NEW YORK POWER AUTHORITY
INDIAN POINT NO. 3 NUCLEAR POWER PLANT
EMERGENCY PLAN - VOLUME III
IMPLEMENTING PROCEDURES

INDEX - REV. #85
(Cont'd)

PROCEDURE #	PROCEDURE TITLE	REV.	DATE
Accountability and Evacuation			
IP-1050	Accountability	20	08/93
IP-1053	Evacuation of Site	8	03/94
IP-1054	Search and Rescue Teams	8	09/93
Non-Radiological Emergencies			
IP-1052	Hazardous Waste Emergency	5	07/93
IP-1055	Fire Emergency Response	9	04/92
IP-1057	Natural Phenomena Emergency	5	11/93
IP-1059	Air Raid Alert	4	10/92
H.P. Release Surveys and Decontamination			
IP-1060	Personnel Radiological Check and Decontamination	9	11/93
IP-1063	Vehicle/Equipment Radiological Check and Decontamination	9	09/93
Emergency Equipment and Maintenance			
IP-1070	Periodic Check of Emergency Preparedness Equipment	25	08/93
IP-1076	Beepers	15	08/93
IP-1085	Maintenance of Emergency Preparedness at IP-3	5	08/93
Exercises, Drills, and Training			
IP-1080	Conduct of Emergency Exercises and Drills	13	12/93

Superseded per 10585 EP IPs 50-286 4/26/94
Per Rev 9405240027

MAR 1994

NEW YORK POWER AUTHORITY
INDIAN POINT NO. 3 NUCLEAR POWER PLANT
EMERGENCY PLAN - VOLUME III

IMPLEMENTING PROCEDURES

INDEX - REV. #85

EMERGENCY PLAN - VOLUME II
EMERGENCY RESPONSE ACTIVATION

EP-FORMS INDEX

EP-FORM #	EP-FORM TITLE	CORRESPONDING PROCEDURE	DATE
1A	Flowchart for Determining Release Rate	IP-1001	12/93
1B	Flowchart for Site Boundary/Point of Interest Dose Calculation	IP-1001	03/94
4	Control Room Emergency Staffing Chart	N/A	12/93
5	Environmental TLD and Air Sample Readout	IP-1011	07/93
6	Emergency Exposure Summary Sheet	N/A	03/93
7	Authorization to Receive Emergency Personnel Exposures	IP-1027	12/93
8	EOF to AEOF Relocation Information	N/A	09/93
12	Ambulance and Attendant Survey Form	IP-1021	11/92
13	Fire Fighter Exposure Record	IP-1055	04/92
14	Personnel Contamination Check	IP-1060	11/93
15	Skin Decontamination Record	IP-1060	11/93
16	Vehicle Contamination Check	IP-1063	09/93
17	Equipment Contamination Check	IP-1063	09/93
18	OSC Emergency Briefing Form	IP-1025	12/93
19	NYPA Communications Message Form	N/A	08/93
20	SAM-2/RD-22 Determination of Radioactive Airborne Concentrations	IP-1012	03/93
21	E-140N or RM-14/HP-210 Determination of Radioactive Airborne Concentrations	IP-1012	03/93
22	MS-2/SPA-3 Determination of Radioactive Airborne Concentrations	IP-1012	03/93
27	Offsite Survey Team Data	IP-1011	07/93

EMERGENCY PLAN - VOLUME II
EMERGENCY RESPONSE ACTIVATION

EP-FORMS INDEX
(CONT'D)

EP-FORM #	EP-FORM TITLE	CORRESPONDING PROCEDURE	DATE	
Part I	New York State Radiological Emergency Data Form, Part I - General Information	IP-1038	03/94	R
Part II	New York State Radiological Emergency Data Form, Part II - Radiological Assessment Data	IP-1038	03/94	R
31a	Plant Status Log (measurements)	N/A	12/93	
31b	Plant Status Log (rad. monitors)	N/A	07/92	
31c	Plant Status Log (equipment status)	N/A	12/92	
40	Manual Dose Projection Worksheet	N/A	12/93	
42	EOF Radiological Survey	IP-1040	12/93	
45	EOF Personnel Dosimetry Record	IP-1040	12/93	
46	EOF Staffing Chart	N/A	03/93	
47	Visitors Log	N/A	03/93	
48	RADCOM Worksheet	IP-1011	07/93	

New York Power Authority

DOSE ASSESSMENT CALCULATIONS

Site Boundary

DATA:				
	W/S _____ (m/sec)	W/D _____ (Deg)	Pasquill _____	Xμ/Q(SB) _____
	Release Duration _____ (hr)	RR (NG) _____ (Note 1)	RR (I) _____ (Note 1)	

TEDE - WHOLE BODY

$$\text{NG: (DDE)}\ \frac{\text{\_\_\_\_\_}}{X\mu/Q\ (SB)\ \text{(Table 2A)}} \times \frac{\text{\_\_\_\_}}{RR_{(NG)}/WS} \times \frac{\text{\_\_\_\_\_}}{DCF_{NG}\ \text{(Table 3B)}} = \frac{\text{\_\_\_\_\_}}{\text{mR/hr (NG)}} \qquad \text{Eq 1}$$

$$\text{I: (CEDE)}\ \frac{\text{\_\_\_\_\_}}{X\mu/Q\ (SB)\ \text{(Table 2A)}} \times \frac{\text{\_\_\_\_}}{RR_{(I)}/WS} \times \frac{3.3E7}{DCF_{I\ CEDE}\ \text{(Table 3B)}} = \frac{\text{\_\_\_\_\_}}{\text{mR/hr } (I_{CEDE})} \qquad \text{Eq 2}$$

$$\text{TEDE} = \left(\frac{\text{\_\_\_\_\_}}{\text{mR/hr(NG) From EQ 1}} + \frac{\text{\_\_\_\_\_}}{\text{mR/hr } (I_{CEDE})\ \text{From EQ 2}}\right) \times \frac{\text{\_\_\_\_\_}}{\text{Release Duration (hours)}} \times \frac{1E\text{-}3}{\text{Rem/mR}} = \frac{\text{\_\_\_\_\_}}{\text{SB TEDE}}\ \text{Rem} \qquad \text{Eq 3}$$

TODE - THYROID

$$\text{I: (CDE)}\ \frac{\text{\_\_\_\_\_}}{X\mu/Q\ (SB)\ \text{(Table 2A)}} \times \frac{\text{\_\_\_\_}}{RR_{(I)}/WS} \times \frac{8.0E8}{DCF_{I\ CDE}\ \text{(Table 3A) (Note 3)}} = \frac{\text{\_\_\_\_\_}}{\text{mR/hr } (I_{CDE})} \qquad \text{Eq 4}$$

$$\text{TODE} = \left(\frac{\text{\_\_\_\_\_}}{\text{mR/hr(NG) From EQ 1}} + \frac{\text{\_\_\_\_\_}}{\text{mR/hr } (I_{CDE})\ \text{From EQ 4}}\right) \times \frac{\text{\_\_\_\_\_}}{\text{Release Duration (hours)}} \times \frac{1E\text{-}3}{\text{Rem/mR}} = \frac{\text{\_\_\_\_\_}}{\text{SB TODE}}\ \text{Rem}$$

New York Power Authority

DOSE ASSESSMENT CALCULATIONS

Point of Interest

SB TEDE = _____ Rem

SB TODE = _____ Rem

SB $X\mu/Q$ = _____

POI (miles)	POI $X\mu/Q$	CF ($X\mu/Q$ POI / $X\mu/Q$ SB)	POI TEDE (SB TEDE X CF)	POI TODE (SB TODE X CF)
2 mi				
5 mi				
10 mi				
other				

NOTES -

1. Use release rates determined from EP Flowchart 1A
2. For site boundary, 2, 5, 10 miles, Reuter Stokes and Verification point $X\mu/Q$ values use Table 2A, att. 4.5 and 5, att. 4.8 and 6, att 4.9. For all other P.O.I.'s see Table 2B, att. 4.5.
3. Table 3A and 3B, dose correction factors are on att. 4.6.

New York Power Authority / Indian Point 3 / Con Edison / Indian Point 2

RADIOLOGICAL EMERGENCY DATA FORM

Part 1

Notification # _____ A

Via RECS Line	Via PHONE	At ALERT or higher:
☐ New York State ☐ Orange Cnty ☐ NYPA	☐ NRC HQ (ENS)	☐ ANI
☐ Westchester Cnty ☐ Putnam Cnty ☐ Con Edison	☐ NRC (Resident)	☐ INPO
☐ Rockland Cnty ☐ City of Peekskill		

1. This message is being transmitted on: _____ (Date) at: _____ (Time) ☐ AM ☐ PM VIA: ☐ A. RECS ☐ B. Other _____

2. ☐ This is..... A. NOT an Exercise B. An Exercise

3. ☐ THE FACILITY PROVIDING THIS INFORMATION IS: A. INDIAN POINT NUMBER 2 B. INDIAN POINT NUMBER 3

4. ☐ The Emergency Classification is: A. Unusual Event B. Alert C. Site Area Emergency D. General Emergency E. Emergency Terminated F. Recovery G. Transportation Incident

5. This Emergency Classification declared on: _____ (Date) at: _____ (Time) ☐ AM ☐ PM

6. ☐ Release of Radioactive Materials
A. No Release *(Above Technical Specifications limits)*
B. Release to the Atmosphere *(Above Technical Specifications limits)*
C. Release to a Body of Water *(Above Technical Specifications limits)*

Protective Action Recommendations:

7. ☒
A. No need for Protective Actions outside the site boundary.
B. EVACUATE the following ERPAs:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50 51

C. SHELTER all remaining ERPAs.

EAL #: ☐ _____

8. Brief Event Description: _____

9. ☐ The Plant status is: A. Stable B. Improving C. Degrading D. Hot Shutdown E. Cold Shutdown

10. ☐ Reactor Shutdown: A. Not Applicable B. _____ (Date) at: _____ (Time) ☐ AM ☐ PM

11. Wind Speed: _____ Meters/Second at elevation _____ meters.

12. Wind Direction: (From) _____ Degrees at elevation _____ meters.

13. ☐ Stability Class: A B C D E F G

14. Reported By: *(Communicator's Name)* _____ at Tel. Number (914) _____

Emergency Director Review/Signature	*Message Ended At:*
_____	_____

MAR 1994

EP-FORM PART II NEW YORK STATE RADIOLOGICAL EMERGENCY DATA FORM NOTIFICATION # B

RADIOLOGICAL ASSESSMENT DATA NYPA Indian Point #3

15. Message transmitted at: DATE:_____ TIME:_____ FROM:_____

16. General release information:

A. RELEASE > TECH. SPEC. STARTED AT:
DATE:_____ TIME:_____

B. PROJECTED DURATION OF RELEASE:_____(hrs.)

C. RELEASE >TECH.SPEC.ENDED DATE:_____ TIME:_____

D. REACTOR SHUTDOWN: N/A OR DATE:_____ TIME:_____

E. WIND SPEED:_____M/SEC.
AT ELEVATION:_____(METERS)

F. WIND DIRECTION:(FROM)_____DEGREES
AT ELEVATION:_____(METERS)

G. STABILITY CLASS:_____(PASQUILL A-G)

17. Atmospheric release information:

A. RELEASE FROM: GROUND LEVEL FT.

B. IODINE/NOBLE GAS RATIO:_____
(Assumed or Actual)

C. TOTAL RELEASE RATE:_____Ci/SEC.

D. NOBLE GAS RELEASE RATE:_____Ci/SEC.

E. IODINE RELEASE RATE:_____Ci/SEC.

F. PARTICULATE RELEASE RATE:_____Ci/SEC.

18. Waterborne release information:

A. VOLUME OF RELEASE:_____GALLONS

B. TOTAL CONCENTRATION (gross):_____µCi/ml

C. RADIONUCLIDES IN RELEASE:_____

D. TOTAL ACTIVITY RELEASED:_____

19. Dose calculations (based on release duration of_____ hrs.):

CALULATION IS BASED ON: (circle one)
A. INPLANT MEASUREMENTS
B. FIELD MEASUREMENTS
C. ASSUMED SOURCE TERM

TABLE BELOW APPLIES TO: (circle one)
A. ATMOSPHERE RELEASE
B. WATERBORNE RELEASE

DISTANCE	X/Q	DOSE TEDE (REM)	DOSE TODE (REM)
SITE BOUNDARY			
2 MILES			
5 MILES			
10 MILES			
MILES			

20. Field measurement of dose rates or surface contamination/deposition:

MILE/SECTOR OR MILES/DEGREES	LOCATION OR SAMPLING POINT	TIME OF READING	DOSE RATE (mR/HR.) OR CONTAMINATION (µCi/m²)

REMARKS:

ED Review:_____

NEW YORK POWER AUTHORITY
INDIAN POINT NO. 3 NUCLEAR POWER PLANT
VOLUME II
EMERGENCY RESPONSE ACTIVATION

APPENDIX 'A'

PERSONNEL CALL-IN ROSTERS

1A

NEW YORK POWER AUTHORITY
INDIAN POINT NO. 3 NUCLEAR POWER PLANT
VOLUME II
EMERGENCY RESPONSE ACTIVATION

APPENDIX 'C'

EMERGENCY RESPONSE FACILITY TELEPHONE LIST

New York Power Authority

DOSE ASSESSMENT CALCULATIONS

Site Boundary

DATA:				
	W/S _____ (m/sec)	W/D _____ (Deg)	Pasquill _____	Xμ/Q(SB) _____
	Release Duration _____ (hr)	RR (NG) _____ (Note 1)	RR (I) _____ (Note 1)	

TEDE - WHOLE BODY

$$\text{NG: (DDE)}\ \frac{\text{Xμ/Q (SB)}}{\text{(Table 2A)}} \times \frac{\quad}{\text{RR}_{(NG)}/\text{WS}} \times \frac{\quad}{\text{DCF}_{NG}\ \text{(Table 3B)}} = \frac{\quad}{\text{mR/hr (NG)}} \qquad \text{Eq 1}$$

$$\text{I: (CEDE)}\ \frac{\text{Xμ/Q (SB)}}{\text{(Table 2A)}} \times \frac{\quad}{\text{RR}_{(I)}/\text{WS}} \times \frac{3.3\text{E}7}{\text{DCF}_{I\ CEDE}\ \text{(Table 3B)}} = \frac{\quad}{\text{mR/hr } (I_{CEDE})} \qquad \text{Eq 2}$$

$$\text{TEDE} = \left(\frac{\quad}{\text{mR/hr(NG)}\ \text{From EQ 1}} + \frac{\quad}{\text{mR/hr } (I_{CEDE})\ \text{From EQ 2}}\right) \times \frac{\quad}{\text{Release Duration (hours)}} \times \frac{1\text{E-}3}{\text{Rem/mR}} = \frac{\quad}{\text{SB TEDE}}\ \text{Rem} \qquad \text{Eq 3}$$

