Change Management Branch
OS7	Observing Services Division
OST11	Program Management Branch
OST32	SEC Development Branch

Code	FAA Organization
AUA-400	IPT* for Weather/Flight Service Systems
AUA-430	Weather Sensors and Aviation Weather Research Product Team
ATP-300	Flight Service Operations Division
ATP-310	Meteorological Support
AOS-700	Network Engineering Management Division
ARU-1	Air Traffic Systems Development Directorate
ARS-100	Aerospace Weather Policy Division
ARS-200	Aerospace Weather Standards Division
ATB-400	Surveillance IPT

*IPT = Integrated Product Team

ACRONYMS

ACCB	ASOS Configuration Control Board
ACU	Acquisition Control Unit
ADAS	AWOS/ASOS Data Acquisition System
AOMC	ASOS Operations and Monitoring Center
APMC	ASOS Program Management Committee
ASOS	Automated Surface Observing System
AWIPS	Advanced Weather Interactive Processing System
AWOS	Automated Weather Observing System
AWPAG	All Weather Precipitation Accumulation Gauge
CMIS	Configuration Management Information System
CO	Contracting Officer
COTR	Contracting Officer Technical Representative
CPU	Central Processing Unit
CSA	Configuration Status Accounting
DAPM	Data Acquisition Program Manager
DCP	Data Collection Package
DOD	Department Of Defense
DRR	Deployment Readiness Review
DTS1	Dew Point Temperature Sensor Replacement - Vaisala Model DTS1
ECP	Engineering Change Proposal
ELC	Expected Life Cycle
EMRS	Engineering Management Reporting System
ET	Electronics Technician
FAA	Federal Aviation Administration
FCA	Functional Configuration Audit
FRU	Field Replaceable Unit
FY	Fiscal Year
IFW	Ice Free Wind Sensor
METAR	Aviation Routine Weather Report
MIC	Meteorologist-In-Charge
MIRS	Management Information Reporting System
MOD KIT	Modification Kit
MOD NOTE	NWS Engineering Modification Note
MTBF	Mean Time Between Failure
NDS	NWS Directives System
NLSC	National Logistics Support Center
NOTAM	Notice To Airmen
NRC	National Reconditioning Center
NSN	National Stock Number
NWS	National Weather Service
OAT	Operational Acceptance Test

OI	Operational Implementation
OIP	Operational Implementation Plan
OPR	Office of Primary Responsibility
OSF	Operational Systems Fielded
PCA	Physical Configuration Audit
PPI	Planned Product Improvement
RAM	Random Access Memory
REL NOTE	Release Note
RC	Request for Change
RFP	Regional Focal Point
SCA	Single Cabinet ASOS
SEC	Systems Engineering Center
SHEF	Standard Hydrometeorological Exchange Format
SPECI	Selected Special Weather Report
ST	System Test
TCP/IP	Transmission Control Protocol/Internet Protocol
TDWR	Terminal Doppler Weather Radar
TRB	Test Review Board
TRG	Test Review Group
TTR	Test Trouble Report
WFO	Weather Forecast Office
WSOM	Weather Service Operations Manual
WSP	Weather Systems Processor

1. INTRODUCTION

1.1 Description of Technology Improvement Scheduled For Implementation

The Automated Surface Observing System (ASOS) is equipped with a Heated Tipping Bucket Rain Gauge (HTBRG) for the measurement of precipitation. The HTBRG accurately measures liquid precipitation in most rain events except for excessively heavy rain events where the tipping bucket cannot tip fast enough and keep up. For freezing or frozen precipitation (e.g., freezing rain, snow, etc.) the HTBRG uses a heated collar and funnel to melt snow and ice so they can be collected by the funnel and measured by the tipping bucket. However, the heated funnel sometimes excessively melts snow resulting in significant evaporation/sublimation/convection losses and consequent under reporting of liquid equivalent precipitation accumulation. At other times, the heating is insufficient to prevent snow from building up, bridging over the gauge orifice, and forming a cap which prevents any further precipitation from falling into the gauge and being measured. This results in under reporting of precipitation accumulation during the precipitation event, and a false surge report when the cap melts at a later time. For this reason, NWS ASOS Planned Product Improvement (PPI) Program has identified an alternate technology precipitation gauge to replace the HTBRG at National Weather Service (NWS)-sponsored ASOS sites. The ASOS All Weather Precipitation Accumulation Gauge (AWPAG) is manufactured by Ott Hydrometrie of Germany and is designed to provide accurate measurement of all types of precipitation. In contrast to earlier weighing gauge designs, the AWPAG does not use oil (environmentally unfriendly) to prevent evaporation. The AWPAG measures precipitation by weighing total accumulation and uses environmentally friendly antifreeze to liquefy the collected snow. The AWPAG also compensates for evaporation and wind-induced vibration effects via the internal algorithm.

The AWPAG can only be installed at sites equipped with the ASOS PPI processor upgrade. The processor upgrade incorporates numerous approved software enhancements and provides the increased processing capability needed to support the ASOS PPI components:

- replacement dew point sensor (the DTS1),
- ice free wind sensor (the Model 425),
- AWPAG,
- enhanced precipitation identifier, and
- ceilometer replacement

The AWPAG contract is with C. C. Lynch and Associates of Pass Christian, Mississippi, representing Ott Hydrometrie of Germany, the gauge manufacturer. The AWPAG measures precipitation by weighing its total accumulation using strain gauge technology to convert the weight to an electrical signal. The AWPAG resolution is 0.01 inches and the gauge capacity is 40 inches of liquid equivalent precipitation. There is additional capacity to hold approximately 13 inches of antifreeze which liquefies the snow collected, reducing its volume while not changing its weight. The AWPAG includes a metal windshield to minimize aerodynamic collection losses of snow and the orifice rim is heated in low temperatures to prevent snow and ice from building up on the rim and reducing the diameter of the orifice.

Prism Communications developed ACU software (V2.7B) for the upgraded ASOS processor to support the AWPAG interface.

1.2 Purpose

The purpose of this document is to provide a clear strategy for the implementation of the AWPAG and to minimize field operational impacts resulting from this modification. Furthermore, this plan delineates major implementation activities and organizational responsibilities required for a smooth transition into operations.

