SALEM GENERATING STATION
EMERGENCY PLAN
EMERGENCY PLAN PROCEDURES INDEX
October 21, 1983

No. 101
U.S. NRC, Dir. of NRR
Washington, D.C. 20555
Mr. S.A. Varga, Chief, Oper.
Reactors BR#1, Div. of Licensing

SECTION III - SECURITY EMERGENCY PROCEDURES — REV. NO.

SECTION IV - RADIATION PROTECTION/CHEMISTRY EMERGENCY PROCEDURES

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SECTION III - SECURITY EMERGENCY PROCEDURES — REV. NO.

SECTION IV - RADIATION PROTECTION/CHEMISTRY EMERGENCY PROCEDURES

EMERGENCY PROCEDURE
EP II-1
EMERGENCY RESPONSE MANAGER RESPONSIBILITIES

ACTION LEVEL

Required for Emergency Operation Facility (EOF) activation.

Preparation to Assume Responsibilities

1. Begin log of activities.

2. Conduct a meeting with the Radiological Support Manager, Site Support Manager, and other members of the offsite response organization to ensure that they are prepared to assume their emergency response functions.

3. Contact the Emergency Duty Officer (EDO) and:
   a) Determine the protective action recommendations made to date with reasons for each and States' actions, if known.
   b) Assume the duties of the emergency coordinator, which includes the nondelegatable duty to make the decision to notify and recommend protective actions to New Jersey and Delaware.

Responsibilities

1. Direct Site Support Manager to implement EP I-1 through EP I-4 for changes in event classification, as recommended by the EDO, SSM or RSM.

2. Review and approve Initial Contact Message form, as required for event classification change or a change in Protective Action Recommendation to the States.

3. Review and approve periodic press releases.

4. Regularly Contact the Deputy Director of the Office of Emergency Management for New Jersey and the Director of the Division of Emergency Planning and Operations for Delaware, using the phone numbers provided in Addendum 1 to insure States are satisfied with data flow from EOF.

Responsibilities (con'd)

5. Review and approve completed Station Status Checklists prior to transmission to the states.

6. Conduct periodic briefings with EOF Support managers to discuss status of the plant and protective action recommendations. Review questions in attachment 1 of this procedure regularly during the event, and the recovery phase.

7. Periodically contact the Senior Vice President - Energy Supply and Engineering with updates on plant status and protective actions recommended to the States.

8. Regularly provide EOF staff with short announcements of status of the event.

9. Ensure that TSC and Control Room are aware of event classification and protective actions recommended.

ATTACHMENT 1

Briefing Questions

1. Do the states understand the cause, type and extent of the accident?
   (Verify by contacting State Emergency Coordinator)

2. What is the condition of the core?
   (Verify by discussing with SSM and TSM)

3. Is there adequate cooling?
   (Verify from subcooling margin data and discussion with SSM)

4. What is the source term?
   a. Core inventory - (TSM/Fuels)
   b. Primary coolant activity - (TSM/Fuels)
   c. Containment atmosphere - (RSM)
   d. Releases to enviornment - (RSM)

5. What is the offsite dose?
   a. Projected-(RSM/SSM)
   b. Measured-(RSM)

6. What about injestion pathway?
   a. Environmental-Samples (RSM)
      Milk
      Vegetation

7. What about habitability of Emergency Response Facilities?
   Control Room/OSC - (SSS/EDO)
   TSC - (SSS/EDO)
   EOF - (RSM)
   TB02 - (RSM)

8. Has a schedule been prepared for 2 or 3 shift operation of the
   TSC - (SSM/EDO)
   EOF - (ASM)

Prepared By: _____

Reviewed By: _____ 10/17/83
Department Head — Date

Reviewed By: _____ 10/17/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: _____ 10/18/83
Station Quality Assurance Review (if required see EP VI-2) — Date

SORC Meeting Number: 83-131 10/20/83
Date

Approved By: _____ 10/21/83
General Manager - Salem Operations — Date

Approved By: _____ 10/4/83
Manager - Nuclear Site Protection — Date

EMERGENCY PROCEDURE
EP II-2
SITE SUPPORT MANAGER RESPONSIBILITES

ACTION LEVEL

Required for Emergency Operation Facility (EOF) activation.

Preparation to Assume Responsibilities

1. Begin log of activities.

2. Verify the capability for communications with the Technical Support Center, using the hotline phone or the numbers provided in Addendum 1.

3. Obtain a briefing from the Technical Support Supervisor (TSS) or the Emergency Duty Officer (EDO) on the plant status and projections for the next 8 hours.

4. Assign a staff member to periodically receive plant status from the Control Room, complete the Operational Status Form and the operational portion of the Station Status Checklist (Figure 3) and implement their distribution.

5. Assign a staff member to initiate and maintain the Operations Status Log and event log on boards at the front of the EOF.

6. Assign a staff member to prepare the operational portion of the Station Status Checklist.

7. Report to the Emergency Response Manager (ERM), when ready to assume responsibility for recommending protective actions based on plant conditions.

Responsibilities

1. Review and approve the operational portion (Part I) of the Station Status Checklist (Attachment 1) and discuss listed parameters with staff.

2. Provide Part I (operational portion) of the Station Status Checklist to RSM to be included with Part II for distribution to the States.

3. Provide Operational Emergency Action Level Recommendations to the Emergency Response Manager based upon discussions with the TSS and information included on the Operational Status form.

4. Implement EP I-1 through EP I-4, when directed by the ERM, for changes in event classification.

5. Prepare an Initial Contact Message form and provide to the State communicators when directed by the ERM for changes in Protective Action Recommendations.

6. Prepare information on the status of the plant for the ERM's periodic briefings, using Attachment 2.

7. Discuss recommendations for event mitigating actions with the Technical Support Manager.

ATTACHMENT 1
STATION STATUS CHECK LIST

Salem Generating Station Unit No. _____

Transmitted By: Name _____ Position: _____

1. Date and Time Event Declared: Date_____ Time _____ (24 hr clock)
2. Accident Classification: ☐ Significant Event ☐ Unusual Event
   ☐ Alert ☐ Site Area Emergency ☐ General Emergency
3. Cause of Incident:

   Primary Initiating Condition used for declaration of incident
   EPI-0 Part _____, Number _____ and/or
   Significant Event No. _____
   Description of the incident _____

   _____

   _____

   _____

4. Status of Reactor: ☐ Tripped/Time _____ ☐ At Power
   ☐ Hot Shutdown ☐ Cold Shutdown
5. Pressurizer Pressure _____ psig Hottest Core Exit TC _____ °F
6. Is offsite power available? ☐ YES ☐ NO
7. Are two or more diesel generators operable? ☐ YES ☐ NO
8. Did the emergency safeguards system activate? ☐ YES ☐ NO
9. Has the containment been isolated? ☐ YES ☐ NO
10. Other pertinent information _____

_____

_____

_____

_____

Station Status Checklist - Radiological Information

11. Gaseous Release: ☐ YES ☐ NO

(A) Release Terminated: ☐ YES ☐ NO

(B) Anticipated or Known Duration of Release _____ Hours

(C) Type of Release: ☐ GROUND ☐ ELEVATED

(D) Wind Speed: ____ MPH Wind Direction: (Toward) _____
Divide by 2 to get _____ M/Sec (From) _____ (Compass Points)
Delta Temp: _____

(E) Stability Class: ☐ Unstable ☐ Neutral ☐ Stable

(F) Release Rate Iodine _____ Ci/Sec.

(G) Release Rate Noble Gas: _____ Ci/Sec.

12. Liquid Release: ☐ YES ☐ NO

(A) Release Terminated: ☐ YES ☐ NO

(B) Anticipated or Known Duration of Release _____ Hours

(C) Estimated Concentration _____ pico Curies/Liter

(D) Release Rate _____ Liters/Hour

13. Projected Off-site Dose Rates (As Soon As Data Is Available):

Distance (miles)	Adult Whole Body (mrem/hr)	Child Thyroid (mrem/hr)
_____	_____	_____
_____	_____	_____
_____	_____	_____

14. 15 minute updates to States:

		Time	Initials
☐ State of New Jersey	_____ Name	_____	_____
☐ State of Delaware	_____ Name	_____	_____
☐ Others	_____ Name	_____	_____
	_____ Agency		
	_____ Name	_____	_____
	_____ Agency		

Briefing Questions

1. What information is known on the following?
   - Core coverage?
   - RCS?
   - Fuel?
   - Fission Product Boundary?

2. Can the event be mitigated operationally?

3. What is the projected duration of the event?

4. What probable changes in operational status would cause change in event classification?

5. Are engineering changes required to mitigate the event? Have they been discussed with the TSM and TSS?

6. What operational actions could change the current radiological conditions?
   - Decrease onsite/offsite doses?
   - Increase onsite/offsite doses?

7. What operational data could impact on the RSM's ability to provide accurate offsite dose estimates? Has this data been collected and provided to the RSM staff?
   - Steam releases?
   - Steam Driven Aux Feedwater Pumps?
   - PORV's?
   - Chemistry Samples?

Prepared By: _____

Reviewed By: _____ 10/17/83
Department Head — Date

Reviewed By: _____ 10/17/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: _____ 10/18/83
Station Quality Assurance Review (if required see EP VI-2) — Date

SORC Meeting Number: 83-131 10/20/83
Date

Approved By: _____ 10/21/83
General Manager - Salem Operations — Date

Approved By: _____ 10/24/83
Manager - Nuclear Site Protection — Date

EMERGENCY PROCEDURE
EP II-3
RADIOLOGICAL SUPPORT MANAGER RESPONSE

ACTION LEVEL

1) As required at the direction of the Emergency Response Manager. The Radiological Support Manager shall perform or cause to be performed the following:

ACTION STATEMENTS

PREPARATION TO ASSUME RESPONSIBILITY

1. The first person arriving at the EOF and qualified to act as the RSM will report to the Emergency Response Manager (ERM) and notify the Radiation Protection Supervisor at the station, and post name on the Communications Board.

2. The RSM's staff will assist the Radiation Protection Department at the station until the RSM's staff is assembled and able to assume its normal functions and until the EOF is declared operational by the ERM.

3. Determine that the staff on had is adequate to accomplish the anticipated initial tasks and consists of at least the following personnel.

   Two (2) qualified Radiological Assessment Staff Members

   Three (3) qualified Communicators.

   Two (2) qualified Off-Site Radiological Monitoring Teams (Two [2] persons/team)

PREPARATION TO ASSUME RESPONSIBILITY (continued)

4. Determine if a sufficient amount of equipment listed in EP VI-9 is on hand to accomplish the anticipated initial tasks. This equipment is located in the EOF supply and emergency equipment locker.

5. Determine that the following radios are in "working order"

   a. Two (2) portable radios to be used by survey teams

   b. Base station radio to be used by a Radiological Suppport Manager Communicator to the survey teams.

6. Determine whether a sufficient amount of pertinent site and environmental data is available to permit dose calculations to be made and to perform assessments.

   The required data would include the following:

   Radiation monitoring system data
   Meteorological data
   On-site field monitoring team data and locations, if available
   Off-site field monitoring team data and locations, if available.
   Protective Action Recommendations, if any.

   Plant status from the SSM staff.

ACTION STATEMENTS (continued)

PREPARATION TO ASSUME RESPONSIBILITY (continued)

7. Report to the Emergency Response Manager that the Radiological Support Manager is ready to assume the responsibilities for off-site surveys, determining dose assessments and projections, and making Protection Action Recommendations.

8. When authorized by the Emergency Response Manager, notify the Radiation Protection Supervisor/designee that the Radiological Support Manager has assumed his responsibilities.

ASSUMPTION OF RESPONSIBILITIES

1. The RSM and staff shall keep a log of all events and actions from the first notification of an emergency to the return of the Station to normal conditions. Log books for this purpose are in the Emergency Communications Cabinets at the EOF.

2. Control of the off-site radiation monitoring teams will be transferred from the TSC to the EOF. Procedures EP IV-109 and EP IV-110B will be used. Off-site radiation monitoring personnel may consite of station Radiation Protection Department personnel and/or EOF assigned.

ASSUMPTION OF RESPONSIBILITIES (continued)

3. Responsibility for off-site dose projection will be transferred from the TSC to the EOF. Procedures EP IV-111, 112, 113 and 114 will be used. These functions will be performed by the Radiation Assessment Staff.

4. Responsibility for recommending off-site protective actions will be transferred from the TSC to the EOF. Procedure EP IV-108 will be used. Protective Action Recommendations should be made to the ERM. The states of New Jersey and Delaware should be informed of the basis for the recommendations after they have been made. These functions will be performed by the Radiation Assessment Staff and Radiological Support Manager.

5. Communications with the States of New Jersey and Delaware, the TSC, NRC, and the off-site radiation monitoring teams will be by telephone or radio manned by Communicators.

6. Establish and maintain phone contact with the States for the purpose of transmitting Station Station Checklist.

   Delaware (302/834-7431 or 302/834-4531)
   New Jersey (609/633-7385 or 609/882-8543)

When authorized by the Emergency Response Manager, notify the States that future Station Status Checklists will be communciated by a Radiological Support Manager Communicator. Assign a staff member to prepare Part II of the Station Status Checklist. Obtain ERM approval of Part I and II prior to transmitting. Station Status Checklist updates will be provided to the States of New Jersey and Delaware approximately every 30 minutes by the Communicators. This frequency is an objective and may vary based on exiting conditions.

7. Establish contact with the following organizations and put them on a standby status to provide support as needed:

   Radiation Management Corporation
   (Addendum No. 1)

   Research and Testing Laboratory
   (Addendum No. 1)
   NRC - HPN

8. Post two TLD control badges and two self-reading control dosimeters in two locations in the EOF, one at the reception area and the other in the RSM's office. Log the dosimeter numbers, time issued, and placement location.

9. Issue a TLD badge and self-reading dosimeter to off-site radiation monitoring teams as required for initial dispatch from the EOF, ensure that off-site radiation montioring reams that were dispatched from the TSC and already in field have necessary dosimetry.

ASSUMPTION OF RESPONSIBILITIES (continued)

10. If the EOF is in the Radioactive plume and the population around the EOF has been evacuated, issue TLDs to all personnel in the EOF.

11. If the RSM feels that the atmosphere in the EOF should be monitored and/or filtered, the RSM should assign one member of his staff to assure that the portable air monitoring system (AMS) and EOF ventilation are operational The AMS should be set-up outside the west door of the EOF with a remote sample head inside the room. The EOF ventilation system is located in the mechanical room south of the EOF (key is located in Rad Support Locker). Verify that the appropriate filters are in line, then switch from normal to by-pass (switch located on west wall of mechanical room).

12. If the EOF becomes contaminated, access to the EOF should be controlled as necessary by activation of a frisking station at the main entrance to the EOF (student door) and instruct the guard that no one is to leave without frisking. All other entries should be secured and posted.

13. The RSM will initiate long term environmental monitoring and coordinate such monitoring with on-site actions and conditions. Long term assistance may be drawn from other nuclear power utilities and contractors.

ASSUMPTION OF RESPONSIBILITIES (continued)

14. Samples from the radiological environmental monitoring stations shall be collected by the Research and Testing Laboratory and analyzed by an apropriate radiation anaylis laboratory. The Radiological Support Manager will contact the Research and Testing Laboratory when it is determined that these samples should be analyzed.

15. The RSM or station's Senior Radiation Protection Department person will establish communication with the medical assistance facilities and personnel of Radiation Management Corporation to put the Emergency Medical Assistance Plan into operation if necessary. Contact will be established as defined in the Emergency Medical Assistance Plan.

LONG RANGE PREPARATION AND TERMINATION OF EOF USE

1. After the emergency is under control and evacuation of the public is no longer likely to be necessary, the Radiological Support Manager's staff shall asist station personnel in determining efforts which may be used to further reduce exposures to the station operating personnel and to the public.

2. Individual and population radiation exposure doses should be evaluated after the incident.

3. The RSM's function will be secured at the direction of the ERM.

NOTE

Forward all completed forms to the Nuclear Emergency Planning Engineer. Attach any referenced completed EP's or attachment.

Prepared By: _____

Reviewed By: _____ 10/17/83
Department Head — Date

Reviewed By: _____ 10/17/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: _____ 10/18/83
Station Quality Assurance Review — Date
(if required see EP VI-2)

SORC Meeting Number: 83-131 10/20/83
Date

Approved By: _____ 10/21/83
General Manager - Salem Operations — Date

Approved By: _____ 10/21/83
Manager - Nuclear Site Protection — Date

EMERGENCY PROCEDURE
EP IV-111
EFFLUENT DOSE CALCULATIONS

ACTION LEVEL

This procedure shall be implemented upon the request of the Senior Shift Supervisor/EDO/ERM or the Radiation Protection staff.

The calculations shall normally be performed by the Radiation Protection personnel in the TSC or the Radiological Assessment Staff at the EOF. At the TSC, the primary individuals responsible for the initial calculations will be the Shift Radiation Protection Technician (Shift RPT) and the REP/ALARA Supervisor.

LIMITS OF AUTHORITY

Projected off-site dose estimates should be made available to the Senior Shift Supervisor/EDO/ERM, and the Radiation Protection Supervisor (RPS) or the Radiological Support Manager (RSM). Transmittal of the projected doses shall require the prior approval of the Senior Shift Supervisor, RPE, or RSM.

If re-entry into an affected area is required for effluent determination, consideration shall be given to the potential for encountering high dose rates. Approval of the Radiation Protection Supervisor and the EDO shall be obtained prior to entering the penetration areas. Approval of SSS/EDO shall be obtained prior to re-entry into evacuated areas.

ATTACHMENTS

No. 1 - Xu/Q Value Determination
No. 2 - (a) & (b) Noble Gas/Iodine Dose Conversion Factor (K) vs. Decay Time

ATTACHMENTS (cont.)

No. 3 - R43 Concentration Conversion Factor vs. Decay Time
No. 4 - Default Values for Low/High Plant Vent Monitors
No. 5 - Containment Monitor R44 Response vs. Dispersion Factor
No. 6 - Survey Meter Response vs. Main Steam Activity
No. 7 - Unit Analysis of Off-Site Dose Calculations
No. 8 - Dose Calculation Sheet
No. 9 - Liquid Release Calculations

ACTION STATEMENTS

1. Contact the Control Room and obtain a briefing on the incident and identify the probable pathways for release of radioactive material.

2. Determine which sections of this procedure are appropriate for the particular release.

*See top left corner of Attachment 8 for release rate determination calculation.

A.1 PLANT RELEASE FROM UNIT NO. 1

A.1.1 Establish contact with the Control Room.

A.1.2 Record the following plant parameters for subsequent calculations.

PARAMETER	NUMBER	VALUE AT SELECTED TIME
a. Low Range Gaseous Release Rate	1R-41C	_____cpm
b. Medium Range Gaseous Release Rate	1R-45B	_____uCi/cc
c. High Range Gaseous Release Rate	1R-45C	_____uCi/cc
d. Backup High Range	R-43	_____mR/hr
e. Iodine Release Rate	1R-41B	
i.PRESENT MONITOR READING		_____cpm(Cx) _____time(Tx)
ii.PREVIOUS MONITOR READING		_____cpm(Co) _____time(To)
f. Plant Vent (1) Flow Rate		_____cfm
g.ΔTemp (2)(4) at Elevation_____(ft)		t_____C°
h. Elevation		_____ ft
i. Wind Speed (3) (4) (5)		_____mph
j. Wind Direction (4) (5)		_____°
k. Shutdown Time		_____hr
l. Transport Distance for Calculation		_____mi

NOTES:

(1) If plant vent flow rate is unobtainable or cannot be estimated, assume 125,000 cfm.

(2) If the (300'°C)-(33'°C) is unobtainable to determine the t use the (150'°C)-(33'°C) reading. If this is unavailable refer to Note 4 and and note chosen elevation.

) If the wind speed is unobtainable, assume 5 mph.
Use Elevation 300' data for an elevated release.
Use Elevation 33' data for a ground release.

(4) Backup meteorological data from Wilmington Airport (302-323-2280 or NAWAS Line) including wind speed, wind direction and estimated stability class. If the estimated stability class is not available, assume conditions to be stable.

(5) Average data over 15 minute period using the strip chart recorder from the control room.

A.1. PLANT RELEASE FROM UNIT NO. 1 (continued)

NOBLE GAS CONTRIBUTION TO WHOLE BODY DOSE RATE

A.1.3a Low range or default value (Attachment 4)

(1R41C or DBA CPM) (Plant Vent Flow Rate)(Xu/Q)(Dose Conversion Factor)(6.56E-5)= __ mrem/hr

(Wind Speed)

(a)(b)(c)(d)(6.56E-5)= __ mrem/hr
(e)

A. 1.3b Medium or High Range (1R45B or 1R45C)

(1R-45B or C)(Plant Vent Flow Rate)(Xu/Q)(Dose Conv. Factor)(1.05E3)= ___ mrem/hr
(Wind Speed)

(f)(b)(c)(d)(1.05E3)= ___ mrem/hr
(e)

A.1.4 High Range (R43)

(R-43)(Plant Vent Flow Rate)(Xu/Q)(Dose Conversion Factor)(1.05E+3)= ____ mrem/hr
(Wind Speed)(Concentration Conversion Factor)

(f)(b)(c)(d)(1.05E+3)= ___ mrem/hr
(e)(g)

NOTE

a. 1R-41C in cpm or 1R45B(C) in uCi/cc,or equivalent cpm value from attachment 4.
b. Plant vent flow rate in ft^3/min.
c. Xu/Q from Attachment 1. $(1/m^2)$
d. Dose conversion factor from Attachment 2(b). $\frac{mrem/hr}{uCi/m^3}$
e. Wind speed in miles per hour.
f. R-43 reading in mR/hr.
g. Concentration conversion factor in $\frac{mrem/hr}{uCi/cc}$ Attachment 3

Calculated By _____ Date _____ Time _____

Reviewed By _____ Date _____ Time _____

A.1 PLANT RELEASE FROM UNIT NO. 1 (continued)

IODINE CONTRIBUTION TO THYROID DOSE COMMITMENT

A.1.5 Determine the rate of increase of iodine activity.

a) Low Range Monitor 1R-41B

$\frac{cpm}{min} = Cx - Co = (\_\_\_\_\_) - (\_\_\_\_\_) = (\_\_\_\_\_)\frac{cpm}{min} = (\_\_\_\_\_)\frac{cpm}{min}$

$Tx - To \quad (\_\_\_\_\_) - (\_\_\_\_\_) \quad (\_\_\_\_\_)min$

NOTE

Refer to Step A.1.2(e).

OR

b) Using Default Values

Use Attachment 4 to determine the appropriate equivalent cpm/min.

_____ cpm/min

A.1.6 Equation for 50 year thyroid dose commitment rate during exposure period.

$$\frac{\frac{cpm}{min}\ (\text{Plant Vent Flow Rate})(Xu/Q)(\text{Iodine Dose Conversion Factor})(3.35E\text{-}7)}{(\text{Wind Speed})} = \_\_\ \frac{mrem}{hr}$$

$$\frac{(a\ \_\_\_\_\_)(b\ \_\_\_\_\_)(c\ \_\_\_\_\_)(d\ \_\_\_\_\_)3.35E\text{-}7)}{(e\ \_\_\_\_\_)} = \_\_\_\ \frac{mrem}{hr}$$

NOTE

a. cpm/min from Step A.1.5 (a or b).

b. Plant vent flow rate in ft^3/min.

c. Xu/Q from Attachment 1. $(1/m^2)$

d. Dose conversion factor from Attachment 2(b). $\frac{mrem/hr}{uCi/m^3}$

e. Wind speed in miles per hour.

Calculated By _____ Date _____ Time _____

Reviewed By _____ Date _____ Time _____

A.1 PLANT RELEASE FROM UNIT NO. 1 (continued)

IODINE CONTRIBUTION TO THYROID DOSE COMMITMENT (continued)

A.1.7 To obtain dose commitment, multiply dose commitment rate by the hours exposed to that rate, (e.g., 15 mrem/hr X 5 hours exposure = 75 mrem-50 year dose commitment).

Calculated By _____ Date _____ Time _____

Reviewed By _____ Date _____ Time _____

A.2 PLANT RELEASE FROM UNIT NO. 2

A.2.1 Contact the Control Room and obtain the following plant parameters for subsequent calculations.

PARAMETER	METER NUMBER	PRESENT MONITOR READING AFTER TIME, TX	PREVIOUS MONITOR READING	VALUE AT SELECTED TIME
a. Low Range Gaseous Release Rate	2R-41C			_____cpm
b. Medium Range Gaseous Release Rate	2R45B			_____ uCi/cc
c. High Range Gaseous Release Rate	2R45C			_____uCi/cc
d. Back-up High Range	R-43			_____ mr/hr
e. Iodine Release Rate	2R-41B	_____cpm (Cx) _____time (Tx)	_____cpm (Co) _____time (To)	
f. Plant Vent (1) Flow Rate				_____ cfm
g Temp(2)(4)				t_____C°
h. Elevation				_____ ft
i. Wind Speed (3)(4)(5)				_____mph
j. Wind Direction (4)(5) (from)				_____°
k. Shutdown Time				_____hr
l. Transport Distance for Calculation				_____mi

NOTES:

(1) If plant vent flow rate is unobtainable or cannot be estimated, assume 125,000 cfm.

(2) If the (300'°C)-(33'°C) is unobtainable to determine the t use the (150'°C)-(33'°C) reading. If this is unavailable refer to Note 4.

(3) If the wind speed is unobtainable, assume 5 mph.
Use Elevation 300' data for an elevated release.
Use Elevation 33' data for a ground release.

(4) Backup meteorological data from Wilmington Airport (302-323-2280 or NAWAS Line) including wind speed, wind direction and an estimated stability class. If the estimated stability class is not available, assume conditions to be stable.

(5) Average data over 15 minute period using the strip chart recorder from the control room.

A.2 PLANT RELEASE FROM UNIT 2 (continued)

WHOLE BODY DOSE RATE DUE TO NOBLE GAS

A.2.2a Low range or default values (Attachment 4)

$$\frac{(\text{2R41C or DBA cpm})(\text{Plant Vent Flow Rate})(\text{Xu/Q})(\text{Noble Gas Dose Conversion Factor})(6.56\text{E-}5)}{(\text{Wind Speed})} = \_\_\_\_ \text{ mrem/hr}$$

$$\frac{(a\ \_\_\_\_)(b\ \_\_\_\_)(c\ \_\_\_\_)(d\ \_\_\_\_)(6.56\text{E-}5)}{(e\ \_\_\_\_)} = \_\_\_\_ \text{ mrem/hr}$$

A.2.2b Medium or High Range (2R45B or 2R45C)

$$\frac{(\text{2R45 B or C})(\text{Plant Vent Flow Rate})(\text{Xu/Q})(\text{Noble Gas Dose Conv. Factor})(1.05\text{E}3)}{(\text{Wind Speed})} = \_\_\_\_\_ \text{mrem/hr}$$

$$\frac{(a\ \_\_\_\_)(b\ \_\_\_\_)(c\ \_\_\_\_)(d\ \_\_\_\_)(1.05\text{E}3)}{(e\ \_\_\_\_)} = \_\_\_\_\_ \text{mrem/hr}$$

OR

A.2.3 High Range (R-43)

$$\frac{(\text{R-43})(\text{Plant Vent Flow Rate})(\text{Xu/Q})(\text{Noble Gas Dose Conversion Factor})(1.05\text{E+}3)}{(\text{Wind Speed})(\text{Concentration Conversion Factor})} = \_\_\_\_ \text{ mrem/hr}$$

$$\frac{(f\ \_\_\_\_)(b\ \_\_\_\_)(c\ \_\_\_\_)(d\ \_\_\_\_)(1.05\text{E+}3)}{(e\ \_\_\_\_)(g\ \_\_\_\_)} = \_\_\_\_ \text{ mrem/hr}$$

NOTE

a. 2R-41C in cpm or 2R45B(C) in uCi/cc, or equivalent cpm value from Attachment 4.
b. Plant vent flow rate in ft^3/min.
c. Xu/Q value from Attachment 1. $(1/m^2)$
d. Dose conversion factor from Attachment 2(a). $\frac{mrem/hr}{uCi/m^3}$
e. Wind speed in miles per hour.
f. R-43 reading in mR/hr.
g. Concentration conversion factor in $\frac{mrem/hr}{uCi/cc}$ Attachment 3.

Calculated By _____ Date _____ Time _____

Reviewed By _____ Date _____ Time _____

A.2 PLANT RELEASE FROM UNIT 2 (continued)

THYROID DOSE COMMITMENT DUE TO IODINE

A.2.4 Determine the rate of increase of iodine activity.

a) Low Range Monitor 2R-41B

$$\frac{cpm}{min} = \frac{Cx-Co}{Tx-To} = \frac{(\quad)-(\quad)}{(\quad)-(\quad)} = \frac{(\quad)cpm}{(\quad)min} = (\quad)\ \frac{cpm}{min}$$

NOTE

Refer to Step A.1.2(e).

OR

b) Using Default Values

Use Attachment 4 to determine the appropriate equivalent cpm/min.

_____ cpm/min

A.2.5 Equation for 50 year thyroid dose commitment during exposure period.

$$\frac{cpm}{min}\ \frac{(\text{Plant Vent Flow Rate})(Xu/Q)(\text{Iodine Dose Conversion Factor})(3.35E\text{-}7)}{(\text{Wind Speed})} = \_\_\_\_\_ \text{ mrem/hr}$$

$$\frac{(a\quad)(b\quad)(c\quad)(d\quad)(3.35E\text{-}7)}{(e\quad)} = \_\_\_\_\_ \text{ mrem/hr}$$

NOTE

a. cpm/min from Step A.2.4 (a or b).
b. Plant vent flow rate in ft^3/min.
c. Xu/Q from Attachment 1. $(1/m^2)$
d. Dose conversion factor from Attachment 2(b). $\frac{mrem/hr}{uCi/m^3}$
e. Wind speed in miles per hour.

Calculated By _____ Date _____ Time _____

Reviewed By _____ Date _____ Time _____

A.2 PLANT RELEASE FROM UNIT 2 (continued)

THYROID DOSE RATE DUE TO IODINE (continued)

A.2.6 To obtain dose commitment, multiply dose commitment rate by the hours exposed to that rate, (e.g., 15 mrem/hr X 5 hours exposure = 75 mrem-50 year dose commitment).

Calculated By _____ Date _____ Time _____

Reviewed By _____ Date _____ Time _____

B. RELEASE RATE DETERMINATION FROM UNMONITORED STEAM RELEASE POINTS

B.1 If control room personnel have determined a primary leak exists in one or more steam generators by one or more of the following indications:

a) Air Ejector High Radiation Alarm
b) Uncontrolled increasing level in steam generator
c) Increasing steam pressure in one steam generator
d) High Activity alarm in the steam generator blowdown system with or without an isolation

then the Senior Shift Supervisor shall initiate monitoring of the affected steam lines upstream of the isolation valves to estimate the microcurie content per cc of steam in the affected steam lines. This action is required if the potential exists for a relief valve lifting, a power operated relief being opened or the operation of the steam driven Aux. Feed Pump attached to the affected Steam Generator (11 & 13)(21 & 23).

B.2 If R46 monitors are functional, uCi/cc activities can be determined for each steam line directly from the display and recorded in Step B.6. If these monitors are inoperable, measurements must be made with a portable survey meter, and the procedure listed in B.3 through B.5 must be implemented.

B.3 Before Radiation Protection personnel enter the penetration areas to measure the contact dose rate on the affected steam lines, the Senior Shift Supervisor/EDO and the Senior Representative from Radiation Protection will evaluate and determine the potential for encountering high radiation areas in the penetration areas due to a:

a) Reactor malfunction resulting in fuel damage
b) LOCA resulting in fission product release to containment causing radiation streaming through containment penetration.

B.4 If any of the above conditions are present, specific action points must be established in accordance with EP I-17 to determine the following requirements.

a) Total dose accumulation for operation
b) Maximum dose rate field to enter
c) Types of dosimeters and instruments to use
d) Type of protective clothing and equipment to be used

B.5 Enter affected penetration area or location and measure the contact dose rate on the affected steam line or Aux. Feed Pump exhaust line.

a) The contact dose rate measurement can be made with any dose rate instrument having a range of 0.1 to at least 10,000 mR/hr.
b) If it is expected that the background in the affected penetration area will be greater than 10 mR/hr a dose rate instrument with a shielded probe should be used.
c) Dose rates should be taken at the indicated location marked on each steam line.
d) Record below the contact dose rate on pipe.

