

CAROLINA POWER & LIGHT COMPANY

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
PLANT EMERGENCY PROCEDURES

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H. B. ROBINSON
SEG PLANT

TITLE

EMERGENCY PLAN AND PROCEDURES

VOLUME 13

RADIOLOGICAL CONTROL DIRECTOR

PEP-2.6.4

REVISION 3

REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE

Recommend By: W. F. Emwely
Emergency Planning Coordinator

5-17-82
DATE

Approved By: W. S. Harker
Plant General Manager

5/24/82
DATE

PEP-2.6.4 RADIOLOGICAL CONTROL DIRECTOR

1.0 Responsibilities and Objectives

The Radiological Control Director is responsible to the Site Emergency Coordinator for:

- 1.1 Managing the radiological monitoring and assessment aspects of the plant during an emergency;
- 1.2 Managing activities to control radiation exposure;
- 1.3 Providing technical and administrative direction to the three Radiological Emergency Teams and to the Dose Assessment Coordinator.
- 1.4 Providing liaison with Corporate personnel in the Harris Energy and Environmental Facility before activation of the Emergency Operations Facility and with the Radiological Control Manager after Emergency Operations Facility activation.

2.0 Scope and Applicability

This procedure shall be implemented when the Technical Support Group becomes activated, or when any of the three Radiological Emergency Teams become activated.

3.0 Actions and Limitations (Priority actions to be addressed by the Site Emergency Coordinator acting as the interim Radiological Control Director are indicated by "*").

3.1 General Requirements

- 3.1.1 Report your position and readiness to the Site Emergency Coordinator.
- 3.1.2 Announce your name and assumed position title to all team leaders that report to you, to the Site Emergency Coordinator and to other personnel in the Technical Support Center.
- 3.1.3 Ensure that all personnel actively assigned to you (i.e., not off site or in the Operational Support Center) are accounted for at all times (see PEP-3.8.2, "Personnel Accountability" for initial accountability requirements).
- 3.1.4 Determine need for additional equipment, supplies, and manpower, and make request for same.
- 3.1.5 Ensure documentation of the following in the Radiological Control Director's log:
 - Communications
 - Key decisions

- Data collected
- Checklists

(in accordance with PEP-4.1, "Record Keeping and Documentation").

- 3.1.6
 - A. When assuming the Radiological Control Director position, request a briefing on the emergency and emergency actions status from the previous position holder. Note completion of this step in the Radiological Control Director's log.
 - B. When relinquishing the Radiological Control Director position, brief your successor on the emergency and emergency actions status. Note completion of this step in the Radiological Control Director's log.
 - C. Notify all appropriate personnel of your name, position you are assuming, and the name of the person you replace. Note completion of this step in the Radiological Control Director's log.
- 3.1.7 Ensure proper use of communications equipment (per PEP-3.1.3, "Use of Communications Equipment").
- 3.1.8 Ensure exposure control is in accordance with PEP-3.7.1, "Emergency Work Permits and Exposure Control" (i.e., Special Radiation Work Permits shall be completed when required).
- *3.1.9 Designate an individual to serve as the Dose Assessment Coordinator. A primary and alternate is listed in Appendix A.1.
- 3.1.10 Coordinate as necessary with the Radiological Control Manager after the Emergency Operations Facility is activated.

3.2 RADIOLOGICAL CONTROL ACTIVITIES

- 3.2.1 Aid in determining the need for protective cover or evacuation and possible route per data supplied by Personnel Protection and Decontamination Team Personnel to Site Emergency Coordinator.
- *3.2.2 Assign priorities to the task at hand to ensure that the ~~personnel resources available are used in the best way to~~ cope with the emergency. EXHIBIT 2.6.4-1, "Radiological Control Director Activity Priorities," presents a general outline of task priorities developed to address an emergency involving personnel injuries and contaminations and a large radiological release. The outline can be used as a first cut at prioritizing the tasks required to respond to the actual emergency. Off-site Radiological Control activities will be the responsibility of the Radiological Control Manager after the Emergency Operations Facility is activated.

Note: The Radiological Control Director may choose to appoint an individual to provide assistance during an emergency. The assistant will report directly to the Director and will perform any function necessary to ensure that the Director's responsibilities and objective are fulfilled.

3.3 DOSE PROJECTIONS

Note: Off-site dose projections will be performed in the Emergency Operations Facility after it is fully activated and staffed.

3.3.1 Initial Dose Projections

*3.3.1.1 Implement PEP-3.4.1, "Initial Dose Projections." Actions may be delegated to the Dose Projection Coordinator.

3.3.1.2 Evaluate results and discuss with Site Emergency Coordinator.

3.3.1.3 If the projected dose is greater than 1 Rem whole body or 5 Rem thyroid, calculate (or have calculated) doses beyond the site boundary per Steps 3.8 of PEP-3.4.1.

3.3.1.4 Determine how often the calculation should be repeated (once per hour or upon any significant change in release rate is recommended).

Note: The dose projection function will be the responsibility of the Radiological Control Manager after the Emergency Operations Facility is activated.

3.3.2 Follow-up Dose Projections

3.3.2.1 Implement PEP-3.4.2, "Whole Body Dose Projections," 3.4.3, "Thyroid Dose Projections," 3.4.4, "Initial Ingestion Dose Analysis," and/or 3.4.6, "Determination of Affected Areas By Use of Visual Aids (Isopleths)" (actions may be delegated to the Dose Assessment Coordinator).

3.3.2.2 Evaluate results and discuss with Site Emergency Coordinator.

3.3.2.3 Determine how often the calculation should be repeated (once per hour or upon any significant change in release rate is recommended).

3.4 SOURCE TERM ASSESSMENT

Note: The frequency of the determination of source terms is dependent on (1) needs for calculating dose projections and confirmations and, (2) changing plant conditions.

