

PROCEDURE 2 - Working Alone

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Synopsis

The purpose of this procedure is to provide guidelines to employees and supervisors when additional personnel assignment may be needed. This procedure applies to all NWS facilities, work locations, and employees.

Initial Implementation Requirements:

- **Analyze Site Operations versus Requirements of the Procedure**
 - Assessment of site-specific situations/operations requiring additional personnel. (2.3.3)
- **Develop/Obtain Documentation/Information required for Site**
 - Develop General Rules to gauge the risks associated with each task. (2.3.3)
- **Designate Person to Administer Working Alone Procedure Requirements**
- **Provide Local Training of Site Personnel**
 - Safety Observer Training. (2.3.5a,b)
 - CPR Certification. (2.3.2a)
 - First Aid Training. (2.3.2a)
- **Inventory Material/Equipment (Procure as required)**
 - Communication Devices. (2.3.4b)

Recurring and Annual Task Requirements:

- **Review/Update Documentation/Information required for Site**
 - Update General Rules to gauge the potential risk associated with each task. (2.3.3)
- **Provide Refresher Training of Site Personnel (when required)**
 - Safety Observer Training. (2.3.5a,b)
 - CPR Certification. (2.3.2a)
 - First Aid Training. (2.3.2a)
- **Replace/Re-calibrate/Maintain Material/Equipment as required**
 - Communication Devices. (2.3.4b)

Working Alone Checklist

Requirements	Reference	YES	NO	N/A	Comments
Is initial and annual review of this procedure conducted and documented?	2.4.2				
Are Engineering Handbooks (EHBs) and system/equipment manuals reviewed by affected personnel for the additional personnel requirement?	2.7				
Are personnel trained in First Aid or First Aid/CPR available when work is being performed in areas where there is a risk of serious injuries and medical services are not readily available?	2.3.2a, Note				
Is a Safety Observer present during all permit-required confined space entry activities?	2.3.2b				
Have all potentially hazardous conditions been evaluated by the Station Manager and/or the Environmental/Safety Focal Point and/or Program Supervisors to determine when additional personnel are necessary?	2.3.3				
Have the Station Manager and/or Environmental/Safety Focal Point established the rules for assignment of additional personnel?	2.3.3				
Have these rules been coordinated and documented?	2.3.3				
Are potentially hazardous environments routinely evaluated by the Environmental/Safety Focal point or another qualified individual prior to the commencement of operations?	2.3.3				
Are adequate communication measures in place for operations which must be performed alone?	2.3.4b				
Are Safety Observers selected and properly trained to perform their duties in accordance with this procedure?	2.3.5b				

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2 WORKING ALONE

2.1 Purpose and Scope

As part of its goal to provide a safe and healthful workplace, National Weather Service (NWS) Headquarters (WSH) is promulgating this procedure to provide guidelines to employees and supervisors when additional personnel assignment may be needed. This procedure applies to all NWS facilities, work locations, and employees.

2.2 Definitions

Field Office. A Field Office may include the following: Weather Forecast Office (WFO), River Forecast Center (RFC), Weather Service Office (WSO), and a Data Collection Office (DCO).

Hazardous Work. Any work that, if not properly performed, poses potential risk to the safety and health of the worker or damage to property, equipment, or the environment.

Operating Unit. For the purpose of this procedure, operating unit includes National Centers for Environmental Prediction (NCEP), National Data Buoy Center (NDBC), NWS Training Center (NWSTC), National Reconditioning Center (NRC), Radar Operations Center (ROC), and Sterling Field Support Center (SFSC).

Qualified Person - A person qualified by education, training, and experience to estimate employee exposures to hazardous materials and work conditions.

Station Manager. For the purpose of this procedure, the station manager shall be either the NWS Regional Director; Directors of Centers under NCEP (Aviation Weather Center, NP6; Storm Prediction Center, NP7; and Tropical Prediction Center, NP8; Space Weather Prediction Center, NP9); Directors of the NDBC, NWSTC, and Chiefs of NRC, ROC and SFSC facilities; or Meteorologist in Charge (MIC), Hydrologist in Charge (HIC), or Official in Charge (OIC).

