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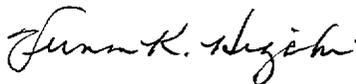
Perry Nuclear Power Plant
Docket No. 50-440
Submittal of Emergency Plan
Implementing Instructions

Gentlemen:

Pursuant to 10 CFR 50 Appendix E, enclosed are changes to the Emergency Plan Implementing Instructions (EPIs) for the Perry Nuclear Power Plant. These changes constitute revisions, temporary changes, or reissued pages. Please follow the updating instructions per the attached Controlled Document Instruction Sheet and return the signed Acknowledgment of Receipt form.

If you have questions or require additional information, please contact me at (440) 280-5294.

Very truly yours,



Vernon K. Higaki, Supervisor
Emergency Planning Unit

VKH: byr

Enclosure

cc: NRR Project Manager
NRC Resident Inspector
NRC Region III, Incident Response Center w/2 attachments

A045

FirstEnergy Nuclear Operating Company
Perry Nuclear Power Plant

Controlled Document Instruction Sheet

Manual: Emergency Plan Implementing Instruction (EPI – B7A/ Rev 8, C-0)

Control Number **60**

<u>Revision Number</u>	<u>Temporary Change No.</u>	<u>Remove and Replace Pages</u>
8	C-1	Reissue Entire Document

PERRY OPERATIONS MANUAL

Emergency Plan Implementing Instruction

PNPP
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CONTROLLED COPY
No.
INFORMATION
ONLY

TITLE: AUTOMATED OFFSITE DOSE CALCULATIONS

REVISION: 8

EFFECTIVE DATE: 5-20-02

PREPARED: J. C. Mack

11-29-01
/ Date

AUTOMATED OFFSITE DOSE CALCULATIONS

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SCOPE OF REVISION:

- Rev. 8 -
1. Revised in its entirety, no revision bars used.
 2. Removed definition not used in text.
 3. Put definitions in alphabetical order.
 4. Incorporated manual mode (old Section 6.9) into regular part of instruction.
 5. Clarified various steps.

AUTOMATED OFFSITE DOSE CALCULATIONS**1.0 PURPOSE**

This procedure provides instruction for the operation of the Computer Aided Dose Assessment Program (CADAP) used in the event of a radiological release to the environment which requires implementation of the Perry Emergency Plan. CADAP is a tool used by the TSC/EOF Dose Assessors or the Shift Chemistry Technician to develop Protective Action Recommendations (PARs).

2.0 SCOPE

This procedure applies to the use of the Computer Aided Dose Assessment Program.

3.0 RESPONSIBILITIES**3.1 Emergency Coordinator**

The TSC Operations Manager prior to the Emergency Operations Facility (EOF) being operational or the Shift Manager prior to the Technical Support Center (TSC) being operational shall perform these duties.

1. Review and approve Protective Action Recommendations (PARs).
2. Authorize the release of the results of dose projections and appropriate protective action recommendations to the applicable offsite agencies.

3.2 Offsite Radiation Advisor

The TSC Radiation Protection Coordinator prior to the EOF being operational or the Shift Engineer prior to TSC being operational shall perform these duties.

1. Supervise the performance of appropriate dose calculations by the Dose Assessor(s), including the review of all calculation sheets used.
2. Review Protective Action Recommendations (PARs), and recommend approval to the Emergency Coordinator.

3.3 TSC/EOF Dose Assessor(s)

These duties shall be performed by a qualified on-shift Chemistry Technician prior to the TSC or EOF being declared operational.

CAUTION

The Computer-Aided Dose Assessment Program (CADAP) user should be aware that dose assessment may be a complex and a multi-optioned endeavor. This instruction is designed to enable the user to perform the required dose projections in a timely manner; however, the user should use his/her judgment in selecting the appropriate options as dictated by the accident.

1. Perform applicable offsite dose calculations.
2. Develop Protective Action Recommendations (PARs) in accordance with <EPI-B8>.
3. Perform contingency calculations (what if?, what count rate will give PARs?, effect of core state, etc.) as requested by the Offsite Radiation Advisor.

3.4 Emergency Planning Unit

1. After a drill/exercise where MASTER capability was transferred from the Control Room PC, ensure Computer Support Unit (CSU) is contacted to have accumulated dose and other drill-related files deleted from the ICSPI, CADAP Directory.

4.0 REFERENCES

4.1 Source References

1. Computer-Aided Dose Assessment Program (CADAP), Version 3.0.2, Software Design Description (SDD), December 2001
2. Emergency Plan for PNPP Docket Nos. 50-440, 50-441

4.2 Use References

1. EPI-A1: Emergency Action Level
2. EPI-B7b: Manual Offsite Dose Calculations
3. EPI-B8: Protective Actions and Guides

4. HPI-B0003: Processing of Personnel Dosimetry
5. PEI-T23: Containment Control
6. Commitments addressed in this document:

None

5.0 DEFINITIONS

5.1 Above Normal Release

During implementation of the Emergency Plan, a release is considered "above normal" when one or more plant vent radiation monitors (D17) exceeds the ALERT (10% ODCM limit) setpoint on a noble gas channel. At this point, a radiological release is considered underway for off-site dose assessment purposes.

5.2 Atmospheric Dispersion Parameter

Symbol X/Q ("chi over q"). The amount of dispersion that has occurred between the point of release and the downwind plume centerline point of interest. X/Q s are expressed in units of sec/m^3 .

5.3 Committed Dose Equivalent (CDE)

The dose equivalent to organs or tissues of reference that will be received from an intake of radioactive material by an individual during the 50 year period following the intake. For dose assessment purposes, CDE for child thyroid is calculated.

5.4 Committed Effective Dose Equivalent (CEDE)

The sum of the products of the weighting factors applicable to each of the body organs or tissues and the committed dose equivalent to these organs or tissues. CEDE is the internal dose component of TEDE.

5.5 Computer-Aided Dose Assessment Program (CADAP)

The software program designed to provide an automated method for determining the present and/or potential offsite consequences of a significant release to the environment from the Perry Plant during an Emergency Plan event.

5.6 Deep Dose Equivalent (DDE)

The dose equivalent measured at a tissue depth of 1 cm ($1000 \text{ mg}/\text{cm}^2$). DDE is the external dose component of TEDE.

5.7 Dose Calculations

The evaluation of the consequences of a release of radioactive material which has exposed, or which may expose, emergency response personnel and members of the general public. Dose calculations include projection of offsite doses based on release parameters for both noble gases and iodines that could contribute to the Total Effective Dose Equivalent (TEDE) and Committed Dose Equivalent-Child Thyroid (CDEct) doses.

5.8 Pasquill Stability Class

Term used to describe the atmospheric conditions relevant to the dispersion of a release. The conditions are categorized into seven classes A through G. Class A is considered "very unstable" and correlates to the best dispersion. Class G is very stable, resulting in poor dispersion (and thereby higher offsite concentrations).

5.9 Total Effective Dose Equivalent (TEDE)

The sum of DDE (external dose) and CEDE (internal dose). For dose assessment purposes, DDE is considered the whole body dose per NUMARC "White Paper," entitled "Implementation of the New EPA Protective Action Guides in Existing Emergency Programs, April 1993."

6.0 DETAILS

The TSC/EOF Dose Assessor(s) or Shift Chemistry Technician will perform the following actions:

6.1 CADAP Log-On Instructions and General Orientation

The CADAP computer program operates in a windows environment. Typical windows based functions can be utilized to maneuver through the CADAP program.

1. If the CADAP PC has been down-powered, turn on the monitor, then the computer, and follow the on-screen instructions to obtain the LOGON INFORMATION screen.
2. Log onto the computer by performing the following:
 - a. Enter "CADAP" for both the Username and Password.
 - b. Click "OK".
3. Ensure the printer is operational and has a sufficient supply of paper.
4. On the desktop, double click on the "CADAP" icon.

5. When the CADAP STARTUP SCREEN appears, perform the following:
 - a. Select the File Maintenance tab.
 - b. Click "OK" to delete old files.
 - c. From the PROGRAM OPERATION tab, perform one of the following:
 - 1) For an actual emergency, select "Real" and "Data on host node".
 - 2) If the simulator is being used, select "Simulator" and "Data on host node".
 - 3) If drill files are being used, select "Drill" and "Data on local node".
 - d. Click "OK".
6. Verify that the window CADAP FOR WINDOWS is displayed, indicating that the program is running.
7. Verify the proper system status is displayed (flashing DRILL MODE, flashing SIMULATOR MODE or nothing flashing for REAL MODE).
8. Plant data (effluent monitor readings, meteorological data and selected plant system data) can be displayed by clicking on the "ICS" pull down menu and selecting "VALUES"
 - a. Periodically monitor the ICS Screen to determine the status and availability of plant and MET parameters.
 - b. Data in the right hand column can be changed as necessary. To change the data values, select the data point to be changed by clicking in the box adjacent to the data field. Double click on the value field and manually type in the new value.
 - c. The displayed data can be printed by clicking "PRINT".
 - d. To exit the ICS screen, click "OK".

(INTENTIONALLY BLANK)

9. When notified that dose assessment/PAR responsibilities have been transferred to your facility, perform the following:

CAUTION

The MASTER Capability should remain with the Control Room, except during events or drills/exercises, to avoid collecting unnecessary files on (ICSPI, CADAP Directory). Master control shall not be taken in the EOF until approved by the Emergency Coordinator.