- *3.4.1 Implement PEP-3.6.1, "Release Estimates Based Upon Stack/Vent Readings," if stack/vent monitors are available.
- 3.4.2 If the stack/vent monitors are not available (operable), implement PEP-3.6.2, "Release Estimates Based Upon Direct Radiation Levels."
- 3.4.3 If estimates of reactor coolant system activity (containment atmosphere activity) or fuel damage are required, implement PEP-3.6.3, "Interpretation of Liquid and Gaseous Samples."
- 3.4.4 To evaluate potential radiological consequences from leaks or spills, implement PEP-3.6.4, "Consequences of Leakage and Spills."

3.5 ENVIRONMENTAL MONITORING ACTIVITIES

- *3.5.1 Assist the Environmental Monitoring Team Leader in selecting proper monitoring locations and assessing radiological conditions expected in the field. If a potential for or if a release that could result in projected doses in excess of 10 rem occurs prior to activating the Environmental Monitoring Team, consider administration of potassium iodide to team members as per PEP-3.8.3.

Note: The Environmental Monitoring Team Leader will be responsible to the Radiological Control Director prior to Emergency Operations Facility activation and to the Radiological Control Manager after Emergency Operations Facility activation.

- *3.5.2 Advise appropriate state and county officials of the initial monitoring efforts underway prior to activation of the Emergency Operations Facility. (This may be carried out via the Representative at the Forward Emergency Operations Center Headquarters).
- 3.5.3 Make the results of monitoring efforts and analysis of samples available to the Forward Emergency Operations Center (prior to activation of the Emergency Operations Facility).
- 3.5.4 Where requested by responsible state officials, arrange for analysis of environmental samples by the Harris Energy & Environmental Center and for whole body counting and bioassay of affected off-site individuals.

Note: This function will be the responsibility of the Radiological Control Manager after activation of the Emergency Operations Facility.

Note: Upon declaration of a Site Emergency where a radioactivity release occurred or declaration of General Emergency, the Radiological Control Director shall request immediate monitoring support.

3.6 PLUME TRACKING ACTIVITIES

Note: This function will be the responsibility of the Radiological Control Manager after activation of the Emergency Operations Facility.

*3.6.1 Upon declaration of any Site or General Emergency arrange for the Environmental Monitoring Teams to monitor the location and radiation levels in the plume using ionization chamber instrumentation.

3.6.2 Direct the Environmental Monitoring Team Leader to obtain the survey gear and prepare for the plume measurements. Ensure silver zeolite iodine cartridges are used for radioiodine and that concentrations as low as 10^{-7} $\mu\text{Ci/cc}$ can be measured.

3.6.3 Direct the Dose Assessment Coordinator to maintain communications with the Environmental Monitoring Team and compare reported readings with those projected.

3.6.4 If deemed necessary and if not already done by the State, request assistance from the Department of Energy for special plume surveys.

Note: All off-site assistance will be requested and coordinated by the Radiological Control Manager after activation of the Emergency Operations Facility.

Note: This cannot be made available for a number of hours, but can be extremely useful in measuring low levels of radioactivity. Such requests shall be made through the South Carolina Bureau of Radiological Health..

3.6.5 If assessments of the plume trajectory are uncertain and if not already done so by the State, request assistance from NOAA and/or the NWS.

Note: These groups may be able to provide expert advice on regional meteorological conditions. Depending on the existing conditions, they may be able to provide devices to measure existing wind patterns (sounding balloons, theodolites) **and thus plume trajectories.** Such requests shall be made through the South Carolina Bureau of Radiological Health.

3.7 PLANT MONITORING ACTIVITIES

*3.7.1 Assist Plant Monitoring Team Leader in selecting proper monitoring and sample collection points and data required, and in assessing radiological conditions at those points.

- 3.7.2 Assist Plant Monitoring Team Leader in determining proper protective gear and dosimetry and in developing any precautions that should be included in the Plant Monitoring Team's briefing. Also consider the administration of potassium iodide as per PEP-3.8.3 to team members if potential projected doses are in excess of 10 rem.

3.8 PERSONNEL PROTECTION

- *3.8.1 Determine need for special protective gear and for deviation from "full" set of Anti C's. Automatic "full" gear with Anti C's and respiratory equipment required for:

- a. Sampling RCS or waste fluid
- b. Cleanup
- c. Entry $>10 \times$ MPC
- d. Entry to rad area of unknown intensity
- e. Entry to containment.

- 3.8.2 Require air samples to remove requirement for respiratory equipment when possible to better facilitate emergency communications.

- *3.8.3 Inform medical facility to set up for receipt of a contaminated injured person(s) prior to allowing the transportation vehicle to leave the site.

Note: Patients are not to be transported to the hospital for treatment if medical attention by the physician can be accomplished at the plant site.

- 3.9 Upon termination of an emergency, collect all team logs and pertinent exhibits and deliver to the Emergency Planning Coordinator.

EXHIBIT 2.6.4-1
RADIOLOGICAL CONTROL DIRECTOR ACTIVITY PRIORITIES⁽¹⁾

Priority	Task	PEP(s) That Implement
1	Search and Rescue and First Aid: Life-Saving Only	PEP-3.9.2,.3 & .6
2	Initial Dose Projections and Comparison with EALs	PEP-3.4.1
3	In-Plant Surveys to Calculate Initial Source Term	PEP-3.3.1
4	Provide Personnel to Accompany Initial Damage Control Team	PEP-3.3.1
5	Prompt Dispatch Off-Site Monitoring Team(s) For Dose Confirmation and Environmental Monitoring (if EOF is not activated)	PEP-3.5.1
6	Provide Personnel to Monitor at the Access Control Point for Radiation/Contaminated Areas	PEP-3.3.1,.2 and PEP-3.8.4
7	Emergency First Aid and Decontamination: <u>not</u> Life-Saving	PEP-3.9.2,.3,& .5
8	Provide Personnel to Accompany Follow-up Reentry Teams	PEP-3.3.1
9	Personnel Exposure Control (Routine Dosimetry Assurance and Completion of Special Radiation Work Permits)	PEP-3.7.1,.2 & .3 & PEP-3.8.3
10	Follow-up Environmental Monitoring (if EOF is not activated)	PEP-3.5.2,.3 & .4
11	Liaison with Off-site Agencies (if EOF is not activated)	
12	Follow-up Dose Projections and EAL Modifications (If EOF is not activated)	PEP-3.4.2,.3,.4 & .6
13	Follow-up In-plant/On-site Monitoring and Sample Collection	PEP-3.3.1, 2, & .3
14	Sample Analysis	PEP-3.3.4
15	Minor First Aid and Decontamination	PEP-3.9.2 & .5

(1) This list of activity priorities is sequenced in a "likely order" for a fast breaking radiological emergency when personnel resources may be limited. Personnel assignments should be made as needed by the specific plant and personnel requirements.



