ENERGY NORTHWEST

INTEROFFICE MEMORANDUM

DATE: August 7, 2000

TO: Distribution

FROM: Procedure Control, Administrative Services, WNP-2 (927A)

Becky D. Francisco

SUBJECT: **WNP-2 PLANT PROCEDURES MANUAL - VOLUME 13**
PACKAGE NO. 2000-373

REFERENCE:

The following Procedure(s) have been revised/approved and are to be inserted in your controlled copy of the Manual and the superseded revisions are to be removed and destroyed:

Procedure	Rev.	Title
13.9.1	24	Environmental Field Monitoring Operations

Also included in this package are EDITORIAL CHANGES, please replace the pages located in your manual with the attached pages:

Procedure	Page
13.1.1A	3, 101, 133, 136, 140

To verify receipt or cancellation of the subject Procedure(s), please sign, date and **return this receipt to Procedure Control, MD 927A** within TEN (10) WORKING DAYS of the date of this IOM.

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Procedure Control (Mail Drop 927A)
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++ **Procedure Control assures delivery is arranged/made to J. Ittner**

* Level 1 File

DATE 08/07/00

EDITORIAL

13.1.1A

REFERENCES, (cont'd)

2.17 NUREG-0654/FEMA-REP-1, Rev. 1, Appendix 1 ("Basis For Emergency Action Levels For Nuclear Power Facilities")

2.18 WNP-2 Safeguards Contingency Plan

2.19 PPM 4.12.1.1, Control Room Evacuation and Remote Cooldown

2.20 ABN-WIND, Tornado/High Winds

2.21 ABN-FLOOD, Reactor Building 422' Area Flooding

2.22 PPM 5.0.10, EOP Flowchart Training Manual

2.23 PPM 5.1.2, RPV Control-ATWS

2.24 PPM 5.1.7, Primary Containment Flooding

2.25 PPM 9.3.22, Core Damage Evaluation

REFERENCE(S):

NUMARC NESP-007, Methodology for Development of Emergency Action Levels, Rev. 2, Unusual Event HA1

WNP-2 Reactor Building 422 Area Flooding, ABN-FLOOD

FSAR Table 3.2-1

WNP-2 Plant Specific EAL Guideline, HA1.7

8 Hazards 8.4 Natural Events

8.4.U.2 Unusual Event

NUMARC IC: HU1 - Natural and destructive phenomena affecting the Protected Area Boundary.

APPLICABILITY:

Operating Conditions	1	2	3	4	5	def

EMERGENCY ACTION LEVEL:

Weather Service projected winds GT 80 mph
OR
CR measured winds GT 66 mph (5 minute average at 33 ft)
OR
Report by plant personnel confirming the occurrence of a tornado striking within the Protected Area Boundary

BASES:

This event is a natural and potentially destructive phenomena that may accompany certain events such as a tornado or hurricane. These sustained high winds may also be produced by unstable weather conditions. However this event occurs, it may be a precursor to a more serious event and, therefore, represents a potential degradation in the level of safety of the plant.

A tornado touching down within the Protected Area is an observed event with the potential to cause damage to structures containing systems or functions necessary for the safe shutdown of the plant. As such, the occurrence of a tornado strike represents a potential degradation in the level of safety of the plant. If structural damage is confirmed, this event would be escalated to Alert 8.4.A.2. If it is determined that the occurrence of the tornado strike has either affected or caused the loss of shutdown cooling functions, then the consequences of the event are assessed under event category 7.1, "System Failures". The event may then be escalated via this category if appropriate.

REFERENCE(S):

ABN-WIND, Tornado/High Winds

NUMARC NESP-007, Methodology for Development of Emergency Action Levels, Rev. 2, Unusual Event HU1

Plant Specific EAL Guideline, HU1.1

8 Hazards 8.4 Natural Events

8.4.U.5 Unusual Event

NUMARC IC: HU1 - Natural and destructive phenomena affecting the Protected Area Boundary.

APPLICABILITY:

Operating Conditions	1	2	3	4	5	def

EMERGENCY ACTION LEVEL:

River level increase which threatens to flood the river pumphouse

BASES:

The station is located on an elevated plateau, well removed from risk of flooding by the Columbia River. The river pumphouse, located lower and closer to the river, may be prone to flooding. Should the river pumphouse be lost, the Standby Service Water Ultimate Heat Sink spray ponds have a 30 day supply of water. However, loss of the river pumphouse is deemed a potential degradation in the level of safety of the plant. The first Control Room indication of river pumphouse flooding would be TMU-LI-7 off-scale high.

REFERENCE(S):

ABN-FLOOD

NUMARC NESP-007, Methodology for Development of Emergency Action Levels, Rev. 2, Unusual Event HU1

Plant Specific EAL Guideline, HU1.7

This list was developed from equipment locations identified in FSAR Table 3.2-1, Seismic Category I. Equipment in Safe Shutdown Buildings is identified in FSAR Table 3.2-1, Seismic Category I.

REFERENCE(S):

ABN-WIND, Tornado/High Winds

NUMARC NESP-007, Methodology for Development of Emergency Action Levels, Rev. 2, Unusual Event HA1

FSAR Table 3.2-1

Plant Specific EAL Guideline, HA1.2

ENERGY NORTHWEST	USE CURRENT REVISION

WNP-2
PLANT PROCEDURES MANUAL

PROCEDURE NUMBER	APPROVED BY	DATE
*13.9.1	DWC - Revision 24	08/07/00

VOLUME NAME
EMERGENCY PLAN IMPLEMENTING PROCEDURES

SECTION
ENVIRONMENTAL FIELD MONITORING AND SAMPLING

TITLE
ENVIRONMENTAL FIELD MONITORING OPERATIONS

TABLE OF CONTENTS

1.0 PURPOSE

This procedure provides those individuals involved with Environmental Field Team (EFT), or Field Team, operations with instructions for responding to radiological emergencies at Energy Northwest nuclear facilities. The Environmental Field Teams will confirm radiological releases through actual measurements in the field to determine the extent of plume travel and contamination spread. Sampling and field analysis will be conducted following the instructions contained in attachments to this procedure.