Working Alone. Performance of any work by an individual who is out of voice or visual contact with all other individuals. In addition to the obvious cases, employees perform work locally but still may be remote from the immediate inhabited areas of the WFO or WFO/RFC or other normally inhabited structure(s). For example, field personnel may work alone:

1. When working on the Radiosonde Replacement System (RRS) in the Upper Air shelter (radome), even though it is within the WFO general area - the pedestal has voltages of 120 volts present in the slip ring assembly.
2. When working in the equipment rooms at the WFO or WFO/RFC, employees may be out of sight or hearing of workers in the operations portion of the WFO or WFO/RFC.
3. Some NRC employees may work alone in the screen room when performing certain work on the WSR-88D, working on the pedestal in the "warehouse" area, or at certain times in one or more of the laboratory areas.
4. Students at, or employees of the NWSTC may work in laboratory or classroom areas out of sight or remote from other personnel. Similar examples may also apply to national centers, regional and national headquarters.

2.3 Procedure

2.3.1 Maintenance Procedures Requiring Two or More Persons. Material contained in the NWS maintenance manuals and Engineering Handbooks (EHB) specifies when two or more maintenance personnel are required to safely perform maintenance procedures. Examples where guidance may be found include: the Doppler surveillance radar (WSR-88D), the Radar Data Acquisition (RDA) unit, antenna pedestal system, Radar Products Generator (RPG) unit, a part of EHB-6; the Radiosonde Replacement System (RRS) maintenance manual set, a part of EHB-9; and Real Property Installed Equipment (RPIE) maintenance manuals.

A detailed example, a summary of WSR-88D maintenance and repair operations requiring two or more maintenance persons, is presented in attachment A. It is NOT a complete listing of operations, as the list is continuously being modified and updated. It is to be used as an example only. For a complete and up-to-date listing, consult the WSR-88D maintenance manual. Some procedures mandate the presence of additional personnel to assist employees performing heavy duty work (e.g., lifting heavy equipment). Other procedures require the presence of a second employee solely as a safety observer to minimize the risk of injury to employees, as described in section 2.3.5, while still others require additional personnel simply due to the nature of the work involved.

2.3.2 Specific Conditions Requiring Additional Personnel. The following additional personnel requirements are derived from OSHA regulations and interpretations.

- a. In accordance with OSHA standard 1910.151, in the absence of an infirmary, clinic or hospital in near proximity to workplace, a person trained in First Aid shall be readily available.

NOTE: OSHA provides 8 minute response time as guidance for determining if medical services are readily available. Nature and extent of the hazards must be evaluated for each site. In general, if there is a risk of injury and medical services are more than 8 minutes away, a first aid trained employee shall be present on site. CPR certification and annual re-certification are recommended. However, if there is a risk of serious injury that may adversely affect employee’s respiration, cause severe bleeding or other life threatening condition, 8-minute response time may be too long (e.g., irreversible brain damage may occur within 4 minutes due to lack of oxygen or death can occur due to arterial bleeding). In this case, a First Aid/CPR trained safety observer shall be present.

- b. A safety observer must be present during all permit-required, confined-space entry activities.

2.3.3 Other Conditions that Require More than One Person. The station manager and the Safety or Environmental/Safety Focal Point, shall coordinate with site personnel to determine and document the general rules they will use to gage the risks under which personnel will be performing their assigned tasks. Conditions such as severe weather, dangerous terrain (including areas where management determines potential risk to the employee to be unacceptably high), exposure to wild animals, exposure to hazardous chemicals, work in the open trenches, sea buoy operations, and others may dictate a need for additional personnel assignment, even if it is not

required by the maintenance procedures. Potentially unsafe conditions shall be identified prior to execution of any project and brought to the attention of appropriate management personnel.