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EMERGENCY PLAN AND PROCEDURES

VOLUME 13

IN-PLANT MONITORING AND SURVEYS

PEP-3.3.1

REVISION 4

REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE

Recommend By: *[Signature]*
Emergency Planning Coordinator

5-17-82
DATE

Approved By: *[Signature]*
Plant General Manager

5/20/82
DATE

PEP-3.3.1 IN-PLANT MONITORING AND SURVEYS

1.0 Responsible Individual and Objectives

The Plant Monitoring Team is responsible for assuring that in-plant monitoring and surveys are conducted, documented and reported as directed by the Radiological Control Director and the Plant Monitoring Team Leader.

2.0 Scope and Applicability

This procedure shall be implemented when an Alert, Site Emergency, or General Emergency has been declared.

This procedure includes direct radiation measurements, contamination surveys and air sampling performed during the course of Damage Control Team entries into radiation areas as well as entries for the sole purpose of measuring radiation levels and collecting air samples.

In order to minimize personnel radiation exposure, all entries must be approved by the Site Emergency Coordinator or his designee in accordance with PEP-3.7.1, "Emergency Work Permits and Exposure Control."

Note: Where this procedure does not address specific monitoring details refer to plant procedures for routine operations.

3.0 Actions and Limitations

Note: For conditions where off-site releases are expected to have occurred and resources are limited, off-site monitoring at the site boundary (confirmation of initial dose projections) is generally of higher priority than building entries whose sole purpose is to determine the radiation environment. Off-site monitoring will be the responsibility of the Radiological Control Manager after activation of the Emergency Operations Facility.

The Plant Monitoring Team shall:

3.1 Obtain briefing from Site Emergency Coordinator, Radiological Control Director or Plant Monitoring Team Leader regarding:

- 3.1.1 Required monitoring data;
- 3.1.2 Anticipated levels of radiation en route;
- 3.1.3 **Suggested routes;**
- 3.1.4 Required protective gear;
- 3.1.5 Exposure limits allowed for this entry.

3.2 Obtain calibrated monitoring equipment from emergency kits or from routine use equipment.

3.3 Prior to leaving equipment storage location, perform an instrument check including:

3.3.1 Power supply.

3.3.2 Current calibration sticker.

3.3.3 Modifications or limitations (per sticker).

3.3.4 Source check (if source is available).

3.4 Obtain necessary communications equipment and assure operability.

3.5 When accompanying Damage Control Teams, verify that team members are properly outfitted with protective gear and dosimetry.

3.6 When conducting surveys separate from Damage Control Team entries, proceed to the locations requiring monitoring, and if necessary use plant survey maps found in HP-1.1, "Radiation Control Area Surveillance Program," in conjunction with EXHIBIT 3.3.1-1, "Radiological Survey Data," to record results.

Note: Refer to PEP-3.3.3 "Collection of Very High Level Radioactive Samples" for special procedures that shall be followed when collecting samples during a Site Emergency or General Emergency.

3.7 Conduct in-plant monitoring and surveys (airborne and direct) as directed in HP-1.1, "Radiation Control Area Surveillance Program."

3.8 Operate direct radiation monitors continuously while proceeding to requested locations and note on EXHIBIT 3.3.1-1 any unanticipated high radiation levels, their location and time and date of reading.

3.9 Record (or communicate to one who is recording) pertinent data at each location requested to be monitored and record on Exhibit 3.3.1-1, "Radiological Survey Data." Exhibit 3.3.1-1 shall be used to record direct radiological, airborne, and contamination survey results.

3.10 Communicate abnormally high readings to the Plant Monitoring Team Leader.

3.11 Collect filters and charcoal cartridges from fixed samplers as directed by the Plant Monitoring Team Leader. Assure each sample is labeled with:

3.11.1 Type of sample;

3.11.2 Time of sample;

3.11.3 Number, if applicable;

3.11.4 Sample location;

3.11.5 mr/hr on contact with sample inside sample bag.

3.12 Bring samples to the counting facility.

Note: Assure adequate integrity of sample containers and strict handling to avoid contamination of facilities. If very high level, (>2 R/hr) refer to PEP-3.3.4 "Analysis of Very High Level Radioactive Samples."

3.13 Plant survey maps contained in HP-1.1, "Radiation Control Area Surveillance Program" may be used to transfer survey results from Exhibit 3.3.1-1. This may be necessary only to be more specific concerning a sample location.

Note: Primary and backup communications link within the plant for survey teams will be by P.A. and PBX telephone lines respectively. If available, hand-held radios may provide an additional means of communications.

RADIOLOGICAL SURVEY DATA

[illegible]



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EMERGENCY PLAN AND PROCEDURES

VOLUME 13

ON-SITE MONITORING AND SURVEYS

PEP-3.3.2

REVISION 2

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Emergency Planning Coordinator

5-17-82
DATE

Approved By: *W. J. Harker*
Plant General Manager

5/24/82
DATE

PEP-3.3.2 ON-SITE MONITORING AND SURVEYS

1.0 Responsible Individuals and Objectives

The Personnel Protection and Decontamination Team and Plant Monitoring Team are responsible to the Radiological Control Director for assuring on site monitoring and surveys are conducted at locations on site (including those outside the protected area), documented and reported to appropriate personnel.