1.3 Scope

This plan describes the extent of implementation related activities: the pre-implementation testing and operational readiness evaluation activities (described in Chapter 2); the pre-operational implementation activities (described in Chapter 3); the operational implementation activities (described in Chapter 4); and the post-operational implementation activities (described in Chapter 5). This plan includes provision for a "Phased Implementation" approach as opposed to a single master schedule for all sites. The phased implementation approach breaks the entire population of sites into discrete implementation batches. Each batch consists of sites with similar characteristics and implementation risks. In the case of the AWPAG the number of sites for each implementation batch is driven by available agency funds for a given year, and as a result, the number of batches may accumulate until all projected sites are implemented over a multi-year period. Factors which may impact the composition of each batch include, sites designated as politically sensitive or high profile, climate/seasonal considerations, service/safety considerations, and those sites with defined implementation risks. Furthermore, within each batch the implementation sequence is based on existing sensor failure rates and on maintenance/ operations cost-benefit considerations; i.e., those sites with the higher failure and maintenance/operations costs are given higher priority. Implementation risks are changes to the existing suite which are more likely to result in failure. This includes complex modifications, complex configurations, and critical external components such as network communications which are beyond the control of ASOS. Those sites with the least operational risk are placed in the earlier implementation batches, while those sites with the greater operational risk are placed in the latter implementation batches. Batches are implemented sequentially as confidence is gained. The batches may be implemented with some overlap. Furthermore, this plan describes any unique additions, exceptions, or limitations. For example, unlike other improvements, the AWPAG may require completion of a follow-on Climate Data Continuity Study.

This plan applies to all 313 NWS sponsored ASOS locations. This includes the 235 NWS sponsored ASOS locations in the Local Climatic Data (LCD) network. If future funds are provided, an additional 20 Federal Aviation Administration (FAA) sponsored ASOS LCD locations may be added to this plan. In total there are 255 ASOS LCD sites. See Appendix III for list of these sites. The implementation of the AWPAG falls within the overall goal of modernizing the ASOS network. This implementation is phase IV of this modernization. Consequently, this implementation plan is labeled Addendum IV.

1.4 Applicable Documents

As applicable, the following documents should be referenced for further guidance and serve as a part of this plan:

- Approved Request For Change (RC) for AWPAG deployment
- Engineering Modification Note # 78
- ASOS Release Note Software Version 2.7B
- Operational Acceptance Test Plan

2.0 TEST ACTIVITIES

The AWPAG must undergo successful government testing before Operational Implementation (OI). This chapter provides a brief overview of the prerequisite test activities leading to OI activities. Pre-implementation test activities are the transition between development activities and OI activities. The sections in this chapter describe test-related activities, are given in general serial order of completion, and identify the primary office(s) responsible for their accomplishment. For ASOS the government test activities are System Test (ST) activities and Operational Acceptance Test (OAT) activities. These activities are necessary to determine if the product improvement is ready for full production and implementation. Two key decision points result from these test activities. The first key decision point is a full, or series of partial production decisions, usually made as a result of successful completion of the ST. This is a program manager decision based on the formal test report and recommendation of a Test Review Group (TRG). The second key decision point is full, or series of partial deployment decisions. A recommendation for this decision is made by the program manager in consultation with the Test Review Board (TRB) consisting of other managers. This recommendation is based on support and advice provided by the TRG. The decision to deploy is made at a formal Deployment Readiness Review (DRR). The DRR team consists of three office directors and selected division chiefs. The decision to deploy is based on successful completion of the OAT.

2.1 Pre-System Test (ST) Activities

This section describes activities which must be completed before the start of the ST, and identifies the office responsible for completion of each activity. These pre-ST activities include:

A. **Prepare Request For Change (RC):** Prior to successful completion of the factory System Integration / Qualification Tests, the Program Management Branch (OST11) will have submitted a Request For Change (RC) for ST activities, through the Change Management process prior to start of the ST. The ASOS Program Management Committee (APMC) is the approving management authority for this process. The approved RC is the formal authorization to begin the ST.

B. **Prepare ST Plan:** The Test & Evaluation Branch (OPS24) prepared and distributed the ST plan prior to start of the ST. This plan includes all activities and deliverables for successful completion of the ST and a draft outline of the ST report. A TRG was formed to adjudicate and classify all Test Trouble Reports (TTR) documented during the ST.

C. **ST Locations and Dates:** ST locations, schedules, and test procedures are determined and managed by OPS24.

D. **Acquisition of ST Units:** Upon successful completion of factory System Integration / Qualification Tests, OST11 will initiate through OPS11 procurement of the AWPAG PPI

components. OST11 with OPS11's support will verify AWPAG PPI components perform correctly prior to delivery of these components to the designated ST locations.

E. **ST Logistic Support:** Necessary components, supplies, spare parts, and test equipment will be made available to ST locations by OPS11.

F. **Install PPI Test Units at ST Sites:** Installation and maintenance of ST equipment will be coordinated by OPS11.

2.2 System Test Activities

This section describes those activities which must be completed during or before the end of the ST and identifies the office(s) responsible for completion of each activity. These ST activities include:

A. **Verify Start of ST:** OPS24 will report the start of the ST.

B. **Data Collection and Analysis:** All necessary data will be collected, compiled and checked for quality and completeness in accordance with the ST plan. The TRG will review and reconcile all TTRs. This process is managed by OPS24.

C. **Verify Completion of the ST:** Where testing identifies serious flaws, additional STs will have to be conducted. During testing, OPS24 will inform the TRG of the results of the test. The TRG will recommend whether or not to proceed to the next phase of testing (i.e., OAT).

D. **ST Report:** A preliminary ST report will be prepared and issued for review by OPS24 as the ST nears completion. This includes an assessment of all outstanding TTRs and a recommendation whether to proceed with a follow-on OAT. The program manager reviewed the recommendation and made the decision weather to proceed to OAT.

2.3 Pre-Operational Acceptance Test (OAT) Activities

This section describes the purpose of the OAT and those activities which must be completed before the start of the OAT, and identifies the office(s) responsible for completion of each activity. The purpose of the OAT is to verify operational performance of the AWPAG under field conditions, ensure there are no adverse systemic effects as a result of integration of the new AWPAG with the ASOS, and verify the viability of NWS Engineering Modification Note (MOD NOTE) and Release Note (REL NOTE). In effect, this is a “dry-run” for the full implementation for the remaining sites. The following activities must be completed prior to start of the OAT:

A. **RC for OAT:** Upon receipt of the preliminary ST report and a recommendation from OPS24

to proceed with the OAT, the Chair of the ASOS Configuration Control Board (ACCB) initiated action to prepare and submit an RC for the OAT. This RC lists all locations included in the OAT. The ACCB adjudicates an RC if the incremental cost for the RC is less than $1 million; the APMC adjudicates the RC if the incremental cost for the RC is $1 million or more. In the case of the AWPAG, the incremental cost for the OAT is less than $1M and therefore the ACCB will adjudicate this RC.