NOTE: Working on any structure that involves climbing or descending shall require a safety observer to be present unless the structure has permanent stairways and platforms with guardrails or scaffolding guards in compliance with OSHA requirements. When the structure does not have permanent stairways and platforms with guardrails or scaffolding guards and when local emergency rescue organization is not available, second person trained in rescue operations must be present.

The following paragraphs include, but are not limited to, examples of work conditions under which it is recommended that two or more people be assigned. The final decision about personnel assignment rests with the station manager, who will consider input from the Safety or Environmental/Safety Focal Point, NWS Employee Organization Representative (time permitting) and the personnel performing the work.

- a. Dangerous Weather or Terrain.
 - (1) When working on a cliff, narrow ledges, or near vertical mountainous slopes where a loss of footing would result in serious injury or death, or when working in areas where there is danger of rock falls or avalanches.
 - (2) When traveling to remote sites in winter, either on foot or by means of an off-road type vehicle, over secondary or unimproved roads or snow trails, in sparsely settled or isolated areas.
 - (3) When working or traveling in sparsely settled or isolated areas results in exposure to dangerous temperatures and/or high winds, and when shelter, other than a temporary shelter, and assistance are not readily available.
 - (4) When participating in snow plowing or snow or ice removal operations, regardless of whether on primary, secondary, or other classes of roads, when there is danger of avalanche; or there is the danger of missing the road and falling down steep mountainous slopes because of lack of snow stakes, “white out” conditions, or sloping ice-pack covering the snow.
 - (5) When working outdoors in hot or cold weather conditions, use the guidance issued by the American Conference of Governmental Industrial Hygienists (ACGIH) for work-rest regimen in hot environment (Attachment B) and work-warming regimen in cold environment (Attachment C). Attachment B should be used for screening purposes only. It is possible that a condition may be above the criteria described in Attachment B and still not represent an unacceptable exposure.
 - (6) When working on river gauges that are located on the side of a bridge which is narrow and has high traffic flow or near rivers at or above flood levels.
- b. Exposure to Hazardous Chemicals. Exposure to hazardous chemicals in certain amounts and concentrations can present a danger to a person’s life or health,

especially when an accidental spill occurs or when chemicals are used in poorly ventilated and small room. An evaluation of hazard (air sampling) may be required before the work can be started. Two or more people shall be assigned when chemical concentrations could potentially exceed OSHA Permissible Exposure Limits, ACGIH Threshold Limit Values (TLVs), or 20% of a Lower Explosive Limit. The estimate of potential exposures shall be made by qualified personnel (such as an Industrial Hygienist, Safety Engineer, etc.). The NOAA SECO or NWS Regional/National Headquarters safety staff should be consulted, if necessary.

- c. Work in Open Trenches. Working in an open trench that is 4 feet or more deep, until proper shoring, sloping, or another approved method of cave-in prevention has been installed.
- d. Work Beneath Hovering Helicopter. Participating in ground operations to attach an external load to helicopters hovering overhead. The second person in the operation shall observe and remain in the view of the person attaching the load in order to signal an emergency since oral communication may not be possible due to helicopter engine or rotor noise.
- e. Work in Unsafe Structures. Working within or immediately adjacent to a building or structure which has been severely damaged by earthquake, fire, tornado, flood, or similar cause. Such work may be performed if considered necessary for the safety of personnel or recovery of valuable materials or equipment, but only when the work is authorized by Regional Headquarters, and, if necessary, in conjunction with the National Headquarters.
- f. Exposure to Wild Animals and Poisonous Insects and Snakes. Performing maintenance in undeveloped areas if danger of encountering wild animals exists (e.g., moose, polar/brown/grizzly bears, black bears in continental United States, large birds of prey), poisonous plants, insects or snakes.
- g. Tropical Jungle Duty. Work that occurs outdoors in undeveloped jungle regions outside the continental United States can be unsafe. Work may involve the following:
 - (1) An unusual degree of physical hardship caused by high heat, humidity, or other inclement conditions.
 - (2) An unusual danger or serious injury due to:
 - i Travel on unimproved roads or rudimentary trails in rugged terrain (e.g., walking on narrow trails in steep mountainous areas, fording deep, fast-moving rivers, and crossing deep crevices via log or other unsafe means).
 - ii Immediate presence of dangerous wildlife (e.g., venomous snakes, poisonous insects, and large carnivores).
- h. High Crime Areas - Work in potentially high crime areas.
- i. Hoisting and Rigging Operations - Additional personnel may be required to assist