Releases of radioactivity may lead to excessively high radiation levels in or near the Operational Support Center, the Technical Support Center, Emergency Operations Facility, the machine shops, the counting areas, or other areas within the site boundary, but removed from the reactor. Periodic surveys of such areas are necessary to assure their continued habitability.

2.0 Scope and Applicability

This procedure shall be implemented if a Site Emergency or General Emergency is declared during which radioactivity is directly released or suspected to be released into the atmosphere, and as directed by the Radiological Control Director or Site Emergency Coordinator.

Note: Where this procedure does not address specific monitoring details refer to PEP-3.3.1, "In-Plant Monitoring and Surveys" and HP-1.1, "Radiation Control Area Surveillance Program."

3.0 Actions and Limitations

Note: For conditions where off-site doses have exceeded or are projected to exceed 0.1 Rem whole body, and resources are limited, confirmatory off-site monitoring at the site boundary takes precedence.

3.1 Unless otherwise directed by the Radiological Control Director the general criteria for determining that radiation levels are acceptably low for continued habitability are:

3.1.1 <5 mR/hr direct;

3.1.2 <1000 dpm/dm² contamination; and

3.1.3 <.25 MPC airborne.

3.2 Obtain calibrated monitoring equipment from emergency kits or from routine-use equipment.

3.3 Perform an instrument check including:

3.3.1 Power supply.

3.3.2 Current calibration sticker.

- 3.3.3 Modifications or limitations (per sticker).
 - 3.3.4 Source check (if available).
 - 3.3.5 Ensure that monitoring instruments are capable of measuring high radiation levels without saturation.
- 3.4 For general radiation measurement of areas that must remain habitable, place TLD's, take air samples and take contamination smear surveys in the following areas and as directed by the Radiological Control Director or as specified in HP-1.1, "Radiation Control Area Surveillance Program":

- 3.4.1 Machine shops
- 3.4.2 Administration building
- 3.4.3 Operational Support Center
- 3.4.4 Technical Support Center
- 3.4.5 Counting areas
- 3.4.6 Assembly areas
- 3.4.7 Emergency Operations Facility

Note: Record results of samples and surveys on Exhibit 3.3.1-1, "Radiological Survey Data."

- 3.5 For specific locations of personnel ingress and egress, personnel monitoring devices (e.g., RM-14) must be set up as needed in support of PEP-3.8.4, "Access Control."

- 3.5.1 Main entrance
- 3.5.2 Visitors Center
- 3.5.3 Guard locations
- 3.5.4 Any other area(s) specified by the Radiological Control Director or Site Emergency Coordinator.

Note: Primary and backup communications link within the plant for survey teams will be by P.A. and PBX telephone lines respectively. If available, hand-held radios may provide an additional means of communications.



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EMERGENCY PLAN AND PROCEDURES

VOLUME 13

CONFIRMATION OF INITIAL OFF-SITE DOSE PROJECTIONS

PEP-3.5.1

REVISION 3

REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE

Recommend By: W.D. Tannolly
Emergency Planning Coordinator

5-17-82
DATE

Approved By: W.S. Hurling
Plant General Manager

5/24/82
DATE

PEP-3.5.1 CONFIRMATION OF INITIAL OFF-SITE DOSE PROJECTIONS

1.0 Responsible Individual and Objectives

The Environmental Monitoring Teams are responsible for the measurement of radiation levels at or near the site boundary; the Radiological Control Director or Dose Assessment Coordinator is responsible for the interpretation of the data and its comparison with initial dose projections.

The initial calculations of the consequences of an accidental release are necessarily based on estimated release rates and atmospheric dispersion. Uncertainties in these estimates can result in calculations which differ by an order of magnitude from the actual off-site consequences. Confirmation and/or modification of the initial dose projections may be required before a decision is made to notify the public or initiate off-site protective actions.

The Environmental Monitoring Teams are responsible to and shall report all data to the Radiological Control Director until the Emergency Operations Facility is activated and fully staffed. At this time, the Radiological Control Manager in the Emergency Operations Facility shall assume all responsibility for the Environmental Monitoring Teams, the interpretation of off-site data, and its comparisons with initial dose projections.

2.0 Scope and Applicability

This procedure provides guidelines for the location of environmental measurements, the measurements to be taken and the comparison of measured radiation levels with the initial dose projections developed per PEP-3.4.1 "Initial Dose Projections."

3.0 Actions and Limitations

3.1 The Environmental Monitoring Team shall:

- 3.1.1 Prior to Emergency Operations Facility activation, consult with the Radiological Control Director or the Dose Projection Coordinator and obtain the current wind direction data or areas to be surveyed. Upon activation, this information should be obtained from the Radiological Control Manager.

Note: Wind direction data is normally reported as direction from which the wind is blowing, so that off-site surveys are needed in the opposite direction and downwind. Confirm wind direction.

- 3.1.2 If the area to be surveyed is not specified, the following guidelines apply:

WIND DIRECTION BETWEEN:

180° and 270° (between S and W)

SURVEY LOCATION

Primary: Lake Robinson
(by boat), 1 km from
plant (e.g., Black Creek)

	<u>Secondary: S to SW;</u> Rte 39 to Rte 737, Rte 737 to south Rte 21
	SW to W: Rte 39 from Rte 28 to Rte 737
270° and 0° (between W and N)	Rte 23, between Rte 151 and Rte 39.
0° and 90° (between N and E)	Rte 23 to Rte 151, turn right and go north on Rte 21 for ~1 mile. Turn around and go south for ~2 miles.
90° and 180° (between E and S)	<u>Primary: Land vehicle,</u> 1 km from plant (e.g., 400 m. or 1/4 mile beyond coal pile)
	<u>Secondary: North on Rte</u> 151, right (North) on Rte 172

These highways and landmarks are shown on EXHIBIT 3.5.1-1.

