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Indian Point 3

AP-18.2
Revision 10

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DOC #	REV #	TITLE	INSTRUCTIONS

THE FOLLOWING PROCURES ARE **NEW**. PLEASE INCORPORATE IN TO YOUR FILES:

IP-EP-115 R/0, IP-EP-251 R/0, IP-EP-255 R/0, IP-EP-310 R/0, IP-EP-410 R/0, IP-EP-510 R/0, IP-EP-520 R/0, IP-EP-610 R/0, IP-EP-620 R/0

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DISTRIBUTION CONTROL LIST

Document Name: EMER PLAN

CC_NAME	NAME	DEPT	LOCATION
1	PLANT MANAGER'S OFFICE	UNIT 3 /ADMINISTRATION	45-3-B
2	EP/TRAINING ADMINISTRATOR	TRAINING	#48
3	RES DEPARTMENT MANAGER	RES DEPARTMENT	45-4-A
4	REFERENCE LIBRARY	RECORDS(TRNG BLDG)	#48
9	JOINT NEWS CENTER	EMERGENCY PLANNING	EOF
10	SHIFT MGR.(LUB-001-GEN)	OPERATIONS	IP3
11	CONTROL ROOM & MASTER	OPS(3PT-D001-D006 ONLY)	IP3
14	EOF	E-PLAN	EOF
16	AEOF/A.GROSJEAN	E-PLAN (EOP'S ONLY)	WPO-12D
19	NUC ENGINEERING LIBRARY	WPO DOCUMENT CONTROL	WPO/7A
22	RESIDENT INSPECTOR	US NRC	45-2-B
23	MCNAMARA N	NRC	OFFSITE
24	MCNAMARA N	NRC	OFFSITE
25	DOCUMENT CONTROL DESK	NRC	OFFSITE
28	AVRAKOTOS N	J A FITZPATRICK	OFFSITE
29	E-PLAN STAFF	E-PLAN	EOF
30	E-PLAN STAFF	E-PLAN	EOF
31	BARANSKI J(VOLUME I ONLY)	ST. EMERG. MGMT. OFFICE	OFFSITE
32	MURPHY L -(VOLUME I ONLY)	DISASTER & EMERGENCY	WESTCHESTR
33	LONGO N (VOLUME I ONLY)	EMERGENCY SERVICES	ROCKLAND
34	GREENE D (VOLUME I ONLY)	DISASTER & CIVIL DEFENSE	ORANGE
35	RAMPOLLA M(VOLUME I ONLY)	OFFICE OF EMERG MANAGE	PUTNAM
41	SIMULATOR	TRAINING	48-2-A
319	C.STELLATO	NRQ-OPS / TRAINING	#48
354	L.GRANT	LRQ-OPS / TRAINING	#48
376	E-PLAN STAFF	E-PLAN	EOF
424	OPS-INSTR (LL'S 1 COPY)	J. CHIUSANO/TRAINING	#48
510	L.GRANT	LRQ-OPS / TRAINING	#48
511	L.GRANT	LRQ-OPS / TRAINING	#48
512	C.STELLATO	NRQ-OPS / TRAINING	#48
513	C.STELLATO	NRQ-OPS / TRAINING	#48
517	PLANT MANAGER'S OFFICE	ADMIN/(IPEC ONLY)	IP2
518	DOCUMENT ROOM	TSC (IPEC ONLY)	UNIT 2
519	TSC	UNIT 2 (IPEC ONLY)	IP2
520	CONTROL ROOM (UNIT 2)	OPERATIONS (IPEC ONLY)	IP2
521	SIMULATOR (UNIT 2)	TRAIN/CENTER (IPEC ONLY)	48-2-A
522	NRC RESIDENT (UNIT2)	US NRC (IPEC ONLY)	IP2
523	ROBERT VOGLE (UNIT 2)	TRAINING LIBRARY	OFFSITE
524	JOHN MCCANN (UNIT 2)	NUC SAFETY/LICENSING	IP2

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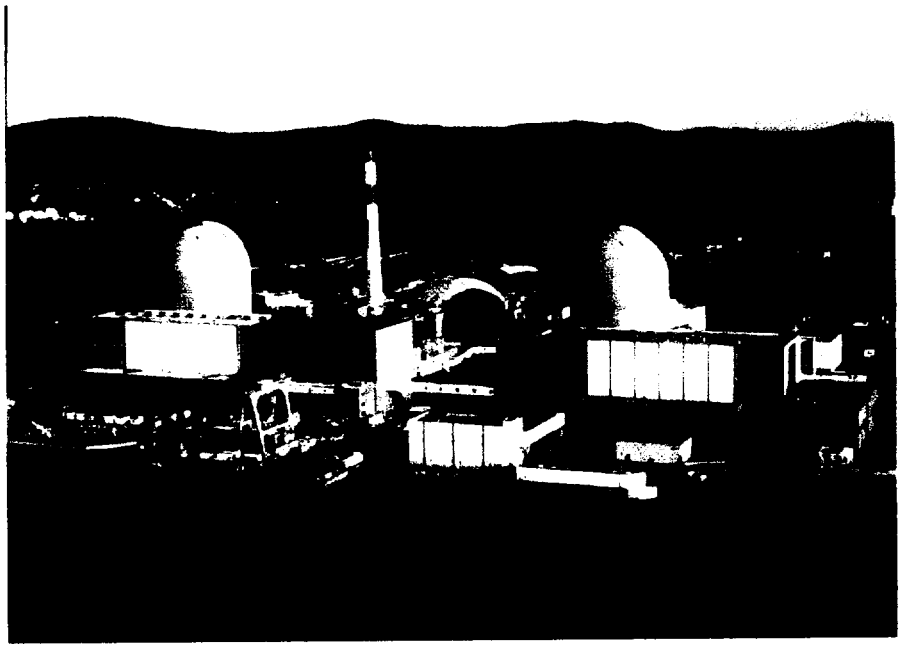
Indian Point Energy Center



Emergency Plan Implementing Procedures

Controlled Copy No.: 25

Indian Point Energy Center
Emergency Plan Implementing Procedures
Table of Contents

Procedure No.	Procedure Title	Rev. No.	Effective Date
IP-EP-115	Emergency Plan Forms	0	07/11/02
IP-EP-251	Alternate Emergency Operations Facility	0	07/11/02
IP-EP-255	Emergency Operations Facility Management and Liaisons	0	07/11/02
IP-EP-310	Dose Assessment	0	07/11/02
IP-EP-410	Protective Action Recommendations	0	07/11/02
IP-EP-510	Meteorological, Radiological & Plant Data Acquisition System	0	07/11/02
IP-EP-520	Modular Emergency Assessment & Notification System (MEANS)	0	07/11/02
IP-EP-610	Emergency Termination and Recovery	0	07/11/02
IP-EP-620	Estimation of Total Population Exposure	0	07/11/02

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CONTROLLED

COPY # 25

Emergency Plan Forms

Prepared by: A Lee (Print Name) _____ (Signature) 6/26/02 (Date)

Approval: Frank Inzirillo (Print Name) _____ (Signature) 7/11/02 (Date)

Effective Date: 7/11/02

Table of Contents

Emergency Plan Forms

1.0 PURPOSE

This procedure controls Forms used by the Emergency Response Organization during emergencies.

2.0 PRECAUTIONS AND LIMITATIONS

NONE

3.0 REFERENCES

NONE

4.0 DEFINITIONS

NONE

5.0 RESPONSIBILITIES

5.1 The Emergency Planning Department is responsible for maintaining forms used by the Emergency Response Organization in accordance with this procedure.

6.0 DETAILS

6.1 Use of Forms

6.1.1 The Implementing Procedure that calls for a form to be completed controls the actual use of forms.

6.1.2 Any needed instructions for form completion will either be on the form itself or in the procedure calling for its use.

6.2 Control of Forms

6.2.1 Forms are numbered sequentially as the need for them is defined by other implementing procedures.

6.2.2 Form numbers will be formatted as "Form EP-n Rev x", where n is the sequential number of the form and x is the current revision of the form.

6.3 Method of Placing Forms in this Procedure

6.3.1 Forms are attached as addendums to this procedure. They will appear formatted in the end use format. There will be no annotation on the addendums or actual forms showing addendum number or procedure page number.

7.0 INTERFACES

Attachment 1, Current List of Effective Forms contains interfacing documents to each form.

8.0 RECORDS

Forms become official records when completed during a declared emergency.

9.0 REQUIREMENTS AND COMMITMENT CROSS-REFERENCE

None

10.0 ATTACHMENTS

Attachment 10.1 Current List of Effective Forms

Attachment 10.1
Current List of Effective Forms
Sheet 1 of 1

Form Number	Current Revision	Form Title (number of pages)	Interfacing Procedures
EP-1			
EP-2			
EP-3			
EP-4			
EP-5			
EP-6			
EP-7	Rev. 0	EOF Staffing	IP-EP-255
EP-8	Rev. 0	Recovery Issues / Strategies Form	IP-EP-610
EP-9	Rev. 0	Essential Information Checklist	IP-EP-255
EP-10	Rev. 0	ERO Log Sheet	IP-EP-255
EP-11	Rev. 0	IPEC Manual Dose Assessment Worksheet / Estimating Containment Activity via R-25 / 26	IP-EP-310
EP-12	Rev. 0	Estimated Total Population Dose (8 pages)	IP-EP-620
EP-13	Rev. 0	IPEC Manual Dose Assessment Worksheet/ TEDE Whole Body Exposure Calculations and TODE Thyroid Exposure Calculations (2 pages)	IP-EP-310
EP-14	Rev. 0		
EP-15	Rev. 0		
EP-16	Rev. 0		
EP-17	Rev. 0	IP-2 Manual Determination of Release Rate	IP-EP-310
EP-18	Rev. 0	IP-3 Manual Determination of Release Rate	IP-EP-310
EP-19	Rev. 0	IPEC Manual Dose Assessment Worksheet/Back Calculating Release Rate from Field Data	IP-EP-310
EP-20	Rev. 0	Emergency Director Turnover Sheet	IP-EP-255

EOF Staffing

No.	Positions	1st SHIFT	2nd SHIFT	
1	Emergency Director			
1	EOF Manager			
1	Information Liaison			
1	ORAD/RATL			
1	ED Technical Advisor			
2*	Dose Assessor / DAHP			
1	Onsite Radiological Communicator (U3 only)			
1	Communicator #1 /Offsite Rad Communicator			
1	Offsite Communicator			
1	Admin & Logistics Manager (U2 only)			
1	MRP-DAS Operator			
1	Survey Team Health Physicist (U2 only)			
1	SAS/Proteus Operator (U2 only)			
3	EOF Clerical Staff			
6	Field Monitoring Team Members			
1	Lead Offsite Liaison			
5	State and County Liaisons			
2	Security Officers			

* Only one Dose Assessor required if determination is made there is limited offsite radiological concerns for event.

Recovery Issue / Strategies Form

Area	Owner	Safety Rel.	Priority	Duration	Man-hours

Description of Issue

Resources Needed

Use this form to document major items to be addressed during Recovery.

Area:	Onsite / Offsite / Public Information	
Owner:	Responsible individual or organization	
Safety Related:	Yes or No	
Priority:	1 = Immediate (24 hr.)	2 = Short Term (1 Week)
	3 = Intermediate (1 Month)	4 = Long Term (> 1 Month)
Duration:	Estimated Calendar Duration	
Man-hours:	Estimated Total Project Hours	

Form EP-8 Rev 0

Essential Information Checklist

Effected Unit: ❑ Unit 2 ❑ Unit 3 ❑ Both

Emergency Classification:

	Time:	EAL #:
❑ Unusual Event	_____	_____
❑ Alert	_____	_____
❑ Site Area Emergency	_____	_____
❑ General Emergency	_____	_____

Last Offsite Notification Completed _____

Reactor: ❑ **At Power** ❑ **Tripped**

RCS:

Temp: _____ °F **Pressure:** _____ **PSIG**

RVLIS / Pressurizer Level: _____

Subcooling: _____

Method of Core Cooling: ❑ **S/G** ❑ **Safety Injection** ❑ **RHR**

Electrical Power Supply: ❑ **138 KV** ❑ **13.8 KV** ❑ **Diesel Generators**

Event Description: _____

Major Equipment Problems:

Current Priorities:	High	Med	Low

❑ **No Release:** ❑ **Release**

Release Status:

❑ In Progress ❑ Expected
❑ Filtered ❑ Unfiltered
❑ Monitored ❑ Unmonitored
❑ Controlled ❑ Uncontrolled

Fission Product Barrier Status

Barrier	Intact	Challenged	Lost
Fuel Clad	❑	❑	❑
RCS	❑	❑	❑
Containment	❑	❑	❑

Date / Time This Checklist was

Completed: _____ / _____

Other: _____

Emergency Response Organization Log Sheet

ERO Position: _____ Name:	Date: _____

Time	Significant Events, Information or Communications

Signature: _____

Form EP-10 Rev 0

IPEC Manual Dose Assessment Worksheet

Estimating Containment Activity via R-25 / 26

Radiological Data

R-25 / 26 Reading		Rem/hr
Dose Conversion Factor (from table below)		(μCi/cc) / (R/hr)

Time after Shutdown (hrs.)	Dose Conversion Factor (μCi/cc) / (R/hr)	
	< 1000 Rem/hr (Gap Release)	> 1000 Rem/hr (Fuel Overheat / Melt Release)
0	0.04	0.03
4	0.12	0.07
8	0.17	0.1
12	0.2	0.13
16	0.22	0.14
20	0.25	0.17
24	0.27	0.18

Vapor Containment Activity Calculation

	×		×	7.4 E+10 cc	=	
R-25 / 26 Reading (R/hr)		Dose Conversion Factor		Containment Volume		Total VC Activity (μCi)

IPEC Manual Dose Assessment Worksheet

Estimating Containment Activity via R-25 / 26

Containment Data		
Containment Pressure		psig
Estimated Leak Rate (see table below)		(cc/sec) – cm^2
Estimated Leak Area		Cm^2 (leak area = πr^2)

Leak Rate per Cm^2			
VC Pressure	Leak Rate (cc/sec)	VC Pressure	Leak Rate (cc/sec)
1.0	8.34E+03	18.0	1.93E+04
1.5	9.96E+03	20.0	1.95E+04
2.0	1.12E+04	22.5	1.97E+04
2.5	1.22E+04	25.0	1.99E+04
3.0	1.31E+04	27.5	2.01E+04
4.0	1.44E+04	30.0	2.03E+04
5.0	1.55E+04	32.5	2.04E+04
6.0	1.63E+04	35.0	2.06E+04
7.0	1.69E+04	37.5	2.07E+04
8.0	1.74E+04	40.0	2.08E+04
9.0	1.78E+04	42.5	2.10E+04
10.0	1.81E+04	45.5	2.11E+04
12.0	1.86E+04	47.5	2.12E+04
14.0	1.89E+04	50.0	2.13E+04
16.0	1.91E+04		

Vapor Containment Release Rate Calculation

	×		×		×	1.0E-06	=
VC Activity (µCi/cc)		Leak Rate (from Table)		Leak Area (Cm^2)		Conversion Factor	VC Release Rate (Ci/sec)

ESTIMATED TOTAL POPULATION DOSE

Sector/Zone	Ref. TLD mrem	Zone Corr. Factor (1)	Interpreted mrem (2)	Modifier (3)	Population (4)	Est. WB Rem
1-1					0	
1-2					55	
1-3					0	
1-4					20	
1-5					335	
1-6					350	
1-7					5,425	
1-8					5,935	
1-9					2,345	
1-10					990	
				SECTOR TOTALS:		
2-1					0	
2-2					40	
2-3					135	
2-4					140	
2-5					1,450	
2-6					1,065	
2-7					825	
2-8					695	
2-9					2,280	
2-10					1,370	
				SECTOR TOTALS:		

(1) Zone in question correction factor (Attachment 2 procedure IP-EP-620 or calculated from formula at bottom of Attachment2 and Xu/Q values)
(2) Multiply TLD mrem by Zone Correction Factor
(3) If no evacuation, modifier is 1.0
(4) 1990 Census

ESTIMATED TOTAL POPULATION DOSE

Sector/Zone	TLD mrem	Zone Corr. Factor (1)	Interpreted mrem (2)	Modifier (3)	Population (4)	Est. WB Rem
3-1					0	
3-2					4,480	
3-3					8,945	
3-4					3,520	
3-5					5,315	
3-6					3,660	
3-7					4,020	
3-8					1,175	
3-9					635	
3-10					1,455	
				SECTOR TOTALS:		
4-1					40	
4-2					2,715	
4-3					3,035	
4-4					1,990	
4-5					2,095	
4-6					2,725	
4-7					2,715	
4-8					5,140	
4-9					5,920	
4-10					4,475	
				SECTOR TOTALS:		

(1) Zone in question correction factor (Attachment 2 procedure IP-EP-620 or calculated from formula at bottom of Attachment2 and Xu/Q values)
(2) Multiply TLD mrem by Zone Correction Factor
(3) If no evacuation, modifier is 1.0
(4) 1990 Census

ESTIMATED TOTAL POPULATION DOSE

Sector/Zone	TLD mrem	Zone Corr. Factor (1)	Interpreted mrem (2)	Modifier (3)	Population (4)	Est. WB Rem
5-1					65	
5-2					505	
5-3					0	
5-4					230	
5-5					140	
5-6					235	
5-7					1,590	
5-8					1,155	
5-9					4,165	
5-10					3,450	
				SECTOR TOTALS:		
6-1					170	
6-2					375	
6-3					260	
6-4					730	
6-5					260	
6-6					675	
6-7					1,145	
6-8					415	
6-9					1,040	
6-10					1,740	
				SECTOR TOTALS:		

(1) Zone in question correction factor (Attachment 2 procedure IP-EP-620 or calculated from formula at bottom of Attachment2 and Xu/Q values)
(2) Multiply TLD mrem by Zone Correction Factor
(3) If no evacuation, modifier is 1.0
(4) 1990 Census

ESTIMATED TOTAL POPULATION DOSE

Sector/Zone	TLD mrem	Ratio Corr. Factor (1)	Interpreted mrem (2)	Modifier (3)	Population (4)	Est. WB Rem
7-1					555	
7-2					2,100	
7-3					980	
7-4					705	
7-5					420	
7-6					5,150	
7-7					3,340	
7-8					2,505	
7-9					2,010	
7-10					6,945	
				SECTOR TOTALS:		
8-1					105	
8-2					1,835	
8-3					1,295	
8-4					635	
8-5					85	
8-6					0	
8-7					0	
8-8					95	
8-9					5,020	
8-10					5,955	
				SECTOR TOTALS:		

(1) Zone in question correction factor (Attachment 2 procedure IP-EP-620 or calculated from formula at bottom of Attachment2 and Xu/Q values)
(2) Multiply TLD mrem by Zone Correction Factor
(3) If no evacuation, modifier is 1.0
(4) 1990 Census

ESTIMATED TOTAL POPULATION DOSE

Sector/Zone	TLD mrem	Zone Corr. Factor (1)	Interpreted mrem (2)	Modifier (3)	Population (4)	Est. WB Rem
9-1					465	
9-2					695	
9-3					25	
9-4					110	
9-5					1,110	
9-6					3,535	
9-7					3,090	
9-8					3,710	
9-9					5,235	
9-10					5,545	
				SECTOR TOTALS:		
10-1					150	
10-2					1,210	
10-3					1,145	
10-4					1,845	
10-5					8,260	
10-6					4,440	
10-7					2,345	
10-8					2,690	
10-9					6,320	
10-10					9,115	
				SECTOR TOTALS:		

(1) Zone in question correction factor (Attachment 2 procedure IP-EP-620 or calculated from formula at bottom of Attachment2 and Xu/Q values)
(2) Multiply TLD mrem by Zone Correction Factor
(3) If no evacuation, modifier is 1.0
(4) 1990 Census

ESTIMATED TOTAL POPULATION DOSE

Sector/Zone	TLD mrem	Zone Corr. Factor (1)	Interpreted mrem (2)	Modifier (3)	Population (4)	Est. WB Rem
11-1					0	
11-2					25	
11-3					1,505	
11-4					2,485	
11-5					2,220	
11-6					3,785	
11-7					2,830	
11-8					1,010	
11-9					3,045	
11-10					3,705	
				SECTOR TOTALS:		
12-1					10	
12-2					345	
12-3					125	
12-4					295	
12-5					160	
12-6					185	
12-7					80	
12-8					20	
12-9					155	
12-10					565	
				SECTOR TOTALS:		

(1) Zone in question correction factor (Attachment 2 procedure IP-EP-620 or calculated from formula at bottom of Attachment2 and Xu/Q values)
(2) Multiply TLD mrem by Zone Correction Factor
(3) If no evacuation, modifier is 1.0
(4) 1990 Census

ESTIMATED TOTAL POPULATION DOSE

Sector/Zone	TLD mrem	Zone Corr. Factor (1)	Interpreted mrem (2)	Modifier (3)	Population (4)	Est. WB Rem
13-1					0	
13-2					280	
13-3					200	
13-4					0	
13-5					0	
13-6					0	
13-7					0	
13-8					70	
13-9					440	
13-10					55	
				SECTOR TOTALS:		
14-1					0	
14-2					80	
14-3					65	
14-4					0	
14-5					25	
14-6					45	
14-7					20	
14-8					620	
14-9					320	
14-10					2,045	
				SECTOR TOTALS:		

(1) Zone in question correction factor (Attachment 2 procedure IP-EP-620 or calculated from formula at bottom of Attachment2 and Xu/Q values)
(2) Multiply TLD mrem by Zone Correction Factor
(3) If no evacuation, modifier is 1.0
(4) 1990 Census

ESTIMATED TOTAL POPULATION DOSE

Sector/Zone	TLD mrem	Zone Corr. Factor (1)	Interpreted mrem (2)	Modifier (3)	Population (4)	Est. WB Rem
15-1					0	
15-2					20	
15-3					105	
15-4					180	
15-5					45	
15-6					0	
15-7					20	
15-8					305	
15-9					25	
15-10					1,055	
				SECTOR TOTALS:		
16-1					0	
16-2					70	
16-3					0	
16-4					95	
16-5					1,635	
16-6					235	
16-7					0	
16-8					35	
16-9					25	
16-10					0	
				SECTOR TOTALS:		

(1) Zone in question correction factor (Attachment 2 procedure IP-EP-620 or calculated from formula at bottom of Attachment2 and Xu/Q values)
(2) Multiply TLD mrem by Zone Correction Factor
(3) If no evacuation, modifier is 1.0
(4) 1990 Census

Manual Dose Assessment Worksheet

TEDE Whole Body Exposure Calculations

Date:	Time	Name:

Meteorology

Wind Direction (from):		Downwind Sector:		WS = Wind Speed (m/sec):	

Pasquill Category: ❑ A ❑ B ❑ C ❑ D ❑ E ❑ F ❑ G

TEDE – Whole Body Exposure — Release Duration (RD): hrs

Distance	NGRR (Ci/sec)	Xu/Q (from tables)	$\frac{1}{WS}$ (M/sec)	K1[1] + Constant[2]	Dose Rate(DR) (mrem/hr)	Dose (mrem) (DR x RD)
Site Boundary		X X	1 / ☐	X	=	
2 Mile		X X	1 / ☐	X	=	
5 Mile		X X	1 / ☐	X	=	
10 Mile		X X	1 / ☐	X	=	

(1) Obtain K1 value from table below.