_____ mR/hr, _____line, _____location

B.6 Use the contact dose rate, corrected for background radiation to determine the uCi/cc concentration in the pipe of concern from Attachment 6, or record the reading directly from the R46 monitor.

_____ uCi/cc

B.7 Use the following flow rates to determine steam release rates:

a) Power operated relief valve 450,000 lb/hr
b) Relief Valve 800,000 lb/hr each
c) Aux. Feed Pump exhaust 50,000 lb/hr

B. RELEASE RATE DETERMINATION FROM UNMONITORED STEAM RELEASE POINTS (continued)

B.8 Multiply the uCi/cc from B.6 and the proper flow rate in lb/hr from B.7 to determine the release rate in uCi/sec.

(uCi/cc)(lb/hr)(3.3) = uCi/sec

(a)(b)(3.3) = _____ uCi/sec

a. uCi/cc from Step B.6.
b. lb/hr from Step B.7.

B.9 Whole body dose rate due to noble gas releases

$$\text{mrem/hr} = \frac{(\text{uCi/sec})(\text{Xu/Q})(\text{DCF})(2.22)}{(\text{Wind Speed - El. 33'})}$$

$$\text{mrem/hr} = \frac{(a\quad)(b\quad)(c\quad)(2.22)}{(d\quad)}$$

NOTE

a. uCi/sec from B.8.
b. Xu/Q in $1/m^2$ from Attachment 1.
c. Dose conversion factor from Attachment 2(a). $\frac{\text{mrem/hr}}{\text{uCi/m}^3}$
d. Wind speed in miles per hour (EL. 33').

B.10 Document total run time for the steam driven Aux. Feed Pump.

B.11 Document the total period of time the relief and power operated relief valves were open on the affected steam generator.

B.12 The number of times the relief and power operated relief valves are open on the affected steam generators are limited as per Emergency Instruction I-4.7.

Calculated By_____ Date_____ Time _____

Reviewed By_____ Date_____ Time _____

C. RELEASES FROM CONTAINMENT LEAKAGE

NOTE

This dose determination assumes a design basis containment leak rate (La). Actual containment leak rates may be more or less. This dose determination is a postulation and should be used as such. Field monitoring results are preferable.

C.1 Contact the control room and obtain the reading on the high range containment radiation monitor R-44.

_____ R/hr

C.2 Using Attachment No. 5, correlate the meter reading to the vertical axis and determine the base X/Q from the horizontal axis.

_____ base X/Q

C.3 Determine the actual Xu/Q using Attachment 1.

_____ actual Xu/Q

C.4 Determine the 24 hour dose.

$$\frac{(\text{Actual Xu/Q})(2.22)}{(\text{Wind Speed - EL. 33'})(\text{Base X/Q})} = \text{24 hour dose in rem}$$

$$\frac{(a\quad)(2.22)}{(b\quad)(c\quad)} = \quad \text{rem}$$

NOTE

a. Acutal Xu/Q from Attachment 1.
b. Windspeed in miles per hour (EL. 33').
c. Base X/Q from Attachment 5 (correlated to containment monitor).

Calculated By_____ Date_____ Time _____

Reviewed By_____ Date_____Time _____

NOTE

Forward all completed forms to the Nuclear Emergency Planning Engineer. Attach other completed EP's or attachments used.

Prepared By: James Clancy

Reviewed By: [signature] 10/13/83
Department Head — Date

Reviewed By: [signature] 10/16/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: [signature] 10/18/83
Station Quality Assurance Review — Date
(if required see EP VI-2)

SORC Meeting No.: 83-131 10/20/83
Date

Approved By: [signature] 10/21/83
General Manager - Salem Operations — Date

Approved By: [signature] 10/21/83
Manager - Nuclear Site Protection — Date

ATTACHMENT 1
Xu/Q VALUE DETERMINATION

Select the Xu/Q values that correspond to the stability class as determined by the temperature, tance from the site and the release point (ground or elevated).

1. USE THE TEMPERATURE VALUE FROM THE METEOROLOGICAL TOWER TO DETERMINE STABILITY CLASS.

Primary Instrument

300 ft. - 33 ft. temperature (°C)

UNSTABLE	NEUTRAL	STABLE
	-1.3	-0.5

NOTE

UNSTABLE IS $\leq$ -1.3°C

NEUTRAL IS > -1.3°C $\leq$ -0.5°C

STABLE IS > -0.5°C

Backup Instrument

150 ft. - 33 ft. temperature (°C)

UNSTABLE	NEUTRAL	STABLE
	-0.6	-0.2

NOTE

UNSTABLE IS $\leq$ -0.6°C

NEUTRAL IS > -0.6°C $\leq$ -0.2°C

STABLE IS > -0.2°C

2.

DISTANCE		GROUND LEVEL RELEASE (E-6/m^2)			ELEVATED LEVEL RELEASE (E-6/m^2)		
METERS	MILES	UNSTABLE	NEUTRAL	STABLE	UNSTABLE	NEUTRAL	STABLE
1000	0.62	14.83	58.43	244.4	16.17	39.01	*
1270 MEA	0.79	9.91	41.54	226.29	11.23	35.34	**
2000	1.2	4.58	21.21	166.5	5.4	23.70	.01
3000	1.9	2.29	11.46	111.9	2.74	14.5	.50
4000	2.5	1.40	7.37	80.6	1.69	9.81	2.44
5000	3.1	.95	5.22	61.4	1.15	7.14	5.24
6000	3.7	.70	3.94	48.7	.85	5.47	7.84
7000	4.4	.53	3.10	39.9	.65	4.35	9.79
8000	4.9	.42	2.52	33.4	.52	3.56	11.05
8045 LPZ	5.0	.42	2.5	33.2	.51	3.53	11.09
9000	5.6	.35	2.10	28.6	.42	2.98	11.76
10000	6.2	.294	1.78	24.8	.35	2.54	12.06
11000	6.8	.250	1.53	21.8	.30	2.20	12.09
12000	7.5	.215	1.34	19.3	.26	1.92	11.93
13000	8.1	.18	1.18	17.3	.22	1.70	11.65
14000	8.7	.165	1.05	15.7	.20	1.52	11.3
15000	9.3	.14	.95	14.22	.18	1.38	10.91
16000 EPZ	9.9	.131	.86	13.01	.16	1.24	10.50

MEA - Minimum Exclusion Area

LPZ - Low Population Zone

EPZ - Emergency Planning Zone

*Value of Xu/Q for 1000 meters distance = 5.15E-16/m^2

**Value of Xu/Q for 1270 meters distance = 1.18E-12/m^2

D ance_____Xu/Q = _____E-6/m^2 (ground) Xu/Q = _____ E-6/m^2 (elevated)

MEAN WIND SPEED HEIGHT ADJUSTMENT FACTOR ($\overline{u}_R$)

INSTRUMENT HEIGHT (METERS)	Height of Release					
	Ground (10m)			Elevated (60m)		
STABILITY:	U	N	S	U	N	S
10.00 (33 ft.)	1.0	1.0	1.0	1.33	1.79	2.44
45.72 (150 ft.)	.781	.613	.468	1.04	1.09	1.15
91.44 (300 ft.)	.704	.493	.331	.935	.877	.813

Example: Ground Release, t = 1.5°C, 150 ft. instrument height, windspeed = 3 mph

Find: X/Q
Use 0.781 for height adjustment for unstable ground conditions

$$X/Q = \frac{(Xu/Q)(2.22 \frac{mph}{m/s})}{(wspeed)(\overline{u}_R)} = \frac{(9.91\ E\text{-}6/m^2)\ 2.22 \frac{mph}{m/s})}{(3\ mph)\ (.781)}$$

$$X/Q = 9.34\ E\text{-}6\ sec/m^3$$

NOBLE GAS DOSE FOLLOWING SHUTDOWN

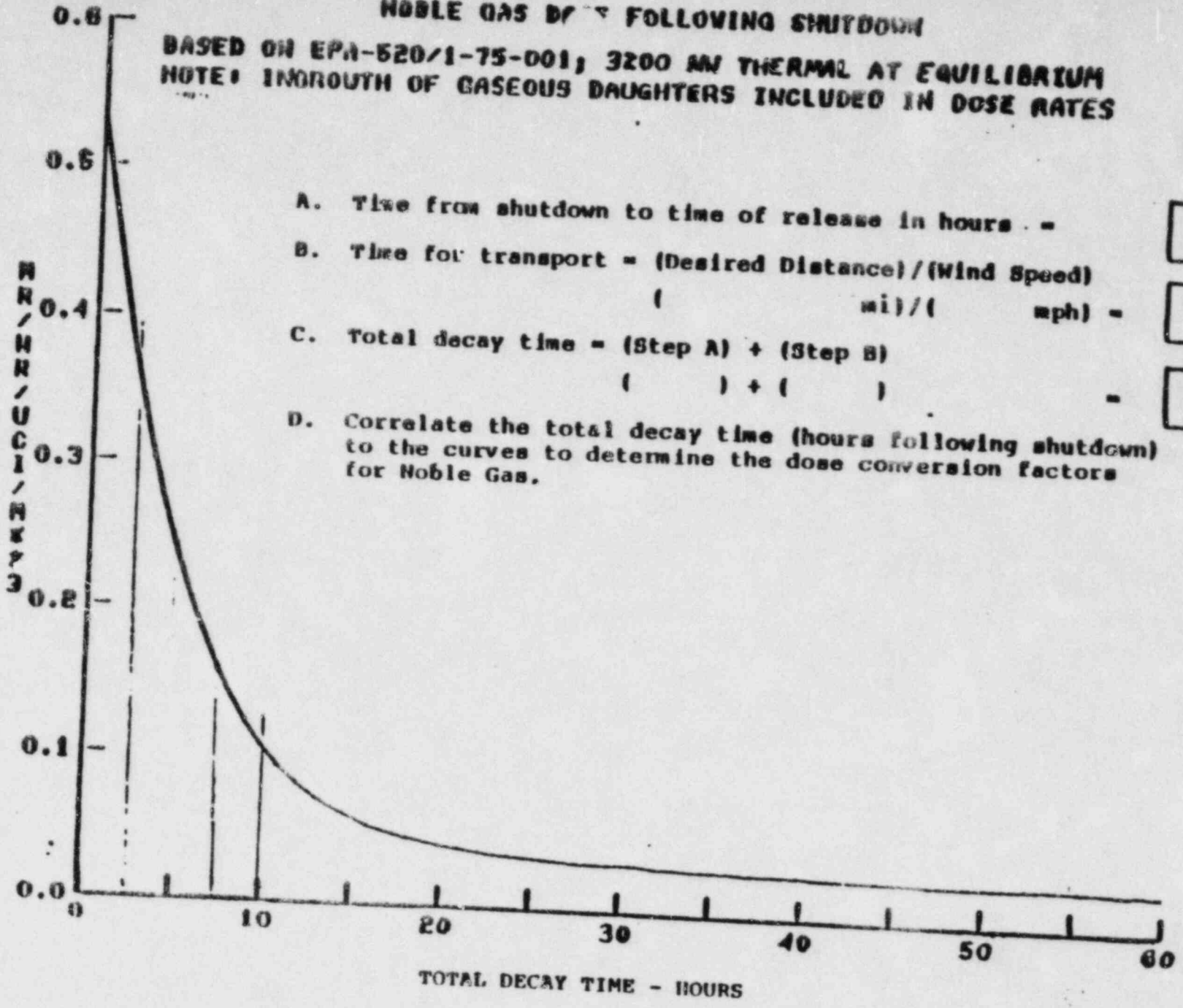
BASED ON EPA-520/1-75-001; 3200 MW THERMAL AT EQUILIBRIUM
NOTE: INGROUTH OF GASEOUS DAUGHTERS INCLUDED IN DOSE RATES

A. Time from shutdown to time of release in hours = [ ] hr

B. Time for transport = (Desired Distance)/(Wind Speed)
(mi)/(mph) = [ ] hr

C. Total decay time = (Step A) + (Step B)
( ) + ( ) = [ ] hr

D. Correlate the total decay time (hours following shutdown) to the curves to determine the dose conversion factors for Noble Gas.



NOBLE GAS DRCF FOLLOWING SHUTDOWN

(MREM/HR)/(UCI/M**3)

HOURS	DRCF	HOURS	NG DRCF	HOURS	NGDRCF	HOURS	NGDRCF
0	.528	16	.0552	31	.0319	46	.0284
1	.457	17	.0512	32	.0315	47	.0283
2	.389	18	.0479	33	.0311	48	.0282
3	.329	19	.0451	34	.0308	49	.0281
4	.277	20	.0428	35	.0305	50	.028
5	.234	21	.0409	36	.0302	51	.0279
6	.197	22	.0393	37	.0299	52	.0278
7	.168	23	.0379	38	.0297	53	.0278
8	.143	24	.0367	39	.0295	54	.0277
9	.123	25	.0357	40	.0293	55	.0276
10	.107	26	.0349	41	.0291	56	.0276
11	.0932	27	.0341	42	.0289	57	.0275
12	.0823	28	.0335	43	.0288	58	.0275
13	.0733	29	.0329	44	.0287	59	.0274
14	.0661	30	.0324	45	.0285	60	.0274
15	.0601						

A. Time from shutdown to time of release in hours = _____ hr

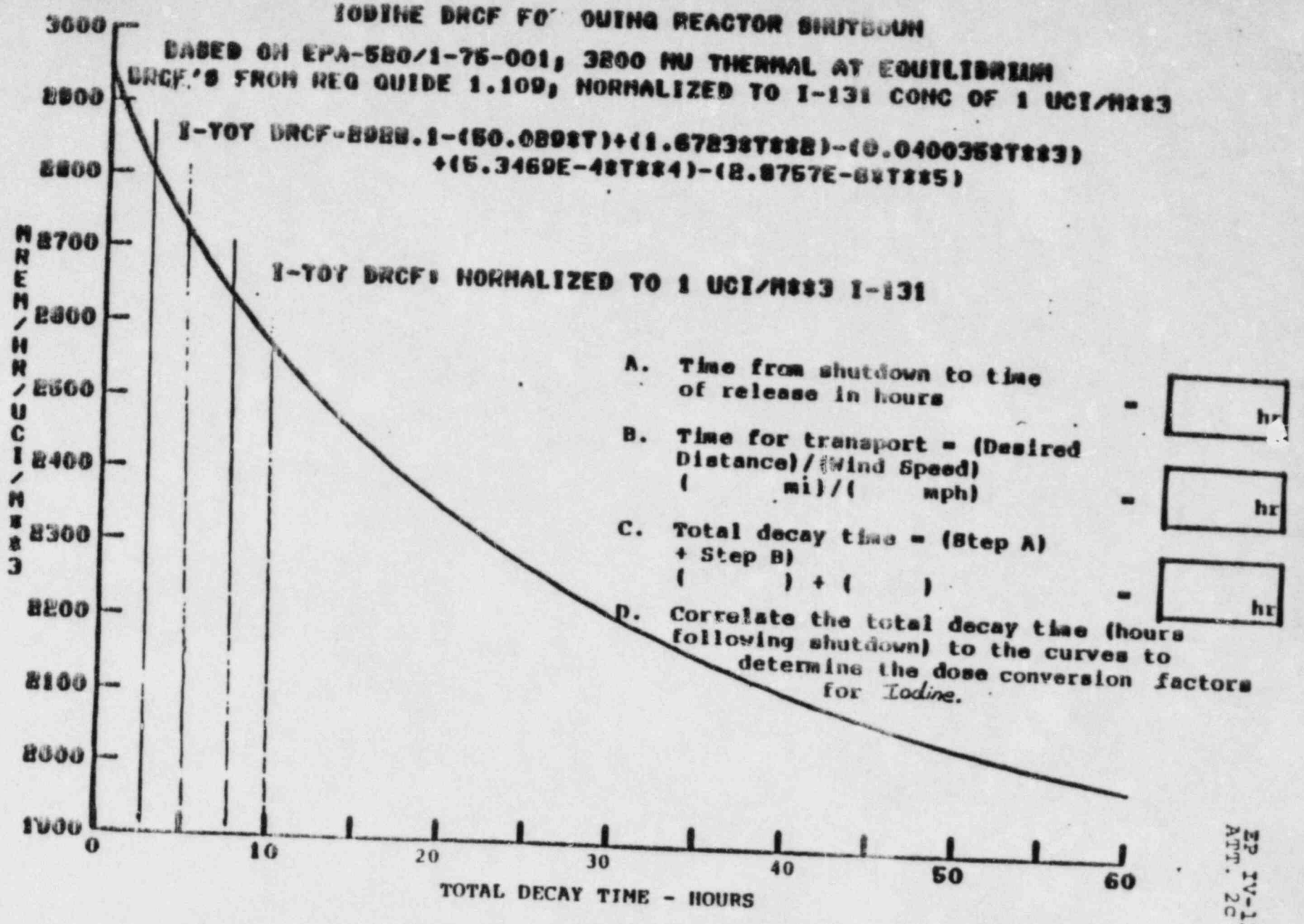
B. Time for transport = (Desired Distance)/(Wind Speed)

(mi)/(mph) = _____ hr

C. Total decay time = (Step A) + (Step B)

( ) + ( ) = _____ hr

D. Correlate the total decay time (hours following shutdown) to the curves to determine the dose conversion factors for Noble Gas.



A. Time from shutdown to time of release in hours = [ ] hr

B. Time for transport = (Desired Distance)/(Wind Speed)
(mi)/(mph) = [ ] hr

C. Total decay time = (Step A) + Step B)
( ) + ( ) = [ ] hr

D. Correlate the total decay time (hours following shutdown) to the curves to determine the dose conversion factors for *Iodine*.

I-TOT DRCF (MREM/HR/UCI/M**3) BASED ON I-131 VERSUS TIME

(MREM/HR)/(UCI/M**3)

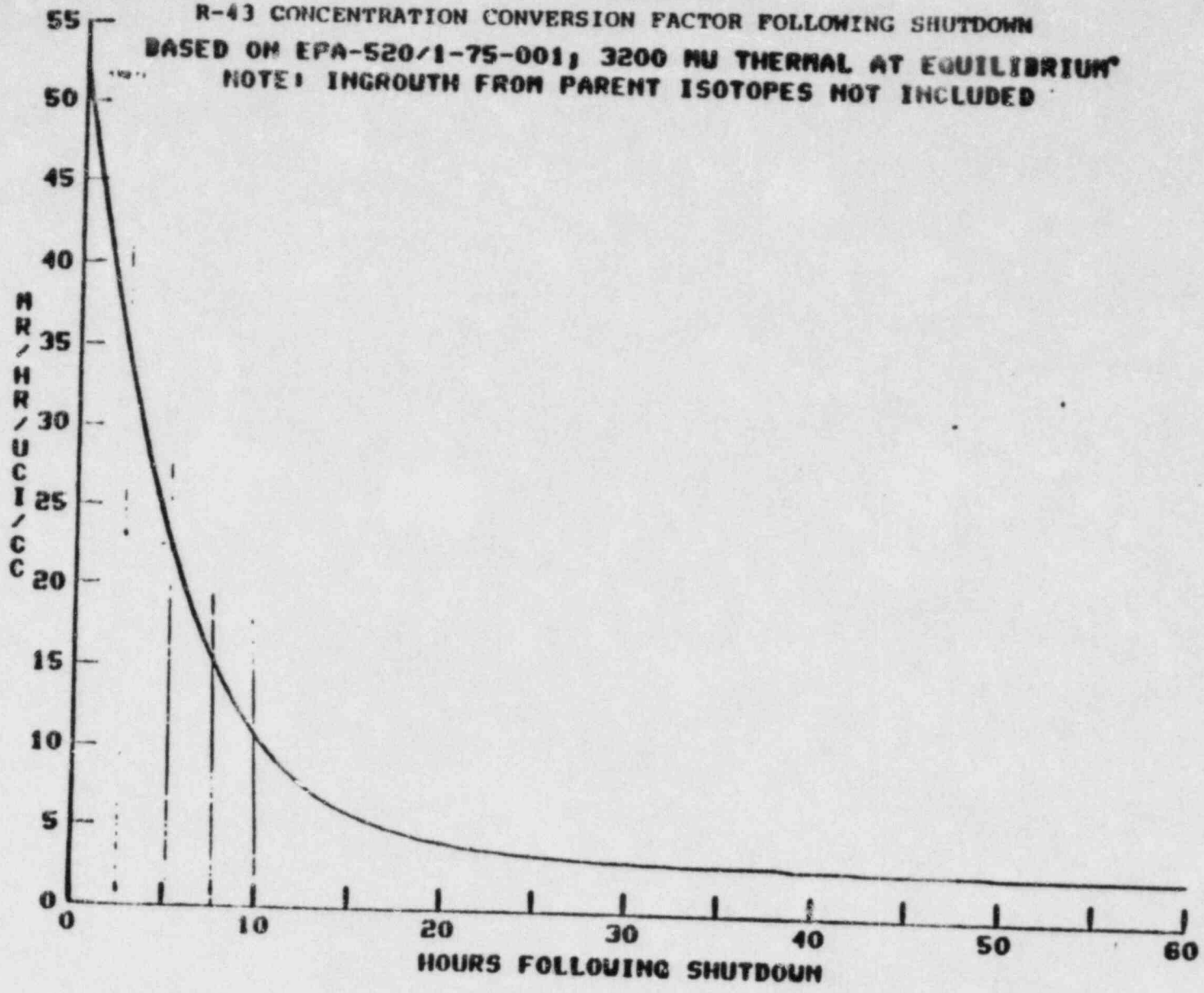
HOURS	DRCF
0	2036.4
1	2079.6
2	2031
3	2787.8
4	2748.5
5	2712.2
6	2678.3
7	2646.6
8	2616.7
9	2588.4
10	2561.6
11	2536.1
12	2511.9
13	2488.7
14	2466.7
15	2445.6
16	2425.4
17	2406
18	2387.5
19	2369.7
20	2352.6
21	2336.2
22	2320.4
23	2305.2
24	2290.6
25	2276.5
26	2262.9
27	2249.9
28	2237.3
29	2225.1
30	2213.4
31	2202
32	2191.1
33	2180.5
34	2170.3
35	2160.5
36	2151
37	2141.7
38	2132.8
39	2124.2
40	2115.9
41	2107.8
42	2100
43	2092.5
44	2085.1
45	2078.1
46	2071.2
47	2064.6
48	2058.2
49	2051.9
50	2045.9
51	2040.1
52	2034.4
53	2028.9
54	2023.6
55	2018.5
56	2013.5
57	2008.7
58	2004
59	1999.4
60	1995

A. Time from shutdown to time of release in hours = _____ hr

B. Time for transport = (Desired Distance)/(Wind Speed)
(mi)/(mph) = _____ hr

C. Total decay time = (Step A) + (Step B)
( ) + ( ) = _____ hr

D. Correlate the total decay time (hours following shutdown) to the curves to determine the dose conversion factors for Iodine.


R-43 CONCENTRATION CONVERSION FACTOR FOLLOWING SHUTDOWN
BASED ON EPA-520/1-75-001; 3200 MW THERMAL AT EQUILIBRIUM
NOTE: INGROUTH FROM PARENT ISOTOPES NOT INCLUDED
MR/HR/UCI/CC
55
50
45
40
35
30
25
20
15
10
5
0
0
10
20
30
40
50
60
HOURS FOLLOWING SHUTDOWN

R-43 CALIBRATION FACTOR (MR/HR)/(UCI/CC)

HOURS	CALFACT	HOURS	CALFACT	HOURS	CALFACT	HOURS	CALFACT
0	52.009	16	5.4256	31	3.1342	46	2.7942
1	45	17	5.03	32	3.0939	47	2.7832
2	38.289	18	4.7034	33	3.0577	48	2.773
3	32.368	19	4.4326	34	3.025	49	2.7635
4	27.287	20	4.207	35	2.9953	50	2.7546
5	23.004	21	4.0181	36	2.9683	51	2.7464
6	19.439	22	3.859	37	2.9437	52	2.7388
7	16.495	23	3.7242	38	2.9211	53	2.7317
8	14.077	24	3.6093	39	2.9005	54	2.7251
9	12.097	25	3.5107	40	2.8814	55	2.7189
10	10.481	26	3.4255	41	2.8639	56	2.7132
11	9.1621	27	3.3515	42	2.8477	57	2.7079
12	8.0868	28	3.2867	43	2.8327	58	2.7029
13	7.2094	29	3.2296	44	2.8189	59	2.6983
14	6.4928	30	3.1791	45	2.8061	60	2.694
15	5.9065						

ATTACHMENT 4
DEFAULT VALUES FOR LOW/HIGH PLANT VENT MONITORS

Read the below accident description and determine which case is applicable. From the table select the appropriate release rates (cpm).

DEFAULT I LOCA WITH FUEL MELTING

A LOCA assuming severe core damage - fuel melting (Regulatory Guide 1.4 assumptions) 100% of noble gases and 25% of the iodines contained in the core are assumed released to the containment. The containment initially leaks at the maximum design leak rate.

DEFAULT II LOCA WITHOUT FUEL MELTING

Primary coolant leaks at a rate fast enough to increase the temperature of the core to the point where there is damage to the fuel rods. For this case, it is assumed that all the gap activity (the gases contained between the fuel and fuel rod) is released to the containment. The containment is assumed to initially leak at the maximum design leak rate. In this accident, it is up to the Senior Shift Supervisor or Emergency Duty Officer (EDO) to assume that there has been no fuel melting. If there is any question, a DEFAULT I LOCA should be assumed.

DEFAULT III DECAY TANK RUPTURE

This procedure is used only if actual radiological monitoring equipment is unavailable for release evaluation (monitors out of service, read off scale, etc.).

DEFAULT IV FUEL HANDLING ACCIDENT

Any activity occurring as a result of a fuel handling accident is normally drawn into the Fuel Handling Building Ventilation System and vented to the plant vent for release. The process monitors are used to monitor these releases; however, should these monitors be out of service or off scale, this technique is used to evaluate off-site dose.

DEFAULT V STEAM GENERATOR TUBE RUPTURE

The activity released during a minor tube rupture can be determined using vent monitors and normal procedures. This procedure addresses the steam generator tube rupture as analyzed in the FSAR. This accident is set apart from others because of the inability to consult radiation monitors to determine the activity release rate. Therefore, this is the primary procedure to determine the activity release rate resulting from a steam generator tube rupture.

ATTACHMENT 4 (continued)

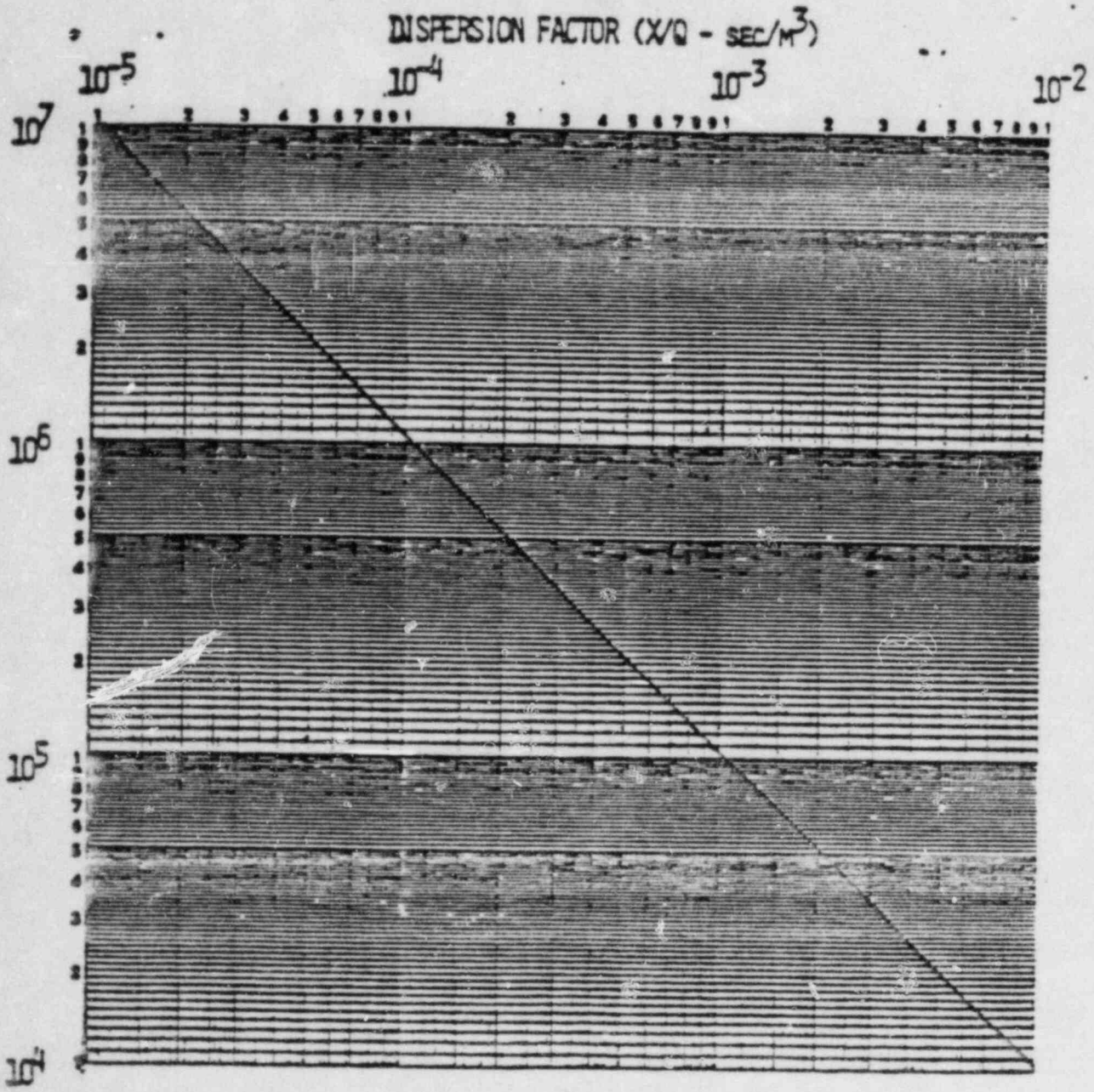
ACCIDENT CLASS	EQUIVALENT NOBLE GAS RELEASE RATE CPM		EQUIVALENT IODINE ACTIVITY INCREASE RATE CPM/MIN	
	UNIT 1	UNIT 2	UNIT 1	UNIT 2
I(1)	2.42 E^5	4.34 E^6	9.35 E^6	9.73 E^6
II(1)	7.82 E^2	1.40 E^4	1.45 E^5	1.51 E^5
III(1)	1.25 E^5	2.24 E^6	NO RELEASE	NO RELEASE
IV(1)	9.9 E^4	1.78 E^6	1.22 E^6	1.27 E^6
V(2)	1.42 E^4	2.54 E^5	3.3 E^6	3.50 E^6

(1) Use actual or estimated plant vent flow (cfm) as provided in the procedure.

(2) Default V is assumed not released through the plant vent so use a flow of 125,000 cfm for this calculation.