as spotter(s) during some hoisting and rigging activities when visibility of the load by the operator may be compromised due to the nature of the lift.

- j. Cooperative Observer (COOP) Program - Station Manager or designated alternate (e.g., Electronics Systems Analyst) shall implement yearly safety reviews of Cooperative Observer Program sites according to the following process:
- (1) The Cooperative Program Manager (CPM) or Management designee shall, on an annual basis, complete a site safety review form (Attachments D & E). Allegations of safety violations are to be documented.
 - (2) The form is provided to the Station Manager. The Station Manager provides a copy to the local union steward, who has 10 calendar days from delivery to provide union input.
 - (3) The Station Manager reviews the form and any input provided and makes a final determination on requirements for subsequent trips to the site. The Station Manager shall consider employee safety, possible remedies/mitigations to any noted hazards, and efficiency.

<p>NOTE: At remote locations¹ without communications² between the CPM and the safety observer and others (e.g., urgent care providers), the safety observer shall be trained in First Aid.</p>

¹ Remote locations are COOP Program sites located more than 3 miles from a home or business.

² Communications include land-line phone from the host site, walkie-talkie, cellular telephone reception or satellite telephone, if available.

2.3.4 Considerations Concerning Assignment of Additional Personnel.

- a. When evaluating the particular situation, all factors contributing to the risk involved shall be considered. In instances when additional personnel are not readily available to support the assigned task, especially when work must be performed at remote sites or on a high structure, postponing routine maintenance task until other personnel become available and/or severe weather conditions improve should be considered.

<p>NOTE: In case of severe weather, travel to the work site may not be safe, even if two people are present.</p>

- b. For situations when the two-person rule is not mandatory, emergency communications (e.g., telephone, cell phone, two-way radio) for personnel who must perform emergency equipment repair alone at remote locations shall be established.
- c. When means of communication are not readily available, emergency rescue measures may need to be arranged in advance.

2.3.5 Safety Observers (“Buddies”). Under special conditions, described in Section 2.3.2 and 2.3.3, when the risk of serious injury to maintenance personnel is judged to be greater than normal, the presence of a safety observer is essential. The safety observer should be able to obtain medical assistance or be trained to render first aid. If there is a risk of serious injury that may adversely affect employee’s respiration or cause severe bleeding or other life threatening condition, the safety observer must be trained in CPR/First Aid (see 2.3.2). The safety observer must have immediate means of communication (e.g., phone, cellular phone, two-way radio, etc.). The following paragraphs provide the requirements applicable to safety observers.

- a. Work Conditions. When work is to be performed under high risk conditions, work shall not begin until a safety observer is present. A safety observer may be other maintenance personnel or trained staff members (e.g., operations staff, meteorology/hydrology staff).
- b. Knowledge and Training. Safety observers shall receive initial and refresher training (as appropriate). Safety observers do not have to be proficient in the task being observed, but as a minimum, should:
 - (1) Be briefed and/or familiar with the potential hazards of the task and be able to detect an unsafe act or condition during the work.
 - (2) Know how to use electrical safety equipment and be familiar with procedures to remove personnel from electrical hazards and when not to touch an affected person.
 - (3) Be trained in First Aid or First Aid/CPR based on conditions described in paragraph 2.3.2 (NOTE).
 - (4) Be familiar with local procedures for obtaining medical assistance.
 - (5) Know where disconnect switches are located and know how to de-energize equipment.
 - (6) Be familiar with and be able to recognize the appropriate safety controls (engineering and administrative) and to select personal protective equipment.
 - (7) When acting as a fire watch for welding and other hot work activities, the observer must be trained in the use of a fire extinguisher and know how to turn off bottled welding gas supplies, and secure and safely move bottled gas cylinders.
 - (8) The safety observer should have no responsibilities or duties other than being the safety watch.
- c. Duties/Responsibilities. The safety observer should:
 - (1) Give positive warning of potential danger to anyone approaching the equipment.
 - (2) Be at a safe distance from which he/she can observe all personnel who are working on the equipment and have access to the main power switch.