(2) Constant for MSL & SGBD is 3.3E+05, for all others use 3.3E+03 (Constant includes Iodine CEDE)

K1 Whole Body @ Time After Shutdown for Noble Gas DDE TAS = _____ hours.		K2 Thyroid For Iodine CDE	
4.7E+5	0 – 1.5 Hours	Iodine Mix	8.0E+8
2.8E+5	1.5 – 2.5 Hours	I-131	2.6E+9
2.3E+5	2.5 – 3.5 Hours	I-132	1.5E+7
2.0E+5	3.5 – 4.5 Hours	I-133	4.4E+8
1.7E+5	4.5 – 6.5 Hours	I-134	2.6E+6
1.2E+5	6.5 – 12.5 Hours	I-135	7.6E+7
5.8E+4	> 12.5 Hours		

NOTE:
Particulate Dose Conversion Factor (DCF) for TEDE is 2.7E+07. This DCF should be used applied during dose assessments performed in the EOF or AEOF only if significant particulates are identified in the release (E.G., FSB Accident). Control Room Staff need not consider particulates.

Form EP-13 Rev. 0

IPEC Manual Dose Assessment Worksheet

TODE Thyroid Exposure Calculations

Date:	Time	Name:

Meteorology

Wind Direction (from):		Downwind Sector:		WS = Wind Speed (m/sec):	

Pasquill Category: ❑ A ❑ B ❑ C ❑ D ❑ E ❑ F ❑ G

NOTES:

For **Less Than** 24 hours use Iodine Mix K2 (8.0 E+8)

For **Greater Than** 24 hours, only use I-131 K2 value when using isotopic analysis. (2.6 E+9)

Isotope I-131 (or Total Mix) TODE – Thyroid Exposure Release Duration (RD)= ____ hrs.

NGRR _____ X K1 _____ = A _____ $RR_{(I\text{-}131\ or\ Total)}$ _____ X K2 _____ = B _____

Distance	Xu/Q (from tables)	$\frac{1}{WS}$ (m/sec)	A + B (above)	Dose Rate (mrem/hr)	Dose (mrem) (DR X RD)
Site Boundary	X	1 / ____	X	=	
2 Mile	X	1 / ____	X	=	
5 Mile	X	1 / ____	X	=	
10 Mile	X	1 / ____	X	=	

Form EP-13 Rev. 0

IP-2 Manual Determination of Release Rate

Determine Noble Gas & Radioiodine Release Rates

Date:	Time:	Name:

Plant Vent Release Rate Calculations (use only one vent monitoring method)

R-27 Wide Range		X		X 4.7E-04	=
	(µCi/cc)		(Plant Vent CFM)*	(Constant)	(NGRR Ci/sec)
R-44 Low / Mid Range		X		X 4.7E-04	=
	(µCi/cc)		(Plant Vent CFM)*	(Constant)	(NGRR Ci/sec)
Vent Contact Reading		X		X	X 4.7E-04 =
	(mR/hr)		(Conv. Factor)	(Plant Vent CFM)*	(Constant) (NGRR Ci/sec)

Time After Shutdown Conversion Factors for Contact Reading	TAS (hr)	Factor	TAS (hr)	Factor
	0 - 2	2.8E-04	6 - 8	4.9E-04
	2 - 4	3.4E-04	8 - 12	6.1E-04
	4 - 6	4.1E-04	12 - 24	7.6E-04

Plant Vent Chemistry Sample		X		X 4.7E-04	=
	(µCi/cc)		(Plant Vent CFM)*	(Constant)	(NGRR Ci/sec)
Air Ejector (AE)					
Air Ejector R-45		X		X 4.7E-04	=
	(µCi/cc)		(AE CFM)**	(Constant)	(NGRR Ci/sec)
Main Steam Line (MSL)					
R-28, R-29 R-30, R-31		X 2.7E-03	X	X 4.9 E-06	=
	(CPM)	(MSL Conv. Factor)	(lbm/hr)***	(Constant)	(NGRR Ci/sec)
Steam Generator Blowdown (SGBD)					
Chemistry Sample		X		X 6.3E-05	=
	(µCi/cc)		(GPM)**	(Constant)	(NGRR Ci/sec)
Total Noble Gas Release Rate: Add Plant Vent + AE + MSL + SGBD				Total NGRR Ci/sec	

Determine Radioiodine Release Rate (RR) In Curies/Second

1. MSL NG RR + SGBD NG RR =	X 1.0E-02 =	
2. Plant Vent NG RR + AE NG RR =	X 1.0E-04 =	
Total Radioiodine Release Rate (Add 1 + 2 to Obtain)	Total IRR (Ci/sec) =	

* If actual flow rate is unavailable, use 70,000 cfm

** If actual flow rate is unavailable, use 20 cfm

*** Steam Generator Atmospheric Flowrate 3.50 E+5 lbm / hr / atmospheric

Steam Generator Safety Flowrate 7.60 E+5 lbm / hr / safety

#22 Auxiluary Feedwater Pump 2.5 x 10^4 lbm / hr

IP-3 Manual Determination of Release Rate

Determine Noble Gas & Radioiodine Release Rates

Date:	Time:	Name:

Plant Vent Release Rate Calculations (use only one vent monitoring method)

R-27 Wide Range		X 1.0E-06	=		
	(µCi/sec)	(Ci/µCi)*			(NGRR Ci/sec)
R-14 Low / Mid Range		X	X 4.7E-04	=	
	(µCi/cc)	(Plant Vent CFM)*	(Constant)		(NGRR Ci/sec)
Vent Contact Reading (Contact / 6 Ft)		X	X	X 4.7E-04	=
	(mR/hr)	(Conv. Factor)	(Plant Vent CFM)*	(Constant)	(NGRR Ci/sec)

Time After Shutdown Conversion Factors for Contact Reading	TAS (hr)	Contact Factor	6 ft	TAS (hr)	Contact Factor	6 ft
	0 - 2	6.0E-04	2.5E-03	6 – 12	2.8E-03	9.5E-03
	2 - 4	1.2E-03	3.8E-03	12 – 24	5.5E-03	1.6E-02
	4 - 6	1.6E-03	5.5E-03	24 – 2 Wk	6.5E-03	2.0E-02

Plant Vent Chemistry Sample	X	X	4.7E-04	=
	(µCi/cc)	(Plant Vent CFM)*	(Constant)	(NGRR Ci/sec)
Air Ejector (AE)				
Air Ejector R-15	X	X	4.7E-04	=
	(µCi/cc)	(AE CFM)**	(Constant)	(NGRR Ci/sec)
Main Steam Line (MSL)				
R-62A, R-62B R-62C, R-62D	X	X	3.2 E-06	=
	(µCi/cc)	(lbm/hr)***	(Constant)	(NGRR Ci/sec)

Total Noble Gas Release Rate: Add Plant Vent + AE + MSL + SGBD	Total NGRR Ci/sec	

Determine Radioiodine Release Rate (RR) In Curies/Second

1. MSL NG RR =	X 1.0E-02 =	
2. Plant Vent NG RR + AE NG RR =	X 1.0E-04 =	
Total Radioiodine Release Rate (Add 1 + 2 to Obtain)	Total IRR (Ci/sec) =	

* If actual flow rate is unavailable, use 70,000 cfm

** If actual flow rate is unavailable, use 20 cfm

*** Steam Generator Atmospheric Flowrate 6.30 E+5 lbm / hr / atmospheric

Steam Generator Safety Flowrate 5.50 E+5 lbm / hr / safety

IPEC Manual Dose Assessment Worksheet

Back Calculating Release Rate from Field Data

Administrative Data	
Field Reading Location	
Field Reading Mileage	Miles
Field Reading Sector	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Meteorology	
Wind Speed (at time of release)	meters/sec
X_μ / Q	

Radiological Data	
Field Reading (clsd window or Reuter Stokes)	mrem / hr
Noble Gas DCF (from table below)	(mr/hr) / (μCi/cc)

Time after Shutdown (hrs.)	Dose Conversion Factor (mr/hr) / (μCi/cc)
0 - 1.5	4.70 E+5
1.5 – 2.5	2.80 E+5
2.5 – 3.5	2.30 E+5
3.5 – 4.5	2.00 E+5
4.5 – 6.5	1.70 E+5
6.5 – 12.5	1.20 E+5
> 12.5	5.80 E+4

Release Rate Calculation

(	×	)	÷	(	×	)	=	
Field Reading (mr/hr)		Wind Speed (m/sec)		X_μ / Q		Noble Gas DCF		NGRR (Ci/sec)

Emergency Director Turnover Sheet

Date:	Time:
Outgoing ED:	Relieving ED:
Turnover from: ❑ CR to EPM/POM ❑ EOF ED to EOF ED	❑ CR or EPM/POM to EOF ED ❑ EOF ED to AEOF ED

Discuss the following items:

1. Emergency Classification: ❑ GE ❑ SAE ❑ Alert ❑ Unusual Event
   EAL:

2. Initiating Event:

3. Current Status of:

   A. Personnel Safety:

   B. Plant Safety:

   C. Accountability:

   D. Site Evacuation:
   Missing Persons:
   Search and Rescue:

   E: Dose Assessment:

   F. Radiological Conditions:

   G. OSC/TSC Status:

5. Status of Offsite Notifications: (summary of evacuation)
   ❑ None ❑ NYS / Counties
   ❑ NRC (headquarters and Residents
   ❑ INPO ❑ ANI

6. Corrective Actions:
   Teams Out:

7. Actions Underway:
   Priorities:

8. Actions that need to be Initiated:

9. Prognosis:

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Alternate Emergency Operations Facility

Prepared by: Al Lee (Print Name) _____ (Signature) 6/26/02 (Date)

Approval: Frank Inzirillo (Print Name) _____ (Signature) 7/10/02 (Date)

Effective Date: 7/11/02

Table of Contents

Alternate Emergency Operations Facility (AEOF)

1.0 PURPOSE

Note:
Position Checklists provided in current Emergency Plan procedures for operations of the Emergency Operations Facility (EOF) are still required to be used by ERO members responding to the AEOF

1.1 The purpose of this procedure is to provide support information for the activation of the Alternate Emergency Operations Facility (AEOF).

2.0 PRECAUTIONS AND LIMITATIONS

None

3.0 REFERENCES

3.1 Current procedures on operations of the "Emergency Operations Facility"

4.0 DEFINITIONS

None

5.0 RESPONSIBILITIES

5.1 The Emergency Director is responsible for:

5.1.1 Ensuring continuity of notifications to New York State (NYS), County, and Federal authorities as required;

5.1.2 Ensuring continuity of notifications to New York State (NYS), County, and Federal authorities as required;

5.1.3 Ensuring continuity of emergency classification, protective action recommendations and notifications during a move to the AEOF; and, coordinating and managing the Emergency Response Organization from this new location.

5.2 The EOF Manager is responsible for:

5.2.1 Ensuring the AEOF is made operational in accordance with this procedure;

5.2.2 Ensuring minimum staffing is attained;

5.2.3 Ensuring other EOF Staff members perform steps outlined in this procedure.

6.0 DETAILS

6.1 EOF Manager shall follow steps in IP-EP-255 for activation and operation of the AEOF

6.2 Access to the AEOF

6.2.1 The Alternate Emergency Operations Facility is located on the 12th floor of the AT&T building at 440 Hamilton Avenue, White Plains, NY. This is approximately a 25 mile drive southeast of the Emergency Operations Facility at Indian Point.

6.2.2 The AT&T building is open from 7 a.m. to 5 p.m. Monday through Friday. To gain access to the building after hours designated personnel will use a key card and the side door.

6.2.3 The AEOF is a dedicated facility that requires a minimum of setup.

6.3 Entry into this procedure is based on guidance provided in ENN-IP-EP-255, Emergency Operations Facility – Management & Liaisons, Attachment 10.2, EOF Manager Checklist

7.0 INTERFACES

7.1 Unit 2 and Unit 3 Emergency Operations Facility Procedures

7.2 IP-EP-255, "Emergency Operations Facility – Management & Liaisons"

8.0 RECORDS

None

9.0 REQUIREMENTS AND COMMITMENTS

None

10.0 ATTACHMENTS

10.1 Layout of the AEOF

10.2 Instructions for Using the AEOF Radios

10.3 Telephone Reference Guide

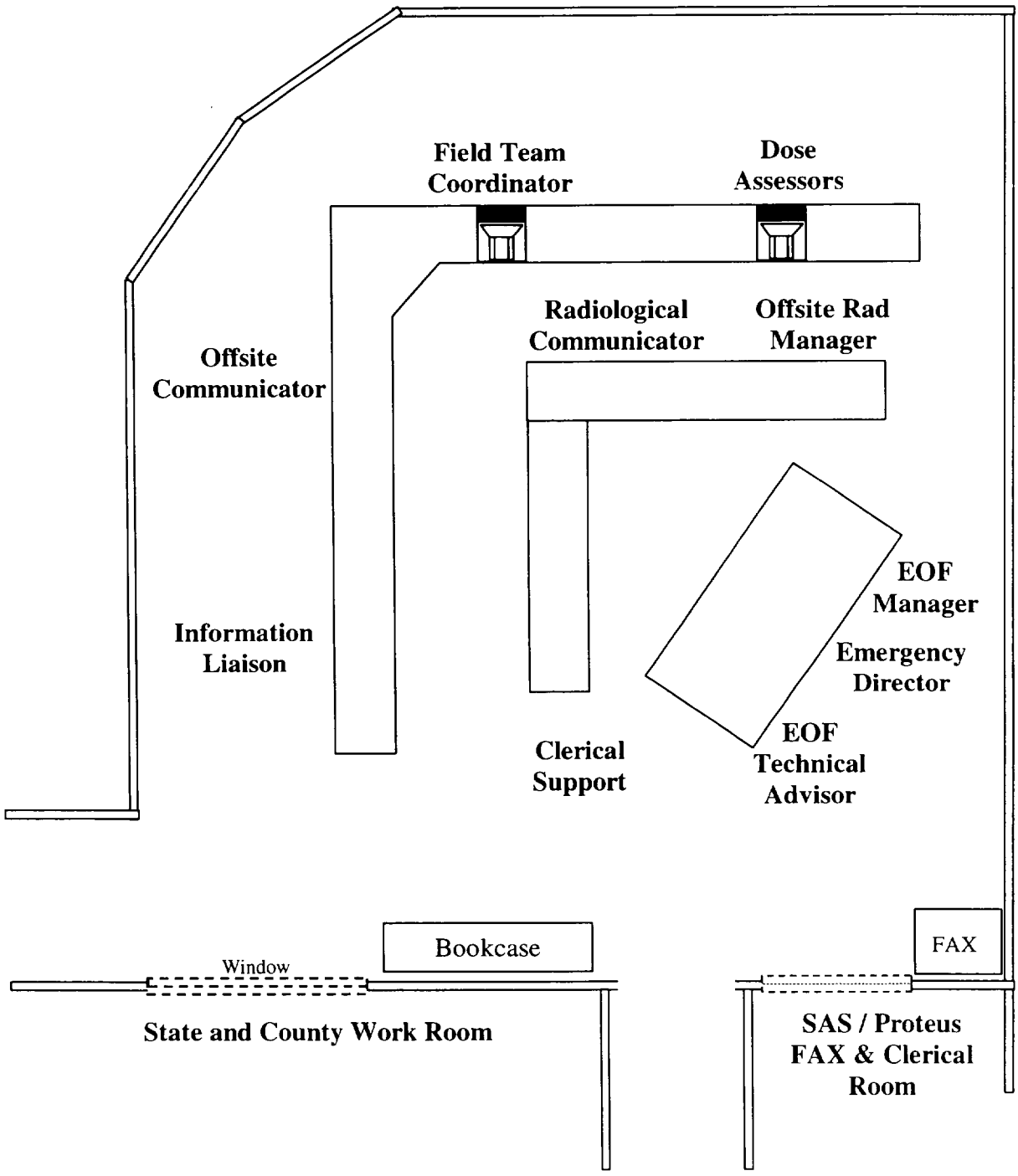
10.4 AEOF Setup Checklist

10.5 Directions to the AEOF

10.6 Directions to the Westchester County Fire Training Center

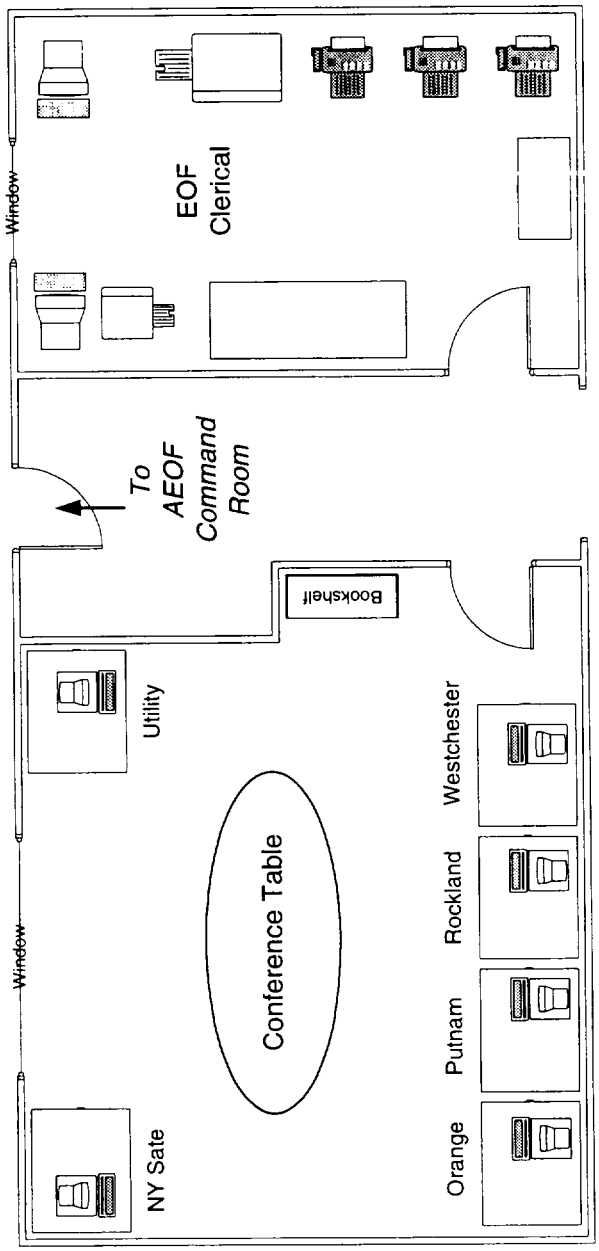
Attachment 10.1
Layout of the AEOF
Sheet 1 of 2

Command Center



Attachment 10.1
Layout of the AEOF
Sheet 2 of 2

State and County / Clerical Center



Attachment 10.2

Instructions for Using the AEOF Radios

Sheet 1 of 3

1.0 Radio Description

1.1 Motorola Consoles (2)

- Channel 1: Frequency 1, IP-3 Security, 153.56 Mhz.

  Frequency 2, Open

- Channel 2: Frequency 1, (repeater), 456.1 Mhz.

  Frequency 2, (non-repeater), 451.1 Mhz.

  (used for mobiles)

- Channel 3: Frequency 1, Local Government Radio, 45.16 Mhz.

(tied to Westchester County Emergency Operations Center (EOC)).

- Desktop Radio Handset: Local Government Radio, 45.16 Mhz. (tied to Westchester County EOC).

2.0 Instructions for Use of Motorola Consoles

2.1 Controls on Desk Microphone

2.1.1 TRANSMIT button

When actuated, the TRANSMIT button turns on the selected radio transmitter. The red transmit indicator on the front panel lights to provide an on-the-air indication.

2.1.2 MONITOR button

When actuated, the MONITOR button enables the operator to determine if the channel is in use before making a transmission. The MONITOR button must be depressed and held while monitoring.

Attachment 10.2

Instructions for Using the AEOF Radios

Sheet 2 of 3

2.2 Controls and Indicators on Control Panel – Horizontal Panel

2.2.1. Channel Select Switches

The channel select switches (CH1 through CH3 – top row only) select channels for transmitter turn-on and monitor commands. Only one channel may be selected; depressing one channel select switch resets all other channel select switches. When a selection is made, receive audio for that channel is switched from the unselect speaker on the front panel to the select speaker on the control console.

2.2.2 F1-F2 Button

The F1-F2 button is used to select either of two frequencies of a two-frequency base station. A FREQ 1 indicator lights when FQ is selected. A FREQ 2 indicator lights when F2 is selected. THIS BUTTON IS FOR CHANNEL 2 ONLY.

2.3. Controls and Indicators on Front Panel – Vertical Panel

ALL BUTTONS ON THIS PANEL SHOULD NOT BE DEPRESSED.

2.4 Reception

The CALL indicator flashes whenever receive audio is present on the associated channel. If the channel is not selected, audio is heard in the unselect speaker at the right side of the front panel. If the channel is selected, audio is heard in the select speaker at the left side of the control panel. Adjust the volume of each speaker as desired using the Unselect Volume control on the front panel for the unselect speaker and VOLUME control on the control panel for the select speaker.

2.5 Transmission

To transmit, first select the desired channel by depressing the appropriate select switch (CH1, CH2, etc.) on the control panel. Only one channel may be selected for transmission. If the BUSY lamp is lit on any channel, an operator cannot transmit on that channel. After selecting the channel, listed to the select audio speaker and if a call is in progress, wait until the call has ended. There may be conversations on the channel, which can only be heard by actuating the Monitor button on the microphone. This will enable the operator to monitor the channel. If the channel is clear, the transmitter may be keyed by depressing the TRANSMIT switch.

Attachment 10.2
Instructions for Using the AEOF Radios
Sheet 3 of 3

3.0 Instructions for use of Motorola Desk Top Controller

NOTE

This unit is for use on Channel 3 Frequency 1 (LOCAL GOVERNMENT RADIO) only.

3.1. To Answer a call

3.1.1 Lift handset off hook. Speaker is muted and received audio is heard in handset earpiece until handset is replaced on hook.

3.1.2 Press Push-to-Talk button on side of handset to talk. The TRANSMIT indicator will light during transmission.

3.1.3 Release Push-to-Talk button to listen.

3.1.4 Hang-up handset when call is terminated.

3.2 To Make A Call

3.2.1 Depress MONITOR button to check that channel is clear.

3.2.2 Lift handset off hook.

3.2.3 Press Push-to-talk button to talk. Note that TRANSMIT indicator lights.

3.2.4 Release Push-to-Talk button to listen.

3.2.5 When call is complete, hang-up handset.

Attachment 10.3
Telephone Reference Guide
Sheet 1 of 3

1.0 Discussion

Each telephone has two telephone lines, an intercom function and a facility paging function.

> **Note**:
> Only two telephones in the facility are speakerphones. You may listen to others over the telephone speaker but they will not be able to hear you unless you use the handset.

1.1 PBX line (272-3xxx exchange) requires that you dial 9 to get an outside line. This line is the first line on the left.

1.2 Outside line (682-8xxx exchange) is a direct dial line to the outside calls. This line is the second line from the left.

1.3 Intercom System uses the On-0ff button and a three-digit code to page or call another telephone number in the facility.

1.4 The Page button will access the facility public address system. This page network also covers the State/County area and the Clerical Support Area. It does not cover the NRC work area (in the EP Manager's office).

2.0 To Answer a Call

2.1 Pick up handset

2.2 Answer the call by pressing the line key with the flashing green LED

3.0 Making an Outside Call from the PBX line

3.1 Pick up the handset

3.2 Press the PBX line button and Dial 9

3.3 Listen for dial tone

3.4 Dial the desired number

Attachment 10.3
Telephone Reference Guide
Sheet 2 of 3

4.0 Making an Outside Call from the Outside line

4.1 Pick up the handset

4.2 Press the outside line button

4.3 Listen for dial tone

4.4 Dial the desired number

5.0 Placing a call on Hold and Retrieving the Call

5.1 Press the HOLD button during a call

5.2 Retrieve the call by pressing the LINE key with the flashing green LED

6.0 Transferring Calls

6.1 During a call depress the HOLD button

6.2 Dial the extension number to which the call will be transferred

6.3 When the recipient answers, announce the call and hang-up

6.4 If recipient does not want to answer call you can return to the caller by pressing the LINE key with the flashing green LED

7.0 Making a Conference Call (this will take both lines)

Only two other people and you can be on the conference call. This will require both telephone lines.