B. **OAT Management Decision:** Upon formal approval of the RC, and TRG concurrence with the final ST report and recommendation, the ASOS PPI Manager will instruct OPS24 to proceed with the OAT. Under special circumstances to meet critical deadlines, the decision to proceed with the OAT could be made based on the preliminary ST report provided no major changes are expected in the final ST report. This decision is made by the ASOS PPI Manager.

C. **Prepare OAT plan:** OPS24 prepared and distributed the OAT plan prior to start of the OAT. This plan identifies OAT locations, dates, schedules, responsibilities, procedures, metrics, evaluation criteria and deliverables (data reports, evaluations, and recommendations) for completion of the OAT. A TRG is formed (same as in ST) to adjudicate and classify all TTRs documented during the OAT.

D. **OAT Locations and Schedule:** The 16 OAT locations were determined by OPS24 in coordination with OPS22, the Observing Services Division (OS7), and NWS regions. The sites selected for the OAT were chosen to ensure a representative sample of operational locations are evaluated.

E. **Acquisition of OAT Units:** Upon notification by OST11 to initiate acquisition of the OAT PPI components, OPS11 (acting as the COTR) will have acquired the OAT PPI components and coordinated with OPS24 and NWS regions the locations where the PPI components will be delivered prior to the start of the OAT.

F. **OAT Logistic Support:** OPS12 ensured NWS logistics support is in place prior to the start of the OAT. This includes all necessary Modification Kits (MOD KIT), maintenance components, supplies, spare parts, and test equipment were delivered to the designated OAT locations and installed. OPS12 will also coordinate the assignment of test equipment part numbers and reference designators with the Configuration Branch (OPS13) and the Logistics Branch (OPS14). This ensures the OAT measures the effectiveness of the support and provides OPS14 information on failures during this period.

G. **OAT Maintenance Coordination Support:** OPS12 coordinated plans for installation and maintenance of the OAT MOD KITs with NWS regions, and the ET responsible for each OAT site prior to start of the OAT.

H. **Prepare & Provide Modification Notes (MOD NOTES):** Draft MOD NOTES will be produced by OPS12 and provided to installation technicians prior to start of installation at the OAT site(s).

I. **OAT Documentation Support:** All necessary documentation was delivered to NWS regions and the test sites prior to start of the OAT. OAT Documentation includes: MOD NOTE produced by OPS12, OAT procedures produced by OPS24, and draft REL NOTE and draft AWPAG implementation Plan produced by OPS22.

2.4 Operational Acceptance Test Activities

The OAT may be conducted in either a single phase or a multiple phase mode. In the single phase mode, the OAT is applied simultaneously to all sites. In the multiple phase mode, the OAT is applied sequentially to selected sub-groups of sites until all sites successfully complete the OAT. The successful completion of the OAT for one group does not preclude the start of the OAT for another group; as such OATs for multiple groups of sites can be conducted simultaneously. The initial group consists of similar sites with the greatest chance for successfully completing the OAT. Subsequent groups are incrementally added to the OAT as confidence is gained and necessary modifications are made until all sites successfully complete the OAT. A designated "group" of sites in the OAT is representative of the larger "batch" of subsequent similar sites to be implemented. The threshold criteria for transitioning from one phase to another phase are established by the TRG and coordinated by OPS24 with and other responsible offices via e-mail correspondence. This section describes the activities which must be completed during and before the end of the OAT. This description identifies the office responsible for completion of each activity. These activities include:

A. **Verify Start of OAT:** OPS24 informed the test team of the times, places, and procedures for the OAT. This was done through ongoing coordination and formal issuance of the OAT plan.

B. **Data Collection and Analysis:** All necessary data were collected, compiled and checked for quality and completeness in accordance with the OAT plan. Whenever possible maintenance data shall be collected via NWS Engineering Management Reporting System (EMRS). The TRG will review and reconcile all TTRs. This process is managed by OPS24.

C. **Verify Draft Operational Implementation Plan (OIP):** A key element of the OAT is the verification of the implementation procedures in the draft OIP. To the extent possible, the OAT is a "dry-run" for the OI. All noted procedural discrepancies will be rectified by the responsible office(s) and reflected in the final OIP as appropriate.

D. **Verify Completion of OAT:** If the OAT results identify a significant failure, a new ST and OAT are necessary after corrective action is completed. During the OAT, OPS24 will inform the TRG of the results. The TRG will determine whether the OAT was successful and whether to recommend the full or next step in the phased implementation of the AWPAG.

E. **OAT Report:** Upon successful completion of either the full, or partial phased group OAT an OAT report will be provided by OPS24 to the ASOS PPI Manager.

3.0 PRE-OPERATIONAL IMPLEMENTATION (OI) ACTIVITIES

This chapter gives a brief overview of the activities which immediately precede and lead to OI activities. These pre-implementation activities are the transition between the test activities and OI activities. They began during the OAT and are to be completed before the start of the OI. The Deployment Readiness Review (DRR) decision to begin the OI provides the requisite authority, guidance, and direction for their completion. The sections in this chapter describe the pre-implementation activities necessary to initiate the follow-on implementation activities and identify the office(s) responsible for their accomplishment. These activities are: planning/decision, logistic support, and operational support. They are accomplished in parallel and are completed by the start of the OI which occurs when the AWPAG is installed and operationally activated at the first site following completion of the OAT. The following activities should be accomplished before the start of the OI.

3.1 Planning/Decision Activities

This section describes those plans and associated decisions which must be completed before the start of the OI. These plans and decisions are essential for orderly and efficient execution of the operational implementation. This description identifies the office(s) responsible for completion of each plan or related decision. These planning/decision activities include:

A. **Prepare OI Plan:** OPS22 will develop and coordinate the execution of the overarching OIP for all ASOS PPIs, and the specific OIP for each PPI component. This OIP addresses the OI for the new ASOS AWPAG. It defines all activities for successful completion of the AWPAG OI and, as such, is labeled as Addendum IV to the overall OIP.