- (3) Have easy access to safety and rescue equipment.
 - (4) Provide near constant surveillance (e.g., two-way radio) or other alternative means of communication.
 - (5) Check with Weather Forecast Office if lightning is expected to affect the work area (see Lightning Safety guidance in Attachment A, Section 5, Occupant Emergency Plan).
- d. Assignment of Safety Observers. The Station Manager shall ensure that the safety observers are assigned before starting the tasks. Individuals making safety observer personnel assignments should consider splitting assignments among station staff to the extent possible.

2.4 Responsibilities

2.4.1 Regional or Operating Unit Environmental/Safety Coordinators

- a. Will monitor and promote compliance with the requirements of this procedure at field offices or Operating Unit facilities.
- b. Will ensure that applicable procedures are implemented at regional headquarters or Operating Unit facilities.

2.4.2 Station Manager

- a. Will review or delegate review, of this procedure on an annual basis to ensure that the facility is complying with its requirements. Confirmation of this review shall be forwarded to the Regional or Operating Unit Environmental/Safety Coordinator.
- b. Will have oversight over the implementation of this procedure and shall ensure that the requirements of this procedure are followed by individuals at the NWS facility.

2.4.2 NWS Headquarters (WSH)

- a. The NWS Safety Office will provide assistance to Regional Headquarters, Operating Units, and field personnel to ensure that NWS facilities comply with requirements of this procedure.
- b. NWSH will coordinate with NOAA SECO, as necessary, regarding compliance issues related to this procedure.

2.4.4 Safety or Environmental/Safety Focal Point

- a. Will ensure that any responsibilities delegated to them by the Station Manager are implemented in accordance with the requirements of this procedure.

2.4.4 Employees

- a. Individual employees affected by this procedure are required to read, understand and comply with the requirements of this procedure and report unsafe or unhealthful conditions and practices to their supervisor or safety focal point.

NOTE: Reference NWS PD 50-11 for complete list of responsibilities
<http://www.weather.gov/directives/050/pd05011c.pdf>

2.5 References

- 2.5.1 American Conference of Governmental Industrial Hygienists, “Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs).”
- 2.5.2 National Weather Service, NWS Occupational Safety and Health Procedure 1, “Fall Protection.”
- 2.5.3 National Weather Service, NWS Occupational Safety and Health Procedure 12, “Confined Space Entry.”
- 2.5.4 U.S. Department of Labor, Occupational Safety and Health Administration, 29 CFR 1910, Subpart Z, “Toxic Substances.”

2.7 Attachments

Attachment A. Table 2-1: Equipment Maintenance Procedures That Require More Than One (1) Person.

NOTE: Attachment A contains examples from NEXRAD manuals (EHB-6). It is provided as a guide only. The latest approved EHBs and system/equipment manuals must be used for equipment-specific guidance. It is appropriate to caution that there is no ultimate guarantee that errors and omission in documentation have been completely eradicated. Common sense and sound judgment should be applied in each and every decision process.