2.0 REFERENCES

2.1 FSAR, Chapter 13.3, Emergency Plan, Sections 2, 5

2.2 CI 4.10, WNP-2 Environmental Thermoluminescent Dosimeter (TLD) Distribution and Collection

2.3 CI 4.11, Trip Directions to TLD Stations

2.4 CI 4.12, Airborne Samples Distribution, Collection and Shipping

2.5 CI 4.13, Trip Directions to Environmental Air Sampler Stations

2.6 PPM 13.2.1, Emergency Exposure Levels/Protective Action Guides

2.7 PPM 13.9.5, Environmental Sample Collection

2.8 PPM 13.9.8, River Evacuation Monitoring

2.9 PPM 13.13.4, After Action Reporting

2.10 PPM 13.14.4, Emergency Equipment

2.11 Sample Identification Form, 968-19324

2.12 Emergency Response Log, 968-23895

2.13 Field Team Dispatch and Tracking Worksheet, 968-25815

2.14 Ten Mile EPZ Field Team Summary Map, 968-25130

2.15 Field Team Radiation Survey Data, 968-26097

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Environmental air sampling should be performed sufficiently downwind to minimize dose. All field team personnel should be instructed to contact MUDAC prior to entering the plume and should be made aware of expected dose rates. Air sampling should not be conducted in fields greater than 2 rem/hr.

3.2 When driving off-road during the dry summer months, Field Team personnel should be aware of the potential for grass fires started by the vehicle's hot exhaust.

3.3 Due to the potential hazard of explosion or fire, adhere to good safety practices when obtaining environmental air samples by connecting the sampler's positive battery terminal lead first, then connecting the negative lead to a ground away from the battery's negative lead cable post (a ground connection can be any metal object within the vehicle's engine compartment). When completed air sampling, disconnect the negative lead first.

3.4 Field Team personnel need to be aware of the potential for heat stress problems when dressed in protective clothing on a hot summer day. The Field Team Coordinator should request a Safety Representative be called out for advisory purposes if this is perceived to be a potential problem.

4.0 PROCEDURE

4.1 Field Team Coordinator Duties

NOTE: The Field Team Coordinator checklist (Attachment 5.8) is provided for guidance.

4.1.1 Provide overall direction of environmental field teams. Coordinate each organization's team activities with the responsible agency for their respective area:

a. Exclusion Area Boundary -- Energy Northwest

b. Hanford Reservation -- Energy Northwest and DOE-RL

c. Outside the Hanford Reservation -- Energy Northwest and Washington State Department of Health

d. Oregon -- Oregon Department of Energy

4.1.2 Assign each field team deployed an identification number for use in communications and reporting (e.g., EN-1, EN-2, DOE-1, DOE-2, etc.).

4.1.3 Interface with the Dose Projection Health Physicist (DPHP) to determine the following:

a. Projected release path.

b. Areas which may require surveys, air sampling, or environmental sampling to verify plume location and deposition.

c. Emergency worker dose correction factor. The REM may need to be consulted for this information.

- the emergency worker dose adjustment factor should be multiplied by the PIC reading to determine total exposure.

4.1.4 Determine current year-to-date (YTD) dose of each Energy Northwest field team member. Using a dose projection computer, double click on the "Run Exposure Report" icon. This will download the most recent exposure report to the computer.

a. Double click on the "View Exposure Report" icon. This will display a list of all Energy Northwest personnel and their exposure history. Scroll to the desired name or select "Edit" and use the "Find" option.

b. Close the window when all desired records have been obtained.

4.1.5 Log each field team member's current year-to-date (YTD) dose, available dose, electronic dosimeter number, and the emergency worker dose correction factor in the Emergency Worker Dose Worksheet Section of the Field Team Dispatch and Tracking Worksheet (Form 968-25815). Available dose is 5000 mrem minus current YTD dose.

4.1.6 If necessary, request a support person or additional field team member to assist with recording incoming field team data.

4.1.7 Perform initial briefing of field teams prior to dispatch per Attachment 5.9.

a. Initial briefings should include individual exposures and limits.

b. Obtain field team vehicle license and cell phone numbers, and record them on the briefing guide.

4.1.8 Direct the Field Team Dispatcher in the control and routine briefing of field teams after they are dispatched.

4.1.9 Develop an initial plan of action to detect radiological effluent releases through the use of field teams taking into account computer generated data on current and potential effluent release exposure areas.

CAUTION: Environmental air sampling should be performed sufficiently downwind to minimize dose. All field team personnel should be instructed to contact MUDAC prior to entering the plume and should be made aware of expected dose rates. Air sampling should not be conducted in fields, projected or actual, greater than 2 rem/hr.

4.1.10 Position field teams per the following guidelines ensuring that field team member exposure is controlled in accordance with ALARA principles:

a. Locate one field team downwind in close proximity to the plant (about ¼-½ mile depending on wind conditions) to verify through field readings when the release begins. Use landmarks rather than GPS coordinates when field teams are close to the plant.

b. Locate the other field teams farther downwind to detect the leading edge and possibly the approximate side boundaries of the plume.

4.1.11 Direct field teams to contact the Field Team Coordinator for further instructions when they have located the plume boundary and prior to entering the plume for additional readings.

4.1.12 Keep the DPHP informed of field monitoring results.

4.1.13 Reposition field teams as necessary to track the plume's leading edge, the side boundaries and, when the release terminates, the trailing edge.

4.1.14 Consult with the REM to determine when an environmental air sample is necessary to determine specific isotopic content of the plume. If so, direct the field team to enter the plume and obtain the air sample keeping exposures ALARA.

a. Electronic dosimeters for field team members are set to alarm at 500 mrem pre hour. Direct field team members to leave the plume and contact you for guidance if their dosimeters go into alarm.

4.1.15 Periodically request dosimeter readings of field team members to assure personnel do not exceed Energy Northwest guides. The Emergency Worker dose limit is 5 rem TEDE, minus any accumulated dose. Ensure dosimeter readings are logged on the Field Team Dispatch and Tracking Worksheet (Form 968-25815).

4.1.16 Maintain up-to-date 10 mile and 50 mile MUDAC Field Team display maps, showing field team locations, and showing field team radiological monitoring results. Update Field Team Summary Maps (968-25130) as needed.