- 3.1.3 If weather conditions do not permit monitoring at ground level or on the river, advise Radiological Control Director (Radiological Control Manager after Emergency Operations Facility has been activated) that helicopter assistance may be needed.
- 3.1.4 Once the initial survey location is identified, pick-up Environmental Monitoring Emergency kit(s) and vehicles.
- 3.1.5 Request, from the Radiological Control Director (Radiological Control Manager after Emergency Operations Facility has been activated) information on expected radiation conditions to be encountered and on any special protective gear required.
- 3.1.6 Proceed to the survey vehicle, load the survey equipment and establish communications with the plant. Each Environmental Monitoring Team member should be properly outfitted with appropriate dosimetry (i.e., TLD and dosimeter obtained from Environmental Monitoring kits). Record TLD and dosimeter serial numbers along with dosimeter readings in Environmental and Personal Dose Data (PEP-3.5.1-2).
- 3.1.7 Proceed to the survey location.
- 3.1.8 Proceed along the survey route, which should be at approximately a right angle to the wind direction.

- 3.1.9 When the maximum dose rate is determined using an ionization chamber, report that value, the time the reading was observed, and the approximate location of the reading to the Radiological Control Director. Proceed until out of the radioactive plume, turn around and repeat the survey. Report pertinent information to Radiological Control Director after the Emergency Operations Facility has been activated.
- 3.1.10 Return to the location of the maximum dose rate. Activate the high volume air sampler and collect a two-to-ten minute air sample (a ten-minute air sample will meet the 10^{-7} uCi/cc detectable limit when using appropriate curve of either Exhibit PEP-3.5.1-4 or PEP-3.5.1-5.
- 3.1.11 Record the starting time, the stopping time, sample flow rate, sample volume, location of the sample, background radiation, name of person collecting sample, and which Environmental Team obtained the sample on Exhibit 3.5.1-2, "Environmental and Personal Dose Data." Also record sample information on a 3 x 5 index card located in the Emergency Monitoring kit.
- 3.1.12 Proceed to a location outside of the plume. Exercising care to protect sample during adverse weather, remove the filter paper, using gloves if needed, and place it flat in a poly bag. Do likewise with the silver zeolite cartridge in another bag. DO NOT CLOSE OR SEAL THE BAGS. Place the survey meter against the surface of each bag and record the readings. Wait five minutes and repeat the readings. Report all four values and the time of the readings and record in "Environmental and Personal Dose Data," Exhibit 3.5.1-2, and on card mentioned in 3.1.11. Insert card in sample bag and seal.

Note: Environmental monitoring data will be reported by means of 2-way VHF radio (operation is explained in PEP-3.1.3). If a 2-way radio fails, joint use of radios is acceptable. If joint use of radios is not feasible, the Darlington County Plant phone system may be used. If Darlington County Plant phone system is not in operation, the Company phone system at the downtown office (341 W. Carolina) could be used. If this is not reasonable, private or public phone systems could be used. If none are available, the CP&L telephones systems, CP&L emergency telephone network or Southern Bell system at the information center may be called upon.

- 3.1.13 Using curves in Exhibit 3.5.1-4 and 3.5.1-5 determine the gross activity and gross iodine and report to the Environmental Monitoring Team Leader. Proceed, as directed, to the site to return the samples for analysis or to other locations as directed.

3.2 The Dose Projection Coordinator (Radiological Control Manager after the Emergency Operations Facility has been activated) shall:

- 3.2.1 Compare the maximum off-site dose rate readings in mR/hr to the projected whole body doses based on plant measurements of noble gas releases and existing meteorological conditions. Where the survey readings are taken at considerable distances from the property boundary (e.g. greater than 1/2 km.), EXHIBIT 3.5.1-1 and EXHIBIT 3.5.1-3, "Extrapolation Ratio for Estimating Doses Beyond Robinson Property Boundary," should be used.

Note: The actual meteorological dispersion values, for any given meteorological stability class, may vary by a factor of five or even more as compared with the values based on standard tables or figures. Where the observed dose rates are within a factor of five of the calculated dose rates it may be assumed that the initial dose projections are reasonably representative of the consequences of the release.

- 3.2.2 If survey meters held against the samples indicate activity has been retained on the filters, this may be evidence that iodine has been released. If the activity on both filters at the second reported reading are within 25% of the first reading it should be presumed, pending isotopic analysis, that iodine is present.

Note: Rb-88, with a 17 minute half-life, may be the predominant activity on paper filters. Thus activity on air samples may be the result of a noble gas release. The above step is an attempt to quickly determine whether iodine has also been released.

1



EXHIBIT 3.5.1-2

ENVIRONMENTAL AND PERSONAL DOSE DATA

NOTE: Deliver to Environmental Monitoring Leader upon completion.

ENVIRONMENTAL DATA						
SAMPLE LOCATION						
AIR SAMPLE START						
AIR SAMPLE STOP						
AIR SAMPLE FLOW RATE (CFM)						
AIR SAMPLE VOLUME (cc)*						
BACKGROUND RADIATION (Mr/Hr)						
FILTER READING (Mr/Hr or CPM)						
FILTER AIR ** ACTIVITY (uCi/cc)						
CARTRIDGE AIR ** (Mr/Hr or CPM)						
CARTRIDGE AIR ** ACTIVITY (uCi/cc)						
FILTER READING AFTER 5 MIN.						
CARTRIDGE READING AFTER 5 MIN.						
INSTRUMENT USED						
INSTRUMENT SERIAL #						
TECHNICIAN						
*VOLUME = FLOW RATE (CFM) X TIME (MIN.) X 28320						
** AIR ACTIVITY = uCi (derived from EXHIBIT 3.5.1-4 or -5) ÷ SAMPLE VOLUME (cc)						
PERSONAL DOSE DATA						
ENVIRONMENTAL TEAM 1 OR 2 NAME	TLD #	DOSIMETER #	INITIAL DOSIMETER READING	FINAL DOSIMETER READING	NET ACCUMULATED DOSE	