ATTACHMENT 5

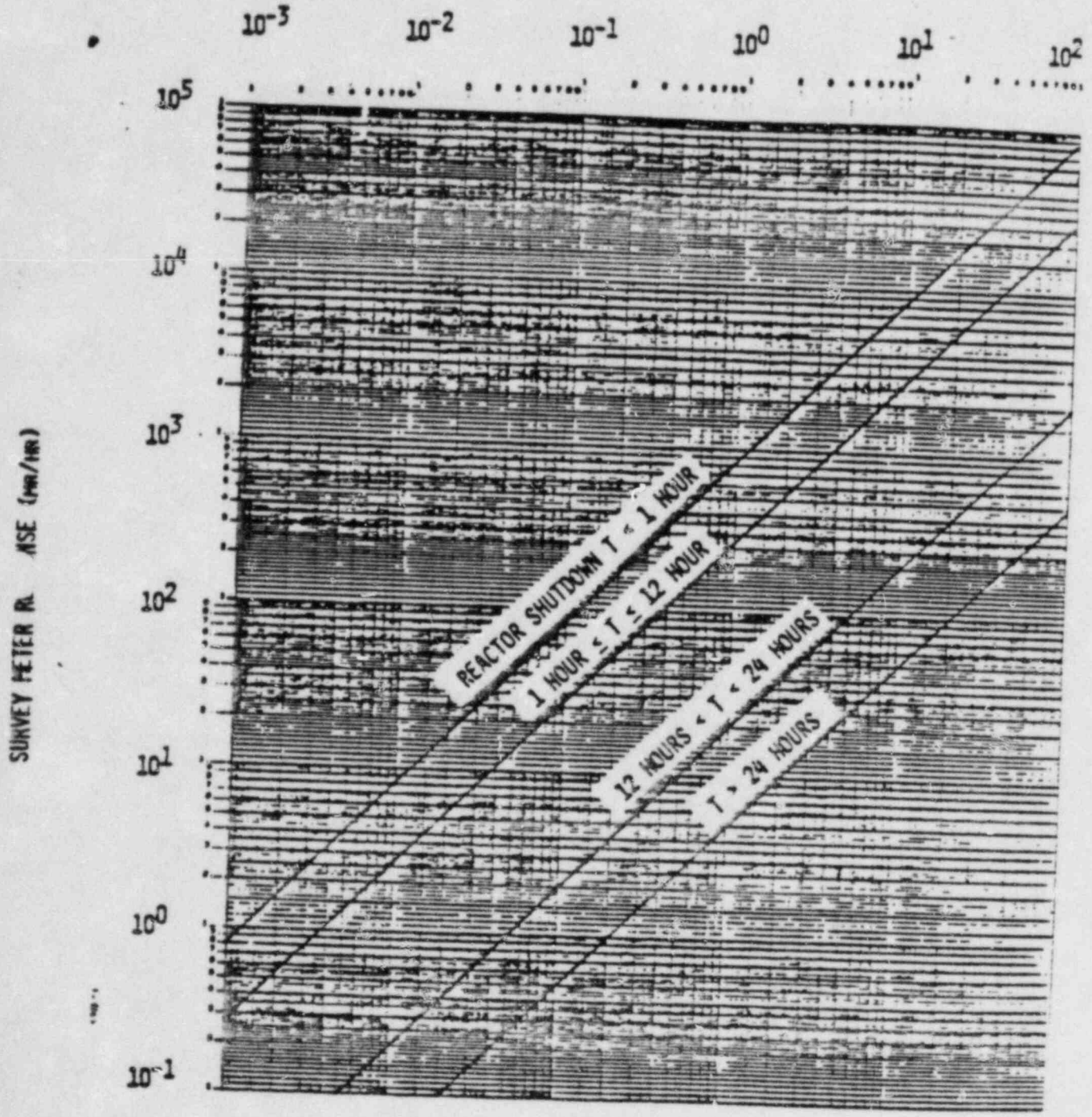
CONTAINMENT MONITOR R-44 VS DISPERSION FACTOR



NOTE

SITE DOSE OF 1 REM IN 24 HOURS FOLLOWING A LOCA AS DETERMINED BY
44 RESPONSE AND X/Q.

ATTACHMENT 6
SURVEY METER RESPONSE VS. MAIN STEAM LINE CONCENTRATION



*TO CONVERT TO μCi/Lb MULTIPLY BY 1.20E4

ATTACHMENT 7
UNIT ANALYSIS OF OFF-SITE DOSE CALCULATIONS

A.1.3a. Unit 1 Low Range Noble Gas (41C)

$$\frac{(\text{cpm} \cdot \frac{\text{uCi/cc}}{1.6\text{E}7\ \text{cpm}})(\text{ft}^3 \cdot \frac{2.832\text{E}4\text{cc}}{\text{ft}^3} \cdot \frac{1\ \text{min}}{60\ \text{sec}})(\frac{1}{\text{m}^2})(\frac{\text{mrem/hr}}{\text{uCi/m}^3})}{(\text{min})(\text{mph} \cdot \frac{0.45\ \text{m/sec}}{\text{mph}})} = 6.56\text{E}{-5}\ \text{mrem/hr}$$

A.1.4 (A.1.3b*) Unit 1 High Range Noble Gas (R-43 or R-45*)

$$\frac{(\text{mr/hr})(\frac{\text{ft}^3}{\text{min}} \cdot \frac{2.832\text{E}4\text{cc}}{\text{ft}^3} \cdot \frac{1\ \text{min}}{60\ \text{sec}})(\frac{1}{\text{m}^2})(\frac{\text{mrem/hr}}{\text{uCi/m}^3})}{(\text{mph} \cdot \frac{0.45\ \text{m/sec}}{\text{mph}})(\frac{\text{mr/hr}}{\text{uCi/cc}})} = 1.05\text{E}3\ \text{mrem/hr}$$

A.1.6 Unit 1 Iodine (41B)

$$\frac{(\frac{\text{cpm}}{\text{min}} \cdot \frac{\text{uCi/cc}}{3.13\text{E}9\ \text{cpm/min}})(\text{ft}^3 \cdot \frac{2.832\text{E}4\text{cc}}{\text{ft}^3} \cdot \frac{1\ \text{min}}{\text{min}})(\frac{1}{60\ \text{sec}})(\frac{1}{\text{m}^2})(\frac{\text{mrem/hr}}{\text{uCi/m}^3})}{(\text{mph} \cdot \frac{0.45\ \text{m/sec}}{\text{mph}})} = 3.35\text{E}7\ \text{mrem/hr}$$

A.2.2a Unit 2 Low Range Noble Gas (41C)

$$\frac{(\text{cpm} \cdot \frac{\text{uCi/cc}}{1.6\text{E}7\ \text{cpm}})(\text{ft}^3 \cdot \frac{2.832\text{E}4\text{cc}}{\text{ft}^3} \cdot \frac{1\ \text{min}}{\text{min}})(\frac{1}{60\ \text{sec}})(\frac{1}{\text{m}^2})(\frac{\text{mrem/hr}}{\text{uCi/m}^3})}{(\text{mph} \cdot \frac{0.45\ \text{m/sec}}{\text{mph}})} = 6.56\text{E}{-5}\ \text{mrem/hr}$$

A.2.3 (A.2.2b*) Unit 2 High Range Noble Gas (R-43 or R-45*)

$$\frac{(\text{mr/hr})(\frac{\text{ft}^3}{\text{min}} \cdot \frac{2.832\text{E}4\text{cc}}{\text{ft}^3} \cdot \frac{1\ \text{min}}{60\ \text{sec}})(\frac{1}{\text{m}^2})(\frac{\text{mrem/hr}}{\text{uCi/m}^3})}{(\text{mph} \cdot \frac{0.45\ \text{m/sec}}{\text{mph}})(\frac{\text{mr/hr}}{\text{uCi/cc}})} = 1.05\text{E}3\ \text{mrem/hr}$$

A.2.5 Unit 2 Iodine (41B)

$$\frac{(\frac{\text{cpm}}{\text{min}} \cdot \frac{\text{uCi/cc}}{3.13\text{E}9\ \text{cpm/min}})(\text{ft}^3 \cdot \frac{2.832\text{E}4\text{cc}}{\text{ft}^3} \cdot \frac{1\ \text{min}}{\text{min}})(\frac{1}{60\ \text{sec}})(\frac{1}{\text{m}^2})(\frac{\text{mrem/hr}}{\text{uCi/m}^3})}{(\text{mph} \cdot \frac{0.45\ \text{m/sec}}{\text{mph}})} = 3.35\text{E}{-7}\ \text{mrem/hr}$$

B.7 Release Rate From Unmonitored Steam

$$\frac{1.20\text{E}4\ \text{cc/lb}}{3.6\text{E}3\ \text{sec/hr}} = 3.3$$

B.8 Whole Body Dose Rates From Release Rate

$$\frac{(\text{uCi})(\frac{1}{\text{sec}})(\frac{1}{\text{m}^2})(\frac{\text{mrem/hr}}{\text{uCi/m}^3})}{(\text{mph} \cdot \frac{0.45\ \text{m/sec}}{\text{mph}})} = 2.22$$

* Since 1/2R-45 read directly in uCi/cc, unit analyses for R-43 are identical except that the mr/hr/uCi/cc conversion factor need not be applied.

DOSE CALCULATION SHEET

PAGE ____ CALC. DATE _____ CALC. TIME _____ BASS - UNIT _____ Monitoring Reading _____

RELEASE RATE FROM RMS —uCi/sec—

Q Release Rate = [RMS] * [Sensit & Unit Constant] * [Release Flow Rate]

DISCHARGES FROM PLANT VENT

IODINE: If R41B is offscale use Att. 4 EP, IV-111

( ) cpm/a R41B ( ) const (h) see note ( ) vent flow = cfm _____ (a) uCi/sec

NOBLE GAS: If R41C, R45B, and R45C are out of service use R43 channel. Use Att. 3, EP IV-111 for 1 term (Remember to divide by 1 term). If R43 is offscale use Att. 4, EP IV-111

( ) cpm R41C ( ) const (j) see note ( ) vent flow = cfm _____ uCi/sec (b)

( ) uCi/cc R45B or C ( ) vent flow cfm (4.72E2) = _____ uCi/sec (b)

( ) mr/hr R43 ( ) const (i) ( ) vent flow cfm (4.72E2) = _____ uCi/sec (b)

DISCHARGES FROM ATMOSPHERIC RELIEF VALVES

Decay Time = _____ hours

Survey Inst. Response = _____ mR/hr

Using Att. 6, EP IV-111 list conc. _____ uCi/cc

( ) uCi/cc (3.3) ( ) lb/hr = _____ uCi/sec (c)

from above or R46

USING CONTAINMENT MONITORS TO ESTIMATE OFFSITE DOSE FROM LEAKAGE. USE Att. 5, EP IV-111.

_____ /hr R44A or B _____ (d) => Base X/Q to yield 1R in 24 hours

Note: For Unit 1 (j) = 2.95E-5 Unit 2 (j) = 2.95E-5
For Unit 1 (h) = 1.31E-7; Unit 2 (h) = 1.31E-7

Op: Does the release rate seem reasonable? If chemistry can take a sample of the vent, compare their reported uCi/cc value with the first two terms above.

Discharges which on the average exceed 1 Ci/sec (3600 Ci/hr) of noble gases are cause for concern. Discharges which on the average exceed 7 uCi/sec (25 uCi/hr) of iodine are cause for

ATMOSPHERIC DISPERSION AT LOCATION OF INTEREST —sec/m³— (See Att. 1, EP IV-111)

Stability? = _____
Ground or Elevated? = _____

(Xu/Q)(2,22) _____ = X/Q
wind speed mph ($\bar{U}_d$)

@ MEA ( )(2,22) / ( )( ) = _____ (d)

@ UPZ ( )(2,22) / ( )( ) = _____ (e)

@ EPZ ( )(2,22) / ( )( ) = _____ (f)

@ ____ ( )(2,22) / ( )( ) = _____ (g)

$\bar{U}_d$: See Att. 1a, EP IV-111

Xu/Q (E-6/m²) Ground			
DC/ @300-30 ft.	<-1.3 unstab	neut	>-0.5 stab
MEA	9.91	41.5	226
2-MILE	2.03	10.3	104
UPZ	.420	2.50	33.2
EPZ	.129	.856	12.9

Xu/Q (E-6/m²) Elevated			
DC/ @300-30 ft.	<-1.3 unstab	neut	>-0.5 stab
MEA	11.2	35.3	*
2-MILE	2.44	13.4	.806
UPZ	.512	3.53	11.1
EPZ	.157	1.22	10.5

Stop: If the wind speed (mph) and stability has not changed you may use the same values in subsequent calculations.

* 2.18E-12

DOSE CONV. FACTOR DCF —(mrem/hr)/(uCi/m³)— => DOSE TO MAN AT THE LOCATION OF INTEREST (See Att. 2, IV-111)

Iodine - Thyroid Dose Rate => H = Q * (X/Q) * (DCF)

@ MEA ( ) uCi/sec (a) ( ) sec/m³ (d) ( ) DCF = _____ Dose Rate (mrem/hr)

@ UPZ ( ) uCi/sec (a) ( ) sec/m³ (e) ( ) DCF = _____ Dose Rate @ t_1= _____

@ EPZ ( ) uCi/sec (a) ( ) sec/m³ (f) ( ) DCF = _____ Dose Rate @ t_2= _____

@ ____ ( ) uCi/sec (a) ( ) sec/m³ (g) ( ) DCF = _____ Dose Rate @ t_3= _____

Noble Gas - Whole Body Dose Rate => H = Q (X/Q) (DCF)

@ MEA ( ) uCi/sec (b or c) ( ) sec/m³ (d) ( ) DCF = _____ Dose Rate (mrem/hr)

@ UPZ ( ) uCi/sec (b or c) ( ) sec/m³ (e) ( ) DCF = _____ Dose Rate @ t_1= _____

@ EPZ ( ) uCi/sec (b or c) ( ) sec/m³ (f) ( ) DCF = _____ Dose Rate @ t_2= _____

@ ____ ( ) uCi/sec (b or c) ( ) sec/m³ (g) ( ) DCF = _____ Dose Rate @ t_3= _____

Whole Body Dose - Containment Leakage

@ MEA ( ) (Base X/Q) * ( ) (X/Q@MEA) (d) = _____ RBM in 24 hrs.

@ UPZ ( ) (Base X/Q) * ( ) (X/Q@LPZ) (e) = _____ RBM in 24 hrs.

@ EPZ ( ) (Base X/Q) * ( ) (X/Q@EPZ) (f) = _____ RBM in 24 hrs.

@ ____ ( ) (Base X/Q) * ( ) (X/Q@) (g) = _____ RBM in 24 hrs.

Stop: If the whole body dose rate exceeds 0.5 rem/hr alert the RSM. If the thyroid dose rate exceeds 7.5 rem/hr alert the RSM. The doses calculated are future doses. List the arrival time for all calculations.

Arrival time (hrs)* t_1 = distance to location (miles) / (wind speed in mph)

$t_2 = 2t_1$

*multiply by 60 to get arrival time in minutes.

- Dose Integrator
- Status Board Attendant
- State Communicators
- Dose Calculator

ATTACHMENT 9
LIQUID RELEASE CALCULATION

In the event of a radioactive liquid release to the Delaware River, the following procedures should be used.

A. Water Sample Activity Determination

A 20 cc sample is taken and placed in a beaker. The sample is placed on top of the SAM 2 detector. The breaker's geometry would be similar to the geometry for counting a charcoal cartridge.

The total gross activity is determined as follows:

1) Multiply the total cpm by 80 to get a reading in dpm. The efficiency of the SAM-2 is approximately 1.25%, hence the ratio of the disintegration rate in dpm to the count rate displayed is 80.

2) Multiply the reading in dpm by 4.5 E-7 cc to obtain a reading in uCi.

3) Divide the reading in uCi by 20 cc to determine the activity in uCi/cc. Multiply this concentration by 1E+9 to determine pCi/l.

4) The following information would be recorded:

   a. Location of sample taken:
   b. Date.Time Sample Counted:
   c. Gross Activity pCi/l:
   d. Date.Time Sample Taken:

B. Dose Determination

The basic equation to calculate the dose conversion factor for a given nuclide is:

Dose Conversion Factor=2.13 x 10^{-6} (Eg + Eb/2)
(mrem/hr per pCi/l)

Where: Eg = average gamma energy per disintegration (MeV)

Eb = average beta energy per disintegration (MeV)

Boating:

For boating activities, the above equation can be modified to the following:

Dose Conversion Factor = 1.07 x 10^{-6} Eg
(mrem/hr per pCi/l)

In this equation adjustments account for the physical geometry and the beta shielding afforded by the boat hull. An additional reduction factor for gamma shielding is also appropriate but such a factor will not be included due to the uncertainty of boat design.

Using normalized dose conversion factors:

Immersion Dose (mrem)	= Normalized dose conversion factor (mrem/hr per pCi/l of the weighted isotopic (mixture)	x Total isotopic concentration (pCi/l	x Exposure Time (hr)	x Dilution Factor

Where: The normalized dose conversion factors are:

Water Immersion (Swimming):

Gamma whole-body doses=

1. 44 x 10^{-6} mrem/hr per pCi/l

Beta-gamma skin doses =

1.72 x 10^{-6} mrem/hr per pCi/l

Boating:

Gamma whole-body dose = 7.21 x 10^{-7} mrem/hr per pCi/l

EMERGENCY PROCEDURE
EP IV-113
COMPUTERIZED DOSE CALCULATIONS

ACTION LEVEL

This procedure may be used in lieu of the manual dose calculation procedures.

RESPONSIBLE INDIVIDUAL

An individual familiar with the Nuclear Data 6700 system (normally a Shift RPT or EOF assessment team member).

ACTION STATEMENTS

1. Contact the Control Room liaison and obtain the necessary information for the respective unit. This information can be compiled onto the Dose Assessment Data Sheet (See Attachment 1).

   UNMONITORED GASEOUS RELEASES (additional information needed)

   a.) Main steamline survey instrument reading (contact-mr/hr.) from field measurements or from R46 (main steamline monitor) data if available.
   b.) Background survey instrument reading (mr/hr) from field measurements.
   c.) Number and duration of power operated relief valves open from CR or EDO.
   d.) Number and duration of automatic relief valves open from CR or EDO.
   e.) Number and duration of auxiliary feed pump exhaust valves open from CR or EDO.

CONTAINMENT LEAKAGE (additional information needed)

a.) High range Containment Monitor Reading (R21/R44 in R/hr.)

2. Ensure a valid user is signed on the computer and that the Dec-writer terminal settings are correct (these settings are listed on the acoustic coupler used with the terminal). Dial 3209 (Salem) to access ND6700. If using a modem, see Attachment 2 for proper accessing procedure.

3. Type in: WHO (return)

4. If the system indicates a user is signed on, proceed to Step 5. If the system response is "NO USER SIGNED ON" Type in: HEL 10 (return)

5. If at the Control Point or EOF type in: JOB AUTO. DOSE 1
   If at the TSC type in: JOB AUTO. DOSCAL

6. The computer code will now ask a series of questions.

   a. Included in these questions is a query concerning whether or not this is the first meter reading in the series. A "yes" answer will eliminate all previously entered data in the file. A "no" answer will add the new data to an already begun file. During an emergency, (or drill) the very first set of data should have a "yes" answer. All remaining entries should be "no". After 24 hours and 45 minutes of data has been entered, it is necessary to begin a new file by replying "yes".

   b. If an elevation for wind speed and temperature readings of 33 feet is entered, it is necessary to call the Wilmington airport(302-323-2280) to determine the proper stability class (unstable, neutral, stable).

USER NOTES:

If a mistaken entry is made at any step of the responses to the computer program's queries, enter (return) instead of answering the next query. This response will return you to the beginning. At the end of each calculation, the option exists to perform additional dose calculations or to perform integated dose calculations, enter the desired distance in meters ($\geq$ 100). (miles x 1.61E3 = meters). To perform an integrated dose calculation, enter the number of 15 minute projections desired (< 100). (i.e., an entry of 8 will give 2 hours of projections beginning with 15 minutes after the latest entered time.) At least two (2) sets of data must be in file (at least one "no" answer) for the calculation to be performed. To exit the program, enter zero (0) to stop or return (cr) to start again (see examples below).

7. Upon answering all of the program's queries, the computer printer will then print out results such as those provided as examples in the following attachments.

NOTE:

If all noble gas or iodine monitors (low, medium, or high range) are inoperable or offscale, after typing in the last "-1" response, a listing of default classes will be printed. Once a default is chosen, the computer will calculate results, based on default values for noble gas and iodine monitor count rates from a file. If you wish to review these values, please refer to Attachment 3 of this procedure.

8. To exit and terminate the program:
   a.) Enter (0) Zero to Stop as per program query.
   b.) Hit Ctrl P to Exit job stream.
   c.) Type in: BYE 10 (Return)
   d.) Response: SIGNED OFF

Prepared By: James Clancy

Reviewed By: _____ 10/13/83
Department Head — Date

Reviewed By: _____ 10/16/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: _____ 10/19/83
Station Quality Assurance Review — Date
(if required see EP VI-2)

SORC Meeting No.: 83-131 — 10/20/83
Date

Approved By: _____ 10/21/83
General Manager - Salem Operations — Date

Approved By: _____ 10/21/83
Manager - Nuclear Site Protection — Date

EXAMPLES INCLUDED IN EP IV-113

ATTACHMENT 4 - EXAMPLE OF ELEVATED RELEASE-PLANT VENT

ATTACHMENT 5 - EXAMPLE OF ELEVATED RELEASE -UNMONITORED

ATTACHMENT 6 - EXAMPLE OF GROUND RELEASE CONTAINMENT LEAKAGE

ATTACHMENT 7 - EXAMPLE OF GROUND RELEASE-PLANT VENT

ATTACHMENT 8 - DEFAULT CLASS EXAMPLE

ATTACHMENT 9 - IODINE RELEASE RATE KNOWN

ATTACHMENT 10 - NOBLE GAS RELEASE RATE KNOWN

ATTACHMENT 11 - INTEGRATION PERFORMED

Attachment 1

DOSE ASSESSMENT DATA SHEET

DATE_____ UNIT_____ TIME OF READING_____

Plant Vent Flow Rate (CFM)_____

Wind Speed (MPH) _____ (EL-300') or _____ (EL-150')

Wind Direction (FROM) _____ (EL-300') or _____ (EL-150')

Temp (°C) _____ (300'-33') or _____ (150'-33')

Release Level (circle one) Elevated / Ground

R31	_____ _____	cpm
R41 A	_____	cpm
R41 B	_____	cpm;* _____ (last reading) cpm @ _____ (time)
R41 C	_____	cpm
R43	_____	mR/hr
R44 A	_____	R/hr
R44 B	_____	R/hr
R45 A	_____	cpm
R45 B	_____	uCi/cc
R45 C	_____	uCi/cc
R45 D	_____	mR/hr
R46 A	_____	uCi/cc
R46 B	_____	uCi/cc
R46 C	_____	uCi/cc
R46 D	_____	uCi/cc
R46 E**	_____	uCi/cc
Steam Line Survey Instrument	_____	mR/hr
Steam Release (Flow Rate)	_____	lbs/hr

Obtain cpm/min from CRT display if available (note cpm/min units)
R46E serves as a backup for any of the other R46 channels, the sum of the remaining 3 - R46 readings must be subtracted from R46E to determine the correct value.

White - Status Board Attendant
Canary - Dose Calculator
Pink - NRC
Goldenrod - Communicator

SET-UP PROCEDURE FOR AUTO DIAL MODEM AND DEC LETTERWRITER TERMINAL

1. Modem Set-up

   a) Ensure modem is off (on/off Button is out).

   b) AL Button is out.

   c) Plug modem power supply transformer into wall outlet and modem power plug into jack on modem.

   d) Connect phone line into wall jack and into either phone jack in the rear of the modem (if a phone is needed for use it can be connected to the other phone jack in the rear of the modem).

2. Terminal Set-up

   a) Ensure terminal power switch is in the off position.

   b) Insert power cord into the terminal power connector, then insert the plug into a power recepticle.

   c) Connect the RS 232 cable to the terminal connector then connect the cable to the modem connector.

3. Terminal Operation

NOTE

Operator input on terminal will be underlined and computer or terminal response will be in quotes.

   a) Turn on terminal power switch.

   b) Push in modem power switch to on position.

   c) Push Control key and hold and simultaneously push Set-up key. The "Set-up" light on the keyboard should be flashing.

   d) Type S return. The terminal will respond with a list of available operating speeds and indicate the current setting. For 300 baud operation the setting should be "G" and for 1200 baud operation the setting should be "I". To set the baud rate type:

      S = G for 300 baud, or
      S = I for 1200 baud.

SET-UP PROCEDURE FOR
AUTO DIAL MODEM AND
DEC LETTERWRITER TERMINAL (con'd)

e) After baud is set push Set-up key. The Set-up light will stop flashing.

f) Verify "Line" light on keyboard is on, if not press Line/Local key.

g) Type A T return.

h) Response "OK".

i) To call a computer from the terminal type:

A T D T , The phone number return

ie. For phone number 3209 Type A T D T , 3 2 0 9 return

For dialing through switchboard commas can be inserted after access number is dialed to allow for dial tone (each comma is a two (2) second wait).

Type A T D T , 4 , , 4 2 9 3 2 0 9 return

j) Response "Connect"

k) Proceed with appropriate procedure as required until computer access is no longer desired.

l) When completed with computer, turn off the modem and turn off the terminal.

NOTE

Each time the terminal is turned off the terminal operation steps should be used when restarting the terminal to ensure the operating speed is set as desired. If the terminal speed is not the same as the speed of the modem connected to the computer the computer will automatically disconnect the call within a few seconds. The modem will then cause the response on the terminal "NO CARRIER".

ATTACHMENT 3
DEFAULT VALUES FOR PLANT VENT MONITORS

Read the below accident description and determine which case is applicable. From the table select the appropriate release rates (cpm).

DEFAULT I LOCA WITH FUEL MELTING

A LOCA assuming severe core damage - fuel melting (Regulatory Guide 1.4 assumptions) 100% of noble gases and 25% of the iodines contained in the core are assumed released to the containment. The containment initially leaks at the maximum design leak rate.

DEFAULT II LOCA WITHOUT FUEL MELTING

Primary coolant leaks at a rate fast enough to increase the temperature of the core to the point where there is damage to the fuel rods. For this case, it is assumed that all the gap activity (the gases contained between the fuel and fuel rod) is released to the containment. The containment is assumed to initially leak at the maximum design leak rate. In this accident, it is up to the Senior Shift Supervisor or Emergency Duty Officer (EDO) to assume that there has been no fuel melting. If there is any question, a DEFAULT I LOCA should be assumed.

DEFAULT III DECAY TANK RUPTURE

This procedure is used only if actual radiological monitoring equipment is unavailable for release evaluation (monitors out of service, read off scale, etc.).

DEFAULT IV FUEL HANDLING ACCIDENT

Any activity occurring as a result of a fuel handling accident is normally drawn into the Fuel Handling Building Ventilation System and vented to the plant vent for release. The process monitors are used to monitor these releases; however, should these monitors be out of service or off scale, this technique is used to evaluate off-site dose.

DEFAULT V STEAM GENERATOR TUBE RUPTURE

The activity released during a minor tube rupture can be determined using vent monitors and normal procedures. This procedure addresses the steam generator tube rupture as analyzed in the FASR. This accident is set apart from others because of the inability to consult radiation monitors to determine the activity release rate. Therefore, this is the primary procedure to determine the activity release rate resulting from a steam generator tube rupture.

ATTACHMENT 3 (continued)

ACCIDENT CLASS	EQUIVALENT NOBLE GAS RELEASE RATE CPM		EQUIVALENT IODINE ACTIVITY INCREASE RATE CPM/MIN	
	UNIT 1	UNIT 2	UNIT 1	UNIT 2
I(1)	2.42 E^5	4.34 E^6	9.35 E^6	9.73 E^6
II(1)	7.82 E^2	1.40 E^4	1.45 E^5	1.51 E^5
III(1)	1.25 E^5	2.24 E^6	NO RELEASE	NO RELEASE
IV(1)	9.9 E^4	1.78 E^6	1.22 E^6	1.27 E^6
V(2)	1.42 E^4	2.54 E^5	3.3 E^6	3.50 E^6

(1) Use actual or estimated plant vent flow (cfm) as provided in the procedure.

(2) Default V is assumed not released through the plant vent so use a flow of 125,000 cfm for this calculation.

Attachment 4

NOTE: Responses are underlined for this procedure only (program entries are not underlined).

EXAMPLE I: ELEVATED RELEASE - PLANT VENT (perform as per request of RPE or RSM)

EMERGENCY PROCEDURE - EFFLUENT DOSE CALCULATIONS: EP IV-113
1 JAN 1982 0:19:11

OPERATOR'S INITIALS - ENTER <CR> ALONE TO STOP.....# PLF

INDICATE TYPE OF RELEASE FOR THIS CALCULATION
1. ELEVATED RELEASE - PLANT VENT
2. GROUND RELEASE - UNMONITORED
3. GROUND RELEASE - CONTAINMENT LEAKAGE
4. GROUND RELEASE - PLANT VENT
.....# 1

ENTER TIME FOR METER READINGS (MILITARY TIME - HRMN)
YOU MUST ENTER 4 DIGITS (E.G. 0945).....# 1800

FOR THE SAKE OF INTEGRATED DOSE CALCULATIONS IS THIS
THE FIRST METER READING IN THIS SERIES (Y/N) ....#Y

UNIT NUMBER (1, OR 2).....# 1

IF AVAILABLE ENTER NOBLE GAS RELEASE RATE (UCI/SEC)
OTHERWISE ENTER -1.....#-1

IF AVAILABLE ENTER IODINE RELEASE RATE (UCI/SEC)
OTHERWISE ENTER -1.....#-1

LOW RANGE GASEOUS RELEASE RATE - METER 1R-41C (cpm)
IF OFFSCALE OR INOPERABLE ENTER -1.....# 4E5

INITIAL IODINE RELEASE RATE - METER 1R-41B (cpm)
IF OFFSCALE OR INOPERABLE ENTER -1.....# 30

FINAL IODINE RELEASE RATE - METER 1R-41B (cpm)
IF OFFSCALE OR INOPERABLE ENTER -1.....# 1300

ELAPSED TIME BETWEEN IODINE READINGS (MIN).....# 5

PLANT VENT FLOW RATE (cfm)
IF VALUE UNATTAINABLE ENTER 125000.....# 68000

ELEVATION FOR WIND SPEED & TEMPERATURE READINGS (FEET)
.....(33 OR 150 OR 300) # 300

TEMP (300') - TEMP (33') - DELTA T (DEG C).....# -.5

WIND SPEED @300 FEET (MPH) - ENTER 5 IF UNKNOWN.....# 1

WIND DIRECTION (DEGREES FROM).....# 256

TIME FROM SHUTDOWN TO RELEASE (HRS).....#1

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

SUMMARY REPORT

NOBLE GAS RELEASE RATE.............................. = 8.024E 05 (UCI/SEC)
IODINE RELEASE RATE................................. = 2.643E 00 (UCI/SEC)
RATE OF INCREASE OF IODINE ACTIVITY............... = 2.540E 02 (CPM/MIN)

	DISTANCE FROM VENT (METERS)	(MILES)	XU/Q (1/M2)	WB DOSE (MREM/HR)	THY DOSE (MREM/HR)	TIME FOR PLUME TO TRAVEL DIST (MIN)	
MEA-	1270.	0.79	4.260E-05	3.041E 0[illegible]	7.106E-01	47.4	ETA = 18:47
	3218.	2.00	1.525E-05	8.935E-00	2.499E-01	120.0	ETA = 19:59
	5500.	3.42	7.115E-06	3.286E-00	1.142E-01	205.1	ETA = 21:25
LPZ-	8045.	5.00	4.031E-06	1.427E-01	6.340E-02	300.0	ETA = 22:59
	10000.	6.22	2.897E-06	8.384E-01	4.490E-02	372.9	ETA = 0:12
	13000.	8.08	1.938E-06	4.182E-01	2.942E-02	484.8	ETA = 2: 4
EPZ-	16000.	9.94	1.408E-06	2.333E-01	2.096E-02	596.6	ETA = 3:56

ENTER DISTANCE FOR ADDITIONAL CALCULATIONS (METERS)
OR ENTER # OF 15 MIN DOSE PROJECTIONS DESIRED (<100)
ENTER 0 TO STOP - ENTER <CR> ALONE TO BEGIN AGAIN.... # 0

Attachment 5

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

EXAMPLE II - GROUND RELEASE - UNMONITORED
(E.G. STEAM GENERATOR TUBE RUPTURE EVENTS)

EMERGENCY PROCEDURE - EFFLUENT DOSE CALCULATION: EP IV-113
1 JAN 1982 0:22:05

OPERATOR'S INITIALS - ENTER <CR> ALONE TO STOP ..... # PLF

INDICATE TYPE OF RELEASE FOR THIS CALCULATION
1. ELEVATED RELEASE - PLANT VENT
2. GROUND RELEASE - UNMONITORED
3. GROUND RELEASE - CONTAINMENT LEAKAGE
4. GROUND RELEASE - PLANT VENT
..... # 2

ENTER TIME FOR METER READINGS (MILITARY TIME - HRMN)
YOU MUST ENTER 4 DIGITS (E.G. 0945)..... # 1800

FOR THE SAKE OF INTEGRATED DOSE CALCULATIONS IS THIS THE FIRST
METER READING IN THIS SERIES (Y/N) .....Y

ENTER APPROPRIATE VALUES
1. # OF POWER OPERATED RELIEF VALVES OPEN.... # 1

2. # OF AUTOMATIC RELIEF VALVES OPEN..... # 2

3. # OF STEAM DRIVEN AUX FEEDWATER PUMPS ON.. # 3

ELEVATION FOR WIND SPEED & TEMPERATURE READINGS (FEET)
.....(33 OR 150 OR 300) # 150

TEMP(150') - TEMP(33') - DELTA T (DEG C).....# -.1

WIND SPEED @ 33 FEET (MPH) - ENTER 5 IF UNKNOWN.....# 33

WIND DIRECTION (DEGREES FROM).....# 1

TIME FROM SHUTDOWN TO RELEASE (HRS).....# 6

CONTACT DOSE RATE ON AFFECTED STEAM LINE OR
AUXILIARY FEED PUMP LINE (MR/HR).....# 300

BACKGROUND DOSE RATE (MR/HR).....# 160

ACTIVITY CONCENTRATION IN PIPE.....= 5.320E-01 (UCI/CC)
RELEASE RATE.....= 3.862E-06 (UCI/SEC)