4.1.17 Periodically, or as requested, provide completed Field Team Summary Maps (Form 968-25130) to the REM.

4.1.18 When directed to assist with river evacuation monitoring, dispatch a field team to implement PPM 13.9.8.

4.1.19 Notify field teams when decisions are made to take KI, or to implement other protective measures.

4.1.20 Arrange for replacement of field team instrumentation or supplies when needed.

4.1.21 Upon shift change, brief your relief on current status of the emergency and field team activities.

4.1.22 Upon shift change or termination of the emergency:

a. Prepare an individual After Action Report. Refer to PPM 13.13.4.

b. Collect Field Team Kit Inventory Sheets and After Action Reports from all field teams.

c. Deliver After Action Reports to the DPHP.

4.2 Field Team Dispatcher Duties

4.2.1 Assign and dispatch field teams as directed and record data on the Field Team Dispatch and Tracking Worksheet (Form 968-25815).

4.2.2 Maintain radio contact with field teams and enforce radio discipline and good practices.

4.2.3 When significant changes occur during the emergency, complete a Field Team Briefing Worksheet (Attachment 5.9), conduct a roll call of all field teams and provide a radio briefing of worksheet information. Record field team acknowledgement following the briefing.

a. Continue to follow up with any teams that fail to acknowledge the briefing. The Washington field team coordinator should be informed of state teams not receiving the briefing.

4.2.4 When directed, notify field teams of any Protective Action Decisions (PADs) affecting the field teams or the public.

4.2.5 Periodically request dosimetry readings from field team members to ensure they are within limits and notify the Field Team Coordinator of results.

4.2.6 Maintain radio communications capability until all field teams have returned to the Plant Support Facility.

4.2.7 Act as Field Team Coordinator when requested.

4.2.8 Upon shift change, brief your relief on the current status of the emergency and field team activities.

4.2.9 Upon shift change or termination of the emergency:

a. Prepare an individual After Action Report. Refer to PPM 13.13.4.

b. Deliver After Action Report, and logs to the Field Team Coordinator.

4.3 Environmental Field Team Member Duties

4.3.1 Upon notification of Alert or higher classification, or as directed, proceed to the Emergency Operations Facility, or if directed, to Energy Northwest Alternate EOF at the MPF, and report to the Radiological Emergency Manager or Field Team Coordinator.

NOTE: If none of the above personnel are present, proceed with those procedure steps listed for getting field team equipment ready for use. Check back with one of the listed personnel when ready for dispatch.

4.3.2 Sign in on the EOF staffing board designated for listing field team members and obtain a field team identification designator number (i.e., EN-1, EN-2, etc.).

NOTE: Additional field team kits and the River Evacuation and Monitoring Kits are located outside Room 201 of the MPF. Keys for the cabinet are located in the glass front key box on the wall adjacent to the Room 201 door. Enter the MPF via the southeast keycard sliding door.

4.3.3 The first team member to arrive at the EOF should retrieve the Field Team Emergency Cabinet keys (key to the First Aid Room for entry to the ambulance bay, and the key to the field team radio cabinet) from the red key box on the EOF Field Team Supply Cabinet.

4.3.4 Obtain keys for the Energy Northwest designated field team vehicles from the EOF Field Team Supply Cabinet.

NOTE: Two of the designated field team vehicles are pool vehicles. One is normally located at Building 11. The second vehicle is located in front of the PEC. Use of another Energy Northwest or personal vehicle may be required to obtain these vehicles. Keys to all four designated field team vehicles are located in the EOF Field Team Emergency Cabinet.

4.3.5 Obtain bundled Field Team Document Packet of Maps, Forms and Procedures, and a GPS unit from the EOF Field Team Supply Cabinet.

NOTE: The electronic dosimeter dose rate alarm is set to 500 mrem per hour. The dose alarm is set to 1800 mrem. If the dosimeter goes into alarm, immediately leave the area and contact the Field Team Coordinator.

4.3.6 Obtain an electronic dosimeter from the EOF Field Team Cabinet. To activate the dosimeter, press the button on the side.

4.3.7 Report to the Ambulance Bay and unlock the following:

a. Field Team Emergency Cabinets #1 through #3 (PSF Ambulance Garage). Leave the key in the last lock.

b. Radio Charger Cabinet (PSF Room 118A - by decon shower).

4.3.8 Obtain field team equipment from the designated cabinets which includes the following:

NOTE: The combination to the field team kits is 911.

a. Protective Clothing Kit

b. Instrumentation Kit

c. Ribboned Stakes for marking sample locations

d. Air Sampling Kit

e. Field Sampling Kit

f. Field Team Portable Radios (2) and Spare Batteries (2) located in the Radio Charging Cabinets in PSF Room 118A.

4.3.9 If the inventory seal on any of the kits is broken, inventory the contents of that kit per the PPM 13.14.4 inventory list (located in the Field Team Document Packet) and notify the Field Team Coordinator if anything is missing.

4.3.10 Using the field team radio cabinet key, obtain the source to be used for performing instrument response checks located in the field team source cabinet in Room 118A. The source shall be returned to this cabinet when response checks are complete, and the cabinet locked.

4.3.11 Perform battery and response check, as applicable, on all radiation survey instruments in the instrumentation kit and record the information on the Checklist for Equipment Test, Attachment 5.1, located in the Field Team Document Packet, using the guidance contained in Attachment 5.1 and Attachment 5.2.

4.3.12 After the last Field Team completes instrument checks, return the source to the field team source cabinet, and return the key to the key box on the EOF Field Team Supply Cabinet.

4.3.13 Set up and test air sampler per Attachment 5.4. Observe rate meter to determine flow, and calculate time to get minimum of 10 cubic feet.

NOTE: The field team vehicle radio needs to be turned on for the following step.

4.3.14 When equipment check and vehicle loading is complete, establish radio contact with MUDAC and conduct radio checks, using the vehicle radio and both portable radios. See Attachment 5.2, Radio, Cellular Phone and GPS Operation Instructions, for guidance.

NOTE: If your radio is inoperable, establish contact by phone, or by cellular phone from a Field Team vehicle.

4.3.15 Turn on the GPS unit and verify the following:

a. The page with altitude, clock and position displays. If another page displays, press PAGES and select GROUP A.

b. Batteries are not low. Verify batteries by pressing PAGES, then select STATUS.

4.3.16 Obtain initial deployment assignment from MUDAC, and when directed by the MUDAC Field Team Coordinator, don appropriate protective clothing (PCs), and proceed to assigned location, continuously monitoring radiation levels.