- Attachment B. Screening Criteria for Heat Stress Exposure (WBGT Values)
- Attachment C. TLVs Work/Warm up Schedule for Four-Hour Shift
- Attachment D. Cooperative Observer Program Site Safety Review Form
- Attachment E. Sample Cooperative Observer Program Site Safety Review Form

ATTACHMENT A
Equipment Maintenance Procedures That Require More Than One (1) Person
WSR-88D maintenance and repair operations

Tech Manual (TM)	TM Chapter #	Reference	Number of Technicians Required	Statements from Procedure
EHB 6-510 RDA Maintenance Shop	6	6.4.2	2	Lifting with Davit Crane and Maintenance Hatch
	6	Table 6-10	2	Wave Guide Switch - Replacement
	6	Table 6-10	2	Spectrum Filter – Replacement Procedure
	4	Table 4-43	2	RDA Restoration Procedures
EHB 6-511	4	4.5.3	2	Modulator Test Points Waveforms – Procedures
	4	4.5.4	2	Equipment Meters Calibration – Procedures
	4	4.5.5	2	Circuit Calibrations
	4	4.5.6	2	PFN Voltage Limit Control
	4	4.5.7	2	Filament Preheat/Power Interrupt Timing Adjustments
	4	4.5.8	2	Proportional Preheat Board Oscillator Adjustment
	4	4.5.9	2	280 Volt Power Supply Relay
	5	5.1.4	2	Interlock Bypass Procedure
	5	5.3.2	2	Transmitter Control Panel
	5	5.3.3	2	Proportional Preheat Battery Replacement
	5	5.3.5	2	280 Volt Power Supply
	5	5.3.6	2	Control Card Rack Circuit Boards
	5	5.3.7	2	Control Card Rack Interconnect Backplane
	5	5.3.8	2	RF Driver
	5	5.3.9	2	RF Pulse Sharper
	5	5.3.10	2	ARC Detector
	5	5.3.11	2	Post Charge Regulator
	5	5.3.12	2	Filter Capacitor Bank
	5	5.3.13	2	Charging Switch

	5	5.3.14	2	Trigger Amplifier
	5	5.3.15	2	Exhaust Blowers
	5	5.3.16	2	Filament Power Supply
	5	5.3.17	2	Focus Coil Power Supply
	5	5.3.18	2	+28 Volt Module J Power Supply
	5	5.3.19	2	+ 15 Volt Module I Power Supply
	5	5.3.20	2	- 15 Volt Module I Power Supply
	5	5.3.21	2	+ 5 Volt Module K Power Supply
	5	5.3.22	2	+ 45 Volt Module L1 Power Supply
	5	5.3.23	2	Vacuum Pump Power Supply Assembly
	5	5.3.24	2	Isolation Transformer
	5	5.3.25	2	Klystron Tube/Focus Coil
	5	5.3.26	2	Heat Exchanger
	5	5.4.2	2	Oil Tank Assembly
	5	5.4.3	2	Modulator Pulse Assembly
	5	5.4.4	2	Cabinet Blower Assembly
	5	5.5.2	2	Low Voltage Power Supplies
	5	5.5.3	2	Filament Current Adjustment
	5	5.5.4	2	Focus Coil Current Adjustments
	5	5.5.6	2	Transmitter Peak Power
	5	5.5.7	2	Post Charge Regulator Alignment
	5	5.5.10	2	Klystron Transmitter Tuning
EHB 6-518	3	Table 3-2	2	Elevation Limit Switch Replacement
	3	Table 3-2	3	RDADP DCU Drawer Power Supply
	3	Table 3-2	2	Elevation Manual items – Replacement Procedures
	3	Table 3-2	2	Azimuth Manual Items – Replacement Procedures
	3	Table 3-2	2	Receiver Protector Replacement Procedure
	3	Table 3-2	2	Low Noise Amplifier Replacement Procedure
	3	Table 3-2	2	Main Bearing Oil Sensor – Replacement Procedures
	3	Table 3-2	2	Azimuth Rotary Joint – Replacement Procedures