B. **Depot Spares Modeling:** The Mean Time Between Failure (MTBF) of years, a system Expected Life Cycle (ELC) of years, and a base number of operational systems fielded (OSF) are among the variables used by OPS14 to run a depot spares model to determine how many spares are needed to operationally support the AWPAG. Data to run the OPS14 spares model will be provided in the form of a Provisioning Parts List (PPL). OPS14 will provide the COTR with the list of data required for input to the spares model. These variables will be provided to OPS14 by the AWPAG COTR, OPS11. The number of required spares will be provided to the ASOS PPI Manager (OST11) prior to full scale production and acquisition management decision.

C. **RC for OI:** Concurrent with preparation of the preliminary OAT report and a recommendation from OPS24 to proceed with the OI, the ASOS PPI Manager (OST11) will initiate action to prepare and submit an RC for the OI. This RC lists all locations included in the OI, contains cost and schedule information, and references an Engineering Change Notice which identifies parts to be added and/or deleted to/from the baseline. The ACCB will consider the preliminary OAT report and recommendation in their deliberations and voting on the RC.

D. **Full Scale Production and Acquisition Management Decision**: If the RC is not approved by the ACCB, it will be referred back to the submitter for rectification and resubmission in accordance with established ACCB procedures. Upon ACCB approval of the RC for the OI, the ASOS PPI Manager will endorse the RC and recommend to the ASOS Program Management Committee (APMC) approval of the RC. The Chair of the APMC, OPS2 will coordinate the APMC management decision making process. Upon receiving the APMC management decision approving AWPAG operational procurement, The ASOS PPI Manager will notify the ASOS PPI Contracting Officer's Technical Representative (COTR), OPS11, to procure the planned quantity of equipment components necessary for the OI. This notification may be made before the final OAT report provided the preliminary OAT report is favorable, however the notification will customarily be made upon receipt of the final OAT report and recommendation to proceed with the OI. If the final OAT report does *not* support proceeding with the OI, then The ASOS PPI Manager will suspend procurement activity until the critical issue(s) cited in the report is/(are) satisfactorily resolved. The actual procurement may occur in batches with staggered delivery dates. The planned deployment schedule will phase with the actual delivery dates and lag slightly to allow adjustment and alignment of the delivery and installation schedules.

E. **OI Deployment Decision:** Upon successful completion of either the full, or partial phased group OAT, receipt of the OAT report from OPS24, and receipt of the appropriate ACCB/APMC management approval for full scale production and acquisition, the ASOS PPI Manager will conduct a Deployment Readiness Review (DRR) with other managers to make a "go-no-go" deployment decision for the larger batch of similar sites in the general population represented by the smaller group of sites referenced in the OAT report. The DRR decision team will consist of managers from various Weather Service Headquarters offices and will be specifically be identified by the ASOS PPI manager. A "Go" deployment decision will be announced by the ASOS PPI Manager to all concerned parties. This will allow other ongoing deployment planning and execution activities to continue to completion for the designated batch of sites.

F. **Identify OI Installation Locations:** The ASOS PPI Manager will coordinate the selection of locations for each procurement batch with the appropriate NWS and FAA offices and solicit their input to this decision. This implementation plan addresses all 313 NWS ASOS locations. An additional 20 FAA sponsored ASOS LCD locations may be added to this plan if funds are provided. These locations are identified in Appendix III.

G. **Develop OI Strategy:** A key element of the OIP is the implementation strategy. Since not all AWPAG MOD KITs will be available initially to all technicians, an overarching installation strategy is needed to ensure equitable distribution of MOD KITs during the production cycle. OPS22 will establish the draw rate strategy for the AWPAG MOD KITs and the installation sequence strategy. The basic elements of these strategies are described below.

1. **Initial Issue Rate Strategy:** Initially, OPS12 will issue the first two AWPAG kits to

each Weather Forecast Office (WFO) as stock is received at the National Logistics Support Center (NLSC). These first two kits are the spare kit and the first installation kit. Subsequent initial distribution of AWPAG kits will be made by OPS12 in accordance with the authorized groups in the AWPAG Implementation Plan. OPS22 will provide authorized updates to the implementation list as appropriate.

2. Installation Sequence Strategy: The initial kit acquired by each WFO must be the spares kit. The spares kit includes those components most likely to require maintenance, repair, or replacement, whereas the operational MOD KIT contains all components needed for complete installation and operation. The succeeding operational MOD KITs may be implemented with consideration of the following criteria:

A. The OI may be conducted in either a single phase or a multiple phase mode. In the single phase mode, the OI strategy is applied simultaneously to all sites. In the multiple phase mode, the OI strategy is applied sequentially to selected sub-groups of sites until all sites successfully complete the OI. The successful completion of the OI for one group does not preclude the start of the OI for another group.

B. The first group of sites to be implemented are those 16 sites included in the OAT for the AWPAG. This group includes the 13 climate continuity sites needed for the AWPAG OAT. All 16 sites in this group are also LCD sites. There are no WSP sites in this group. These sites are operationally implemented at the successful conclusion of the OAT process and affirmative DRR decision. See Appendix IV for list of these sites.

C. The second group consists of 193 NWS LCD sites and 7 NWS Non-LCD sites (Total: 200 sites). There are no WSP sites in this group. See Appendix IV for list of the LCD sites in this group.

D. The third group consists of 71 NWS non-LCD sites in order of decreasing latitude. There are no WSP sites in this group. See Appendix IV for list of NWS non-LCD sites.

E. The forth group consists of 26 NWS sponsored dual WSP- LCD sites not contained in the preceding groups. See Appendix IV for list of these WSP-LCD sites. These sites may not be implemented until software version 2.80 becomes operational. The 26 NWS WSP-LCD sites in this group may be implemented in parallel with sites in group two provided an interim software version with WSP or 2.80, whichever occurs first, is fielded at these sites. See Appendix IV for list of these sites. The combined total for groups three and four is 97 sites.

F. The last group consists of 16 FAA LCD sites and 4 FAA sponsored dual WSP-

LCD sites. These sites will only be implemented if funds are provided. See Appendix IV for list of the FAA sponsored LCD sites. The 16 FAA LCD sites may be implemented in parallel with sites in group two provided funds are provided. Likewise, the 4 FAA WSP-LCD sites in this group may also be implemented in parallel with sites in group two provided an interim software version with WSP or 2.80, whichever occurs first, is fielded and funds are provided.