TODE - THYROID

$$\text{I: (CDE)}\ \frac{\text{Xμ/Q (SB)}}{\text{(Table 2A)}} \times \frac{\quad}{\text{RR}_{(I)}/\text{WS}} \times \frac{8.0\text{E}8}{\text{DCF}_{I\ CDE}\ \text{(Table 3A) (Note 3)}} = \frac{\quad}{\text{mR/hr } (I_{CDE})} \qquad \text{Eq 4}$$

$$\text{TODE} = \left(\frac{\quad}{\text{mR/hr(NG)}\ \text{From EQ 1}} + \frac{\quad}{\text{mR/hr } (I_{CDE})\ \text{From EQ 4}}\right) \times \frac{\quad}{\text{Release Duration (hours)}} \times \frac{1\text{E-}3}{\text{Rem/mR}} = \frac{\quad}{\text{SB TODE}}\ \text{Rem}$$

New York Power Authority

DOSE ASSESSMENT CALCULATIONS

Point of Interest

SB TEDE = _____ Rem

SB TODE = _____ Rem

SB $X\mu/Q$ = _____

POI (miles)	POI $X\mu/Q$	CF $(X\mu/Q\ POI)/(X\mu/Q\ SB)$	POI TEDE (SB TEDE X CF)	POI TODE (SB TODE X CF)
2 mi	_____	_____	_____	_____
5 mi	_____	_____	_____	_____
10 mi	_____	_____	_____	_____
_____ other	_____	_____	_____	_____

NOTES -

1. Use release rates determined from EP Flowchart 1A
2. For site boundary, 2, 5, 10 miles, Reuter Stokes and Verification point $X\mu/Q$ values use Table 2A, att. 4.5 and 5, att. 4.8 and 6, att 4.9. For all other P.O.I.'s see Table 2B, att. 4.5.
3. Table 3A and 3B, dose correction factors are on att. 4.6.

Indian Point 3
Nuclear Power Plant
P.O. Box 215
Buchanan, New York 10511

914-736-8000

New York Power Authority

EMERGENCY PLAN PROCEDURES

PROCEDURE NO. IP-1015 REV. 5

TITLE: POST ACCIDENT ENVIRONMENTAL SAMPLING AND COUNTING

WRITTEN BY: Mary Lou Chouband 3/23/94
SIGNATURE/DATE

REVIEWED BY: Dara Gay 3/24/94
SIGNATURE/DATE

PORC REVIEW: W D Hamil 3/28/94
SIGNATURE/DATE

APPROVED BY: D Gay for DQ 3/28/94
SIGNATURE/DATE

EFFECTIVE DATE: 04/04/94

IP-1015

POST ACCIDENT ENVIRONMENTAL SAMPLING AND COUNTING

TABLE OF CONTENTS

IP-1015

POST ACCIDENT ENVIRONMENTAL SAMPLING AND COUNTING

1.0 PURPOSE

This procedure describes the environmental sampling and counting which may be requested following a release of radioactive material to the environment. R

2.0 RESPONSIBILITIES

2.1 The Emergency Director (ED)/Resident Manager (RM) is responsible for requesting post accident environmental sampling when a radiological release to the environment is suspected or known to have occurred.

2.2 The Radiological Assessment Team Leader (RATL)/Radiological and Environmental Services Manager (RESM) is responsible for reviewing the sampling/counting results and informing the ED/RM. With ED approval, the RATL is responsible for requesting assistance from Con Edison. A

3.0 REFERENCES

3.1 Con Edison Procedure IP-1004, "Post Accident Offsite Environmental Surveys, Sampling and Counting"

3.2 IP-1011, "Offsite Monitoring/Site Perimeter Surveys".

4.0 PROCEDURE D

4.1 EVALUATE the need for post accident environmental sampling and counting with assistance from the RATL/RESM. The following conditions should be considered:

A. Discharge:
- Isotopes involved
- Number of curies
- Particulates involved
- Length of time
- Half life of isotopes
- Specific concentrations in the environmental ambient air

B. Weather conditions at time of sampling
C. Seasonal considerations affecting sample availability
D. Areas to be sampled

4.2 DEVELOP a post accident sampling plan if sampling is needed.

4.3 REQUEST the Con Edison Nuclear Environmental Monitoring (NEM) organization perform the sampling. Utilize the Con Edison Emergency Plan Implementing Procedure IP-1004, "Post Accident Offsite Environmental Surveys, Sampling and Counting". Sample counting may be performed by JAF Environmental Lab or Teledyne Isotopes in Westwood, New Jersey. R

4.4 CONSIDER the following to determine the nature and frequency of sampling and counting. R

A. Incident conditions (i.e., whether there has been a radioactive release from the plant, magnitude of the release if any, etc.);

B. Environmental conditions (i.e., seasonal considerations affecting sample availability, weather, etc.);

C. Data collected (i.e., if sampling indicates significantly different values from historical data, etc.);

D. Recommendations from the RATL.

4.5 USE as guidance Attachment 5.1, "Table 1 - Post Accident Sampling Locations" when requesting post accident environmental sampling locations and Attachment 5.2, "Table 2 - Post Accident Sampling Frequency Guidelines" after the termination of the release. R

4.6 NOTIFY the New York State (NYS) Bureau of Environmental Radiation Protection, Dose Assessment Group at the NYS Emergency Operations Center, and the County EOCs (Westchester, Rockland, Orange, and Putnam) that sampling is to begin. Coordinate sampling efforts with NYS/Counties, where feasible. (NYS and County EOC phone numbers are listed in Appendix 'B', Volume II of the Emergency Plan.) A

4.7 REVIEW results of the survey and forward the information to NYS/Counties (see 4.6 above).

5.0 ATTACHMENTS

5.1 Post Accident Sampling Locations

5.2 Post Accident Sampling Frequency Guidelines

ATTACHMENT 5.1

TABLE 1
POST ACCIDENT SAMPLING LOCATIONS

SECTOR	MILES	LOCATION	SAMPLE TYPE
1	10.8	Cold Spring	Shoreline soil, aquatic vegetation, bottom sediment
1	20.0	Roseton	Precipitation, air particulate, gamma, radioiodine, soil, broad leaf vegetation
2	0.5	Lent's Cove	Shoreline soil, aquatic vegetation, gamma
2	1.75	Peekskill Gas Holder Building	Precipitation, air particulate, radioiodine
3	0.8	Charles Point	Gamma
3	3.5	Camp Field Reservoir	Drinking water
4	4.8	Pine Road, Cortlandt	Gamma
5	On Site	Bleakley and Broadway	Gamma
5	5.0	Croton Avenue, Cortlandt	Gamma
6	0.5	Sector 6 - Reuter Stokes Pole	Gamma
7	On Site	Water Meter House	Gamma
7	3.5	9A North of Furnace Dock	Gamma
8	On Site	Service Building	Gamma
8	6.4	Croton Point	Air particulate, radioiodine, gamma
9	1.6	Cortlandt Yacht	Gamma
9	1.5	Gays Hill Rd. So.	Gamma
10	0.25	Algonquin Gas Line	Air particulate, radioiodine
10	0.6	Met Tower	Air particulate, radioiodine, soil, broad leaf vegetation
10	0.9	White Beach	Shoreline soil, gamma
10	1.0	NYU Tower	Air particulate, radioiodine, gamma, soil, broad leaf vegetation

ATTACHMENT 5.1

TABLE 1
POST ACCIDENT SAMPLING LOCATIONS

SECTOR	MILES	LOCATION	SAMPLE TYPE
10	1.5	Off Verplanck	Hudson River water, shoreline soil
10	3.3	Grassy Point	Air particulate, radioiodine, gamma
10	4.6	Railroad Avenue and Rte. #9W	Gamma
11	5.0	Willow Grove Road and Birch Drive	Gamma
12	On Site	Discharge Canal	Hudson River water
12	1.5	Lovett	Air particulate, radioiodine
12	5.0	Sign 2 miles so. of Exit 18 Palisades Parkway Southbound	Gamma
13	1.2	Gays Hill Rd. No.	Gamma
14	On Site	Inlet Pipe into Plants	Hudson River water
14	1.2	Rte. #9W - Across from R/S #14	Gamma
15	1.0	Rte. #9W - South of Ayers Road	Gamma
15	4.7	Palisades Parkway Lake Welch	Gamma
16	0.9	Ayers Road	Gamma
16	4.5	Manitou Inlet	Shoreline soil
16	5.0	Rte. #9W - Fort Montgomery	Gamma
86 *	86 *	Near Site	Fish, Crabs, Clams
99 **	99 **	Near Site	Broad Leaf Vegetation

86* Samples of fish, crabs, and clams should be collected where available near site.

99** Broad leaf vegetation should be collected where available near site.

IR

ATTACHMENT 5.2

TABLE 2
POST ACCIDENT SAMPLING FREQUENCY GUIDELINES

Once the release has been terminated, the following guidelines are provided for air and water releases:

f_s - short term 0 to 2 days
f_l - long term 3 days to 3 months

1. WATER RELEASE (To Hudson River)

If there is a significant release to the river (e.g., > 100 Ci), the following sampling guidelines should be considered in developing the post accident sampling plan. If there is a release of less than 100 Ci, the sampling plan should be reduced accordingly.

Sample Type	Sample Source	Locations	Frequency
Surface water	Grab Sample	Table 1 sample points - every 1/2 mile up river to 3 miles - every 1/2 mile down river to 5 miles	f_s - 2/day f_l - weekly 1 sample from incoming tide 1 sample from outgoing tide
Biota	Fish, crabs, clams	Table 1 sample points where available	f_s - 1/day f_l - 1/week
Shoreline sediment		Table 1 sample points	f_s - 1/day f_l - 1/week

2. AIR RELEASE

Sample Type	Sample Source	Locations	Frequency
Air Particulate Radioiodine		Table 1 locations IP-1011 locations in affected sections	f_s - 1/day f_l - 1/week
Direct gamma	TLD	All TLD locations	After release is terminated and as scheduled thereafter. Monitor frequently during release.
	Reuter Stokes	16 locations	

ATTACHMENT 5.2

TABLE 2
POST ACCIDENT SAMPLING FREQUENCY GUIDELINES

2. AIR RELEASE (CONT'D)

Sample Type	Sample Source	Locations	Frequency	
Grass and broad leaf vegetation		Table 1 locations and random gardens in affected sectors	f_s = once f_1 = 1/week	A
Fallout	Precipitation	Table 1 precipitation locations if raining	Daily	D
Drinking water	Grab	Table 1 locations and others, depending upon magnitude of the release	f_s = 1/day in affected sectors f_1 = 1/week in affected sectors	
River fish, crabs, clams		Table 1 sample points, where available	If estimated 1 or more curies are deposited on river.	D

Indian Point 3
Nuclear Power Plant
P.O. Box 215
Buchanan, New York 10511

914-736-8000

New York Power Authority

EMERGENCY PLAN PROCEDURES

PROCEDURE NO. IP-1017 REV. 11

TITLE: PROTECTIVE ACTION RECOMMENDATIONS

FOR THE OFFSITE POPULATION

WRITTEN BY: Maryann Claubaud 3/23/94
SIGNATURE/DATE

REVIEWED BY: [signature] 3-24-94
SIGNATURE/DATE

PORC REVIEW: [signature] 3/25/94
SIGNATURE/DATE

APPROVED BY: [signature] 3/25/94
SIGNATURE/DATE

EFFECTIVE DATE: 04/04/94

IP-1017

PROTECTIVE ACTION RECOMMENDATIONS FOR THE OFFSITE POPULATION

TABLE OF CONTENTS

A

IP-1017

PROTECTIVE ACTION RECOMMENDATIONS FOR THE OFFSITE POPULATION

1.0 PURPOSE

This procedure describes the methods to be used by the Emergency Director (ED) in determining the protective actions to recommend to New York State (NYS) and County authorities.

2.0 RESPONSIBILITIES

2.1 The ED is responsibile for making protective action recommendations (PARs) when the "Initiating Conditions/Emergency Action Levels" indicate that a General Emergency is declared or when such actions are deemed necessary.

2.2 The decision to initiate the recommended protective actions is the responsibility of NYS and County authorities.

R

3.0 REFERENCES

3.1 Environmental Protection Agency (EPA) Protective Action Guidelines (PAGs) 400-R-92-001

3.2 Initiating Conditions/Emergency Action Levels, Volume II, Emergency Plan

3.3 RTM-91 Response Technical Manual, NUREG/BR-0150

3.4 NRC IE Notice 83-28, "Flowchart for General Emergency Offsite Protective Decisions"

3.5 IP-1001 - Determining the Magnitude of Release

A

4.0 PROCEDURE

4.1 TAKE appropriate steps for onsite personnel when PARs are made for the offsite population.

4.2 CONSIDER for all PARs the principle of maintaining radiation exposures as low as reasonably achievable (ALARA).

4.3 MAKE PARs when a General Emergency is declared in accordance with Attachment 5.1, "Flowchart for General Emergency - Offsite Protective Action Recommendations".

4.4 BASE PARs on either plant conditions or on actual releases. All recommendations shall be made on the basis of the Emergency Response Planning Areas (ERPAs).