	3	Table 3-2	2	Circulator – Replacement Procedure
	3	Table 3-2	2	Bandpass Filter – Replacement Procedure
	6	6.4.2	2	Lifting with Davit Crane and Maintenance Hatch
EHB 6-520	6	Table 6-7	2	Router Assembly Replacement Procedure
	6	Table 6-7	2	KVM Switch Replacement Procedure
	6	Table 6-7	2	UPS Assembly Replacement
	6	Table 6-7	2	LAN Switch Replacement
	6	Table 6-7	2	FAA RMS Power Administrator Replacement
	6	Table 6-7	2	Power Filter Replacement
	6	Table 6-7	2	MSCF Processor Assembly Replacement
	6	Table 6-7	2	MSCF Processor Drive Replacement Procedure
	6	Table 6-7	2	MSCF Monitor Replacement
EHB 6-540	6	6.5.5	2	RDA/RPG MLOS Shelter PDP Circuit Breaker Replacement
EHB 6-550	3	3.2.11	2	Security Alarm Panel Operational Check
	3	3.2.23	2	Hydrogen Detector Operation Check
	3	3.3.3	2	RPIE Fault Maintenance Procedure
	3	3.5.4	2	Lifting with Davit Crane and Maintenance Hatch
	3	3.5.7.1 – .93	2	Removal Replacement Procedures for a variety of components
	3	3.6.1-.10	2	Alignment and Adjustments Procedures for a variety of components

**Equipment Maintenance Procedures That Require More Than One (1) Person
Upper Air Maintenance Activities**

Tech Manual (TM)	TM Chapter #	Reference	Number of Technicians Required	Statements from Procedure
		ART -1	2	Removing and Replacing Azimuth Drive – device is over 90lbs Elevation Drive – device is over 90lbs
			2	Azimuth Drive Synchro Adjustment One person must work on exposed electrical wiring at or over 120 v while one ensures alignment is correct.
			2	Pylon Replacement Awkward work and weight of device
		ART - 2	2	Removing and Replacing Azimuth Drive – device is over 90lbs Elevation Drive – device is over 90lbs
			2	Azimuth Drive Synchro Adjustment One person must work on exposed electrical wiring at or over 120 v while one ensures alignment is correct.
			2	Pylon Replacement Awkward work and weight of device
		RRS	2	Scanner Replacement

ATTACHMENT B

Screening Criteria for Heat Stress Exposure (WBGT values)
(ACGIH, 2001 TLVs and BEIs)

Hourly Activity	Light		Moderate		Heavy		Very Heavy	
	Unacclimatized	Acclimatized	Unacclimatized	Acclimatized	Unacclimatized	Acclimatized	Unacclimatized	Acclimatized
100% Work	27.5	29.5	25	27.5	22.5	26.0	21.0	25.0
75% Work 25% Rest	29.0	30.5	26.5	28.5	24.5	27.5	22.5	26.5
50% Work 25% Rest	30.0	31.5	28.0	29.5	26.5	28.5	25.0	27.5
25% Work 75% Rest	31.0	32.5	29.0	31.0	28.0	30.0	26.5	29.5

Notes:

- WBGT values are expressed in °C and are rounded to the nearest half degree.
- Work and rest environments are assumed to be the same. When they are different, hourly time-weighted averages (TWA) should be calculated and used. TWAs for work rates should also be used when they vary within the hour.
- Values in the table are applied by reference to the "Work-Rest Regimen" section of the *Documentation* and assume 8-hour work days in a 5-day work week with conventional breaks as discussed in the *Documentation*. When work days are extended, consult the "Application of the TLV" section of the *Documentation*.

* - TLVs - Threshold Limit Values

ATTACHMENT C
TLVs* Work/Warm Up Schedule for Four-Hour Shift
 (ACGIH, 2001 TLVs and BEIs)