G. The implementation order of the sites within in these groups is left to the regions. Preference should be given to sites with greater maintenance problems and maintenance costs associated with the new sensor/software. Consideration should also be given to scheduling sites on the same day which are closely spaced wherever possible. Additional scheduling preference should be given to AWPAG installation at cold weather sites over warm weather sites. No special trip is necessary when installing the new AWPAG. The AWPAG should be installed when a preventative or corrective maintenance is otherwise initiated. OS7 is tasked to coordinate the determination of specific criteria for phased deployment batches. OPS22 will identify the sites in each batch which meet the criteria.

H. The implementation of the AWPAG sensor will occur over a 13 month period, depending on available funds. Site preparation will precede and occur in tandem with site implementation. OST11 will manage the site preparation activities. OPS22 will manage and post schedule changes to the ASOS Implementation data base and make this information available to regional and headquarters offices. Flags will be set within the database to identify sites implemented prior to their authorized "release date." OPS22 will notify OPS12, OPS13, and OST11 of these unauthorized installations. OPS22 will also coordinate the selection and implementation scheduling of specific sites for these batches. The current schedule is:

Group #	Fiscal Year (FY)	Authorized Implementation Release Date	# OF SITES		
			NWS Locations	FAA Locations	Total
1	FY '03	01/01/03 ~Mid May 2003	16 OAT-LCD sites: Phase 1: 13 sites Phase 2: 16 sites	0	16
2	FY '03	06/01/03	193 LCD 7 Non-LCD	0	200
3	FY '04	10/01/03	71 Non-LCD	0	97
4	FY '04	Interim SW load with WSP, or SW load 2.80	26 WSP-LCD	0	
5	FY '04	When funding provided	0	16 LCD* 4 WSP-LCD*	20*

NOTE: No FAA locations are currently scheduled to receive AWPAG sensor.

* These numbers may change depending on when and if funding is provided for these sites. Any changes will be coordinated with the ASOS PPI Manager.

3.2 Logistic Support Activities

This section describes those logistic activities which must be completed before the start of the OI. This description identifies the office responsible for completion of each activity. These activities include:

A. **Procurement:** Full production and procurement of the AWPAG, associated equipment, and their delivery to NLSC will be managed by OPS11. This function includes serving as the COTR. Upon notification of formal approval of the full production contract award via the RC/Change Management process, OPS11 will coordinate the issuance of the production contract with the Contracting Officer (CO). A production rate and procurement schedule will be established by OPS11 at time of contract award. Current plans are to procure the AWPAG for 216 NWS sponsored ASOS locations. AWPAGs for the remaining 97 NWS sponsored ASOS locations will be procured in FY'04. Any FAA AWPAG procurement is dependent on future finding. There are no current plans to fund AWPAG implementation at FAA sponsored locations.

B. **Supply Support Strategy:** All procured full production AWPAG sensors will be entered into

the supply channel through the NLSC. OPS14 will establish a national stock number for the AWPAG kit. The MOD NOTE for this installation issued by OPS12 will inform field technicians how to order this kit. OPS12 will ensure spares needed to support fielded systems are in stock at NLSC. **Note:** Each WFO having an ASOS technician must have a spare kit on hand before installing their first site.

C. Installation and Maintenance Coordination: OPS12 will coordinate all activities for installation and maintenance of operational AWPAG at designated locations in consonance with the planned OI installation sequence. These activities include scheduling for technician installation and check-out of the AWPAG, ensuring all PPI and support equipment are available for the technicians, ensuring all necessary maintenance documentation is provided to the technicians and ensuring all necessary maintenance training is conducted.

3.3 Configuration Management Activities

This section describes CM activities for the AWPAG during the pre- and post-OI period. The CM activities insure technical details and funding commitments are properly coordinated with affected organizations. CM activities also insure the AWPAG functional and physical characteristics are properly identified and documented. All changes to the AWPAG and related equipment are documented in NWS Configuration Management baseline via EMRS. NWS Requirements and Change Management Branch (OS12) coordinates the review and approval of the Request for Change to formally authorize the development and implementation of the new technology. NWS Configuration Branch (OPS13) updates configuration management baselines and performs periodic audits to insure the AWPAG still conforms to its specifications, engineering drawings, interface control documents, etc.

A. Audits: Audits will be accomplished to verify the final tested and accepted configuration of the AWPAG meets all of its approved requirements.

B. Functional Configuration Audit: The Functional Configuration Audit (FCA) will be performed on the production unit and should be one of the units produced for the OAT. The test results of the unit tested must conform to the requirements specifications and will represent the baseline of all units implemented. Any changes required during this implementation must be re-audited and baselined in order to assure total compatibility throughout the entire network.

C. Physical Configuration Audit: The Physical Configuration Audit (PCA) will be completed after the FCA to insure the configuration baseline will comply with all required configurations and markings, the documentation reflect the individual components, and the engineering documentation represents the baselined system and interfaces. The FCA must end before PCA ends, but PCA can start before FCA ends.

D. **Configuration Status Accounting:** Configuration Status Accounting (CSA) tracks the installation of the AWPAG at the individual ASOS sites. The current status of MOD NOTE 78 implementation may be viewed at the ASOS CM Web site:
http://cmhome.nws.noaa.gov/asos/index.asp
Then select the "site information" option.

3.4 Operational Support Activities

This section describes those documentation, training, user notification, and validation activities which must be completed before the start of the OI. This section identifies the office(s) responsible for completion of each activity. These activities include:

A. **Documentation:** The following documentation will be provided to the implementation and operational personnel at the responsible WFO prior to OI of a given site:

1. Engineering MOD NOTES will be provided to WFO technicians by OPS12 for installation and follow-on maintenance activities. This will occur prior to the start of scheduled OI of the first full production AWPAG in the WFO's area of responsibility.

2. Operational Release Notes will be provided by OPS22 to NWS ASOS Regional Focal Point (RFP) for distribution to affected WFOs prior to the start of the scheduled OI of the first AWPAG in their region. These release notes will also be distributed by OPS22 to designated FAA focal points and made available (as appropriate) to DOD offices for distribution to their affected facilities.

3. Any update to NWS Directives System (NDS) Chapters will be provided by the appropriate Weather Service Headquarters Office to the WFOs prior to OI. OS7 will coordinate production and distribution of the updates. OPS22 will monitor and ensure timely compliance.