- a. Click on the "UTILITIES" pull down menu.
- b. Select MASTER TERMINAL (Master Terminal Info screen will appear).
- c. Click "TAKE".
- d. When "This terminal is designated MASTER" is displayed, click "CANCEL".

10. Perform various dose projections as needed:

- Effluent Monitor Readings (Section 6.2)
- Effluent Sample Results (Section 6.3)
- Containment Failure Contingency (Section 6.4)
- Fuel Handling Accident Contingency (Section 6.5)
- RMT Field Data (Section 6.6)
- RMT Iodine Cartridge Data Analyses (Section 6.7)
- Deposition Exposure Calculations (Section 6.8)

11. Refer to Section 6.9 for instructions on the use of various utility features, i.e., Alarms, Note Pad, Calculator, etc.

6.2 Effluent Monitor Projections

1. From the CADAP FOR WINDOWS screen, click on the "PROJECTIONS" drop down menu.
2. Select "EFFLUENT MONITOR".
3. Select the vent path of concern or utilize the "UNMONITORED RELEASE" option.
4. If the effluent monitor readings are incorrect or indicate bad data (magenta), they can be manually changed by double clicking in the value field and manually typing in the correct value.

CAUTION

Source term is determined for each calculation using current plant conditions. Actual core state will be provided by the Offsite Radiation Advisor. At a minimum, Operations personnel and Reactor Engineering personnel should be included in the decision making process.

5. Click on the appropriate "Source Term used for calculation, based on CORE CONDITION" (No Damage, Clad Damage, Fuel Melt).
6. Using Attachment 1, CADAP Logic Flowchart, verify the proper non-noble gas reduction factors are indicated for the vent selected.
7. Enter the "Time Since Reactor Power <4%".

NOTE: If "time since reactor power <4%" is less than 1 hour or is not provided, the program defaults to 1 hour.

8. If the release is through more than one vent, click "Another", otherwise proceed to Step 10.
9. Repeat Steps 3-8 until all release paths are entered.
10. Click "OK".
11. Verify meteorological data, release duration, and event classification on the METEOROLOGICAL DATA Screen:
 - a. When the meteorological tower is lost or the meteorological data is invalid ('magenta'), perform one of the following:
 - 1) Edit the data if available under the VALUES TO USE column by double clicking the value and manually typing in the correct value, or
 - 2) If using visual observations, click the "ALT" button and select the appropriate conditions per <EPI-B7b>.
 - b. Revise the release duration (in hours), if appropriate.
 - c. Select either "YES" or "NO", as appropriate, based on the current event classification to respond to inquiry "Has a General Emergency been declared?"
 - d. Click "OK", verify the RESULTS - SCREEN 1 window appears.

CAUTION

The Preliminary Emergency Classification based on projected dose, which is displayed on the RESULTS - SCREEN 1 window, is for information only. This is NOT to be used in lieu of classification in accordance with <EPI-A1>.

12. Click on the "FILE" drop down menu and select "PRINT" to print this data page. Repeat this step if more than one copy is desired.
13. If requested, click on the "NOTIFICATION" drop down menu to display Page 2 of 2 of the Follow-up Notification form.
 - a. Verify the following information is correct and complete:
 - 1) Meteorological data (can only change precipitation option).
 - 2) Recommended protective actions (should automatically update).
 - 3) Basis for the PARs.
 - 4) Offsite Release information:
 - Airborne Release
 - Liquid Release
 - Actual Start Time (clock time)
 - Estimated Start Time (clock time)
 - Release Duration
 - Time of Reactor Power <4% (clock time)
 - 5) Release rates (cannot be changed).
 - 6) Source term used (cannot be changed).
 - 7) Non-noble gas reduction factors utilized (cannot be changed).
 - 8) Projected offsite doses (cannot be changed).
 - 9) Field survey data (cannot be changed) or Not Applicable.
 - 10) Estimate of any surface contamination (inside plant/outside plant).
 - 11) DRD to TEDE conversion factor (cannot change, notify Environmental Liaison of current value).
 - 12) Drill or Actual Emergency option.

- b. If any of the information is incorrect and cannot be changed on this screen, reperform the dose projections utilizing the correct information.
 - c. Obtain a printout by clicking on the "FORM" drop down menu and selecting "PRINT".
14. If desired to accumulate the dose calculations, perform the following:
- a. Click on the "INTEGRATED DOSE" drop down menu and select "ADD".
 - b. Select the sector (A-R) closest to centerline of the projected plume.
 - c. Verify the dose rates are correct.
 - d. Click "OK".

NOTE: The "Accumulated Dose" window gives you results for the particular dose projection you are running. The window will allow you to look at previous doses, replace the old calculations with the current figures, and print the current values.

Only the terminal designated as the "Master" will be able to save data to a common file. If not the "Master", data is saved only at the local PC.

6.3 Effluent Sample Analysis Projections

1. From the CADAP FOR WINDOWS screen, click on the "PROJECTIONS" drop down menu.
2. Select "SAMPLE ANALYSIS".
3. Input the sample data ($\mu\text{Ci}/\text{cc}$) from the sample results for only those isotopes identified.
4. Input the flow rate (kcfm) for the appropriate vent.
5. If sample results are available for more than one vent path, click "ADD", otherwise proceed to Step 7.
6. Repeat Steps 3 through 5 until all vent sample data is entered.
7. Click "OK".

8. Verify meteorological data, release duration, and event classification on the METEOROLOGICAL DATA Screen:
 - a. When the meteorological tower is lost or the meteorological data is invalid ('magenta'), perform one of the following:
 - 1) Edit the data if available under the VALUES TO USE column by double clicking the value and manually typing in the correct value, or
 - 2) If using visual observations, click the "ALT" button and select the appropriate conditions per <EPI-B7b>.
 - b. Revise the release duration (in hours), if appropriate.
 - c. Select either "YES" or "NO", as appropriate, based on the current event classification to respond to inquiry "Has a General Emergency been declared?"
 - d. Click "OK", verify the RESULTS - SCREEN 1 window appears.

CAUTION

The Preliminary Emergency Classification based on projected dose, which is displayed on the RESULTS - SCREEN 1 window, is for information only. This is NOT to be used in lieu of classification in accordance with <EPI-A1>.

9. Click on the "FILE" drop down menu and select "PRINT" to print this data page. Repeat this step if more than one copy is desired.
10. If requested, click on the "NOTIFICATION" drop down menu to display Page 2 of 2 of the Follow-up Notification form.
 - a. Verify the following information is correct and complete:
 - 1) Meteorological data (can only change precipitation option).
 - 2) Recommended protective actions (should automatically update).
 - 3) Basis for the PARs.
 - 4) Offsite Release information:
 - Airborne Release
 - Liquid Release
 - Actual Start Time (clock time)
 - Estimated Start Time (clock time)

- Release Duration
 - Time of Reactor Power <4% (clock time)
- 5) Release rates (cannot be changed).
 - 6) Source term used (cannot be changed).
 - 7) Non-noble gas reduction factors utilized (cannot be changed).
 - 8) Projected offsite doses (cannot be changed).
 - 9) Field survey data (cannot be changed) or Not Applicable.
 - 10) Estimate of any surface contamination (inside plant/outside plant).
 - 11) DRD to TEDE conversion factor (cannot change, notify Environmental Liaison of current value).
 - 12) Drill or Actual Emergency option.
- b. If any of the information is incorrect and cannot be changed on this screen, reperform the dose projections utilizing the correct information.
- c. Obtain a printout by clicking on the "FORM" drop down menu and selecting "PRINT".
11. If desired to accumulate the dose calculations, perform the following (this is not normally done for dose projections from effluent samples if dose projections from effluent monitor readings are being accumulated):
- a. Click on the "INTEGRATED DOSE" drop down menu and select "ADD".
 - b. Select the sector (A-R) closest to centerline of the projected plume.
 - c. Verify the dose rates are correct
 - d. Click "OK"

NOTE: The "Accumulated Dose" window gives you results for the particular dose projection you are running. The window will allow you to look at previous doses, replace the old calculations with the current figures, and print the current values.

Only the terminal designated as the "Master" will be able to save data to a common file. If not the "Master", data is saved only at the local PC.

6.4 Contingency - Containment Failure

1. From the CADAP FOR WINDOWS screen, click on the "CONTINGENCY" drop down menu.
2. Select "CONTAINMENT".
3. Select one of the following:
 - a. "DESIGN LEAKAGE" to conservatively project the off-site dose consequences from the source term in CNTMT, in which CNTMT integrity is not threatened, or
 - b. "TOTAL FAILURE" to project the resulting off-site dose based on a "worst case" scenario in the event of a CNTMT failure resulting from CNTMT over-pressurization or explosive gas concentrations, or in preparation for venting of CNTMT per <PEI-T23>.
4. Verify the radiation monitor readings, containment pressure and time since reactor power <4%. These readings can be changed by double clicking in the data field and manually entering the correct value.

NOTE: If "time since reactor power <4%" is less than 1 hour or not provided, the program will default to 1 hour.