4.3.17 The following Stability Class tables are provided to complement the briefing information received from the Field Team Coordinator.

STABILITY CLASS TABLE

Stability Classification	NRC Categories (Stability)
Extremely unstable	*A (1)*
Moderately unstable	*B (2)*
Slightly unstable	*C (3)*
Neutral	*D (4)*
Slightly stable	*E (5)*
Moderately stable	*F (6)*
Extremely stable	*G (7)*

4.3.18 Notify the Field Team Dispatcher upon arrival at your assigned location.

4.3.19 As directed, perform general area surveys, ground contamination surveys and portable air samples following the instructions contained in Attachments 5.3 through 5.6.

4.3.20 Maintain a chronology of significant inputs, actions, events and their resolutions on an already established log, or on the Emergency Response Log (Form 968-23895), for attachment to your After Action Report per PPM 13.13.4.

4.3.21 If directed to perform River Evacuation Monitoring refer to PPM 13.9.8.

4.3.22 If directed to retrieve environmental TLDs and/or fixed air samples, refer to Attachment 5.7.

4.3.23 When relieved at shift change, or termination of emergency event:

a. Brief your relief on responsibilities, duties and current status of actions being performed.

b. Report to the PSF ambulance bay area for survey, and, if necessary, decontamination.

c. Turn in personal dosimetry to the Health Physics Center staff and report to MUDAC for debriefing.

d. Prepare an individual After Action Report per PPM 13.13.4.

e. Deliver After Action Reports to the Field Team Coordinator.

4.3.24 When assigned as relief for the on shift Environmental Field Team Members:

a. Report to the Field Team Coordinator in MUDAC.

b. Receive an update on present conditions, and instructions for relieving the on shift team members.

c. Prior to beginning the assignment, obtain electronic dosimetry from the EOF Field Team Cabinet, and report to the Health Physics Center for a complete set of protective clothing.

d. Obtain replacement radio batteries from the radio charging cabinets in PSF Room 118A if needed.

e. Proceed to the field team location you are relieving, receive briefing and relieve the on shift field team.

f. Perform a battery check on all applicable instrumentation. Complete the Checklist for Equipment Test, Attachment 5.1.

g. Upon return of field team equipment:

1) Restore equipment to correct field team kit container and place in designated cabinet.

2) Refer to PPM 13.14.4, Emergency Equipment, for a list of kit contents. If kits contain the required items, reseal the kits.

3) Complete the Field Team Kit Replenishment Log located on the inside of the field team cabinet door noting any items used out of the kits. Refer to Attachment 5.10.

- Include the replenishment log with your After Action Report.

h. Prepare an Individual After Action Report per PPM 13.13.4.

i. Deliver all logs, data work sheets, and After Action Reports to the Field Team Coordinator.

5.0 ATTACHMENTS

5.1 Radiation Survey Instruments: Battery and Response Checks

5.2 Radio, Cellular Phone and GPS Operation Instructions

5.3 Field Radiation Surveys (General Area and Ground Contamination)

5.4 Portable Air Sampling Instructions

5.5 Sample Identification Form (968-19234) Instructions

5.6 Air Sampling Worksheet

5.7 Environmental TLD and Fixed Air Sample Retrieval Instructions

5.8 Field Team Coordinator Checklist

5.9 Field Team Briefing Worksheet

5.10 Field Team Kit Replenishment Log

RADIATION SURVEY INSTRUMENTS: BATTERY AND RESPONSE CHECKS

Prior to departure from the EOF, all radiation survey instruments should be battery and response checked. The Cesium 137 check source for response checking the instruments is located in the Field Team Source Cabinet inside a lead container. When response checking the instruments you are looking for any indication of an elevated reading.

When response checking the RO-2A (Beta/Gamma Dose Rate Meter) you may need to remove the source from the lead container and check window open in order to see a response. When finished, return the source to its container, and the container to the field team source cabinet. Lock the cabinet to maintain adequate source control, and return the key to the EOF Field Team Supply Cabinet.

1. Ludlum Model 2 Count Rate Meter

   The Ludlum Model 2 Count rate meter should be used when measuring gamma and beta radiation to determine Beta and Gamma contamination. It is used to take readings on air sample cartridges and filters. It is also used to detect levels of contamination on samples, equipment and on yourself.

   The Count rate meter can be used to differentiate between Gamma and Beta radiation by placing a piece of cardboard over the probe. If uncovered readings are higher than covered readings then this is an indication of the presence of Beta radiation. If there is no difference between the readings, you are seeing only Gamma. An indication of Beta would mean you are in the plume. An indication of only Gamma would mean the plume is overhead.

   a. Battery Check

      1.1.1 Place Selector switch to BAT. The needle should deflect to BAT TEST portion of the scale.

      - If the battery response does not deflect into the BAT TEST portion of the scale, the two D cell batteries should be replaced.

   b. Response Check

      1.2.1 Attach the HP 260 pancake probe to the count rate meter.

      1.2.2 Press the RES button to ensure that scale reading goes to zero.

      1.2.3 Set the Selector switch to X1.

      1.2.4 Set the F-S switch to fast. The F-S response toggle switch dampens meter response from 3 seconds (F) to 11 seconds (S).

1.2.5 Set the audio toggle to ON

1.2.6 Slowly pass the probe over the surface of the source at about one centimeter.

1.2.7 If the response check was satisfactory; initial, date and check the SAT block on the checklist.

1.2.8 If the instrument fails the response check, contact the HP in the Health Physics Center for assistance.

2. Ludlum Model 3 Micro R Meter

The Ludlum Micro R meter should be used for detection of very low level gamma radiation. This instrument is used to determine plume boundaries (10 times background or approximately 100 micro R) and to determine dose rates. The Micro R meter has a range of 0 to 3000 Micro R/hr. When levels exceeding 2000 Micro R/hr are detected, the RO-2A should be used.

For initial surveys, the meter should be set to the X1 range. The Range selector switch positions for the Micro R meter includes a X0.1 scale. On the meter this indicates a range of 0 to 3 Micro R/hr. Because background is approximately 10 Micro R/hr, this scale will always be pegged.

a. Battery Check

2.1.1 Place Selector switch to BAT. The needle should deflect to BAT TEST portion of the scale.

- If the battery response does not deflect into the BAT TEST portion of the scale, the two D cell batteries should be replaced.

b. Response Check

2.2.1 Press the RES button to ensure that scale reading goes to zero. The RES button should also be pushed when changing ranges to quickly re-zero the meter.