4. Any update to the ASOS Users' Guide and other related ASOS documents will be funded by the agency requiring the update and production management provided by OPS22. Updates will be provided to key focal points in affected agencies prior to OI. Currently no updates are planned.

5. OPS22 will post the Final AWPAG Implementation Plan on the Surface Observation Program Web site: http:///www.nws.noaa.gov/ops2/Surface/index.htm

B. **Training:** In the case of the AWPAG, there is a functional change in how precipitation accumulation is measured and therefore maintenance training is required. Maintenance training will be modified to include the AWPAG.

C. **Pre-Implementation User Notification:** Any planned change in operations or disruption in

service must be documented and distributed to the affected user community prior to actual execution of the change. This notification is intended to give users ample time to make any necessary adjustments to automated equipment and procedures prior to the implementation. This notification may take many forms including, Public Notification Statement via Advanced Weather Interactive Processing System (AWIPS), notification via Family of Services, Notice To Airmen (NOTAM), notification of local airport authority, and notification of national and international user community through NWS Telecommunications Gateway. OPS22 will coordinate with various organizations to ensure these notifications are disseminated.

Each WFO will issue a Public Notification Statement (PNS) describing the change and its impact to all affected users on a case-by-case basis until all scheduled sites in their area of responsibility have been implemented. The PNS for each site should be issued 48-72 hours prior to implementation. The following template should be modified as appropriate and used for this PNS:

NOUS4 KWBC XXXXXX
PNSWSH

PUBLIC INFORMATION STATEMENT...TECHNICAL IMPLEMENTATION NOTICE 03-XX
NATIONAL WEATHER SERVICE HEADQUARTERS WASHINGTON DC
HMM EDT DAY MON DD 2003

TO FAMILY OF SERVICES /FOS/ SUBSCRIBERS...NOAA WEATHER WIRE SERVICE /NWWS/ SUBSCRIBERS...EMERGENCY MANAGERS WEATHER INFORMATION NETWORK /EMWIN/ SUBSCRIBERS...OTHER NATIONAL WEATHER SERVICE /NWS/ CUSTOMERS OF AVIATION...CLIMATOLOGICAL DATA AND FORECASTS...NWS EMPLOYEES

FROM RAINER DOMBROWSKY
CHIEF...OBSERVING SERVICES DIVISION

SUBJECT AUTOMATED SURFACE OBSERVING SYSTEM /ASOS/ PRECIPITATION ACCUMULATION SENSOR REPLACEMENT

THE FOLLOWING CHANGES HAVE NO DIRECT IMPACT ON NOAA WEATHER WIRE SERVICE SUBSCRIBERS.

THE ASOS PRODUCT IMPROVEMENT PROGRAM WILL SOON BEGIN REPORTING DATA FROM A NEW PRECIPITATION GAUGE ...THE ALL WEATHER PRECIPITATION ACCUMULATION GAUGE /AWPAG/.

THE PRESENT GAUGE...A HEATED TIPPING BUCKET/HTB/ GAUGE IS PRONE TO UNDER REPORTING FROZEN AND FREEZING PRECIPITATION. THE AWPAG IS A HEATED WEIGHING GAUGE AND IS MORE ACCURATE IN MEASURING AND REPORTING FREEZING AND FROZEN PRECIPITATION.

THE AWPAG HAS BEEN IN FIELD TESTS THROUGHOUT THE PAST WINTER. WHILE STILL IN AN OPERATIONAL TEST...IN LATE MAY AND JUNE OF 2003 THE AWPAG WILL BECOME THE OPERATIONAL GAUGE AT THE FOLLOWING 16 OPERATIONAL ACCEPTANCE TEST LOCATIONS.

MOB	MOBILE	AL	FCA	KALISPELL	MT
MCN	MACON	GA	AVP	WILKES BARRE	PA
BOI	BOISE	ID	ERI	ERIE	PA
SPI	SPRINGFIELD	IL	ABE	ALLENTOWN	PA
BOS	BOSTON	MA	ABR	ABERDEEN	SD
PWM	PORTLAND	ME	TRI	BRISTOL	TN
LAN	LANSING	MI	AMA	AMARILLO	TX
MKG	MUSKEGON	MI	GRB	GREEN BAY	WI

IF YOU HAVE ANY QUESTIONS ABOUT THIS CHANGE...PLEASE CONTACT ONE OF THE FOLLOWING INDIVIDUALS AT NWS HEADQUARTERS

STEVEN PRITCHETT
SURFACE OBSERVATIONS PROGRAM MANAGER
SILVER SPRING MD
PHONE 301-713-1792 X181
E-MAIL STEVEN.PRITCHETT@NOAA.GOV

OR

DAVID MANNARANO
SURFACE OBSERVING SYSTEMS IMPLEMENTATION MANAGER
SILVER SPRING MD
PHONE 301-713-2093 X103
E-MAIL DAVID.MANNARANO@NOAA.GOV

OR

RICHARD AHLBERG
ASOS PRODUCT IMPROVEMENT PROGRAM MANAGER
SILVER SPRING MD
PHONE 301-713-1975 X160
E-MAIL RICHARD.AHLBERG@NOAA.GOV

THIS AND OTHER NWS TECHNICAL IMPLEMENTATION NOTICES ARE AVAILABLE ON THE INTERNET AT /USE LOWER CASE LETTERS/

HTTP://WWW.NWS.NOAA.GOV/OM/NOTIF.HTM

MORE DETAILED IMPLEMENTATION INFORMATION IS AVAILABLE ON THE SURFACE OBSERVATION PROGRAM WEB PAGE AT /USE LOWER CASE LETTERS EXCEPT S IN SURFACE/

HTTP://WWW.NWS.NOAA.GOV/OPS2/SURFACE/INDEX.HTM

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NNNN

D. Verify Completion of all Pre-Operational Implementation Activities: The preceding activities must be completed before commencement of the OI activities. The OPS22 Implementation Manager will ensure all prerequisite activities are verified as completed. Furthermore, OPS22 will have informed the implementation team of the schedules, responsibilities, and procedures for the OI. This was done through ongoing coordination and formal issuance of this OIP.