5. Click "OK".
6. Verify meteorological data, release duration, and event classification on the METEOROLOGICAL DATA Screen:
 - a. When the meteorological tower is lost or the meteorological data is invalid ('magenta'), perform one of the following:
 - 1) Edit the data if available under the VALUES TO USE column by double clicking the value and manually typing in the correct value, or
 - 2) If using visual observations, click the "ALT" button and select the appropriate conditions per <EPI-B7b>.
 - b. Revise the release duration (in hours), if appropriate.
 - c. Select either "YES" or "NO", as appropriate, based on the current event classification to respond to inquiry "Has a General Emergency been declared?"
 - d. Click "OK", verify the RESULTS - SCREEN 1 window appears.

CAUTION

The Preliminary Emergency Classification based on projected dose, which is displayed on the RESULTS - SCREEN 1 window, is for information only. This is NOT to be used in lieu of classification in accordance with <EPI-A1>.

7. Click on the "FILE" drop down menu and select "PRINT" to print this data page. Repeat this step if more than one copy is desired.

6.5 Contingency - Fuel Handling Accident

1. From the CADAP FOR WINDOWS screen, click on the "CONTINGENCY" drop down menu.
2. Select "FUEL HANDLING".
3. Select either "ACCIDENT IN CONTAINMENT" or "ACCIDENT IN FUEL HANDLING BLDG." as appropriate.
4. Input appropriate bundle age, if known.

NOTE: Bundle age equals time since in core. If bundle age is not known, the program will default to using the time reactor <4% power as bundle age. If bundle age is not provided, it will default to 1 hour.

5. Select status of FHBVS (Fuel Handling Building Ventilation System).
6. Click "OK".
7. Verify meteorological data, release duration, and event classification on the METEOROLOGICAL DATA Screen:
 - a. When the meteorological tower is lost or the meteorological data is invalid ('magenta'), perform one of the following:
 - 1) Edit the data if available under the VALUES TO USE column by double clicking the value and manually typing in the correct value, or
 - 2) If using visual observations, click the "ALT." button and select the appropriate conditions per <EPI-B7b>.
 - b. Revise the release duration (in hours), if appropriate.
 - c. Select either "YES" or "NO", as appropriate, based on the current event classification to respond to inquiry "Has a General Emergency been declared?"

d. Click "OK", verify the RESULTS - SCREEN 1 window appears.

CAUTION

The Preliminary Emergency Classification based on projected dose, which is displayed on the RESULTS - SCREEN 1 window, is for information only. This is NOT to be used in lieu of classification in accordance with <EPI-A1>.

8. Click on the "FILE" drop down menu and select "PRINT" to print this data page. Repeat this step if more than one copy is desired.
9. If requested, click on the "NOTIFICATION" drop down menu to display Page 2 of 2 of the Follow-up Notification form.
 - a. Verify the following information is correct and complete:
 - 1) Meteorological data (can only change precipitation option).
 - 2) Recommended protective actions (should automatically update).
 - 3) Basis for the PARs.
 - 4) Offsite Release information:
 - Airborne Release
 - Liquid Release
 - Actual Start Time (clock time)
 - Estimated Start Time (clock time)
 - Release Duration
 - Time of Reactor Power <4% (clock time)
 - 5) Release rates (cannot be changed).
 - 6) Source term used (cannot be changed).
 - 7) Non-noble gas reduction factors utilized (cannot be changed).
 - 8) Projected offsite doses (cannot be changed).
 - 9) Field survey data (cannot be changed) or Not Applicable.
 - 10) Estimate of any surface contamination (inside plant/outside plant).
 - 11) DRD to TEDE conversion factor (cannot change, notify Environmental Liaison of current value).

12) Drill or Actual Emergency option.

- b. If any of the information is incorrect and cannot be changed on this screen, reperform the dose projections utilizing the correct information.
- c. Obtain a printout by clicking on the "FORM" drop down menu and selecting "PRINT".

6.6 Radiation Monitoring Team (RMT) - Field Data

1. From the CADAP FOR WINDOWS screen, click on the "RMTs" drop down menu.
2. Select "FIELD SAMPLE".
3. Utilizing a RMT FIELD DATA REPORT from EPI-B3, enter the following information, based on availability of data:
 - a. Location of reading (descriptive, street location from block A).
 - b. Sector(s) (A-R, available on maps).
 - c. Distance from plant (miles, block B9).
 - d. Time since reactor power <4% (hours, will default to 1 hour).
 - e. Filter-adsorber reading (cpm, block B7).
 - f. Bare-adsorber reading (cpm, block B8).
 - g. Background reading (cpm, block B6).
 - h. Closed window reading (mr/hr, block B3 or A5).
 - i. Immersion time (expected release duration at time of sample)
4. Click "OK".

NOTE: If air sample data is entered, a Child Thyroid Dose for the sample location is calculated for that particular air sample.

5. Click "PROJECT".
6. Verify meteorological data, release duration, and event classification on the METEOROLOGICAL DATA Screen:
 - a. When the meteorological tower is lost or the meteorological data is invalid ('magenta'), perform one of the following:
 - 1) Edit the data if available under the VALUES TO USE column by double clicking the value and manually typing in the correct value, or

- 2) If using visual observations, click the "ALT." button and select the appropriate conditions per <EPI-B7b>.
- b. Revise the release duration (in hours), if appropriate.
- c. Select either "YES" or "NO", as appropriate, based on the current event classification to respond to inquiry "Has a General Emergency been declared?"
- d. Click "OK", verify the RESULTS - SCREEN 1 window appears.

CAUTION

The Preliminary Emergency Classification based on projected dose, which is displayed on the RESULTS - SCREEN 1 window, is for information only. This is NOT to be used in lieu of classification in accordance with <EPI-A1>.

7. Click on the "FILE" drop down menu and select "PRINT" to print this data page. Repeat this step if more than one copy is desired.
8. If requested, click on the "NOTIFICATION" drop down menu to display Page 2 of 2 of the Follow-up Notification form.
 - a. Verify the following information is correct and complete:
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 - 3) Basis for the PARs.
 - 4) Offsite Release information:
 - Airborne Release
 - Liquid Release
 - Actual Start Time (clock time)
 - Estimated Start Time (clock time)
 - Release Duration
 - Time of Reactor Power <4% (clock time)
 - 5) Release rates (cannot be changed).
 - 6) Source term used (cannot be changed).
 - 7) Non-noble gas reduction factors utilized (cannot be changed).

- 8) Projected offsite doses (cannot be changed).
 - 9) Field survey data (cannot be changed) or Not Applicable.
 - 10) Estimate of any surface contamination (inside plant/outside plant).
 - 11) DRD to TEDE conversion factor (cannot change, notify Environmental Liaison of current value).
 - 12) Drill or Actual Emergency option.
- b. If any of the information is incorrect and cannot be changed on this screen, reperform the dose projections utilizing the correct information.
- c. Obtain a printout by clicking on the "FORM" drop down menu and selecting "PRINT".
9. Compare RMT data with dose projection data based on plume location and RMT sample time. (factor in plume travel time to sample location)

6.7 RMT - Iodine Cartridge Analysis

NOTE: The Chemistry Lab will provide the isotopic data after analysis of the RMT Iodine Cartridge on the Multi-channel Analyzer.

1. From the CADAP FOR WINDOWS screen, click on the "RMTs" drop down menu.
2. Select "ANALYZED CART."
3. Enter the appropriate isotopic concentrations.
4. Enter the distance from the plant (miles).
5. Click "OK".
6. Click "PROJECT".
7. Verify meteorological data, release duration, and event classification on the METEOROLOGICAL DATA Screen:
 - a. When the meteorological tower is lost or the meteorological data is invalid ('magenta'), perform one of the following:
 - 1) Edit the data if available under the VALUES TO USE column by double clicking the value and manually typing in the correct value, or
 - 2) If using visual observations, click the "ALT." button and select the appropriate conditions per <EPI-B7b>.
 - b. Revise the release duration (in hours), if appropriate.

- c. Select either "YES" or "NO", as appropriate, based on the current event classification to respond to inquiry "Has a General Emergency been declared?"
- d. Click "OK", verify the RESULTS - SCREEN 1 window appears.

CAUTION

The Preliminary Emergency Classification based on projected dose, which is displayed on the RESULTS - SCREEN 1 window, is for information only. This is NOT to be used in lieu of classification in accordance with <EPI-A1>.

8. Click on the "FILE" drop down menu and select "PRINT" to print this data page. Repeat this step if more than one copy is desired.
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 - 3) Basis for the PARs.
 - 4) Offsite Release information:
 - Airborne Release
 - Liquid Release
 - Actual Start Time (clock time)
 - Estimated Start Time (clock time)
 - Release Duration
 - Time of Reactor Power <4% (clock time)
 - 5) Release rates (cannot be changed).
 - 6) Source term used (cannot be changed).
 - 7) Non-noble gas reduction factors utilized (cannot be changed).
 - 8) Projected offsite doses (cannot be changed).
 - 9) Field survey data (cannot be changed) or Not Applicable.

- 10) Estimate of any surface contamination (inside plant/outside plant).
 - 11) DRD to TEDE conversion factor (cannot change, notify Environmental Liaison of current value).
 - 12) Drill or Actual Emergency option.
- b. If any of the information is incorrect and cannot be changed on this screen, reperform the dose projections utilizing the correct information.
- c. Obtain a printout by clicking on the "FORM" drop down menu and selecting "PRINT".

6.8 Deposition Exposure Calculations

1. From the CADAP FOR WINDOWS screen, click on the "DEP EXP" drop down menu.
2. For dose calculations based on a 1 meter dose rate reading, perform the following, otherwise proceed to Step 3.
 - a. Enter the 1 meter dose rate reading (R/hr).
 - b. Enter the time since reactor power <4%.