TOTAL RUN TIME FOR STEAM DRIVEN
AUXILIARY FEED PUMP (HRS)....................# 3.5

TOTAL PERIOD OF TIME RELIEF
AND POWER OPERATED RELIEF VALVES
WERE OPEN ON THE AFFECTED STEAM GENERATOR (HR)......# 4

RESULTS

	DISTANCE FROM VENT (METERS)	(MILES)	XU/Q (1/M2)	WB DOSE (MREM/HR)	NOB GAS DCF MR/HR/UCI/CC	TIME FOR PLUME TO TRAVEL DIST (MIN)	
MEA-	1270.	0.79	2.263E-04	1.163E+01	1.979E-01	1.4	ETA = 18: 1
	3218.	2.00	1.036E-04	5.295E-00	1.967E-01	3.6	ETA = 18: 3
	5500.	3.42	5.447E-05	2.764E-00	1.953E-01	6.2	ETA = 18: 6
LPZ-	8045.	5.00	3.319E-05	1.671E-00	1.937E-01	9.1	ETA = 18: 9
	10000.	6.22	2.478E-05	1.240E-00	1.925E-01	11.3	ETA = 18:11
	13000.	8.08	1.733E-05	8.585E-01	1.907E-01	14.7	ETA = 18:14
EPZ-	16000.	9.94	1.301E-05	6.385E-01	1.889E-01	18.1	ETA = 18:18

ENTER DISTANCE FOR ADDITIONAL CALCULATIONS (METERS)
ENTER 0 TO STOP - ENTER <CR> ALONE TO BEGIN AGAIN.... # 8045

DISTANCE FROM VENT (METERS)	(MILES)	XU/Q (1/M2)	WB DOSE (MREM/HR)	NOB GAS DCF MR/HR/UCI/CC	TIME FOR PLUME TO TRAVEL DIST (MIN)	
8045.	5.00	3.319E-05	1.671E-00	1.937E-01	9.1	ETA = 18: 9

ENTER DISTANCE FOR ADDITIONAL CALCULATIONS (METERS)
OR ENTER # OF 15 MIN DOSE PROJECTIONS DESIRED (<100)
ENTER 0 TO STOP - ENTER <CR> ALONE TO BEGIN AGAIN.... # 0

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Attachment 6

EXAMPLE III - GROUND RELEASE - CONTAINMENT LEAKAGE (PERFORMED AS PER REQUEST OF RPE OR RSM)

EMERGENCY PROCEDURE - EFFLUENT DOSE CALCULATION: EP IV-III
1 JAN 1982 0:23:01

OPERATOR's INITIALS - ENTER <CR> ALONE TO STOP..... # PLF

INDICATE TYPE OF RELEASE FOR THIS CALCULATION
1. ELEVATED RELEASE - PLANT VENT
2. GROUND RELEASE - UNMONITORED
3. GROUND RELEASE - CONTAINMENT LEAKAGE
4. GROUND RELEASE - PLANT VENT
..... # 3

ENTER TIME FOR METER READINGS (MILITARY TIME - HRMN)
YOU MUST ENTER 4 DIGITS (E.G. 0945)..... # 2000

FOR THE SAKE OF INTEGRATED DOSE CALCULATIONS IN THIS
THE FIRST METER READING IN THIS SERIES (Y/N)..*Y

UNIT NUMBER (1, OR 2)..... # 1
ELEVATION FOR WIND SPEED & TEMPERATURE READINGS (FEET)
.....(33 OR 150 OR 300) # 300

TEMP (300') TEMP(33') - DELTA T (DEG C)..... # -1.2

WIND SPEED @ 33 FEET (MPH) - ENTER 5 IF UNKNOWN.. # 22

WIND DIRECTION (DEGREES FROM)..... # 3

TIME FROM SHUTDOWN TO RELEASE (HRS)..... # .6

HIGH RANGE CONTAINMENT RADIATION MONITOR R21/R44
READING (R/HR)..... # 333

DISPERSION FACTOR (X/Q)..... # 3.153E-01 (SEC/M3)

RESULTS

	DISTANCE FROM VENT (METERS)	(MILES)	XU/Q (1/M2)	WB DOSE (MREM/HR)	TIME FOR PLUME TO TRAVEL DIST (MIN)	
MEA-	1270.	0.79	4.154E-05	1.329E-05	2.2	ETA = 20: 2
	3218.	2.00	1.029E-05	3.293E-06	5.5	ETA = 20: 5
	5500.	3.42	4.503E-06	1.441E-06	9.3	ETA = 20: 9
LPZ-	8045.	5.00	2.496E-06	7.989E-07	13.6	ETA = 20:13
	10000.	6.22	1.780E-06	5.697E-07	17.0	ETA = 20:16
	13000.	8.08	1.183E-06	3.787E-07	22.0	ETA = 20:22
EPZ-	16000.	9.94	8.564E-07	2.741E-07	27.1	ETA = 20:27

ENTER DISTANCE FOR ADDITIONAL CALCULATIONS (METERS)
ENTER 0 TO STOP - ENTER <CR> ALONE TO BEGIN AGAIN.... # 3218

DISTANCE FROM VENT (METERS)	(MILES)	XU/Q (1/M2)	WB DOSE (MREM/HR)	TIME FOR PLUME TO TRAVEL DIST (MIN)	
3218.	2.00	1.029E-05	3.293E-06	5.5	ETA = 20: 5

ENTER DISTANCE FOR ADDITIONAL CALCULATIONS (METERS)
OR ENTER # OF 15 MIN DOSE PROJECTIONS DESIRED (<100)
ENTER 0 TO STOP - ENTER <CR> ALONE TO BEGIN AGAIN.... # 0

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Attachment 7

EXAMPLE IV: GROUND RELEASE - PLANT VENT (FOR MOST PLANT VENT RELEASES)

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EMERGENCY PROCEDURE - EFFLUENT DOSE CALCULATION:  EP IV-113
 1 JAN 1982  0:23:50

OPERATOR'S INITIALS - ENTER <CR> ALONE TO STOP..... # PLF

INDICATE TYPE OF RELEASE FOR THIS CALCULATION
      1.  ELEVATED RELEASE - PLANT VENT
      2.  GROUND RELEASE - UNMONITORED
      3.  GROUND RELEASE - CONTAINMENT LEAKAGE
      4.  GROUND RELEASE - PLANT VENT
            ..................................... # 4

ENTER TIME FOR METER READINGS (MILITARY TIME - HRMN)
      YOU MUST ENTER 4 DIGITS (E.G. 0945)..... # 1800

FOR THE SAKE OF INTEGRATED DOSE CALCULATIONS IS THIS
      THE FIRST METER READING IN THIS SERIES (Y/N)..#Y

UNIT (1, OR 2)..................................... # 1

IF AVAILABLE ENTER NOBLE GAS RELEASE RATE (UCI/SEC)
      OTHERWISE ENTER -1.....................#-1

IF AVAILABE ENTER IODINE RELEASE RATE (UCI/SEC)
      OTHERWISE ENTER -1.....................#-1

LOW RANGE GASEOUS RELEASE RATE - (METER 1R-41C (CPM)
      IF OFFSCALE OR INOPERABLE ENTER -1..... # 4E5

INITIAL IODINE RELEASE RATE - METER 1R-41B (CPM)
      IF OFFSCALE OR INOPERABLE ENTER -1..... # 30

FINAL IODINE RELEASE RATE - METER 1R-41B (CPM)
      IF OFFSCALE OR INOPERABLE ENTER -1..... # 1300

ELAPSED TIME BETWEEN IODINE READINGS (MIN)..... # 5

PLANT VENT FLOW RATE (CFM)
      IF VALUE UNATTAINABLE ENTER 125000..... # 68000

ELEVATION FOR WIND SPEED & TEMPERATURE READINGS (FEET)
      .....(30 OR 150 or 300) # 150

TEMP(150')  TEMP(33')    = DELTA T (DEG C)..... # -.5

WIND SPEED @ 33 FEET (MPH) - ENTER 5 IF UNKNOWN... # 1

WIND DIRECTION (DEGREES FROM)..................... # 256

TIME FROM SHUTDOWN TO RELEASE (HRS)............... # 1
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SUMMARY REPORT

NOBLE GAS RELEASE RATE.......................... = 8.024E-05 (UCI/SEC)
IODINE RELEASE RATE............................. = 2.643E-00 (UCI/SEC)
RATE OF INCREASE OF IODINE ACTIVITY............. = 2.540E-02 (CPM/MIN)

	DISTANCE FROM VENT (METERS)	(MILES)	XU/Q (1/M2)	WB DOSE (MREM/HR)	THY DOSE (MREM/HR)	TIME FOR PLUME TO TRAVEL DIST (MIN)	
MEA-	1270.	0.79	4.154E-05	1.428E-01	6.930E-01	47.4	ETA = 18:47
	3218.	2.00	1.029E-05	2.901E-00	1.686E-01	120.0	ETA = 19:59
	5500.	3.42	4.503E-06	1.001E-00	7.230E-02	205.1	ETA = 21:25
LPZ-	8045.	5.00	2.496E-06	4.252E-01	3.926E-02	300.0	ETA = 22:59
	10000.	6.22	1.780E-06	2.480E-01	2.759E-02	372.9	ETA = 0:12
	13000.	8.08	1.187E-06	1.229E-01	1.796E-02	484.8	ETA = 2: 4
EPZ-	16000.	9.94	8.564E-07	6.833E-02	1.275E-02	596.6	ETA = 3:56

ENTER DISTANCE FOR ADDITIONAL CALCULATIONS (METERS)
OR ENTER # OF 15 MIN DOSE PROJECTIONS DESIRED (<100)
ENTER 0 TO STOP - ENTER <CR> ALONE TO BEGIN AGAIN.... # 0

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EMERGENCY PROCEDURE - EFFLUENT DOSE CALCULATION: EP IV-113
22 SEP 1983 9:26:13

OPERATOR'S INITIALS - ENTER <CR> ALONE TO STOP .............# KG

INDICATE TYPE OF RELEASE FOR THIS CALCULATION
        1.  ELEVATED RELEASE - PLANT VENT
        2.  GROUND RELEASE - UNMONITORED
        3.  GROUND RELEASE - CONTAIMENT LEAKAGE
        4.  GROUND RELEASE - PLANT VENT
                ................................# 4

ENTER TIME FOR METER READINGS (MILITARY TIME - HRMN)
        YOU MUST ENTER 4 DIGITS (E.G. 0945).....# 1800

FOR THE SAKE OF INTEGRATED DOSE CALCULATION IS THIS
THE FIRST METER READING IN THIS SERIES (Y/N).....# Y

UNIT NUMBER (1, OR 2) ..........................# 1

IF AVAILABLE ENTER NOBLE GAS RELEASE RATE (UCI/SEC)
        OTHERWISE ENTER -1.....................# -1

IF AVAILABLE ENTER IODINE RELEASE RATE (UCI/SEC)
        OTHERWISE ENTER -1 ....................# -1

LOW RANGE GASEOUS RELEASE RATE - METER 1R-41C (CPM)
        IF OFFSCALE OR INOPERABLE ENTER -1 .....# -1

MEDIUM OR HIGH RANGE GASEOUS RELEASE
        MONITOR R45B OR R45C (UCI/CC)
        IF OFFSCALE OR INOPERABLE ENTER -1 .....# -1

HIGH RANGE GASEOUS RELEASE RATE - METER R-43 (MR/HR)
        IF OFFSCALE OR INOPERABLE ENTER -1 .....# -1


CASE 1 LOCA
===========
        A LOCA ASSUMING SEVERE CORE DAMAGE WITH FUEL MELTING.
        ASSUME 100% OF THE NOBLE GASES AND 25% OF THE IODINES
        ARE RELEASED TO THE CONTAINMENT.  THE CONTAINMENT
        INITIALLY LEAKS AT THE MAXIMUM DESIGN LEAK RATE.