4.5 MAKE initial PARs within 15 minutes of a General Emergency declaration.

4.6 TRANSMIT to NYS/Counties via NYS Radiological Data Form, Part I.

4.7 RE-EVALUATE the PARs based on the following:

- Source term
- Release duration
- Chemistry sample
- Meteorology/forecast data
- Field data
- EPA PAGs (Attachment 5.2)
- ERPAs affected (Attachment 5.3)
- NYS/County actions

D

5.0 ATTACHMENTS

5.1 Flowchart for General Emergency - Offsite Protective Action Recommendations and Conversion of Sector/Zones to ERPAs

5.2 Environmental Protection Agency (EPA) Protective Action Guidelines (PAGs)

5.3 10-Mile Emergency Planning Zone Map

D

END OF TEXT

ATTACHMENT 5.1

FLOWCHART FOR GENERAL EMERGENCY
OFFSITE PROTECTIVE ACTION RECOMMENDATIONS

GENERAL EMERGENCY DECLARED

↓

EVACUATE: (1)	2-MILE RADIUS	TABLE I
	2-5 MILES DOWNWIND	TABLE IIA, B, C
SHELTER:	ALL REMAINING ERPAS WITHIN THE 10-MILE RADIUS	

R

↓

CONTINUE ASSESSMENT AND MODIFY PARS BASED ON:

SOURCE TERM	CHEMISTRY SAMPLE
EPA PAGS	ERPAS AFFECTED
FIELD DATA	RELEASE DURATION
NYS/COUNTY ACTION	METEOROLOGICAL/FORECAST DATA

(1) EVACUATION NOTES:

- FOR ALL EVACUATIONS, SHELTER THE REMAINING ERPAS AND PROMPTLY RELOCATE THE POPULATION AFFECTED BY ANY GROUND CONTAMINATION FOLLOWING PLUME PASSAGE.

R

- DISTANCES ARE APPROXIMATE. ACTUAL DISTANCES ARE BASED ON ERPA BOUNDARIES (ATTACHMENT 5.3).
- CONSIDER EPA PAGS (ATTACHMENT 5.2). EVACUATION MAY BE REQUIRED BEYOND THE 2-MILE RADIUS AND 5 MILES DOWNWIND IF THE PAGS ARE EXPECTED TO BE EXCEEDED.
- CONDITIONS MAY EXIST (E.G., PUFF RELEASE) WHERE SHELTERING SHOULD BE RECOMMENDED.

SEE PAGE 2 FOR 'SECTOR/ZONE TO ERPA' CONVERSION TABLES.

ATTACHMENT 5.1

FLOWCHART FOR GENERAL EMERGENCY
OFFSITE PROTECTIVE ACTION RECOMMENDATIONS

TABLE I - 0-2 MILE RADIUS - Evacuate all ERPAs including river ERPAs.

1, 2, 3, 4, 7, 29, 30, 38, 39, 42, 43, 44, 45, 46

TABLE IIA - 2-5 MILE RADIUS

Up-Valley Plumes (wind speed < 4 m/sec and wind direction from 102-209)	
All Pasquil Categories	ERPAs 8, 9, 16, 18, 26

TABLE IIB - 2-5 MILE RADIUS

Down-Valley Plumes (wind speed < 4 m/sec and wind direction from 340-101)	
Pasquill Categories	ERPAs affected
A, B	5, 6, 31, 47, 48, 49
C, D, E, F, G	6, 31, 47, 48

TABLE IIC - 2-5 MILE RADIUS

Cross-Valley (wind speed > 4 m/sec OR wind direction 210-339)			
Wind Direct From (deg)	Center Sector No	Pasquil Categories A & B ERPAs affected	Pasquil Categories C-G ERPAs affected
169 - 190	1 N	8,9,16,18,24,26	8,16,18,26
191 - 213	2 NNE	8,9,16,18, 26	8,9,16,18
214 - 235	3 NE	8,9,16,18, 49	8,9,16,18
236 - 258	4 ENE	5,8,9,16,18,48,49	8,9,49
259 - 280	5 E	5,6,8,9,47,48,49	5,8,9,47,48,49
281 - 303	6 ESE	5,6,8,9,47,48,49	5,6,9,47,48,49
304 - 325	7 SE	5,6,9,31,47,48,49	5,6,47,48, 49
326 - 348	8 SSE	5,6,31,47,48,49	5,6,31,47,48,49
349 - 010	9 S	5,6,31,47,48,49	6,31,47,48
011 - 033	10 SSW	6,31,40,47,48	31
034 - 055	11 SW	31,40	31,40
056 - 078	12 WSW	31,40	31,40
079 - 100	13 W	24,26,31,40	40
101 - 123	14 WNW	16,24,26,40	24,26,40
124 - 145	15 NW	8,16,24,26,40	16,24,26,40
146 - 168	16 NNW	8,16,18,24,26,40	8,16,24,26,40

R

ATTACHMENT 5.2

EPA PROTECTIVE ACTION GUIDELINES

Recommended protective actions to reduce whole body and thyroid dose from exposure to a gaseous plume.

PROJECTED DOSE (REM) TO THE POPULATION		RECOMMENDED ACTIONS (a)	COMMENTS
Whole Body (TEDE) Thyroid (TODE)	< 1 < 5	No planned protective actions. (b) State may issue an advisory to seek shelter* and await further instructions. Monitor environmental radiation levels.	Previously recommended protective actions may may be reconsidered or or terminated.
Whole Body (TEDE) Thyroid (TODE)	≥ 1 ≥ 5	Evacuate unless constraints make it impractical; then shelter. Monitor environmental radiation levels. Control access.	If constraints exist, special consideration should be given for evacuation of children and pregnant women.

GUIDANCE ON DOSE LIMITS FOR WORKERS PERFORMING EMERGENCY SERVICES (REM)

Whole Body (TEDE):		
10	Protecting valuable property	Lower dose not practicable.
25	Lifesaving or protection of large populations.	Lower dose not practicable.
> 25	Lifesaving or protection of large populations.	Only on a voluntary basis to persons fully aware of the risks involved.

TEDE - Total Effective Dose Equivalent: Sum of external effective dose equivalent and committed effective dose equivalent to nonpregnant adults from exposure and intake during an emergency situation. Workers performing services during emergencies should limit dose to the lens of the eye to three times the listed value and doses to any other organ (including skin and body extremities) to ten times the listed value.

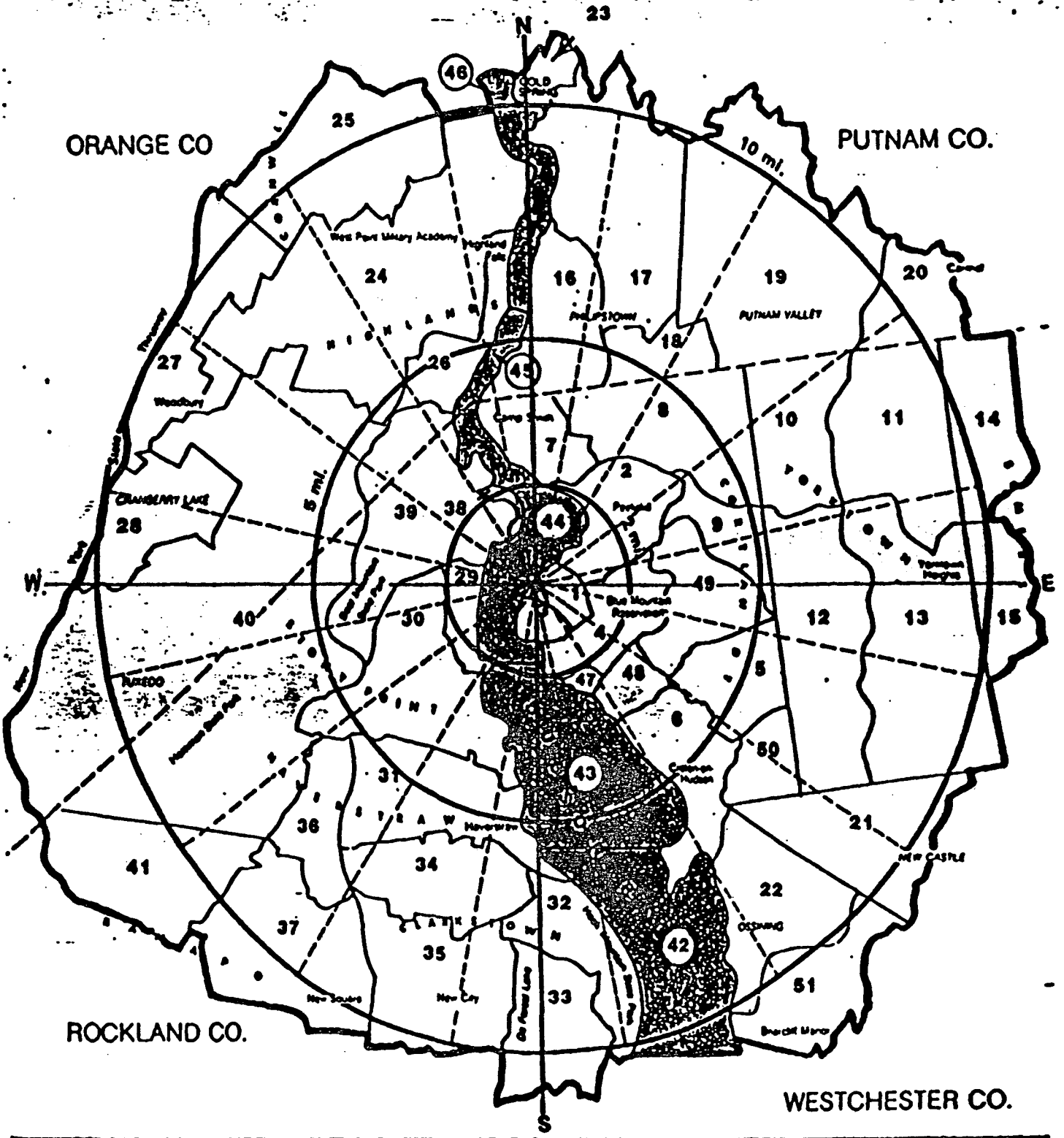
TODE - Total Organ Dose Equivalent: Sum of external effective dose equivalent and committed dose equivalent (to the Thyroid).

(a) These actions are recommended for planning purposes. Protective action decisions at the time of the incident must take existing conditions into consideration.

(b) At the time of the incident, officials may implement low-impact protective actions in keeping with the principle of maintaining radiation exposures as low as reasonably achievable (ALARA).

* Sheltering is recommended to heighten awareness only.

VOLUME III
IP-1017
ATTACHMENT 5.3



★ Indian Point Nuclear Power Plants

MAR 1994

10-Mile Emergency Planning Zone

Indian Point 3
Nuclear Power Plant
P.O. Box 215
Buchanan, New York 10511

914-736-8000

New York Power Authority

EMERGENCY PLAN PROCEDURES

PROCEDURE NO. IP-1028 REV. 6

TITLE: CORE DAMAGE ASSESSMENT

WRITTEN BY: Michael H Cochrane 02/04/94
SIGNATURE/DATE

REVIEWED BY: Lawrence D Daw 2-4-94
SIGNATURE/DATE

PORC REVIEW: W D Hamel 3/9/94
SIGNATURE/DATE

APPROVED BY: D. Quinn 3/9/94
SIGNATURE/DATE

EFFECTIVE DATE: 03/31/94

IP-1028
CORE DAMAGE ASSESSMENT

1.0 PURPOSE

The purpose of this procedure is to provide a methodology to determine the extent of core damage following an accident. The assessment is based on radionuclide concentrations and other parameters.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 It is recommended that completed attachments of this procedure NOT be transmitted to the EOF, AEOF, Recovery Center, or Joint News Center due to their sensitivity and potential for media misinterpretation.

2.2 This procedure is an approximate method and may give some conflicting results. Engineering judgement must be used throughout.

2.3 Some areas for potential errors are:

- Plateout of samples in containment or in sample lines;
- Gamma spectroscopy of highly radioactive samples;
- Estimates of ECCS water volumes or sump volumes;
- Calculations of core inventories;
- Effect of multiple precursors in the parent-daughter decay chains and unequal release fractions.

2.4 The uncertainties are such that core damage estimates using this methodology are sufficient only to establish major categories of fuel damage. This categorization, with confirmation, will require extensive additional analysis for several days past the accident date.

3.0 DISCUSSION

3.1 This core damage procedure is based on quantitative and qualitative assessments of various plant parameters, some of which are interrelated.

A. Radiation monitors in the VC: This is a gross but immediately available measurement of noble gases released.

B. Radioactivity released from the core:

1. Measured in RCS, VC atmosphere, sumps in VC.
2. Correct by power history, decay, etc.
3. Evaluate versus expected radioactivity released for clad damage, fuel overheat, fuel melt.

C. Hydrogen in containment: A measure of the amount of the zirconium water reaction from the fuel cladding.

D. Core exit thermocouples and reactor vessel level instrumentation: When available, used to determine whether the core has been uncovered and what type of fuel damage may have occurred.

3.2 Qualitative Assessment of Core Damage

Attachment 6.1, Qualitative Assessment of Core Damage, should be used in conjunction with the quantitative assessment of core damage which follows in Section 4.0. Section 5.0 provides further instructions on performing qualitative core damage assessment estimates. This shall be performed during the early stages as a part of reactor core monitoring, as well as being used to verify the quantitative core damage assessment.

A

4.0 PROCEDURE: QUANTITATIVE CALUCLATIONS OF CORE DAMAGE

The calculations can be performed by following the attachments as worksheets or by running the computer programs. Instructions for the program are listed in Attachment 6.4B.

4.1 Data Collection

A. Using Attachment 6.2, record all appropriate data concerning RCS, sumps in VC, and VC atmosphere sampling.

B. Power History - Note: If computer is being used, the power history data has already been entered; follow the prompts in the program.

1. Record EFPD and calendar days of operation on Attachment 6.4, Part 1.

2. If reactor has been at steady state power (± 10% of average power level) for 4 days or more, record power level on Attachment 6.4, Part 2.

3. If reactor has not been at steady state power for at least 30 days, use Attachment 6.4A to record power history over the last 30 days.

C. Record sample results from RCS, Recirc. Sump, VC atmosphere on Attachments 6.5 and 6.6.

4.2 Power History Correction Factor (PCF)

The inventories of fission products shown in Attachment 6.3 are for end of core life 100% power steady state operating conditions. This must be corrected for actual power history.