7.1 Adding an Outside line

a. Press the HOLD button during a call

b. Press the other line button

c. Dial the party to be included in the conference (remember to dial 9 if using the PBX number)

d. Press CONF button after the call is answered to connect all parties

Attachment 10.3
Telephone Reference Guide
Sheet 3 of 3

7.2 Adding an Internal extension

a. Press the HOLD button during a call

b. Press the other line button

c. Dial the extension number to be included in the conference

d. Press CONF button after the call is answered to connect all parties

7.3 To End the Conference Call hang up the telephone

8.0 Using the Intercom function

8.1 Press the ON/OFF button so that the light illuminates

8.2 Dial the three digit number for the party you wish to reach

9.0 Using the Page function

9.1 Pick up the handset

9.2 Press the PAGE button

9.3 Address the entire facility (this does not cover the NRC work area)

ATTACHMENT 10.4
AEOF Setup Checklist
Sheet 1 of 1

1.	SYNCHRONIZE the AEOF time with the Control Room.	❑
2.	DISTRIBUTE AEOF Position Books	❑
3.	TEST all phones and headsets	❑
4.	VERIFY the following Status Boards are ready:	❑
	- Indian Point Wind Sector Map	❑
	- Meteorological (MET) Status	❑
	- Site Perimeter Map	❑
	- Visitors sign-in	❑
	- Protective Action Recommendation Board	❑
	- Verification Point Map	❑

Notes / Follow up Items:

Attachment 10.5

Directions to the AEOF

Sheet 1 of 1

Directions to the AEOF:

1. Take US-9 South from Buchanan. (~7 miles)
2. Take NY-9A South towards Briarcliff Manor.
3. Stay on NY-9A South. (~5 miles)
4. Stay straight to go onto NY-100 South / Briarcliff Peekskill Parkway / NY-9A South
5. Take the RT-100 ramp towards RT-9 / Saw Mill River Parkway. (0.4 miles)
6. Keep left at the fork in the ramp.
7. Turn slightly left onto Broadway / NY-141.
8. Take the ramp towards Sprain Brook Parkway / Bronx River Parkway.
9. Merge onto Taconic State Parkway South.
10. Take Sprain Brook Parkway South towards New York City.
11. Merge onto Sprain Brook Parkway South. (3.5 miles)
12. Take the I-287 East exit on the left towards White Plains.
13. Merge onto I-287 East. (2.0 miles)
14. Take exit number 6, RT-22, towards White Plains / North White Plains.
15. Turn right onto North Broadway / NY-22 South. (0.7 miles)
16. Turn right onto Hamilton Ave / NY-119 W.

***Note**: There is 3 separate AT&T buildings on Hamilton St. 360, 400 & 440 the AEOF is located in 440 Hamilton. In the evenings use door on side of building between 400 Hamilton and 440 Hamilton.*

17. Park on the roof of the Sears parking deck, across the street from the AT&T building at 440 Hamilton.

Attachment 10.6

Directions to the Westchester County Fire Training Center

Sheet 1 of 1

1. Route 9 South to Route 9A South
2. Take 9A South approximately 12 miles – past Westchester County Police Headquarters
3. Stay on 9A to Dana Road (road past "Topps")
4. Make a LEFT onto Dana Road
5. Fire Training Center is 2nd driveway on RIGHT

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COPY # 25

Emergency Operations Facility Management and Liaisons

Prepared by:	Al Lee (Print Name)	(Signature)	6/26/02 (Date)
Approval:	Frank Inzirillo (Print Name)	(Signature)	7/11/02 (Date)

Effective Date: 7/11/02

Table of Contents

Emergency Operations Facility – Management and Liaisons

1.0 PURPOSE

1.1 To describe the steps for activation and operations of the Emergency Operations Facility (EOF).

2.0 PRECAUTIONS AND LIMITATIONS

2.1 EOF habitability checks are necessary to ensure long-term manning of the EOF. Should conditions exist which may result in a loss of long-term habitability of the EOF, evaluate the need for relocation of emergency response functions to the Alternate EOF in accordance with EP-IP-251 "Alternate Emergency Operations Facility."

2.2 This procedure only contains steps for members of the EOF staff who are common to both units:

- Emergency Director
- EOF Manager
- State and County Liaisons
- Lead Offsite Liaison

3.0 REFERENCES

3.1 Unit 2 Emergency Plan

3.2 Unit 3 Emergency Plan

3.3 Indian Point Energy Center Emergency Plan

4.0 DEFINITIONS

NONE

5.0 RESPONSIBILITIES

5.1 The Emergency Director (ED) is responsible for overall command and control of the emergency response, including classifications, notifications, PARs and ensuring all resources are available to mitigate conditions.

5.2 The EOF Manager is responsible for overseeing operations of the EOF and assisting the ED in performance of key duties.

5.3 The State and County Liaison is responsible for reporting to their assigned offsite EOC and providing support to the EOC staff.

5.4 The Lead Offsite Liaison is responsible for keeping the State and County Liaisons informed of onsite conditions and providing information on EOC operations to the EOF staff.

6.0 DETAILS

6.1 The Emergency Director (ED) shall follow the instructions outlined in Attachment 10.1, Emergency Director Checklist.

6.2 The EOF Manager shall follow the instructions outlined in Attachment 10.2, EOF Manager Checklist.

6.3 The State and County Liaison shall follow the instructions outlined in Attachment 10.3, State and County Technical Liaison Checklist

6.4 The Lead Offsite Liaison shall follow the instructions outlined in Attachment 10.4, Lead Offsite Liaison Checklist.

7.0 INTERFACES

7.1 Unit 2 and Unit 3 EOF procedures.

7.2 IP-EP-410, "Protective Action Recommendations"

7.3 IP-EP-251, "Alternate Emergency Operations Facility"

8.0 RECORDS

Any logs or forms completed by members of the ERO during an actual declared emergency are permanent quality records.

9.0 REQUIREMENTS AND COMMITMENTS

NONE

10.0 ATTACHMENTS

10.1 Emergency Director Checklist

10.2 EOF Manager Checklist

10.3 State and County Liaison

10.4 Lead Offsite Liaison

Attachment 10.1
Emergency Director Checklist
Sheet 1 of 9

1.0 **Initial Responsibility/Activity**	**Notes**
1.1 Initial Orientation. ❑	
A. Sign in on EOF staffing board and EOF staffing form (EP-7).	
B. Upon arrival at the EOF review facility status boards, EDDS/PICS and any other available sources to become familiar with current plant status.	
C. Obtain a briefing from the acting ED (if the EOF has not been activated, either the SM or EPM/POM will be the acting ED in the Control Room):	
1. Use an Essential Information Checklist (Form EP-9) to document the briefing.	
2. **IF** completed NYS Radiological Emergency Data Forms are not present in the EOF **THEN** Request the CR to fax copies of all forms used to make offsite notifications to the EOF for your review.	
D. **IF** the emergency affects both units, **THEN** obtain a briefing from both CR's. Assign EOF appropriately to fill their assigned positions.	
1.2 Assume the position of Emergency Director. ❑	
A. **IF** the EOF has **NOT** been activated **THEN**:	
1. **IF** an EOF Manager is **NOT** yet present **THEN**	
(a) Ensure individuals are filling the EOF positions as they become available:	
(b) **IF** additional personnel are needed **THEN** call or direct someone to call additional individuals using the Emergency Telephone Directory (Unit 2) or Appendix A (Unit 3)	

Attachment 10.1
Emergency Director Checklist
Sheet 2 of 9

Initial Responsibility/Activity (cont.) **Notes**

2. **WHEN** there is sufficient EOF staff present to assume the following emergency functions:

   - EOF Technical Advisor to assess plant conditions and recommend emergency classifications.
   - ORAD/RATL to perform dose assessment and formulate protective action recommendations (PARs)
   - Offsite Communicator to make notifications to offsite authorities

   THEN declare the EOF activated, announce facility activation within the facility and record activation time in the ED ERO Log.

3. Use a Emergency Director Turnover Sheet (Form EP-20) to perform a formal turnover with the acting ED in the Control Room:

   - Coordinate the official time of turnover to ensure it will not interfere with or delay required emergency classification, offsite notifications or issuance of PARs.
   - Once the determination has been made to formally turnover ED responsibilities, make an announcement to EOF personnel that you are now the Emergency Director.

4. Inform, or direct the EOF Manager to inform, the following individuals that you have assumed the duties of Emergency Director and that the EOF is activated.

   (a) Emergency Plant Manager (EPM – Unit 2) or Plant Operations Manager (POM – Unit 3)

   (b) Shift Manager (CR)

   (c) Company Spokesperson or JNC Director (if activated) via the Information Liaison

   (d) White Plains Office (directly or through the Recovery Support Group Manager via the Emergency Telephone Directory or Appendix C)

Attachment 10.1
Emergency Director Checklist
Sheet 3 of 9

Initial Responsibility/Activity (cont.) **Notes**

5. Direct EOF Manager or Offsite Communicator to notify Offsite Agencies of the time that the EOF was activated:
   (a) NRC via ENS
   (b) NYS and 4 Counties

B **IF** relieving another Emergency Director in the EOF **THEN** perform a formal turnover with the current Emergency Director:

1. Review the Emergency Director's activity log
2. Obtain briefing from current ED on the emergency and any actions the have been competed or are in progress using an Emergency Director Turnover Sheet (Form EP-20) to document the turnover.
3. Once the formal turnover is complete direct the EOF Manager to inform the EOF, TSC, CR and JNC that you are now the Emergency Director.

2.0 Continuous Responsibility/Activity **Notes**

2.1 Maintain personnel accountability in the EOF ❑

A. Direct EOF personnel required to temporarily leave the EOF area to inform the EOF Manager before leaving the work area.

B. If you leave the area, upon your return, obtain a briefing from the EOF Manager on any events that have occurred while you were away.

2.2 Maintain a Log: ❑

A. Maintain or direct an EOF Clerk to maintain a log using a ERO Log Sheet (Form EP-10), or equivalent.

B. Log when you assume the duties of Emergency Director (and EOF activation if not previously done).

C. Log significant decisions and important details used to make decisions (emergency classification changes and protective actions recommendations).

Attachment 10.1
Emergency Director Checklist
Sheet 4 of 9

Continuous Responsibility/Activity (cont.) **Notes**

D. Log all significant communications with other members of the ERO and all communications with individuals offsite.

E. **IF** you have assigned someone to maintain the ED log **THEN** periodically review the log for accuracy.

2.3 Classify Emergency Conditions (non-delegable) ❑

A. Review plant conditions with the Emergency Plant Manager (EPM) or Plant Operations Manager(POM) and ED Technical Advisor.

B. Review offsite radiological data with the ORAD/RATL and EOF Manager.

C. Compare current information and recommendations with the thresholds on the EAL Wall Chart or Emergency Classification Procedure and if necessary the EAL Technical Basis Document.

D. Solicit recommendation for change of classification from the EPM/POM.

E. Escalate the emergency classification when appropriate.

F. Notify the EPM/POM and the EOF Staff when and at what time the new emergency classification is made.

G. **IF** the emergency is classified as a Site Area Emergency **THEN** direct release of onsite non-essential personnel. Consider this action at the Alert classification.

H. **IF** the emergency is classified as a Site Area Emergency **THEN** ensure accountability is completed within 30 minutes of the sounding of the site assembly alarm. Authorize search & rescue for any missing persons.

I. **IF** conditions have stabilized **THEN** review procedure IP-EP-610, Emergency Termination and Recovery for termination and entry into Recovery.

Attachment 10.1
Emergency Director Checklist
Sheet 5 of 9

Continuous Responsibility/Activity (cont.) **Notes**

2.4 Make Protective Action Recommendations (PARs) (non-delegable) ❑

NOTE:
Protective Action Recommendations (PARs) are to be made only at the General Emergency classification.

A. Assess, with the assistance of the ORAD/RATL and EOF Manager, the appropriate PAR per IP-EP-410, Protective Action Recommendations.

B. Reevaluate the adequacy of PARs when plant conditions, dose projections, meteorological, or environmental conditions change.

C. PARs shall be transmitted to offsite authorities within 15 minutes of the decision to make the PAR using the offsite notification methods.

2.5 Direct initial notification of emergency classification and/or PARs to offsite authorities (State, local and NRC) (non-delegable) ❑

NOTE:
Initial offsite notifications to State and local authorities must be completed within 15 minutes of making an emergency declaration or PAR. Notification of the NRC shall be done as soon as possible after state and local authorities have been notified and must be completed within 1 hour.

A. Direct the EOF Manager to ensure a NYS Radiological Emergency Data Form Part I is being completed.

B. Review and approve (sign) the completed NYS Radiological Emergency Data Form Part I (non-delegable).

C. Direct the EOF Manager to have the Offsite Communicator transmit data on the form to the State and Local authorities and the NRC and report to you when task is complete.

Attachment 10.1
Emergency Director Checklist
Sheet 6 of 9

Continuous Responsibility/Activity (cont.) **Notes**

2.6 Direct periodic update notification to offsite authorities ❑

A. Direct the EOF Manager to ensure completion of a NYS Radiological Emergency Data Form Parts I and II (if applicable) at the following frequencies:

1. When there has been a significant change in release rates and/or meteorological conditions. (Part I & II)

   OR

2. When there has been a significant change in plant conditions (Part I).

   OR

NOTE:
When onsite conditions are stable, time period for periodic updates may be extended with concurrence from offsite authorities.

3. Approximately every 30 minutes when conditions are static.

B. Review and approve the completed NYS Radiological Emergency Data Form Part I (non-delegable).

C. Direct the EOF Manager to have Offsite Communicator transmit data on the form to State and Local authorities and the NRC and report to you when task is complete.

D. Ensure Part II of form is faxed to State and Counties.

2.7 Periodically meet with offsite representatives present in the EOF (State, Local, FEMA and NRC) ❑

A. Coordinate with the Lead Offsite Liaison to ensure representatives are kept current on:

1. emergency events
2. current plant conditions
3. emergency response activities currently underway
4. offsite radiological release status, dose assessment and PARs

B. Conduct periodic briefing of offsite representatives as deemed appropriate.

Attachment 10.1
Emergency Director Checklist
Sheet 7 of 9

Continuous Responsibility/Activity (cont.) **Notes**

2.8 Review and approve/concur Entergy news releases ❑

A. Maintain the EOF Information Liaison apprised of current emergency status and any significant events that may be of public interest.

B. Ensure that the EOF Information Liaison obtains a copy of any news release prior to issue for your review and approval (prior to JNC activation) or technical concurrence (after JNC activation).

C. Direct copies of news releases be given to offsite representatives in the EOF upon approval.

D. Confer with the Company Spokesperson at the JNC, EOF Manager, Technical Advisor and ORAD/RATL if there is any question as to the accuracy of the proposed news release prior to approval.

2.9 Conduct periodic facility briefings ❑

A. Coordinate with the EOF Manager to schedule the conduct of periodic facility briefings. Establish a briefing schedule of approximately every 30 minutes or as conditions change.

B. Use an Essential Information Checklist (Form EP-9) as a guide for leading the briefings.

C. Direct the ED Technical Advisor and the ORAD/RATL to participate in briefing facility personnel on current plant status and offsite radiological conditions respectively.

D. **Emphasize** what the major tasks and priorities are during every briefing.

E. Direct EOF staff to review their procedure to ensure required actions are being performed.

F. Periodically ensure the Company Spokesperson and the other facility managers are briefed on EOF activities.

Attachment 10.1
Emergency Director Checklist
Sheet 8 of 9

Continuous Responsibility/Activity (cont.) **Notes**

2.10 Approve emergency radiation exposures and KI issuance for Entergy Workers ❑

A. When requested by the EPM/POM, EOF Manager and/or ORAD/RATL, approve emergency radiation exposures and/or issuance of KI for Entergy emergency workers outside the Protected Area Fence.

B. Authorize emergency exposures for all monitoring team personnel dispatched from the EOF and other EOF staff as required. Ensure this authorization is documented in the ED's Log Sheet.

C. Potassium Iodide should be issued for any expected or actual Thyroid Exposure > 25 Rem CDE.

2.11 Acquire and allocate Entergy and external resources as needed to support emergency response. ❑

A. Review personnel, equipment and supply needs with the EPM/POM.

B. Make all Nuclear Organization resources available to supply needed items.

C. Direct the Admin & Logistics Manager or the Corporate Recovery Support Group Manager to interface and coordinate with the Entergy Corporate organization to acquire needed equipment and resources that are not under the direct control of the Indian Point Nuclear Organization.

D. Request support from INPO and Federal authorities when needed.

Attachment 10.1
Emergency Director Checklist
Sheet 9 of 9

3.0 Closeout Activity **Notes**

3.1 Terminate the emergency and enter the Recovery Phase. ❑

A. Refer to IP-EP-610, Termination and Recovery, for guidance on entry into Recovery Phase.

B. Identify who will become the Recovery Manager.

C. Notify the Recovery Manager of the intention to enter recovery.

D. Terminate the emergency and officially enter the Recovery Phase.

E. Formally turnover the emergency organization to the Recovery Manager

F. Direct notification of the following locations that Indian Point has entered the Recovery Phase:

1. The NRC via Emergency Notification System (ENS)
2. State and Counties using a NYS Radiological Emergency Data Form – Part I, via the RECS
3. All activated emergency response centers (CR, TSC/OSC and JNC)

G. Ensure that a written summary of the event is provided to State and Counties per IP-EP-610, Termination and Recovery

3.2 Direct all Emergency Response Organization Managers to review documentation generated during the emergency. ❑

A. Verify all required documentation has been competed.

B. Verify accuracy of documentation.

C. Provide additional documentation such as summary reports or closeout reports that could assist in recovery of station.

3.3 Have ERO members provide all logs and records to the Recovery Manager upon termination of the emergency and entry into the Recovery Phase. ❑

Attachment 10.2
EOF Manager
Sheet 1 of 11

1.0 Initial Responsibility/Activity **Notes**

1.1 Initial Orientation. ❑

A. Sign in on EOF staffing board and EOF staffing Form (EP-7).

B. Ensure EOF set-up is completed (U3 IP-2300).

C. Upon arrival at the EOF review facility status boards, EDDS information and any other available sources to become familiar with current plant status, if available.

D. Obtain briefing from the Emergency Director

1. Use an Essential Information Checklist (Form EP-9) to document briefing items.

2. Request any additional information on current status of emergency response.

E. If the emergency affects both units, assist the ED in assigning the appropriate EOF staff to fill their assigned positions.

1.2 Assume the position of EOF Manager. ❑

A. **IF** the EOF has **NOT** been activated **THEN**:

1. **IF** the NYS Radiological Emergency Data Form Part I (Part II if required) completed by the CR are not available in the EOF **THEN**, request CR fax copies to EOF.

2. Review notification forms, noting time next notification is due.

3. **WHEN** the following minimum staff is available, **THEN** inform the On-Call ED that you are ready to activate the EOF.

(a) ORAD/RATL
(b) Offsite Communicator
(c) Technical Advisor

4. Review Normal EOF Staffing Form (EP-7) to verify full EOF Staffing.

5. **IF** additional personnel are required **THEN**:

(a) **IF** it is during normal working hours **THEN** call or assign someone to call the Assembly Coordinator in the Energy Education Center or the Hall Monitor in the Hill Training Center for additional personnel.

Attachment 10.2
EOF Manager
Sheet 2 of 11

Initial Responsibility/Activity (cont.) | **Notes**

(b) **IF** the needed individuals are **NOT** available onsite **THEN** call or assign someone to call individuals at home using the Emergency Telephone Directory (Unit 2) or Appendix A Phone List (Unit 3).

6. **WHEN** the EOF On-Call Emergency Director assumes ED responsibilities from the acting ED in the CR **THEN:**

   (a) Inform the following personnel that ____(name)_____ is now the Emergency Director and that the EOF is activated.

   (1) Emergency Plant Manager/Plant Operations Manager

   (2) Shift Manager

   (3) JNC director

   (4) White Plains Office directly or through the Recovery Support Group Manager via the Emergency Telephone Directory or Appendix C.

   (b) Notify or direct the Offsite Communicator to notify Offsite Agencies that the EOF is now activated:

   (1) NRC via ENS

   (2) NYS and 4 Counties via RECs

7. Establish EOF Access Control

   (a) Assign individual to act as EOF Registration Assistant and have them to sit at the EOF entrance desk to ensure personnel sign-in.

   (b) Direct the EOF Registration Assistant to allow access only to personnel who show a valid ID from the following organizations unless authorized:

   (1) Entergy

   (2) State, Counties (Putnam, Orange, Rockland or Westchester) or Public Service Commission

   (3) NRC or FEMA

Attachment 10.2
EOF Manager
Sheet 3 of 11

Initial Responsibility/Activity (cont.) | **Notes**

(c) Direct the EOF Registration Assistant to obtain permission from EOF Manager or Emergency Director for anyone not properly badged.

8. Ensure the Lead Offsite Liaison is coordinating the State and County Liaisons at the EOCs. Provide them with the following directions:

   (a) Direct that the Liaisons should provide technical assistance to EOC personnel and direct any other request to the EOF.

   (b) Direct the Liaisons NOT to talk to the press and direct any media questions to the JNC.

B. **IF** relieving another EOF Manager **THEN** perform a formal turnover with the current EOF Manager:

1. Review the Emergency Director's activity log

2. Obtain briefing from current EOF Manager on the emergency and any actions the have been completed or are in progress.

3. Announcement to the EOF that you are now the EOF Manager.

2.0 Continuous Responsibility/Activity | **Notes**

2.1 Maintain personnel accountability in the EOF ❑

A. Direct EOF personnel to inform you and sign out at registration desk if they must temporarily leave the EOF.

B. **IF** you are temporarily leaving the work area **THEN**

1. Inform the Emergency Director if you are leaving the work area.

2. Upon return, obtain a briefing from the Emergency Director on any events that have occurred while you were away.

2.2 Assit the Emergency Director in maintaining a Log ❑

A. Use ERO Log Sheets (Form EP-10) to log information, or equivalent.

Continuous Responsibility/Activity | **Notes**

B. Log when the Emergency Director assumed the duties of ED (and EOF activation if not previously done).

C. Log when you assumed the duties of EOF Manager.

D. Log significant decisions and important details used to make decisions. (Emergency classification changes and protective actions recommendations shall be logged)

E. Log significant communications with other members of the ERO and all communications with individuals offsite.

2.3 Keep the ED informed of changing conditions that may cause an upgrade in the Emergency Classification. ❑

A. Review plant data with ED Technical Advisor.

B. Review offsite radiological data with ORAD/RATL.

C. Compare current information and recommendations with EAL Wall Charts, Emergency Classification Procedures. and the EAL Technical Basis Documents.

D. Inform the ED of any possible changes in the Emergency Classification.

2.4 Assist the ED in determining the appropriate Protective Action Recommendations to Offsite Authorities. ❑

NOTE:
Protective Action Recommendations (PARs) shall only be made at the General Emergency Classification

A. Support the Dose Assessment team on the assessment of PAR's per IP-EP-410, Protective Action Recommendations

B. Support the Dose Assessment team on the reevaluation of PARs when plant conditions, dose projection, meteorological, or environmental measurements change.

Attachment 10.2
EOF Manager
Sheet 5 of 11

Continuous Responsibility/Activity | **Notes**

C. Once the ED makes or changes a PAR it shall be transmitted to offsite authorities using a NYS Radiological Emergency Data Form, Part I, within 15 minutes of the decision to make the PAR.

