

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

E. H. LEASBURG  
VICE PRESIDENT  
NUCLEAR OPERATIONS

April 6, 1982

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
Attn: Mr. Robert A. Clark, Chief  
Operating Reactors Branch No. 3  
Division of Licensing  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

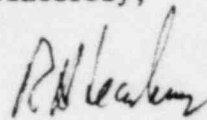
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Docket Nos. 50-338  
50-339  
License Nos. NPF-4  
NPF-7

Gentlemen:

EMERGENCY PLAN IMPLEMENTING  
PROCEDURES - NORTH ANNA  
POWER STATION

As set forth in the provisions of 10 CFR Part 50, Appendix E, Paragraph 5, the enclosed North Anna Power Station Emergency Plan Implementing Procedure, No. 2 is being forwarded.

Sincerely,



R. H. Leasburg

Enclosure - Emergency Plan Implementing Procedures  
- North Anna Power Station (10 copies)

cc: Mr. James P. O'Reilly, Regional Administrator  
Office of Inspection and Enforcement  
Region II (3 copies)



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EMERGENCY PLAN IMPLEMENTING PROCEDURES

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<u>EPIP NO.</u>	<u>Procedure</u>	<u>Safety Code</u>	<u>Effective Date</u>
EPIP-1	Emergency Classification and Organization Formation, Notification and Communications	S	01-15-82
EPIP-2	Unplanned or Uncontrolled Release of Radioactive Material	S	02-24-82
EPIP-3	Injured Personnel	S	02-11-81
EPIP-4	Fuel Handling Accident	S	08-31-77
EPIP-5	Steam Generator Tube Rupture	S	08-31-77
EPIP-6	Main Steam Line Rupture	S	08-31-77
EPIP-7	Loss of Coolant Accident	S	11-25-81
EPIP-8	Evacuation and Access Control	S	09-02-77
EPIP-9	Personnel Accountability	S	11-25-81
EPIP-10	Personnel Monitoring and Decontamination	S	11-25-81
EPIP-11	Estimating Release From Radiation Monitoring System Data	S	07-02-80
EPIP-12	Estimating Release From Station System Inventory Data	S	07-30-80
EPIP-13	Estimating Release From Offsite Radiological Data	S	11-25-81
EPIP-14	Estimating Doses From Release Data	S	11-25-81

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<u>EPIP NO.</u>	<u>Procedure</u>	<u>Safety Code</u>	<u>Effective Date</u>
EPIP-15	Estimating Doses From Environmental Data	S	08-31-77
EPIP-16	Offsite Air, Contamination and Radiation Monitoring	S	11-25-81
EPIP-17	Offsite Water and Foodstuff Monitoring	S	08-15-77
EPIP-18	Emergency Exposure Criteria	S	08-08-77
EPIP-19	Fire Protection	S	11-25-81
EPIP-20	News and Information Releases	S	11-25-81
EPIP-21	Emergency Preparedness and Training	S	01-15-82

VIRGINIA ELECTRIC AND POWER COMPANY  
NORTH ANNA POWER STATION

UNPLANNED OR UNCONTROLLED RELEASE OF  
RADIOACTIVE MATERIAL

- 1.0 Shift Supervisor Response
- 2.0 Operations Response
- 3.0 Health Physics Response

Appendix 1 Stability Class Determination

Appendix 2 Blank Forms EPIP 2.1, Report on Information Sought By  
Emergency Coordinator or Director

Appendix 3 Blank Forms EPIP 2.2 Gaseous Release Evaluation

Appendix 4 Blank Forms EPIP 2.3 Liquid Release Evaluation

Appendix 5 Dose Equivalent Factors and MPCs for Various Nuclides

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RECOMMEND APPROVAL: AM Stafford

APPROVED BY: WM Lintner

CHAIRMAN STATION NUCLEAR SAFETY  
AND OPERATING COMMITTEE

DATE: 02-24-82

**SAFETY RELATED**

1.0 Shift Supervisor Response

1.1 Obtain from Appendix 2 of this procedure a FORM EPIP-2.1, "Report on Information Sought by Emergency Director".

1.2 Check, as appropriate to the existing situation, the blocks opposite the data desired under gaseous or liquid release.

NOTE: If radiation monitoring system data is checked, initiate EPIP 11, Estimating Release from Radiation Monitoring System Data.

NOTE: Dose estimates are going to require radiation surveys and/or sampling and therefore require time to complete. To obtain results sooner, strike out any data not considered applicable.