NOTE: If "time since reactor power <4%" is less than 1 hour or not provided, the program will default to 1 hour.

- c. Enter a detailed description of the location at which the sample was taken.
 - d. Click "OK".
 - e. Click "PRINT".
3. For dose calculations based on the isotopic analysis of a field sample, perform the following:
 - a. Enter the isotopic values for the isotopes indicated (zero must be entered if isotope was not detected).
 - b. Enter the time since reactor power <4%.

NOTE: If "time since reactor power <4%" is less than 1 hour or not provided, the program will default to 1 hour.
 - c. Enter a detailed description of the location at which the sample was taken.
 - d. Select "YES" or "NO" to add the sample to average.

- e. Click "OK".
- f. Click "PRINT".

6.9 CADAP Program Utilities

1. From the CADAP FOR WINDOWS screen, click on "UTILITIES"
2. Select the utility desired (ALARMS, NOTE PAD, VIEW CALCULATION, CALCULATOR). Below is a brief explanation of each of the utilities:

a. ALARM

Used to alert the user when a parameter increases or decreases by the specified percentage. When the input to CADAP increases by the percentage listed in the window, the ICS window will be automatically displayed and the alarming parameter will flash.

This percentage can be edited by the user as well as being turned on and off by clicking the appropriate button. When editing is complete, click "OK".

b. NOTE PAD

Used to store information by the user. Type in the desired information, then click "OK". To erase information in the Note window, click "CLEAR".

c. VIEW CALCULATION

Allows the user to view the last dose projection or follow up notification form performed. This is used for quick reference. and can be printed. Click "CLOSE" to exit.

d. CALCULATOR

A computer calculator to be used by the user. The user may use the mouse to click on the appropriate calculator keys or enter numbers using the number portion of the keyboard. When finished, close the window to return to the Main CADAP window.

6.10 Exiting the CADAP Program

1. From the CADAP FOR WINDOWS screen, click on the "PROJECTIONS" drop down menu.
2. Select "EXIT".
3. If desired, shutdown the computer using the Standard Windows procedure (Start, Shutdown), and turn off the Computer and Monitor.

6.11 Records

6.11.1 Records Handling

1. All records generated by this procedure should be turned over to EPU for disposition.

6.11.2 Records Capture

The following records are generated by this procedure:

Quality Assurance Records

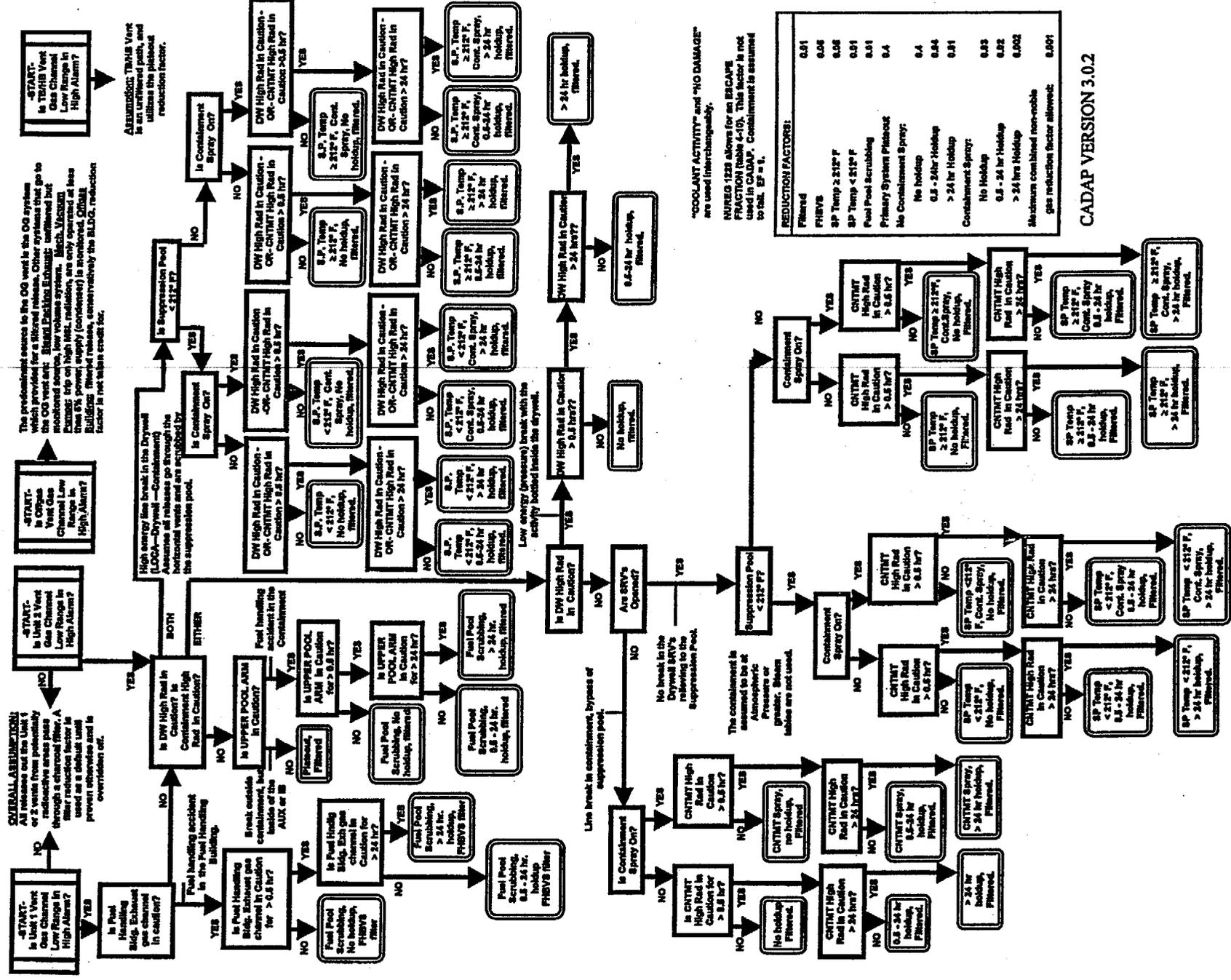
None

Non-Quality Records

Dose Projections

Follow-up Notification Forms

CADAP Logic Flowchart



REDUCTION FACTORS:

Filtered	0.01
FRNVS	0.06
SP Temp > 212° F	0.08
SP Temp < 212° F	0.01
Pool Pool Scrubbing	0.01
Primary System Pressure	0.4
No Containment Spray:	
No holdup	0.4
0.5 - 24hr Holdup	0.04
> 24 hr Holdup	0.01
Containment Spray:	
No Holdup	0.03
0.5 - 24 hr Holdup	0.02
> 24 hrs Holdup	0.002
Minimum combined non-noble gas reduction factor allowed:	0.001

CADAP VERSION 3.0.2

FirstEnergy Nuclear Operating Company

PERRY NUCLEAR POWER PLANT

UNIT 1 & 2

ACKNOWLEDGMENT OF RECEIPT

Title Emergency Plan Implementing Instructions EP1 – B3/ Rev 8, C-1

Control No. 60

Letter No./Date PY-CEI/NRR-2641L / May 20, 2002

Signature

Date

Title

Return to:

Perry Nuclear Power Plant
Attn: B.Y. Richardson, A240
P. O. Box 97
Perry, Ohio 44081

FirstEnergy Nuclear Operating Company
Perry Nuclear Power Plant

Controlled Document Instruction Sheet

Manual: Emergency Plan Implementing Instruction (EPI – B3/ Rev 8, C-1)

Control Number **60**

<u>Revision Number</u>	<u>Temporary Change No.</u>	<u>Remove and Replace Pages</u>
8	C-1	Reissue Entire Document

RADIOLOGICAL SURVEYS FOR EMERGENCIES

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SCOPE OF REVISION:

Periodic Review - Required

- Rev. 8 -
1. Consolidates RMT Communicator duties into the Environmental Liaison and TSC Dose Assessor positions.
 2. Revises RMT Status Briefing Form.
 3. Identifies the HPN Circuit as open communications link for dose assessment/RMT status. (CRRA #98-1439-001)
 4. Inserts definition establishing threshold for an "elevated" radiological release for off-site dose assessment purposes. (CRRA #98-1438-001)
 5. Clarifies responsibilities for coordinating and directing RMT activities during initial activation, interim, and final staffing phases.

Change History

PIC Number: 1 Affected Pages: 1, iii, 2, 3, 4, 4a, 7, 9, 11, 12, 14, 15, 16, 17, 19, 20, 21

Summary of Change:

1. Describes how to calculate Turnback Dose in Definitions section.
 2. Changed terminology from "Elevated" to "Above Normal" release.
 3. Replaced Health Physics with Radiation Protection where applicable.
 4. Clarified RMT Leader role at Step 4.6.
 5. Added note at 4.7 to clarify RMT Helper must have a valid Operator (Drivers) License. Deleted step of TSC Dose Assessor checking for license at Step 5.5.2.1.
 6. Step 5.2.1 ensures the names of the RMT team members are identified.
 7. Attachment 1, PNPP No. 8153, was changed at Step 4 on page 17 to add flexibility of delivery of samples at conclusion of sampling, based upon RP discretion.
 8. Sub-steps changed at 5.6.4 and 5.6.10, since previous steps were redundant to RMT Mobilization Checklist steps. Sub-steps remaining in Steps 5.6.4 and 5.6.10 are to cover items not on the checklist.
 9. Updated RMT Mobilization Checklist (PNPP No. 8153) to eliminate redundant inventories.
 10. Updated RMT Field Data Report (PNPP No. 7762) to clarify an example given on the form.
 11. Deleted Step 5.1.2. Same direction is given in 5.2.1, a more appropriate section.
 12. Deleted respirator from Step 5.5.1. Unsafe to drive with respirator.
 13. Updated radio operation steps on Attachment 3.
-

RADIOLOGICAL SURVEYS FOR EMERGENCIES

1.0 PURPOSE

To provide instructions for conducting and evaluating radiological surveys to be performed by the Radiation Monitoring Teams (RMTs) at or beyond the Site Boundary as a result of an actual or potential radiological release to the environment.