2.5 IF the ED changes the emergency classification THEN ensure notification of State and Local authorities be completed within 15 minutes. ❑

NOTE:
The MEANS Computer program may be used to print NYS Radiological Emergency Data Forms.

A. Complete (or designate the completion of) a NYS Radiological Emergency Data Form (Part I)

B. Have the ED review and approve the completed NYS Radiological Emergency Data Form (The ED approval is non-delegable).

C. Direct Offsite Communicator to transmit data on form to State and Local authorities and report to you when task is complete.

D. Direct transmittal of form data to NRC as soon as possible but no later than1 hour.

2.6 Direct periodic updates to offsite authorities be prepared ❑

NOTE:
Completion and transmittal of part II of the NYS Radiological Emergency Data Form may not be needed if there has been no significant release of radioactive materials.

A. Ensure completion of a NYS Radiological Emergency Data Form Part I (Part II if required) at the following times:

1. When there has been a significant change in release rates and/or meteorological data.
2. When there has been a significant change in plant conditions.
3. **OR** approximately every 30 minutes if conditions are static.

Attachment 10.2
EOF Manager
Sheet 6 of 11

Continuous Responsibility/Activity **Notes**

B. Present completed form to the ED for review and approval. (The ED's Approval is non-delegable.)

C. Direct Offsite Communicator to transmit, via RECS, data on the Part I form and by fax, the Part II form to State and Local authorities and the NRC and report to you when task is complete.

2.7 Ensure the Lead Offsite Liaison is briefing offsite representatives present at the EOF (State, Local, FEMA and NRC) ❑

A. Upon their arrival at the facility, offsite representatives should be briefed on:

1. emergency events
2. current plant conditions
3. emergency response activities currently underway
4. offsite radiological release status
5. dose assessment and PARs

B. Coordinate with ED and ORAD/RATL the periodic meetings of offsite representatives as deemed appropriate.

2.8 Evaluate the need to release all Non-Essential Personnel and recommend release to ED if conditions warrant. ❑

A. Check with the EPM/POM on conditions within the Protected Area and the ORAD/RATL on conditions outside the Protected Area.

B. Release of non-essential personnel should occur at a Site Area Emergency, if radiological plume direction does not preclude.

C. **IF** conditions exist at an Alert that could warrant release **THEN** consider release of non-essential personnel from site.

Continuous Responsibility/Activity | **Notes**

2.9 Assist the ED in periodic facility briefings ❑

A. Coordinate with the Emergency Director to schedule the conduct of periodic facility briefings. Establish a briefing schedule of approximately every 30 minutes or as conditions change.

B. Use FormEP-9, Essential Information Checklist as a guide for leading the briefings.

C. Direct the ED Technical Advisor and the ORAD/RATL to participate in briefing facility personnel on current plant status and offsite radiological conditions respectively.

D. **Emphasize** what the major tasks and priorities are.

2.10 IF additional resources are need to support emergency response THEN assist, and or direct the Admin & Logistics Manager or the Corporate Recovery Support Group Manager to assist ED in making request to Federal agencies or other non-Entergy organizations. ❑

2.11 Relocation of the EOF to AEOF

A. **IF** the following conditions are present **THEN** perform an organized evacuation of the EOF to the AEOF.

NOTE:
Evacuation may be performed at rates below those listed based on plant conditions and response needs.

- Exposure rates > 80 mRem/Hr TEDE **OR** 500mRem/Hr TODE
- Projected Whole Body Dose for a 12 hour period is > 1 Rem TEDE **OR** Thyroid Dose >5 Rem TODE
- Airborne concentrations which may result in exceeding occupational limits for inhalation specified in 10CFR20, Appendix B, Table 1.

B. **IF** plant conditions warrant, **THEN** consider starting relocation to the AEOF.

Attachment 10.2
EOF Manager
Sheet 8 of 11

Continuous Responsibility/Activity | **Notes**

C. **IF** time permits, **THEN** have a relief shift report to the AEOF and perform turnover prior to evacuation of EOF:

   1. Have relief team to begin set up of the AEOF. Direct them to set up facility in accordance with procedure IP-EP-251, Attachment 10.4, AEOF Setup Checklist.

D. Determine the speed at which the relocation of personnel should occur giving consideration to the following items:

   1. Consider the impact of immediate relocation vs. projects in progress.
   2. Current radiological conditions within the EOF and the Plant.
   3. Radiological conditions en route.
   4. The adequacy of response from the alternate location.

E. With the assistance of the ORAD/RATL, determine if contamination controls are needed when leaving the EOF. Items to consider:

   1. Are personnel going to become contaminated reaching their vehicles
   2. Are personnel going to become contaminated in route to the AEOF.
   3. What steps are needed to prevent contamination of the AEOF
   4. **IF** time allows **THEN** consider arranging for a bus to relocate personnel. (this will minimize movement of potentially contaminated vehicles outside the Emergency Planning Zone)

F. Direct the ORAD/RATL to:

   1. Determine radiological controls needed to safely transfer personnel to the AEOF.
   2. Consider contamination control measures needed to prevent contamination of AEOF.

Continuous Responsibility/Activity | **Notes**

3. **IF** EOF Staff members are or will be potentially contaminated **THEN**:
   a. Send personnel to the Westchester County Fire Training Center for monitoring and decontamination. (Attachment 10.5 contains directions to center).
   b. Inform Westchester County of decision to have Indian Point ERO members decontaminated at center and arrange for expeditious processing of personnel.
4. Individuals should be decontaminated prior to arrival at AEOF.
5. Transfer offsite radiological assessment responsibilities:
   a. To a qualified ORAD/RATL located at the AEOF

      OR

   b. Back to the Control Room.

G. Direct the EOF staff to relocate to the AEOF as follows:

1. Instruct clerical personnel to make and distribute copies of Attachment 10.5 of procedure IP-EP-251, Directions to the AEOF, to EOF Staff members, Federal, State and Local representatives in the EOF.
2. Direct EOF Staff to wear their ID badges enroute to the AEOF and show them to authorities if necessary to transit through evacuated areas.
3. **IF** it was determined that contamination controls are needed, **THEN** brief EOF Staff members to go to the Westchester Fire Training Center for decontamination AND inform the AEOF staff of the required actions.
4. **IF** between 7 a.m. to 5 p.m., Monday through Friday, **THEN** responding emergency personnel should enter through the main entrance to 440 Hamilton.
5. **IF** it is during non-working hours **THEN** responding emergency personnel should enter through the side door.

Attachment 10.2
EOF Manager
Sheet 10 of 11

Continuous Responsibility/Activity | **Notes**

H. **IF** communications systems are still functional **THEN** notify the following locations that the EOF is being relocated to the AEOF:

1. Offsite authorities verifying they have the telephone numbers they can use to maintain communications.
2. The Joint News Center
3. The Technical Support Center
4. The Operational Support Center
5. The Control Room
6. The Emergency Planning Staff Member at the AEOF

I. Coordinate evacuation of the EOF with the ED and the EPM/POM transferring ED responsibilities back to the EPM/POM if another ED can not assume responsibilities at the AEOF

J. Have copies of Directions to the AEOF, Attachment 10.5 of Procedure IP-EP-251, Alternate Emergency Operations Facility, directions distributed to EOF Staff.

K. Request that the EPM announce the decision to evacuate and ensure relief shift is made aware of re-location.

2.12 Arrange for second Shift

A. **IF** it is a Unit 3 event **THEN**:

1. Request the ED establish a relief time.
2. Direct Emergency Response Facilities to prepare rosters for second shift.
3. Inform the POM, TSC Manager and OSC Manager of the relief time and that they are to inform ERO members prior to releasing them and have their staffs contact relief personnel not currently onsite.

B. **IF** it is a Unit 2 event **THEN** the OSC Accountability Clerk will be establishing relief rosters. Work with ED and EPM to establish relief time.

Attachment 10.2
EOF Manager
Sheet 11 of 11

3.0 **Closeout Activities**	**Notes**
3.1 Termination of the emergency and entry into the Recovery Phase. (The ED is responsible for directing entry into the Recovery Phase) ❑	
A. Refer to IP-EP-610, Termination and Recovery, for guidance on entry into Recovery Phase.	
B. Assist the ED in formulation of a recovery plan.	
C. Notify the following locations that Indian Point has entered the Recovery Phase:	
1. The NRC via Emergency Notification System (ENS)	
2. State and Counties using information on a NYS Radiological Emergency Data Form Part I, via the RECS	
3. All activated emergency response centers (CR, TSC/OSC and JNC)	
4. WPO Office	
3.2 Ensure that a written summary of the event is provided to State and Counties per IP-EP-610, Termination and Recovery.	
3.3 Direct EOF Staff to return all equipment to proper storage locations. ❑	
3.4 Review all documentation the EOF Staff maintained during the emergency: ❑	
A. Ensure logs, forms and other documentation are complete	
B. Ensure all temporary procedures used and/or developed are properly documented for use by Recovery Organization so that necessary actions can be taken for plant operations.	
3.5 Provide all logs and records to the Recovery Manager upon termination of the emergency and entry into the Recovery Phase. ❑	

Attachment 10.3
State and County Liaison
Sheet 1 of 3

1.0 Initial Responsibility/Activities — **Notes**

1.1 Assume the position of State or County Liaison. ❑

NOTE:
IF more than one liaison arrives at an EOC, **THEN** one individual should assume position and other individual(s) should stand by until all EOCs have been staffed and relief schedule established.

A. Report to your assigned offsite Emergency Operations Center (EOC)
   1. Show your Identification to EOC security and inform them of your purpose for being at the EOC.
   2. Inform the Emergency Operations Center Manager (title may vary for different EOCs) you have arrived.
   3. Contact Lead Offsite Liaison:
      (a) Using wireless phone call into State and County Liaison Conference Bridge (Phone number and password are listed in the Emergency Telephone Directory)
      (b) Inform the Lead Offsite Liaison of your arrival at the Emergency Operations Center and you are now the <location> Technical Liaison.
   4. **IF** the Lead Offsite Liaison is **NOT** available **THEN** contact the EOF Manager (via the Emergency Telephone Directory or Appendix C) and inform him/her of your arrival at <location>.

B. **IF** relieving another State and County Liaison **THEN** perform a formal turnover with the current liaison:
   1. Review current emergency status
   2. Obtain briefing from current State and County Technical Liaison on the emergency and any actions the have been competed or are in progress.
   3. Inform the Lead Offsite Liaison or EOF manager that you are now the State and County Liaison for _____(location)_____
   4. Inform key members of the EOC staff you are now the liaison.

Attachment 10.3
State and County Liaison
Sheet 2 of 3

2.0 Continuous Responsibility/Activities — **Notes**

2.1 Maintain a Log ❑

A. Use Form EP-10, ERO Log Sheet to log information.

B. Log when you assumed the duties of State or County Liaison

C. Log significant communications, important details on information coming into the Emergency Operations Center.

2.2 Provide technical assistance to the Emergency Operations Center staff. ❑

NOTE:
DO NOT: Express any opinions regarding the events.
DO NOT: Question or "second guess" ED decisions.
DO NOT: Provide any prognosis or guesses of where the event may go.

A. Request copies of notification and data forms received from the plant and clarify the data received.

B. Use an Essential Information Checklist (Form EP-9) to document updates on emergency and plant conditions.

C. Answer questions regarding plant systems and operations, and how they relate to the current conditions.

D. Be prepared to brief EOC Staff on basis for decisions made by the Emergency Director.

E. Be prepared to provide technical briefings to EOC staff regarding the sequence of events and the current plant status.

F. Contact the Lead Offsite Liaison for clarification of any questionable or confusing data, or if any question of a "sensitive" nature has been posed.

2.3 Keep the Emergency Operations Facility informed of actions being taken at your assigned Emergency Operations Center. ❑

A. Inform the Lead Offsite Liaison of Protective Actions the State or Counties are implementing.

Attachment 10.3
State and County Liaison
Sheet 3 of 3

3.0 **Closeout Responsibility/Activities**	Notes
3.1 **Collect all materials you provided to the EOC.**	❑
3.2 **Review all documentation maintained during the emergency by the State and County Liaisons to ensure it is complete and organized.**	❑
3.3 **Provide all logs and records to the Emergency Planning Manager upon termination of the emergency and entry into the Recovery Phase.**	❑

Attachment 10.4
Lead Offsite Liaison
Sheet 1 of 3

1.0 Initial Responsibility/Activities | **Notes**

1.1 Assume the position of Lead Offsite Liaison. ❑

A. Report to the Emergency Operations Facility (EOF)

B. Sign in on the EOF staffing board and EOF staffing Form (EP-7)

C. Obtain a briefing from the Emergency director

NOTE:
All Technical Liaisons may not be present when you assume your position. The State EOC is located in Albany and it may take 2 hours or more for individual to arrive.

D. Establish communications with State and County Technical Liaisons and ensure all liaisons are in place:

1. Using wireless phone located in the upstairs State and County work area call into State and County Liaison Conference Bridge (Phone number and password are listed in the Emergency Telephone Directory)
2. Inform State and County Technical Liaisons (Located at the Emergency Operations Centers (EOCs) on bridged conference call) that you are assuming Lead Offsite Liaison, List each Technical Liaison here:

   (a) State: _____

   (b) Westchester County _____

   (c) Rockland County _____

   (d) Putnam County _____

   (e) Orange County _____

3. Re-assign extra State and County Liaisons at one location to another location if needed.

E. Greet and/or contact State and County Representative as they arrive at the EOF and have them sign in on EOF Visitor Board and have them complete and don a name tag.

Attachment 10.4
Lead Offsite Liaison
Sheet 2 of 3

Initial Responsibility/Activities (cont.) | **Notes**

1.2 **IF** relieving another Lead Offsite Liaison, **THEN** perform a formal turnover with the current Lead Offsite Liaison:

A. Review current emergency status and plant conditions
B. Obtain briefing from current Lead Offsite Liaison on the emergency and any actions that have been competed or are in progress.
C. Obtain briefing from State and County Liaisons located in the EOCs
D. Have off-going liaison introduce you to representatives in EOF.

1.3 Inform the EOF Manager that you are now the Lead Offsite Liaison

2.0 Continuous Responsibility / Activities | **Notes**

2.1 Maintain a Log ❑

A. Use Form EP-10, ERO Log Sheet to log information.
B. Log when you assumed the duties of Lead Offsite Liaison.
C. Log significant communications, important details on information provided to Offsite Representative and EOC Liaisons.

2.2 Ensure EOC Liaison Staffing ❑

A. **IF** all State and County Technical Liaisons are not present in EOCs within two hours of EOF activation **THEN** attempt to fill positions.

2.3 Provide technical assistance to the EOF State and County Representatives and to the State and County Technical Liaisons located at the EOCs. ❑

NOTES:
When answering questions from offsite representatives:
DO NOT:
1) Express any opinions regarding the events
2) Question or "double guess" ED decisions
3) Provide any prognosis or guesses of where the event may go

A. Request copies (from EOF Clerical Staff) of notification and data forms received from the plant and clarify the data received.

Attachment 10.4
Lead Offsite Liaison
Sheet 3 of 3

Continuous Responsibility /Activities (cont.) | **Notes**

B. Keep updated on plant and emergency conditions:
   1. Use the Essential Information Checklist (Form EP-9) or acquire one from the ED to gather information and provide it to State and County Liaisons located at EOCs.
   2. Receive update on plant conditions from the Emergency Director Briefings.

C. Answer questions and provide clarification as needed from the State and County Representatives (in the EOF) and State and County Liaisons regarding plant systems and operations, and how they relate to the current conditions.

D. Be prepared to brief offsite representatives on basis for decisions made by the Emergency Director.

E. Request the Emergency Director, EOF Manager, ORAD/RATL and/or Technical Advisor to the ED assist in keeping the offsite representatives located in the EOF updated.

2.4 Keep the EOF Manager informed of actions being taken at State and County Emergency Operations Centers. ❑

A. Report when EOCs are activated.

B. Report Protective Actions the State or Counties are implementing.

3.0 Closeout Responsibility/Activities | **Notes**

3.1 Collect all materials (or copies of materials) you provided to the State and County Representatives in the EOF. ❑

3.2 Review all documentation maintained during the emergency by the Lead Offsite Liaisons to ensure it is complete and organized. ❑

3.3 Provide all logs and records to the EOF Manager upon termination of the emergency and entry into the Recovery Phase. ❑

CONTROLLED

COPY # 25

Dose Assessment

Prepared by: Al Lee (Print Name) _____ (Signature) 7/2/02 (Date)

Approval: Frank Inzirillo (Print Name) _____ (Signature) 7/11/02 (Date)

Effective Date: 7/11/02

Table of Contents

DOSE ASSESSMENT

1.0 PURPOSE

To describe the methods of estimating the whole body and thyroid dose to onsite personnel and the offsite population in the event of an accidental release of radioactivity to the environment.

2.0 PRECAUTIONS AND LIMITATIONS

NONE

3.0 REFERENCES

3.1 IP-EP-520, Modular Emergency Assessment & Notification System (MEANS)

3.2 IP-EP-530, Obtaining Meteorological, Radiological and Dose Assessment Data from MR.P DAS

3.3 IP-2 Manual Determination of Release Rate (Form EP-17)

3.4 IP-3 Manual Determination of Release Rate (Form EP-18)

3.5 IPEC Manual Dose Assessment Worksheet/TEDE Whole Body Exposure Calculations and TODE Thyroid Exposure Calculations (Form EP-13)

3.6 IPEC Manual Dose Assessment Worksheet/Release Rate Back Calculated from Field Reading (Form EP-19)

3.7 Estimating Containment Activity via R-25 / 26 (Form EP-11)

4.0 DEFINITIONS

4.1 Meteorological, Radiological, and Plant Parameter Data Acquisition System (MRP-DAS) – the system which provides meteorological, Reuter Stokes and certain plant parameter data (VC Temperature, VC Pressure, Plant Vent and VC High Radiation Monitors)

4.2 Total Effective Dose Equivalent (TEDE) – The sum of the Deep Dose Equivalent (DDE) and the Committed Effective Dose Equivalent (CEDE).

4.3 Total Organ Dose Equivalent (TODE) – The sum of the Committed Dose Equivalent (CDE) to a body organ or tissue and the Deep Dose Equivalent (DDE).

4.4 Site Boundary – For Dose Assessment and Protective Action Recommendation purposes the Site Boundary is the closes distance at which members of the public would be exposed to a release. When the plume is traveling toward the water, the distance to the nearest point on opposite side of Hudson River will be considered as the Site Boundary.

5.0 RESPONSIBILITIES

Dose Assessment staff in the Control Room (CR) and in the Emergency Operations Facility (EOF) are responsible for assessing actual and potential planned and unplanned releases to the environment.

6.0 DETAILS

6.1 Use of Modular Emergency Assessment and Notification System (MEANS):

Refer to procedure IP-EP-520, MEANS for guidance on performing dose assessments using computer program.

6.2 MRP-DAS:

Refer to IP-EP-530, Obtaining Meteorological, Radiological and Dose Assessment Data from MRP-DAS.

6.3 Hand Calculation:

6.3.1 Obtain the proper Release Rate Form for the plant in the emergency (IP2 or IP3 Release Rate Forms).

6.3.2 Determine radioactive release concentration or rate (µCi/cc OR CPM) from installed radiation monitors OR via a Chemistry sample and enter onto the appropriate Release Rate calculation form (Forms EP-17(unit 2) or EP-18 (unit 3))

6.3.2.1 WHEN the plant vent survey is used, convert contact field reading to µCi/cc using conversion factor for appropriate time after shutdown. See the appropriate Release Rate calculation form (EP-FORM-17 (unit 2) or EP-FORM-18 (unit 3)).

6.3.2.2 WHEN back calculating release rate from the field, use Form EP-19.

6.3.2.3 WHEN using R-25/26 to calculate the release rate, use Form EP-11.

6.3.3 If necessary, determine the rate at which this concentration is being released. Insert values obtained into the proper equation(s) on the appropriate section of the Release Rate calculation form (Forms EP-17 (unit 2) or EP-18 (unit 3)). Calculate the noble gas release rate (NGRR)

6.3.4 Calculate the radioiodine release rate (Ci/sec) using the default equation (assumes NG/I ratio) OR the Chem Sample equation on the appropriate Release Rate calculation form (Forms EP-17 (unit 2) or EP-18 (unit 3)).

6.3.5 Obtain the appropriate Xµ/Qs from Attachment 10.1, 10.2 or 10.3. Record these values on the IPEC Manual Dose Assessment Worksheet (Form EP-13).

6.3.6 Obtain meteorological data in accordance with IP-EP-530.

6.3.7 Enter the release rates (RR), wind speed (WS) AND appropriate constants on the IPEC Manual Dose Assessment Worksheet (Form EP-13).

6.3.8 Determine the TEDE (Whole Body) AND TODE (Thyroid) exposure rates at the site boundary, 2, 5 AND 10 mile radius.

6.3.9 Determine exposure rates at other distances utilizing the Xμ/Q's from Attachment 10.2.

6.3.10 **IF** the calculated or actual doses exceed the following **THEN**, if in the CR, immediately inform the Shift Manager (SM) or Emergency Plant Manager (EPM) or, if in the Emergency Operations Facility(EOF)/ Alternate Emergency Operations Facility (AEOF), the Offsite Radiological Assessment Director (ORAD) or Radiological Assessment Team Leader (RATL):

6.3.10.1 1 Rem /hr TEDE, or

6.3.10.2 5 Rem/hr TODE, or

6.3.10.3 1 Rem Integrated Dose TEDE, or

6.3.10.4 5 Rem Integrated Dose TODE

6.3.11 Determine if there is a release above plant Technical Specifications using one or more of the following methods:

6.3.11.1 Compare release value with pre-evaluated waste permits for releases in progress. This information can be obtained from the control room and/or the Chemistry Team leader in the OSC.

6.3.11.2 FOR IP2 releases, compare release value against the conservative instantaneous atmospheric release limit of 22,200 uCi/sec. This value is based on the IP2 portion of the allowable instantaneous release limit, 225 mRem/yr.

6.3.11.3 FOR IP3 releases, compare release value against the conservative instantaneous atmospheric release limit of 38,100 uCi/sec. This value is based on the IP3 portion of the allowable instantaneous release limit, 275 mRem/yr.

6.3.11.4 If there is a release to the environment above Technical Specifications, complete Parts I & II of New York State Radiological Data Form." These forms can be filled in by hand or refer to procedure IP-EP-520, Modular Emergency Assessment & Notification System (MEANS) to have MEANS automatically print out these forms.

6.3.12 New York State Radiological Data Form, Part 1, General Information, shall be transmitted:

6.3.12.1 Within 15 minutes of the declaration of an emergency,

6.3.12.2 Within 15 minutes of a significant change in plant status or emergency classification change.

6.3.12.3 With updates approximately every 30 minutes

a. EP Form Part II, "New York State Radiological Data Form Part II, Radiological Assessment Data" shall be **completed** and **transmitted**:

1. As soon as possible after it has been determined that a release above technical specifications exists.
2. When updated (approximately every 30 minutes)
3. If there is a significant change in the release.

6.3.13 To help visualize plume location, determine the proper plume dispersion overlay:

6.3.13.1 **IF** Speed < 4 m/s AND Direction between 340° - 101° **THEN:**

a. Use BLUE down valley overlays.

b. CENTER overlay on plant and ALIGN N - S and E – W lines with those on map.

6.3.13.2 **IF** Speed < 4 m/s AND Direction between 102° - 209° **THEN:**

a. Use YELLOW up valley overlays.

b. CENTER overlay on plant and ALIGN N - S and E – W lines with those on map.