A. Steady state power (± 10%) prior to shutdown:

1. Long-lived nuclide correction is calculated in Attachment 6.4, Part 3.

2. Short-lived and medium-lived nuclide corrections are calculated in Attachment 6.4, Part 4.

B. Transient Power History:

1. Long-lived nuclides: Transient power history not applicable, use Attachment 6.4 to calculate power correction factor.

2. Short and medium-lived nuclides: correct each nuclide separately using Attachment 6.4A as a calculation sheet. Computer-calculated power correction factors are also available. They may be accessed by using Attachment 6.4B.

4.3 Chemistry Sample Corrections

Samples of RCS, Recirc. Sump, and VC atmosphere must be corrected using Attachment 6.5 (Water Samples) and Attachment 6.6 (VC Atmosphere).

A. Back-Decay Correction CF (bd)

1. This factor is used to correct the sample result back to the time of reactor shutdown.

2. Nuclides that are daughters in a chain must be accounted for by following the calculations in Attachment 6.5A.

3. The chemistry computer has the capability to back-decay nuclides. Ensure that this correction is not applied twice. The daughters as discussed above should not be back-decayed by the chemistry computer.

B. Temperature-Pressure Correction CF (tp)

1. This factor is used to account for the differences in temperature and pressure between the sample and the sampled system (e.g., RCS, VC air).

2. Water samples are corrected for temperature only.

3. Air samples are corrected for both temperature and pressure.

4.4 Calculation of Percent Core Damage

A. The calculation of percent core damage involves 3 basic steps:

1. Determination of activity released from the core;
2. Determination of the power corrected activity inventory;
3. Comparison of the actual activity released to the expected inventory.

B. This calculation is performed for clad damage, fuel overheat, and fuel melt using Attachments 6.7, 6.7A, 6.7B, 6.7C, and 6.7D.

1. Calculate total activity released by radionuclide:

a. Using Attachment 6.7 as a calculation sheet, add the activity from RCS, containment sumps, and VC atmosphere to determine total activity released from the core.

b. Values for activity concentrations are obtained from Attachments 6.5 and 6.6, and should have been previously corrected for decay, dilution, temperature, pressure, etc. in accordance with Attachments 6.5 and 6.6.

2. Calculate activity normally present in the RCS during operations:

a. Using Attachment 6.7A as a calculation sheet, determine the amount of each nuclide present during normal operations.

b. This activity is subtracted from the total amount released from the core.

c. This calculation is only used in assessing clad damage. For other types of fuel damage, it is an insignificant fraction of the activity.

3. Calculate Percent Fuel Damage:

a. Use Attachments 6.7B (Clad Damage), 6.7C (Fuel Overheat), and 6.7D (Fuel Melt) as calculation sheets.

b. Correct the nuclide inventories from Attachment 6.3 using the previously developed power correction factors.

c. Compare the activity released (Attachments 6.7, 6.7A) to the corrected inventories to obtain percent fuel damage.

4.5 Assessment of Core Damage using Activity Released

A. Assessment of core damage involves determining:

1. The type of core damage: clad damage, fuel overheat, fuel melt.
2. The amount of core damage: 0 to 100% in each of the above categories.

B. Comparison with expected inventories released:

Attachment 6.3 lists the nuclides associated with the 3 types of fuel damage and the amount of activity expected to be released for 100% clad damage, 100% fuel overheat, and 100% fuel melt.

C. The nuclides released are characteristic of the type of damage as are the ratios of nuclides.

D. Clad Damage:

1. Nuclides associated with cladding damage are primarily the medium-lived and long-lived noble gases and iodines.

2. Attachment 6.7B contains the calculated percent clad damage.

3. The ratios of the noble gases to Xe-133 (and Iodines to I-131) in the gap differ from the ratios in the fuel itself. The ratios are shown in Attachment 6.3 and can help to ascertain whether the release was from the fuel (fuel overheat or melt) or from the gap (clad damage).

4. RCS pressure, temperature, and power transients may result in Iodine spiking where the Iodine concentrations in the RCS increase sharply. This is not indicative of cladding failure but should be considered so that it is not confused with clad damage. Attachment 6.8 provides an estimate of the total I-131 release that might be expected during an iodine spike.

5. Clad rupture is dependent on fuel temperature and RCS pressure where higher RCS pressures will delay clad rupture.

E. Fuel Overheat:

1. Moderately volatile fission products are released during fuel overheat conditions, including cesium, ruthenium, and tellurium in addition to the more volatile noble gases and iodines. Lesser amounts of barium and strontium are also released.

2. Attachment 6.7C provides the calculated percent fuel overheat.

3. The use of the isotopic ratios listed in Attachment 6.3 can be used to determine the source of the noble gases and iodines.

F. Fuel Melt:

1. Fuel pellet melting leads to rapid release of noble gases, iodines, bromines, and cesiums remaining after fuel overheat.

2. Significant release of the strontium, barium-lanthanum chemical groups is the most distinguishing feature of fuel melt conditions.

3. Attachment 6.7D provides the calculated percent fuel melt.

4. The use of isotopic ratios listed in Attachment 6.3 can be used to determine the source of the noble gases and iodines.

G. Non-Uniform Core Damage:

1. The above evaluations address an assumed uniform distribution of core damage. The degree of damage may vary within the core, and this should be considered in explaining any conflicting data.

5.0 QUALITATIVE ASSESSMENT OF CORE DAMAGE

There are plant indicators that should be monitored during an accident. These can provide an initial estimate of core damage. These can also provide a qualitative verification of the quantitative core damage assessment. The plant indicators include containment hydrogen concentration, core exit thermocouple temperatures, reactor vessel water level, and containment radiation level. An overal summarization of these parameters is provided in Attachment 6.1.

5.1 Containment Hydrogen Concentration

A. An accident in which the core is uncovered and the fuel rods are exposed to steam may result in the chemical reaction of the zirconium in the cladding with the steam to produce hydrogen. It is assumed that all hydrogen produced by this reaction is released to the containment atmosphere. R

B. The hydrogen dissolved in the primary system during normal operation contributes an insignificant amount of the total hydrogen released to the containment. The hydrogen recombiners will not have a significant effect on a zirconium - steam reaction in the case of severe core degradation.

C. The percentage of zirconium water reaction, based on containment hydrogen concentration, does not equal the percentage of clad damaged but it does provide a qualitative indication of the extent of clad damage. R

D. Attachment 6.9 shows the relationship between the hydrogen concentration and the percentage of zirconium water reaction.

5.2 Core Exit Temperatures and Reactor Vessel Water Levels

A. Core Exit Thermocouples (CETC) and the Reactor Vessel Level Indication System (when available) (RVLIS) readings can be used for qualitative core damage estimates in the following ways. R

1. Due to the heat transfer mechanisms between the fuel rods, steam, and thermocouples, the highest clad temperature will be higher than the CETC readings. Therefore, if thermocouples read greater than 1300°F, clad failure may have occurred. 1300°F is the lower limit for cladding failures.

2. If any RCPs are running, CETCs will be good indicators of clad temperatures and no core damage should occur since the forced flow of the steam-water mixture will adequately cool the core.

3. No generalized core damage can occur if the core has not been uncovered. So if RVLIS full range indicates that the collapsed liquid level has never been below the top of the core and no CETC has indicated temperatures corresponding to superheated steam at the corresponding RCS pressure, then no generalized core damage has occurred.

4. Attachment 6.10 provides information on types of damage to fuel at increasing temperatures.

5. Graph RCS-15 in the Graphs Book provides indication of RVLIS level versus reactor core height.

A

5.3 Containment Radiation Levels

A. R-25 and R-26 are located just above the 95' VC and can be used as a gross indication of activity (primarily noble gases) in the containment atmosphere.

B. R-25 and R-26 would be expected to read approximately the same value if there were noble gases dispersed in containment.

C. Attachment 6.11 provides data on expected radiation levels for clad damage, fuel overheat, and fuel melt conditions.

6.0 ATTACHMENTS

6.1 Qualitative Assessment of Core Damage
6.2 Sampling Data for Core Damage Calculations
6.3 Core Release Inventories of Characteristic Fission Products
6.4 Power Correction for Core Inventories - Steady State
6.4A Power Correction for Core Inventories - Transient Conditions
6.4B Instructions for Use of CORDAM Computer Program
6.4C Results from Computer Program Test Case
6.5 Water Sample Data and Calculations
6.5A Parent-Daughter Decay Correction
6.6 VC Atmosphere Sample Data and Calculations
6.7 Calculation of Total Activity Release from Core
6.7A Calculation of Activity Present During Normal Operations
6.7B Calculation of Percent Clad Damage
6.7C Calculation of Percent Fuel Overheat
6.7D Calculation of Percent Fuel Melt
6.8 Expected Iodine Spike vs. Normal Iodine Activity
6.9 VC Hydrogen Concentration vs. Zirconium - Water Reaction
6.10 Expected Fuel Damage Correlation with Fuel Rod Temperature
6.11 Expected Containment Radiation Levels Post-Accident (R-25/R-26)
6.12 References

QUALITATIVE ASSESSMENT OF CORE DAMAGE

	NO DAMAGE	CLAD DAMAGE	FUEL OVERHEAT	FUEL MELT
Radiation Levels in VC * (R-25 & R-26)	0 R/hr.	Up to 337 R/hr.	Up to 3.4E5 R/hr.	Up to 6.7E5 R/hr.
% Hydrogen in VC **	0%	<----------Up to 12.6%---------->		
Core Exit Thermocouples	600°F	1300°F and check temperature vs. pressure for super heated core uncovery.		
RVLIS (if available) ***	Full	Used in conjunction with CETCs to determine core uncovery.		
Expected Nuclides	Kr, Xe, I	Kr, Xe, I	Cs, Te	Sr, Ba, La, Pr

* Time dependent R-25/R-26 readings can be found in Attachment 6.11.

** Presence of hydrogen is indicative of reaction of the cladding but does not indicate whether fuel overheat or melt has occurred.

*** No generalized core damage can occur if the core remains covered.

SAMPLING DATA FOR CORE DAMAGE CALCULATIONS

Calculation No.: _____

Current Date: _____ Reactor Shutdown: Date: _____

Current Time: _____ Time: _____

SAMPLE AND MEDIA DATA

	RCS	VC ATMOSPHERE	RECIRC SUMP	OTHER
Sample No.	_____	_____	_____	_____
Date of Sample	_____	_____	_____	_____
Time of Sample	_____	_____	_____	_____
Sample Temperature (°F)	_____°F	_____°F	_____°F	_____
Sample Pressure (psia)	_____psia	_____psia	_____psia	_____
System Temperature (°F)	_____°F	_____°F	_____°F	_____
System Pressure (psia) or Level	_____psia	_____psia	_____ft (see a. below)	_____

Volume of ECCS Dilution Water: _____ gallons

---

a. Level in Recirc. Sump: _____ft _____gallons

b. Level in VC Sump: _____ft _____gallons

c. Level in Reactor Sump: _____inches _____gallons

(NOTE: This can only be estimated based on the 2½" level alarm, the 6" level alarm, and the reactor sump pump light; Technical Support Center should estimate this volume if necessary.)

d. Level in Containment: _____inches above 46 ft. elevation _____gallons

e. Total estimated gallons of water in VC sumps and floor: _____gallons

FEB 1994

CORE RELEASE INVENTORIES OF CHARACTERISTIC FISSION PRODUCTS

NUCLIDE	HALF-LIFE	DECAY CONSTANT (1/DAY)	GAP RELEASE (Ci)	FUEL OVERHEAT RELEASE (Ci)	FUEL MELT RELEASE (Ci)	FUEL PELLET** ACTIVITY RATIO	GAP** ACTIVITY RATIO
Clad Failure Nuclides							
Kr-85*	10.72 yr	1.77E-4	1.6E4	9.0E5	1.5E6	.01	.11
Kr-87	76.3 m	1.31E1	3.1E3	1.8E7	3.0E7	.22	.022
Kr-88	2.84 h	5.86E0	6.7E3	2.5E7	4.2E7	.29	.045
Xe-131m	11.84 d	5.85E-2	7.5E2	2.8E5	4.7E5	.004	.004
Xe-133	5.245d	1.32E-1	1.5E5	8.8E7	1.5E8	1.0	1.0
I-131	8.04 d	8.62E-2	2.4E5	4.3E7	7.2E7	1.0	1.0
I-133	20.8 h	8.00E-1	1.6E5	8.8E7	1.5E8	2.1	.71
I-135	6.61 h	2.52E0	8.3E4	7.9E7	1.3E8	1.9	.39
Fuel Overheat Nuclides							
Cs-137*	30.17 y	6.3E-5	N/A	4.9E6	8.1E6	---	---
Te-129	69.6 m	1.4E1	N/A	1.5E7	2.4E7	---	---
Te-132	78.2 h	2.1E-1	N/A	6.2E7	1.0E8	---	---
Fuel Melt Nuclides							
Ba-140	12.79 d	5.4E-2	N/A	2.2E5	3.5E7	---	---
La-140	40.22 h	4.1E-1	N/A	2.5E5	3.7E7	---	---
La-142	95.4 m	1.1E1	N/A	1.9E5	3.1E7	---	---
Pr-144	17.28 m	5.8E1	N/A	1.5E5	1.4E6	---	---

* Long-lived nuclides.