EXHIBIT 3.5.1-3

EXTRAPOLATION RATIO FOR ESTIMATING DOSES BEYOND ROBINSON PROPERTY BOUNDARY

DISTANCE FROM PLANT		ATMOSPHERIC STABILITY CLASS						
km	miles	A	B	C	D	E	F	G
2.5	0.3	1	1	1	1	1	1	1
1	0.62	.11	0.26	0.31	0.48	0.68	0.74	0.71
2	1.2	0.017	0.065	0.093	0.17	0.27	0.45	0.36
3	1.9	0.01	0.030	0.045	0.085	0.14	0.28	0.21
4	2.5	0.01	0.016	0.025	0.059	0.095	0.18	0.15
5	3.1	0.01	0.01	0.019	0.004	0.068	0.13	0.11
6	3.7	0.01	0.01	0.01	0.033	0.054	0.11	0.089
7	4.4	0.01	0.01	0.01	0.027	0.043	0.085	0.071
8	5.0	0.01	0.01	0.01	0.020	0.035	0.068	0.057

TO USE THIS EXHIBIT:

1. Determine distance from Plant, as from EXHIBIT 3.5.1-1.
2. Divide the reported maximum observed dose rate in mR/hr by the extrapolation ratio corresponding to the distance at which the survey was conducted and the atmospheric stability class.
3. Compare this result with the initial whole body dose projection of PEP 3.4.1.