4.0 OPERATIONAL IMPLEMENTATION (OI) ACTIVITIES

This chapter gives a comprehensive description of the OI activities. The sections in this chapter describe the implementation activities necessary to initiate operational activation of the product improvement and identify the office(s) responsible. These activities include: Implementation Management, Activities, Acquisition Activities, Installation Activities, and OI Monitoring and Coordination Activities. They are accomplished in parallel during the OI activity phase.

4.1 Implementation Management Activities

This section describes those activities to initiate, monitor, coordinate, and manage change during the implementation process. The main aspects of implementation management are initiation, oversight, and monitoring. Initiation responsibilities are described in subsection 1. Oversight responsibilities and the office(s) responsible for carrying out the oversight are described in subsection 2, and check list monitoring and documentation responsibilities are described in subsection 3.

A. **Implementation Management Decision:** The ASOS PPI Manager will initiate implementation activities upon receipt of a "go" deployment decision by the DRR Group for the batch of deployment sites represented by the OAT group considered for deployment by the DRR Group. OPS22 will identify the specific sites in each batch approved for deployment and post the list on the Surface Observation Program Web page: **http://www.nws.noaa.gov/ops2/Surface/index.htm**

B. **Oversight Responsibilities:** OPS22 has overall responsibility for managing and coordinating the OI activities. These responsibilities include ensuring the implementation is executed according to plan and coordinating any necessary adjustments with other key participants. This includes coordination with: OPS24 for managing the successful completion of all prerequisite testing prior to OI; OST32 for monitoring acquisition and delivery of MOD KITS and other material necessary for implementation to NLSC; OPS13 for tracking MOD NOTE 78 completions in accordance with this implementation plan; OPS14 for managing the logistics supply, repair; OPS12 for managing the distribution of OI MOD KITS and other materials, and the installation and maintenance activities; and NWS Regional Focal Point (RFP) for managing and coordinating all implementation activities within their respective regions. Several implementation data base reports were created to track site implementation changes. These reports are routinely updated and made available to OPS22 and other offices involved in implementation activities. Examples of these reports are in Appendix II. OPS22 will manage the data bases and coordinate their availability to other implementation partners.

The RFPs have a unique responsibility to fine tune and manage the implementation sequence within the region, and coordinate with the local WFO to resolve implementation issues and ensure a successful implementation. The RFPs will compile and forward 30-day

implementation status reports to OPS22 via e-mail. These status reports will include the newly completed Checklist, Part B and the 30-day Evaluation Reports from the WFO. The status reports will only be forwarded to OPS22 when the problems noted by the WFO either cannot be resolved at the regional level or have national impact.

C. Check List: A key component of the oversight responsibilities is monitoring the status and progress of the implementation. A two part check list tool has been developed to assist in this activity. The purpose of the check list is to ensure that all essential activities described in this document are completed as scheduled. The check list follows the general organization of this plan. The Check List is found in Appendix I.

Part A: This part is completed once by OPS22. It applies to all locations subject to OI It is completed prior to the beginning of the OI process for the first full or partial phased deployment of the AWPAG.

Part B: This part is initially completed by the responsible WFO for each site which is implemented. The Meteorologist-In-Charge (MIC) at each WFO is responsible for ensuring this check list is completed and sent forward in a timely manner (within 24hours, see below). This includes annotating the check list with the completion dates (mm/dd/yy) of those items for which the WFO is designated as the Office of Primary Responsibility (OPR), and attaching a brief narrative which describes any problems encountered and any solutions found or recommended. Both the check list and narrative will be retained on site for 6 months. A copy will be forwarded via E-Mail to the RFP within 24 hours upon completion only when the problems either cannot be resolved at the local level or have regional or national implications. The RFP will compile these check lists and narratives into a monthly E-Mail status report to OPS22 only when the problems noted by the WFO either cannot be resolved regionally or have national implications. OPS22 will coordinate with the designated OPRs to ensure the remaining items are completed.

4.2 Acquisition Activities

This section describes those activities involved in acquisition, stocking, and distribution of the operational AWPAG MOD KITS.

A. Verify Start of OI: OPS22 will verify the start date of the OI.

B. Monitor & Validate Delivery: As the COTR, OPS11 will monitor and ensure timely delivery of all planned production units to the NLSC. Any discrepancies or delays in scheduled delivery of the AWPAG to NLSC will be reported by NLSC to OPS11 in a timely manner. Throughout the production cycle OPS11 will perform a quality assurance function on units being delivered to the NLSC, report any discrepancies and provide remediation recommendations to the CO.

C. Stock Kits at NLSC: The new AWPAG and associated parts needed for installation will be

stocked as a kit at NLSC. A National Stock Number (NSN) will be established by the Logistics Branch (OPS14) for this kit. Procedures for requisitioning this kit will be disseminated to field installation technicians by OPS12 prior to the start of the OI. OPS14 will manage all logistic support for the implementation of the new ASOS AWPAG. NLSC will manage inventory of all necessary supplies, spares, and modification kits, and filling orders from field technicians for dissemination of AWPAG kits.

D. **Requisition Kits from NLSC:** The first two kits will be issued to each WFO by OPS12 from the stock at NLSC. These kits are the spares kit and one initial kit for installation. The spares kit only includes those critical Field Replaceable Unit (FRU) components which are most likely to fail. Other components will be available from NLSC. For all subsequent installation kits, the WFO ET will requisition the AWPAG Mod kit from NLSC when they are ready to install the AWPAG in accordance with the Draw Rate Strategy described in Section 3.1, paragraph G1.

4.3 Installation Activities

This section describes the appropriate documentation source which governs downloading of archive, preparation, installation, and checkout of the operational system.

A. **Downloading of Archive:** Not applicable.

B. **Site Preparation:** Site preparation will precede and occur in tandem with site installation. OST11 will manage this activity. Contract support will be used for site preparation for the AWPAG wind shield. Instructions are included in the contract Statement Of Work.

C. **Installation & Checkout:** Field technicians will perform installation and checkout of the AWPAG in accordance with the Engineering MOD NOTE # 78. Generally this process will take about 5 hours or less.

4.4 OI Monitoring & Coordination Activities

This section describes the monitoring and coordination activities associated with the operational implementation which follow installation and checkout. These activities are executed in consonance with the oversight and check list activities described in section 4.1.C. They include installation notification, initiate maintenance monitoring and confirm operations, installation status reporting, and any necessary post implementation notification to users.