CASE 2 LOCA
===========
LESS SEVERE LOCA THEN CASE 1.  PRIMARY COOLANT HAS LEAKED FAST
        ENOUGH TO INCREASE THE TEMPERATURE OF THE CORE TO THE
        POINT WHERE THERE IS DAMAGE TO THE FUEL RODS.  IT IS UP
        TO THE SENIOR SHIFT SUPERVISOR/EDO TO ASSUME THAT THERE
        HAS BEEN NO FUEL MELTING.  IF THERE IS ANY QUESTION.
        CASE 1 LOCA SHOULD BE ASSUMED.
```

CASE 3 GAS DECAY TANK RUPTURE

THESE DEFAULT VALUES SHOULD BE USED ONLY IF THE ACTUAL RADIOLOGICAL MONITORING EQUIPMENT IS UNAVAILABLE FOR RELEASE EVALUATION.

CASE 4 FUEL HANDLING ACCIDENT

NORMALLY ANY RELEASE SHOULD BE DRAWN INTO THE PLANT VENT FOR MONITORING. IF THE EFFLUENT MONITORS ARE INOPERABLE. THEN THESE VALUES SHOULD BE USED.

CASE 5 STEAM GENERATOR TUBE RUPTURE

THESE VALUES ARE FROM THE TUBE RUPTURE AS ANALYZED IN THE FSAR. MONIORS MAY NOT BE AVAILABLE TO MONITOR THE RELEASE POINT. THEREFORE, THIS IS THE PRIMARY WAY TO ESTIMATE OFF-SITE DOSES.

SELECT THE APPROPRIATE ACCIDENT DISCRIPTION (1-5)

1. CASE I - LOCA
2. CASE II - LOCA
3. CASE III - DECAY TANK RUPTURE
4. CASE IV - FUEL HANDLING ACCIDENT
5. CASE V - STEAM GENERATOR TUBE RUPTURE

.....# 1

INITIAL IODINE RELEASE RATE - METER 1R-41B (CPM)
IF OFFSCALE OR INOPERABLE ENTER -1 .....# -1

FINAL IODINE RELEASE RATE - METER 1R-41B (CPM)
IF OFFSCALE OR INOPERABLE ENTER -1 .....# -1

PLANT VENT FLOW RATE (CFM)
IF VALUE UNATTAINABLE ENTER 125000 .....# 68000

ELEVATION FOR WIND SPEED & TEMPERATURE READINGS (FEET)
.....(33 OR 150 OR 300) # 150

TEMP (150') - TEMPT (33') - DELTA T (DEG C) ..... # .5

WIND SPEED @ 33 FEET (MPH) - ENTER 5 IF UNKNOWN .... # 1

WIND DIRECTION (DEGREES FROM) ..... # 256

TIME FROM SHUTDOWN TO RELEASE (HRS) .... # 1

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XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

SUMMARY REPORT

NOBLE GAS RELEASE RATE .... = 4.855E 05 (UCI/SEC)
IODINE RELEASE RATE .... = 9.728E 04 (UCI/SEC)
RATE OF INCREASE OF IODINE ACTIVITY ...... = 9.350E 06 (CPM/MIN)

	DISTANCE (METERS)	FROM VENT (MILES)	XU/Q (1/M2)	WB DOSE (MREM/HR)	THY DOSE (MREM/HR)	TIME FOR PLUME TO TRAVEL DIST (MIN)
MEA-	1270.	0.79	2.263E-04	9.775E 01	1.390E 05	47.4 ETA = 18:47
	3218.	2.00	1.036E-04	3.672E 01	6.248E 04	120.0 ETA = 19:59
	5500.	3.42	5.447E-05	1.522E 01	3.220E 04	205.1 ETA = 21:25
LPZ-	8045.	5.00	3.319E-05	7.107E 00	1.922E 04	300.0 ETA = 22:59
	10000.	6.22	2.478E-05	4.340E 00	1.414E 04	372.9 ETA = 0:12
	13000.	8.08	1.733E-05	2.262E 00	9.681E 03	484.8 ETA = 2:04
EPZ-	16000.	9.94	1.301E-05	1.305E 00	7.132E 03	596.6 ETA = 3:56

ENTER DISTANCE FOR ADDITIONAL CALCULATIONS (METERS)
OR ENTER # OF 15 MIN DOSE PROJECTIONS DESIRED (<100)
ENTER 0 TO STOP - ENTER <CR> ALONE TO BEGIN AGAIN....# 0

EMERGENCY PROCEDURE - EFFLUENT DOSE CALCULATION: EP IV-113
22 SEP 1983 9:30:47

OPERATOR'S INITIALS - ENTER <CR> ALONE TO STOP ..... # KG

INDICATE TYPE OF RELEASE FOR THIS CALCULATION
1. ELEVATED RELEASE - PLANT VENT
2. GROUND RELEASE - UNMONITORED
3. GROUND RELEASE - CONTAINMENT LEAKAGE
4. GROUND RELEASE - PLANT VENT
..... # 4

ENTER TIME FOR METER READINGS (MILITARY TIME - HRMN)
YOU MUST ENTER 4 DIGITS (E.G. 0945) ..... # 1800

FOR THE SAKE OF INTEGRATED DOSE CALCULATIONS IN THIS THE
FIRST METER READING IN THIS SERIES (Y/N) ..... # Y

UNIT NUMBER (1 OR 2) ..... # 1

IF AVAILABLE ENTER NOBLE GAS RELEASE RATE (UCI/SEC)
OTHERWISE ENTER -1 ..... # -1

IF AVAILABLE ENTER IODINE RELEASE RATE (UCI/SEC)
OTHERWISE ENTER -1 ..... # 6E2

LOW RANGE GASEOUS RELEASE RATE - METER 1R-41C (CPM)
IF OFFSCALE OR INOPERABLE ENTER -1 ..... # 4E5

PLANT VENT FLOW RATE (CFM)
IF VALUE UNATTAINABLE ENTER 125000 ..... # 68000

ELEVATION FOR WIND SPEED & TEMPERATURE READINGS (FEET)
.....(33 OR 150 OR 300) # 150

TEMP(150') - TEMP(33') - DELTA T (DEG C) ..... # -.5

WIND SPEED @ 33 FEET (MPH) - ENTER 5 IF UNKNOWN .... # 1

WIND DIRECTION (DEGREES FROM) ..... # 256

TIME FROM SHUTDOWN TO RELEASE (HRS) ..... # 1

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

SUMMARY REPORT

NOBLE GAS RELEASE RATE ..... = 8.024E 05 (UCI/SEC)
IODINE RELEASE RATE ..... = 6.000E 02 (UCI/SEC)
RATE OF INCREASE OF IODINE ACTIVITY ..... = 9.350E 06 (CPM/MIN)

	DISTANCE FROM VENT (METERS)	(MILES)	XU/Q (1/M2)	WB DOSE (MREM/HR)	THY DOSE (MREM/HR)	TIME FOR PLUME TO TRAVEL DIST (MIN)
MEA-	1270.	0.79	4.154E-05	2.966E 01	1.573E 02	47.4 ETA = 18:47
	3218.	2.00	1.029E-05	6.027E 00	3.827E 01	120.0 ETA = 19:59
	5500.	3.42	4.503E-06	2.080E 00	1.642E 01	205.1 ETA = 21:25
LPZ-	8045.	5.00	2.496E-06	8.834E 01	8.915E 00	300.0 ETA = 22:59
	10000.	6.22	1.780E-06	5.151E 01	6.264E 00	372.9 ETA = 0:12
	13000.	8.08	1.183E-06	2.553E 01	4.078E 00	484.8 ETA = 2:04
EPZ-	16000.	9.94	8.564E-07	1.420E 01	2.896E 00	596.6 ETA = 3:56

ENTER DISTANCE FOR ADDITIONAL CALCULATIONS (METERS)
OR ENTER # OF 15 MIN DOSE PROJECTIONS DESIRED (<100)
ENTER 0 TO STOP - ENTER <CR> ALONE TO BEGIN AGAIN....# 0

EMERGENCY PROCEDURE - EFFLUENT DOSE CALCULATION: EP IV-113
22 SEP 1983 9:33:56

OPERATOR'S INITIALS - ENTER <CR> ALONE TO STOP ..... # KG

INDICATE TYPE OF RELEASE FOR THIS CALCULATION
1. ELEVATED RELEASE - PLANT VENT
2. GROUND RELEASE - UNMONITORED
3. GROUND RELEASE - CONTAINMENT LEAKAGE
4. GROUND RELEASE - PLANT VENT
..... # 4

ENTER TIME FOR METER READING (MILITARY TIME - HRMN)
YOU MUST ENTER 4 DIGITS (E.G. 0945) ..... # 1800

FOR THE SAKE OF INTEGRATED DOSE CALCULATIONS IS THIS THE
FIRST METER READING IN THIS SERIES (Y/N) ..... # Y

UNIT NUMBER (1 OR 2) ..... # 1

IF AVAILABLE ENTER NOBLE GAS RELEASE RATE (UCI/SEC)
OTHERWISE ENTER -1 ..... # 8E5

IF AVAILABLE ENTER IODINE RELEASE RATE (UCI/SEC)
OTHERWISE ENTER -1 ..... # -1

INITIAL IODINE RELEASE RATE - METER 1R-41B (CPM)
IF OFFSCALE OR INOPERABLE ENTER -1 ..... # 30

FINAL IODINE RELEASE RATE - METER 1R-41B (CPM)
IF OFFSCALE OR INOPERABLE ENTER -1 ..... # 1300

ELAPSED TIME BETWEEN IODINE READINGS (MIN) ..... # 5

PLANT VENT FLOW RATE (CFM)
IF VALUE UNATTAINABLE ENTER 125000 ..... # 68000

ELEVATION FOR WIND SPEED & TEMPERATURE READING (FEET)
....(33 OR 150 OR 300) # 150

TEMP(150') - TEMP(33') - DELTA T (DEG C) ..... # -.5

WIND SPEED @ 33 FEET (MPH) - ENTER 5 IF UNKNOWN ... # 1

WIND DIRECTION (DEGREES FROM) ..... # 256

TIME FROM SHUTDOWN TO RELEASE (HRS) ..... # 1

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

SUMMARY REPORT

NOBLE GAS RELEASE RATE .... = 8.000E 05 (UCI/SEC)
IODINE RELEASE RATE .... = 2.643E 00 (UCI/SEC)
RATE OF INCREASE OF IODINE ACTIVITY ...... = 2.540E 02 (CPM/MIN)

	DISTANCE (METERS)	FROM VENT (MILES)	XU/Q (1/M2)	WB DOSE (MREM/HR)	THY DOSE (MREM/HR)	TIME FOR PLUME TO TRAVEL DIST (MIN)
MEA-	1270.	0.79	4.154E-05	2.957E 01	6.930E 01	47.4 ETA = 18:47
	3218.	2.00	1.029E-05	6.009E 00	1.686E 01	120.0 ETA = 19:59
	5500.	3.42	4.503E-06	2.074E 00	7.230E 02	205.1 ETA = 21:25
LPZ-	8045.	5.00	2.496E-06	8.808E 01	3.926E 02	300.0 ETA = 22:59
	10000.	6.22	1.780E-06	5.136E 01	2.759E 02	372.9 ETA = 0:12
	13000.	8.08	1.183E-06	2.546E 01	1.796E 02	484.8 ETA = 2:04
EPZ-	16000.	9.94	8.564E-07	1.415E 01	1.275E 02	596.6 ETA = 3:56

ENTER DISTANCE FOR ADDITIONAL CALCULATIONS (METERS)
OR ENTER # OF 15 MIN DOSE PROJECTIONS DESIRED (<100)
ENTER 0 TO STOP - ENTER <CR> ALONE TO BEGIN AGAIN....# 0

HIT CTRL P TO EXIT JOB STREAM
> BYE 10

.GNED OFF

EMERGENCY PROCEDURE - EFFLUENT DOSE CALCULATION: EP IV-113
22 SEP 1983 8:33:16

OPERATOR'S INITIALS - ENTER <CR> ALONE TO STOP ..... # JC

INDICATE TYPE OF RELEASE FOR THIS CALCULATION
1. ELEVATED RELEASE - PLANT VENT
2. GROUND RELEASE - UNMONITORED
3. GROUND RELEASE - CONTAINMENT LEAKAGE
4. GROUND RELEASE - PLANT VENT
..... # 4

ENTER TIME FOR METER READING (MILITARY TIME - HRMN)
YOU MUST ENTER 4 DIGITS (E.G. 0945) ..... # 0800

FOR THE SAKE OF INTEGRATED DOSE CALCULATIONS IS THIS
THE FIRST METER READING IN THIS SERIES (Y/N) ..... # Y

UNIT NUMBER (1 OR 2) ..... # 1

IF AVAILABLE ENTER NOBLE GAS RELEASE RATE (UCI/SEC)
OTHERWISE ENTER -1 ..... # 7E6

IF AVAILABLE ENTER IODINE RELEASE RATE (UCI/SEC)
OTHERWISE ENTER -1 ..... # 8E2

PLANT VENT FLOW RATE (CFM)
IF VALUE UNATTAINABLE ENTER 125000 ..... # 70000

ELEVATION FOR WIND SPEED & TEMPERATURE READINGS (FEET)
.....(33 OR 150 OR 300) # 150

TEMP(150') - TEMP(33') - DELTA T (DEG C) ..... # -1

WIND SPEED @ 33 FEET (MPH) - ENTER 5 IF UNKNOWN ..... # 1

WIND DIRECTION (DEGREES FROM) ..... # 0

TIME FROM SHUTDOWN TO RELEASE (HRS) ..... # 0

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

SUMMARY REPORT

NOBLE GAS RELEASE RATE .... = 7.000E 06 (UCI/SEC)
IODINE RELEASE RATE .... = 8.000E 02 (UCI/SEC)
RATE OF INCREASE OF IODINE ACTIVITY ...... = 0.000E-01 (CPM/MIN)

	DISTANCE (METERS)	FROM VENT (MILES)	XU/Q (1/M2)	WB DOSE (MREM/HR)	THY DOSE (MREM/HR)	TIME FOR PLUME TO TRAVEL DIST (MIN)
MEA-	1270.	0.79	9.911E-06	7.234E 01	5.086E 01	47.4 ETA = 8:47
	3218.	2.00	2.028E-06	1.221E 01	1.021E 01	120.0 ETA = 9:59
	5500.	3.42	8.082E-07	3.852E 00	3.984E 00	205.1 ETA = 11:25
LPZ-	8045.	5.00	4.204E-07	1.536E 00	2.028E 00	300.0 ETA = 12:59
	10000.	6.22	2.893E-07	8.615E 01	1.374E 00	372.9 ETA = 14:12
	13000.	8.08	1.842E-07	4.048E 01	8.559E 01	484.8 ETA = 16:04
EPZ-	16000.	9.94	1.289E-07	2.138E 01	5.870E 01	596.6 ETA = 17:56

ENTER DISTANCE FOR ADDITIONAL CALCULATIONS (METERS)
OR ENTER # OF 15 MIN DOSE PROJECTIONS DESIRED (<100)
ENTER 0 TO STOP - ENTER <CR> ALONE TO BEGIN AGAIN....#

EMERGENCY PROCEDURE - EFFLUENT DOSE CALCULATION: EP IV-113
22 SEP 1983 8:42:16

OPERATOR'S INITIALS - ENTER <CR> ALONE TO STOP ..... # JC

INDICATE TYPE OF RELEASE FOR THIS CALCULATION
1. ELEVATED RELEASE - PLANT VENT
2. GROUND RELEASE - UNMONITORED
3. GROUND RELEASE - CONTAINMENT LEAKAGE
4. GROUND RELEASE - PLANT VENT
..... # 4

ENTER TIME FOR METER READING (MILITARY TIME - HRMN)
YOU MUST ENTER 4 DIGITS (E.G. 0945) ..... # 0815

FOR THE SAKE OF INTEGRATED DOSE CALCULATIONS IS THIS
THE FIRST METER READING IN THIS SERIES (Y/N) ..... # N

UNIT NUMBER (1 OR 2) ..... # 1

IF AVAILABLE ENTER NOBLE GAS RELEASE RATE (UCI/SEC)
OTHERWISE ENTER -1 ..... # 9E6

IF AVAILABLE ENTER IODINE RELEASE RATE (UCI/SEC)
OTHERWISE ENTER -1 ..... # 2E3

PLANT VENT FLOW RATE (CFM)
IF VALUE UNATTAINABLE ENTER 125000 ..... # 70000

ELEVATION FOR WIND SPEED & TEMPERATURE READINGS (FEET)
.....(33 OR 150 OR 300) # 150

TEMP(150') - TEMP(33') - DELTA T (DEG C) ..... # -1

WIND SPEED @ 33 FEET (MPH) - ENTER 5 IF UNKNOWN ..... # 1

WIND DIRECTION (DEGREES FROM) ..... # 0

TIME FROM SHUTDOWN TO RELEASE (HRS) ..... # 0

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

SUMMARY REPORT

NOBLE GAS RELEASE RATE .... = 9.000E 06 (UCI/SEC)
IODINE RELEASE RATE .... = 2.000E 03 (UCI/SEC)
RATE OF INCREASE OF IODINE ACTIVITY ...... = 0.000E-01 (CPM/MIN)

	DISTANCE FROM VENT (METERS)	(MILES)	XU/Q (1/M2)	WB DOSE (MREM/HR)	THY DOSE (MREM/HR)	TIME FOR PLUME TO TRAVEL DIST (MIN)
MEA-	1270.	0.79	9.911E-06	9.301E 01	1.272E 02	47.4 ETA = 9:02
	3218.	2.00	2.028E-06	1.570E 01	2.552E 01	120.0 ETA = 10:14
	5500.	3.42	8.082E-07	4.953E 00	9.959E 00	205.1 ETA = 11:40
LPZ-	8045.	5.00	4.204E-07	1.975E 00	5.069E 00	300.0 ETA = 13:14
	10000.	6.22	2.893E-07	1.108E 00	3.434E 00	372.9 ETA = 14:27
	13000.	8.08	1.842E-07	5.204E 01	2.140E 00	484.8 ETA = 16:19
EPZ-	16000.	9.94	1.289E-07	2.749E 01	1.468E 00	596.6 ETA = 18:11

ENTER DISTANCE FOR ADDITIONAL CALCULATIONS (METERS)
OR ENTER # OF 15 MIN DOSE PROJECTIONS DESIRED (<100)
ENTER 0 TO STOP - ENTER <CR> ALONE TO BEGIN AGAIN....# 12

INTEGRATION OF DOSES AND RELEASE RATES -MEA-

TIME	TOT WB DOSE (MR)	TOT THY DOSE (MR)	NOBLE GASES (UCI)	IODINE (UCI)	PROJ/CALC
815.	1.808E 01	1.272E 01	1.750E 06	2.000E 02	CALC
830.	4.134E 01	4.452E 01	4.000E 06	7.000E 02	PROJ
845.	6.459E 01	7.630E 01	6.250E 06	1.200E 03	PROJ
900.	8.784E 01	1.081E 02	8.500E 06	1.700E 03	PROJ
915.	1.111E 02	1.399E 02	1.075E 07	2.200E 03	PROJ
930.	1.343E 02	1.717E 02	1.300E 07	2.700E 03	PROJ
945.	1.576E 02	2.035E 02	1.525E 07	3.200E 03	PROJ
1000.	1.808E 02	2.352E 02	1.750E 07	3.700E 03	PROJ
1015.	2.041E 02	2.670E 02	1.975E 07	4.200E 03	PROJ
1030.	2.273E 02	2.988E 02	2.200E 07	4.700E 03	PROJ
1045.	2.506E 02	3.306E 02	2.425E 07	5.200E 03	PROJ
1100.	2.739E 02	3.624E 02	2.650E 07	5.700E 03	PROJ
1115.	2.971E 02	3.942E 02	2.875E 07	6.200E 03	PROJ

INTEGRATION OF DOSES AND RELEASE RATES -LPZ-

TIME	TOT WB DOSE (MR)	TOT THY DOSE (MR)	NOBLE GASES (UCI)	IODINE (UCI)	PROJ/CALC
815.	3.840E 01	5.069E 01	1.750E 06	2.000E 02	CALC
830.	8.776E 01	1.774E 00	4.000E 06	7.000E 02	PROJ
845.	1.371E 00	3.042E 00	6.250E 06	1.200E 03	PROJ
900.	1.865E 00	4.309E 00	8.500E 06	1.700E 03	PROJ
915.	2.359E 00	5.576E 00	1.075E 07	2.200E 03	PROJ
930.	2.852E 00	6.844E 00	1.300E 07	2.700E 03	PROJ
945.	3.346E 00	8.111E 00	1.525E 07	3.200E 03	PROJ
1000.	3.840E 00	9.378E 00	1.750E 07	3.700E 03	PROJ
1015.	4.333E 00	1.065E 01	1.975E 07	4.200E 03	PROJ
1030.	4.827E 00	1.191E 01	2.200E 07	4.700E 03	PROJ
1045.	5.321E 00	1.318E 01	2.425E 07	5.200E 03	PROJ
1100.	5.814E 00	1.445E 01	2.650E 07	5.700E 03	PROJ
1115.	6.308E 00	1.572E 01	2.875E 07	6.200E 03	PROJ

INTEGRATION OF DOSES AND RELEASE RATES -EPZ-

TIME	TOT WB DOSE (MR)	TOT THY DOSE (MR)	NOBLE GASES (UCI)	IODINE (UCI)	PROJ/CALC
815.	5.345E 02	1.468E 01	1.750E 06	2.000E 02	CALC
830.	1.222E 01	5.137E 01	4.000E 06	7.000E 02	PROJ
845.	1.909E 01	8.086E 01	6.250E 06	1.200E 03	PROJ
900.	2.596E 01	1.247E 00	8.500E 06	1.700E 03	PROJ
915.	3.283E 01	1.614E 00	1.075E 07	2.200E 03	PROJ
930.	3.971E 01	1.981E 00	1.300E 07	2.700E 03	PROJ
945.	4.658E 01	2.348E 00	1.525E 07	3.200E 03	PROJ
1000.	5.345E 01	2.715E 00	1.750E 07	3.700E 03	PROJ
1015.	6.032E 01	3.082E 00	1.975E 07	4.200E 03	PROJ
1030.	6.720E 01	3.449E 00	2.200E 07	4.700E 03	PROJ
1045.	7.407E 01	3.816E 00	2.425E 07	5.200E 03	PROJ
1100.	8.094E 01	4.183E 00	2.650E 07	5.700E 03	PROJ
1115.	8.781E 01	4.550E 00	2.875E 07	6.200E 03	PROJ

ENTER DISTANCE FOR ADDITIONAL CALCULATIONS (METERS)
OR ENTER # OF 15 MIN DOSE PROJECTIONS DESIRED (<100)
ENTER 0 TO STOP - ENTER <CR> ALONE TO BEGIN AGAIN ..... # 0

EMERGENCY PROCEDURE
EP IV-114
COMPUTERIZED DOSE CALCULATIONS ON PROGRAMMABLE CALCULATOR (TI-59)

ACTION LEVEL

This procedure may be used in lieu of the manual dose calculation procedures.

RESPONSIBLE INDIVIDUAL

An individual familiar with the Texas Instruments TI-59 programmable calculator (normally a Shift RPT or EOF assessment team member).

ACTION STATEMENTS

PART A

DOSE CALCULATIONS FOR PRE-SELECTED LOCATIONS
(MEA, LPZ, EPZ, OR 5.5 10, AND 13 Km LOCATIONS)

1. Contact the Control Room (or TSC) and obtain the necessary information for the respective unit. This information can be compiled onto the Dose Assessment Data sheet (Attachment 3, EP IV-112).

   WIND SPEED (mph)
   WIND DIRECTION (degrees, from)
   DELTA TEMPERATURE (ΔT, °C)
   TIME FROM START OF INCIDENT (hrs)
   NOBLE GAS MONITOR (cpm) - Unit 1 (1R-41C);
   Unit 2 (2R-41C)
   HIGH RANGE MONITOR (mR/hr) - R-45/R-43
   INITIAL READING FROM IODINE MONITOR (cpm) -
   Unit 1 (1R-41B); Unit 2 (2R-41B)
   FINAL (OR MOST RECENT) READING FROM IODINE
   MONITOR (cpm) - Unit 1 (1R-41B); Unit 2 (2R-41B)
   TIME BETWEEN READINGS ON IODINE MONITOR
   (minutes) - Unit 1 (1R-41B); Unit 2 (2R-41B)

PART A (continued)

2. Prepare programmable calculator TI-59 for use:

   a) Lock TI-59 calculator securely into printer cradle (PC-100).
   b) Turn printer power on, then turn calculator power on.
   c) Select the Salem 1 or 2 (appropriate) MET-RMS-DOSE calculation cards (two cards - three sides) for the distances of interest (i.e., MEA, LPZ, EPZ or 5.5, 10 15 Km).
   d) Prior to card reading, press 3 Op (2nd tier) 17. (The number 719.29 should appear on display.) Then press CLR. Press CLR before reading any card side.
   e) Read all appropriate program card sides (cards are to be inserted into slot on right hand side of TI-59). This program is contained on three (3) sides of two (2) cards. If the calculator display blinks following the attempt to read the cards, the card has not been read. Press CLR and reinsert this card side until number designated of card side is shown on display without flashing.
   f) After reading all appropriate program cards, initialize calculator by pressing 2nd A.

3. RUN DATA ON PROGRAM (see example - Attachment 1).

   a) Enter wind direction from which the wind blows (degrees AZIMUTH), then press A.

NOTE

The direction the wind blows towards will also automatically printout.

PART A (continued)

b) Enter the wind speed (mph) then press R/S.
c) Enter station delta temperature (ΔT), then press R/S.
d) Select type of release, Press 0 for ground level release, or 1 for elevated release (plant vent), then press R/S.

NOTE

The calculator will now pause for 5 to 10 seconds and then print three numbers with exponents representing the X/Q values for the three program distances (i.e., MEA, LPZ, and EPZ).

e) Following this calculator printout, enter the plant vent flow rate in cubic feet per minute (cfm), then press B. (Default value for flow rate is 125,000 cfm).
f) Select type of data to be introduced: for low range vent monitors or FSAR Design Basis Accident (DBA), enter 0; for high range monitors, press 1, then press R/S.
g)
   1. If 0 (zero) is selected above enter the appropriate Noble Gas Monitor reading (cpm), or DBA cpm equivalent then press R/S. DBA (design basis accident) classes and cpm equivalents are given in Attachment 5.
   2. If one (1) is selected above, enter reading from R-45 as actually read on the instrument (uCi/cc), then press R/S. Next, enter one (1) then press R/S. If R-45 is out of order, enter mr/hr reading from R-43 as read from the monitor and press R/S. Next, enter the R43 concentration conversion factor from attachment 4 and press R/S.

PART A (continued)

h) Enter the initial iodine monitor reading (cpm), or 0 for DBA cpm equivalent, then press R/S.

i) Enter the latest iodine monitor reading (cpm), then press R/S. If off-scale, use DBA default values - these defaults can be used with R-45 readings (see Attachment 5 for DBA default values).

j) Enter the amount of time lapse (delta time) between the iodine monitor reading time (t_0) and latest reading time (t_1) in minutes, then press R/S.

NOTE

For DBA default or zero readings use one (1) minute.

k) After calculator finishes printing (eight lines of numbers in exponential form taking 10 to 20 seconds), enter the appropriate Noble Gas Dose Rate Conversion Factor (DRCF) for MEA. See Attachment 2 for decay time versus factor graphic. After entering this factor, press C.

NOTE

The eight lines of output represent Noble Gas and iodine source terms and calculated concentrations (see Attachment 1).

l) Enter the appropriate Iodine Dose Rate Conversion Factor for MEA (see Attachment 3), then press R/S.

m) Enter the appropriate Noble Gas DRCF for LPZ (Attachment 2), then press R/S.

n) Enter the appropriate Iodine DRCF for LPZ (Attachment 3), then press R/S.

PART A (continued)

o) Enter the appropriate Noble Gas DRCF for EPZ (Attachment 2), then press R/S.

p) Enter the appropriate Iodine DRCF for EPZ (Attachment 3), then press R/S.

q) This completes the dose calculation program, (e.g., the dose rates for whole body and thyroid are printed out for the MEA, LPZ, and EPZ). To reinitialize calculator, press CLR, then press 2nd A. To sign off, press CLR and then turn off calculator first and then the printer.

NOTE

1. Be sure to partition (3 OP 17) before reading cards.

2. Be sure that all card sides are read properly.

3. Be sure to initialize calculator (2nd A) before data entry.

4. ALL KEYBOARD ENTRIES REQUIRE CLOSING STATEMENT: THIS STATEMENT IS R/S for all entries except wind direction (press A), plant vent flow rate (follow with B), and the Noble Gas Dose Rate Conversion Factor for MEA (then press C).

ATTACHMENT 1
EXAMPLE PROBLEM FOR TI-59 CALCULATIONS

EXAMPLE

GIVEN: a) Meteorological data is as follows:
wind direction (from) = 230° at 300' Elevation
wind speed = 1 mph
ΔT = 0.5°C

b) Unit 1 Containment monitor 1P41B reads 1500 cpm now. Five minutes ago, this monitor was reading 50 cpm.

c) Plant vent flow rate = 68,000 cfm

d) Monitor 1R-41C reads 500,000 cpm

e) Reactor has been shut down for two hours

SOLVE: a) What are the whole body and thyroid dose rates for the MEA, LPZ, and EPZ distances.

ANSWERS:

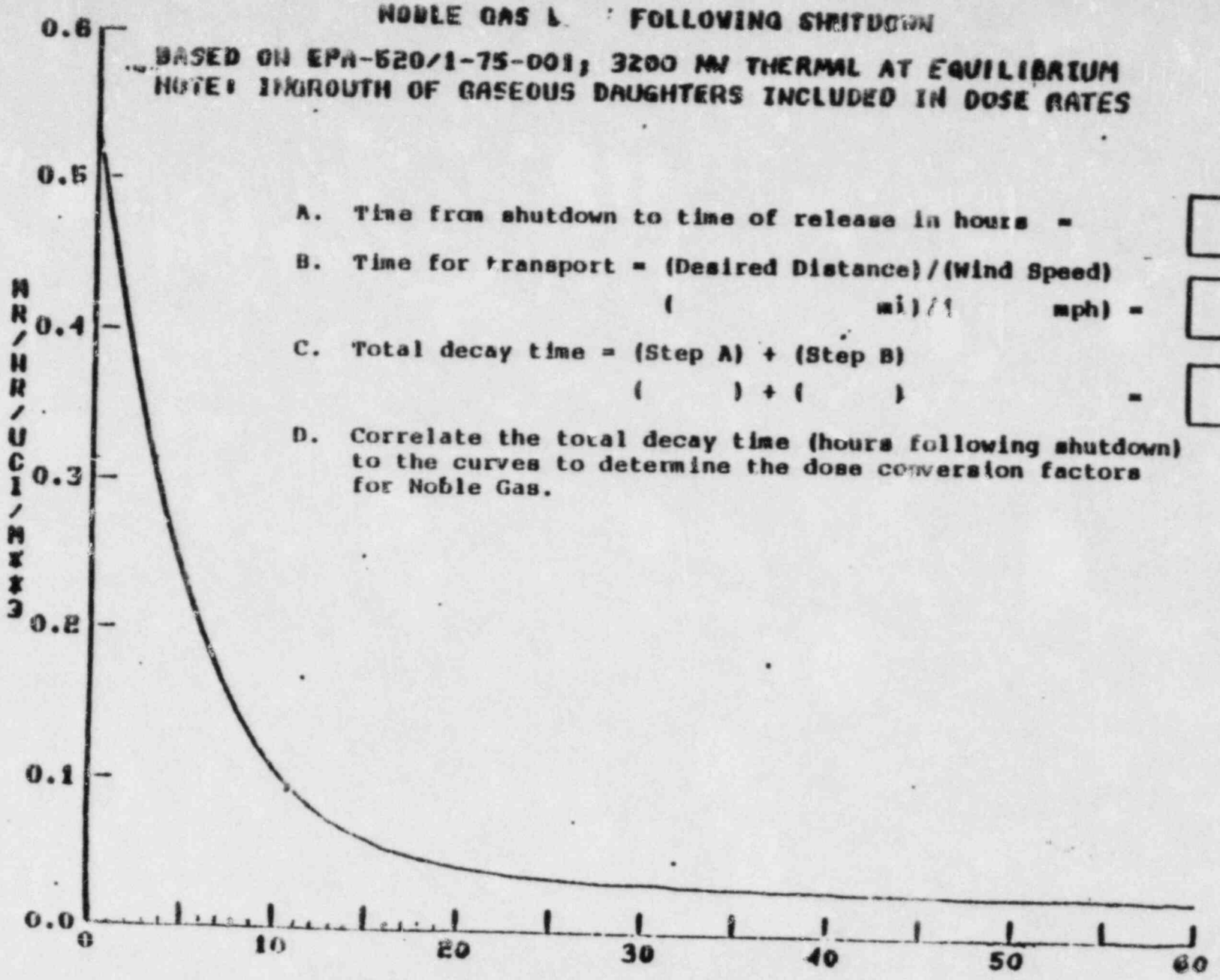
	(mrem/hr)	
DISTANCE	WHOLE BODY	THYROID
MEA	32.5	0.792
LPZ	1.54	0.071
EPZ	.253	0.023

PRINTOUT FOR EXAMPLE PROBLEM (TI-59)

INPUT Explanation	Press	TI-59 PRINTOUT	OUTPUT	UNITS Units
3a. wind direction (from)	A	230.		(°)
		50.	Wind direction (towards)	(°)
3b. wind speed	R/S	1.		(mph)
3c. Δ temperature	R/S	-0.5		(°C)
3d. elevated release	R/S	1.		
		7.8963851-05	MEA X/Q	(sec/m^3)
		7.8963851-06	LPZ X/Q	(sec/m^3)
		2.7290623-06	EPZ X/Q	(sec/m^3)
3e. station vent flow	B	68000.		(cfm)
		32096000.	Vent flow	(in cc/sec)
3f. low range monitor choice	R/S	0.		
3g. noble gas monitor	R/S	5.05		(cpm)
3h. initial iodine monitor reading	R/S	50.		(cpm)
3i. current iodine monitor reading	R/S	1500.		(cpm)
3j. delta time between iine readings	R/S	5.		(minutes)
		1.003 06	Noble Gas Source	(uCi/sec)
		2.969201 00	Iodine Source Term	(uCi/sec)
		7.9200743 01	NG-MEA conc.	(uCi/m^3)
		7.9200743 00	NG-LPZ conc.	(uCi/m^3)
		2.7372495 00	NG-EPZ conc.	(uCi/m^3)
		2.3445954-04	I-MEA conc.	(uCi/m^3)
		2.3445954-05	I-LPZ conc.	(uCi/m^3)
		8.1031343-06	I-EPZ conc.	(uCi/m^3)
3k. MEA dose rate conv. factor-Noble Gas (NG)	C	.34		(-)
3l. MEA dose rate conv. factor-iodine	R/S	2780.		(-)
3m. LPZ dose rate conv. factor-Noble Gas	R/S	.17		(-)
3n. LPZ dose rate conv. factor-iodine	R/S	2650		(-)
3o. EPZ dose rate conv. factor-Noble Gas	R/S	.08		(-)
3p. EPZ dose rate conv. factor-iodine	R/S	2520		(-)
		26.92825251	WB Dose Rate MEA	(mrem/hr)
		.6517975282	Thyroid Dose Rate MEA	(mrem/hr)
		1.346412625	WB Dose Rate LPZ	(mrem/hr)
		.0621317788	Thyroid Dose Rate LPZ	(mrem/hr)
		.2189799571	WB Dose Rate EPZ	(mrem/hr)
		.0204193985	Thyroid Dose Rate EPZ	(mrem/hr)

NOBLE GAS [illegible] FOLLOWING SHUTDOWN

BASED ON EPA-520/1-75-001; 3200 MW THERMAL AT EQUILIBRIUM
NOTE: INGROUTH OF GASEOUS DAUGHTERS INCLUDED IN DOSE RATES



A. Time from shutdown to time of release in hours = _____ hr

B. Time for transport = (Desired Distance)/(Wind Speed)
(mi)/(mph) = _____ hr

C. Total decay time = (Step A) + (Step B)
( ) + ( ) = _____ hr

D. Correlate the total decay time (hours following shutdown) to the curves to determine the dose conversion factors for Noble Gas.

NOBLE GAS DACF FOLLOWING SHUTDOWN

(MREM/HR)/(UCI/M**3)

HOURS	DRCF	HOURS	NG DRCF	HOURS	NGDRCF	HOURS	NGDRCF
0	.528	16	.0552	31	.0319	46	.0284
1	.457	17	.0512	32	.0315	47	.0283
2	.389	18	.0479	33	.0311	48	.0282
3	.329	19	.0451	34	.0308	49	.0281
4	.277	20	.0428	35	.0305	50	.028
5	.234	21	.0409	36	.0302	51	.0279
6	.197	22	.0393	37	.0299	52	.0278
7	.168	23	.0379	38	.0297	53	.0278
8	.143	24	.0367	39	.0295	54	.0277
9	.123	25	.0357	40	.0293	55	.0276
10	.107	26	.0349	41	.0291	56	.0276
11	.0932	27	.0341	42	.0289	57	.0275
12	.0823	28	.0335	43	.0288	58	.0275
13	.0733	29	.0329	44	.0287	59	.0274
14	.0661	30	.0324	45	.0285	60	.0274
15	.0601						

A. Time from shutdown to time of release in hours = _____ hr

B. Time for transport = (Desired Distance)/(Wind Speed)

(mi)/(mph) = _____ hr

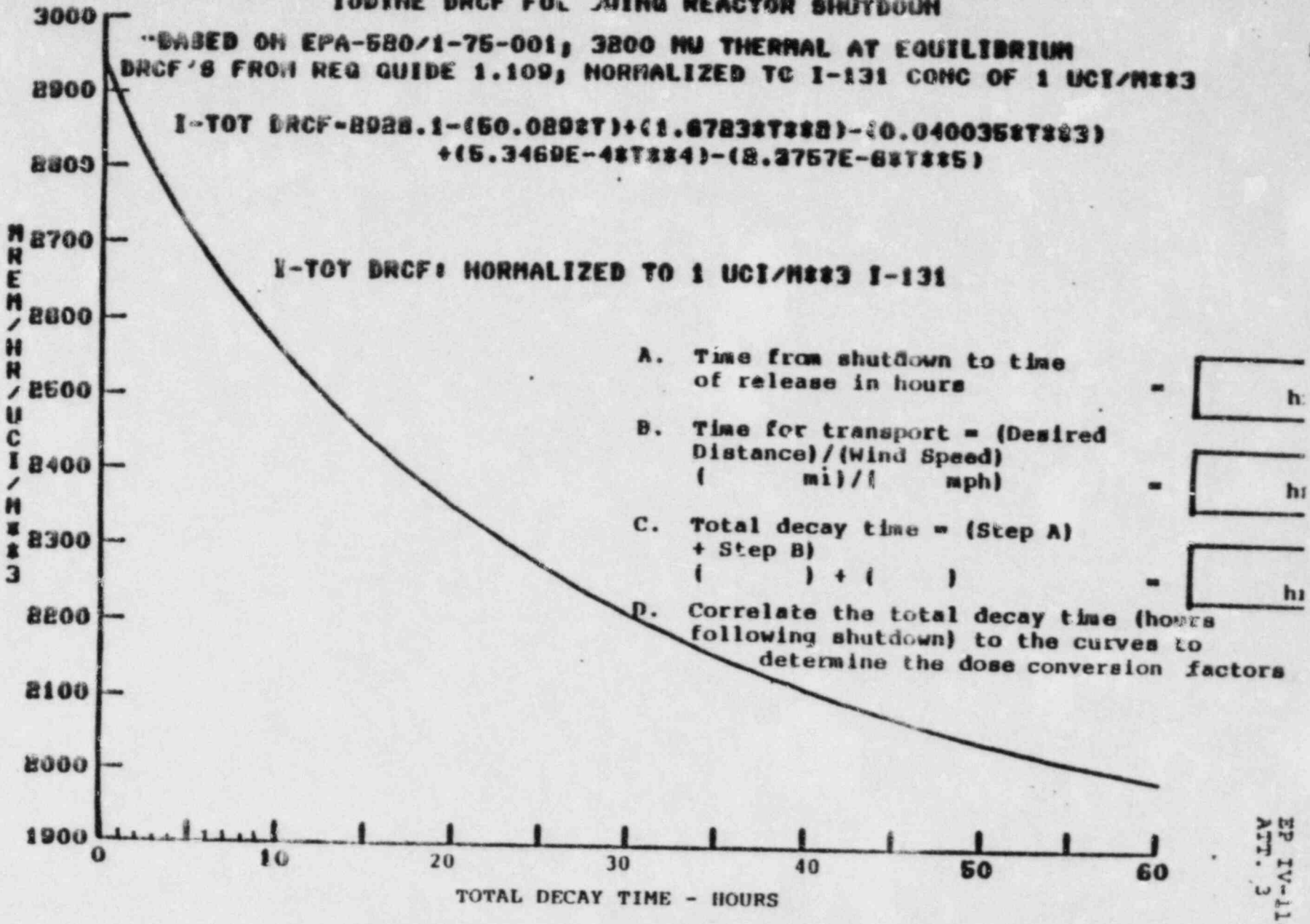
C. Total decay time = (Step A) + (Step B)

( ) + ( ) = _____ hr

D. Correlate the total decay time (hours following shutdown) to the curves to determine the dose conversion factors for Noble Gas.

Attachment 3

IODINE DRCF FOLLOWING REACTOR SHUTDOWN



"BASED ON EPA-580/1-75-001; 3800 MW THERMAL AT EQUILIBRIUM
DRCF'S FROM REG GUIDE 1.109; NORMALIZED TO I-131 CONC OF 1 UCI/M**3

I-TOT DRCF=8928.1-(50.089*T)+(1.6783*T**2)-(0.040035*T**3)
+(5.3469E-4*T**4)-(8.2757E-6*T**5)

I-TOT DRCF: NORMALIZED TO 1 UCI/M**3 I-131

A. Time from shutdown to time of release in hours = [ ] hr

B. Time for transport = (Desired Distance)/(Wind Speed)
(mi)/(mph) = [ ] hr

C. Total decay time = (Step A) + Step B)
( ) + ( ) = [ ] hr

D. Correlate the total decay time (hours following shutdown) to the curves to determine the dose conversion factors

I-TOT DRCF (MREM/HR/UCI/M**3) BASED ON I-131 VERSUS TIME

(MREM/HR)/(UCI/M**3)

HOURS	DRCF
0	2036.4
1	2879.6
2	2831
3	2787.8
4	2748.5
5	2712.2
6	2678.3
7	2646.6
8	2616.7
9	2588.4
10	2561.6
11	2536.1
12	2511.9
13	2488.7
14	2466.7
15	2445.6
16	2425.4
17	2406
18	2387.5
19	2369.7
20	2352.6
21	2336.2
22	2320.4
23	2305.2
24	2290.6
25	2276.5
26	2262.9
27	2249.9
28	2237.3
29	2225.1
30	2213.4
31	2202
32	2191.1
33	2180.5
34	2170.3
35	2160.5
36	2151
37	2141.7
38	2132.8
39	2124.2
40	2115.9
41	2107.8
42	2100
43	2092.5
44	2085.1
45	2078.1
46	2071.2
47	2064.6
48	2058.2
49	2051.9
50	2045.9
51	2040.1
52	2034.4
53	2028.9
54	2023.6
55	2018.5
56	2013.5
57	2008.7
58	2004
59	1999.4
60	1995

A. Time from shutdown to time of release in hours = _____ hr

B. Time for transport = (Desired Distance)/(Wind Speed)
(mi)/(mph) = _____ hr

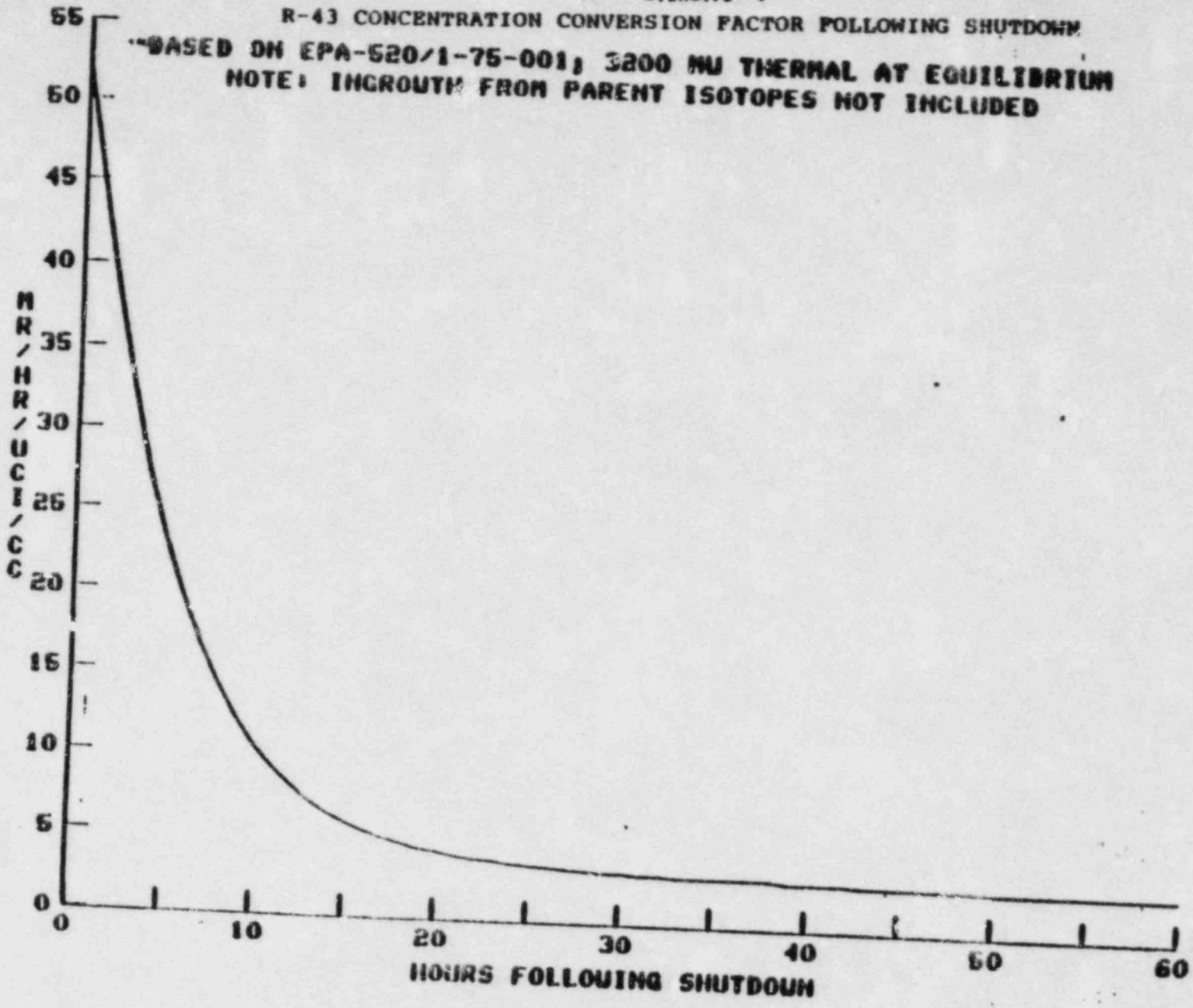
C. Total decay time = (Step A) + (Step B)
( ) + ( ) = _____ hr

D. Correlate the total decay time (hours following shutdown) to the curves to determine the dose conversion factors for Iodine.

Ciment 4

R-43 CONCENTRATION CONVERSION FACTOR FOLLOWING SHUTDOWN

**BASED ON EPA-520/1-75-001; 3200 MW THERMAL AT EQUILIBRIUM
NOTE: INGROUTH FROM PARENT ISOTOPES NOT INCLUDED



R-43 CALIBRATION FACTOR (MR/HR)/(UCI/CC)

HOURS	CALFACT	HOURS	CALFACT	HOURS	CALFACT	HOURS	CALFACT
0	52.009	16	5.4256	31	3.1342	46	2.7942
1	45	17	5.03	32	3.0939	47	2.7832
2	38.289	18	4.7034	33	3.0577	48	2.773
3	32.368	19	4.4326	34	3.025	49	2.7635
4	27.287	20	4.207	35	2.9953	50	2.7546
5	23.004	21	4.0181	36	2.9683	51	2.7464
6	19.439	22	3.859	37	2.9437	52	2.7388
7	16.495	23	3.7242	38	2.9211	53	2.7317
8	14.077	24	3.6093	39	2.9005	54	2.7251
9	12.097	25	3.5107	40	2.8814	55	2.7189
10	10.481	26	3.4255	41	2.8639	56	2.7132
11	9.1621	27	3.3515	42	2.8477	57	2.7079
12	8.0868	28	3.2867	43	2.8327	58	2.7029
13	7.2094	29	3.2296	44	2.8189	59	2.6983
14	6.4928	30	3.1791	45	2.8061	60	2.694
15	5.9065						

ATTACHMENT 5
DEFAULT VALUES FOR LOW/HIGH PLANT VENT MONITORS