2.0 REFERENCES

2.1 Source References

1. NUREG-0654, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants
2. FEMA-REP-2, Guidance on Offsite Emergency Radiation Measurement Systems (September 1980)
3. Emergency Plan for PNPP Docket Nos. 50-440, 50-441
4. EPI-A8: Emergency Operations Facility Activation

2.2 Use References

1. EPI-B8: Protective Actions and Guides
2. EPI-B7b: Manual Offsite Dose Calculations
3. EPI-B10: Emergency Radiological Environmental Monitoring Program
4. EPI-B11: Emergency Dosimetry Issue
5. Emergency Response Telephone Directory
6. PSI-0007: Reporting Emergency Plan-Related Communications Equipment Problems
7. EPI-B7a: Automated Offsite Dose Calculations
8. EPI-B9: Emergency Records
9. PAP-1701: Records Management Program
10. Commitments addressed in this document:

F00747 P00042 P00095
F00982 P00059

3.0 DEFINITIONS

3.1 Turnback Dose

The whole body dose of an individual as indicated by a direct-reading dosimeter that when reached, the individual must exit the area and go to a low background area to preclude exceeding an administrative dose limit.

Turnback dose is calculated by determining the team member with the lowest available dose, dividing by 2 to allow for exit from the plume, and finally dividing by the Gamma-TEDE dose conversion factor to account for iodine exposure. Gamma-TEDE conversion factors can be obtained from the Computer Aided Dose Assessment Program (CADAP) or from Table 3-1 in EPI-B7b.

3.2 Above Normal Release

During implementation of the Emergency Plan, a release is considered "above normal" when one or more plant vent radiation monitors (D17) exceeds the ALERT (10% ODCM limit) setpoint on a noble gas channel. At this point, a radiological release is considered underway for off-site dose assessment purposes.

4.0 RESPONSIBILITIES

4.1 Offsite Radiation Advisor (ORA): Coordinate the mobilization and deployment of Radiation Monitoring Teams (RMTs) through the EOF Lead Dose Assessor to assess the impact of a radiological release from the plant.

4.2 Radiation Protection Coordinator (RPC):

1. Direct the activities of Radiation Protection Section personnel within the Protected Area and evaluate the effects within the Protected Area of the release based on data obtained.
2. Perform the duties of the ORA, until the EOF is declared operational and properly relieved by the ORA, utilizing a shift Chemistry Technician as TSC Dose Assessor.

4.3 EOF Lead Dose Assessor:

1. Direct the deployment of RMTs based on projected radiological and meteorological conditions to verify release plume boundaries and magnitude/radiological consequences of release.
2. Establish appropriate dose limits, turnback dose, potassium iodide (KI), and protective equipment requirements for RMTs based on projected or actual radiological assessments of the release.
3. Oversee the development of an environmental sampling plan, as applicable, and the shipment and analysis of collected samples.

4.4 EOF Environmental Liaison:

1. Serves as the communications link between the EOF Lead Dose Assessor and RMTs in the mobilization and deployment of RMTs.
2. Assist the EOF Lead Dose Assessor in tracking RMT position, documenting field sample results/readings, providing periodic status briefings, and in establishing limits and protective equipment requirements for radiological exposure of RMT members.
3. Assist in the development of an environmental sampling plan.
4. Coordinate with RECS the packaging and shipping of collected environmental samples to an offsite laboratory, and the interpretation of sample results per <EPI-B10>.

4.5 TSC Dose Assessor: Perform the duties of the EOF Lead Dose Assessor and Environmental Liaison, until the EOF is declared operational and responsibility for dose assessment has been transferred to the ORA.

4.6 RMT Leader: Perform plume monitoring surveys, sample collection, monitor RMT team dose and implement appropriate contamination/exposure control measures.

4.7 RMT Helper: Operate vehicle, handle communications with the TSC and EOF, and assist in the collection of samples at the RMT Leader's direction.

NOTE: RMT Helper must have a valid Operator (Driver's) License.

5.0 ACTIONS

5.1 TSC Radiation Protection Coordinator

5.1.1 Contact an on-shift or available Chemistry Technician, qualified as Dose Assessor, through the Operations Support Center (OSC) and direct him/her to report to the TSC to mobilize and direct RMTs deployment.

5.1.2 Upon the declaration of a Site Area Emergency, direct the TSC Dose Assessor to mobilize a third RMT.

5.1.3 Upon activation of the EOF, direct the Dose Assessor to brief the EOF Dose Assessment Staff on continuing dose assessment and RMT activities.

NOTE: Offsite dose assessment activities and protective action development can NOT be assumed by the EOF until the TSC Operations Manager transfers responsibility for oversight of these actions to the EOF Emergency Coordinator.

5.1.4 Notify the ORA and TSC Dose Assessor when the TSC Operations Manager has transferred responsibility for PAR decisions to the EOF Emergency Coordinator, and authorize the TSC Dose Assessor to transfer control of dose assessment RMT activities to the EOF.

1. Maintain an open link with the EOF Dose Assessment Staff through the Health Physics Network (HPN).
 2. Direct the relocation of the TSC Dose Assessor to the EOF or release to the OSC.
- 5.1.5 For events in which the EOF was not activated, direct the Dose Assessor to recall, debrief, and release RMT personnel when the event is terminated.

5.2 TSC Dose Assessor

- 5.2.1 Identify qualified RMT Leaders and Helpers in the OSC, or call in additional personnel and dispatch teams to the TEC as required by the current Emergency classification.

ALERT - at an ALERT two (2) RMT(s) are required.

SITE AREA or GENERAL EMERGENCY - at a Site Area Emergency or a General Emergency a total of three (3) RMT(s) are required. <P00042>

NOTE: A RMT consists of a RMT Leader and a RMT Helper. RMT Leader is usually a Sr. RP Technician. A RMT Helper is usually a Radwaste Surveyor. In some instances, other individuals are specifically trained to these positions.

1. Initiate callouts for additional RMT personnel using the <Emergency Response Telephone Directory> under the OSC listing.

- 5.2.2 Direct one team member to report to the EOF Decontamination Room to inventory equipment and the other member to pick up an RMT vehicle after verifying he/she has a valid State operator's license.

NOTE: The location for designated EPU/RMT vehicles when not in use, is posted on EOF Decon. Room keybox.

1. If notified by RMT member that EPU vehicles are not located in their designated parking spaces, recall vehicles by dialing 275-4810, to activate pagers assigned to each vehicle, and enter a callback number.

- 5.2.3 Brief RMT(s) on the following using the RMT Mobilization Checklist (PNPP No. 8153, Attachment 1).

1. Existing and expected changes in meteorological conditions.
2. Present and/or expected plume path.
3. Actual and projected radiation exposures, direct-reading dosimeter (DRD), and "turnback" dose based on the DRD to Total Effective Dose Equivalent (TEDE) Conversion Factor generated by the Computer-Aided Dose Assessment Program (CADAP).

- a. Use default conversion factor of one (1) if DRD to TEDE Conversion Factor is not available.

4. Protective clothing or additional equipment to be worn.
 - a. When a shelter or evacuation order has been issued for the general public, direct RMT personnel to don protective clothing (white cloth/paper coveralls, gloves, and herculite booties).
5. Dosage and possible side effects for potassium iodide (KI) tablets using the manufacturer's patient insert located on the back of Potassium Iodide (KI) Tracking Form (PNPP No. 9177).
 - a. When the potential exists for an iodine exposures in excess of 10 rem to the Adult/Thyroid (2xChild Thyroid value), obtain approval for potassium iodide (KI) to be taken per <EPI-B8>, and direct RMTs to administer KI.
6. Travel routes to and from anticipated area to be monitored.
 - a. Direct RMTs to monitor for plume on side roads in lieu of busy main roadways, i.e., SR2 or I90, where a slow-moving vehicle would cause a hazard to RMT personnel and other vehicular traffic.
7. At your discretion, direct the RMTs to inventory Environmental Sampling Kit and to take kit into field when dispatched.
8. Obtain the RMT vehicle nos., and the names, SSNs and available dose for each team member.

5.2.4 When contacted via radio or cellular telephone by an RMT that they are standing by, direct RMT(s) to proceed into the field to begin plume monitoring or to specific hold points.

NOTE: Operating guidelines for the RMT radio units and cellular telephones are contained in Attachment 3.