EXHIBIT 3.5.1-4

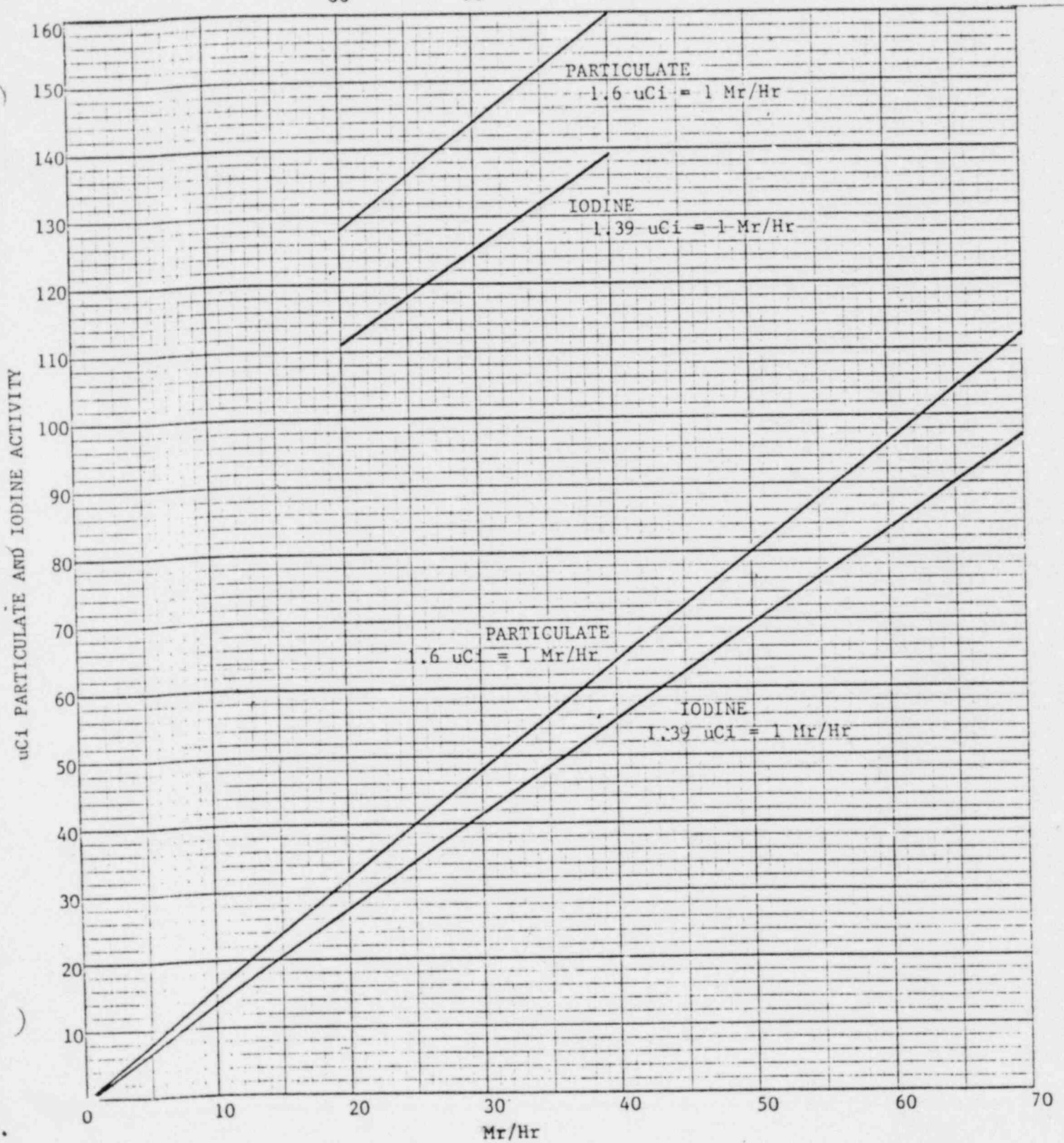
PARTICULATE AND IODINE ACTIVITY USING GM DETECTOR
ONE INCH FROM SAMPLE

Mr/Hr

80

90

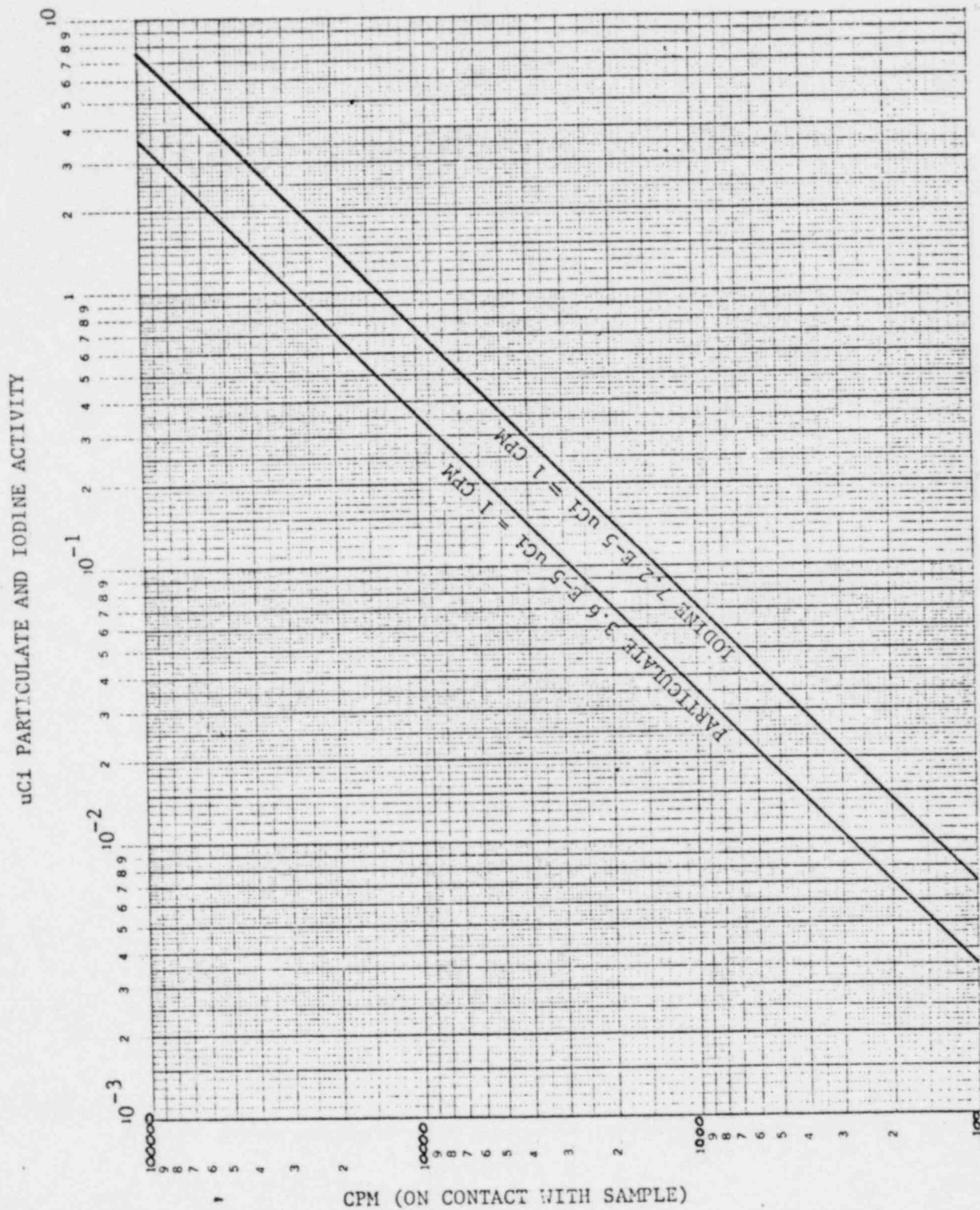
100



ONE INCH FROM SAMPLE

EXHIBIT 3.5.1-5

PARTICULATE AND IODINE ACTIVITY USING GM
DETECTOR ON CONTACT WITH SAMPLE





H. B. ROBINSON
SEG PLANT

TITLE

EMERGENCY PLAN AND PROCEDURES

VOLUME 13

PLUME TRACKING BY ACTUAL MEASUREMENT

PEP-3.5.3

REVISION 2

REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE

Recommend By: *W. B. Emmons*
Emergency Planning Coordinator

5-17-82
DATE

Approved By: *W. A. Harkins*
Plant General Manager

5/29/82
DATE

PEP-3.5.3 PLUME TRACKING BY ACTUAL MEASUREMENT

1.0 Responsible Individual and Objectives

The Radiological Control Director (the Radiological Control Manager after the Emergency Operations Facility is activated) is responsible for maintaining up-to-date assessment of the areas affected by radioactivity release into the environment. (For purposes of this procedure, this includes that area where exposure to members of the public are predicted to exceed 100 mrem.)

2.0 Scope and Applicability

This procedure is to be implemented upon declaration of any Site or General Emergency where projected off-site exposures approach or exceed the levels associated with Environmental Protection Agency's Protective Action Guidelines. A determination must be made of doses in the affected areas. While these doses may be inferred from interpretations of release data, time varying meteorological conditions and results from environmental surveys, actual plume tracking should be attempted where practicable. This procedure applies primarily to CP&L activities, necessary for emergency responses, but performed prior to full activation of the state response organizations. Where releases continue for more than several hours, plume tracking efforts will be under the direction of the State; but CP&L may be requested to provide input. This procedure also addresses CP&L support of State-directed plume tracking efforts.

3.0 Actions and Limitations

3.1 The Environmental Monitoring Team shall provide necessary personnel and equipment to measure radioactivity levels in the plume.