Read the below accident description and determine which case is applicable. From the table select the appropriate release rates (cpm).

CASE I LOCA

A LOCA assuming severe core damage - fuel melting (Regulatory Guide 1.4 assumptions) 100% of Noble Gases and 25% of the iodines contained in the core are assumed released to the containment. The containment initially leaks at the maximum design leak rate.

CASE II LOCA

Primary coolant leaks at a rate fast enough to increase the temperature of the core to the point where there is damage to the fuel rods. For this case, it is assumed that all the gap activity (the gases contained between the fuel and fuel rod) is released to the containment. The containent is assumed to initially leak at the maximum design leak rate. In this accident, it is up to the Senior Shift Supervisor or Emergency Duty Officer (EDO) to assume that there has been no fuel melting. If there is any question, a Case I LOCA should be assumed.

CASE III DECAY TANK RUPTURE

This procedure is used only if actual radiological monitoring equipment is unavailable for release evaluation (monitors out of service, read off scale, etc.).

CASE IV FUEL HANDLING ACCIDENT

Any activity occurring as a result of a fuel handling accident is normally drawn into the Fuel Handling Building Ventilation System and vented to the plant vent for release. The process monitors are used to monitor these releases; however, should these monitors be out of service or off scale, this technique is used to evaluate off-site dose.

CASE V STEAM GENERATOR TUBE RUPTURE

The activity released during a minor tube rupture can be determined using vent monitors and normal procedures. This procedure addresses the steam generator tube rupture as analyzed in the FSAR. This accident is set apart from others because of the inability to consult radiation monitors to determine the activity release rate. Therefore, this is the primary procedure to determine the activity release rate resulting from a system generator tube rupture.

ACCIDENT CLASS	EQUIVALENT NOBLE GAS RELEASE RATE CPM		EQUIVALENT IODINE ACTIVITY INCREASE RATE (CPM/MIN)	
	Unit 1	Unit 2	Unit 1	Unit 2
I(1)	2.42 E^5	4.34 E^6	9.35 E^6	9.73 E^6
II(1)	7.82 E^2	1.40 E^4	1.45 E^5	1.51 E^5
III(1)	1.25 E^5	2.24 E^6	NO RELEASE	NO RELEASE
IV(1)	9.9 E^4	1.78 E^6	1.22 E^6	1.27 E^6
V(2)	1.42 E^4	2.54 E^5	3.3 E^6	3.50 E^6

(1) Use actual or estimated plant vent flow (cfm) as provided in the procedure.

(2) Case V is assumed not to be released through the plant vent so use a flow of 125,000 cfm for this calculation.

PART B

DOSE CALCULATIONS BASED ON RELEASE RATE OR FIELD MEASUREMENT (OPTIONAL) FOR ANY LOCATION

1. Contact the Control Room or TSC or EOF field team coordinator. Obtain the necessary information from the respective unit.

   a. Noble Gas Release Rate in Curies per second (can be calculated from RMS data using Part A of this procedure).
   b. Wind speed in miles per hour (mph), direction, and stability class.

2. Based on the time since shutdown and the plant conditions affecting the release, determine the Noble Gas and iodine dose rate conversion factors (DRCF) from Attachments 6 and 7, and estimate the duration of exposure.

3. Prepare programmable calculator TI-59 for use:

   a. Lock TI-59 Calculator into printer cradle (PC-100).
   b. Turn printer on, then calculator power on.
   c. Select the Release Rate Dose Calculation Cards (two [illegible] - three sides).
   d. Prior to card reading, partition the TI-59 by pressing 3 Op (2nd tier) 17. (The number 719.29 should appear on display.) Then press CLR. Press CLR before reading any card side.
   e. Read all three sides from the two program cards. If the calculator display blinks following the attempt to read the card side, the card side has not been read. Press CLR and reinsert this card side until number designation of card side is shown on display without flashing.

PART B (continued)

f. After reading all three (3) card sides, initialize calculator by pressing 2nd A.

4. Data Entry

a. Enter distance in miles for which dose rates and dose commitments are desired and press A (e.g., if dose calculations for a location 10 miles from the station are desired, press 10 A).
b. Enter appropriate Xu/Q (Attachment 11), then press B (program code inserts exponent of 10^{-6}; if Xu/Q = 6.1 x 10^{-6}, then simply enter 6.1).
c. Enter Noble Gas release rate (Qn) in Curies/second (Ci/sec), then press C.
d. Enter Iodine release rate (Qi) in Ci/sec then press D.
e. Enter wind speed in miles per hour (mph), then press E.
f. If available, enter field measured iodine concentration (XI) in Ci/m^3 (same as (uCi/cc), then press A' (press 2nd A).
g. If available, enter field measured whole body dose rate in R/hr, then press B' (press 2nd B). If not available enter zero, then press 2nd A.
h. Enter estimated duration of release in hours and minutes with decimal point, then press C' (press 2nd C).
i. Divide value of DRCF for Iodine from Attachment 7 by 1000 to correct to appropriate units (rem-m^3/Ci-hr, and enter this value, then press D' (press 2nd D).
j. Multiply value of DRCF for Noble Gas from Attachment 6 by 10 to correct to appropriate units (rem-m^3/Ci-hr), and enter this value, then press E' (2nd E).

PART B (continued)

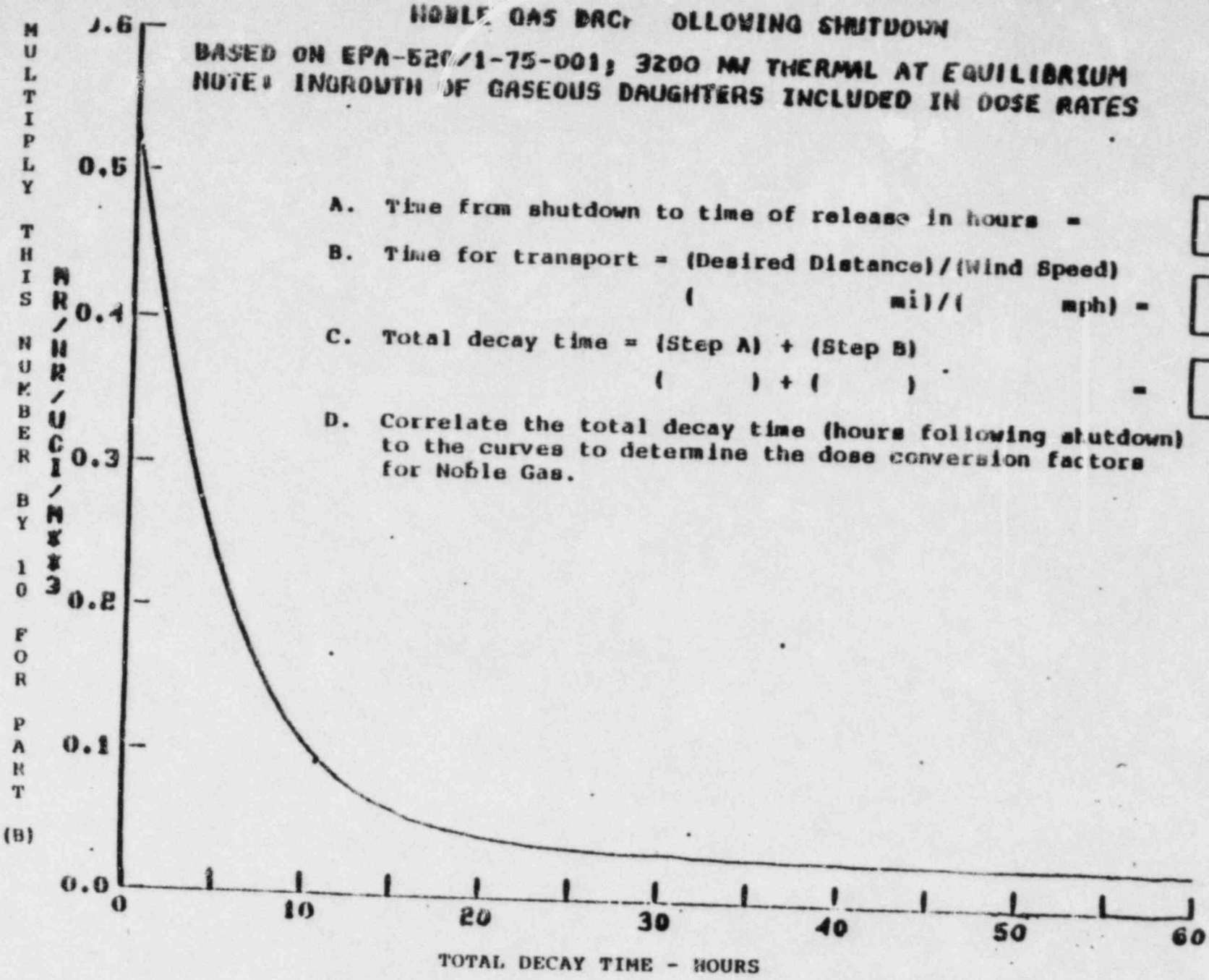
5. Running Program

a. Press R/S and program will run.

b. Example printout is shown on Attachment 8. Initial data entries should first be logged on data log sheet (Attachment 9). Results should be logged onto calculation sheet (Attachment 10).

NOBLE GAS DOSE FOLLOWING SHUTDOWN

BASED ON EPA-520/1-75-001; 3200 MW THERMAL AT EQUILIBRIUM
NOTE: INGROWTH OF GASEOUS DAUGHTERS INCLUDED IN DOSE RATES



A. Time from shutdown to time of release in hours = _____ hr

B. Time for transport = (Desired Distance)/(Wind Speed)
(mi)/(mph) = _____ hr

C. Total decay time = (Step A) + (Step B)
( ) + ( ) = _____ hr

D. Correlate the total decay time (hours following shutdown) to the curves to determine the dose conversion factors for Noble Gas.

NOBLE GAS DRCF FOLLOWING SHUTDOWN

(MREM/HR)/(UCI/M**3)

HOURS	DRCF	HOURS	NG DRCF	HOURS	NGDRCF	HOURS	NGDRCF
0	.528	16	.0552	31	.0319	46	.0284
1	.457	17	.0512	32	.0315	47	.0283
2	.389	18	.0479	33	.0311	48	.0282
3	.329	19	.0451	34	.0308	49	.0281
4	.277	20	.0428	35	.0305	50	.028
5	.234	21	.0409	36	.0302	51	.0279
6	.197	22	.0393	37	.0299	52	.0278
7	.168	23	.0379	38	.0297	53	.0278
8	.143	24	.0367	39	.0295	54	.0277
9	.123	25	.0357	40	.0293	55	.0276
10	.107	26	.0349	41	.0291	56	.0276
11	.0932	27	.0341	42	.0289	57	.0275
12	.0823	28	.0335	43	.0288	58	.0275
13	.0733	29	.0329	44	.0287	59	.0274
14	.0661	30	.0324	45	.0285	60	.0274
15	.0601						

A. Time from shutdown to time of release in hours = _____ hr

B. Time for transport = (Desired Distance)/(Wind Speed)

(mi)/(mph) = _____ hr

C. Total decay time = (Step A) + (Step B)

( ) + ( ) = _____ hr

D. Correlate the total decay time (hours following shutdown) to the curves to determine the dose conversion factors for Noble Gas.

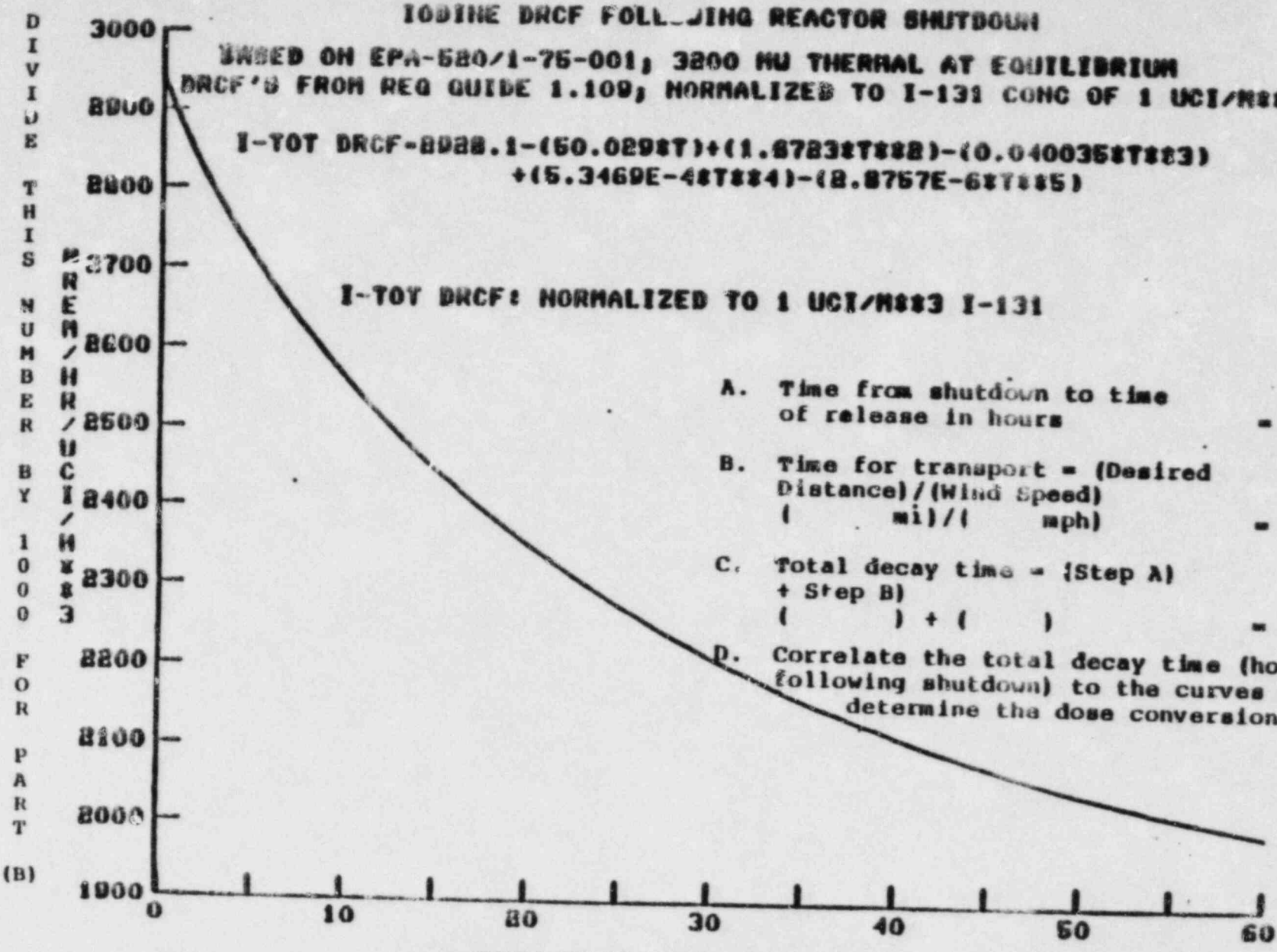
Attachment 7

IODINE DRCF FOLLOWING REACTOR SHUTDOWN

BASED ON EPA-520/1-75-001; 3200 MW THERMAL AT EQUILIBRIUM
DRCF'S FROM REG GUIDE 1.109; NORMALIZED TO I-131 CONC OF 1 UCI/M**3

I-TOT DRCF=8928.1-(50.029*T)+(1.8783*T**2)-(0.040035*T**3)
+(5.3469E-4*T**4)-(8.8757E-6*T**5)

I-TOY DRCF: NORMALIZED TO 1 UCI/M**3 I-131



A. Time from shutdown to time of release in hours = [ ] hr

B. Time for transport = (Desired Distance)/(Wind Speed)
(mi)/(mph) = [ ] hr

C. Total decay time = (Step A) + Step B)
( ) + ( ) = [ ] hr

D. Correlate the total decay time (hours following shutdown) to the curves to determine the dose conversion factors

I-TOT DRCF (MREM/HR/UCI/M**3) BASED ON I-131 VERSUS TIME

(MREM/HR)/(UCI/M**3)

HOURS	DRCF
0	2936.4
1	2870.6
2	2831
3	2787.8
4	2748.5
5	2712.2
6	2678.3
7	2646.6
8	2616.7
9	2588.4
10	2561.6
11	2536.1
12	2511.9
13	2488.7
14	2466.7
15	2445.6
16	2425.4
17	2406
18	2387.5
19	2369.7
20	2352.6
21	2336.2
22	2320.4
23	2305.2
24	2290.6
25	2276.5
26	2262.9
27	2249.9
28	2237.3
29	2225.1
30	2213.4
31	2202
32	2191.1
33	2180.5
34	2170.3
35	2160.5
36	2151
37	2141.7
38	2132.8
39	2124.2
40	2115.9
41	2107.8
42	2100
43	2092.5
44	2085.1
45	2078.1
46	2071.2
47	2064.6
48	2058.2
49	2051.9
50	2045.9
51	2040.1
52	2034.4
53	2028.9
54	2023.6
55	2018.5
56	2013.5
57	2008.7
58	2004
59	1999.4
60	1995

A. Time from shutdown to time of release in hours = _____ hr

B. Time for transport = (Desired Distance)/(Wind Speed)
(mi)/(mph) = _____ hr

C. Total decay time = (Step A) + (Step B)
( ) + ( ) = _____ hr

D. Correlate the total decay time (hours following shutdown) to the curves to determine the dose conversion factors for Iodine.

ATTACHMENT 8
EXAMPLE PRINTOUT OF DOSE CALCULATIONS BASED ON RELEASE RATE

	TIME	
Distance from Site (miles)	3.00 00	A1
Distance from Site (meters)	4.83 03	A2
X_u/Q ($1/M^2$ X 10^{-6})	3.20 00	B
Wind speed (u) in meters/second	2.25 00	C
Plume Travel Time (ETA) hrs. min.	360.00-03	D
Dispersion X/Q ($1/m^2$)	1.42-06	E
Iodine Release Rate (Ci/sec)	1.20 00	F1
Noble Gas Release Rate (Ci/sec)	100.00 00	F2
Dispersion Model Projected Iodine Concentration at distance A	1.71-06	G1
Dispersion Model Projected Noble Gas Concentration at distance A	142.22-06	G2
Measured Iodine concentrations (if any) (uCi/cc)	0.00 00	G'1
Measured Noble Gas Exposure Rate (R/hr) (if any)	0.00 00	G'2
Dose Rate Conversion Factor-Iodine (rem-m^3/Ci-hr)	5.60 00	H1
Dose Rate Conversion Factor-Noble Gas (rem-m^3/Ci-hr)	3.30 00	H2
Calculated Thyroid Dose Rate-Model	9.56 00	I1
Calculated Whole Body Dose Rate-Model	46.93-03	I2
Thyroid Dose Rate-Field Data (if any)	0.00 00	I'1
Whole Body Dose Rate-Field Data (if any)	0.00 00	I'2
Estimated Duration of release (hrs.min.) (3.30 = 3 hours, 30 minutes)	3.30 00	J
Calculated Thyroid Dose Commitment-Model	33.45 00	K1
Calculated WB Dose Commitment-Model	164.27-03	K2
Thyroid Dose Commitment-Field Data	0.00 00	K'1
Whole Body Dose Commitment-Field Data	0.00 00	K'2

	INPUT CHECK	
Distance in miles	3.00 00	A
X_u/Q X 10^{-6}	3.20 00	B
Noble Gas Release Rate (Ci/sec)	100.00 00	C
Iodine Release Rate (Ci/sec)	1.20 00	D
Wind Speed in mph	5.00 00	E
Measured Iodine Field Conc. (if any)	0.00 00	A'
Measured Field Exposure Rate (if any)	0.00 00	B'
Estimated Duration of Release (hrs/min)	3.30 00	C'
Iodine DRCF X 10^6 (rem-m^3/Ci-hr)	5.60 00	D'
Noble Gas DRCF X 10^2 (rem-m^3/Ci-hr)	3.30 00	E'

ATTACHMENT 9
PROGRAM DATA FORM RELEASE RATE DOSE CALCULATION

TIME OF DATA 24 HOUR CLOCK	(A) DISTANCE FROM SITE (MILES)	(B) Xu/Q* x 10^{-6}	(C) NOBLE GAS RELEASE RATE (Ci/sec)	(D) IODINE RELEASE RATE (Ci/sec)	(E) WIND SPEED (mph)	(A') MEASURED** FIELD IODINE CONCENTRATION (uCi/cc)	(B') MEASURED** FIELD EXPOSURE RATE (R/hr)	(C') ESTIMATED DURATION OF RELEASE (hrs/min)	(D') IODINE*** DRCF x 10^{6} (rem-m^3/ Ci hr)	(E') NOBLE*** GAS DRCF x 10^{2} (rem-m^3- Ci hr)

INITIALS _____

NOTES: *Taken from Attachament 11
**If available
***Taken from Attachments 6 and 7

ATTACHMENT 10

CALCULATION SHEET FOR ABSORBED DOSE RATES AND DOSE COMMITMENTS

(AIRBORNE RELEASES)

DATE __________ TIME __________ (24 HR CLOCK)

PREPARED BY ____________________

A DISTANCE FROM SITE A1 MILES A2 METERS	D PLUME TRAVEL TIME T (hr.min) ETA	G CALCULATED ATMOSPHERIC CONCENTRATION X (Ci/m^3)	G' MEASURED ATMOSPHERIC CONCENTRATION (Ci/m^3) NOBLE GAS EXPOSURE RATE (R/hr)	I CALCULATED DOSE RATE FROM DISPERSION MODEL (rem/hr) **	I' DOSE RATE BASED ON FIELD MEASUREMENT (rem/hr) **	K CALCULATED DOSE COMMITMENT FROM DISPERSION MODEL (rem)**	K' DOSE COMMITMENT BASED ON FIELD MEASUREMENT (rem)**
A1		G1	G'1	I1	I'1	K1	K'1
A2		G2	G'2 R/hr	I2	I'2	K2	K'2
A1		G1	G'1	I1	I'1	K1	K'1
A2		G2	G'2 R/hr	I2	I'2	K2	K'2
A1		G1	G'1	I1	I'1	K1	K'1
A2		G2	G'2 R/hr	I2	I'2	K2	K'2
A1		G1	G'1	I1	I'1	K1	K'1
A2		G2	G'2 R/hr	I2	I'2	K2	K'2
A1		G1	G'1	I1	I'1	K1	K'1
A2		G2	G'2 R/hr	I2	I'2	K2	K'2
A1		G1	G'1	I1	I'1	K1	K'1
		G2	G'2 R/hr	I2	I'2	K2	K'2
A1		G1	G'1	I1	I'1	K1	K'1
A2		G2	G'2 R/hr	I2	I'2	K2	K'2

NOTE: THE TOTAL DECAY TIME IS THE SUM OF THE TIME FROM REACTOR SHUTDOWN UNTIL THE TIME OF PLUME ARRIVAL. NO CREDIT WILL BE TAKEN FOR I DEPLETION FROM THE PLUME OR DECAY IN TRANSIENT.

LETTERS CORRESPOND TO LETTERS IN OUTPUT OF PROGRAM

*NUMBER FOLLOWING LETTER IS INTERPRETED AS FOLLOWS: 1 (ONE) = IODINE; 2 (TWO) = NOBLE GAS

**NUMBER FOLLOWING LETTER IS INTERPRETED AS FOLLOWS: 1 (ONE) = THYROID; 2 (TWO) = WHOLE BODY

ATTACHMENT 11
Xu/Q VALUE DETERMINATION

S t the Xu/Q values that correspond to the stability class as determined by the temperature, distance from the site and the release point (ground or elevated).

1. USE THE TEMPERATURE VALUE FROM THE METEOROLOGICAL TOWER TO DETERMINE STABILITY CLASS.

Primary Instrument

300 ft. - 33 ft. temperature (°C)

UNSTABLE	NEUTRAL	STABLE
-1.3	-0.5	

NOTE

UNSTABLE IS $\leq$ -1.3°C

NEUTRAL IS > -1.3°C $\leq$ -0.5°C

STABLE IS > -0.5°C

Backup Instrument

150 ft. - 33 ft. temperature (°C)

UNSTABLE	NEUTRAL	STABLE
-0.6	-0.2	

NOTE

UNSTABLE IS $\leq$ -0.6°C

NEUTRAL IS > -0.6°C $\leq$ -0.2°C

STABLE IS > -0.2°C

2.

DISTANCE		GROUND LEVEL RELEASE (E-6/m^2)			ELEVATED LEVEL RELEASE (E-6/m^2)		
METERS	MILES	UNSTABLE	NEUTRAL	STABLE	UNSTABLE	NEUTRAL	STABLE
1000	0.62	14.83	58.43	244.4	16.17	39.01	*
1270 MEA	0.79	9.91	41.54	226.29	11.23	35.34	**
2000	1.2	4.58	21.21	166.5	5.4	23.70	.01
3000	1.9	2.29	11.46	111.9	2.74	14.5	.50
4000	2.5	1.40	7.37	80.6	1.69	9.81	2.44
5000	3.1	.95	5.22	61.4	1.15	7.14	5.24
6000	3.7	.70	3.94	48.7	.85	5.47	7.84
7000	4.4	.53	3.10	39.9	.65	4.35	9.79
8000	4.9	.42	2.52	33.4	.52	3.56	11.05
8045 LPZ	5.0	.42	2.5	33.2	.51	3.53	11.09
9000	5.6	.35	2.10	28.6	.42	2.98	11.76
10000	6.2	.294	1.78	24.8	.35	2.54	12.06
11000	6.8	.250	1.53	21.8	.30	2.20	12.09
12000	7.5	.215	1.34	19.3	.26	1.92	11.93
13000	8.1	.18	1.18	17.3	.22	1.70	11.65
14000	8.7	.165	1.05	15.7	.20	1.52	11.3
15000	9.3	.14	.95	14.22	.18	1.36	10.91
16000 EPZ	9.9	.131	.86	13.01	.16	1.24	10.50

MEA - Minimum Exclusion Area
LPZ - Low Population Zone
EPZ - Emergency Planning Zone

*Value of Xu/Q for 1000 meters distance = 5.15E-16/m^2
**Value of Xu/Q for 1270 meters distance = 1.18E-12/m^2

Distance_____Xu/Q = _____E-6/m^2 (ground) Xu/Q = _____ E-6/m^2 (elevated)

Prepared By: James Clancy

Reviewed By: _____ 10/13/83
Department Head — Date

Reviewed By: _____ 10/16/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: _____ 10/18/83
Station Quality Assurance Review — Date
(if required see EP VI-2)

SORC Meeting No.: 83 - 131 — 10/20/83
Date

Approved By: _____ 10/21/83
General Manager - Salem Operations — Date

Approved By: _____ 10/21/83
Manager - Nuclear Site Protection — Date

EMERGENCY PROCEDURE
EP IV-213
EVALUATION OF RMS DATA FROM HIGH RANGE CHANNEL R45-D

ACTION LEVEL

After high range monitor R45 is triggered into service by high alarm on the R41C noble gas plant vent monitor channel. The data from R45D can be used to calculate iodine release rates when other means are unavailable (e.g. R41B iodine plant vent monitor).

RESPONSIBLE INDIVIDUAL

The Radiation Protection Engineer, a Technical Supervisor of Radiation Protection, the Radiological Support Management, or a Radiological Assessment Staff member shall be responsible for implementing this procedure.

ACTION STATEMENTS

Obtain the R45D count rate (in cpm) from the control room liaison (or from Dose Assessment Data Sheet, Attachment 1 of EP IV-113). Obtain sample buildup time for R45D monitor. Sample buildup time for this RMS channel is the difference in time between when the R45 channel is triggered into service and the time of the current monitor reading. For example, if R41C went into alarm at 1015 hours triggering R45 into service and the monitor reading time is 1215 hours, then two (2) hours of sample buildup have occurred. Once sample buildup time has been established, use Attachment 1 to determine concentration of iodine (in uCi/cc) in the plant vent effluent based on the channel count rate (cpm).

ACTION STATEMENTS (cont'd)

Convert the plant vent flow rate in cubic feet per minute (cfm) to cubic centimeters per sec (cc/sec). To perform this conversion multiply cfm by 472 to obtain cc/sec.

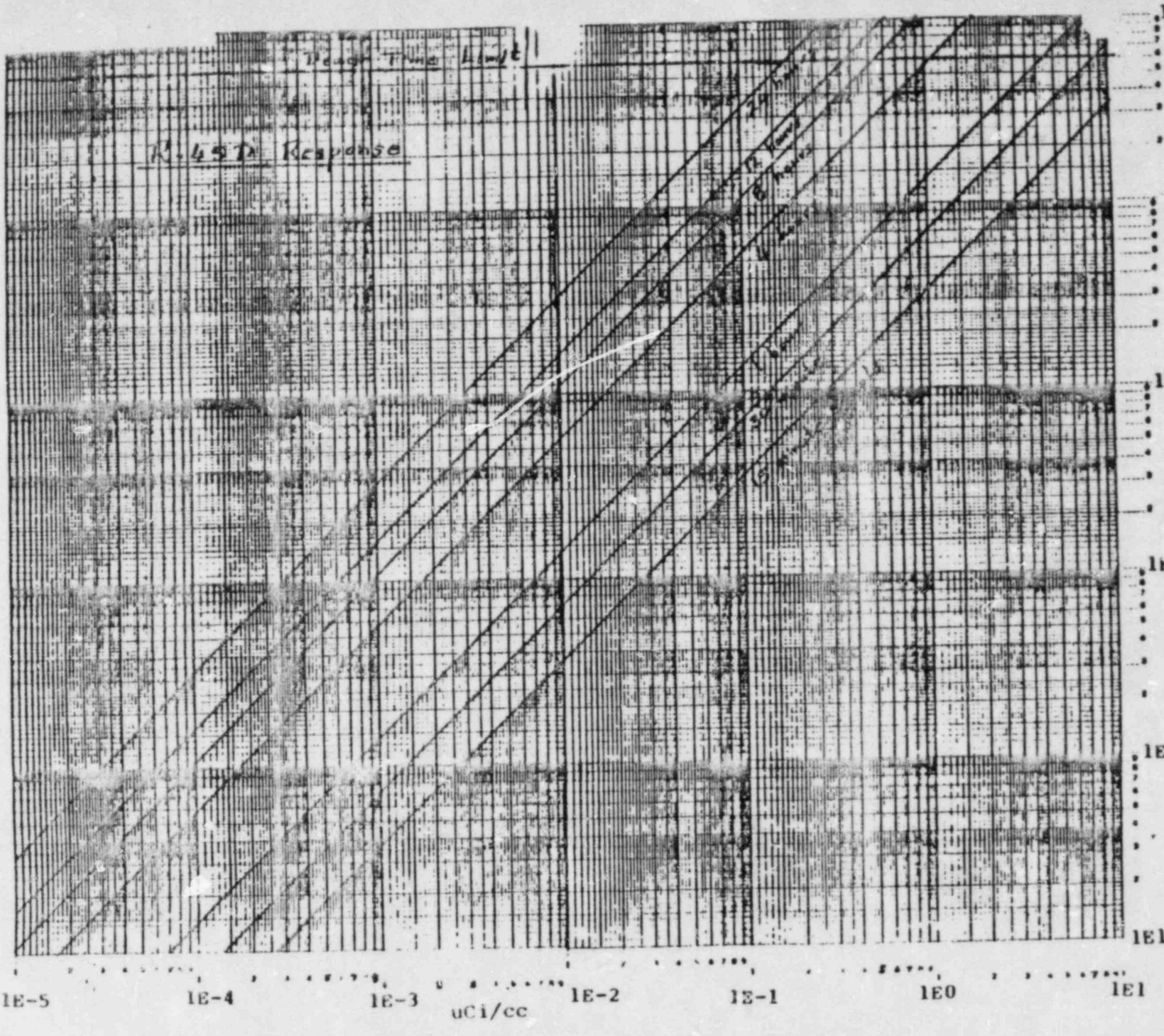
To obtain iodine release rate in uCi/sec, multiply iodine plant vent concentration (uCi/cc) by the plant vent flow rate in (cc/sec).

Example:

Given: 1) 2R45D is reading 100 cpm at 1200 hours
2) 2R41C triggered 2R45 into service at 1100 hours
3) Plant vent flow rate is 80,000 cfm

Solve 1) Sample buildup time = 1200 - 1100 hours = 1 hour
2) Plant vent flow rate = 80,000 ft^3/min(cfm) X 472 cc.min/ft^3.sec = 37,760,000 cc/sec = 3.78E7 cc/sec
3) 100 cpm after 1 hour sample buildup corresponds to 7.0E-4 uCi/cc iodine concentration in the plant vent (see Attachment 1).
4) Iodine release rate is the product of 3.78E7 cc/sec and 7E-4 uCi/cc which is 2.65 E + 4 uCi/sec.

These release rate data can be used in Emergency Procedures EP IV-111, EP IV-113, and EP IV-114 to perform dose calculations.


Peak Time Limit
Alpha Response
1E6
1E5
1E4
1E3
1E2
1E1
Counts/minute
1E-5
1E-4
1E-3
1E-2
1E-1
1E0
1E1
uCi/cc

Prepared By: James Clancy

Reviewed By: J. O'Connor WST — 10-17-83
Department Head — Date

Reviewed By: Cheryl A. Satunas — 10-17-83
Nuclear Emergency Planning Engineer — Date

Reviewed By: D. C. Perkins — 10/18/83
Station Quality Assurance Review — Date
(if required see EP VI-2)

SORC Meeting No.: 83-131 — 10/20/83
Date

Approved By: J. M. Zupko Jr — 10/21/83
General Manager - Salem Operations — Date

Approved By: [signature] — 10/4/83
Manager - Nuclear Site Protection — Date

EMERGENCY PROCEDURE
EP V-1
TECHNICAL SUPPORT MANAGER (TSM) RESPONSE

ACTION LEVEL

This procedure shall be implemented upon receipt of notification that the EOF is to be activated.

ACTION STATEMENTS

TIME	INITIAL	
_____	_____	1. Implement Procedure EP II-4 (Initiation and Activation of Emergency Response Support Callout) and, if necessary, EP II-5 (Paging Emergency Response Personnel).
_____	_____	2. Proceed to the Emergency Operations Facility (EOF) and enter through the student entrance.

NOTE

Be certain you have your PSE&G ID card with you.

_____	_____	3. Upon arrival at the EOF, initiate a log of your activities.
_____	_____	4. Report to the Emergency Response Manager (ERM) to inform him of your arrival.
_____	_____	5. Verify operation of telephone lines.

ACTIONS STATEMENTS (continued)

TIME	INITIALS	
		6. Verify that the following Technical Support positions are staffed.
_____	_____	Technical Support Team Leader - EOF
_____	_____	Technical Support Team - EOF
_____	_____	Technical Support Team Leader - TSC
_____	_____	Quality Assurance Team Leader - EOF
_____	_____	Quality Assurance Team - EOF
_____	_____	Licensing Support Team Leader - EOF
_____	_____	Licensing Support Team - EOF
_____	_____	Fuel Support Team Leader - EOF
_____	_____	Fuel Support Team - EOF
_____	_____	7. Report to the ERM and inform him that the Nuclear Support function is fully operational.

8. Meet with Technical Support Team Leader - EOF to assess support required by Technical Support Team Leader - TSC.

9. Meet with the Site Support Manager (SSM) to assess:

   a. present level of technical support needed by SSM
   b. future level of technical support anticipated.

10. Meet with staff team leaders and assign support tasks.

ACTION STATEMENTS (continued)

TIME	INITIALS	
		11. Direct staff team leaders to prepare a watch bill for continuous 24-hour operation of their functional areas.
		12. Assist the ERM by:
		a. technical assessment of plant conditions; and
		b. providing information on technical support operations both planned and in progress.

NOTE

Forward all completed forms to the Nuclear Emergency Planning Engineer. Attach any referenced completed EPs or attachments.

Prepared By: D. Jagt

Reviewed By: _____ 9/22/83
Department Head — Date

Reviewed By: _____ 10/5/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: _____ 10/5/83
Station Quality Assurance Review (if required see EP VI-2) — Date

SORC Meeting Number: 83-129 _____ 10/12/83
Date

Approved By: _____ 10/17/83
General Manager - Salem Operations — Date

Approved By: _____ 10/13/83
Manager - Nuclear Site Protection — Date

EMERGENCY PROCEDURE
EP V-5
LICENSING SUPPORT TEAM LEADER RESPONSE

ACTION LEVEL

This procedure shall be implemented upon notification of activation of the EOF.

ACTION STATEMENTS

TIME	INITIALS	
_____	_____	1. Implement Procedure EP II-4 (Initiation and Activation of Emergency Response Support Callout) and, if necessary, EP II-5 (Paging Emergency Response Personnel).
_____	_____	2. Proceed to the Emergency Operations Facility (EOF) and enter through the student entrance.

NOTE

Be sure to have Public Service Identification Card with you to facilitate passage through police road blocks and for access to the EOF.

_____	_____	3. Upon arrival initiate a log of your activities.
_____	_____	4. Advise the Technical Support Manager of your arrival and state of readiness to provide support.
		5. Provide support as necessary in all aspects of licensing and safety.

Prepared By: D. Jagt

Reviewed By: _____ 9/2/83
Department Head — Date

Reviewed By: _____ 10/5/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: _____ 10/5/83
Station Quality Assurance Review (if required see EP VI-2) — Date

SORC Meeting Number: 83-129 _____ 10/12/83
Date

Approved By: _____ 10/14/83
General Manager - Salem Operations — Date

Approved By: _____ 10/13/83
Manager - Nuclear Site Protection — Date

EMERGENCY PROCEDURE
EP V-6
FUEL SUPPORT TEAM LEADER (FSTL) RESPONSE

ACTION LEVEL

This procedure shall be implemented upon notification of activation of the EOF.

ACTION STATEMENTS

TIME	INITIALS	
_____	_____	1. Implement Procedure EP II-4 (Initiation and Activation of Emergency Response Support Callout) and, if necessary, EP II-5 (Paging Emergency Response Personnel).
		2. Proceed to the EOF.

NOTE

Be sure to have Public Service Identification Card with you to facilitate passage through police road blocks and permit access to the EOF.

3. Establish your work area. The Nuclear Fuel Support Team Leader shall be responsible for all fuel matters and directing personnel to perform the following functions:

   a. Obtain information regarding core condition, including plant operating history, coolant activity, etc.

   b. Assess the condition of the core.

ACTION STATEMENTS (continued)

TIME INITIALS

c. Evaluate coolant activity and core condition and perform a fuel damage, transient and T/H analyses.

4. Verify that you have adequate staff available to perform core damage/fuel safety evaluation.

5. Verify that computer terminals required are operable. Locate and check operation of terminals.

6. Report to the Engineering Support Manager to inform him of your arrival.

7. Notify the Engineering Support Manager when adequately staffed for the event in progress.

8. Establish contact with the Operations Assessment Engineer in the TSC and determine present condition of the core.

   The following codes will be run to verify core and fuel conditions.

   ° Transients

ACTION STATEMENTS (continued)

Use DYNOLE or RETRAN to calculate system pressure, temperature, flow, etc.

° T/H

Use COBRA or VIPRE to calculate DNBR, fuel and coolant temperatures in hot channel(s).

° Fuel Performance

Use MICROPOSHO (on TI-59) or other available codes to calculate fuel failure fraction. Use FRAP to calculate hot channel fuel temperature.

9. Evaluate the information available to the Technical Support Team - TSC as required to perform core safety/damage analysis.

10. Contact fuel vendor (Westinghouse) and/or consultants (JAI or EI) for additional support as requried.

11. Report results of evaluations to the ESM.

NOTE

Forward all completed forms to the Nuclear Emergency Planning Engineer. Attach any referenced completed EPs or attachments.

Prepared By: D. Hsu

Reviewed By: E. L. Ramfeld — 10/6/83
Department Head — Date

Reviewed By: C Sakenas for — 10/11/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: D C Peters — 10/18/83
Station Quality Assurance Review (if required see EP VI-2) — Date

SORC Meeting Number: 83-131 — 10/20/83
Date

Approved By: J. M. Zudans Jr — 10/21/83
General Manager - Salem Operations — Date

Approved By: Peter A. Morrison — 10/21/83
Manager - Nuclear Site Protection — Date

EMERGENCY PROCEDURE
EP V-7
NUCLEAR ENGINEERING, QUALITY ASSURANCE, LICENSING, AND NUCLEAR FUELS DIVISION REPRESENTATIVES

ACTION LEVEL

This procedure shall be implemented upon notification of activation of the TSC and/or EOF.

ACTION STATEMENTS

TIME INITIALS

1. Upon notification, proceed as soon as possible to your assigned emergency duty station (TSC or EOF).

NOTE

Be sure to carry Public Service Identification card which will facilitate passage through police road blocks and for entry to the site or EOF. Your arrival at your emergency duty station is expected within two hours of initial contact.

2. Sign in upon arrival at your emergency duty station.

3. If the emergency notification is during normal work hours, all Division personnel without emergency duty assignments will remain at their work normal area and follow instructions received from their Group Leaders and/or Division Head.

NOTE

Forward all completed forms to the Nuclear Emergency Planning Engineer. Attach any referenced completed EPs or attachments.

Prepared By: D. Jagt

Reviewed By: _____ 9-27-83
Department Head — Date

Reviewed By: _____ 10/5/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: _____ 10/5/83
Station Quality Assurance Review (if required see EP VI-2) — Date

SORC Meeting Number: 83-129 _____ 10/12/83
Date

Approved By: _____ 10/14/83
General Manager - Salem Operations — Date

Approved By: _____ 10/13/83
Manager - Nuclear Site Protection — Date

ADMINISTRATIVE PROCEDURE
EP VI-1
REVISION AND APPROVAL OF PLANS AND PROCEDURES

ACTION LEVEL

This procedure details the methods for reviewing the Salem Generating Station Emergency Plan, Emergency Plan Procedures Manual and Emergency Plan Training Manual.