1. When an RMT team cannot be contacted initially over vehicle radio, call the EOF Decon. Room at Extension 5809 to determine the whereabouts of RMT personnel.
2. If contact with an RMT(s) can not be re-established in a timely manner after the team(s) have been deployed, attempt to contact the RMT(s) via the cellular phone installed in each vehicle per Attachment 3. A conference bridge can also be established with RMT vehicle cellular phones using guidance contained in the <Emergency Response Telephone Directory>.
3. Report any failures or problems with RMT radios or cellular phones per <PSI-0007> to initiate troubleshooting efforts.

5.2.5 Determine the approximate location of the release plume, and postulated doses/dose rates using CADAP.

- 5.2.6 After informing RMT members of postulated doses/dose rates and confirming the "turnback" dose, deploy RMTs to verify plume boundaries and centerline and to obtain iodine air samples if required; request RMT members to report DRD reading upon exiting plume.
1. Ensure RMTs are informed of exact travel route to be taken and the postulated location of the release plume.
 - a. Do not direct RMTs to enter plume if projected dose exceeds established "turnback" dose for team members, or if in your judgment, dose to obtain survey/sample results will not provide any additional useful dose assessment data.
 2. Record survey and sample data report from RMTs on an RMT Field Data Report (PNPP No. 7762, Attachment 4).
- 5.2.7 Perform dose calculations based on RMT sample data using CADAP per <EPI-B7a> or manually per <EPI-B7b>.
- 5.2.8 Continuously update radiological status boards in the TSC and keep the RPC advised of radiological conditions offsite and RMT status.
- 5.2.9 Periodically evaluate radiological conditions RMTs may encounter; revise the "turnback" dose based on dose assessments and direct RMTs to use protective equipment or measures as follows:
1. When a sheltering or evacuation recommendation has been issued for the general public, direct RMT personnel to don protective clothing (white cloth/paper coveralls, gloves, and herculite booties).
 2. When the potential exists for iodine exposures in excess of 10 rem to the Adult Thyroid (2xChild Thyroid dose), obtain approval for KI to be taken per <EPI-B8>, and direct RMT members to administer.
- 5.2.10 Provide periodically status updates to RMT members using the RMT Status Briefing Form (PNPP No. 9530, Attachment 2).
- 5.2.11 When directed by the RPC, brief the ORA and EOF staff on continuing offsite dose assessment and RMT operations, but do not relinquish responsibility until authorized.

NOTE: Offsite dose assessment and development of protective actions can NOT be assumed by EOF until the TSC Operations Manager transfers responsibility for oversight of these actions to the EOF Emergency Coordinator.

5.2.12 Turnover control of the dose assessment and RMTs activities to the EOF when authorized by the RPC.

1. Relocate to the EOF Display Room or report to OSC, as directed by RPC.

5.2.13 Upon completion of RMT activities with the EOF not activated, secure the RMTs by performing the following:

1. Direct the RMTs to return to the EOF, and debrief RMTs as necessary using the RMT Mobilization Checklist.
2. Review RMT survey and sample results.
3. Direct the delivery of used adsorber canisters either to the Chemistry Laboratory (599' level Control Complex) or alternate location to be determined by Radiation Protection.
4. If KI was issued or the potential for iodine exposure existed, direct RMT members to report to Radiation Protection for a whole body count.
5. Ensure Dosimetry Issuance Cards (PNPP No. 7522) are completed by RMT members, and forward card along with TLD to the Dosimetry Issue Office (SBA15) per <EPI-B11> for processing.

5.3. EOF Offsite Radiation Advisor

5.3.1 Assess the manpower available at the EOF upon arrival and initiate calls using the <Emergency Response Telephone Directory> to fill the following positions:

- Lead Dose Assessor (pager)
- Dose Assessor
- Environmental Liaison

5.3.2 Contact the TSC RPC to coordinate the transfer of RMT and dose assessment activities to the EOF.

1. Authorize the Lead Dose Assessor to assume responsibility for offsite dose assessment and control of RMTs, only when directed by the EOF Emergency Coordinator.

5.3.3 Ensure that Federal, State, and local county representatives in the EOF are kept apprised of RMT activities and survey results using the RMT Field Data Transfer Sheet (PNPP No. 8447, Attachment 6).

5.3.4 Direct the EOF Lead Dose Assessor to coordinate the development of an Environmental Sample Plan, and direct the Dose Assessor controlling RMTs to recall and equip RMTs for environmental monitoring per <EPI-B10>, if required.

- 5.3.5 Direct the relief of RMT personnel as appropriate; ensure that dosimetry required by <EPI-B11> is available to support relief.
- 5.3.6 When appropriate, direct the Environmental Liaison to recall, debrief, and release RMT personnel.
- 5.4 EOF Lead Dose Assessor
- 5.4.1 Verify that adequate exposure and "turnback" dose limits have been established for RMT members.
- 5.4.2 Based on dose projections, obtained from the Dose Assessor using CADAP per <EPI-B7a>, and available dose, establish a plan with the Environmental Liaison for the deployment of RMTs to verify the location and magnitude of the release plume.
1. Direct the Environmental Liaison to instruct a RMT(s) to traverse the plume, using a predetermined travel route and "turnback" dose, to verify plume boundaries and centerline, and to obtain an air sample if warranted to properly assess the composition and magnitude of the release.
 2. Do not direct RMTs to enter plume if projected dose exceeds established "turnback" dose, or if in your judgment, the dose required to obtain survey/sample results does not warrant additional exposure to RMT members.
 3. Direct RMTs to monitor plume using side roads in lieu of busy main roadways or designated evacuation routes, i.e., SR2 or I90, where a slow-moving vehicle could cause a hazard to RMT personnel and other vehicles.
- 5.4.3 Use data collected by RMTs to verify plume location and magnitude (TEDE and CDE doses) based on dose projections performed by the Dose Assessor.
- 5.4.4 Ensure RMT members periodically receive a status briefing using the RMT Status Briefing Form.
- 5.4.5 Periodically evaluate radiological conditions RMTs may encounter; revise the "turnback" dose based on dose assessments and direct the RMTs to use protective equipment or measures as follows:
1. When a shelter or evacuation recommendation has been issued by the Emergency Coordinator for the general public, direct RMT personnel to don protective clothing (white cloth/paper coveralls, gloves, and herculite booties).
 2. When the potential exists for iodine exposures in excess of 10 rem to the Adult Thyroid (2xChild Thyroid dose), obtain approval for KI to be administered per <EPI-B8> to RMT members.

- 5.4.6 Record and communicate field team results with Federal and State representatives in the EOF using the RMT Field Data Transfer Sheet.
- 5.4.7 Direct RMT(s) to conduct environmental sampling per <EPI-B10>, if sampling of the ingestion pathway is ordered by the ORA.
- 5.4.8 Upon completion of plume pathway surveys, perform the following:
1. Direct RMTs to return to the EOF and debrief RMTs as necessary using the RMT Mobilization Checklist.
 2. Review RMT survey and sample results.
 3. Direct the delivery of used adsorber canisters either to the Chemistry Laboratory (599' level Control Complex) or alternate location to be determined by Radiation Protection.
 4. If potassium iodide (KI) was issued or the potential for iodine exposure existed, direct RMT members to report to Radiation Protection for a whole body count.
 5. Ensure Dosimetry Issuance Cards (PNEP No. 7522) are completed by RMT members, and forward card along with TLD to the Dosimetry Issue Office (SBA15) per <EPI-B11> for processing.

5.5 EOF Environmental Liaison

- 5.5.1 Contact the TSC Dose Assessment Area at Extension 5884 to become apprised of the following:
1. Location of RMT personnel/vehicles assembled and protective measures (i.e., PCs, etc.) being used by the RMTs.
 2. Whether the TSC has mobilized a third RMT at the declaration of a Site Area Emergency.
 3. Names, Social Security Numbers (SSNs), and current and available exposures for RMT personnel currently mobilized.
 4. Actual or potential radiological releases and meteorology.
 5. Dose assessment/RMT data currently collected, and offsite protective actions currently in effect.
 6. "Turnback" dose assigned to RMTs and current DRD to TEDE Conversion Factor.
 - a. Use default conversion factor of one (1) if DRD to TEDE Conversion Factor is not available.
- 5.5.2 Mobilize a third RMT if not yet in place, and brief per Section 5.2.5 prior to dispatching into field.
1. Deleted

- 5.5.3 Notify the Lead Dose Assessor once communications with the RMTs have been satisfactorily tested and ready to accept responsibility for control of RMTs.
- 5.5.4 Assume responsibility from the TSC Dose Assessor for directing RMT activities only when authorized by the Lead Dose Assessor, and inform the RMT(s) by radio or telephone that the EOF is now directing all RMT operations.
- 5.5.5 Determine the approximate location of the release plume and postulated dose/dose rates from the Dose Assessor and track position on facility map/status boards.
- 5.5.6 Communicate directions from the Lead Dose Assessor on the deployment of RMT(s) to team members, including entry into the release plume to determine boundaries/centerline and for the collection of air samples using the RMT 800 MHz Company Radio System per Attachment 3.
1. Ensure RMTs are informed of the exact travel route to be used, postulated position of the release plume, established "turnback" dose, and specific actions to be taken upon arrival.
- NOTE: Side roads should be used in lieu of busy main roads or designated evacuation routes, i.e., SR2 or I90, where slow-moving vehicles could cause a hazard to RMT personnel and other vehicular traffic.
2. Track the location of RMT vehicles and release plume, and monitor exposure of RMT personnel to prevent inadvertent exposure or conditions in which vehicle may become trapped by release plume due to changing meteorological conditions.
 3. Record survey and air sample information from RMTs on the RMT Field Data Report, including current DRD reading, upon team exiting the plume.
- 5.5.7 Direct RMT members to implement specific protective actions, e.g., KI, don PCs, etc., at the direction of the Lead Dose Assessor.
- 5.5.8 Provide periodic status updates to RMT members using the RMT Status Briefing Form.
1. If radio communications with an RMT(s) is lost and can not be promptly restored, attempt contacting the RMT(s) using the cellular phone installed in each vehicle. A conference bridge can be established with RMT vehicle cellular phones per instructions provided in the <Emergency Response Telephone Directory>.
 2. Report any failure or problems with RMT radios or cellular phones per <PSI-0007> to initiate troubleshooting efforts.
- 5.5.9 Continuously update radiological status boards in the EOF and keep the Lead Dose Assessor advised of RMT results and status.