** Ratio for Noble Gases is to Xe-133 = NG Isotope/Xe-133.
Ratio for Iodines is to I-131 = I Isotope/I-131.

FEB 1994

POWER HISTORY CORRECTION FOR STEADY STATE POWER HISTORY

1. Data for Long-Lived Nuclides Power Correction Factor.

	EFPD	Calendar Days		
		Start Date of the		
Current Cycle	_____	Oldest Fuel Cycle	_____	(A)
Previous Cycle	_____	Current Date	_____	(B)
2 Cycles Previous	_____	Days Between (A)&(B)	_____	
Total -	_____			

2. Data if Plant has been at Steady-State Power (within 10% of average power level).

Steady State Power Level (last 4 days) - _____ %
Steady State Power Level (last 30 days) - _____ %

3. Calculation of Long-Lived Power Correction Factor.

	Nuclide	Half-Life	EFPD/Calendar Days
Long-Lived Nuclides	Kr-85	10.72y	_____
	Cs-137	30.17y	_____

4. Calculation of Short & Medium-Lived Power Correction Factor-(Steady State Operation).

	Nuclide	Half-Life	Steady State Power Level (%) (last 4 days): P(4)	P(4)/100%
Short-Lived Nuclides	Kr-87	76.3 m	_____	_____
	Kr-88	2.84 h	_____	_____
	I-133	20.8 h	_____	_____
	I-135	6.61 h	_____	_____
	Te-129	69.6 m	_____	_____
	La-142	95.4 m	_____	_____
	Pr-144	17.28 m	_____	_____

	Nuclide	Half-Life	Steady State Power Level (%) (last 30 days): P(30)	P(30)/100%
Medium-Lived Nuclides	Xe-131m	11.84 d	_____	_____
	Xe-133	5.245d	_____	_____
	I-131	8.04 d	_____	_____
	Te-132	78.2 h	_____	_____
	Ba-140	12.79 d	_____	_____
	La-140	40.22 h	_____	_____

NOTE: Short-Lived Power Correction Factor (PCF) - P(4)/100%
Medium-Lived Power Correction Factor (PCF) - P(30)/100%
Long-Lived Power Correction Factor (PCF) - EFPD/Calendar Days

FEB 1994

POWER HISTORY CORRECTION FOR NUCLIDE i
(Transient Power History)

Nuclide: _____ Half-Life: _____

λ = _____ day $^{-1}$ (from Attachment 8.3)

Period	P_j Power Level (%)	T_j Duration (Days)	t_j (Days) Decay Time	$(1-e^{-\lambda i T j})$	$(e^{-\lambda t j})$	$P_j(1-e^{-\lambda i T j})(e^{-\lambda t j})$
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

$\Sigma^{P}_{j}(1-e^{-\lambda i T j})(e^{-\lambda i t j})$ = _____

$$PCF_i = \frac{\Sigma^{P}_{j}(1-e^{-\lambda i T j})(e^{-\lambda t j})}{100\%} = \text{_____}$$

P_j - steady reactor power level (percent)

λ_i - decay constant for isotope i (day $^{-1}$)

T_j - time at power level P_j (days)

t_j - time since end of T_j to reactor shutdown (days)

NOTE: Power history should cover the last 30 days or more.

FEB 1994

INSTRUCTIONS FOR USE OF COMPUTER PROGRAM FOR CALCULATIONS

1.0 Use a full duplex, 300 or 1200 baud terminal. Parity setting is none. Ensure modem is turned on, if it isn't already.

1.1 Dial ([redacted]) [redacted]

1.2 When the terminal says "xxxxxxxxxxx", type [redacted] (ensure the caps lock is on). DO NOT hit RETURN, it will return automatically after typing [redacted].

1.3 When the terminal says "PLEASE LOG IN", type [redacted]K and hit RETURN.

1.4 When the terminal requests "USER NUMBER", type P489PFM, (password)* and hit RETURN.

2.0 If the above number is busy or out of service, use the following procedure:

2.1 Dial [redacted] and set the terminal to EVEN parity.

2.2 Turn on modem (if not already on) when tone is heard.

2.3 Wait 5 seconds, type .... (4 periods), hit RETURN. (Ensure caps lock is on.)

2.4 When the terminal requests "PLEASE SIGN ON", type APX and hit RETURN.

2.5 When the terminal asks for "HOST:", type [redacted] and hit RETURN.

2.6 When the terminal requests "USER NUMBER", type P489PFM, (password)x and hit RETURN.

3.0 Type -PCF and hit RETURN. (Allow about 30 seconds for the program to run.) A complete Power Correction Factor report will be sent to the screen. Date and time given should be the time of trip or commencement of reactor shutdown. If this is not the case, inform the Site Reactor Engineer or the Performance and Reliability Supervisor to update the shutdown file.

4.0 First you must run a test case of the core damage assessment computer program. Type -CORTEST and hit RETURN. The program will automatically execute using test input data. To ensure the program is functioning correctly, compare the output of the program to the test results listed in Attachment 6.4C.

5.0 Type -CORDAM and input the data requested. Note that the printout obtained in Step 3 will be used as part of the input section to this program. -CORDAM will complete all calculations and output Attachments 6.5 through 6.7D.

6.0 Type BYE, hit RETURN. When terminal asks for "HOST:", type BYE, hit RETURN.

7.0 Turn off the modem and exit the communications program.

* Password available from Site Reactor Engineer, Performance and Reliability Supervisor, or Control Room.

TEST CASE OF ATTACHMENT 6.7D
CALCULATION OF PERCENT FUEL MELT

(A)	(B)	(C)	(D)=(B)x(C)	(E)	(F)	(G)
Nuclide	Uncorrected Fuel Melt Release Inventory (Ci)	Power Correction Factor (Atts. 6.4/ 6.4A)	PCF Corrected Fuel Melt Inventory (Ci)	Activity Released From Core (Ci)*	(E/D x 100%) Percent Fuel Melt	NG or Iodine Ratios **
Kr-85	1.500E+06	6.850E-01	1.027E+06	1.479E+08	1.440E+04	6.464E-01
Kr-87	3.000E+07	9.915E-01	2.975E+07	8.450E+11	2.841E+06	3.692E+03
Kr-88	4.200E+07	9.923E-01	4.168E+07	6.360E+09	1.526E+04	2.779E+01
Xe-131m	4.700E+05	9.810E-01	4.611E+05	1.178E+08	2.555E+04	5.149E-01
Xe-133	1.500E+08	9.998E-01	1.500E+08	2.288E+08	1.526E+02	1.000E+00
I-131	7.200E+07	9.948E-01	7.163E+07	1.051E+08	1.467E+02	1.000E+00
I-133	1.500E+08	9.993E-01	1.499E+08	1.522E+08	1.016E+02	1.449E+00
I-135	1.300E+08	9.949E-01	1.293E+08	4.261E+08	3.294E+02	4.056E+00
Cs-137	8.100E+06	6.850E-01	5.548E+06	6.997E+07	1.261E+03	N/A
Te-129	2.400E+07	1.000E+00	2.400E+07	1.094E+09	4.560E+03	N/A
Te-132	1.000E+08	1.000E+00	1.000E+08	5.812E+07	5.812E+01	N/A
Ba-140	3.500E+07	1.000E+00	3.500E+07	4.223E+07	1.206E+02	N/A
La-140	3.700E+07	1.000E+00	3.700E+07	3.153E+07	8.522E+01	N/A
La-142	3.100E+07	1.000E+00	3.100E+07	1.878E+10	6.058E+04	N/A
Pr-144	1.400E+06	1.000E+00	1.400E+06	1.785E+06	1.275E+02	N/A

FEB 1994

WATER SAMPLE DATA AND CALCULATIONS

Water Sample Type: Sample No.:_____

☐ RCS ☐ Recirc Sump ☐ Other:_____

(A) Nuclide	(B) Half-Life	(C) Decay Constant $\lambda(hr^{-1})$	(D) Reported $\mu Ci/cc$	(E) Back-Decay Correction Factor	(F) Temperature Correction Factor	(G) Corrected $\mu Ci/gram$
Kr-85	10.72 Y	7.38 E-6				
Kr-87	76.3 m	5.45 E-1				
Kr-88	2.84 h	2.44 E-1				
Xe-131m*	11.84 d	2.44 E-3				
Xe-133*	5.245d	5.51 E-3				
I-131	8.40 d	3.59 E-3				
I-133	20.8 h	3.33 E-2				
I-135	6.61 h	1.05 E-1				
Cs-137	30.17 y	2.62 E-6				
Te-129*	69.6 m	5.98 E-1				
Te-132	78.2 h	8.86 E-3				
Ba-140	12.79 d	2.26 E-3				
La-140*	40.22 h	1.72 E-2				
La-142*	95.4 m	4.36 E-1				
Pr-144*	17.28 m	2.41 E0				

Column E: Back-Decay Correction Factor = CF(bd) = $\frac{1}{e^{-\lambda t}} = e^{\lambda t}$

* NOTE: Nuclides marked with * are daughters in a decay chain. This must be taken into account in order to back-decay correct. Attachment 6.5A should be followed for those nuclides.

Column F: Temperature Correction Factor CF(t).
This factor converts $\mu Ci/cc$ to $\mu Ci/g$.
If temperature of the water is <200°F, CF(t) = 1, and $\mu Ci/cc = \mu Ci/g$.
If temperature of the water is ≥200°F, use the Table below to determine CF(t).

Column G: Corrected $\mu Ci/g$ = reported $\mu Ci/cc$ x CF(bd) x CF(t)

(G) = (D) x (E) x (F)

RCS Water Temperature	Temperature Correction Factor CF(t)
≤ 150°F	1.0
200°F	.97
300°F	.92
400°F	.86
500°F	.79
600°F	.68
700°F	.44

PARENT-DAUGHTER DECAY CORRECTION

The Table on Page 2 of this Attachment lists the significant parent-daughter relationships. The decay scheme of the parent-daughter is described as follows:

$$Q_B(t) = K \frac{\lambda B}{\lambda B - \lambda A} Q^\circ_A(e^{-\lambda A t} - e^{-\lambda B t}) + Q^\circ_B e^{-\lambda B t}$$

Where:

Q°_A - 100% fuel melt inventory (Ci) of parent*

Q°_B - 100% fuel melt inventory (Ci) of daughter*

$Q_B(t)$ - hypothetical daughter activity (Ci) at sample time

K - branching factor*

λ_A - parent decay constant, (hr^{-1})*

λ_B - daughter decay constant (hr^{-1})*

t - time period from shutdown to time of sample (hr)

1. Calculate the hypothetical daughter concentration, $Q_B(t)$ at the time of sampling assuming 100% fuel melt release of both parent and daughter activity.

2. Determine the fraction (Fr) of the decay of the initial inventory of the daughter to the hypothetical daughter activity at sample time.

$$Fr = \frac{Q^\circ_B(e^{-\lambda B t})}{Q_B(t)}$$

3. Calculate the amount of the measured sample specific activity associated with the decay of the daughter that was released.

M_B - Fr x measure specific activity (μCi/gm or μCi/cc)

Where: M_B - measured activity of B

4. Use this value of M_B as the reported μCi/cc in Column D of Attachment 6.5 or 6.6 and continue with further corrections as necessary on Attachment 6.5 or 6.6.

* See Page 2 of this Attachment for data on affected nuclides.

FEB [illegible] 1994

Parent Nuclide	$\lambda_A(hr^{-1})$	Q°_A	K	Daughter Nuclide	$\lambda_B(hr^{-1})$	Q°_B	$Q_B(t)$	Fr	M_B*
I-131	3.59E-3	7.2E7	.008	Xe-131m	2.44E-3	4.7E5	____	____	____
I-131	3.33E-2	1.5E8	.976	Xe-133	5.51E-3	1.5E8	____	____	____
Xe-133m	1.28E-2	2.1E7	1.0	Xe-133	5.51E-3	1.5E8	____	____	____
Sb-129	.161	2.3E7	.827	Te-129	.598	2.4E7	____	____	____
Te-129m	8.47E-4	5.8E6	.68	Te-129	.598	2.4E7	____	____	____
Ba-140	2.26E-3	3.5E7	1.0	La-140	1.72E-2	3.7E7	____	____	____
Ba-142	3.78	3.3E7	1.0	La-142	.436	3.1E7	____	____	____
Ce-144	1.02E-4	1.3E6	1.0	Pr-144	2.41	1.4E6	____	____	____

* M_B should be transferred to Attachment 6.5 or 6.6 into Column D, reported μCi/cc.

FEB [illegible] 1994

VC ATMOSPHERE SAMPLE DATA AND CALCULATIONS

Sample No.: _____

(A) Nuclide	(B) Half-Life	(C) Decay Constant $\lambda(hr^{-1})$	(D) Reported $\mu Ci/cc$	(E) Back-Decay Correction Factor	(F) Temp/Press Correction Factor	(G) Corrected $\mu Ci/gram$
Kr-85	10.72 Y	7.38 E-6				
Kr-87	76.3 m	5.45 E-1				
Kr-88	2.84 h	2.44 E-1				
Xe-131m*	11.84 d	2.44 E-3				
Xe-133*	5.245d	5.51 E-3				
I-131	8.04 d	3.59 E-3				
I-133	20.8 h	3.33 E-2				
I-135	6.61 h	1.05 E-1				
Cs-137	30.17 y	2.62 E-6				
Te-129*	69.6 m	5.98 E-1				
Te-132	78.2 h	8.86 E-3				
Ba-140	12.79 d	2.26 E-3				
La-140*	40.22 h	1.72 E-2				
La-142*	95.4 m	4.36 E-1				
Pr-144*	17.28 m	2.41 E0				

Column E: Back-Decay Correction Factor - $CF(bd) = \frac{1}{e^{-\lambda t}} - e^{\lambda t}$

* NOTE: Nuclides marked with * are daughters in a decay chain. This must be taken into account in order to back-decay correct. Attachment 6.5A should be followed for those nuclides.

Column F: Temperature/Pressure Correction Factor - $CF(tp) = \frac{P(a)}{P(s)} \times \frac{(T(s) + 460)}{(T(a) + 460)}$

T(a), P(a) - VC atmosphere temperature °F and pressure (psia)
T(s), P(s) - VC sample temperature °F and pressure (psia)

Column G: Corrected $\mu Ci/cc$ - reported $\mu Ci/cc$ x CF(bd) x CF(tp)

(G) - (D) x (E) x (F)

FEB 1994

FEB 1 1994

CALCULATION OF ACTIVITY RELEASED FROM CORE

Nuclide	RCS Corrected (uCi/gram)	x	RCS (grams)*	x 10^{-6}	RCS =(Ci)	Sump Corrected (uCi/gram)	x	VC Sumps (grams)**	x 10^{-6}	Sump =(Ci)	VC Atmos. Corrected (uCi/cc)	x 7.39E4 ***	VC Atmos. =(Ci)	Total Activity E RCS & Sump & VC Atmosphere (Ci)
Kr-85														
Kr-87														
Kr-88														
Xe-131m														
Xe-133														
I-131														
I-133														
I-135														
Cs-137														
Te-129														
Te-132														
Ba-140														
La-140														
La-142														
Pr-144														

* Normally 90,000 gal. x 3785 cc/gal. x 1 gram/cc = 3.41 E8 grams

** Water in VC (gallons) x 3785 cc/gal. x 1 gram/cc = VC sumps (grams)

This value should be based on data from all available level instrumentation (see Attachment 6.2) and should be approximately equal to ECCS volume added. VC sump and Recirc. sump volumes can be determined using Control Room Graph Book.