A. **Installation Notification:** Upon successful completion of installation and checkout, the Electronic Technician (ET) will update the Engineering Management Reporting System (EMRS) in accordance with MOD NOTE 78 and notify, via e-mail, the responsible WFO and RFP of this occurrence. A sample A-26 is included as part of Appendix V.

B. Initiate Maintenance Monitoring and Confirm Operations: Example of description:

1. **WFO Status Monitoring:** The WFO, in conjunction with the AOMC will begin routine maintenance monitoring.

2.. **30-Day Evaluation Report:** The WFO will also conduct a close 30 consecutive day meteorological monitoring and evaluation of the data from the newly implemented site to ensure the data are complete, consistent with expected local conditions or independently confirmed as representative of unique meso-scale phenomena, and the system is operating normally. All discrepancies will be noted and reported to the RFP in a timely manner (usually within 2 business days). Upon the conclusion of the 30-day monitoring period, the WFO will complete and forward to the RFP a narrative report on the results of the monitoring and evaluation only for those sites which they deem merit regional or national attention. The report shall include the identification of the location evaluated, the dates of the evaluation, the office and person conducting the evaluation, and the narrative. The narrative shall include a description of any discrepancies found which relate in any way to the implemented change, and any solutions which act on the discrepancy.

3. **RFP Status Monitoring:** The RFP will closely monitor the status of the installation, checkout and OI. The RFP will conduct periodic teleconferences with the field to assess installation, maintenance, and meteorological performance. When necessary, they will initiate timely corrective actions which are beyond the capability of the local WFO. They will also collect and compile the 30 day implementation Evaluation Reports from the WFOs and forward those which they deem merit national attention in monthly status reports to the OPS22 Implementation Manager via e-mail.

4. **AOMC Status Monitoring:** The AOMC will monitor the operational status of the newly implemented ASOS site for 30 days to ensure proper functioning and availability of data from that site. The AOMC will monitor and report on the status of the implementation and apprise the OPS22 Implementation Manager of any unusual ASOS performance related to the implemented improvement during the 30-day close monitoring period.

C. Installation Status Reporting Coordination:

1. The AOMC will monitor the installation and implementation status of every site and provide daily reports. These reports will be provided through the ASOS Implementation List Server (ASOS_Implementation@infolist.nws.noaa.gov). Those wishing to join this list server are asked to submit their request to: david.mannarano@noaa.gov

2. OPS22 will monitor the status and track the progress of the implementation from daily AOMC reports, periodic reports from the EMRS, Configuration Management Information System (CMIS), and Management Information Reporting System (MIRS), and monthly reports provided by the RFP. OPS22 will use these reports to provide weekly staff note updates for mid- and upper-level management on the status of the implementation, and initiate remedial corrective actions to resolve any difficulties and keep the implementation on schedule. The

ASOS PPI Manager will use these reports to update monthly/quarterly management Quad Chart reports for senior management briefings. OPS22 will also ensure drafts, updates, data bases, and other documents related to the formal Implementation Plan which are too large for the list server will be announced on the list server and posted on the Surface Observing Program Web Site: **http://www.nws.noaa.gov/ops2/Surface/index.htm**

5.0 POST OI ACTIVITIES

The completion of the OI at each location marks the transition to post implementation activities. This chapter gives a comprehensive description of the post-OI activities. The sections in this chapter describe the post-implementation activities necessary to integrate the new AWPAG into routine ongoing operations, and identify the office(s) responsible. These activities include: Post-Implementation User Notification, Operational Quality Control, Documentation, Disposition of Old Equipment, and Sensor Continuity Study. They may begin immediately upon operational activation and are accomplished in parallel.

A. **Post-Implementation User Notification:** Upon notification of successful initiation of service by the AOMC, OPS22 will issue notification of the change and its impact to all affected users on a monthly basis until all scheduled sites have been implemented.

B. **Operational Quality Control:** The responsible WFO will continue with normal monitoring of the operation of the newly installed AWPAG beyond the initial 30 day close monitoring period. This will ensure proper ongoing operation of both the installed unit and the entire system. The WFO will perform maintenance on system components for which they are responsible. Any PPI parts returned to National Reconditioning Center (NRC) which are still under warranty will be reported by NRC (OPS16) to the PPI COTR, OST32.

C. **Operations And Maintenance:** The WFO will perform maintenance on system components for which they are responsible. Any PPI parts returned to National Reconditioning Center (NRC) which are still under warranty will be reported by NRC (OPS16) to the PPI COTR, OST32.

D. **Documentation:** Five operations are necessary to ensure proper documentation of changes to ASOS. They are:

1. Data entry into the EMRS;
2. Data entry into the CMIS;
3. Data entry into the MIRS; and
4. Data entry into ASOS SYSLOG
5. Completion of and submission to NCDC of WS Form A-1, A-3, B-44, etc. to document meta data change at site.

The EMRS Form A-26 update is accomplished by the ET as part of the OI. A sample Form A-26 is included as part of Appendix V. The Regions will ensure the EMRS update is accomplished. The CMIS will be updated from new information in the EMRS. OPS13 will ensure this action is accomplished. The MIRS will be updated through the EMRS input to the CMIS. OPS22 will ensure that the MIRS staff makes timely updates to the MIRS. Upon completion of the installation, the ET will enter appropriate remarks into the ASOS SYSLOG to document this change in accordance with MOD NOTE # 78. The WFO will complete

applicable WS Forms A-1, A-3, B-44 and forward them to Regional Headquarters within 5 working days after implementation for review and submission to NCDC. Note: A-1 and A-3 forms are required for all ASOS locations; B-44 forms are also required for ASOS Local Climate Data (LCD) sites.

E. **Disposal of Old Equipment:** NWS disposal policy for the old equipment being replaced is contained in NWS disposal document written by OPS1 (OPS12, OPS14) in coordination with OS7. Specific procedures for disposal, in accordance with the disposal guidance, is included in the MOD NOTE # 78. Note: Disposal policy/procedure may include returning some or all of old equipment to stock at NRC. The disposal policy for the AWPAG requires all replaced HTB gauges be returned to stock at NRC and used only as spares for supporting remaining ASOS sensors.

F. **Climate Continuity Study:** At a sub-set of implemented sites, a data continuity study will be conducted to ensure no biases or meteorological discontinuities are introduced into the climate record which are not documented. This study will last one to two years or more. Sites will be selected based on climatic considerations. OS7 will manage this activity.