6.3.13.3 **IF** speed ≥ 4 m/s OR direction between 210° - 339° **THEN:**

a. Use RED cross valley overlays.

b. CENTER overlay and point plume along wind direction

6.3.14 **IF** a General Emergency has been declared **AND/OR** calculated or actual offsite doses are EQUAL to or GREATER than the following **THEN** use IP-EP-410 "Protective Action Recommendations" to determine what protective action recommendations should be conveyed to the EPM/ED:

6.3.14.1 1 Rem /hr TEDE, or

6.3.14.2 5 Rem/hr TODE, or

6.3.14.3 1 Rem Integrated Dose TEDE, or

6.3.14.4 5 Rem Integrated Dose TODE

6.4 In the EOF only:

6.4.1 Calculate projected doses using MEANS or manual methods.

6.4.2 If available, verify projected doses with actual field radiological data.

a. EP Form Part II, "New York State Radiological Data Form Part II, Radiological Assessment Data" shall be **completed** and **transmitted**:

1. As soon as possible after it has been determined that a release above technical specifications exists.
2. When updated (approximately every 30 minutes)
3. If there is a significant change in the release.

6.3.13 To help visualize plume location, determine the proper plume dispersion overlay:

6.3.13.1 **IF** Speed < 4 m/s AND Direction between 340º - 101º **THEN:**

a. Use BLUE down valley overlays.

b. CENTER overlay on plant and ALIGN N - S and E – W lines with those on map.

6.3.13.2 **IF** Speed < 4 m/s AND Direction between 102º - 209º **THEN:**

a. Use YELLOW up valley overlays.

b. CENTER overlay on plant and ALIGN N - S and E – W lines with those on map.

6.3.13.3 **IF** speed ≥ 4 m/s OR direction between 210º - 339º **THEN:**

a. Use RED cross valley overlays.

b. CENTER overlay and point plume along wind direction

6.3.14 **IF** a General Emergency has been declared **AND/OR** calculated or actual offsite doses are EQUAL to or GREATER than the following **THEN** use IP-EP-410 "Protective Action Recommendations" to determine what protective action recommendations should be conveyed to the EPM/ED:

6.3.14.1 1 Rem /hr TEDE, or

6.3.14.2 5 Rem/hr TODE, or

6.3.14.3 1 Rem Integrated Dose TEDE, or

6.3.14.4 5 Rem Integrated Dose TODE

6.4 In the EOF only:

6.4.1 Calculate projected doses using Step 5.1 and/or Step 5.3 above.

6.4.2 If available, verify projected doses with actual field radiological data.

6.4.3 If available, back-calculate and/or verify release rates based on actual field radiological data using a IPEC Manual Dose Assessment Worksheet, Back Calculating Release Rate from Field Data (Form EP-19).

6.4.4 Review Site Perimeter surveys.

6.4.5 Review Field Surveys.

6.4.6 Review Reuter Stokes data. Attachment 10.4, Reuter-Stokes Location Xμ/Q for 1 Meter/Sec Windspeed provides Xμ/Q values for comparison purposes.

6.4.7 Exchange offsite monitoring and projected data with State and Counties.

6.4.8 If required, estimate release rates utilizing High Range Vapor Containment radiation monitors R-25/26 (Form EP-11).

7.0 INTERFACES

7.1 IP-EP-410, Protective Action Recommendations

7.2 IP-EP-520, Modular Emergency Assessment & Notification System (MEANS)

7.3 IP-EP-530, Obtaining Meteorological, Radiological and Dose Assessment Data from MRP-DAS.

8.0 RECORDS

Forms and reports completed during an actual emergency are permanent records.

9.0 REQUIREMENTS AND COMMITMENT CROSS-REFERENCE

Unit 2 and 3 Emergency Plans

10.0 ATTACHMENTS

10.1 Site Boundary Xμ/Q Values

10.2 Xμ/Q Values for other Distances

10.3 2, 5 and 10 Mile Xμ/Q Values

10.4 Reuter-Stokes Location Xμ/Q for 1 Meter/Sec Windspeed

10.5 Discussion

Attachment 10.1

Site Boundary Xμ/Q by Pasquill Stability Category

Cross Valley (Wind Direction from 210° – 339° or Wind Speed ≥ 4 m/s)

Sheet 1 of 2

Sector	Wind From	Distance (Meters)	Pasquill Categories						
			A	B	C	D	E	F	G
1*	169º to 190º	2977	5.5 E-7	9.0 E-7	5.7 E-6	2.1 E-5	4.3 E-5	1.1 E-4	2.0 E-4
2*	191º to 213º	3234	5.2 E-7	1.0 E-6	5.0 E-6	1.9 E-5	3.9 E-5	9.6 E-5	1.8 E-4
3	214º to 235º	716	3.6 E-6	2.0 E-5	5.3 E-5	1.5 E-4	2.7 E-4	4.9 E-4	7.1 E-4
4	236º to 258º	701	3.7 E-6	2.0 E-5	5.4 E-5	1.6 E-4	2.7 E-4	5.0 E-4	7.2 E-4
5	259º to 280º	762	3.2 E-6	1.8 E-5	4.8 E-5	1.4 E-4	2.5 E-4	4.7 E-4	6.8 E-4
6	281º to 303º	625	4.7 E-6	2.5 E-5	6.4 E-5	1.8 E-4	3.1 E-4	5.5 E-4	7.9 E-4
7	304º to 325º	610	4.9 E-6	2.6 E-5	6.6 E-5	1.9 E-4	3.2 E-4	5.6 E-4	8.0 E-4
8	326º to 348º	701	3.7 E-6	2.0 E-5	5.4 E-5	1.6 E-4	2.7 E-4	5.0 E-4	7.2 E-5
9	349º to 10º	1006	2.1 E-6	1.0 E-5	3.2 E-5	9.9 E-5	1.8 E-4	3.6 E-4	5.4 E-4
10	11º to 33º	1006	2.1 E-6	1.0 E-5	3.2 E-5	9.9 E-5	1.8 E-4	3.6 E-4	5.4 E-4
11	34º to 55º	488	7.7 E-6	3.6 E-5	8.8 E-5	2.5 E-4	4.0 E-4	6.7 E-4	9.2 E-4
12*	56º to 78º	2349	6.6 E-7	1.5 E-6	8.3 E-6	3.0 E-5	6.0 E-5	1.4 E-4	2.6 E-4
13*	79º to 100º	1802	8.1 E-7	3.2 E-6	1.3 E-5	4.3 E-5	8.5 E-5	1.9 E-4	3.3 E-4
14*	101º to 123º	1689	9.0 E-7	3.7 E-6	1.4 E-5	4.8 E-5	9.2 E-5	2.0 E-4	3.5 E-4
15*	124º to 145º	1432	1.2 E-6	5.1 E-6	1.9 E-5	6.1 E-5	1.2 E-4	2.4 E-4	4.0 E-4
16*	146º to 168º	1416	1.2 E-6	5.2 E-6	1.9 E-5	6.2 E-5	1.2 E-4	2.5 E-4	4.0 E-4

* Plume for these sectors goes over the water before it touches public or private land. Site boundary in these cases is taken to be the landfall point at the sector center.

Attachment 10.1
Sheet 2 of 2

Site Boundary Xμ/Q by Pasquill Stability Category

Up Valley Plumes (wind speed <4 m/s) Wind Direction from 102° – 209°(1)

Pasquill Categories						
A	B	C	D	E	F	G
5.2 E-7	1.0 E-6	5.0 E-6	1.9 E-5	3.9 E-5	9.6 E-5	1.8 E-4

Site Boundary Xμ/Q by Pasquill Stability Category

Down Valley Plumes (wind speed <4 m/s) Wind Direction from 340° – 101°(2)

Pasquill Categories						
A	B	C	D	E	F	G
3.7 E-6	1.0 E-5	3.2 E-5	9.9 E-5	1.8 E-4	3.6 E-4	5.4 E-4

(1) Plume centerline will always cross the site boundary at sector 2. Therefore, the sector 2 Xμ/Q values are used.

(2) Plume centerline will cross the site boundary at either sector 8 (Pasquill category A) or sector 10 (for Pasquill category B – G)

Attachment 10.2

Xμ/Q for 1 Meter/Sec Windspeed for other Distances

Sheet 1 of 1

Sector	Distance (Meters)	Pasquill Categories						
		A	B	C	D	E	F	G
1.0	1608	9.5 E-7	4.0 E-6	1.5 E-5	5.0 E-5	9.0 E-5	2.1 E-4	3.4 E-4
1.5	2412	6.3 E-7	2.1 E-6	1.1 E-5	5.4 E-5	5.4 E-5	1.3 E-4	2.2 E-4
2.0	3216	5.2 E-7	8.3 E-7	5.0 E-6	1.9 E-5	3.9 E-5	9.6 E-5	1.8 E-4
2.5	4020	4.4 E-7	5.8 E-7	3.5 E-6	1.4 E-5	3.7 E-5	7.0 E-5	1.7 E-4
3.0	4824	3.6 E-7	5.0 E-7	2.8 E-6	1.0 E-5	2.2 E-5	5.7 E-5	1.3 E-4
3.5	5628	3.2 E-7	4.2 E-7	2.0 E-6	8.1 E-6	1.8 E-5	4.7 E-5	1.1 E-4
4.0	6432	2.8 E-7	3.7 E-7	1.6 E-6	6.8 E-6	1.5 E-5	4.0 E-5	9.4 E-5
4.5	7236	2.6 E-7	3.5 E-7	1.4 E-6	5.8 E-6	1.3 E-5	3.5 E-5	7.3 E-5
5.0	8040	2.4 E-7	3.2 E-7	1.2 E-6	5.1 E-6	1.1 E-5	3.1 E-5	6.7 E-5
5.5	8844	2.1 E-7	3.1 E-7	9.9 E-7	4.4 E-6	1.0 E-5	2.8 E-5	5.9 E-5
6.0	9648	2.0 E-7	2.7 E-7	8.3 E-7	3.8 E-6	9.1 E-6	2.5 E-5	5.4 E-5
6.5	10452	1.9 E-7	2.5 E-7	7.5 E-7	3.5 E-6	8.2 E-6	2.3 E-5	5.0 E-5
7.0	11256	1.8 E-7	2.4 E-7	6.7 E-7	3.2 E-6	7.5 E-6	2.1 E-5	4.7 E-5
7.5	12060	1.7 E-7	2.3 E-7	6.1 E-7	3.0 E-6	6.9 E-6	1.9 E-6	4.3 E-5
8.0	12864	1.6 E-7	2.2 E-7	5.5 E-7	2.7 E-6	6.3 E-6	1.8 E-5	4.1 E-5
8.5	13668	1.5 E-7	2.1 E-7	5.0 E-7	2.5 E-6	5.8 E-6	1.7 E-5	3.8 E-5
9.0	14472	1.5 E-7	2.0 E-7	4.6 E-7	2.3 E-6	5.5 E-6	1.6 E-5	3.6 E-5
9.5	15276	1.4 E-7	1.9 E-7	4.2 E-7	2.1 E-6	5.4 E-6	1.5 E-5	3.4 E-5
10.0	16080	1.4 E-7	1.8 E-7	4.0 E-7	2.1 E-6	5.3 E-6	1.5 E-5	3.4 E-5

Attachment 10.3

2, 5 and 10 Mile Xμ/Q for 1 Meter/Sec Windspeed

Sheet 1 of 1

	Xμ/Q		
PASQUILL CATEGORY	**2 MILE**	**5 MILE**	**10 MILE**
A	5.2E-7	2.4E-7	1.4E-7
B	8.3E-7	3.2E-7	1.8E-7
C	5.0E-6	1.2E-6	4.0E-7
D	1.9E-5	5.1E-6	2.1E-6
E	3.9E-5	1.1E-5	5.3E-6
F	9.6E-5	3.1E-5	1.5E-5
G	1.8E-4	6.7E-5	3.4E-5

Attachment 10.4

Reuter-Stokes Location Xμ/Q for 1 Meter/Sec Windspeed

Sheet 1 of 1

Sector Monitor Distance (m)		Stability Class						
		A	B	C	D	E	F	G
1	3226	5.3E-7	8.4E-7	5.1E-6	1.9E-5	4.0E-5	9.8E-5	1.8E-4
2	3379	5.2E-7	8.3E-7	5.0E-6	1.8E-5	3.9E-5	9.7E-5	1.7E-4
3	2574	6.3E-7	1.2E-6	7.3E-6	2.6E-5	5.3E-5	1.2E-4	2.4E-4
4	1448	1.2E-6	4.6E-6	1.8E-5	6.1E-5	1.1E-4	2.4E-4	3.9E-4
5	1287	1.4E-6	6.4E-6	2.3E-5	7.3E-5	1.4E-4	2.8E-4	4.4E-4
6	643	4.3E-6	2.2E-5	6.0E-5	1.8E-4	3.0E-4	5.5E-4	7.7E-4
7	643	4.3E-6	2.2E-5	6.0E-5	1.8E-4	3.0E-4	5.5E-4	7.7E-4
8	804	2.9E-6	1.7E-5	4.5E-5	1.3E-4	2.4E-4	4.5E-4	6.6E-4
9	1126	1.8E-6	8.5E-6	2.6E-5	8.1E-5	1.5E-4	3.2E-4	4.9E-4
10	1287	1.4E-6	6.4E-6	2.3E-5	7.3E-5	1.4E-4	2.8E-4	4.4E-4
11	1287	1.4E-6	6.4E-6	2.3E-5	7.3E-5	1.4E-4	2.8E-4	4.4E-4
12	2494	6.4E-7	1.3E-6	7.5E-6	2.7E-5	5.6E-5	1.2E-4	2.4E-4
13	1870	8.0E-7	2.7E-6	1.2E-5	4.2E-5	8.1E-5	1.8E-4	3.2E-4
14	1870	8.0E-7	2.7E-6	1.2E-5	4.2E-5	8.1E-5	1.8E-4	3.2E-4
15	1648	9.4E-7	3.9E-6	1.5E-5	5.0E-5	9.7E-5	2.1E-4	3.6E-4
16	1770	8.4E-7	3.3E-6	1.3E-5	4.5E-5	8.8E-5	1.9E-4	3.4E-4

Attachment 10.5
Discussion
Sheet 1 of 2

The following instrumentation/methodology can be used to determine the noble gas release rate.

- Plant vent monitor-low range (Direct Readout)
- Plant vent monitor-high range (Direct Readout)
- Plant vent survey-hand held instrument or remote readout
- Isotopic analysis of sample taken from release point.
- Condenser air ejector monitor (Direct Readout).
- Main steam line monitors.
- Back-calculating a release rate based on actual field radiological data.
- Containment radiation monitors R-25 and R-26 to measure the source term within containment and to estimate potential releases from containment.
- Potential exposure to the population if a future release of the existing containment source term occurs, utilizing the following information:

1. Containment pressure relief line contains three isolation valves (one in containment and two outside).
2. Containment purge system contains two isolation valves on the Inlet Duct (one in containment and one outside).
3. Containment purge system contains two isolation valves on the Exhaust Duct (one in containment and one outside).
4. Weld Channel (WC) and Isolation Valve Seal Water System (IVSWS) are pressurized to ensure that during accident conditions a pressure build up to AT LEAST 50 psi in containment would NOT cause a leak of radioactive material to the environment as long as the isolation valves remained in the closed position.
5. WITHOUT WC AND IVSWS, BUT with isolation valves closed, the containment leakrate is expected to be LESS THAN 0.1% of the containment volume per day (Tech Spec) WITH a pressure buildup to 50 psi inside containment. At lower pressures the leakrate would be smaller, approaching zero as the pressure differential approaches zero.
6. Containment Volume = **2.6×10^6 ft^3 = 7.4×10^{10} cc**

Attachment 10.5
Discussion
Sheet 2 of 2

7. For IP2 and Post-Steam Generator Tube Rupture (SGTR) cooldown using blowdown situations, the determination of the gaseous release rate from the blowdown flash tank shall be accomplished by determining the noble gas concentration in the faulted SG blowdown (Chem sample µCi/cc) AND the blowdown rate (GPM).

CONTROLLED

COPY # 25

Protective Action Recommendations

Prepared by:	Al Lee (Print Name)	(Signature)	6/26/02 (Date)
Approval:	Frank Inzirillo (Print Name)	(Signature)	7/11/02 (Date)

Effective Date: 7/11/02

Table of Contents

PROTECTIVE ACTION RECOMMENDATIONS

1.0 PURPOSE

To prescribe the responsibilities and methods for determining recommended protective actions for New York state and County authorities.

2.0 PRECAUTIONS AND LIMITATIONS

NONE

3.0 REFERENCES

EPA Protective action Guidelines

4.0 DEFINITIONS

Protective Action Recommendations (PARs) – Specific recommendations made by the Emergency Director to the local authorities in accordance with Emergency Plan procedures based on Protection Action Guidelines.

5.0 RESPONSIBILITIES

5.1 The Shift Manager is responsible for evaluating accident conditions, classifying the accident, and recommending protective actions to offsite authorities during the initial phases of the accident. The Emergency Director assumes these responsibilities when he takes control of the emergency response from the Shift Manager. The Offsite Radiological Assessment Director (ORAD) or the Offsite Radiological Assessment Team Leader (RATL) will assist the Emergency Director with protective action recommendations.

5.2 The decision to initiate any protective actions is solely the responsibility of the local authorities.

6.0 DETAILS

6.1 NUE, Alert, Site Area Emergency

Recommend no protective actions be taken.

6.2 General Emergency

6.2.1 The initial protective action recommendation should be made within 15 minutes of the GENERAL EMERGENCY declaration.

6.2.2 Protective Action Recommendations (PARs) shall be made in accordance with Attachment 10.1. Sectors / ERPA's are identified on Attachment 10.2.

6.2.3 The initial PAR shall be made in the first GENERAL EMERGENCY notification to the State/Counties. All subsequent, Part I notifications shall include the latest PAR.

6.2.4 Re-evaluate the PARs based on the following:

6.2.4.1 Changes in Wind Direction

6.2.4.2 Dose Assessment - (When release duration is NOT able to be estimated, use four hours as a default value),

6.2.4.3 Field data,

6.2.4.4 EPA PAGs – Attachment 10.3,

6.2.5 As protective action recommendations change, ensure appropriate steps are taken to protect the onsite population.

6.2.6 **IF** dose projections indicate a EPA PAG will be exceeded beyond 10 miles **THEN** send field teams to confirm projections and discuss possible protective actions with offsite officials if projections prove possible.

7.0 INTERFACES

7.1 Evacuation Travel Time Estimates

7.2 IP-EP-310, Dose Assessment

8.0 RECORDS

NONE

9.0 REQUIREMENTS AND COMMITMENT CROSS-REFERENCE

NONE

10.0 ATTACHMENTS

10.1 Flowchart for General Emergency Protective Action Decisions

10.2 Conversion of Sector/Zones to ERPAs

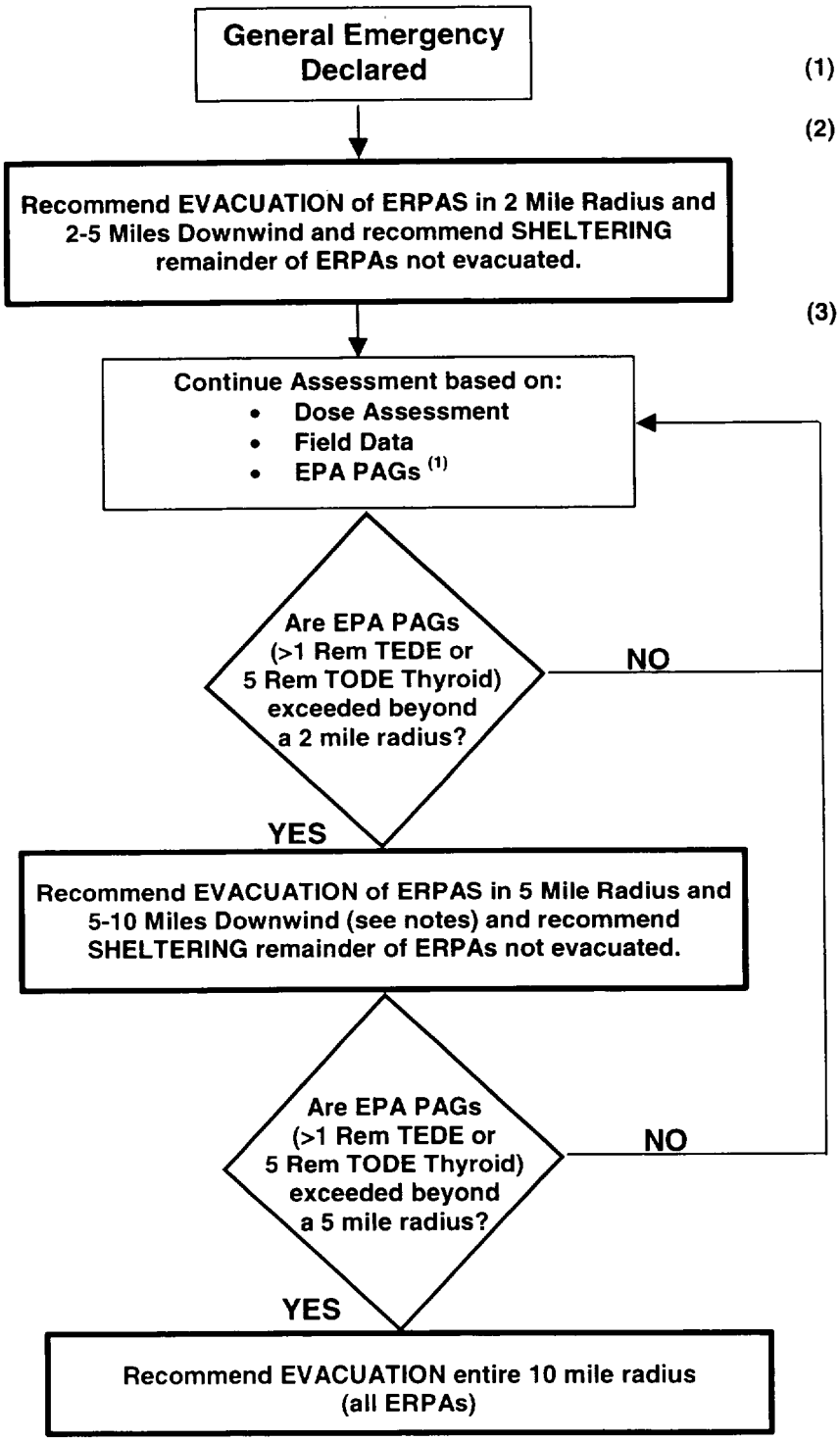
10.3 EPA Protective Action Guidelines

10.4 Overlay Selection Flow Chart

Attachment 10.1

FLOWCHART FOR GENERAL EMERGENCY PROTECTIVE ACTION DECISIONS

Sheet1 of 1



Notes:

(1) Refer to Attachment 10.3 for details on EPA PAGs.

(2) IF an EPA PAG is exceeded or expected to be exceeded beyond 10 miles THEN consider the need for PARs beyond 10 miles and discuss possible actions with State.

(3) IF recommended ERPAS change THEN add new ERPAS to new PAR DO NOT subtract any ERPA in which actions have previously been recommended.

Attachment 10.2

CONVERSION OF SECTOR/ZONES TO ERPAS

Sheet 1 of 2

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

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

TABLE IIA - 2-5 MILES DOWNWIND

Up-Valley Plumes (wind speed < 4 m/sec and wind direction from 102-209)	
All Pasquil Stability Categories	ERPAs 8, 9, 16, 18, 26, 45, 49

TABLE IIB - 2-5 MILES DOWNWIND

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

TABLE IIC - 2-5 MILES DOWNWIND

Cross-Valley (wind speed ≥ 4 m/sec OR wind direction from 210-339)

Wind Direct From (deg)	Center Sector No	Pasquil Stability Categories A & B ERPAs affected	Pasquil Stability 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

Attachment 10.2

CONVERSION OF SECTOR/ZONES TO ERPAS

Sheet 2 of 2

TABLE I - 0-5 MILE RADIUS - Evacuate all ERPAs.