NOTE: The activity is determined from the Recirc. Sump. This is assumed to be the activity in all water in the VC sumps. Consider this as a possible source of error.

*** uCi/cc x 2.61 E6 cu. ft. x 2.83 E4 cc/cu. ft. x 10^{-6} Ci/uCi = 7.39 E4

CALCULATION OF ACTIVITY PRESENT DURING NORMAL OPERATIONS

(A) Nuclide	(B) Normal Operations RCS Conc (uCi/cc)* x 320**	(C) RCS (Ci) Normal Ops	(D) Normal Operations VC Conc (uCi/cc)* x 7.4E4***	(E) VC (Ci) Normal Ops	(F) Activity Released From Core (Attachment 7)	(G)=(F)-(C)-(E) Corrected Ci Released From Core
Kr-85						
Kr-87						
Kr-88						
Xe-131m						
Xe-133						
I-131						
I-133						
I-135						

* Obtain from recent pre-shutdown RCS sample:

- Available from Chemistry or Site Reactor Engineer
- If unavailable, use the following approximate values as a sum of the operation activity:

	Ci
Kr-85	12
Kr-87	12
Kr-88	20
Xe-131m	40
Xe-133	200
I-131	8
I-133	10
I-135	10

** 320 = 3.2E8 cc RCS x 1E-6 Ci/uCi

*** 7.4E4 = 7.4E10 cc in VC x 1E-6 Ci/uCi

FEB 1994

The results in Column G to be used in Attachment 6.7B.

NOTE: **Account for Iodine spiking in accordance with Section 4.5.D and Attachment 6.8, if necessary.**

CALCULATION OF PERCENT CLAD DAMAGE

(A) Nuclide	(B) Uncorrected Clad Damage Inventory	(C) Power Correction Factor (Attachment 6.4 or 6.4A)	(D) = (B) x (C) PCF Corrected Clad Damage Inventory	(E) Activity Released From Core (Ci)*	(F) (E/D) x 100% Perc. Clad Damage	(G) NG or Iodine Ratios**
Kr-85	1.6E4					
Kr-87	3.1E3					
Kr-88	6.7E3					
Xe-131m	7.5E2					
Xe-133	1.5E5					
I-131	2.4E5					
I-133	1.6E5					
I-135	8.3E4					

* From Attachment 6.7A.

** $\frac{\text{Noble Gas Isotope}}{\text{Xe-133}}$ or $\frac{\text{Iodine Isotope}}{\text{Xe-131}}$ (Compare to ratios in Attachment 6.3.)

NOTE: The percent fuel damage values can only be considered as approximations. If the actual age of the fuel assembly(s) damaged and the power region in the core is different from the core average (core average was used to develop the inventories in Column B), then the actual inventories in the fuel damaged could differ by a factor of 2-3. The calculated percent damage must be considered along with the isotopic ratios (Column G), presence of other nuclides, and other parameters as discussed elsewhere in this procedure.

FEB [illegible] 1994

CALCULATION OF PERCENT FUEL OVERHEAT

(A)	(B)	(C)	(D) = (B)x(C)	(E)	(F)	(G)
Nuclide	Uncorrected Fuel Overheat Release Inventory (Ci)	Power Correction Factor (Attachment 6.4 or 6.4A)	PCF Corrected Fuel Overheat Inventory (Ci)	Activity Released From Core (Ci)*	(E/D x 100%) Percent Fuel Overheat	NG or Iodine Ratios **
Kr-85	9.0E5					
Kr-87	1.8E7					
Kr-88	2.5E7					
Xe-131m	2.8E5					
Xe-133	8.8E7					
I-131	4.3E7					
I-133	8.8E7					
I-135	7.9E7					
Cs-137	4.9E6					
Te-129	1.5E7					
Te-132	6.2E7					
Ba-140	2.2E5					
La-140	2.5E5					
La-142	1.9E5					
Pr-144	1.5E5					

* From Attachment 6.7.

** $\frac{\text{Noble Gas Isotope}}{\text{Xe-133}}$ or $\frac{\text{Iodine Isotope}}{\text{I-131}}$ (Compare to ratio in Attachment 6.3.)

FEB 1 1994

NOTE: The percent fuel damage values can only be considered as approximations. If the actual age of the fuel assembly(s) damaged and the power region in the core is different from the core average (core average was used to develop the inventories in Column B), then the actual inventories in the fuel damaged could differ by 20-30%. The calculated percent damage must be considered along with the isotopic ratios (Column G), presence of other nuclides, and other parameters as discussed elsewhere in this procedure.

FEB 1994

CALCULATION OF PERCENT FUEL MELT

(A)	(B)	(C)	(D)	(E)	(F)	(G)
Nuclide	Uncorrected Fuel Melt Release Inventory (Ci)	Power Correction Factor (Attachment 6.4 or 6.4A)	PCF Corrected Fuel Melt Inventory (Ci)	Activity Released From Core (Ci)*	(E/D x 100%) Percent Fuel Melt	NG or Iodine Ratios **
Kr-85	1.5E6					
Kr-87	3.0E7					
Kr-88	4.2E7					
Xe-131m	4.7E5					
Xe-133	1.5E8					
I-131	7.2E7					
I-133	1.5E8					
I-135	1.3E8					
Cs-137	8.1E6					
Te-129	2.4E7					
Te-132	1.0E8					
Ba-140	3.5E7					
La-140	3.7E7					
La-142	3.1E7					
Pr-144	1.4E6					

* From Attachment 6.7

** $\frac{\text{Noble Gas Isotope}}{\text{Xe-133}}$ or $\frac{\text{Iodine Isotope}}{\text{I-131}}$ (Compare to ratio in Attachment 6.3.)

NOTE: The percent fuel damage values can only be considered as approximations. If the actual age of the fuel assembly(s) damaged and the power region in the core is different from the core average (core average was used to develop the inventories in Column B), then the actual inventories in the fuel damaged could differ by 30-40%. The calculated percent damage must be considered along with the isotopic ratios (Column G), presence of other nuclides, and other parameters as discussed elsewhere in this procedure.

EXPECTED IODINE SPIKE VS. NORMAL IODINE ACTIVITY

I-131 μCi/gram*	Average I-131 Release (Curies)	Maximum I-131 Release (Curies)
0.5 - 1.0	3400	6500
0.1 - 0.5	380	950
.01 - 0.1	200	650
.001 - .01	100	300
< .001	2	10

* Normal operating I-131 specific activity in RCS.

VC HYDROGEN CONCENTRATION VS. ZIRCONIUM-WATER REACTION

Percent Zirconium Water Reaction	Hydrogen Concentration in VC (Volume %)
10	1.3%
20	2.5%
30	3.8%
40	5.0%
50	6.3%
60	7.5%
70	8.8%
80	10.0%
90	11.3%
100	12.6%

FEB 1994

EXPECTED FUEL DAMAGE CORRELATION WITH CORE EXIT THERMOCOUPLE READINGS

Fuel Damage	Temperature °F*
No Damage	< 1300
Clad Damage	1300 - 2000
Ballooning of zircaloy cladding	> 1300
Burst of zircaloy cladding	1300 - 2000
Oxidation of cladding and hydrogen generation	> 1600
Fuel Overtemperature	2000 - 3450**
Fission product fuel lattice mobility	2000 - 2550
Grain boundary diffusion release of fission products	2450 - 3450**
Fuel Melt	> 3450**
Dissolution and liquefaction of UO_2 in the the zircaloy - ZrO_2 eutectic	> 3450**
Melting of remaining UO_2	5100**

---

* These temperatures are material property characteristics and are non-specific with respect to locations within the fuel and/or fuel cladding.

** Core Exit Thermocouple are not valid over 3000°F.

NOTE: When narrow range thermocouple readings go offscale (as indicated by an asterisk on the thermocouple map), use the wide range readings.

EXPECTED CONTAINMENT RADIATION LEVELS POST-ACCIDENT (R-25/R-26)

Time After Shutdown	R/hr for 100% Clad Damage	R/hr for 100% Fuel Overheat	R/hr for 100% Fuel Melt
* 0	337	3.4 E5	6.7 E5
5 min.	152	1.7 E5	3.2 E5
1 hr.	51	7.2 E4	1.2 E5
2 hrs.	37	5.4 E4	9.2 E4
4 hrs.	24	3.4 E4	5.8 E4
8 hrs.	16	2.0 E4	3.4 E4
12 hrs.	13	1.4 E4	2.5 E4
24 hrs.	8.9	8.2 E3	1.4 E4
48 hrs.	4.6	3.8 E3	6.7 E3
4 days	2.8	2.0 E3	3.8 E3
8 days	1.7	1.2 E3	2.3 E3
15 days	0.7	5.0 E2	1.1 E3
30 days	0.1	1.6 E2	3.7 E2

R

Radiation levels are taken from Reference 15 of Attachment 6.12.

* Expected maximum spike values.

REFERENCES

1. Reactor Analysis Procedure RA-24, "Emergency Plan Information". A

2. "Clarification of TMI Action Plan Requirements", NUREG-0737, USNRC, November 1980.

3. "A Report to the Commission and to Public, NRC Special Inquiry Group", M. Rogovin, 1980.

4. "ORIGEN Isotope Generation and Depletion Code", Oak Ridge National Laboratory, CCC-217.

5. Method of Calculating the Fractional Release of Fission Products from Oxide Fuel, ANSI/ANS 5.4 - 1982.

6. WCAP-9964, Westinghouse Electric Corporation.

7. "Source Term Specification", ANS 18.1 Standard 1976.

8. "Radionuclide Release Under Specific LWR Accident Conditions", Draft NUREG-0956, USNRC, January 1983.

9. "Release of Fission Products from Fuel in Postulated Degraded Accidents", IDCOR Draft Report, July 1982.

10. "TMI-2 Accident: Core Heat-up Analysis", NSAC/24, January 1981.

11. "Light Water Reactor Hydrogen Manual", NUREG/CR-2726, August 1983.

12. Westinghouse Emergency Response Guidelines.

13. Analysis of the Three Mile Island Accident and Alternative Sequences, Prepared for NRC by Battelle, Columbus Laboratories, NUREG/CR-1219.

14. Westinghouse Owners Group Core Damage Assessment Methodology, February 1984.

15. Core Damage Procedure based upon Post-Accident Chemistry and Radiation Sample Analysis, R. W. Bradshaw, R. D. Ivany, Combustion Engineering, Inc., November 1983.

16. "Post-Accident High-Range Containment Radiation Monitor Response", IP3-CALC-RAD-00002. R

Indian Point 3
Nuclear Power Plant
P.O. Box 215
Buchanan, New York 10511

914-736-8000

New York Power Authority

EMERGENCY PLAN PROCEDURES

PROCEDURE NO. IP-1038 REV. 16

TITLE: EMERGENCY NOTIFICATIONS

"THIS PROCEDURE HAS BEEN EXTENSIVELY REVISED."

WRITTEN BY: Mary Ann Chaubard 3/23/94
SIGNATURE/DATE

REVIEWED BY: Maggie McCough 03/24/94
SIGNATURE/DATE

PORC REVIEW: [signature] 3/31/94
SIGNATURE/DATE

APPROVED BY: [signature] 3/31/94
SIGNATURE/DATE

EFFECTIVE DATE: 04/04/94

IP-1038

EMERGENCY NOTIFICATIONS

TABLE OF CONTENTS

IP-1038

EMERGENCY NOTIFICATIONS

1.0 PURPOSE

This procedure describes the methods used to provide pertinent information to the offsite agencies and the NRC using the New York State (NYS) Radiological Emergency Data Forms, Parts I and II (Attachments 5.1/5.2), and the NRC Event Notification Worksheet - Form #361 (Attachment 5.3).

2.0 RESPONSIBILITIES

2.1 The Control Room (CCR) is responsible for initially filling out and communicating Part I and Part II (if applicable) to the offsite agencies.

2.2 The Offsite Communicator is responsible for transmitting offsite emergency notifications in accordance with this procedure.

2.3 The Emergency Planning Staff is responsible for testing the communications equipment described in this procedure in accordance with IP-1070, "Periodic Check of Emergency Preparedness Equipment".

3.0 REFERENCES

3.1 Appendix 'B', Offsite Emergency Telephone List, Volume II, Emergency Plan

3.2 IP-1070, "Periodic Check of Emergency Preparedness Equipment"

3.3 10 Code of Federal Regulations, Part 50.72

3.4 NUREG 0654, "Criteria for the Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Plants", Rev. 1

4.0 PROCEDURE

> **NOTE**
>
> The Radiological Emergency Communications System (RECS) Line is the primary means of emergency notification off site. The backup methods are the Local Government Radio (LGR) or regular telephones as described in Sections 4.3 and 4.4 respectively.

4.1 NOTIFY NYS and Counties within fifteen (15) minutes of an emergency declaration. The four (4) emergency classifications are:

- Notification of Unusual Event
- Alert
- Site Area Emergency
- General Emergency

A. FILL OUT Part I (Part II when applicable) using black ink. Abbreviations (ie., PAB, LOCA, etc.) are not allowed.

B. NUMBER each Part I (Part II when applicable) in sequential order in the top right corner.

- IF an emergency classification is closed out and shortly thereafter another emergency declaration occurs, THEN start sequential numbering from one (1).

C. ENSURE all information is complete on Part I including the appropriate letters placed in the boxes. (Refer to Attachment 5.1, EP-Form Part I, New York State (NYS) Radiological Emergency Data Form.) Pay particular attention to the following:

1. IF Recovery is selected in Item #4 of Part I, THEN only transmit once upon entering the Recovery Phase.

   - IF Emergency Terminated is selected in Item #4 of Part I, THEN the Recovery Phase is not implemented.

2. The TIME recorded in Item #5 of Part I will only change when the emergency classification changes. The 15-minute requirement is based on this.

3. In Item #7 of Part I, record the number and the wording of the Emergency Action Level (EAL) used to classify the event, as a minimum.

D. ENSURE the Emergency Director (ED) reviews and signs Part I prior to transmitting.

4.2 USE the RECS Line as follows:

- CCR: PICK UP handset on the red RECS Line phone located on the Offsite Communicator's desk. Depress ring button on lower left side for approximately three (3) seconds.