- 3.1.1 Obtain Environmental Monitoring Kits and vehicles. Load vehicles and properly outfit each Environmental Monitoring Team member with appropriate dosimetry (i.e., TLD and Dosimetry). Record TLD and dosimeter numbers along with initial dosimeter reading on PEP Exhibit 3.5.1-2.
- 3.1.2 Consult with the Dose Assessment Coordinator (Radiological Control Manager after the Emergency Operations Facility is activated) and review the release, estimated release heights and wind directions.
- 3.1.3 Establish communications with the Environmental Monitoring Team Leader via radio contact. (If necessary, consult PEP-3.1.3, "Use of Communications Equipment.")
- 3.1.4 Proceed to a distance about 1 km from the plant, in the general downwind direction.
- 3.1.5 Travel a right angle to the reported wind direction and measure the highest dose rate using a Ionization Chamber. GM type instruments may be used for initial plume location.

- 3.1.6 If it has been determined that the release is from an elevated location or is associated with steam (as from open steam relief valve, steam line break, etc.) attempt (where it is safe to do so) to measure the height at which the maximum dose rate is observed.

Note: This will provide useful benchmark information to help interpret subsequent measurements.

- 3.1.7 Proceed downwind, periodically taking crosswind measurements and reporting locations of maximum readings at any given distance.

Note: This may need to be repeated for continuing releases.

- 3.1.8 Collect 2-10 minute air samples (iodine and particulate) at the location of maximum dose rates (cloud centerline) at various distances (e.g., 1, 2, 3, 4, 5, 10, 20 miles from the site).

- 3.1.9 Record the starting time, the stopping time, sample flow rate, sample volume, location of the sample, background radiation, name of person performing sample and Environmental Monitoring Team obtaining the sample on PEP Exhibit 3.5.1-2, "Environmental and Personal Dose Data." Also record sample information on 3 x 5 index card located in emergency kit.

- 3.1.10 Proceed to a location outside plume. Exercising care to protect sample during adverse weather, remove the filter paper, using gloves if needed, and place in a flat poly bag. Do likewise with the silver zeolite cartridge. DO NOT CLOSE OR SEAL THE BAGS. Place the survey meter against the surface of each bag and record the readings. Wait five (5) minutes and repeat the readings. Record all four values and the time of readings on PEP Exhibit 3.5.1-2 and on card mentioned in 3.1.9. Insert card in sample bag and seal.

- 3.2 The Dose Assessment Coordinator (Radiological Control Manager after the Emergency Operations Facility is activated) shall:

- 3.2.1 Provide projected plume trajectory estimates to the Environmental Monitoring Team Leader.

- 3.2.2 Record and display a summary of the reported results (time, location, rate) on the map or other available forms.

- 3.2.3 If releases or meteorological conditions change substantially during the plume tracking effort, advise and make recommendations as to revised tracking locations.

3.2.4 Revise projected doses where plume tracking results so indicate.

Note: Make sure that all reported dose rates are adjusted to reflect a common time (e.g., correct for differences in decay) before revising projected doses.



H. B. ROBINSON
SEG PLANT

TITLE

EMERGENCY PLAN AND PROCEDURES

VOLUME 13

EMERGENCY FACILITIES AND EQUIPMENT

PEP-4.2

REVISION 0

REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE
1	RBS/ms	4-25-81						
2	RBS/ms	5-24-82						

Recommend By:

Stan Crocker
E&RC Supervisor

2-20-87
DATE

Approved By:

W. J. Hall
Plant General Manager

2/20/87
DATE

PEP-4.2 EMERGENCY FACILITIES AND EQUIPMENT

1.0 Responsible Individuals and Objectives

The Emergency Planning Specialist is responsible to the Emergency Planning Coordinator for assuring that site emergency facilities and equipment are adequate for providing organized coordination and control of on-site and off-site activities during an emergency. This shall include staffing and inventories, calibration and operation of equipment and instrumentation.

2.0 Scope and Applicability

Emergency facilities and equipment shall be maintained and kept operational, with inventories kept current and available upon need.

3.0 Actions and Limitations

The Emergency Planning Specialist shall:

3.1 Maintain an on-going up-to-date copy of PEP-Appendix A for the following emergency facilities:

- 3.1.1 Technical Support Center
- 3.1.2 Operational Support Center
- 3.1.3 Plant Media Center
- 3.1.4 Corporate Media Center
- 3.1.5 Corporate Emergency Operations Center
- 3.1.6 The Harris Energy and Environmental Center
- 3.1.7 Forward Emergency Operations Center

3.2 Establish Plant Media Center with Bell System telephones at the Visitors Center, with readily available temporary trailers for additional office space. (See PEP-3.1.3 - Use of Communications Equipment.)

3.3 Verify the operation, testing and calibration of the following systems at required intervals:

- 3.3.1 Communications system (monthly);
- 3.3.2 Geophysical phenomena monitors (semi-annually);
- 3.3.3 Radiological monitors (semi-annually);
- 3.3.4 Process monitors (semi-annually);
- 3.3.5 Fire detection (semi-annually).

- 3.4 Verify the performance of calibration of emergency equipment in accordance with existing calibration procedures.
- 3.5 Ensure the inventory of protective facilities and equipment (i.e., decontamination facilities), first aid and medical facilities, supplies and equipment and damage control equipment and supplies, at specific periodic intervals and after each use, in accordance with PT-43, "Emergency Kit Inventory."
- 3.6 Maintain a copy of an inventory sheet in its respective emergency kit.
- 3.7 Transmission and Distribution Supervisor will conduct testing and reporting of results on the siren system. (Sirens malfunctioning outside normal work hours may be reported on the next work day.)
 - 3.7.1 Transmission and Distribution will forward records of all semi-monthly, quarterly, and annual test as recorded on the public notification siren and inspection test form to H. B. Robinson Plant, attention Emergency Planning Specialist.
 - 3.7.2 Emergency Planning Specialist will notify the appropriate County Civil Defense Director when sirens are out of service for any reason, including maintenance, breakdown, or test failure. Likewise, notify Civil Defense Director when equipment is returned to service. (Notification to County Civil Defense Directors can be made the next working day.)
 - 3.7.3 Emergency Planning Specialist will prepare and forward to the State an annual report certifying the successful testing of the sirens in the area of the plant during the previous year.