Revisions to any of these three (3) manuals will be made whenever changes are necessary to ensure that the Emergency Plan can be properly implemented.

NOTE

On-the-spot changes to any portion of an Emergency Procedure must be approved by the Emergency Coordinator (SSS, EDO or ERM). On-the-spot changes will only be requested during an actual incident otherwise routine revision procedures will be utilized.

Any holder of a manual may prepare revision(s) to any section or procedure included in one of the manuals. Implementing procedure changes will be coordinated by the department head responsible for the given procedure (see Table 6-1.1).

A Revision Request Form (Figure 6-1.1) is filled out by the person preparing the revision. A description of the revision requested and reason for revision shall be included.

A list of effective revisions shall be maintained in front of each manual indicating the latest revision number and effective date.

When an on-the-spot change is made, it is the responsibility of the individual authorizing the change to ensure that a revision request is submitted within 10 days.

ACTION STATEMENTS - SECTION I

On The Spot Changes to Procedures

1. When making an on-the-spot change, the initiator must not change the intent of the procedure. Before making the change the initiator should ask, as a minimum, the following questions:

   a) Would the on-the-spot change involve a violation of 10CFR50, Appendix E?
   b) Would the on-the-spot change supersede existing Technical Specification requirements?
   c) Would the on-the-spot change alter the technical content or approach of the procedure?

   If the answer to any of these questions is yes, then the on-the-spot change should not be made.

2. The initiator should hand write the change at the appropriate point of the procedure and request approval of the emergency coordinator (SSS, EDC, ERM).

3. The emergency coordinator must review and approve any on-the-spot change, by initialing the hand written change.

4. It is the responsibility of the individual authorizing the change to ensure that a Revision Form (Figure 6-1.1) is submitted at the conclusion of the event. Proceed to Section II for detailed instruction.

ACTION STATEMENTS - SECTION II

Plan and Procedure Revisions

1. Preparer completes Revision Request Form (Figure 6-1.1).
   a) Contact Nuclear Emergency Planning Engineer for revision number.
   b) Fill in appropriate names and titles on Figure 6-1.1 based on information in Table 6-1.1.
   c) Attach edited copies and supporting documents as appropriate.
   d) Transmit Revision Request Form to appropriate department head (see Table 6-1.1).

2. Department head performs initial review of proposed revision.
   a) Department head will return revision to preparer if revision request is disapproved or further information is needed.
   b) If the department head approves, submit the revision to the Nuclear Emergency Planning Engineer as indicated on Table 6-1.1.
   c) As indicated on Table 6-1.1, submit the revision to the Station Quality Assurance for review prior to SORC approval.
   d) Contact the Chairman of SORC and arrange for a review meeting. Transmit a copy of the change to the SORC Chairman and to the Nuclear Emergency Planning Engineer for file.

3. SORC reviews proposed revision.
   a) Department head presents revision.
   b) SORC recommendation is made to General Manager - Salem Operations.
   c) Proposed revision is transmitted with SORC Meeting number and date for approval by the General Manager - Salem Operations.

ACTION STATEMENTS (continued)

4. Manager - Nuclear Site Protection gives the proposed revision a final review and approval. Revision is forwarded to Nuclear Emergency Planning Engineer for distribution.

5. Nuclear Emergency Planning Engineer revises plan.

   a) Revisions will be made to each section or procedure of the manual. The initial revision number will be Revision 0 and each subsequent revision will be the succeeding number. Revised pages will be issued with the entire section or procedure and not as individual pages.
   b) Revisions will be indicated by a vertical line in the right margin.
   c) Revisions will be correlated with the other two emergency plan documents for consistency.
   d) All changes will be documented and pages will be distributed in accordance with EP VI-2 and EP VI-3.

Prepared By: C A Burge

Reviewed By: Cheryl A Sakenas — 6/15/83
Department Head — Date

Reviewed By: Cheryl A Sakenas for — 6/15/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: D C Parker — 7/20/83
Station Quality Assurance Review — Date
(if required see EP VI-2)

SORC Meeting No.: 83-129 JM Fay — 10/12/83
Date

Approved By: J W Gilbert Jr — 10/12/83
General Manager - Salem Operations — Date

Approved By: Peter A Morris — 10/13/83
Manager - Nuclear Site Protection — Date

EMERGENCY PLAN REVISION REQUEST FORM
FIGURE 6-1.1
SALEM GENERATING STATION

☐ PLAN SECTION _____

☐ PROCEDURE MANUAL PROCEDURE NO. _____

☐ TRAINING MANUAL SECTION _____

REVISION NO. _____ OBTAIN REVISION NUMBER FROM NUCLEAR EMERGENCY PLANNING ENGINEER

BRIEF DESCRIPTION OF REVISION PROPOSED:

REASON FOR REVISION:

RESPONSIBLE INDIVIDUAL	NAME	DATE RECEIVED	DATE TRANSMITTED	SIGNATURE
PREPARER		NA		
DEPARTMENT HEAD (SEE TABLE 6-1.1)				
NUCLEAR EMERGENCY PLANNING ENGINEER				
STATION QA (SEE TABLE 6-1.1)				
SORC MEETING NO.				
MANAGER - NUCLEAR SITE PROTECTION				
NUCLEAR EMERGENCY PLANNING ENGINEER				

TABLE 6-1.1

REVISION REVIEW RESPONSIBILITY FLOW

MANUAL SECTION	REVISION BY	DEPT. HEAD REVIEW	P REVIEW	QA REVIEW	SORC REVIEW	APPROVAL		REVISION AND DISTRIBUTION
Emergency Plan (All)	Preparer	Nuclear Emergency Planning Engineer	Nuclear Emergency Planning Engineer	*	SORC	General Manager Approval	Manager Nuclear Site Protection	Nuclear Emergency Planning Engineer
Training Manual (All)	Preparer	Nuclear Emergency Planning Engineer	Nuclear Emergency Planning Engineer	*	SORC	General Manager Approval	Manager Nuclear Site Protection	Nuclear Emergency Planning Engineer
Procedures I - On Site	Preparer	Operations Manager	Nuclear Emergency Planning Engineer	Station QA	SORC	General Manager Approval	Manager Nuclear Site Protection	Nuclear Emergency Planning Engineer
Procedures II - Off Site	Preparer	Nuclear Emergency Planning Engineer	Nuclear Emergency Planning Engineer	Station QA	SORC	General Manager Approval	Manager Nuclear Site Protection	Nuclear Emergency Planning Engineer
Procedures III - Security	Preparer	Security Supervisor	Nuclear Emergency Planning Engineer	Station QA	SORC	General Manager Approval	Manager Nuclear Site Protection	Nuclear Emergency Planning Engineer
Procedures IV - Radiation Protection	Preparer	Radiation Protection Engineer	Nuclear Emergency Planning Engineer	Station QA	SORC	General Manager Approval	Manager Nuclear Site Protection	Nuclear Emergency Planning Engineer
Procedures IV - Chemistry	Preparer	Technical Manager	Nuclear Emergency Planning Engineer	Station QA	SORC	General Manager Approval	Manager Nuclear Site Protection	Nuclear Emergency Planning Engineer
Procedures V - Nuclear Support Department	Preparer	General Manager Nuclear Support	Nuclear Emergency Planning Engineer	Station QA	SORC	General Manager Approval	Manager Nuclear Site Protection	Nuclear Emergency Planning Engineer

* Not Required

ADMINISTRATIVE PROCEDURE
EP VI-2
DISTRIBUTION OF PLANS AND PROCEDURES

ACTION LEVEL

This procedure details the methods for distribution of the Salem Generating Station Emergency Plan, Emergency Plan Procedures Manual and Emergency Plan Training Manual.

All revisions shall be distributed by the Nuclear Emergency Planning Engineer.

When the manual is to be located in a particular location, vehicle, locker, etc., a person shall be designated who is responsible for the maintenance of that manual.

The holder shall insert the revision, sign and date the form appropriately and indicate the date revisions were entered and when the information was reviewed with subordinates if applicable.

The form shall be returned to the Nuclear Emergency Planning Engineer.

ACTION STATEMENT

When an approved Emergency Plan Revision is forwarded to the Nuclear Emergency Planning Engineer for distribution, the Nuclear Emergency Planning Engineer shall perform the following:

1. Distribute revision.

   a) Follow distribution instructions provided on Figure 6-2.1.
   b) Distribute a revision in accordance with Figure 6-2.2.

c) Include a revised index indicating the date of the revision and the plan section(s) or procedure(s) which have been revised in each distribution.

2. Verify distribution.

a) When the distribution sheets are returned by the manual holders the revision status of each manual will be recorded on Figure 6-2.3. The distribution sheets shall be retained on file by the Manager - Nuclear Site Protection.

b) If more than a one month lapse occurs between issuance of a revision to distribution and return of a revision sheet a check will be made with the manual holder to insure prompt entry of the revision.

Prepared By: C A Burge

Reviewed By: Cheryl A Sakenas for NEPE — 6/9/83
Department Head — Date

Reviewed By: Cheryl A Sakenas for — 6/9/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: [signature] — 7/20/83
Station Quality Assurance Review — Date
(if required see EP VI-2)

SORC Meeting No.: 83-128 [signature] — 10/5/83.
Date

Approved By: [signature] — 10/7/83
General Manager - Salem Operations — Date

Approved By: [signature] — 10/11/83
Manager - Nuclear Site Protection — Date

EMERGENCY PLAN REVISION REQUEST FORM
FIGURE 6-2.1
SALEM GENERATING STATION

MANUAL NO. _____

REVISION NO. _____ TO: ☐ PLAN

☐ PROCEDURES MANUAL

☐ TRAINING MANUAL

REVISE YOUR COPY OF THE PLAN BY INSERTING THE ATTACHED SECTION(S) IN THE APPROPRIATE PLACE, AS SPLECIFIED BELOW, AND DESTROYING THE OLD SECTION(S). REVISIONS ARE IDENTIFIED BY A VERTICAL LINE IN THE RIGHT MARGIN.

NOTE: COMPLETE THE FOLLOWING INFORMATION AND RETURN THIS SHEET TO THE NUCLEAR EMERGENCY PLANNING ENGINEER, P.O. BOX 236, HANCOCKS BRIDGE, NEW JERSEY 08038.

MANUAL NO. _____ DATE THIS CHANGE ENTERED _____

DATE THIS INFORMATION REVIEWED WITH SUBORDINATES: _____

SIGNATURE: _____

FIGURE 6-2.2
DISTRIBUTION LIST

Manual No. 1
Operations Manager
Senior Shift Supervisors Office
Salem Generating Station

Manual No. 2
Operations Manager
Unit #1 Control Room
Salem Generating Station

Manual No. 3
Operations Manager
Unit #2 Control Room
Salem Generating Station

Manual No. 4
General Mgr.-Salem Operations
J. M. Zupko, Jr.
Salem Generating Station

Manual No. 5
Public Affairs Manager-Nuclear
R. A. Silverio
Artificial Island

Manual No. 6
Asst. General Mgr.-Salem Oper.
J. Driscoll
Salem Generating Station

Manual No. 7
Operations Manager
L. Fry
Salem Generating Station

Manual No.8
Maintenance Manager
J. Gallagher
Salem Generating Station
Salem Generating Station

Manual No. 9
Office Administrator
R. Potter
Salem Generating Station

Manual No. 10
Technical Engineer
J. Jackson
Salem Generating Station

Manual No. 11
Tecnical Manager
L.K. Miller
Salem Generating Station

Manual No. 12
Q. A. - Salem
B. Leap
Salem Generating Station

Manual No. 14
Radiation Protection Engineer
J. O'Connor
Salem Generating Station

Manual No. 15
Security Supervisor
T. DiGuiseppi
Salem Generating Station

Manual No. 17
Nuclear Emergency Planning
Engineer
Artificial Island

Manual No. 18
Safety Review Group
B. Hall
Artificial Island

Manual No. 19
Senior Public Info. Rep.
W. Denman
Second Sun - Salem

Manual No. 20
Security Supervisor
Guard House - Main Gate
Salem Generating Station

Manual No. 21
Security Supervisor
Guard House - Contractor
Salem Generating Station

Manual No. 22
Maintenance Manager
Senior Supervisor
Salem Generating Station

Manual No. 23
I & C Engineer
Salem Generating Station

Manual No. 24
Chemical Engineer
R. Dolan
Salem Generating Station

Manual No. 25
Radiation Protection Engineer
Senior Supervisor-RP
Salem Generating Station

Manual No. 26
Radiation Protection Engineer
Control Point (Main)
Salem Generating Station

Manual No. 27
Radiation Protection Engineer
Control Point (Main)
Salem Generating Station

Manual No. 28
Radiation Protection Engineer
Control Point (A Building)
Salem Generating Station

Manual No. 29
Radiation Protection Engineer
Control Room Emergency Locker
Salem Generating

Manual No. 30 through 32
Manager-Nuclear Site Protection - TSC
Artificial Island

Manual No. 33 through 36
Manager - Nuclear Site Protection - EOF Locker
Artificial Island

Manual Nos. 37 & 38
Library
Nuclear Training Center-Salem

Manual No. 39
Training Staff
Pat Landers
Nuclear Training Center-Salem

Manual No. 40
Training Staff
James Beattie
Nuclear Training Center-Salem

Manual No. 41
Radiation Protection Engineer
Emergency Van
Salem Generating Station

Manual No. 43

Manual No. 44
Senior Public Info. Rep.-Salem
Emergency News Center
Second Sun

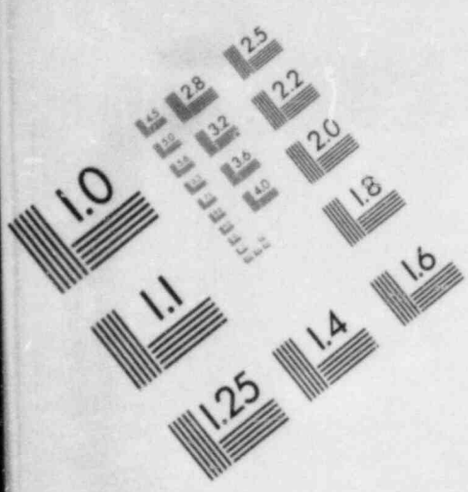
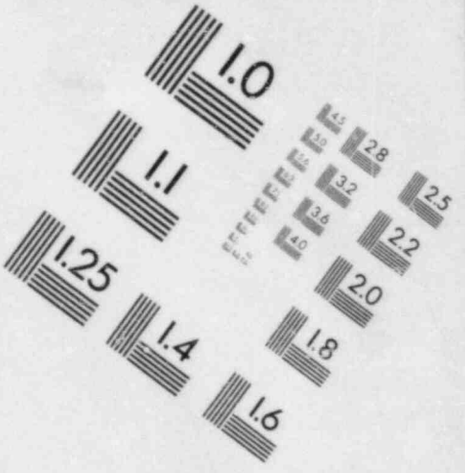
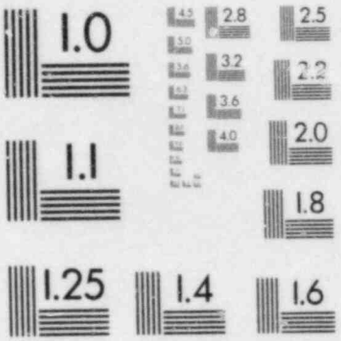
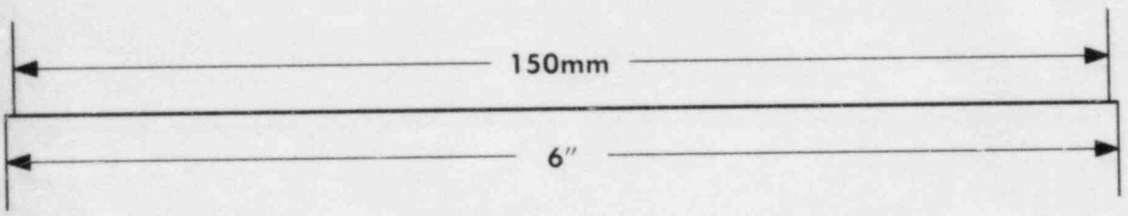
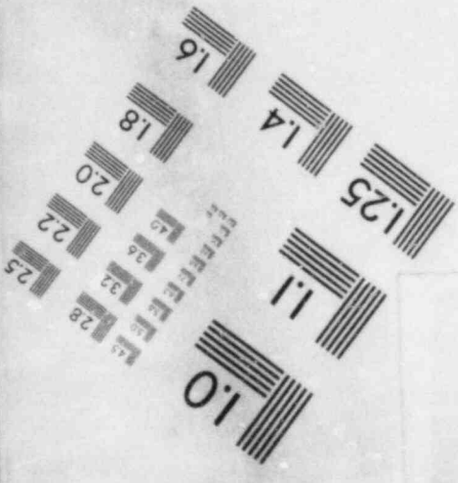


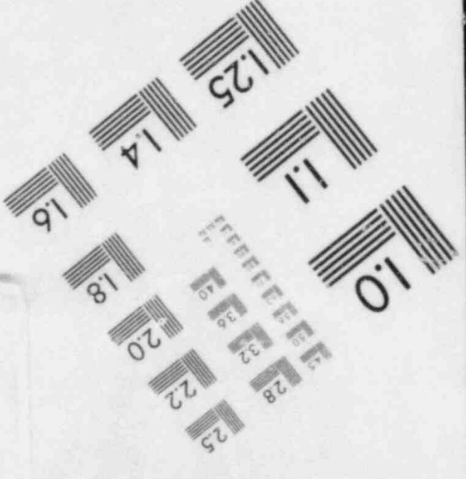
IMAGE EVALUATION TEST TARGET (MT-3)











Manual No. 45
General Manager - Hope Creek
R. Salvesen
Hope Creek Generating Station

Manual No. 46
Technical Document Room
M. Ochs
Salem Generating Station

Manual No. 47
Public Affair: Manager
R.A. Silverio (Home Copy)
Salem Generating Station

Manual No. 48
Operations Engineer
L. Catalfomo
Salem Generating Station

Manual No. 49
Senior Staff Engineer
J. Clancy
Artificial Island

Manual No. 50

QA Office
Salem Generating Station

Manual No. 51
Emergency Duty Officer
L. Catalfomo (Home Copy)
Salem Generating Station

Manual No. 52
Emergency Duty Officer
L. Fry (Home Copy)
Salem Generating Station

Manual No. 53

Emergency Duty Officer
Salem Generating Station

Manual No. 54
Manager-Nuclear Procurement &
Material Control-R. DeSanctis
Artificial Island

Manual No. 55
Senior Engineer
C. A. Sakenas
Artificial Island

Manual No. 56
Principal Staff Engineer
N. C. Allman
80 Park Plaza 16C

Manual No. 57
General Manager-Nuclear Svs.
H. J. Midura
Artificial Island

Manual No. 58
Mgr.-Nuclear Site Maintenance
F. Meyer
Artificial Island

Manual No. 59
Manager-Nuclear Fuel
E. S. Rosenfeld
Artificial Island

Manual No. 60
Manager-Systems Engineering
L. A. Reiter
Artificial Island

Manual No. 61
Assistant to V.P.
C. P. Johnson
80 Park Plaza 15A

Manual No. 63
Manager-Nuclear Engineering
& Controls - T.N. Taylor
Artificial Island

Manual No. 64
Manager-Radiation Protection
Services - W. L. Britz
Artificial Island

Manual No. 65
Mgr.-Nuclear Plant Engineering
R. Gura
Artificial Island

Manual No. 66
Manager - Nuclear Site
Protection
P. A. Moeller
Artificial Island

Manual No. 67
Manager - Nuclear Engineering
Design
A. Thomson
Artificial Island

Manual No. 68
Chief System Operator - Elec.
Elec. Load Dispatch Center
80 Park Plaza,Newark

Manual No. 69
Lead Engineer
C. A. Burg
Artificial Island

Manual No. 70
Principal Staff Engineer
R. F. Yewdall
80 Park Plaza, Newark

Manual No. 71
Senior Vice President -
Energy Supply & Engineering
R. M. Eckert
80 Park Plaza, Newark

Manual No. 72
General Manager-
Corporate QA
R. L. Mitti
80 Park Plaza 16E

Manual No. 73
Manager-Methods & Admin.
R. A. Burricelli
Artificial Island

Manual No. 74
M. Gavioli
Nuclear Training Center
Salem

Manual No. 75
General Manager
Nuclear Support
J. T. Boettger
Artificial Island

Manual No. 76
Supervisor QA Audits-Salem
H. Lowe
QA Trailer

Manual No. 77
Manager-Licensing & Analysis
R. P. Douglas
80 Park Plaza 16D

Manual No. 79
Manager-Nuclear Licensing &
Regulation - E. Liden
Artificial Island

Manual No. 81
General Manager - Info. Svs.
A. F. Lenehan
80 Park Plaza, Newark

Manual No. 82
Gen. Mgr. Mech. Eng.
T. Pietrofitta-Atlantic Elect.
P.O. Box 1500
Pleasantville, NJ 08232

Manual No. 83
Vice President-Public Relat.
R. H. Franklin
80 Park Plaza 4B

Manual No. 87
Manager - Nuclear Const. Support
E. W. Barradale
Artificial Island

Manual No. 88
Manager - QA Nucler Operations
A. Nassman
Artificial Island

Manual No. 89
Vice President -
Nuclear
R. A. Uderitz
Artificial Island

Manual No. 91
Asst. General Mgr.- Nuclear
Engineering - D. J. Jagt
Artificial Island

Manual No. 92 and 93
New Jersey Bureau of Radiation
Protection
Mr. Frank Cosolito, Chief
380 Scotch Road
Trenton, New Jersey 08628

Manual No. 94 & 95
Delaware Emergency Planning
& Operations
Mr. C. Jester, Director
Delaware City, Delaware 19706

Manual No. 96
New Jersey State Police (OEM)
Major H. Spedding
Deputy Director
P.O. Box 7068
West Trenton, New Jersey 08625

Manual No. 97
Salem County OEM Coordinator
Mr. D. C. May
Salem County Admin. Bldg.
94 Market Street
Salem, New Jersey 08098

Manual No. 98
Cumberland County OEM
Coordinator
Mr. E. J. Hoffman
R. D. #8, Box 46
Bridgeton Avenue
Bridgeton, New Jersey 08302

Manual No. 99 & 102
New Castle County, Department
of Public Safety
Coordinator for Emergency
Preparedness
Mr. R. Kendall
3601 North Dupont Highway
New Castle, Delaware 19720

Manual 100
New Jersey BPU
Mr. R. Hartung
Department of Energy
1100 Raymond Boulevard
Newark, New Jersey 07102

Manual No. 101
U.S. Nuclear Regulatory Comm.
Director of Nuclear Reactor
Regulation
Washington, D.C. 20555

Attention: Mr. S.A. Varga
Chief
Operating Reactors
BR#1
Div. of Licensing

Manual Nos. 111 and 112
U.S. Nuclear Reguatory Comm.
Office of Inspection and
Enforcement - Region I
Administrator
631 Park Avenue
King of Prussa, PA 19406

Manual No. 113
U.S. Nuclear Regualtory Comm.
Resident Inspector -
Salem Generating Station

Manual No. 114
Lower Alloways Creek Towship
The Honorable Harry Coleman
Mayor
The Municipal Building
Hancocks Bridge, New Jersey 08038

Manual No. 115
Radiation Management Corporation
Mr. T. Linnemann
3508 Market Street
Philadelphia, PA 19104

Manual No. 116
Institute for Nuclear Power Oper.
Emergency Preparedness Department
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

Manual No. 117
Kent County, Department of Emergency
Planning and Operations
Mr. E. C. Golder, Director
38 The Green
Dover, Delaware 19901

Manual No. 118
Westinghouse Electric Company
T. G. Satryan, Manager
Operating Plant Projects - NSID
P. O. Box 2728
Pittsburg, PA 15230

Manual No. 119
Porter Consultants
125 Argyle Road
Ardmore, PA 19003

Manual No. 120
Commanding Officer
U.S. Coast Guard Base
Gloucester City, New Jersey 08030

Manual No. 121
Manager Environmental Division
PSE&G Research Corporation
Research and Testing Lab
Maplewood 220

Manual No. 122
Conner & Wetterhahn
Room 1050
1747 Pennsyulvania Avenue, N.W.
Washington, D.C. 20006

Attention: Mr. Mark Wetterhahn

Manual No. 123
T. Deckard
Lead Construction Engineer
Hope Creek Generating Station

Manual No. 124
P. Kudless
Project Construction Manager
Hope Creek Generating Station

FIGURE 6-2.3
EMERGENCY PLAN DISTRIBUTION
VERIFICATION SHEET

MANUAL NO.	REV.	REV.	REV.	REV.	REV.	REV.	REV.	REV.	REV.

ADMINISTRATIVE PROCEDURE
EP VI-3
REVIEW OF PLANS AND PROCEDURES

ACTION LEVEL

This procedure details the methods for performing the annual planning reviews and quarterly telephone list verification.

ACTION STATEMENTS

1. The Manager - Nuclear Site Protection shall insure that the Emergency Plan Manuals are reviewed, that all revisions have been made, that the plan and procedures are accurate and adequate and that agreement between PSE&G and other emergency response groups are adequate.

   a) Prior to the annual exercise, manuals located in emergency response centers will be reviewed to insure that all revisions have been made.

      Other manuals used for implementing the plan will be reviewed as described in EP VI-2 to insure that all revisions have been made.

   b) Following receipt of the critique review comments on the annual exercise, the emergency manuals shall be reviewed and revised as necessary to incorporate substantive drill and exercise critique comments. This review will be documented on Figure 6-3.1.

   c) Following the annual exercise, all letters of agreements between PSE&G and other emergency response groups shall be reviewed. This review will take into account the critique

ACTION STATEMENTS (continued)

comments from the annual exercise. Biennially all letters of agreement will be renewed. This renewal may consist of either a letter from the parties to the formal agreement stating that the agreement is satisfactory or a new formal agreement.

2. The Manager - Nuclear Site Protection shall insure that the emergency telephone lists are reviewed quarterly and updated. This review will be documented on in accordance with the Inspection Order System.

Prepared By: C A Burge

Reviewed By: Cheryl A Sakenas for NEPE — 6/9/83
Department Head — Date

Reviewed By: Cheryl A Sakenas for — 6/9/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: R. D. C. Parker — 7/30/83
Station Quality Assurance Review — Date
(if required see EP VI-2)

SORC Meeting No.: 83-128 — 10/5/83
Date

Approved By: [signature] — 10/7/83
General Manager - Salem Operations — Date

Approved By: [signature] — 10/4/83
Manager - Nuclear Site Protection — Date

FIGURE 6-3.1
DOCUMENTATION OF REVIEWS 19__
SALEM GENERATING SATION

Review	Performed By	Date	Signature
Annual Manual Revision Verification			
Annual EP VI-2 Manual Review			
Annual Agreement Review			

Reviewed By: _____

Nuclear Emergency Planning Engineer

ADMINISTRATIVE PROCEDURE
EP VI-4
PROCEDURES FORMAT

ACTION LEVEL

This procedure provides format guidance for preparers of emergency plan implementing procedures.

RESPONSIBLE INDIVIDUAL

Emergency Plan Procedure preparer.

ACTION STATEMENT

1. GENERAL GUIDANCE

Implementing procedures for emergency plan actions shall contain, as appropriate, the following elements:

Individual assignment of authorities and responsibilities for performance of specific tasks or staff position.

Protective action levels and protective measures outlined for the identified emergency.

Specific actions to be taken by coordinating support groups.

Procedures for medical treatment and handling of contaminated individuals.

Special equipment requirements for items such as medical treatment, emergency personnel rescue, specific radiation detection, personnel dosimetry, procedures for making emergency equipment available, plus operating instructions for this equipment, and provisions for its periodic inspection and maintenance.

ACTION STATEMENTS (continued)

Identification of the emergency communications network, including communications required for personnel notification and effective coordination of all support groups.

Description of alarm signals in each facility. (Signals for initiating protective measures should be clear and distinct from process or operational alarm system to avoid confusion.)

Procedures required to restore the plant to normal conditions following an emergency.

Requirements for periodically testing of procedures, communications network and alarm systems to assure that they function properly.

2. PROCEDURE FORMAT GUIDANCE

Procedures should be typed on 8-1/2 x 11 inch paper for ease of use, duplication and preparation.

The words CAUTION, DANGER, WARNING and all actual switch or indicator positions should be capitalized for emphasis.

Equipment when specifically identified should be capitalized (Example: No. 11 Steam Generator).

When an uncommon abbreviation is used in a procedure it shall be accompanied by its unabbreviated form the first time it appears. The abbreviation may then be used unaccompanied.

Procedure sections should be capitalized and underlined. The following sections should be used in the order provided when applicable):

ACTION STATEMENTS (continued)

ACTION LEVEL - Gives guidance on when the procedure should be used, including alarms or communications.

RESPONSIBLE INDIVIDUAL - Lists individual(s) by title who is responsible for initiation or implementation of the procedure. This may be included as a portion of the action statement section.

ACTION STATEMENTS - Individual steps necessary to carry out the response required, these steps should be sequentially numbered (1., 2., etc.) and should be written to provide the following: general guidance, procedural action(s) to be taken or verification and record of completion of an action or series of actions.

LIMITS ON AUTHORITY - Where specific limits on the authority of the responsible individual exist these limits should be clearly described and the chain of authority or reporting clearly indicated.

EQUIPMENT REQUIREMENT - This may either be a list of equipment required to perform the procedures or reference to an attachment, figure or table which provides any equipment requirements.

COMMUNICATION NETWORK - Describes the communications flow for implementating the procedure and when required the personnel identification methods to be used to insure positive identification of the person(s) making communications.

ATTACHMENTS - Lists the attachments which are to be used with the procedure.

ACTION STATEMENTS (continued)

3. PAGE FORMAT GUIDANCE

Each page of the procedure should be identified by Generic Code, Section Number, and Procedure Number (Example: EP IV-3) near the upper right hand corner of the page. Sufficient space should be allowed above and to the right of the procedure identifier to permit reproduction without loss of the identifier.

Each page of the procedure should be sequentially numbered and identify total number of pages in the documents. The total page count should include tables and figures included in the procedure. Attachments should be separately numbered in this same manner. The page numbers should be located at the bottom center of the page. Sufficient space should be allowed below the page numbers to permit reproduction without loss of the page number.

Each page of the procedure should indicate the revision. The revision number should be located near the lower right hand corner of the page. Sufficient space should be allowed below and to the right of the revision number to permit reproduction without loss of the revision number.