2.2.2 Set the Selector switch to X1.

2.2.3 Set the F-S switch to fast. The F-S response toggle switch dampens meter response from 3 seconds (F) to 11 seconds (S).

2.2.4 Set the audio toggle to ON.

2.2.5 Slowly pass the probe over the surface of the source at about one centimeter.

2.2.6 If the response check was satisfactory; initial, date and check the SAT block on the checklist.

2.2.7 If the instrument fails the response check, contact the HP in the Health Physics Center for assistance.

3. Eberline Model RO-2A Meter

CAUTION: The chamber face of the RO-2A is a Beta window of ultra-thin mylar and is covered by a sliding Beta shield to allow Beta/Gamma differentiation. Caution should be taken not to puncture the mylar screen when the Beta shield is open.

The Eberline Model RO-2A meter should be used once levels of radiation exceed 2000 Micro R/hr detected by the Micro R meter.

The Beta window is moved by first depressing the friction release button located on the side of the instrument case. To slide the window, tilt the case either up or down while depressing the button.

Full instrument response time of the RO-2A is five seconds. This means the meter needle will move from a reading of zero to 90% of full scale in five seconds. To obtain accurate results, the instrument should be moved slowly enough to evaluate the extent of a change in meter reading.

To differentiate between Beta and Gamma radiation, a reading should first be taken with the window open and then with window closed. If there is no difference in readings you are seeing only Gamma. If there is a difference then you are seeing both Gamma and Beta. A reading with both Gamma and Beta detected would indicate that you are in the plume.

a. Battery Check

3.1.1 The RO-2A has two battery checks with two nine volt batteries for each test. Place the Range Selector switch in each BAT position and verify that the meter indicates above the BATT OK mark.

- If the battery response does not deflect into the BAT OK portion of the scale, the nine volt batteries should be replaced.

b. Response Check

3.2.1 Place the Range Selector switch in the ZERO position and adjust ZERO knob until the meter indicates ZERO (0).

3.2.2 Set the Selector Switch to the 0-50 mR/hour position.

3.2.3 With the window open, slowly pass the instrument over the source at about one centimeter. (You may need to remove the source from the lead container to obtain a response.)

3.2.4 If the response check was satisfactory; initial, date and check the SAT block on the checklist.

3.2.5 If the instrument fails the response check, contact the HP in the Health Physics Center for assistance.

CHECKLIST FOR EQUIPMENT TEST

NOTE: Return the check source to the field team source cabinet and lock the cabinet when done response checking instruments. Return the key to the EOF Field Team Supply Cabinet key box.

Instrumentation Kit	Serial Number	Initials/Date & Time	Response Check		Battery Check	
			Sat	Unsat	Sat	Unsat
Micro R Meter						
Beta/Gamma Dose Rate Meter (RO-2A)						
Count Rate Meter/Pancake GM Probe (Frisker/Geiger counter)						
Portable Radio (Check operability with Field Team Coordinator)	N/A		N/A	N/A		
Verify Cell Phone operation	N/A		N/A	N/A	N/A	N/A
Global Positioning System (GPS) Unit			N/A	N/A		
Zero High Range Pocket Dosimeters	N/A		N/A	N/A	N/A	N/A
Zero Low Range Pocket Dosimeters	N/A		N/A	N/A	N/A	N/A
Return Source to field team source cabinet; lock cabinet; return key to the field team cabinet.	N/A		N/A	N/A	N/A	N/A
Other (Specify)			Partic-ulate	Iodine	Cubic Feet	
Air Sampler Operational Check						

RADIO, CELLULAR PHONE AND GPS OPERATION INSTRUCTIONS

1. Radio Operating Procedures

   a. Turn on the radio (vehicle radios must be turned on each time the vehicle is turned off and back on).
   b. Set the frequency selector to the F-1 channel.
   c. Place the speaker toggle switch to normal position (speaker open).
   d. Rotate the squelch control counterclockwise until you receive squelch.
   e. Adjust the volume to desired level.
   f. Rotate the squelch control clockwise until the noise just stops. This is the threshold setting. Do not adjust further. Excessive squelch reduces radio sensitivity. If unable to silence squelch, the battery must be replaced. Contact the Field Team Dispatcher for replacement batteries.

2. Radio Transmitting Instructions

   NOTE: Continuous transmissions lasting longer than approximately 30 seconds will be automatically interrupted by the repeater.

   a. Hold the radio upright with the speaker-microphone grill two or three inches from your mouth.
   b. Do not interrupt another user. If you do, someone will not be heard.
   c. When preparing to transmit, press the talk switch, and wait approximately one second before talking.
   d. Talk in a slow, clear, normal voice, with brief transmissions.
   e. When finished transmitting, release the talk switch to receive.
   f. State the station you are calling first, then state your identification number (e.g., MUDAC this is EN-2, or EN-2 this is WA-3).

3. Cellular Phone Instructions

   a. The cellular phone is activated automatically when the vehicle's ignition switch is in the ON position (vehicle running or not). If the phone does not activate, check the ON/OFF push button on the left side of the stand. It must be IN for operation.

   b. To place a call:

      - Remove the phone from its stand (or leave in the stand to use the remote microphone), enter the phone number you are calling and press the SND key.
      - When the call is complete, press the END key and hold the CLR key until the number you called is removed from the display.

   c. To receive a call:

      - Remove the phone from its stand, or to use the remote microphone, press the SND key to answer the call. Your phone will be disconnected when the calling party hangs up.

GPS OPERATING INSTRUCTIONS

1. Start up

   a. Attach the cigarette lighter adapter to the GPS unit.
   b. Press the PWR button.
   c. Press EXIT twice to view Altitude, Clock and Position information.
      1) If this information does not display, select PAGES and GROUP A. Press EXIT to close the options window.

2. Obtaining a Position

   a. The unit activation requires the unit to lock onto several satellites. Depending upon the length of time since the last activation, this may take three to five minutes.

3. Viewing Local map

   a. Press PAGES and select MAP 1, using the UP/DOWN arrow.

   b. Use the ZOUT/ZIN to enlarge or decrease the area to be viewed.

   c. Use the arrow keys to move the cross hairs to the desired location.

   d. Press the EXIT button to remove menu overlays.