Air Temperature - Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph wind		15 mph wind		20 mph wind	
⁰ C (approx.)	⁰ F (approx.)	Max Work Period	No. of Breaks								
-26 ⁰ to -28 ⁰	-15 ⁰ to -19 ⁰	(Norm. Breaks) 1		(Norm. Breaks) 1		75 min	2	55 min	3	40 min	4
-29 ⁰ to -31 ⁰	-20 ⁰ to -24 ⁰	(Norm. Breaks) 1		75 min	2	55 min	3	40 min	4	30 min	5
-32 ⁰ to -34 ⁰	-25 ⁰ to -29 ⁰	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	
-35 ⁰ to -37 ⁰	-30 ⁰ to -34 ⁰	55 min	3	40 min	4	30 min	5	Non-emergency work should cease			
-38 ⁰ to -39 ⁰	-35 ⁰ to -39 ⁰	40 min	4	30 min	5	Non-emergency work should cease					
-40 ⁰ to -42 ⁰	-40 ⁰ to -44 ⁰	30 min	5	Non-emergency work should cease							
-43 ⁰ & below	-45 ⁰ & below	Non-emergency work should cease		Non-emergency work should cease							

Notes:

- Schedule applies to any 4-hour work period with moderate to heavy work activity, with worm-up periods of ten (10) minutes in a warm location and with an extended break (e.g., lunch) at the end of the 4-hour period in a warm location. For light-to-moderate work (limited physical movement): apply schedule one step lower. For example, at -35⁰ C (-30⁰ F) with no noticeable wind (step 4), a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (step 5).
- The following is suggested as a guide for estimating wind velocity if accurate information is not available:
 5 mph: light flag moves; 10 mph: light flag fully extended; 15 mph: raises newspaper sheet; 20 mph: blowing and drifting snow.
- TLVs apply only for workers in dry clothing.

* - TLVs - Threshold Limit Values

ATTACHMENT D

Cooperative Observer Program Site Safety Review Form

This form covers site safety at a Cooperative Observer Program site for routine visits. It is not intended to cover every extenuating possibility. Cooperative Observer Program site visitors are expected to use sound judgment in ensuring personal safety.

WFO _____

Cooperative Site	Hazard	Explanation	Remedy	Last Reviewed/initials

Hazards:

1. Siting Dangers - Requiring work (1) on a cliff, narrow ledge, or steeply inclined slope, where a loss of footing would result in death or serious injury, or when working in areas where there is significant danger of rock falls or avalanches; (2) on river gauges located on the side of a bridge without adequate sidewalks; (3) at a high crime site; (4) with hoisting or rigging operations; or (5) outdoors in undeveloped jungle regions outside the continental U.S.

2. Transient Factors – (1) Exposure to factors which may lead to danger, such as expected encounters with wild animals, birds of prey, or snakes who have a high potential for inflicting serious injury or death; or, (2) Hazardous Weather - When working at remote sites in extreme summer/winter weather, when shelter is not readily available.

ATTACHMENT E
Sample Cooperative Observer Program Site Safety Review Form

WFO Charleston, WV

Cooperative Site	Hazard	Explanation	Remedy	Last Reviewed/initials
Elbow Knob 3SW, WV	None			6/27/03/JMP
Keebler, KY	a	Instrument shelter located on 35% grade (estimated); back slopes to cliff 5' away with 10' drop.		3/25/04/JMP
Mitchell General Store, WV	b(2)	11/28/03 visit - early season storm - 4+” and falling, over 3 miles of unimproved roads (gravel)	Reschedule required service for summer months; 2 person trips for unscheduled service when accumulating warning criteria snow forecast.	11/28/03/GGR
Gypsum 1W, WV	None			6/02/03/JKS
Etc.				

Hazards:

1. Siting Dangers - Requiring work (1) on a cliff, narrow ledge, or steeply inclined slope, where a loss of footing would result in death or serious injury, or when working in areas where there is significant danger of rock falls or avalanches; (2) on river gauges located on the side of a bridge without adequate sidewalks; (3) at a high crime site; (4) with hoisting or rigging operations; or (5) outdoors in undeveloped jungle regions outside the continental U.S.
2. Transient Factors – (1) Exposure to factors which may lead to danger, such as expected encounters with wild animals, birds of prey, or snakes who have a high potential for inflicting serious injury or death; or, (2) Hazardous Weather - When working at remote sites in extreme summer/winter weather, when shelter is not readily available.