1, 2, 3, 4, 5, 6, 7, 8, 9, 16, 18, 24, 26, 29, 30, 31, 38, 39, 40, 43, 44, 45, 47, 48, 49

TABLE IIA – 5-10 MILES DOWNWIND

Up-Valley Plumes (wind speed < 4 m/sec and wind direction from 102-209)	
All Pasquil Stability Categories	ERPAs 10, 11, 12, 13, 14, 17, 19, 20, 23, 25, 46

TABLE IIB - 5-10 MILES DOWNWIND

Down-Valley Plumes (wind speed < 4 m/sec and wind direction from 340-101)	
Pasquil Stability Categories	ERPAs affected
A, B	12, 21, 22, 32, 33, 34, 35, 36, 37, 42, 50, 51
C, D, E, F, G	12, 21, 22, 32, 33, 34, 35, 36, 37, 42, 50, 51

TABLE IIC – 5-10 MILES DOWNWIND

Cross-Valley (wind speed ≥ 4 m/sec OR wind direction from 210-339)

Wind Direct From (deg)	Center Sector No	Pasquil Stability Categories A & B ERPAs affected	Pasquil Stability Categories C-G ERPAs affected
169 - 190	1 N	10,17,19,20,23,25,27	17,19,23,25,27
191 - 213	2 NNE	10,11,12,13,14,17,19,20,23, 46	10,11,17,19,20,23,46
214 - 235	3 NE	10,11,12,13,14,15,17,19,20,23	10,11,12,13,14,17,19, 20,23
236 - 258	4 ENE	10,11,12,13,14,15,17,19,20,21,50	10,11,12,13,14,15,17,19,20
259 - 280	5 E	10,11,12,13,14,15,19,20,21,22,50,51	10,11,12,13,14,15,19,20,21,50
281 - 303	6 ESE	10,11,12,13,14,15,20,21,22,50,51	10,11,12,13,14,15,20,21,22,50,51
304 - 325	7 SE	11,12,13,14,15,21,22,32,33,34,35,50 ,51	11,12,13,14,15,21,22,32,50,51
326 - 348	8 SSE	12,13,21,22,32,33,34,35,36,37,50,51	12,13,21,22,32,33,34,35,50,51
349 - 010	9 S	12,21,22,32,33,34,35,36,37,41,50,51	12,21,22,32,34,35,36,37,50,51
011 - 033	10 SSW	22,31,32,33,34,35,36,37,41,51	32,33,34,35,36,37,41
034 - 055	11 SW	28,32,33,34,35,36,37,41	34,35,36,37,41
056 - 078	12 WSW	27,28,34,35,36,37,41	28,34,35,36,37,41
079 - 100	13 W	25,27,28,34,36,37,41	27,28,36,37,41
101 - 123	14 WNW	25,27,28,41	25,27,28
124 - 145	15 NW	17,23,25,27,28	17,23,25,27,28
146 - 168	16 NNW	17,19,23,25,27,28	17,23,25,27

Attachment 10.3

EPA PROTECTIVE ACTION GUIDELINES

Sheet 1 of 1

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 actions. (b) State may issue an advisory to seek shelter and await further instructions. Monitor environmental radiation levels	Previously recommended protective actions may be reconsidered 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 population	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 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).

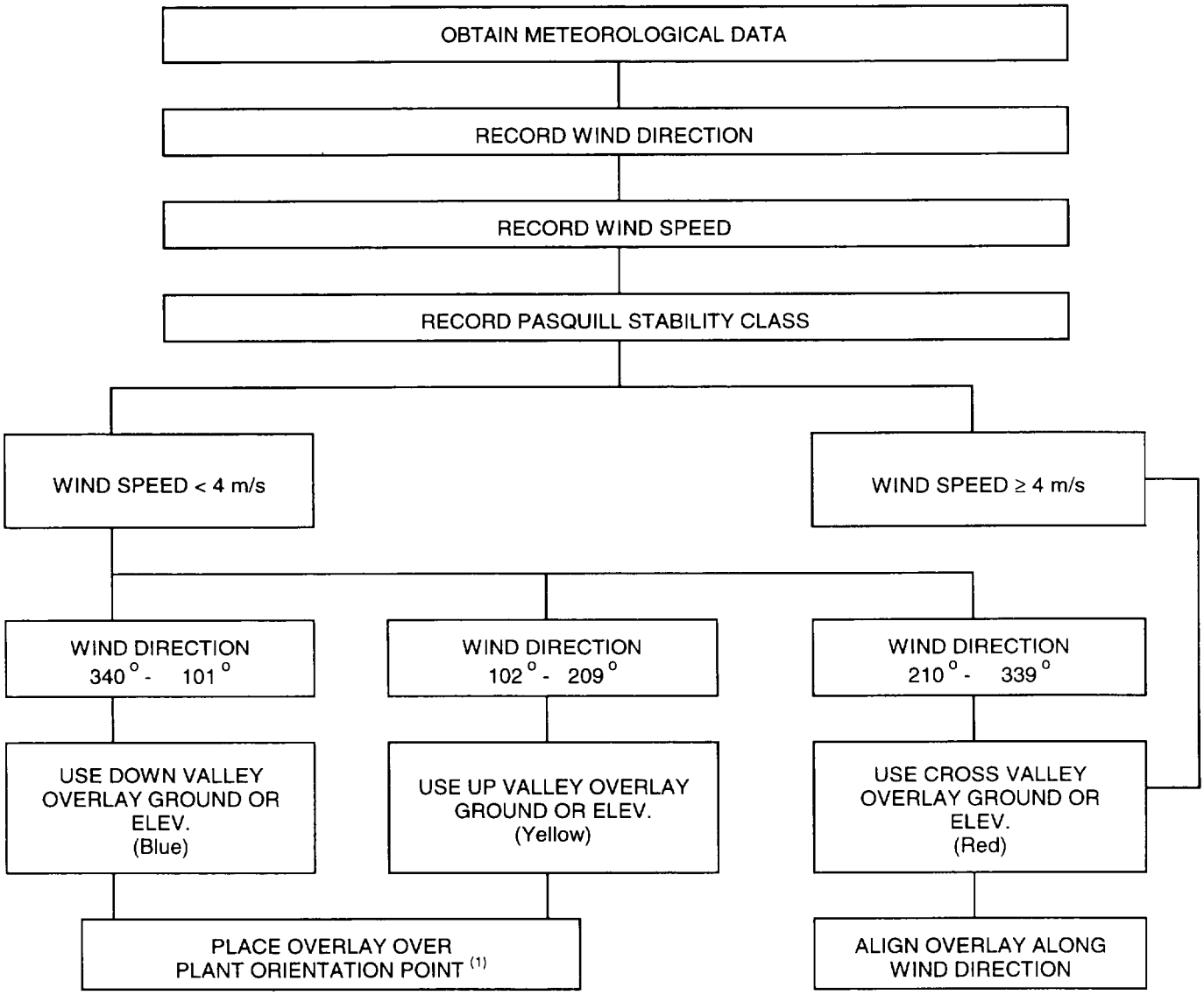
(a) These actions are recommended for planning purposes. Protective action decisions at the time of the incident must take existing conditions into consideration.

(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)

Attachment 10.4

OVERLAY SELECTION FLOW CHART

Sheet 1 of 1



1. Plant Orientation Point

   a. Using down valley overlay (Blue) align horizontal axis on 90° - 270° line with plume extending south.

   b. Using up valley overlay (Yellow) align horizontal axis on 90° - 270° line with plume extending north.

CONTROLLED

COPY # 25

Meteorological, Radiological & Plant Data Acquisition System

Prepared by:	Al Lee	Al Lee	6/26/02
	Print Name	Signature	Date
Approval:	Frank Inzirillo	Frank Inzirillo	7/10/02
	Print Name	Signature	Date

Effective Date: 7/11/02

Table of Contents

Meteorological, Radiological & Plant Data Acquisition System

1.0 PURPOSE

1.1 This procedure describes the methods available to obtain meteorological, Reuter Stokes and selected plant parameter data in the Central Control Rooms (CRs), the Emergency Operating Facility (EOF) and/or the Alternate Emergency Operating Facility (AEOF).

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Primary and Backup Tower data is normally available as an average of the data collected over a fifteen-minute period beginning and ending respectively seven and one half minutes before and after each hour and each following successive fifteen minutes from 01:00 through 24:45 Eastern Standard Time (EST) each day.

2.2 Wind speed may be reported in miles per hour (mph) or meters per second (m/s), where: 1.0 mph = 0.447 m/s; or 1.0 m/s = 2.237 mph.

2.3 Since U2 and U3 personnel use this procedure, some of the ways to obtain the meteorological data may not apply to one of the units.

3.0 REFERENCES

NONE

4.0 DEFINITIONS

Meteorological, Radiological & Plant Data Acquisition System (MRP.DAS) – system that provides meteorological, radiological and certain plant parameter data i.e.: R-27, R-25/26, VC Pressure and VC Temperature.

5.0 RESPONSIBILITIES

The Unit 2 Control Room (CR) Operators, the Unit 3 Chemistry Technicians and the MRP-DAS Operators are responsible for the implementation of this procedure.

6.0 DETAILS

6.1 Obtaining Meteorological Data:

6.1.1 Primary Methods:

6.1.1.1 Control Room (CR):

a. USE the meteorological display panel 10-m elevation to obtain to obtain wind speed, wind direction and Pasquill Category.

6.1.1.2 Emergency Operations Facility (EOF):

a. USE the meteorological display panel 10-m elevation to obtain to obtain wind speed, wind direction and Pasquill Category.

6.1.1.3 Alternate Emergency Operations Facility (AEOF):

a. USE the meteorological data obtained via a personal computer.

6.1.2 Back –up methods:

6.1.2.1 CALL Unit 2 or 3 CR identify yourself and ask for the 10m elevation wind speed, wind direction and Pasquill Category.

6.1.2.2 OBTAIN data from MRP-DAS using a personal computer (Attachment 10.1):

NOTE:

For Unit 3 CR, go to the Eplan folder to access MRP-DAS

a. Double-click the "**MRP-DAS LIVE DATA Graphics**" shortcut for the "C:\Mrp-das\Graphics" window.

b. Double-click the "mrp-das.piw" icon for the "PI-ProcessBook –mrp-das.piw [Read Only]" window.

c. Click the "MRP-DAS" tab for the available selections.

d. Click; i.e., select one of the following:

1. "Daily Summary Report"
2. "Meteorological Data Summary Report" 6 Hour Forecast"
3. Last 3 hrs and 3hr forecast"

e. Double click the highlighted selection for the data report.

f. Read the reports from the display; OR Print the report. Click the "Print" [printer] button on the toolbar at the top of the report window. Click the "***OK***" button on the "Print" window.

g. Click the "close ***window***" button to return to the "MRP-DAS" tab.

NOTE:

A PI Process Book window may appear with the question "Save changes to ...". Answer by clicking "NO".

h. Repeat by highlighting other selections as required.

i. Click the "close ***window***" button for all the open windows to return to the desktop.

6.1.2.3 OBTAIN Primary Tower data (Attachments 10.2 or 10.3):

a. Ensure the personal computer is turned on.

NOTE:

Where applicable, log on using your Network Login name and password. If already logged into a different computer may receive a message stating you do not have authority for dual access, please close this message. The computer will re-boot which takes approximately 2 minutes.

b. On the main screen double click on "Primary Tower.ht."

c. The "Connect" box will appear. Check if the phone number, 736-3263 is displayed. If not, click on Modify button and enter the number.

d. Use the default "Your location."

e. Click on "Dial." The terminal screen will indicate a

status of "Connecting", then "Dialing".

f. Following "Log in", for the Unit 2 report enter "Unit 2", for the Unit 3 report enter "ccreof" and hit Return.

g. The screen will display the last six sets of meteorological data, including Wind Speed, Pasquill Category, Wind direction and Temperature.

h. Print the report. Highlight the text of the report. Right-click within the highlighted portion of the report. Click "Print". Click "OK".

i. At the prompt, "Would you like to run this report again, enter "Y" to do so or "Return" to disconnect.

j. To Exit, click on the X in the top right corner.

6.1.2.4 OBTAIN data from the Backup Tower (Attachment 10.4):

CAUTION:

Except for testing, connect a remote terminal to this data logger only when all other sources of Primary and BackupTower data are inaccessible. The MRP-DAS is deprived of data for the duration of the connection.

a. Ensure the personal computer is turned on.

NOTE:

Where applicable, log on using your Network Login name and password. If already logged into a different computer you may receive a message stating you do not have authority for dual access, please close this message. The computer will re-boot which takes approximately 2 minutes.

1. A "Connect" box will appear. Check the following information:
2. If the phone number 737-6913 is not displayed, then Click on Modify button and enter this number.
3. If you receive: Your Location then use the default location
4. Click on "Dial". The terminal screen will indicate a status of "Connecting", then "Dialing".
5. When connected, hit Return 4 times; (4 asterisks should appear).
6. Type the number of 15-minute records desired counting back from now followed by B (i.e., 4B). Press Return.
7. Type the number of records desired again followed by D (i.e., 4D). Press Return.
8. The report will appear on the computer screen as data strings (Attachment 10.3, "Example 3, Backup Tower").
9. Print the report. Highlight the text of the report. Right-click within the highlighted portion of the report. Click "Print". Click "OK".

6.1.2.5 OBTAIN data from Offsite Agencies

a. Use the emergency telephone list to locate the offsite agencies phone numbers.

b. ACCUWEATHER -- use personal computer to log on to offsite agencies web Select ACCUWEATHER: www.accuweather.com and ENTER "Buchanan, NY" OR "10511". Click "My Local Page, Hourly Forecasts".

c. National Weather Service (NWS) Select National Weather Service: www.nws.noaa.gov and ENTER "Buchanan, NY" for "Local Forecast, City, St". Click "GO".

6.2 Obtaining Reuter Stokes and Selected Plant Parameter Data

6.2.1 Double-click the "**MRP-DAS LIVE DATA Graphics**" shortcut for the "C:\Mrp-das\Graphics" window.

6.2.2 Double-click the "mrp-das.piw" icon for the "PI-ProcessBook –mrp-das.piw [Read Only]" window.

6.2.3 Click the "MRP-DAS" tab for the available selections.

6.2.4 Click; i.e., highlight one of the select

6.2.4.1 To obtain the Reuter Stokes Data, click the 5 mile radius

6.2.4.2 To obtain the Plant Parameter Data, click either the Unit 2 Plant Parameter or Unit3 Plant Parameter Data selection.

7.0 INTERFACES

IP-EP-310, Dose Assessment

8.0 RECORDS

NONE

9.0 REQUIREMENTS AND COMMITMENT CROSS-REFERENCE

NONE

10.0 ATTACHMENTS

10.1 EXAMPLE: MRP-DAS METEORLOGICAL DATA REPORT

10.2 EXAMPLE: PRIMARY TOWER METEOROLOGICAL DATA, UNIT 3 REPORT

10.3 EXAMPLE: PRIMARY TOWER METEOROLOGICAL DATA, UNIT 2 REPORT

10.4 EXAMPLE: BACKUP TOWER DATA LOGGER REPORT

10.5 PASQUILL CATEGORY vs TEMPERATURE CHANGE at GROUND LEVEL (60m – 10m)

10.6 Estimation of Pasquill Category

10.7 DISCUSSION

Attachment 10.1

EXAMPLE: MRP-DAS METEORLOGICAL DATA REPORT

Sheet 1 of 1

NOTE:
All "9s" in a data field indicates the data was not collected.

*** DAILY SUMMARY REPORT ***
*** DATE: 05/29/2002 07:10 ***

*** MET TOWER DATA (M/S,DEG FROM,F) ***

TIME HRMN (EST)	SPD10M	SPD60M	DIR10M	DIR60M	DT60	DT122	PC
0700	2.2	3.3	2	15	-1.2	-2.1	D

*** UNIT #2 PLANT PARAMETER DATA ***

VC P948A (PSIG)	VC P948B (PSIG)	VC T1203 (F)	VC R-25 (R/HR)	VC R-26 (R/HR)	VENT R-27 (UCI/SEC)
-.2	.0	1.02E+02	<=1.00E+00	<=1.00E+00	2.53E+02

*** UNIT #3 PLANT PARAMETER DATA ***

CONT (PSIG)	CONT (F)	DOME (R/HR)	RAD VENT (UCI/SEC)
-.1	94	<=1.0E+00	1.0E+01

*** ATMOSPHERIC DISPERSION ***

SITE BOUNDARY DIST= .6 MILES XU/Q (1/M2)	2 MILES XU/Q (1/M2)	5 MILES XU/Q (1/M2)	10 MILES XU/Q (1/M2)
1.0E-04	1.9E-05	5.1E-06	2.1E-06

*** OFFSITE MONITOR DATA ***

MON NO	1	2	3	4	5	6	7	8
SECTOR	N	NNE	NE	ENE	E	ESE	SE	SSE
RAD (MR/HR)	3.4E-03	6.9E-03	6.8E-03	7.0E-03	6.3E-03	7.3E-03	7.9E-03	7.4E-03

MON NO	9	10	11	12	13	14	15	16
SECTOR	S	SSW	SW	WSW	W	WNW	NW	NNW
RAD (MRHR)	8.5E-03	6.0E-03	5.9E-03	8.5E-03	1.1E-02	6.5E-03	7.0E-03	8.4E-03

*** METEOROLOGICAL FORECAST ***

HOUR	SPEED (MPH)	DIRECTION(FROM)	RAIN	STABILITY
17 0	5.8	130	YES	D
18 0	4.9	50	YES	D
19 0	4.5	30	YES	D
20 0	4.0	0	YES	D
21 0	3.6	350	NO	D
22 0	3.6	340	NO	D

Attachment 10.2

EXAMPLE: PRIMARY TOWER METEOROLOGICAL DATA, UNIT 3 REPORT

Sheet 1 of 1

Dial: (914) 736-3263

(You may need to dial "1" or "9" before the telephone number to achieve a connection).

Indian Point Nuclear Station

Meteorological Data System

CCREOF Report

Tue Dec 14 10:47:23 EST 1999

Meteorological data

10 meter Elevation

TIME (EST)	WIND SPEED (MPH)	PAS CAT (FROM)	WIND DIR	TEMP (F)
+915.00	+7.2371	+4.0000	+12.221	+37.497
+930.00	+6.1625	+4.0000	+85909	+37.848
+945.00	+5.4943	+4.0000	+14.319	+38.095
+1000.0	+7.1415	+4.0000	+19.885	+38.751
+1015.0	+6.7935	+4.0000	+23.504	+39.072
+1030.0	+6.3646	+4.0000	+25.942	+39.208

NOTE: Pasquil +1 = A, +2 = B, +3 = C, +4 = D, +5 = E, +6 = F, +7 = G

* mph. x .45 = m/sec

Attachment 10.3

EXAMPLE: PRIMARY TOWER METEOROLOGICAL DATA, UNIT 2 REPORT

Sheet 1 of 1

Dial: (914) 736-3263

(You may need to dial "1" or "9" before the telephone number to achieve a connection).

Entergy Northeast
Indian Point Entergy Center
Primary Meteorological Tower Data
Unit 3 Hp-9000, Unit 2 Report

Tue Jul 9 16:03:34 EDT 2002

Meteorological data

TIME (EST)	122mWD (From)	122mWS (m/s)	122mPC (1-7/A-G)	60mWD (From)	60mWS (m/s)	10mWD (From)	10mWS (m/s)	10mPC (1-7/A-G)
1345	96	1.7	4	118	1.8	105	1.2	3
1400	20	1.4	4	38	1.4	35	1.0	4
1415	278	1.3	4	250	1.6	283	1.0	4
1430	245	1.9	4	263	1.8	232	1.2	4
1445	245	2.6	4	273	2.1	254	1.2	4
1500	221	4.2	4	247	3.1	243	1.5	4

NOTE: Pasquill +1 = A, +2 = B, +3 = C, +4 = D, +5 = E, +6 = F, +7 = G

Would you like to run this Again {Y,N} [Default is NO]

Attachment 10.4

EXAMPLE: BACKUP TOWER DATA LOGGER REPORT

Sheet 1 of 1

(914) 737-6913

(You may need to dial "1" or "9" before the telephone number to achieve a connection).

*4B
A1 L+3610.0 c0833
*4D
01+0001. 02+1999. 03+348.0 04+1000. 05+19.29 06+28.03 07+2.640 08+1.000
09+0.000
01+0001. 02+1999. 03+348.0 04+1015. 05+21.41 06+23.09 07+2.996 08+1.000
09+0.000
01+0001. 02+1999. 03+348.0 04+1030. 05+28.34 06+23.50 07+2.556 08+1.000
09+0.000
01+0001. 02+1999. 03+348.0 04+1045. 05+26.02 06+17.77 07+3.151 08+2.000
09+0.000

Channel
1 = ID
2 = Year
3 = Julian Date
4 = Time (EST) of Data Acquisition
5 = Average Wind Direction 10M (Degrees from)
6 = Standard Deviation (Sigma Theta) of wind direction 10M (Degrees)
7 = Average Wind Speed 10M (m/sec)
8 = Pasquill Category 10M (1-7=A-G), i.e.:
- 1 = Pasquill A
- 2 = Pasquill B
- 3 = Pasquill C
- 4 = Pasquill D
- 5 = Pasquill E
- 6 = Pasquill F
- 7 = Pasquill G

9 = Calm Wind Speed Flag 10M (0.000=OK, 4.000=calm)

...

Attachment 10.5

PASQUILL CATEGORY

vs

TEMPERATURE CHANGE at GROUND LEVEL (60m – 10m)

Sheet 1 of 1

PASQUILL CATEGORY	TEMPERATURE CHANGE (°F)
A	≤ -1.74
B	-1.56 to ≤-1.74
C	-1.56 to ≤-1.37
D	-1.37 to ≤-0.46
E	-0.46 to ≤+1.37
F	+1.37 to ≤+3.66
G	>+3.66

Attachment 10.6

Estimation of Pasquill Category

Sheet 1 of 1

Use this addendum to determine the Pasquill Category in the absence of both measured vertical temperature differences AND the standard deviation (sigma theta) for horizontal wind direction.

DEFINITION OF PASQUILL STABILITY CATEGORY	
PASQUILL CATEGORY	**STABILITY CONDITIONS**
A	Extremely unstable
B	Moderately unstable
C	Slightly unstable
D	Neutral
E	Slightly stable
F	Moderately stable
G	Extremely stable

Pasquill category can be estimated by observing or estimating the time of day, solar radiation, cloudiness, and wind speed.

KEY TO STABILITY CATEGORIES					
Surface Wind Speed (m/s)	**DAYTIME**			**NIGHT**	
	Incoming Solar Radiation (Insolation)			**Cloudiness**	
	Clear Sky	**Partly Cloudy**	**Overcast**	**Thinly Overcast or >4/8 Low Cloud**	**Clear to Partly Cloudy**
<2	A	A-B	B	E-F	G
2-3	A-B	B	C	E	F
4-5	B	B-C	C	D	E
5-6	C	C-D	D	D	D
>6	C	D	D	D	D

General Definitions

1. Daytime is considered as one hour after sunrise to one hour before sunset.
2. (a) Clear sky - less than 20 percent cloud cover.
   (b) Partly cloudy - 20 to 80 percent cloud cover.
   (c) Overcast - 80 to 100 percent cloud cover.