3. Satellite Status Screen

   a. Appears each time the unit is turned on.

   b. Displays satellite status and a battery level indicator on the lower right.

FIELD RADIATION SURVEYS

1.0 General Area Surveys-

1.1 Before entering an affected area, perform a background measurement using the Micro-R Meter and record background reading and time on form 968-26097.

1.2 As directed by MUDAC, proceed toward the plume using the Emergency Zone Map booklet from the Field Team Kit and GPS unit to determine the location of the plume.

1.3 Using the MicroR meter set on the x1 scale, search for the edge of the plume (defined as ten times background). Increase scales as radiation levels increase.

1.4 When the Micro-R Meter reads 2000 micro-R/hr (2 mrem/hr) or greater, change to the beta/gamma dose rate instrument, RO-2A.

NOTE: If your electronic dosimeter goes into alarm, immediately leave the area and contact the Field Team Coordinator. The dosimeter will reset when the dose rate returns to a level less than 500 mrem per hour.

1.5 When directed by MUDAC, traverse the plume constantly monitoring radiation levels and record locations, dose rates and other required information for the plume centerline and edges on form 968-26097 (indicate type of survey by G for general area). Proceed until the other edge of the plume is identified.

1.6 If the dose rate is greater than 2 mrem/hr, use the beta/gamma dose rate instrument to tell if you are in the plume or just seeing plume shine as follows:

NOTE: All open and closed readings must be done in the same location and not from a moving vehicle. Consider ALARA practices in choosing how many readings to take.

a. When first entering the plume, and again at centerline, take open and closed window readings at 3 feet and 6 inches above the ground.

b. If the open and closed window readings are approximately the same, then the plume is probably overhead and has not touched down.

c. If the open window reading is higher than the closed window reading, (by approximately 20% or greater) then you are probably in the plume.

d. Record both sets of open and closed window readings.

1.7 If the Micro-R Meter indicates a plume reading of less than 2000 micro-R/hr, you can determine if you are actually in the plume (instead of under it) by repeating Step 1.6 using the Count Rate Meter/GM pancake probe as the instrument, and the cardboard from your notebook as a window.

1.8 Do not stop to report data while in the plume. Report the plume edge and centerline readings and their locations to the Field Team Dispatcher at the earliest possible time.

1.9 Leave the plume area when not taking readings, but leave the instrument turned on at all times for constant monitoring purposes.

1.10 After being in the plume, periodically conduct a survey of yourself and your vehicle using the count rate meter, and if grossly contaminated, advise the Field Team Dispatcher.

2.0 Ground Contamination Surveys

2.1 As directed by the Field Team Dispatcher, perform a ground contamination survey:

a. Select small area of level ground (3′ x 3′) with minimal vegetation.

NOTE: The detector probe should not be allowed to touch the ground or come in contact with potentially contaminated vegetation.

b. Using the Micro-R Meter and the count rate meter, take readings at ground level (1-2 inches (5 cm) above the surface) and at waist level, approximately 3 feet above the ground.

c. If Micro-R Meter readings are above 2000 micro-R/hr, use the dose rate meter and repeat ground level and waist level readings at the same locations.

d. If ground level reading is higher than waist level reading, assume the ground to be contaminated.

2.2 Record all four readings on the Field Team Radiation Survey Data Form, 968-26097 (indicate the type of survey by C for contamination).

2.3 Repeat the ground contamination survey in several locations.

2.4 Select the highest set of readings and report them to the Field Team Dispatcher.

PORTABLE AIR SAMPLING INSTRUCTIONS

> WARNING: Environmental air sampling should be performed sufficiently downwind to minimize dose. All field team personnel should be instructed to contact MUDAC prior to entering the plume and should be made aware of expected dose rates. Air sampling should not be conducted in fields, projected or actual, greater than 2 rem/hr and closer than 1.2 miles from the plant.

When directed by MUDAC, collect an environmental air sample in accordance with the following instructions:

NOTE: Air sampler preparation (sample head assembly) and paperwork initiation should be performed outside the plume. Test operate the air sampler and determine CFM flow setting prior to entering the plume to reduce risk of exposure. Refer to steps 9 and 10 of this Attachment.

1. Use a portable air sampler, equipped with a two-inch sample head, to obtain particulate and radioiodine samples.

2. Continue to monitor your exposure during performance of this procedure.

   NOTE: During drills, use the charcoal cartridges marked for drill use. DO NOT use silver zeolite cartridges during drills.

   NOTE: If your electronic dosimeter goes into alarm, immediately leave the area and contact the Field Team Coordinator. The dosimeter will reset when the dose rate returns to a level less than 500 mrem per hour.

3. Insert a clean two-inch filter paper, (spongy side facing outward), into the air sample head, and attach to the sampler. Refer to the diagram in this Attachment.

4. Proceed to assigned sample location.

> WARNING: Potential hazard of explosion or fire during connection of the sampler's leads to the vehicle's battery terminals exists.

5. Connect the sampler's positive lead to the vehicle's positive battery terminal first, then connect the negative lead to a ground away from the battery's negative terminal. A ground connection can be any metal object within the vehicle's engine compartment.

6. Leave vehicle engine running while operating the air sampler to assure constant voltage.

7. Ensure the following conditions of operation are met:

   - If at all possible, do not place sampler on a known contaminated surface
   - Keep sampler away from vehicle exhaust gases
   - Do not point air sampler inlet toward any object which may restrict air flow
   - Do not stand in front of sampler inlet when running or allow loose clothing to restrict air flow

8. Turn the air sampler on. Determine initial flow rate from the rotometer on the side of the air sampler.

9. If the flow rate is less than one or greater than five CFM, the air sample will be invalid. Leave the plume and contact the Field Team Coordinator for further instructions.

10. Perform area dose rate survey for sample location.

11. Return to the vehicle's interior and record start flow rate, sample start time and sample location dose rate on the Sample Identification Form (Form 968-19324).

12. Based on air sampler flow rate, determine the sample time necessary to obtain a sample of 10 cubic feet.

13. Upon completion of sampling, note stop flow rate and sample stop time, then turn off and disconnect sampler. Disconnect the negative lead, then the positive lead.

14. Leave the area of the plume to complete your documentation following the instructions in Attachment 5.5.

15. Label the plastic bags for the filter and charcoal cartridges with the sample identification number, location, date, and time collected.