----- 1.3 Assign responsibility of the FORM EPIP-2.1 to someone in Operations and to the senior HP representative onsite. Sign the Form following "requested by", enter the date and time. Personally ensure the assigned operator receives the Form.

1.4 Evaluate the applicability of Appendix 1, "Significance and Evaluation of Release Estimates Based on Station System Inventory Data", of EPIP 12, "Estimating Release from Station System Inventory Data".

2.0 Operations Response

Follow the instructions for the applicable blocks as indicated on FORM EPIP-2.1.

2.1 Meteorological Data

- 2.1.1 Stability Class - Read directly from template attached to delta T recorder in Control Room. If delta T is not available, use alternate methods given in Appendix 1, "Stability Class Determination", of this procedure.
- 2.1.2 Wind Speed - Obtain from recorder in Control Room. Use the 150 foot elevation, if not available use the 35 foot elevation, and if neither is available use an estimate from visual observations.
- 2.1.3 Wind Direction - Obtain from recorder in Control Room using an approximate average of the previous 15 minutes. Use the 150 foot elevation, if not available use the 35 foot elevation, and if neither available use an estimate from visual observations.

2.2 Radiation Monitoring System Data

- 2.2.1 Initiate EPIP 11, "Estimating Release from Radiation Monitoring System Data".

2.3 Source Evaluation Data

- 2.3.1 Source of Release - Identify the source as per tank number or in the case of a pipe or tube break the source supplying the pipe or tube, describe system malfunction or any other useful information.



2.0 Operations Response (cont.)

2.3.2 Possible Paths to Environs - Indicate possible paths the liquid or gases may get offsite, such as storm drains or process vent. This will aid HP in selecting sampling locations.

2.3.3 Actual or Estimated Duration of Release - Indicate the actual or estimated duration of the release to the environment in hours.

NOTE: If the release is continuous and an estimate must be made as to when it will be terminated, the Emergency Director, Operations and Health Physics should consult one another and determine the estimated duration. If no estimate of the duration can be arrived at and the actual dose rate at the site boundary exceeds 50 mr/hr sustained for greater than 30 minutes, the Emergency Director shall declare a General Emergency.

2.3.4 Estimated Cubic Feet or Gallons Released - Indicate cubic feet or gallons of gas or liquid actually or projected to be released.

2.3.5 Dilution Water - Indicate the available dilution water flow rate.

2.3.6 Present Status/Remarks - Provide any information which will aid HP such as indicating if the release is still in progress and if so when will it be terminated.

2.4 Forward FORM EPIP-2.1 to the assigned HP representative as soon as the above steps are complete.

3.0 Health Physics Response

3.1 Determine the Activity Released or Dose Estimates as requested on FORM EPIP 2.1 per the following steps as appropriate.

3.2 Activity Released

3.2.1 If either of the four EPIP's listed below have been initiated by Operations, release data will be generated by that EPIP, in which case proceed to step 3.2.3 below.

EPIP-4 Fuel Handling Accident

EPIP-5 Steam Generator Tube Rupture

EPIP-6 Main Steam Line Rupture

EPIP-7 Loss of Coolant Accident

3.2.2 Select and initiate (based on available information) one or more of the following EPIP's to estimate release:

EPIP-11 Radiation Monitoring System Data

EPIP-12 Station System Inventory Data

EPIP-13 Offsite Radiological Data

3.2.3 As release data is obtained the results are to be entered on FORM EPIP 2.2, "Gaseous Release Evaluation", or FORM EPIP 2.3, "Liquid Release Evaluation", as appropriate. Blank forms and instructions are in Appendix 3 or 4, respectively.

3.2.4 Perform the calculations of equivalent Xe-133 and I-131 and percentage MPC as indicated on FORM EPIP 2.2 or 2.3.



3.0 Health Physics Response (cont.)

3.3 Dose Estimates

3.3.1 Select and initiate one or both of the following EPIP's  
to estimate doses.

EPIP-14 Release Data (requires step 3.2 above)

EPIP-15 Environmental Data

3.4 Enter the requested data on FORM EPIP 2.1, sign and enter the  
date and time and return the form to the originator (Operations)  
or as directed.

UNPLANNED OR UNCONTROLLED RELEASE OF RADIOACTIVE MATERIAL

APPENDIX 1

STABILITY CLASS DETERMINATION

THIS APPENDIX IS TO BE USED TO DETERMINE STABILITY  
CLASS IF THE DELTA T RECORDER IN THE CONTROL ROOM IS INOPERABLE

1. Fluctuation of Wind Direction
2. Rules of Thumb

1.0 Fluctuation of Wind Direction

Wind direction fluctuation is the number of compass point degrees, on the wind direction recorder trace, between the two extreme gusts remaining after ignoring the two most extreme gusts (one on the left, one on the right) occurring during a 15 minute period. This difference in degrees between gusts can then be related to stability class.