Attachment 10.7

DISCUSSION

Sheet 1 of 2

1. Meteorological data (i.e. wind speed, wind direction AND Pasquill category) are normally available from the following sources:

   a. Primary Meteorological (Met) Tower Sensors
   b. Backup Met Tower Sensors
   c. Backup (Standby) Met Tower Sensors
   d. Weather Service Contractor
   e. National Weather Service
   f. Local Observations

   Two data loggers, one for Unit 2 and one for Unit 3, in the Shelter at the base of the Primary Met Tower, process and record data from the sensors. The Unit-2 data logger displays data on a Met Display Panel in the Shelter and distributes its data over telephone lines to the Meteorological, Radiological and Plant Parameter Data Acquisition System (MRP-DAS) computer in the EOF and the Met Display Panels in the Unit 2 CCR and EOF. The Unit-3 data logger data can be displayed on a desktop computer in the Shelter and is distributed to an HP-9000 at Unit-3. As a last resort, should all other sources of Primary Tower data fail, data from both these data loggers is available to a remote terminal by telephone line.

2. A data logger in the enclosure at the base of the Backup Tower processes and records data from the sensors and forwards it over a telephone line to a data logger in the EOF. The data logger in the EOF processes data from the Backup (Standby) Tower, records data from both backup towers, and forwards the data to the MRP-DAS computer and the Video Graphic recorder in the EOF. Backup Tower data is forwarded when it is available and Standby Backup Tower data forwarded when it is not. As a last resort, when all other sources of BackupTower data are unavailable, data from the data logger at the Backup Tower and the EOF may be available to a remote terminal by telephone line.

3. Forecast wind speed, wind direction, Pasquill category and precipitation data for the site is provided under contract to MRP-DAS. This data is also available via facsimile or voice telephone on request.

4. Data displayed on the Met Display Panel in the Unit 2 CCR is also available from the printer at the back of the Panel. The MRP-DAS computer records and distributes data from the primary data logger to the Met Display Panel in the U3 CCR, the PI-Client terminal in the EOF, and the PI-Client terminals in State and Local Government Emergency Operation Centers. MRP-DAS will substitute backup data for lost primary data normally available to the PI-Client terminals.

Attachment 10.8

DISCUSSION

Sheet 2 of 2

5. MRP-DAS data is available using the "ProcessBook" graphics Meteorological Data Summary and Daily Summary Report at the PI-Client terminal in the EOF and by telephone line to other PI-Client terminals.

6. HP-9000 data is available by telephone at remote terminals including those at the AEOF, Unit 2 CCR and EOF.

7. In addition to data provided directly to MRP-DAS, the contractor also provides meteorological data in a report exclusively for the site. This report is available by telephone at remote terminals and includes:

   a. Meteorological data from National Weather Service (NWS) stations, within fifty miles of Indian Point.

   b. Surface weather, upper air data AND forecasts for the Indian Point Emergency Planning Zone.

8. Meteorological data is also available from National Weather Service and contractor representatives by telephone voice communication on request.

9. Data is also determined by local weather observations including those in Attachment 10.6 for the Pasquill Category.

CONTROLLED

COPY # 25

Modular Emergency Assessment & Notification System (MEANS)

repared by:	Al Lee		6/21/02
	Print Name	Signature	Date
Approval:	Frank Inzirillo		7/11/02
	Print Name	Signature	Date

Effective Date: 7/11/02

Table of Contents

Modular Emergency Assessment & Notification System (MEANS)

1.0 PURPOSE

1.1 To describe the use of the Modular Emergency Assessment and Notification System (MEANS).

1.2 To describe administrative procedures used to update Emergency Action Level Computerized Information System (EALCIS) module data.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Guidance in Procedure IP-EP-310, Dose Assessment governs performance of offsite radiological assessment.

2.2 Guidance in Procedure IP-EP-410, Protective Action Recommendations governs development of Protective Action Recommendations to be provided to offsite authorities.

3.0 REFERENCES

3.1 MEANS Version 4.0 User Manual Indian Point Station, Operations Support Services, Inc.

3.2 IP-EP-320, Dose Assessment

3.3 IP-EP-410, Protective Action Recommendations

3.4 Unit 2 and Unit 3 Emergency Classification Procedures

4.0 DEFINITIONS

4.1 System Description and Terms

The MEANS computer program for the Indian Point 2 Station is a graphical software application designed to operate within the Microsoft Windows® environment. Application operation and system requirements are dictated by Microsoft Windows® protocols.

The MEANS program, when launched, presents the user with a command switchboard which allows operation and interaction among the three emergency planning notification, assessment and information applications:

- New York State Radiological Emergency Data Forms (INForms)
- Dose Assessment and Protective Action Recommendations (DAPAR)
- Emergency Action Level Computerized Information System (EALCIS)

In addition to furnishing a rapid mechanism for switching between the applications, MEANS provides the interface to save and import meteorological, dose projection and protective action recommendation information[1] and the EAL brief non-technical descriptions onto the notification forms eliminating the need for redundant or additional data input. The interface flow diagram (figure 2-1) illustrates the basic application interactions.

This procedure contains detailed information for operating and understanding the MEANS Interface, the applications and the EALCIS administration application. It is not required nor intended to be used as a step-by-step instruction when using the MEANS interface however, the user must be familiar with basic computer operations within the Microsoft Windows® environment, dose assessment and protective action recommendations in order to operate the program effectively.

A brief description of the purpose and an illustration of each of the application's windows are provided by this procedure. Since users are not constrained to operating the application in any step order, a table is used to describe information and functions for the objects (such as buttons, fields and graphs) contained in MEANS. Information and functions include descriptions, options, units and limits as applicable.

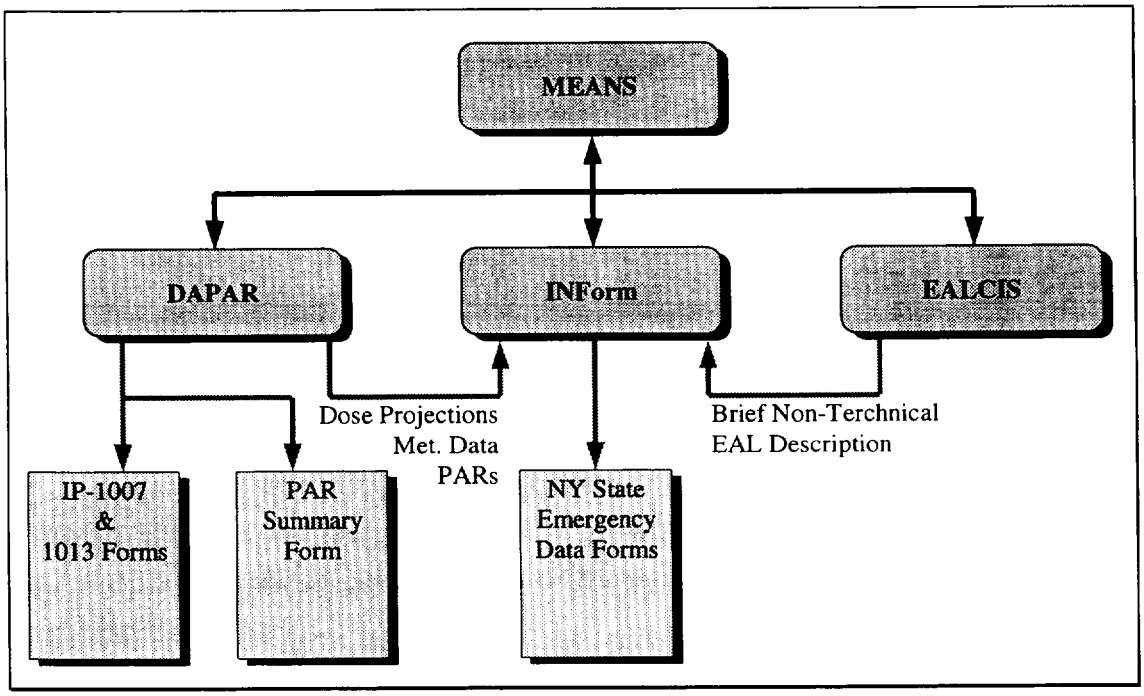


Figure 2-1: MEANS Interface Flow Diagram

[1] Dose projection and protective action recommendation data imported onto the emergency data forms is calculated by the DAPAR application in accordance with the methodologies of IP-EP-310and IP-EP-410 respectively.

A menu bar is provided to allow the user to quit the program from any point. Additionally, the application version and serial number can be obtained from the menu bar. A description of the function for each control is provided at the bottom of the application window (within the status bar) whenever the control has the focus.

The table in Attachment 10.6, MEANS Window Summary, provides details for most windows presented in the program.

5.0 RESPONSIBILIITES

5.1 Individuals assigned to perform dose assessment or make offsite noritfications during emergency will operate the MEANs program.

5.2 Personnel assigned to the Emergency Planning Department are responsible for performing administrative task to maintain the accuracy of the EAL portions of the MEANS program.

6.0 DETAILS

6.1 General MEANS Operations

6.1.1 Upon startup, the program opens to the MEANS interface (Main switchboard). The window directs program flow and provides for the sharing and transfer of information between the modules applications. Once an application's button is selected, the switchboard is hidden and the program module is opened for input. The user can return to the main switchboard by exiting the application. All of the user entered information is retained when switching between the applications.

6.1.2 Selecting the 'Emergency Data Forms' button opens the initial notification forms application to allows rapid completion of the New York State Radiological Emergency Data Forms, Parts 1 and 2.

6.1.3 Selecting the 'Dose Assessment and PARs' button opens the DAPAR application. Dose projection and assessment is performed from effluent information related to a monitored release and is based on the hand calculation methodologies of IP-EP-310, "Dose Assessment", and IP-EP-410, "Protective Action Recommendations". Up to seven multiple release points can be entered simultaneously during a single session.

6.1.4 The 'Emergency Action Levels' button opens an interactive database which provides the criteria, conditions, definitions, tables, references, and technical bases of the EALs.

6.2 Part I of the NYS Radiological Emergency Data Form

To complete Part I of the NYS Radiological Emergency Data Form go to Attachment 10.1, MEANS User Guide #1, NYS Radiological Emergency Data Form (Part I)

6.3 Part II of the NYS Radiological Emergency Data Form

To complete Part II of the NYS Radiological Emergency Data Form go to Attachment 10.2, MEANS User Guide #2, NYS Radiological Emergency Data Form (Part II)

6.4 Dose Assessment

To perform Dose Assessment and Protective Action Recommendations (DAPAR) go to 10. 3, User Guide #3, DAPAR

6.5 Review of Emergency Action Level Information

To use the Emergency Action Level Computerized Information System go to 10.4, Use of MEANS for EAL Information Functions.

6.6 System Administration

To perform administrative functions on the Emergency Action Level Computerized Information System go to Attachment 10.5, System Administration **NOTE**: Only authorized personnel shall make changes to EAL Data.

7.0 INTERFACES

7.1 IP-EP-310, Dose Assessment

7.2 IP-EP-410, Protective Action Recommendations

7.3 Unit 2 and Unit 3 Emergency Action Level Procedures

8.0 RECORDS

During actual emergencies calculations performed and reported to offsite authorities will be captured and maintained by the Emergency Planning Department.

9.0 REQUIREMENTS AND COMMITMENT CROSS-REFERNERCE

None

10.0 ATTACHMENTS

10.1 MEANS User Guide #1 NYS Radiological Emergency Data Form (Part I)

10.2 MEANS User Guide #2 NYS Radiological Emergency Data Form (Part II)

10.3 MEANS User Guide #3 DAPAR

10.4 Use of MEANS for EAL Information Functions

10.5 System Administration

10.6 MEANS Window Summary

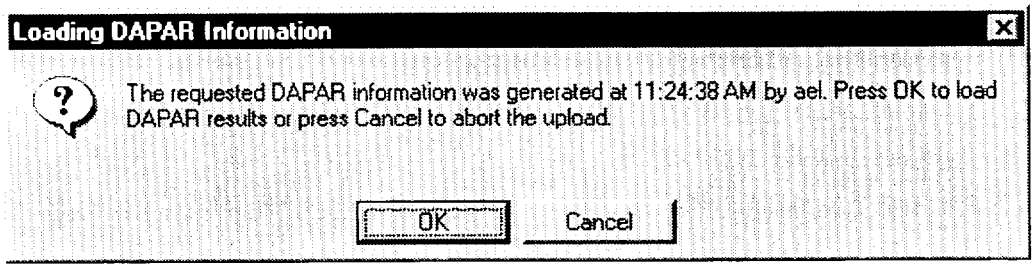
Attachment 10.1
MEANS User Guide #1
NYS Radiological Emergency Data Form (Part I)
Sheet 4 of 5

5.9 To import directly from the DAPAR module perform the following:

5.9.1 Data must be exported from DAPAR prior to importing it into Part II, see Attachment 3 for guidance on exporting data.

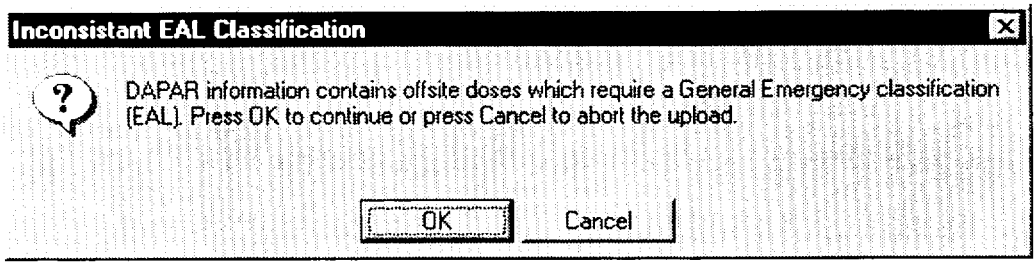
5.9.2 Radiological Data cannot be imported UNLESS, "A release is selected on Part I of the form.

5.9.3 IF the data has been exported AND a release has been selected THEN the "Load DAPAR" button will become active and pressing it will provide the following prompt:



5.9.4 Verify that the time matches data you wish to import and press "OK" to import data.

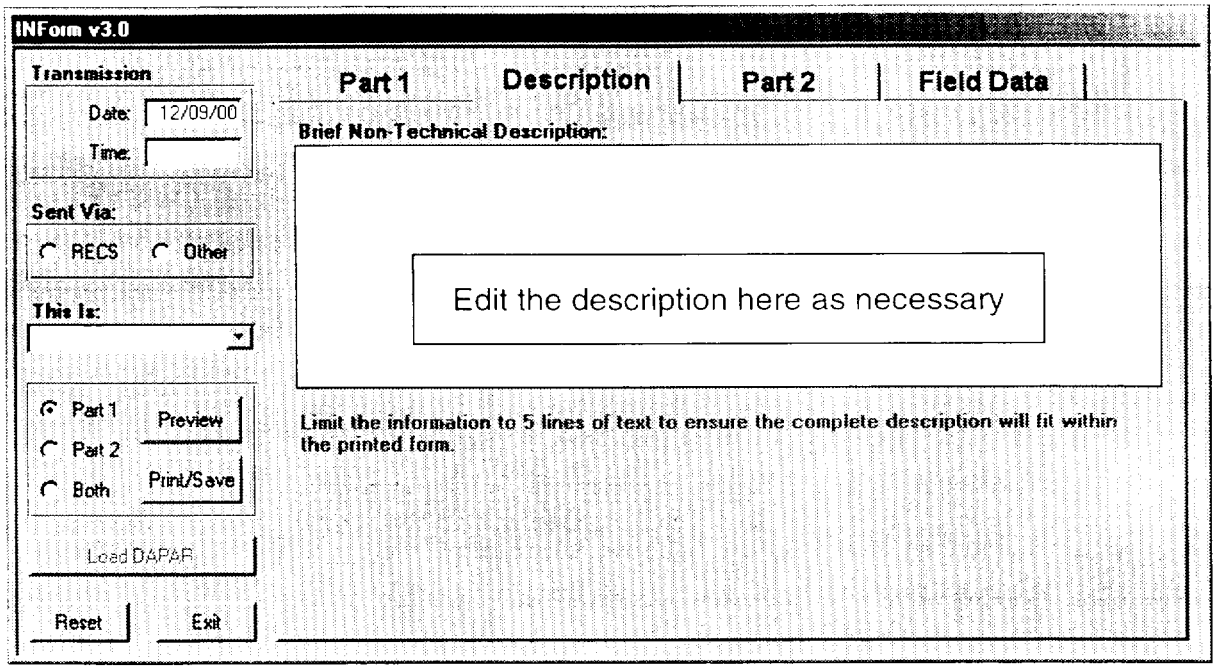
5.9.5 **IF** the DAPAR dose projections require a PAR **THEN** you will receive the following prompt:



5.10 **IF** there is no radiological release **THEN** Enter the wind speed, wind direction from, and the stability class into Met Data.

Attachment 10.1
MEANS User Guide #1
NYS Radiological Emergency Data Form (Part I)
Sheet 5 of 5

6.0 **IF** there is a need to change the description **THEN** select the "Description Tab" to open the following window:



7.0 Select the ERPAs in the Evacuate ERPAs section of the Part I window.

7.1 The program selects default ERPAS based on wind direction

7.2 If you inport data from DAPAR program updates ERPAs in accordance with Dose Projections

7.3 Once a recommendation has been made to evauate an ERPA that ERPA should always be included in updated recommendations.

8.0 Select the "*Preview*" button to see the completed form on-screen and verify data.

9.0 Select the "*Print/Save*" button to print the form and save it to the historical records.

10.0 To complete a periodic update notification form:

10.1 The information will remain as entered until the user edits fields or presses the "*Reset*" button.

10.2 Make any required changes to the information.

10.3 Preview and Print/Save.

Attachment 10.2
MEANS User Guide #2
NYS Radiological Emergency Data Form (Part II)
Sheet 1 of 5

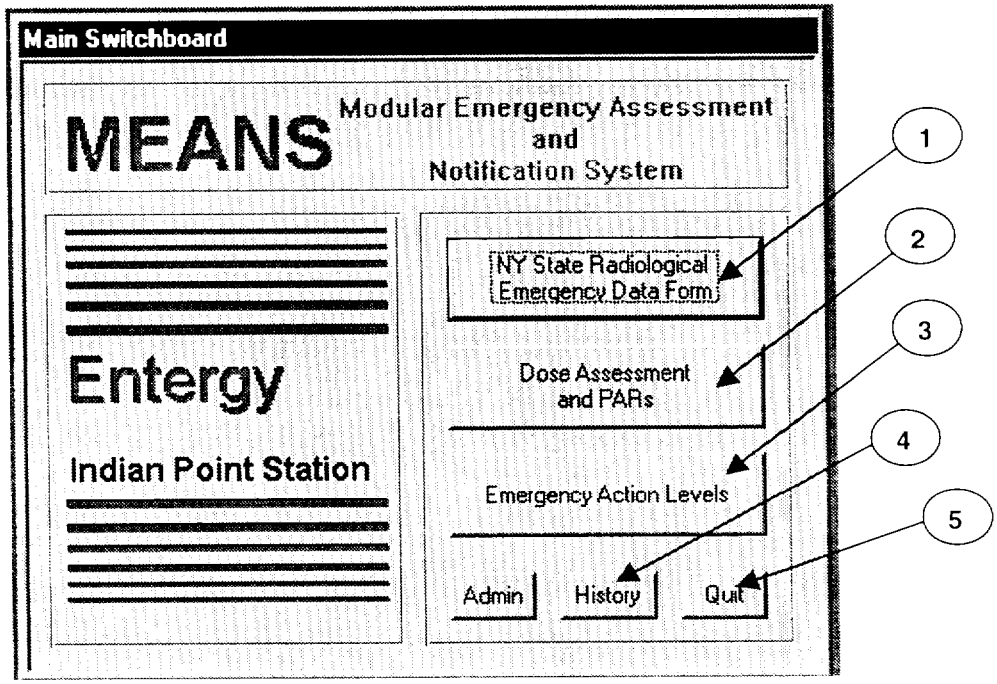
1.0 **IF** the MEANS program is NOT running **THEN** start the MEANS program by one of the following:

1.1 Double clicking icon on desktop

1.2 Selecting Means from the start memo

1.3 Locating Means program on the "C" Drive

2.0 The following window will open:



3.0 Description of Choices (buttons) on Main Switchboard:

3.1 Button 1 – Opens up the NYS Radiological Emergency Data Form Input Screen. (INForm)

3.2 Button 2 – Opens up DAPAR input screens to perform Dose Assessments.

3.3 Button 3 – Opens up Database of Emergency Action Levels (EAL), which allows review of EAL Descriptions and Technical Basis.

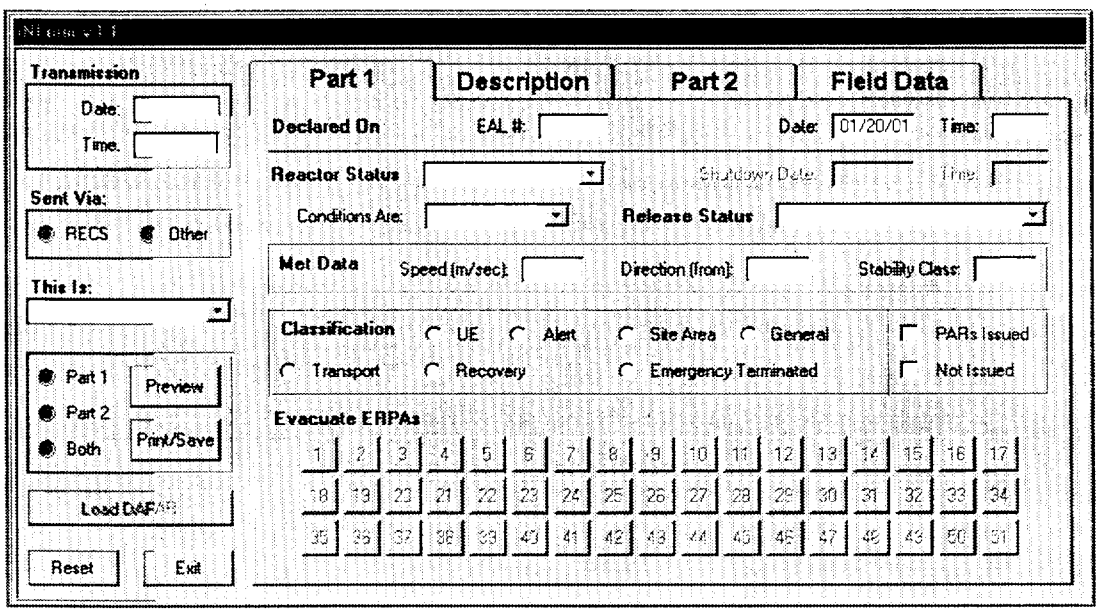
3.4 Opens up access to historical notification and dose assessment forms. Forms are stored when the *"print/save"* button is pressed from within the modules to print forms. Copies of historical forms can be printed from this window.