- EOF: PICK UP handset, depress button on telephone console marked 'RECS', and push the RECS signal button for approximately three (3) seconds. When transmitting data, depress bar on handset to talk and release to listen. Turn up volume as necessary.

- AEOF: PICK UP handset on the red desk phone marked RECS. Depress button on lower left side for approximately three (3) seconds.

A. ANNOUNCE the following when the ringing stops:

"THIS IS TO REPORT THAT A _____ EMERGENCY HAS BEEN DECLARED AT INDIAN POINT NO. 3. STAND BY FOR ROLL CALL".

"New York State"
"Westchester County"
"Rockland County"
"Orange County"
"Putnam County"
"Peekskill"
"Con Edison Control Room"

NOTE

The 15-minute requirement is met upon completion of the NYS/County roll call.

- Continue transmitting Part I even if some stations do not answer the roll call.

B. DIRECT all parties to Part I.

C. TRANSMIT Part I information speaking slowly and clearly.

WARNING

FOR A GENERAL EMERGENCY: IF AN EMERGENCY CLASSIFICATION IS UPGRADED TO A GENERAL EMERGENCY, DO NOT FINISH THE PREVIOUS PART I UPDATE. STATE THAT A GENERAL EMERGENCY HAS BEEN DECLARED AND THAT A COMPLETED PART I WILL BE TRANSMITTED AS SOON AS POSSIBLE.

FOR NUE/ALERT/SAE: IF PLANT CONDITIONS/EMERGENCY CLASSIFICATION CHANGES WHILE PART I IS BEING COMPLETED, OR IS COMPLETE AND READY FOR TRANSMISSION, OR WHILE NYS/COUNTIES ARE BEING NOTIFIED, TRANSMIT THE INFORMATION AND ADVISE THAT CONDITIONS HAVE CHANGED, WILL UPDATE SHORTLY.

D. CONDUCT roll call after Part I has been transmitted by saying, "(NAME OF STATION) did you copy?"

E. RECORD message end time on the bottom of Part I and sign off by saying, "Indian Point No. 3 out at (TIME) and (DATE)".

F. FAX Part I to NYS and County Warning Points and Emergency Operation Centers (EOCs), Dose Assessment Groups. Fax numbers are programmed in the CCR and EOF fax machines but are also found in Appendix 'B', Volume II of the Emergency Plan. Refer to EP-Operator Aid, "Fax Machine Instructions" found in IP-1070, "Periodic Check of Emergency Preparedness Equipment", if necessary.

- FAX Part II only to NYS/County EOCs in the event of a release.

G. UPDATE NYS/Counties every 30 minutes.

4.3 USE the LOCAL GOVERNMENT RADIO (LGR) if the RECS Line is inoperable.

> NOTE
>
> DO NOT wait for Part I to be filled out when notifying NYS/Counties using the LGR.

A. USE a regular telephone to first notify NYS Warning Point.

1. TRANSMIT the following information:

"THIS IS TO REPORT THAT A _____ EMERGENCY HAS BEEN DECLARED AT INDIAN POINT #3. STAND BY FOR FAX."

> NOTE
>
> After NYS/County EOCs have been activated, the LGR can be used without calling New York State.

B. USE the LGR as follows:

- CCR: TURN ON unit located on the left end of the Reactor Operator's (RO) desk, turn up volume, and depress bar on handset to talk. Release the bar to listen.
- EOF: PICK UP handset and depress button on telephone console labelled LGR. Push bar on handset to transmit data and release to listen. Turn up volume as necessary.
- AEOF: TURN ON unit located on the Communicator's desk, turn up volume, depress bar on handset to talk, and release bar to listen.

C. TRANSMIT the following:

"THIS IS TO REPORT THAT A _____ EMERGENCY HAS BEEN DECLARED AT INDIAN POINT NO. 3. STAND BY FOR ROLL CALL".

"Westchester County"
"Rockland County"
"Orange County"
"Putnam County"

"Stand by for fax."

NOTE

The 15-minute requirement is met upon completion of the NYS/County roll call.

D. FAX Part I to NYS and County Warning Points and Emergency Operation Centers (EOCs), Dose Assessment Groups. Fax numbers are programmed in the CCR and EOF fax machines but are also found in Appendix 'B', Volume II of the Emergency Plan. Refer to EP-Operator Aid, "Fax Machine Instructions" found in IP-1070, "Periodic Check of Emergency Preparedness Equipment", if necessary.

° FAX Part II only to NYS/County EOCs in the event of a release

E. UPDATE NYS/Counties every 30 minutes.

4.4 USE REGULAR TELEPHONES to call each NYS/County Warning Point when the RECS Line and LGR are inoperable. (Refer to Appendix 'B', Volume II, Emergency Plan for telephone numbers.)

° New York State
° Westchester County
° Rockland County
° Orange County
° Putnam County

NOTE

DO NOT wait for Part I to be filled out when notifying NYS/Counties using regular telephones.

A. TRANSMIT the following message:

"THIS IS TO REPORT THAT A _____ EMERGENCY HAS BEEN DECLARED AT INDIAN POINT NO. 3. STAND BY FOR FAX".

NOTE

The 15-minute requirement is met upon completion of calls to NYS and Counties.

B. FAX Part I to NYS and County Warning Points and Emergency Operation Centers (EOCs), Dose Assessment Groups. Fax numbers are programmed in the CCR and EOF fax machines but are also found in Appendix 'B', Volume II of the Emergency Plan. Refer to EP-Operator Aid, "Fax Machine Instructions" found in IP-1070, "Periodic Check of Emergency Preparedness Equipment", if necessary.

- FAX Part II only to NYS/County EOCs in the event of a release

C. UPDATE NYS/Counties every 30 minutes.

4.5 NOTIFY the NRC using the NRC EMERGENCY NOTIFICATION SYSTEM (ENS) Phone immediately after NYS/County notifications and not later than one (1) hour after the time the licensee declares an emergency.

NOTE

A regular telephone is backup to the ENS Phone.

A. PICK UP the ENS Phone handset (tan phone with red face plate) and dial the first number as listed on the phone. If no answer or trouble on the line, dial the next number, in sequence, etc.

- CCR: Located on the STA desk by the fax machines.
- EOF: Located on the telephone consoles and in the NRC Room.
- TSC: Located on the Communicator's desk.

B. PROVIDE the emergency classification, time of classification, and brief event description. If additional information is requested, fill out NRC Form #361, "Event Notification Worksheet" (Attachment 5.3) and transmit the data.

C. UPDATE the NRC every 30 minutes.

B. PROVIDE the emergency classification, time of classification, and brief event description. If additional information is requested, fill out NRC Form #361, "Event Notification Worksheet" (Attachment 5.3) and transmit the data.

C. UPDATE the NRC every 30 minutes.

4.6 NOTIFY American Nuclear Insurers (ANI) and Institute for Nuclear Power Operations (INPO) via regular telephone at an Alert or higher emergency classification.

- ANI and INPO notifications will be completed by the Recovery Center when activated.

5.0 ATTACHMENTS

5.1 EP-Form Part I - New York State Radiological Emergency Data Form

5.2 EP-Form Part II - New York State Radiological Emergency Data Form

5.3 NRC Form #361 - Event Notification Worksheet

END OF TEXT

New York Power Authority
Indian Point 3
/ Con Edison
Indian Point 2

RADIOLOGICAL EMERGENCY DATA FORM

Part I

Notification #_____A

Via RECS Line	Via PHONE	At ALERT or higher:
☐ New York State ☐ Orange Cnty ☐ NYPA ☐ Westchester Cnty ☐ Putnam Cnty ☐ Con Edison ☐ Rockland Cnty ☐ City of Peekskill	☐ NRC HQ (ENS) ☐ NRC (Resident)	☐ ANI ☐ INPO

1. This message is being transmitted on: _____ *(Date)* at: _____ *(Time)* ☐ AM ☐ PM VIA: ☐ A. RECS ☐ B. Other _____

2. ☐ This is..... A. NOT an Exercise B. An Exercise

3. ☐ THE FACILITY PROVIDING THIS INFORMATION IS: A. INDIAN POINT NUMBER 2 B. INDIAN POINT NUMBER 3

4. ☐ The Emergency Classification is: A. Unusual Event B. Alert C. Site Area Emergency D. General Emergency E. Emergency Terminated F. Recovery G. Transportation Incident

5. This Emergency Classification declared on: _____ *(Date)* at: _____ *(Time)* ☐ AM ☐ PM

6. ☐ Release of Radioactive Materials
A. No Release *(Above Technical Specifications limits)*
B. Release to the Atmosphere *(Above Technical Specifications limits)*
C. Release to a Body of Water *(Above Technical Specifications limits)*

Protective Action Recommendations:

7. ☒
A. No need for Protective Actions outside the site boundary.
B. EVACUATE the following ERPAs:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50 51

C. SHELTER all remaining ERPAs.

EAL #: ☐ _____

8. Brief Event Description: _____

9. ☐ The Plant status is: A. Stable B. Improving C. Degrading D. Hot Shutdown E. Cold Shutdown

10. ☐ Reactor Shutdown: A. Not Applicable B. _____ *(Date)* at: _____ *(Time)* ☐ AM ☐ PM

11. Wind Speed: _____ Meters/Second at elevation _____ meters.

12. Wind Direction: (From) _____ Degrees at elevation _____ meters.

13. ☐ Stability Class: A B C D E F G

14. Reported By: *(Communicator's Name)* _____ at Tel. Number (914) _____

Emergency Director Review/Signature	*Message Ended At:*
_____	_____

Volume III - IP-1038, Attachment 5.1

EP-Form Part I

ATTACHMENT 5.2

-FORM PART II NEW YORK STATE RADIOLOGICAL EMERGENCY DATA FORM
PART II - RADIOLOGICAL ASSESSMENT DATA

NOTIFICATION # B
NYPA Indian Point #3

15. Message transmitted at: DATE:_____ TIME:_____ FROM:_____

16. General release information:

A. RELEASE > TECH. SPEC. STARTED AT:
DATE:_____TIME:_____
B. PROJECTED DURATION OF RELEASE:_____(hrs.)
C. RELEASE >TECH.SPEC.ENDED DATE:_____TIME:_____
D. REACTOR SHUTDOWN: N/A OR DATE:_____TIME:_____
E. WIND SPEED:_____M/SEC.
AT ELEVATION:_____(METERS)
F. WIND DIRECTION:(FROM)_____DEGREES
AT ELEVATION:_____(METERS)
G. STABILITY CLASS:_____(PASQUILL A-G)

17. Atmospheric release information:

A. RELEASE FROM: GROUND LEVEL FT.
B. IODINE/NOBLE GAS RATIO:_____
(Assumed or Actual)
C. TOTAL RELEASE RATE:_____Ci/SEC.
D. NOBLE GAS RELEASE RATE:_____Ci/SEC.
E. IODINE RELEASE RATE:_____Ci/SEC.
F. PARTICULATE RELEASE RATE:_____Ci/SEC.

18. Waterborne release information:

A. VOLUME OF RELEASE:_____GALLONS
B. TOTAL CONCENTRATION (gross):_____μCi/ml
C. RADIONUCLIDES IN RELEASE:_____
D. TOTAL ACTIVITY RELEASED:_____

19. Dose calculations (based on release duration of_____ hrs.):

CALULATION IS BASED ON: (circle one)
A. INPLANT MEASUREMENTS
B. FIELD MEASUREMENTS
C. ASSUMED SOURCE TERM

TABLE BELOW APPLIES TO: (circle one)
A. ATMOSPHERE RELEASE
B. WATERBORNE RELEASE

DISTANCE	Xμ/Q	DOSE TEDE (REM)	DOSE TODE (REM)
SITE BOUNDARY			
2 MILES			
5 MILES			
10 MILES			
MILES			

20. Field measurement of dose rates or surface contamination/deposition:

MILE/SECTOR OR MILES/DEGREES	LOCATION OR SAMPLING POINT	TIME OF READING	DOSE RATE (mR/HR.) OR CONTAMINATION ($\mu Ci/m^2$)

REMARKS:

ED Review:_____

NRC FORM 361
(3-601)

U.S. NUCLEAR REGULATORY COMMISSION
OPERATIONS CENTER

EVENT NOTIFICATION WORKSHEET

NOTIFICATION TIME	FACILITY OR ORGANIZATION	UNIT	CALLER'S NAME	CALL BACK #: ENS _____ or ( ) _____ - _____

EVENT TIME & ZONE	EVENT DATE
	/ /
POWER/MODE BEFORE	POWER/MODE AFTER

EVENT CLASSIFICATIONS

	GENERAL EMERGENCY	GEN/AAEC
	SITE AREA EMERGENCY	SIT/AAEC
	ALERT	ALE/AAEC
	UNUSUAL EVENT	UNU/AAEC
	50.72 NON-EMERGENCY	*(see next columns)*
	PHYSICAL SECURITY (73.71)	D???
	TRANSPORTATION	NTRA
	MATERIAL/EXPOSURE	B???/E???/F???
	FITNESS FOR DUTY	HFIT
	OTHER	N???/C???/G???

1-Hr Non-Emergency 10 CFR 50.72(b)(1)

	(i)(A)	TS Required S/D	ASHU
	(i)(B)	TS Deviation	ADEV
	(ii)	Degraded Condition	ADEG
	(ii)(A)	Unanalyzed Condition	AUNA
	(ii)(B)	Outside Design Basis	AOUT
	(ii)(C)	Not Covered by OPs/EPs	ACNC
	(iii)	Earthquake	ANEA
	(iii)	Flood	ANFL
	(iii)	Hurricane	ANHU
	(iii)	Ice/Hail	ANIC
	(iii)	Lightning	ANLI
	(iii)	Tornado	ANTO
	(iii)	Oth Natural Phenomenon	ANOT
	(iv)	ECCS Discharge to RCS	ACCS
	(v)	Lost ENS	AENS
	(v)	Lost Other Assessment/Comms	AARC
	(v)	Emergency Siren INOP	AESS
	(vi)	Fire	AFIR
	(vi)	Toxic Gas	ACHE
	(vi)	Rad Release	ARAD
	(vi)	Oth Hampering Safe Op.	AHIN

4-Hr Non-Emergency 10 CFR 50.72(b)(2)

	(i)	Degrade While S/D	ADAS
	(ii)	RPS Actuation (scram)	ARPS
	(ii)	ESF Actuation	AESF
	(iii)(A)	Safe S/D Capability	AINA
	(iii)(B)	RHR Capability	AINB
	(iii)(C)	Control of Rad Release	AINC
	(iii)(D)	Accident Mitigation	AIND
	(iv)(A)	Air Release > 2X App B	AAIR
	(iv)(B)	Liq Release > 2X App B	ALIQ
	(v)	Offsite Medical	AMED
	(vi)	Offsite Notification	APRE

DESCRIPTION

Include: Systems affected, actuations & their initiating signals, causes, effect of event on plant, actions taken or planned, etc.