16. If using charcoal cartridge vs. Silver Zeolite, purge noble gases by reconnecting air sampler to vehicle battery and drawing clean air through filter and cartridge for a minimum of 2 minutes.

17. Disassemble sample head to allow access to the particulate filter and the cartridge.

18. Determine filter and cartridge dose rate or count rate by placing the appropriate instrument detector on the inlet side of the filter or cartridge.

19. Record field iodine and particulate results in Remarks Section of Sample Identification Form and report to Field Team Coordinator.

20. Record sample readings on Sample Identification Form (968-19324).

21. Remove the filter (using tweezers) and the cartridge from sample head and place filter and cartridge in separate plastic bags then seal bags.

22. Report particulate filter and cartridge readings to MUDAC. If requested by MUDAC, perform a field analysis of the cartridge or particulate filter by performing the following steps:

    NOTE: If the sample must be measured by dose rate meter, call the dose rate in to MUDAC and skip step b.

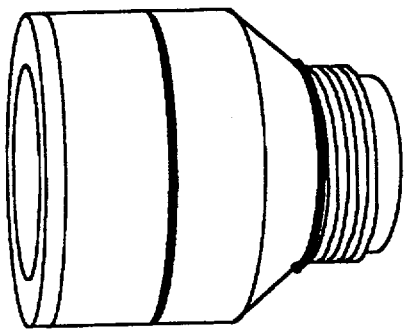
    a. Obtain background count rate (should be less than 500 cpm) and cartridge or filter count rate (see Step 17 above) and record on Attachment 5.6. Inform MUDAC of the results.

    b. Calculate the μCi/cc of Iodine Activity or Particulate Activity using the equations in Step 1 and Step 2 of Attachment 5.6.

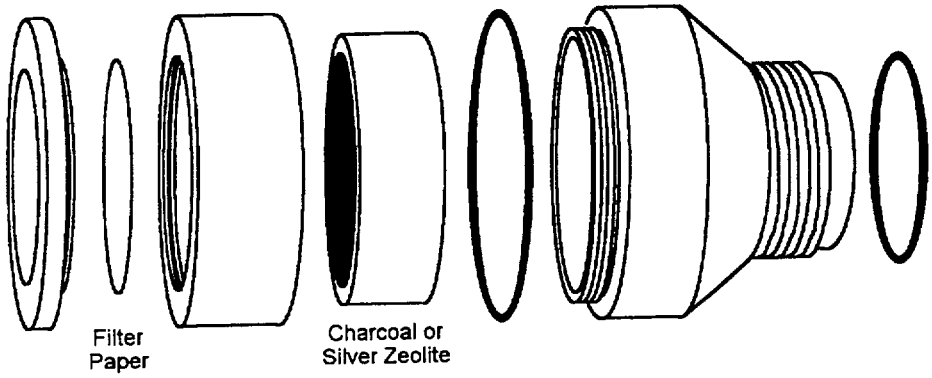
23. Survey team members for contamination. If contaminated, advise the Field Team Dispatcher.

24. Transport the samples, with Sample Identification Forms, as directed by the Field Team Coordinator. Ensure that particulate filters and the corresponding cartridges are transported together and that Sample Identification Forms accompany the samples.

SAMPLE HEAD DIAGRAM



Sample Head - Assembled



Sample Head - Disassembled

970713
Nov 1997

**Filter Cartridge and Sample Head for High Volume Air Sampling Pumps
Model CFH-30**

SAMPLE IDENTIFICATION FORM (968-19234) INSTRUCTIONS

1. SAMPLE IDENTIFICATION FORM

List one sample per form. For air samples, use one sample form and one sample identification number for both the cartridge and particulate filter. Attach one copy of the form to the cartridge and one to the particulate filter.

2. SAMPLE IDENTIFICATION NUMBER DESIGNATION

SAMPLE ID NUMBERS will be in a two segment alpha-numeric code using the following format:

FIELD TEAM	SEQUENCE
AA0	000

FIELD TEAM CODES	SEQUENCE
Use a two-letter and single number designator, (e.g., EN-1 for Energy Northwest Field Team 1).	Use sequential numbers for each team throughout an event, (e.g., 003 for the third sample taken by a given team).

3. SAMPLE TYPE

Describe the type of sample being collected-air, soil, vegetation, water, etc.

4. FIELD TEAM SAMPLE LOCATION/DESIGNATION

Use sample station numbers where they exist, such as continuous environmental air sampling stations (e.g., Sample Station 3). Where no sample station number exists, as in emergency field samples, enter the GPS location.

AIR SAMPLING WORKSHEET

Sample No. _____

Analysis Time _____

Analyst _____

1. Cartridge Filter: AgZ Filter ☐ Charcoal Filter ☐

(Sample CPM _____) - (Background CPM_____) = Net CPM_____

$$\frac{\text{Net CPM}}{(1.89 \times 10^8) \times (\text{sample volume ft}^3)} = \_\_\_\_\_ \ \mu\text{Ci/cc I Activity}$$

NOTE 1: $1.89 \times 10^8 = 0.003$ (eff) $\times 2.83 \times 10^4$ cc/ft^3 $\times 2.22 \times 10^6$ dpm/μCi

NOTE 2: If using charcoal cartridge, ensure cartridge is purged of noble gases.

2. Particulate Filter

(Sample CPM _____) - (Background CPM_____) = Net CPM_____

$$\frac{\text{Net CPM}}{(5.65 \times 10^9) \times (\text{sample volume ft}^3)} = \_\_\_\_\_ \ \mu\text{Ci/cc Particulate Activity}$$

NOTE: $5.65 \times 10^9 = 0.09$ (eff) $\times 2.83 \times 10^4$ cc/ft^3 $\times 2.22 \times 10^6$ dpm/μCi.

Attachment 5.6

ENVIRONMENTAL TLD AND FIXED AIR SAMPLE RETRIEVAL INSTRUCTIONS

1.0 ENVIRONMENTAL TLD RETRIEVAL

Radiological Emergency Manager/Field Team Coordinator Duties

1.1 Consult with the Washington DOH representative at the Emergency Operations Facility (EOF) and determine the need for collection and replacement of environmental TLDs during the emergency.

NOTE: If possible, involve the Radiological Environmental Monitoring Program (REMP) Supervisor in any nonscheduled collection or deployment of environmental TLDs.