5.6 RMT Members

5.6.1 Proceed to the EOF Decontamination Room, when directed.

1. Obtain EOF Decontamination Room door and padlock keys from the Emergency Plan keybox located outside the EOF Records Room to unlock both doors into the EOF Decontamination Room and cabinets, drawers, and lockers in the Decontamination Room. Return the keys to the keybox before proceeding further.

5.6.2 Contact the TSC Dose Assessor at Ext. 5884/5728, or EOF Environmental Liaison in Display Room if facility is operational, to report your arrival.

5.6.3 Assemble into RMT teams, each team will consist of a RMT Leader and RMT Helper.

5.6.4 Each RMT team member must complete their assigned actions listed on the RMT Mobilization Checklist (Attachment 1):

NOTE: The RMT Mobilization checklist is located inside of the RMT clipboard(s) which are stored in the EOF Decontamination Room on the main counter.

-- If vehicles are not available in designated parking spaces on the North side of the TEC, notify the TSC/EOF immediately.

-- If at any time while tracking the plume, RMT radio communications with the TSC/EOF are lost and cannot be promptly restored, use the cellular phones installed in the vehicles to notify the TSC/EOF. Instructions for establishing a conference bridge with the TSC or EOF are contained in the <Emergency Response Telephone Directory>.

1. **RMT Leader:** Assemble RMT equipment using checklist located in the RMT Clipboard.

-- If the seal on an Emergency Kit is broken, it has to be inventoried prior to use.

2. **RMT Leader:** Contact the TSC Dose Assessor at Ext. 5884/5728, or EOF Environmental Liaison in Display Room to inform the TSC/EOF of the vehicle number, names, SSNs, and current and available doses.

3. Deleted

4. Deleted
5. Deleted
6. Deleted
7. Deleted
8. Deleted
9. Deleted
10. Deleted
11. Deleted

5.6.5 When directed to proceed to a hold or monitoring location outside the plume, perform the following:

1. Ensure that you are adequately informed on travel routes to be taken, present postulated location of release plume (if any), assigned a "turnback" dose, and actions to be taken once you reach this location.

NOTE: RMTs should not be directed to monitor for plume on busy or major roadways, i.e., SR2 or I90, where a slow-moving RMT vehicle would create a hazard to RMT personnel and other vehicular traffic. RMT personnel should use their judgment and notify the TSC/EOF whenever they feel that vehicular traffic on designated road is unsafe to support RMT monitoring activities.

2. Turn on the E-520 or equivalent survey meter and continuously monitor ambient radiation levels with meter probe held outside vehicle to prevent inadvertent transiting of the release plume. Do not transit the release plume unless directed.
3. Immediately report any abnormal fluctuations in general area radiation levels.
4. Periodically observe the reading on your DRDs and ensure that your exposure is maintained within the "turnback dose".

5.6.6 When directed to transit the release plume, perform the following:

1. Secure all unnecessary accesses or openings to the vehicle (i.e., windows, heaters, vents) prior to entering the plume.
2. Identify a specific reference point, e.g., SR20 and Parmly Road, before starting to traverse the plume and indicate the road being traveled to transit the plume.
3. Zero the vehicle's tripometer.
4. Slowly transit the release plume obtaining radiation readings with the survey meter outside the vehicle window with the meter probe window open.
5. Periodically read your DRD to determine exposure received.
 - a. If at any time your DRD Reading approached the "turnback" dose or measured dose rates significantly exceed those projected by the TSC/EOF, immediately exit the plume and report observations to TSC/EOF.
6. When an increase in radiation levels is observed, obtain a reading with the probe window closed to verify the plume's boundary, note the tripometer reading and record on RMT Field Data Report.
 - a. If radiation levels remain constant, the readings are indicating radiation levels as a result of "shine" from the plume; continue to traverse plume until boundary is identified.

7. With the probe window closed, proceed through the plume noting the tripometer and radiation monitor reading at the plume centerline (highest reading) and the opposite plume boundary; record this information on the RMT Field Data Report form.
 - a. At no time stop while transiting the release plume unless directed.
 - b. If directed, obtain an air sample at the plume centerline using the Iodine Air Sample Procedure (Attachment 5) and record reading on an RMT Field Data Report. <F00982>
 8. Upon exiting the plume, read and record DRD readings on the RMT Field Data Report.
 9. Report the location of the plume boundaries and centerline in respect to the reference location noted above, the probe closed-window radiation levels at the plume centerline, and DRD doses recorded on the RMT Field Data Report.
- 5.6.7 When instructed to only identify or verify plume boundary, perform Section 5.6.6, Steps 1 thru 6, then turn around and exit plume.
1. Record information on the RMT Field Data Report, then communicate data back to TSC/EOF.
- 5.6.8 Document periodic briefings by TSC and EOF on an RMT Status Briefing Form.
- 5.6.9 Conduct environmental monitoring by obtaining and utilizing the Environmental Sampling Kit to collect samples as directed in accordance with <EPI-B10>.
- 5.6.10 Upon completion of the plume monitoring aspect of the emergency, report back to the EOF as directed for debriefing using the RMT Mobilization Checklist.
1. Upon return from monitoring perform steps designated on the RMT Mobilization Checklist under the Deactivation section on sheet 2 of 2.
 2. Deleted
 3. Deleted
 4. Deleted

5. Deleted
6. Deleted
7. Deleted
8. Deleted

5.7 Records

5.7.1 Records Handling

1. The records generated by emergency response personnel will be collected and maintained by Emergency Planning Unit (EPU) pursuant to <EPI-B9>. The Emergency Records Package will be transferred to Records Management pursuant to <PAP-1701>.

5.7.2 Records Capture

The following records are generated by this document:

Quality Assurance Records

RMT Mobilization Checklist (PNPP No. 8153)

RMT Status Briefing Form (PNPP No. 9530)

RMT Field Data Report (PNPP No. 7762)

RMT Air Sample Canister Label (PNPP No. 6284)

RMT Field Data Transfer Sheet (PNPP No. 8447)

Non-Quality Records

None

Sheet 1 of 2

PNPP No. 8153 Rev. 2/21/02

RMT MOBILIZATION CHECKLIST

(To be completed by RMT Leader)

EPI-B3

TEAM MEMBERS:	NAME	SSN	AVAILABLE DOSE	RMT NUMBER
LEADER - (1)	_____	- -	_____ mRem	
(2)	_____	- -	_____ mRem	
TEAM ACTIVATION CHECKS				COMPLETED
1. [RMT Helper] Obtain a radio-equipped four wheel-drive vehicle. VEHICLE No. _____ <i>NOTE: Vehicle keys and gasoline credit cards are kept in EOF Decon. Room key box Location of vehicles when not in use is posted on key box.</i>				1.
2. [RMT Helper] Check the condition and operation of vehicle prior to returning to EOF: a. Check level of gas and windshield wiper fluid. b. Ensure that a spare tire and jack are in vehicle. c. Test operation of RMT radio (Channel 5G) and cellular phone with the TSC or EOF. d. Vehicle running properly.				2a. 2b. 2c. 2d.
3. [RMT Leader] Ensure all instrumentation calibration due dates have not expired.				3.
4. [RMT Leader] Perform a visual inspection, battery check, and response check on all radiation survey instruments, and a flow rate check on air sampler with a "test" canister attached.				4.
5. Rezero and attach dosimeter(s) and TLD badge to the front torso of body; record all required information on the Dosimetry Issuance Card contained in dosimetry packet. <P00095>				Leader 5.
6. Obtain coveralls, and booties for each team member from the designated EOF Decon. Room locker.				6.
7. Review plume monitoring guidelines (Section 5.6.6.) and iodine air sampling procedure (Attachment 5).				7.
8. Contact the TSC or EOF (if operational) to report availability and to obtain a briefing on the the following: TSC Dose Assessor: Ext. 5884 EOF Dose Assessor (Display Room): Ext. 5795 a. Meteorological Conditions. b. Present and/or expected plume path. c. Actual and projected radiation exposures. d. Protective clothing or additional equipment to be worn: _____ _____ e. Guidance on proper KI usage/dose and on possible side effects, KI to be administered: <input type="checkbox"/> Yes <input type="checkbox"/> No f. Travel routes to and from anticipated area to monitored. g. Inform the TSC/EOF of vehicle no., and the names, SSNs and available dose for each team member.				8a. 8b. 8c. 8d. 8e. 8f. 8g.
9. If directed, place the Environmental Sampling Kit in the emergency vehicle. If the seal is broken on the kit, it will have to be inventoried to ensure the kit is fully stocked.				9.
10. Don protective equipment or administer KI, if applicable.				10.
11. Load RMT equipment and kit(s) into vehicle and notify TSC/EOF via radio that you are standing by for instructions.				11.
CHECKLIST COMPLETED _____			DATE/TIME DISPATCHED _____	
RMT LEADER				

RMT STATUS BRIEFING FORM

PNPP No. 9530 Rev. 8/25/98

EPI-B3

This form should be filled out by Dose Assessor or Environmental Liaison hourly or when the conditions change.