The first page of each procedure should provide generic title (Emergency Procedure or Administrative Procedure), procedure number and procedure title. This should be located near the upper center of the first page.

4. SIGNATURE BLOCK GUIDANCE

A signature block shall be provided at the end of the procedure. This signature block shall be as shown:

ACTION STATEMENTS (continued)

Prepared By: Name of Preparer

Reviewed By: _____ _____
Department Head Date

Reviewed By: _____ _____
Nuclear Emergency Planning Engineer Date

Reviewed By: _____ _____
Station Quality Assurance Review Date
(if required see EP VI-2)

SORC Meeting No.: _____ _____
Date

Approved By: _____ _____
General Manager - Salem Operations Date

Approved By: _____ _____ _____
Manager - Nuclear Site Protection Date

ACTION STATEMENTS (continued)

5. TABLES AND FIGURES GUIDANCE

Tables will usually consist of information in columns and rows. Each table should be numbered according to procedure section, procedure number, table sequence number (Example: Table 6-4.1) and titled appropriately. The number and title should be placed at the top of the first page of the table. The table identifier (Example: Table 6-4.1) will be placed below the procedure identifier in the upper right hand corner of the page. Example: EP VI-4
Table 6-4.1

A figure usually will consist of information which is either graphic or non tabular in form. Each figure should be numbered according to procedure section, procedure number, figure sequence number (Example: Figure 6-4.1), and titled appropriately. The figure identifier and title should be placed below the figure. Additionally the figure identifier should be placed below the procedure identifier in the upper right hand corner of the page. Example: EP VI-4
Figure 6-4.1

6. ATTACHMENT AND ADDENDA GUIDANCE

An attachment should be considered to be a removable part of a procedure and should be used to separate information from the body of the procedure which may be either a special case (Example: Telephone Lists) or not necessary for implementing the procedure. Attachments should be sequentially numbered (Example: Attachment 1, Attachment 2, etc.) and identified on each page below the procedure identifier. An attachment should be revised with the procedure to which it is attached.

ACTION STATEMENTS (continued)

An addenda should be considered to be an attachment which has an independent status (Example: EP Telephone Directory) and thus may be referenced by one or more procedures. Addenda should be sequentially numbered (Example: Addendum 1, Addendum 2, etc.) and identified on each page in the upper right hand corner of the page. Addenda will be prepared, reviewed and approved in the same manner as a procedure.

Prepared By: C. A. Burge

Reviewed By: Cheryl A Sakenas for NEPE 6/9/83
Department Head Date

Reviewed By: Cheryl A Sakenas for 6/9/83
Nuclear Emergency Planning Engineer Date

Reviewed By: [signature] 7/20/83
Station Quality Assurance Date

SORC Meeting No.: 83-128 [signature] 10/5/83
Date

Approved By: [signature] 10/7/83
General Manager - Salem Operations Date

Approved By: [signature] 10/11/83
Manager - Nuclear Site Protection Date

ADMINISTRATIVE PROCEDURE
EP VI-5
CONDUCT OF DRILLS AND EXERCISES

ACTION LEVEL

1. Drill or exercise required to be conducted by an Inspection Order.

2. Drill or exercise required to be conducted as ordered by the Manager - Nuclear Site Protection.

ACTION STATEMENTS

NOTE

This procedure is to be completed by the Nuclear Emergency Planning Engineer.

1. If an Inspection Order has been received, record the date and Inspection Order number.

   Date _____ Inspection Order No. _____

2. Assign a Coordinator to prepare a scenario, using Attachment 1 of this procedure.

   Coordinator _____

3. After review by the Nuclear Emergency Planning Engineer, submit to the Manager - Nuclear Site Protection for approval and schedule the date the drill is to be conducted, with the concurrence of the General Manager - Salem Operations.

ACTION STATEMENTS (continued)

4. The coordinator shall assign observers and perform the following:

   a) Brief observers on the approved scenario, including details and information they are to provide to participate during the actual performance of the drill or exercise.
   b) Assign them to locations.
   c) Provide each observer with an Observation Sheet (Attachment 2 of this procedure).

NOTE

Observers shall normally include Licensed Operators, Emergency Duty Officers, Radiation Protection personnel, and Ouality Assurance personnel, however, other Company employees or consultants may be assigned as observers at the discretion of the Nuclear Emergency Planning Engineer.

Off-site organizations may supply their own observers.

5. As determined for each drill or exercise, notify off-site organizations and/or Company employees of the drill in advance to confirm their level of participation.

6. Conduct the drill or exercise under the following guidelines:

ACTION STATEMENTS (continued)

a) Announcements should be preceeded and followed by the words:

"THIS IS A DRILL, THIS IS A DRILL."

b) During a drill or exercise, any action to alter actual plant operating conditions shall be simulated unless otherwise directed by the General Manager - Salem Operations.

7. All drill worksheets and/or observation sheets should be collected and reviewed by the Nuclear Emergency Planning Engineer.

8. The Coordinator shall critique the drill or exercise with observers, and participants. Complete the Evaluation Report (Attachment 3), and forward to the Nuclear Emergency Planning Engineer.

9. Following a drill or exercise, the Coordinator shall prepare an Exercise Dificiency Sheet and forward to the Nuclear Emergency Planning Engineer. The Nuclear Emergency Planning Engineer will submit the Evaluation Report (Attachment 3) and any Exercise Deficiency Sheets (Attachment 4) to SORC within 90 days of the drill or exercise.

10. SORC shall review the completed exercise package, including deficiencies, with recommendations for resolution.

ACTION STATEMENTS (continued)

11. Forward Deficiency Sheets (Attachment 4) to the appropriate personnel for resolution.

12. The Nuclear Emergency Planning Enginee shall review and file all completed drill and exercise results and ensure that all deficiencies are adequately reviewed and corrected.

Return completed copy of this procedure with all attached documents to the Manager - Nuclear Site Protection.

_____ _____

Coordinator Date

NOTE

Drills and exercises are scheduled in acordance with Table I with referenced procedures and Inspection Order Numbers.

Prepared By: C. A. Sakenas

Reviewed By: Cheryl A Sakenas 6/15/83
Department Head Date

Reviewed By: Cheryl A Sakenas for 6/15/83
Nuclear Emergency Planning Engineer Date

Reviewed By: D A Person 7/20/83
Station Quality Assurance Review Date
(if required see EP VI-2)

SORC Meeting No.: 83-129 10/12/83
Date

Approved By: J M Fulton Jr 10/14/83
General Manager - Salem Operations Date

Approved By: Peter A. Morrison 10/13/83
Manager - Nuclear Site Protection Date

TABLE I
EMERGENCY PLAN
EXERCISES AND DRILLS

EXERCISE TITLE	FREQUENCY	REFERENCE
1. State of New Jersey/PSE&G	Annually	I.O. 300073
2. State of Delaware/PSE&G	Annually	I.O. 300072

NOTE

Items 1 and 2 may be conducted separately or as a coordinated single exercise.

Items 1 and 2 shall include one night exercise (beginning between 6:00 p.m. and 6:00 a.m.) within six (6) years.

DRILL TITLE	FREQUENCY	REFERENCE
1. Fire Brigade	Quarterly	Fire Protection Plan I.O. 800010
2. First Aid Team	Quarterly	Fire Protection Plan I.O. 800012
3. Medical Emergency (Contaminated Personnel)	Annually	Radiation Management Corporation I.O. 300067
4. Radiological Monitoring	Annually	I.O. 300068
5. Health Physics (Simulated Elevated Samples Only)	Semi-Annually	I.O. 300069
6. Personnel Accountability	Annually	I.O. 300070

DRILL OR EXERCISE
SCENARIO SHEET
ATTACHMENT 1

Title: _____ Drill or Exercise Date _____
I.O. Number _____

INTENT

NOTE: List here those outstanding procedures, instructions, equipment and communications, including specific actions of personnel or emergency teams that the drill or exercise is to check.

DRILL SCENARIO

NOTES: (1) Scenario shall be sufficiently detailed such that simulated emergency conditions, locations and reports (including values) are described fully enough to enable responsible actions (may be simulated) to be taken. Include simulated casualties, local support services support required, personnel emergencies, use of protective clothing, deployment of survey teams and PIO activities.

(2) All scenarios shall include the following notes:

NOTE 1: Advise the Senior Shift Supervisor to terminate the drill or exercise if plant operating conditions warrant such an action.

NOTE 2: For all notification to local, state and federal agencies predetermined statements shall be available to prevent confusion.

Review: _____ Approval: _____

Nuclear Emergency Planning Engineer

Manager - Nuclear Site Protection

Return completed copy to the Nuclear Emergency Planning Engineer

DRILL OR EXERCISE OBSERVATION SHEET ATTACHMENT 2

Drill or Exercise Date: _____

Observers Name: _____

Observers Location: _____

Title: _____

Information to Provide: _____

_____

_____

_____

Time Commenced: _____ Time Terminated: _____

OBSERVATIONS, COMMENTS AND RECOMMENDATIONS

NOTE: Observations should include the proper and effective use of procedures, equipment and personnel.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

NOTE: Use additional pages as necessary.

Signature: _____ Title: _____

Return completed copy to the Nuclear Emergency Planning Engineer

DRILL OR EXERCISE
EVALUATION REPORT
ATTACHMENT 3

Drill or Exercise

Title: _____ I.O. No.: _____

Exercise or Drill Date: _____

COMMENTS (Using evaluations of observers and critiques)

DEFICIENCIES

Prepared By: _____ Approved By: _____

Date: _____

Nuclear Emergency
Planning Engineer

Return completed copy to the Nuclear Emrgency Planning Engineer.

EXERCISE
DEFICIENCY SHEET
ATTACHMENT 4

Title: _____ I.O. No.: _____

Exercise or Date: _____

Deficiency No.: _____

Date Noted: _____

RECOMMENDATION

SORC Reviewed: _____within 90 days of Exercise

CORRECTIVE ACTION

Assigned To: _____ Department_____

Date for Completion: _____

Action Taken:

Completed By: _____ Date Completed: _____

NOTE: Return completed Drill Deficiency Sheets to the Nuclear Emergency Planning Engineer.

Corrective Action

_____ Satisfactory _____Unsatisfactory _____

Manager - Nuclear Site Protection

EMERGENCY PROCEDURE
EP VI-6
INVENTORY OF EOF SUPPLY LOCKERS

ACTION LEVEL

Inventory of Emergency Supply Lockers at the EOF will be performed on a quarterly schedule, as required by an Inspection Order, and following use. This will be the responsibility of the Nuclear Energency Planning Engineer.

ACTION STATEMENTS

1. If an inspection order has been received, record the date and Inspection Order number at the top of Attachment 1.

2. Using Tables 1 - 8 of Attachment 1, perform an inventory of emergency supplies located in the appropriately labeled lockers.

3. Note any discrepencies on Attachment 1. The Nuclear Emergency Planning Engineer is responsible for correcting the noted discrepencies.

4. Complete and return one copy of the Inspection Order to the Technical Department in accordance with Administrative Procedure No. 10.

Prepared By: C Sakenas

Reviewed By: Cheryl A Sakenas for NEPE — 6/9/83
Department Head — Date

Reviewed By: Cheryl A Sakenas for — 6/9/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: [signature] — 7/20/83
Station Quality Assurance Review — Date
(if required see SE VI-2)

SORC Meeting No.: 83-128 [signature] — 10/5/83
Date

Approved By: [signature] — 10/7/83
General Manager - Salem Operations — Date

Approved By: Peter A. Morton — 10/4/83
Manager - Nuclear Site Protection — Date

TABLE 1
EMERGENCY EQUIPMENT INVENTORY

STATE LOCKER

SHELF	ITEM	NOMINAL QUANTITY	QUANTITY FOUND	SPECIAL INSTRUCTION
1	NJ State Emergency Plan and Procedures	1		
1	Telephone 935-5003	1		
1	Telephone PL 389 186	1		
1	Telephone PL 388 420	1		
2	Telephone 935-7606	1		
2	Telephone 935-7607	1		
2	Telephone 935-5002	1		
2	Delaware State Emergency Plan and Procedures	1		
3	EMRAD Radio	1		
4	NJ State Radio	1		

TABLE 2
EMERGENCY EQUIPMENT INVENTORY

RADIATION SUPPORT MANAGER

SHELF	ITEM	NOMINAL QUANTITY	QUANTITY FOUND	SPECIAL INSTRUCTION
1	Salem Emergency Plan and Procedures	1		
2	Clerical supplies	-		
3	Calculational forms			
	- Station Status Checklist	20		
	- Dose Assessment (RMS)	20		
	- Field Monitoring	20		
	- Dose Calculation Sheet	20		

TABLE 3
EMERGENCY EQUIPMENT INVENTORY

RADIATION SUPPORT LOCKER

SHELF	ITEM	NOMINAL QUANTITY	QUANTITY FOUND	SPECIAL INSTRUCTION
1	Reference books	-		
1	Logbooks	10		
2	Clerical supplies	-		
2	Tape recorder	1		
2	Rulers	12		
3	TI-59 Calculator	1		
3	EPZ map	1		
4	Headsets (phone)	6		

TABLE 4
EMERGENCY EQUIPMENT INVENTORY

SITE SUPPORT/ENGINEERING SUPPORT

SHELF	ITEM	NOMINAL QUANTITY	QUANTITY FOUND	SPECIAL INSTRUCTION
1	Salem Emergency Plan and Procedures	1		
1,2	Logbooks	2		
1,2	Clerical supplies	-		
3	Calculational forms			
	- operations data	20		
	- initial contact	20		
3	Headsets	6		
4	Station diagrams			
	- mylar	1 set		
4	Waste baskets	4		

TABLE 5
EMERGENCY EQUIPMENT INVENTORY

SUPPLY LOCKER

SHELF	ITEM	NOMINAL QUANTITY	QUANTITY FOUND	SPECIAL INSTRUCTION
1	First aid kits	4		
1	Headsets	6		
2	Computer paper	-		
2	Printer	1		
2	Hazeltine terminal	1		
4	Logbooks	20		
4	Letter pads	20		
4	Pens	20		
5	File Folders	20		
5	Plant drawings	1 set		

TABLE 6
EMERGENCY EQUIPMENT INVENTORY

ADMINISTRATIVE SUPPORT MANAGER

SHELF	ITEM	NOMINAL QUANTITY	QUANTITY FOUND	SPECIAL INSTRUCTION
1	Registration log	1		
1	Name tags	50		
2	Petty cash forms	2 pads		
2	Clerical supplies	-		
2	Logbook	1		
3	Baskets	2		
3	File folders	12		
4	Letter pads	12		
4	Bookends	1 box		
5	Markers	12		

TABLE 7
EMERGENCY EQUIPMENT INVENTORY

EMERGENCY RESPONSE MANAGER

SHELF	ITEM	NOMINAL QUANTITY	QUANTITY FOUND	SPECIAL INSTRUCTION
1	Salem Emergency Plan and Procedures	1		
1	Delaware Emergency Plan and Procedures	1		
1	NJ Emergency Plan and Procedures	1		
2	Clerical supplies	-		
3	PA system	1		
4	Wastebasket	1		

TABLE 8
EMERGENCY EQUIPMENT INVENTORY

PUBLIC INFORMATION MANAGER

SHELF	ITEM	NOMINAL QUANTITY	QUANTITY FOUND	SPECIAL INSTRUCTION
1	Salem Emergency Plan and Procedures	1		
1	Delaware Emergency Plan and Procedures	1		
1	NJ Emergency Plan and Procedures	1		
2	Clerical supplies	-		
3	EBS radio	1		
4	New Jersey Emergency Plan and Procedures	1		
5	Delaware Emergency Plan and Procedures	1		

ADMINISTRATIVE PROCEDURE
EP VI-7
CONDUCT OF COMMUNICATIONS DRILLS

ACTION LEVEL

1. Communications drill required to be conducted by an Inspection Order.

2. Communications drill required to be conducted as ordered by the Manager - Nuclear Site Protection.

ACTION STATEMENTS

NOTE

This procedure is to be completed by the Nuclear Emergency Planning Engineer.

1. If an Inspection Order has been received, record the date and Inspection Order number.

   Date _____ Inspection Order No. _____

2. Refer the appropriate attachment to the designated individual using Table 1 as a guide.

3. Upon completion of the drill the attachment should be forwarded to the Nuclear Emergency Planning Engineer for review.

4. The Nuclear Emergency Planning Engineer will complete and return the I.O. card to the Adminstrative Office - Salem Operations.

5. The Nuclear Emergency Planning Engineer is responsible for ensuring all problems or deficiencies are corrected and documented as soon as possible.

Prepared By: C. A. Sakenas

Reviewed By: Cheryl A Sakenas 6/15/83
Department Head — Date

Reviewed By: Cheryl A Sakenas for 6/15/83
Nuclear Emergency Planning Engineer — Date

Reviewed By: [signature] 7/20/83
Station Quality Assurance — Date
(if required see EP VI-2)

SORC Meeting No.: 83-128 [signature] 10/5/83
Date

Approved By: [signature] 10/7/83
General Manager - Salem Operations — Date

Approved By: [signature] 10/11/83
Manager - Nuclear Site Protection — Date

TABLE I
COMMUNICATIONS DRILLS

DRILL TITLE	FREQUENCY	Attachment	REFERENCE
1. New Jersey and Delaware (State, County, & local governments)	Monthly	1	I.O.300063
2. Federal Agencies	Quarterly	2	I.O.300064
3. Full Fan Out - New Jersey and Delaware	Annually	3	I.O.300065
4. PSE&G Facilities and Survey Teams	Annually	4	I.O.300066

EMERGENCY PLAN
COMMUNICATIONS DRILL WORKSHEET
NEW JERSEY AND DELAWARE
(STATE, COUNTIES AND LOCAL GOVERNMENTS)

1. NEW JERSEY STATE POLICE

a. Direct Line

The Senior Shift Supervisor, or designee, shall initiate a test call for each of the following locations. Repeat the following test message:

THIS IS A COMMUNICATION TEST DRILL, THIS IS A COMMUNICATION TEST DRILL

THIS IS _____ FROM SALEM GENERATING STATION. DO YOU READ ME LOUD AND CLEAR? THIS IS A COMMUNICATION TEST DRILL.
(name)

	SAT	UNSAT	CALLER	DATE/TIME
Senior Shift Supervisor's Office	_____	_____	_____	_____
TSC	_____	_____	_____	_____
EOF	_____	_____	_____	_____

b. Secondary Line

The Senior Shift Supervisor, or designee, shall initiate a test call to the New Jersey State Police Dispatcher on 882-2000. Repeat the test message in 1.a above.

Caller _____

Person Contacted _____

Time/Date _____

Unsat* _____ Sat _____

*If unsat describe problem at bottom of page.

2. DELAWARE STATE POLICE

a. Direct Line

The Senior Shift Supervisor or designee shall initiate a test call from each of the following locations. Repeat the test message in 1.a.

	SAT	UNSAT	CALLER	DATE/TIME
Senior Shift Supervisor's Office	_____	_____	_____	_____
TSC	_____	_____	_____	_____
EOF	_____	_____	_____	_____

b. Secondary Line

The Senior Shift Supervisor or designee shall initiate a test call to the Delaware State Police on 302-736-5851. Repeat the test message in 1.a.

Caller _____

Person Contacted _____

Time/Date _____

Unsat* _____ Sat _____

*If unsat describe problem at bottom of page.

3. SALEM COUNTY EOC

a. Direct Line

The Senior Shift Supervisor or designee shall initiate a test call from each of the following locations. Repeat the test message in 1.a.

	SAT	UNSAT	CALLER	DATE/TIME
Senior Shift Supervisor's Office	_____	_____	_____	_____
TSC	_____	_____	_____	_____
EOF	_____	_____	_____	_____

b. Secondary Line

The Senior Shift Supervisor or designee shall initiate a test call to the Salem County Fire Dispatcher on 935-4505. Repeat the test message in 1.a.

Caller _____

Person Contacted _____

Time/Date _____

Unsat* _____ Sat _____

*If unsat describe problem at bottom of page.

4. CUMBERLAND COUNTY EOC

a. Primary (Direct Line)

The Senior Shift Supervisor or designee shall initiate a test call from each of the following locations. Repeat the test message in 1.a.

	SAT	UNSAT	CALLER	DATE/TIME
Senior Shift Supervisor's Office				
TSC				
EOF				

b. Secondary Line

The Senior Shift Supervisor or designee shall initiate a test call to the Cumberland County on 455-8500. Repeat the test message in 1.a.

Caller _____

Person Contacted _____

Time/Date _____

Unsat* _____ Sat _____

*If unsat describe problem at bottom of page.

5. NEW CASTLE COUNTY EOC

a. Primary (Direct Line)

The Senior Shift Supervisor or designee shall initiate a test call from each of the following locations. Repeat the test message in 1.a.

	SAT	UNSAT	CALLER	DATE/TIME
Senior Shift Supervisor's Office	_____	_____	_____	_____
TSC	_____	_____	_____	_____
EOF	_____	_____	_____	_____

b. Secondary Line

The Senior Shift Supervisor or designee shall initiate a test call to New Castle County on 302-571-7949. Repeat the test message in 1.a.

Caller _____

Person Contacted _____

Time/Date _____

Unsat* _____ Sat _____

*If unsat describe problem at bottom of page.

6. KENT COUNTY EOC

a. Primary (Direct Line)

The Senior Shift Supervisor or designee shall initiate a test call from each of the following locations. Repeat the test message in 1.a.

	SAT	UNSAT	CALLER	DATE/TIME
Senior Shift Supervisor's Office				
TSC				
EOF				

b. Secondary Line

The Senior Shift Supervisor or designee shall initiate a test call to Kent County on 302-678-9111. Repeat the test message in 1.a.

Caller _____

Person Contacted _____

Time/Date _____

Unsat* _____ Sat _____

*If unsat describe problem at bottom of page.

7. LOWER ALLOWAYS CREEK TOWNSHIP

a. Primary (Direct Line)

The Senior Shift Supervisor or designee shall initiate a test call from each of the following locations. Repeat the test message in 1.a.

	SAT	UNSAT	CALLER	DATE/TIME
Senior Shift Supervisor's Office	_____	_____	_____	_____
TSC	_____	_____	_____	_____
EOF	_____	_____	_____	_____

b. Secondary Line

The Senior Shift Supervisor or designee shall initiate a test call to the LAC Dispatcher on 935-7300. Repeat the test message in 1.a.

Caller _____

Person Contacted _____

Time/Date _____

Unsat* _____ Sat _____

*If unsat describe problem at bottom of page.

8. NOAA WEATHER STATION (WILMINGTON AIRPORT)

The Senior Shift Supervisor or designee shall initiate a test call to the NOAA Weather Station on 302-323-2280. Repeat the test message in 1.a.

Caller _____

Person Contacted _____

Time/Date _____

Unsat* _____ Sat _____

*If unsat describe problem at bottom of page.

Forward completed forms to the Nuclear Emergency Planning Engineer.

Reviewed By: _____ Date: _____

EMERGENCY PLAN
COMMUNICATIONS DRILL WORKSHEET
FEDERAL AGENCIES

1. NRC (ENS) DIRECT LINE

The Senior Shift Supervisor or designee shall initiate a test call from each of the following locations. Repeat the test message in 1.a.

THIS IS A COMMUNICATION TEST DRILL, THIS IS A COMMUNICATION TEST DRILL. THIS IS _____ (name) FROM THE SALEM GENERATING STATION. DO YOU READ ME LOUD AND CLEAR?

THIS IS A COMMUNIATION TEST DRILL.

	SAT	UNSAT	CALLER	DATE/TIME
Senior Shift Supervisor's Office	_____	_____	_____	_____
No. 1 Control Room	_____	_____	_____	_____
No. 2 Control Room	_____	_____	_____	_____
TSC	_____	_____	_____	_____
EOF	_____	_____	_____	_____

*If unsat describe problem.

2. NRC (HPN) DIRECT LINE

The Senior Shift Supervisor or designee shall initiate a test call from each of the following locations. Repeat the test message in 1.a.

	SAT	UNSAT	CALLER	DATE/TIME
TSC	_____	_____	_____	_____
Control Point	_____	_____	_____	_____
EOF	_____	_____	_____	_____

*If unsat describe problem.

3. U.S. DEPARTMENT OF ENERGY (FRMAP) BROOKHAVEN AREA

The Senior Shift Supervisor or designee shall initiate a test call to the U. S. Department of Energy (Brookhaven) at (516) 282-2200. Repeat the message in 1.a.

Telephone Number Called _____

Shift Clerk _____

Person Contacted _____

Time/Date _____

Unsat* _____ Sat _____

*If unsat describe problem.

4. U.S. COAST GUARD

The Senior Shift Supervisor or designee shall initiate a test call to the U.S. Coast Guard-Station (Gloucester) at (609) 456-1370. Repeat the test message in 1.a.

Telephone Number Called _____

Shift Clerk _____

Person Contacted _____

Time/Date _____

Unsat* _____ Sat _____

*If unsat describe problem.

5. INGESTION STATES (PENNSYLVANIA AND MARYLAND CIVIL DEFENSE)

The Senior Shift Supervisor or designee shall initiate a test call to the Maryland Civil Defense at (301)486-4422 and Pennsylvania Emergency Management Agency at (717) 783-8150. Repeat the test message in 1.a.

	PENNSYLVANIA	MARYLAND
Telephone Number Called	_____	_____
Shift Clerk	_____	_____
Person Contacted	_____	_____
Time/Date	_____	_____
Unsat*	_____	_____
Sat	_____	_____

*If unsat describe problem.

Reviewed By:_____ Date:_____

EMERGENCY PLAN
COMMUNICATIONS DRILL WORKSHEET
FULL FAN OUT - NEW JERSEY AND DELAWARE

A. Nuclear Emergency Planning Engineer contacts both states at least one week prior to drill the full fan out to inform them of the upcoming drill.

1. State of New Jersey

Person Contacted	Contacted By	Time/Date

2. State of Delaware

Person Contacted	Contacted By	Time/Date

B. Contact the states and repeat the following message:

THIS IS A TEST DRILL, THIS IS A TEST DRILL. THIS IS _____ (Name) _____ (Title) AT SALEM NUCLEAR GENERATING STATION. PLEASE INITIATE A FULL FAN OUT COMMUNICATIONS TEST OF YOUR AGENCIES.

THIS IS A TEST DRILL.

	CONTACT	CALLER	TIME/DATE
1. New Jersey State Police			

Primary: Direct Line
Secondary: 882-2000

2. Delaware State Police			

Primary: (Direct Line)
Secondary: 302-736-5851

Return this completed form to the Nuclear Emergency Planning Engineer.

Reviewed By: _____ _____ Date

EMERGENCY PLAN
COMMUNICATIONS DRILL WORKSHEET
PSE&G FACILITIES AND SURVEY TEAMS

1. FACILITIES

The Shift Supervisor or designee shall initiate phone calls to each of the below listed facilities using the conference lines. Repeat the following message:

THIS IS A COMMUNICATIONS TEST, THIS IS A COMMUNICATIONS TEST.

THIS IS _____, DO YOU READ ME LOUD AND CLEAR?
(name)

THIS IS A COMMUNICATION TEST.

LINE**	SAT	UNSAT	CALLER	CONTACTED	TIME/DATE
TSC/Senior Shift Supervisor					
TSC/Senior Shift Supervisor/Newark					
TSC/No. 1 Control Room					
TSC/No. 2 Control Room					
TSC/Senior Shift Supervisor/EOF					

*If unsatisfactory state reason.

**Arrangement should be made for third party assistance, where necessary.

2. SURVEY TEAMS

Have Radiation Protection dispatch four one man survey "teams" to various areas of the building. Attempt to contact each team using normal plant communications. Each team must be contacted at least twice (at two different locations) for a minimum of eight contacts. The areas must include each Reactor Building, the Auxiliary Building and each Fuel Handling Building.

All abortive attempts must be logged and indicated as unsatisfactory.

	AREA BUILDING ELEV.	PHONE EXT. OR PA	SAT	UNSAT	CALLER	PERSON CONTACTED	DATE/ TIME
1							
2							
3							
4							
5							
6							
7							
8							
9							
0							

*If unsat state reason.

Forward all completed forms to the Nuclear Emergency Planning Engineer.

Reviewed By: _____ Date: _____