2.1 Subtract the degree reading of the gust second in on the left from the degree reading of the gust second in on the right.

2.2 Obtain the stability class from the following table.

DEGREES FLUCTUATION

STABILITY CLASS

> 135	A
105 to 135	B
75 to 104	C
45 to 74	D
23 to 44	E
8 to 22	F
< 8	G

EXAMPLE

The following chart indicates for the last 15 minutes the difference between "second in" gusts is 90 degrees. The stability class would be C.

## 2.0 Rules of Thumb

If appropriate met tower data is not available use the following table to determine stability class.

ESTIMATED WIND SPEED MPH	DAYTIME			NIGHTTIME	
	Amount of sunlight reaching the surface <u>STRONG</u>	<u>MODERATE</u>	<u>SLIGHT</u>	Thin overcast or cloudy	Little Cloudiness
< 4	A	B	B	F	G
4	B	B	C	E	F
9	B	C	C	D	E
> 13	C	D	D	D	D

UNPLANNED OR UNCONTROLLED RELEASE OF RADIOACTIVE MATERIAL

APPENDIX 2

BLANK FORMS EPIP 2.1

REPORT ON INFORMATION SOUGHT BY EMERGENCY COORDINATOR OR DIRECTOR

REPORT ON INFORMATION SOUGHT BY EMERGENCY COORDINATOR OR DIRECTOR

Requested By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Assigned to: \_\_\_\_\_ OPS \_\_\_\_\_ HP

GASEOUS RELEASE DATA

OPS ☐ Meteorological Data. By: \_\_\_\_\_ date/time \_\_\_\_\_

Stability Class \_\_\_\_\_ Determined by \_\_\_\_\_ AT, \_\_\_\_\_ Wind  $\sigma$  \_\_\_\_\_ Rule of Thumb  
Wind Speed \_\_\_\_\_ MPH \_\_\_\_\_ Meters per second (MPH  $\times$  0.45)  
Wind Direction \_\_\_\_\_

OPS ☐ Radiation Monitoring System Data for Unit \_\_\_\_\_.  
EPIP 11 initiated by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

OPS ☐ Source Evaluation Data. By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Source of Release \_\_\_\_\_  
Possible Paths to Environs \_\_\_\_\_  
Actual/Estimated Duration of Release: \_\_\_\_\_ hours  
Actual/Estimated Volume Released: \_\_\_\_\_ cubic ft.  
Present Status/Remarks: \_\_\_\_\_

HP ☐ Activity Released. By: \_\_\_\_\_ date/time \_\_\_\_\_

Curies Xe-133 \_\_\_\_\_ Curies I-131 \_\_\_\_\_  $\times$  MPC (10CFR20)

HP ☐ Dose Estimates. By: \_\_\_\_\_ date/time \_\_\_\_\_

Offsite Whole Body \_\_\_\_\_ rem Onsite Whole Body \_\_\_\_\_ rem  
Offsite Thyroid \_\_\_\_\_ rem Onsite Thyroid \_\_\_\_\_ rem

LIQUID RELEASE DATA

OPS ☐ Source Evaluation Data. By: \_\_\_\_\_ date/time \_\_\_\_\_

Source of Release \_\_\_\_\_  
Possible Paths to Environs \_\_\_\_\_  
Actual/Estimated Duration of Release: \_\_\_\_\_ hours  
Actual/Estimated Volume Released: \_\_\_\_\_ gals. Dilution Water \_\_\_\_\_ GPM  
Present Status/Remarks: \_\_\_\_\_

OPS ☐ Radiation Monitoring System Data for Unit \_\_\_\_\_.  
EPIP 11 initiated by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

HP ☐ Activity Released. By: \_\_\_\_\_ date/time \_\_\_\_\_

Gross Curies of Non Tritium or Gases \_\_\_\_\_  
Curies Tritium \_\_\_\_\_ Curies Gases \_\_\_\_\_  $\times$  MPC (10CFR20)

HP ☐ Dose Estimates. By: \_\_\_\_\_ date/time \_\_\_\_\_

Offsite Whole Body \_\_\_\_\_ rem Onsite Whole Body \_\_\_\_\_ rem  
Offsite Thyroid \_\_\_\_\_ rem Onsite Thyroid \_\_\_\_\_ rem  
Offsite Any Organ \_\_\_\_\_ rem