DATE _____	TIME _____
METEOROLOGICAL CONDITIONS	
Wind Speed _____ mph	Wind Direction [FROM] _____ degrees
PLANT CONDITIONS: (Basics only- e.g. reactor shutdown, breached fission product barriers, etc.)	
EMERGENCY CLASSIFICATION:	
<input type="checkbox"/> UE <input type="checkbox"/> ALERT <input type="checkbox"/> SAE <input type="checkbox"/> GE	
PROTECTIVE ACTION RECOMMENDATION:	
<input type="checkbox"/> None Required <input type="checkbox"/> Evacuate Subareas: (circle) 1 / 2 / 3 / 4 / 5 / 6 / 7 / Lake	
RELEASE INFORMATION (NOTE: A release is considered in progress when vent radiation monitor levels are above the D17 "ALERT" alarm setpoint.)	
<input type="checkbox"/> No release in progress at this time.	
<input type="checkbox"/> Release in progress: Start Time: _____ Postulated Plume Distance from Plant: _____	
<input type="checkbox"/> Postulated Whole Body Readings at Plume Centerline: (if applicable)	
SB _____ mrem/hr 1 mile _____ mrem/hr 2 miles _____ mrem/hr 3 miles _____ mrem/hr 4 miles _____ mrem/hr 5 miles _____ mrem/hr	6 miles _____ mrem/hr 7 miles _____ mrem/hr 8 miles _____ mrem/hr 9 miles _____ mrem/hr 10 miles _____ mrem/hr
MISCELLANEOUS:	
TSC/EOF COMMUNICATOR USE ONLY	
Transmitted By: _____	_____ / _____
<i>Communicator's Name</i>	<i>Date/Time</i>
ACKNOWLEDGEMENT: RMT TEAM NO. 1 / 2 / 3 (Circle)	

OPERATING GUIDELINES FOR THE RMT RADIO UNITS AND CELLULAR TELEPHONES

A. TSC/EOF COMMUNICATIONS:

NOTE: Refer to the equipment guideline section of the <Emergency Response Telephone Directory> for instructions on the use of Backup EOF radio unit.

1. RMT Radio Units:

- a. Ensure the radio is on channel 5G.
- b. Adjust volume control to appropriate level.
- c. Transmit by either utilizing the handset or pressing the transmit button.

NOTE: When the transmit button is pushed the transmit light will be on.

- d. To receive a transmission the handset must be in the cradle and the transmit light off.

2. Cellular Phones:

- a. Refer to the <Emergency Response Telephone Directory> for instructions on establishing a conference bridge.

<u>Vehicle No.</u>	<u>Phone No.</u>
#5639	1-216-978-2591
#5799	1-216-978-2596
#5640	1-216-978-4495
#5800	1-216-978-4361

OPERATING GUIDELINES FOR THE RMT RADIO UNITS AND CELLULAR TELEPHONESB. COMMUNICATIONS FROM RMT VEHICLES:1. RMT Radio Units:

- a. Turn on the mobile RMT Radio. Turn up radio volume.
- b. Verify that the radio is on channel 5-G; change channel if necessary by pressing the up or down arrow key until channel is displayed.
- c. Depress the PTT (Push to Talk) button on the side of the microphone and speak directly into the front of the microphone. Ensure the status light indicates a continuous RED.
 - 1) If a loud buzzing tone (system-busy tone) is heard, simply release the PTT button, pause a few seconds and try again.

NOTE: This buzzing tone results if the CEI offsite radio system channels are all in use when attempting to transmit.

- d. Release the PTT button when done.

2. Cellular Telephones:

- a. To place a call, dial the following:

<u>RMT Vehicle Nos.</u>	<u>Vehicular Cellular Phone Nos.</u>
#5639	1-216-978-2591
#5799	1-216-978-2596
#5640	1-216-978-4495
#5800	1-216-978-4361

RMT FIELD DATA REPORT

PNPP No. 7762 Rev. 2/19/02

EPI-B3

A. PLUME SURVEY RESULTS

RMT # 1 at Sept. 1 / 1205 (Date/Time)

"SAMPLE↓"

LOCATION	(1) MILES	(2) DIR.	(3) OF	(4) ON	(5) (mRem/hr) READING
(a) BOUNDARY	0.2	N	Route 20	Antioch	
(b) CENTERLINE	0.7	N	Route 20	Antioch	30
(c) BOUNDARY	1.2	N	Route 20	Antioch	

RMT # _____ at _____ (Date/Time)

LOCATION	(1) MILES	(2) DIR.	(3) OF	(4) ON	(5) (mRem/hr) READING
(a) BOUNDARY					
(b) CENTERLINE					
(c) BOUNDARY					

B. AIR SAMPLE RESULTS (Complete if air sample taken)

1 RMT No..... _____

2 Date/Time Sample Taken 1 _____

3 Monitor Closed Reading..... _____ mrem

4 Duration..... _____ min.

5 Flowrate..... _____ cfm

6 Background at 4'..... _____ cpm

7 Filter Adsorber Reading..... _____ cpm

8 Bare Adsorber Reading..... _____ cpm

9 Distance From Plant..... _____ mile(s)

#10 Sample Location: _____

REMARKS:

C. Present location:

DRD Readings Upon Exiting Plume:

(1) _____ mrem (2) _____ mrem

TSC/EOF COMMUNICATOR USE ONLY (Block 'C' must be completed)

Received By: _____

TSC/EOF Communicator's Name

Date _____ Time _____

IODINE AIR SAMPLING PROCEDURE <F00982>

A. Procedure

1. Open and mount a previously unused filter-adsorber canister over the air sampler suction tube and stretch the retainer cord over the outer end of the canister.
2. Park at the sample location, leaving engine running.
3. Take a background reading at 4 feet above the ground using the survey meter to determine the whole body exposure level at the sampling site. Record the RMT#, DATE/TIME, and the monitor READING on the RMT Field Data Report (#1 thru #3).
4. Connect the air sampler to the cigarette lighter socket, using the attached DC adapter. Run sampler power cord through the vehicle window keeping the window closed to the extent possible.

NOTE: During rainy/snowy weather, the sampler may be placed inside the vehicle, provided a window or door is open.

5. Place the air sampler approximately 3 to 4 feet off the ground, e.g., hood of vehicle. <P00095>
6. Set timer on air sampler for 5 minutes and adjust the flow rate to 5.0 cfm using the manual adjustment knob. Record DURATION and FLOW RATE on the RMT Field Data Report (#4 and #5).

-- If the air sampler fails to draw 5.0 cfm, use the following equation to adjust the length of the sample:

$$\frac{25 \text{ ft}^3}{x \text{ cfm}} = y \text{ min.}$$

x = flow rate the air sampler is capable of drawing

y = sample length

7. RMT members shall continually monitor radiation levels at the sample location using the survey meter and periodically observe their personnel dosimeters to keep apprised of their radiation exposure while obtaining the air sample.
8. When the air sample is completed, carefully place a plastic bag over the canister and proceed outside the exposure plume where background is less than 300 cpm to measure the air sample.
9. When outside the plume, take a background measurement with the PRM-6 or equivalent at approximately 4 feet above the ground. Record the 4' measurements on the RMT Air Field Data Report (#6).

IODINE AIR SAMPLING PROCEDURE <F00982>

10. Carefully remove the canister from the sampler and insert the GM-1 probe into the air suction tube of the canister. Allow the meter to stabilize and record the FILTER-ADSORBER READING on the report form (#7).
11. Pull the tape on the outside of canister and remove the glass filter cloth. Place the filter cloth in a bag and place the bag in the quart can.
12. Read the bare adsorber canister and record BARE ADSORBER (canister) READING on the report form (#8).
13. Record the DISTANCE FROM PLANT and SAMPLE LOCATION on the report form (#9 and #10).
14. Return the canister to its quart can containing the bag and reseal with the correct lid. Fill out an RMT Air Sample Canister Label (PNPP No. 6284, Attachment 5) and attach to the quart can exterior.
15. Return to Section 5.6.6 of instruction.

RMT AIR SAMPLE CANISTER LABEL (PNPP NO. 6284)

RMT AIR SAMPLE CANISTER LABEL	
<small>PNPP No. 6284 Rev. 2/94</small>	<small>EPI-B3</small>
/ 1 RMT NO.	_____
/ 2 Date/Time Sample Taken	_____ / _____
/ 3 E-520 Closed Reading	_____ mrem
/ 4 Duration	_____ min.
/ 5 Flowrate	_____ cfm
/ 6 Background at 4'	_____ cpm
/ 7 Filter-Adsorber Reading ..	_____ cpm
/ 8 Bare Adsorber Reading	_____ cpm
/ 9 Distance From Plant	_____ mi.
/10 Sample Location:	
Completed By:	

Name	