NOTIFICATIONS	YES	NO	WILL BE
NRC RESIDENT			
STATE(s)			
LOCAL			
OTHER GOV AGENCIES			
MEDIA/PRESS RELEASE			

ANYTHING UNUSUAL OR NOT UNDERSTOOD? ☐ YES *(Explain above)* ☐ NO

DID ALL SYSTEMS FUNCTION AS REQUIRED? ☐ YES ☐ NO *(Explain above)*

MODE OF OPERATION UNTIL CORRECTED: ESTIMATED RESTART DATE:

ADDITIONAL INFO ON BACK? ☐ YES ☐ NO

VOLUME III - IP-1038, ATTACHMENT 5.3

VOLUME III - IP-1038, ATTACHMENT 5.3

RADIOLOGICAL RELEASES: CHECK OR FILL IN APPLICABLE ITEMS *(specific details/explanations should be covered in event description)*

☐ LIQUID RELEASE	☐ GASEOUS RELEASE	☐ UNPLANNED RELEASE	☐ PLANNED RELEASE	☐ ONGOING	☐ TERMINATED
☐ MONITORED	☐ UNMONITORED	☐ OFFSITE RELEASE	☐ T.S. EXCEEDED	☐ RM ALARMS	☐ AREAS EVACUATED
☐ PERSONNEL EXPOSED OR CONTAMINATED		☐ OFFSITE PROTECTIVE ACTIONS RECOMMENDED		*State release path in description.	

	Release Rate (Ci/sec) *	% T.S. LIMIT	HOO GUIDE	Total Activity (Ci)	% T.S. LIMIT	HOO GUIDE
Noble Gas			0.1 Ci/sec			1000 Ci
Iodine			10 uCi/sec			0.01 Ci
Particulate			1 uCi/sec			1 mCi
Liquid *(excluding tritium & dissolved noble gases)*			10 uCi/min			0.1 Ci
Liquid (tritium)			0.2 Ci/min			5 Ci
Total Activity						

	PLANT STACK	CONDENSER/AIR EJECTOR	MAIN STEAM LINE	SG BLOWDOWN	OTHER
RAD MONITOR READINGS:					
ALARM SETPOINTS:					
% T.S. LIMIT *(if applicable)*					

RCS OR SG TUBE LEAKS: CHECK OR FILL IN APPLICABLE ITEMS: *(specific details/explanations should be covered in event description)*

LOCATION OF THE LEAK *(e.g., SG =, valve, pipe, etc.)*:

LEAK RATE:	UNITS: gpm/gpd	T.S. LIMITS:	SUDDEN OR LONG TERM DEVELOPMENT:

LEAK START DATE:	TIME:	COOLANT ACTIVITY & UNITS: PRIMARY –	SECONDARY –

LIST OF SAFETY RELATED EQUIPMENT NOT OPERATIONAL:

EVENT DESCRIPTION *(Continued from front)*

ACCOUNTABILITY

ACCOUNTABILITY AREA	ACCOUNTABILITY OFFICER	OFFICE EXT.	ASSEMBLY AREA EXT.
Lead Account. Officer	Security Shift Coordinators		
Training	Kim Begany Bill Heady Bruce Witherell		
Warehouse	Richie Bell Julie Heier Richie Ryan		
Machine Shop	Chuck Alphin Dennis Colwell Roseann Jowitt Jeanine Schukal		
Site Engineering Building	Marie Campanaro Tony Irsola Nancy Lull		
Control Room	Barbara Grein Al Martuscelli Gail Ruh	5200	
TSC	Don Calabrese Lisa Cole Jean Moretti		
OSC	Mike Dinelli Mary Ellen Mastrogiacomo Bernadette Wiggin		
EOF	Laura Eagens Shannon Lyons Christine Metzger Jennifer Pfannes		

Con Edison Service Center
(West Store Room Area)

TELEPHONE EXTENSIONS

IP-3 Control Room

IP-2 Control Room (Con Edison)

IP-2 NEM Lab/Offsite Teams (Con Edison)

Shift Supervisor's Office

Operations Manager's Office

Security Shift Coordinator

Command Guard House (CAS)

Con Edison LAO

Westinghouse (Gary Fidler)

OSC Manager

H.P. Team Leader (OSC)

Security Team Leader (OSC)

TSC Manager

Emergency Director (EOF)

Emergency Director (AEOF)

EOF Onsite Rad. Communicator

NRC IP-3 Resident Inspector

Construction Services Office

Met. Office Trailer

Training Center

Site Engineering Office

Indian Point 3
Nuclear Power Plant
P.O. Box 215
Buchanan, New York 10511

914-736-8000

New York Power Authority

EMERGENCY PLAN PROCEDURES

PROCEDURE NO. IP-1053 REV. 8

TITLE: EVACUATION OF SITE

"THIS PROCEDURE HAS BEEN EXTENSIVELY REVISED."

WRITTEN BY: Maggie McCough 03/18/94
SIGNATURE/DATE

REVIEWED BY: MaryAnn Chaubard 3/23/94
SIGNATURE/DATE

PORC REVIEW: [signature] 3/30/94
SIGNATURE/DATE

APPROVED BY: [signature] 3/30/94
SIGNATURE/DATE

EFFECTIVE DATE: 04/04/94

IP-1053

EVACUATION OF SITE

TABLE OF CONTENTS

IP-1053

EVACUATION OF SITE

1.0 PURPOSE

The purpose of this procedure is to provide criteria for the evacuation of non-essential personnel from the Indian Point Site and describes the actions to be followed.

2.0 RESPONSIBILITIES

2.1 The Emergency Director (ED) is responsible for determining when evacuation of non-essential personnel is required in accordance with this procedure.

2.2 The Radiological Assessment Team Leader (RATL) is responsible for advising the ED of radiological conditions on site.

2.3 The Lead Accountability Officer (LAO) is responsible for coordinating evacuation of the assembly areas.

NOTE

Non-essential personnel are considered to be all NYPA and Con Edison personnel who have not been assigned specific emergency response duties, visitors, and contractor personnel.

3.0 REFERENCES

3.1 Table 4-1, "Initiating Conditions/Emergency Action Levels Volume II of the Emergency Plan"

3.2 IP-1050, "Accountability"

4.0 PROCEDURE

4.1 USE the following criteria as guidance for evacuating site personnel.

- Alert Emergency with potential for radioactive airborne releases;
- Site Area Emergency;
- General Emergency;
- Any condition which in the opinion of the ED or RATL warrants evacuation.

4.2 EVACUATE site non-essential personnel as soon as possible following completion of the accountability process or at the discretion of the ED. This assumes that evacuation is the protective action which shall result in the lowest personnel exposure.

4.3 COORDINATE all decisions involving site evacuation through the Westchester County Emergency Operations Center (EOC).

4.4 DETERMINE if evacuees can be dismissed directly to their homes or if they must reassemble at the Con Edison Service Center (West Store Room area) for contamination checks and decontamination. See Attachment 5.1, "Indian Point Site Service Center Building (Con Edison)".

4.5 DETERMINE which mode of transportation can be used to leave the site.

4.6 ENSURE the IP-2 Control Room is notified of the decision to evacuate non-essential personnel.

4.7 ENSURE a safe and orderly evacuation once site accountability has been completed and/or an evacuation has been deemed necessary by completing the following steps.

A. DISMISS evacuees directly to their homes using private vehicles if there has been no release.

B. COMPLETE the following when a radioactive airborne release occurs or is imminent:

1. CONTACT the Operations Support Center (OSC) H.P. Team Leader to request health physics assistance.

2. REQUEST a Health Physics Technician (H.P.) to monitor the approved site evacuation route and vehicles for contamination.

a. DISMISS evacuees directly to their homes using private vehicles if no contamination.

3. REQUEST a Health Physics Technician (H.P.) be dispatched to the assembly areas if evacuation route and vehicles are contaminated:

a. CHECK personnel and vehicles for contamination and advise the RATL of any contamination found.

b. ACCOMPANY evacuees to the Con Edison Service Center, and notify the ED upon their arrival.

c. DECONTAMINATE private vehicles before leaving the site.

NOTE

If there has been a release with offsite as well as onsite contamination, private vehicles can be released off site without going to the Con Edison Service Center for decontamination.

4.8 DETERMINE onsite evacuation route by using wind direction as the deciding factor. See Attachment 5.2, "IP-3 Assembly Area and Evacuation Routes".

A. Wind from the south (up valley flow): Use the southerly route and enter the Con Edison Service Center area by way of the Con Edison maintained gate as instructed.

B. Wind from the north (down valley flow): Use the northerly route passing through the Con Edison river front Security gate and up to the Service Center as instructed.

C. Wind cross valley: Decide which route (north or south) to take or to have personnel remain in their assembly areas.

NOTE

Assembly Area and Evacuation Route Maps are posted throughout the Site.

4.9 DIRECT the EOF Offsite Communicator to contact the Westchester County EOC to discuss the proposed evacuation route off site with the Director of the Office of Disaster and Emergency Services in order to assure that movement from the Site is coordinated with the County plans and actions.

4.10 ENSURE IP-2 Security is advised of the pending evacuation (via the OSC Security Team Leader) so all routes necessary for evacuation are open through any Con Edison gates.

4.11 CALL the LAO to advise him/her of the pending evacuation and what instructions are to be provided to personnel in the assembly areas.

A. The LAO shall advise Security and the Assembly Area Accountability Officers of the following:

- Pending site evacuation
- Route to take off site
- Mode of transportation to use
- Go home or reassemble at the Con Edison Service Center for contamination checks

B. The LAO shall call the ED when evacuation of non-essential personnel is complete.

5.0 ATTACHMENTS

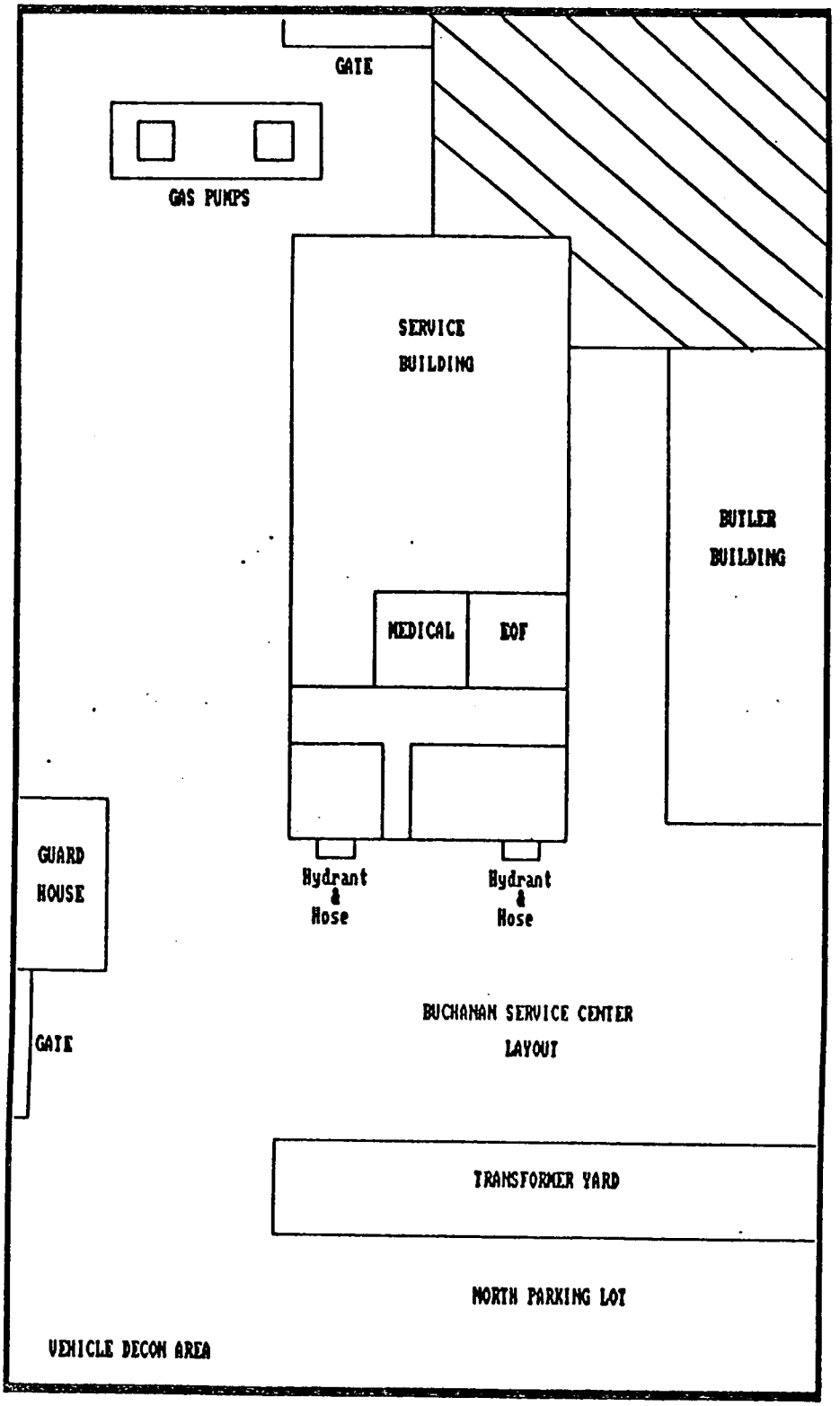
5.1 Indian Point Site Service Center Building (Con Edison)

5.2 IP-3 Assembly Area and Evacuation Routes

END OF TEXT

ATTACHMENT 5.1

CON EDISON SERVICE CENTER LAYOUT



VOLUME III
IP – 1053
Attachment 5.2