UNPLANNED OR UNCONTROLLED RELEASE OF RADIOACTIVE MATERIAL

APPENDIX 3

BLANK FORM EPIP 2.2

GASEOUS RELEASE EVALUATION

Results Obtained from	Onsite
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Offsite Data

Remarks/Additional Information:

Sum of Equiv. Ci Xe-133 Released	Total
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Sum of Equiv. Ci I-131 Released		Total
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$$x \text{ MPC} = \frac{X/Q}{8.64 \times 10^4} \times (\text{Total Ci/MPC for Xe} + \text{Total Ci/MPC for I})$$

$$= \frac{X/Q}{8.64 \times 10^4} \times (\text{_____} + \text{_____}) = \text{Times MPC}$$

Results By: \_\_\_\_\_

Date/Time: \_\_\_\_\_

UNPLANNED OR UNCONTROLLED RELEASE OF RADIOACTIVE MATERIAL

APPENDIX 4

BLANK FORMS EPIP 2.3

LIQUID RELEASE EVALUATION

## LIQUID RELEASE EVALUATION

Date/Time of Associated Form EPIP 2.1

Sample Obtained from

Remarks/Additional Information:

[illegible]

Total Non-Tritium or Non-Radiogases

H-3			3E-3		
Total Dissolved Radiogases					

Total Dissolved Radiogases

Calculation of the number of times MPC exceeded averaged over 24 hours

$$\begin{aligned} \text{x MPC} &= \frac{1.83 \times 10^{-7}}{\text{Dilution Water GPM}} \times \text{Total for all } \mu\text{Ci Released/MPC} \\ &= \frac{1.83 \times 10^{-7}}{(\quad)} \times (\quad + \quad + \quad) \\ &= \quad \times \text{MPC} \end{aligned}$$

Results By: \_\_\_\_\_

Date/Time: \_\_\_\_\_

UNPLANNED OR UNCONTROLLED RELEASE OF  
RADIOACTIVE MATERIAL

APPENDIX 5

DOSE EQUIVALENT FACTORS AND MPCs  
FOR VARIOUS NUCLIDES

DOSE EQUIVALENT FACTORS AND MPC's FOR VARIOUS NUCLIDES

<u>NUCLIDE</u>	<u>DOSE EQUIVALENT FACTOR</u>	<u>MPC - AIR UNRESTRICTED</u>	<u>MPC - WATER UNRESTRICTED</u>
H-3	6.4 E + 0	2 E - 7	3 E - 3
Kr-85	8.8 E - 2	3 E - 7	-----
Kr-85m	5.2 E + 0	1 E - 7	-----
Kr-87	5.2 E - 3	2 E - 8	-----
Kr-88	6.1 E + 1	2 E - 8	-----
Xe-131m	1.1 E + 1	4 E - 7	-----
Xe-133	1.0 E + 0	3 E - 7	-----
Xe-133m	1.1 E + 0	3 E - 7	-----
Xe-135	8.4 E + 0	1 E - 7	-----
Mn-54	7.0 E + 2	1 E - 9	1 E - 4
Mn-56	1.9 E + 2	2 E - 8	1 E - 4
Fe-59	1.6 E + 3	2 E - 9	5 E - 5
Co-58	7.7 E + 2	2 E - 9	9 E - 5
Co-60	2.0 E + 3	3 E - 10	3 E - 5
Cr-51	3.3 E + 1	8 E - 8	2 E - 3
Sr-89	1.6 E + 4	3 E - 10	3 E - 6
Sr-90	1.7 E + 4	3 E - 10	3 E - 7
Sr-91	2.9 E + 2	9 E - 9	5 E - 5
Zr-95	1.4 E + 3	1 E - 9	6 E - 5
Mo-99	1.0 E + 2	7 E - 9	4 E - 5
Ru-106	9.1 E + 3	2 E - 10	1 E - 5
Te-132	3.9 E + 2	4 E - 9	2 E - 5
Cs-134	5.1 E + 3	4 E - 10	9 E - 6
Cs-136	9.1 E + 2	6 E - 9	6 E - 5
Cs-137	2.8 E + 3	5 E - 10	2 E - 5
Ba-140	2.0 E + 3	1 E - 9	2 E - 5
Ce-144	8.6 E + 3	2 E - 10	1 E - 5
I-131	1.0 E + 0	1 E - 10	3 E - 7
I-132	3.8 E - 2	3 E - 9	8 E - 6