1.2 When collection is determined advisable, dispatch an experienced REMP staff member as part of an Environmental Field Team, to replace the ANNUAL TLD badges at selected locations as described in CI 4.10 and CI 4.11.

NOTE: Copies of CI 4.10 and CI 4.11 are in the document packet of the Environmental Field Team kit located in the MUDAC emergency supply cabinet.

REMP Staff Member Duties

1.3 Contact the Energy Northwest TLD Administrator to obtain replacement environmental TLDs for distribution.

1.4 Ensure that the required number of TLDs are provided for each exchange group as directed by the Radiological Emergency Manager (REM).

1.5 Contact the Field Team Coordinator regarding radiological conditions in the field, and follow his/her directions on individual radiation protection measures.

1.6 Proceed to the TLD stations as directed by the Field Team Coordinator.

1.7 Exchange only the ANNUAL TLDs.

1.8 When the TLDs have been exchanged, return to the Health Physics Center and turn them in to the Health Physics Center Staff for processing.

2.0 FIXED AIR SAMPLE RETRIEVAL

Radiological Emergency Manager/Field Team Coordinator Duties

2.1 Consult with the Washington DOH representative at the EOF and determine the need for collection of fixed air samples during the emergency.

NOTE: If possible, involve the REMP Supervisor in any nonscheduled collection of fixed air samples.

2.2 If collection is determined advisable, dispatch experienced REMP personnel as part of an Environmental Field Team to collect air samples at selected locations in accordance with CI 4.12 and CI 4.13.

NOTE: Copies of CI 4.12 and CI 4.13 are in the document packet of the Environmental Field Team kit located in the MUDAC emergency supply cabinet.

REMP Staff Member Duties

2.3 Contact the Field Team Coordinator regarding radiological conditions in the field and follow his/her directions on radiation protection measures to be taken.

2.4 Proceed to the fixed air sample stations as directed by the Field Team Coordinator.

2.5 Collect the air samples.

NOTE: If the emergency involved a radioactive release, calculations of the volume of air sampled may need to be restricted to the time during which the plume or puff was over the station. Request guidance from the Field Team Coordinator if the fixed air sample was in the path of a release during the sampling period.

2.6 When the air samples have been collected, return to the Health Physics Center and turn them in to the Health Physics Center Staff for processing.

FIELD TEAM COORDINATOR CHECKLIST DATE_____

	Actions	Time Completed	Initials
1.	Sign in on board, obtain supply drawer from EOF supply cabinet, and notify the REM of your availability.	_____	_____
2.	Brief the field team coordinators from other agencies supplying field teams and reach a consensus about management of their field teams.	_____	_____
3.	Determine current year-to-date exposure of Energy Northwest field team members prior to deployment.	_____	_____
4.	Assign field team members and a designate team identification number (one HP and one non HP per team, if possible).	_____	_____
5.	Ensure field teams have transportation and other equipment.	_____	_____
6.	Direct the Field Team Dispatcher(s) to brief the teams approximately each 30 minutes on current radiological projections or other appropriate information about emergency conditions.	-ongoing-	
7.	If necessary, assign an individual to act as field team recorder.	_____	_____
8.	Interface with the Dose Projection HP to determine projected plume path and emergency worker dose factor.	-ongoing-	
9.	Develop a strategy for assigning Field Teams initially, verifying plume path, and dealing with EOF inaccessibility.	-ongoing-	
10.	Direct field teams to perform field surveys per field team survey instructions contained in this procedure.	-ongoing-	
11.	Provide completed Field Team data summary maps to the Dose Projectionist Health Physicist (DPHP) as new information is developed. During rapidly changing conditions, try to do this at least every 30 minutes.	-ongoing-	
12.	Provide field team air sample data to the Dose Projection Health Physicist (DPHP) for use in calculating dose projections.	-ongoing-	
13.	If requested to assist with river evacuation monitoring, implement PPM 13.9.8 (kits are in MPF).	_____	_____
14.	Direct the dispatcher to periodically ask for field team dosimetry readings. Keep exposure ALARA.	-ongoing-	

	Actions	Time Completed	Initials
15.	Arrange for field team replacement supplies, as necessary.	-ongoing-	
16.	Provide completed Field Team Summary Maps to the REM.	-ongoing-	
17.	Notify field teams when decision is made to recommend KI.	_____	_____
18.	Upon shift change or change to State control, brief replacements.	_____	_____
19.	Upon shift change or termination of the emergency:		
	a. Prepare an individual After Action Report. Refer to PPM 13.13.4.	_____	_____
	b. Deliver After Action Report, logs, and all field team work sheets to the REM.	_____	_____

FIELD TEAM BRIEFING WORKSHEET

Date _____

Time _____

Plant Status: _____

_____

Initial Briefing: 1) Cell Phone: EN-1:_____ EN-2:_____ EN-3:_____

2) YTD Exposures: _____ _____ _____

_____ _____ _____

Emergency Classification: _____

Release Point: _____ Release Type: _____

Environmental Release Time: _____ Duration:_____

Projected Dose/Location: _____

Weather: Wind Direction From: _____ Speed:_____

Forecast: _____

PAD for Public: _____

_____

RADIOLOGICAL ASSESSMENT

Expected Conditions: __Hi Rad __Hi Contamination __Hi Airborne

Protective Clothing: __None __Single

Exposure Limitations: Individual Dose Limits____

Dose/Dose Rate to Notify MUDAC:____

Roll Call/Acknowledgment:

TEAM NO.	ACKNOWLEDGED AT: (Time)	COMMENTS

FIELD TEAM KIT REPLENISHMENT LOG

Date _____ Team Members _____

FIELD TEAM MEMBERS: List below the items used from each kit during the drill/event so that the kits can be restocked appropriately. Include the completed log with your After Action Report.

INSTRUMENTATION KIT:

_____
_____
_____
_____
_____

AIR SAMPLING KIT:

_____
_____
_____
_____
_____

PROTECTIVE CLOTHING KIT:

_____
_____
_____
_____
_____

FIELD SAMPLING KIT:

_____
_____
_____
_____
_____

MISCELLANEOUS (FORMS, MAPS, PROCEDURES, ETC.)

_____
_____
_____
_____

Return electronic dosimeters to the HP Technician in the HP Center for TES updates.

Attachment 5.10