Attachment 10.2
MEANS User Guide #2
NYS Radiological Emergency Data Form (Part II)
Sheet 2 of 5

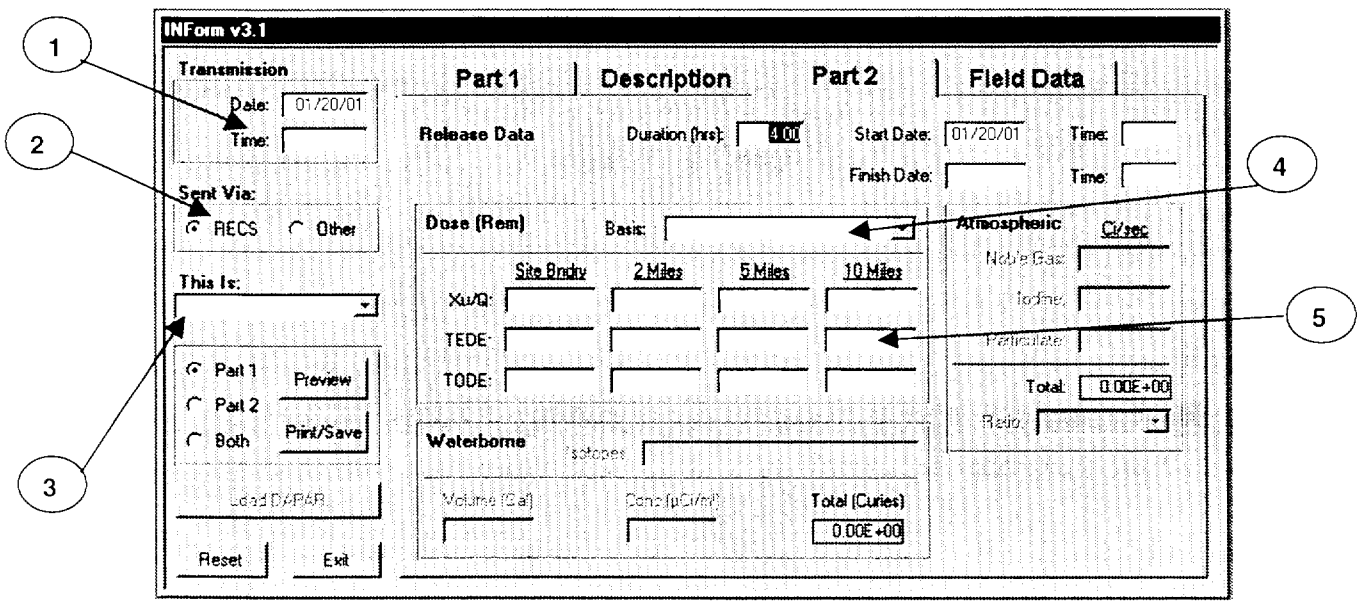
3.5 Button 5 -- Closes program.

3.6 The Admin button is used by Emergency Planning Staff to edit EAL information.

4.0 Press **Button 1** and the following window will open:



5.0 Choose the "Part 2" tab at the top of the window and the following window will open:



Attachment 10.2
MEANS User Guide #2
NYS Radiological Emergency Data Form (Part II)
Sheet 3 of 5

6.0 To complete Part II of the NYS Notification Form perform the following steps:

NOTES:

Fields on the form can be selected with the mouse cursor or by tabbing between fields.

Pressing **Exit** will take you back to Main Switchboard keeping all information entered.

Pressing **Reset** will clear all fields

6.1 **DO NOT** enter a transmission time at this time. (This time should be entered by communicator when message is transmitted to offsite agencies.)

6.2 Select "*RECS*" or "*Other*" for method to be used to transmit data. Normally this will be via RECS.

6.3 Click on the drop down button in the "*This Is*:" field and select "*NOT and Exercise*" or "*An Exercise*"

6.4 Enter Release Data:

6.4.1 **IF** the Release Duration is known **THEN** enter known value

ELSE

Use default value of **4 hours**.

6.4.2 **IF** the release start and stop dates and times are known **THEN** enter these values

6.5 Choose the basis for the projected doses

6.5.1 Inplant Measurements

6.5.2 Field Measurements

6.5.3 Assumed Source Term

NOTES:

Projected offsite doses may be entered manually or imported from the DAPAR module in MEANS

Before information can be imported from DAPAR the individual performing dose assessments must export the data from DAPAR.

Attachment 10.2
MEANS User Guide #2
NYS Radiological Emergency Data Form (Part II)
Sheet 4 of 5

6.6 Enter "*Dose (Rem)*"

6.6.1 Doses may be entered manually.

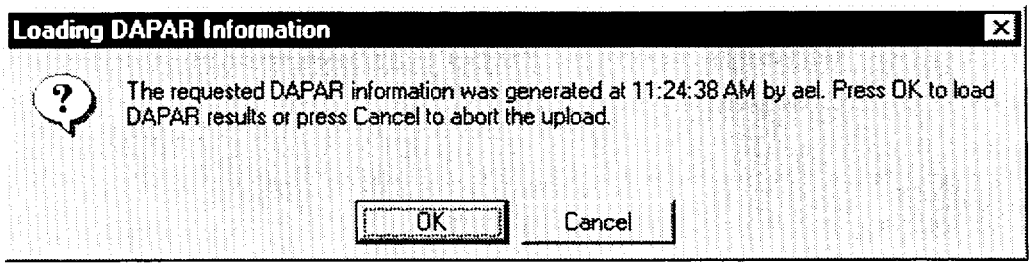
OR

6.6.2 Imported directly from DAPAR module as follows:

A. Data must be exported from DAPAR prior to importing it into Part II. See Attachment 10.3 for guidance on exporting data.

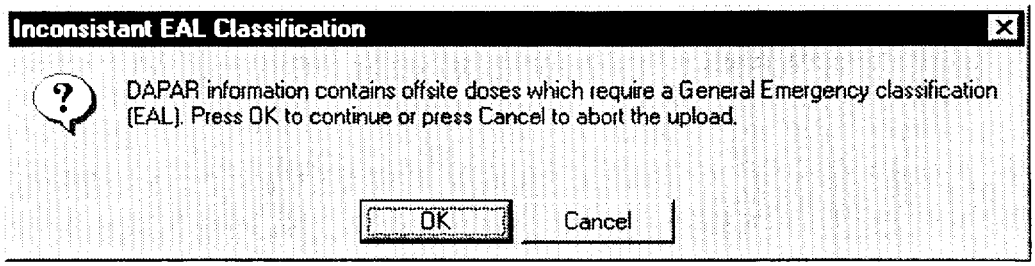
B. Radiological data **CANNOT** be imported unless, a release is selected on Part I of the form.

C. **IF** the data has been exported AND a release has been selected **THEN** the "*Load DAPAR*" button will become active. Pressing it will provide the following prompt:



D. Verify that the time matches the data you wish to import and press "*OK*" to import data.

E. **IF** the results of the DAPAR dose projections require a PAR (projected doses exceed PAGs) and a General Emergency has not been selected on Part I **THEN** you will receive the following prompt:



The program will not allow issuing of a Protective Action Recommendation unless there is a General Emergency

Attachment 10.2
MEANS User Guide #2
NYS Radiological Emergency Data Form (Part II)
Sheet 5 of 5

6.7 Atmospheric data can only be entered if a "*Above or Below TS to Atmosphere*" is chosen on Part I

6.8 Waterborne data can only be entered if a "*Above or Below TS to Water*" is chosen on Part I

6.9 **IF** unmonitored release option is selected **THEN** DAPAR Data can not be loaded.

Attachment 10.3
MEANS User Guide #3
Dose Assessment and Protective Action Recommendations
Sheet 1 of 7

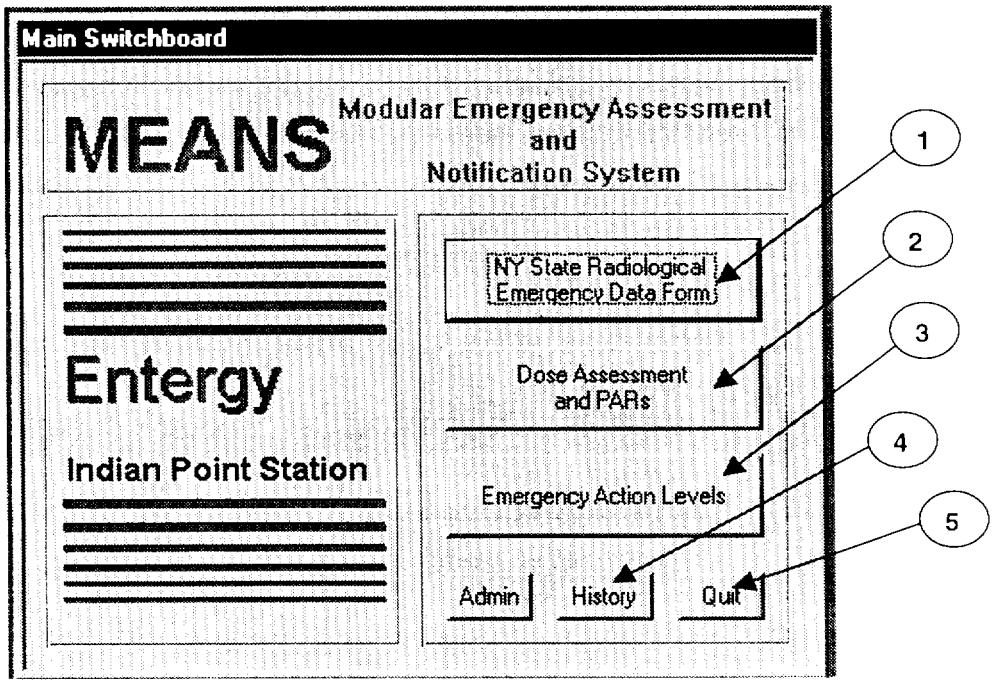
1.0 **IF** the MEANS program is NOT running **THEN** start the MEANS program by one of the following:

1.1 Double clicking icon on desktop

1.2 Selecting Means from the start memo

1.3 Locating Means program on the "Public Drive (R) Drive" EPlan Folder.

2.0 The following window will open:



3.0 Description of Choices (buttons) on Main Switchboard:

3.1 Button 1 – Opens up the NYS Radiological Emergency Data Form Input Screen (INForm).

3.2 Button 2 – Opens up DAPAR input screens to perform Dose Assessments.

3.3 Button 3 – Opens up Database of Emergency Action Levels (EAL), which allows review of EAL Descriptions and Technical Basis.

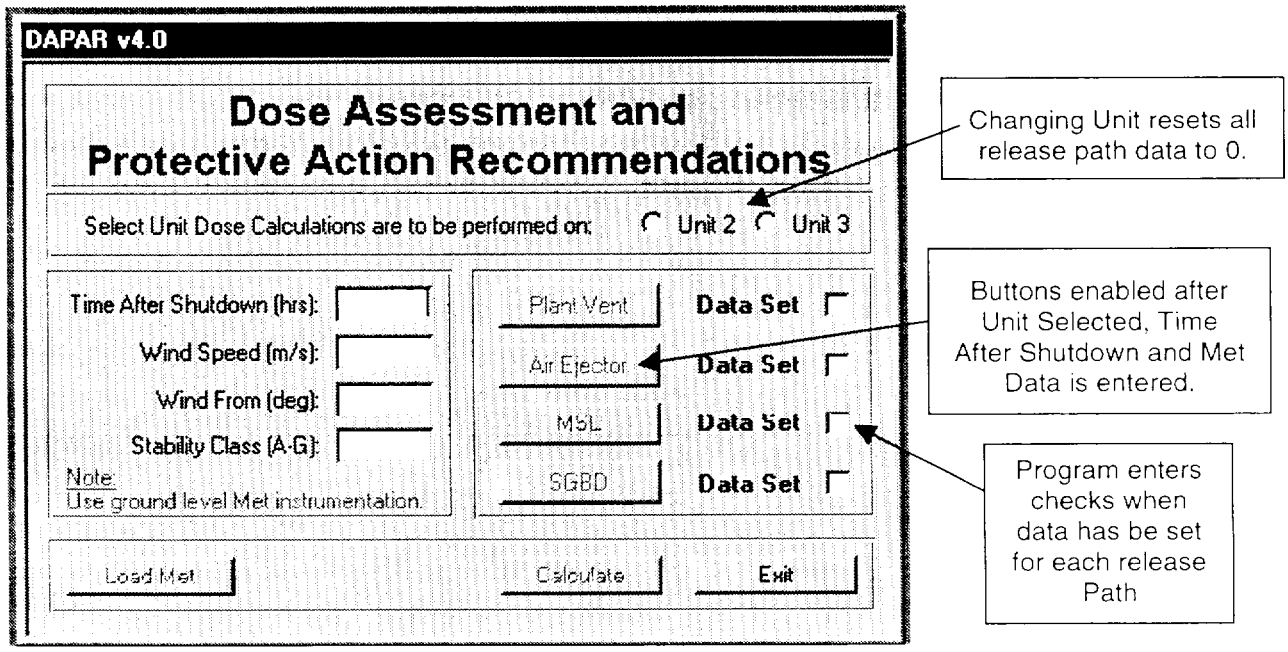
3.4 Button 4 – Opens up access to historical notification and dose assessment forms. Forms are stored when the *"print/save"* button is pressed from within the modules to print forms. Copies of historical forms can be printed from this window.

Attachment 10.3
MEANS User Guide #3
Dose Assessment and Protective Action Recommendations
Sheet 2 of 7

3.5 Button 5 -- Closes program.

The Admin button is used by Emergency Planning Staff to edit EAL information.

4.0 Choose **Button 2** to open the Dose Assessment and Protective Action Recommendation" (DAPAR) module:



Notes:

The buttons to perform dose calculations will not become active until Unit, Met Data and Time after shutdown data is entered.

IF you "Load Met" data from Form I, after entering Time After Shutdown **THEN** tab to the Time After Shutdown field and re-enter time to activate buttons.

IF you have "Data Set" for more than one release path **THEN** the program will sum dose projections from each set of data. To clear "Set Data" press the cancel button in appropriate window.

5.0 Select affected Unit

6.0 Enter the reactor "*Time After Shutdown (hrs)*:"

Attachment 10.3
MEANS User Guide #3
Dose Assessment and Protective Action Recommendations
Sheet 3 of 7

7.0 Enter, "*Wind Speed (m/s)*", Wind Direction, "*Wind From (deg)*:" and "*Stability Class (A-G)*:"

OR

Press "*Load Met*' button to load meteorological data previously entered in NYS Radiological Emergency Data Form.

8.0 Select the button that matches the location of the release.

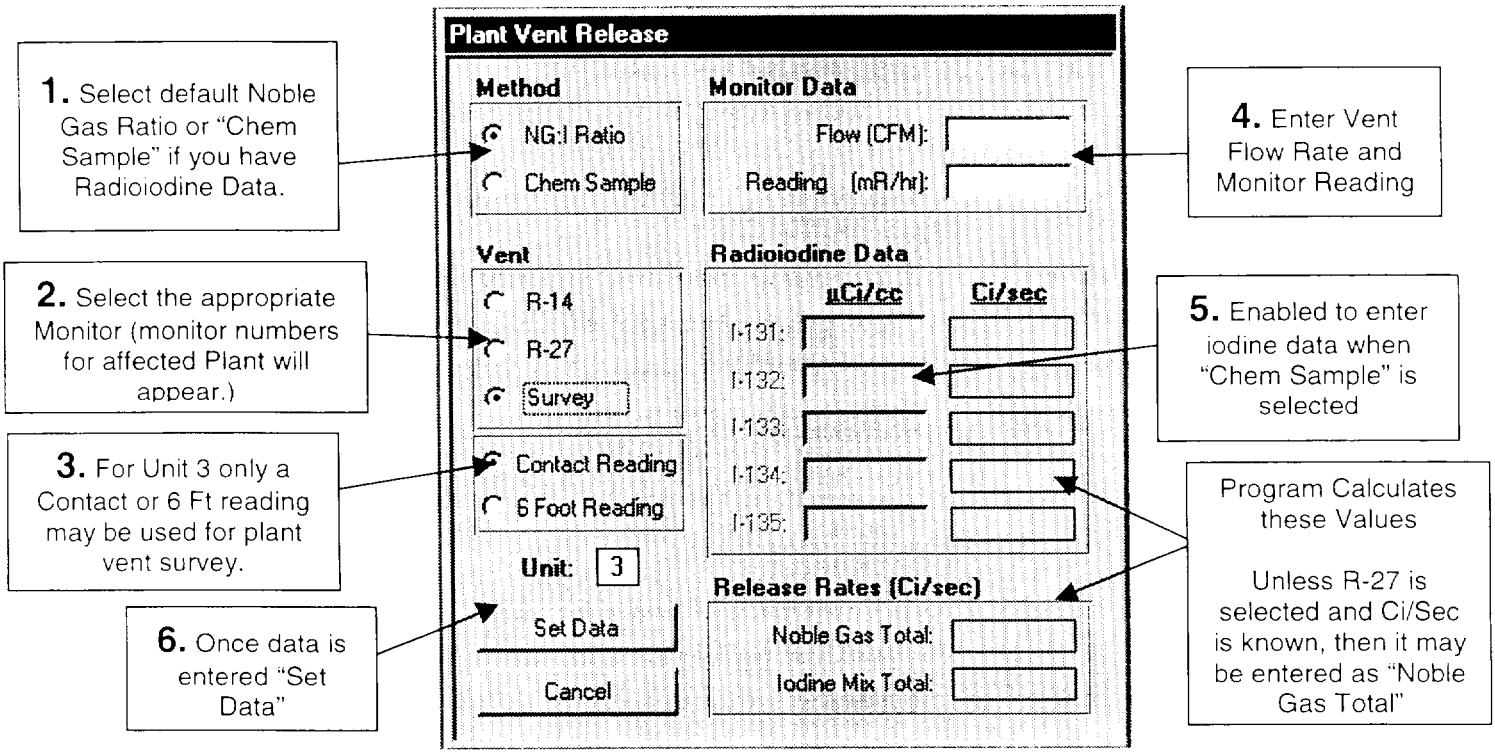
8.1 "*Plant Vent*' for R-44 (R-14 unit 3), R-27 or survey of release from plant vent.

8.2 "*Air Ejector*" for a release from the Air Ejector. (R-45)

8.3 "*MSL*" for a release from a SG or ruptured main steam line. (R-28, 29, 30, 31 or R-62A-D)

8.4 "*SGBD*" for a release from a Steam Generator Blowdown line. (R-49)

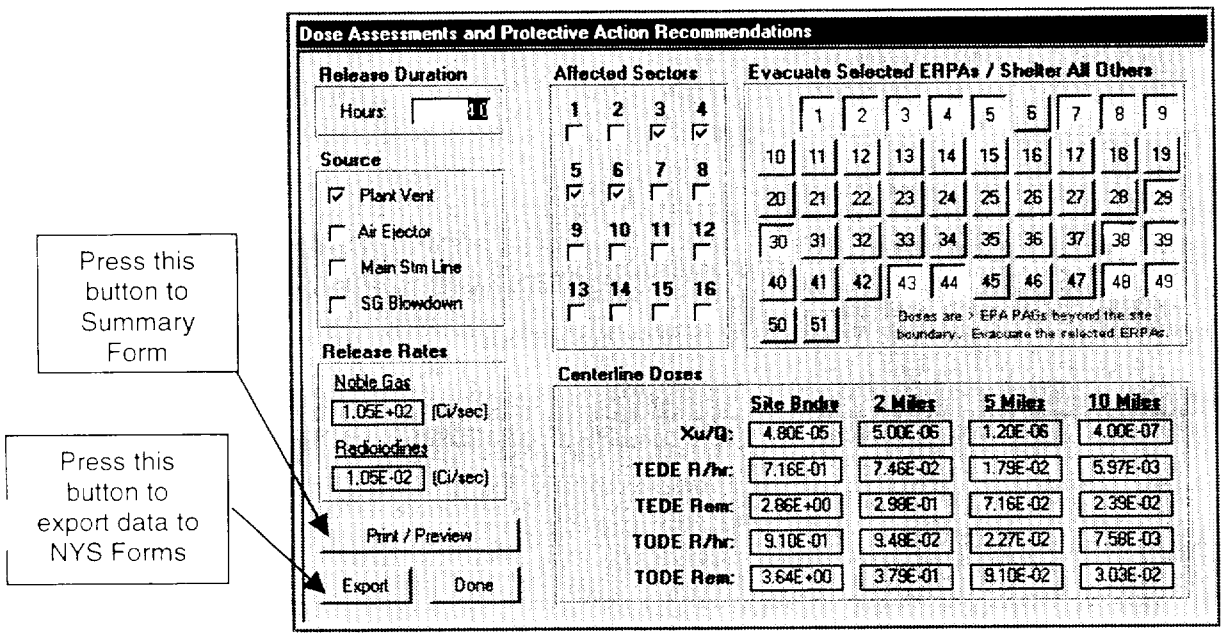
9.0 **IF** you choose "*Plant Vent*' **THEN** enter appropriate information in the following window:



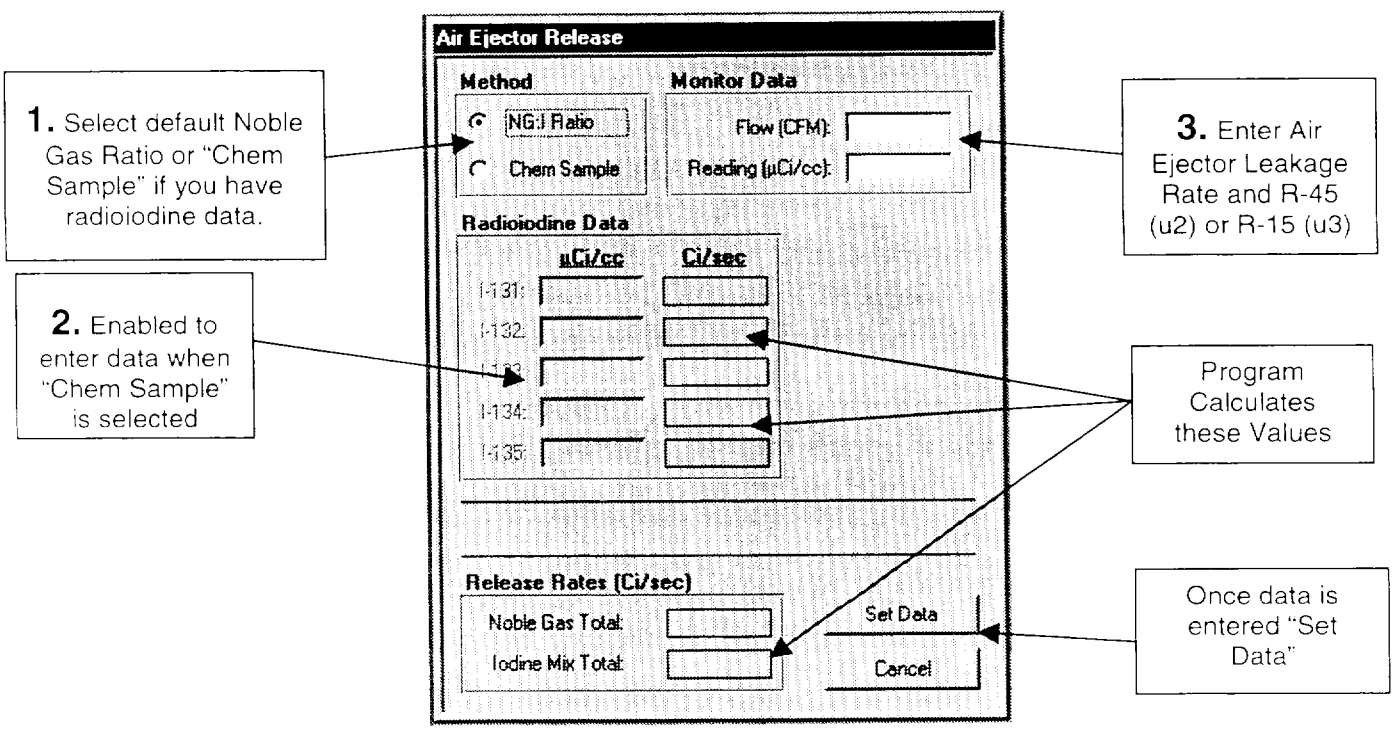
9.1 Once Data is set for the plant vent the "*Dose Assessment and Protective Action Recommendations*" (see section 4.0) window will open again.

Attachment 10.3
MEANS User Guide #3
Dose Assessment and Protective Action Recommendations
Sheet 4 of 7

9.2 Press the "*Calculate*" button to perform dose projection calculations. The following window will open:



10.0 **IF** you choose "Air Ejector" **THEN** enter appropriate information in the following window:



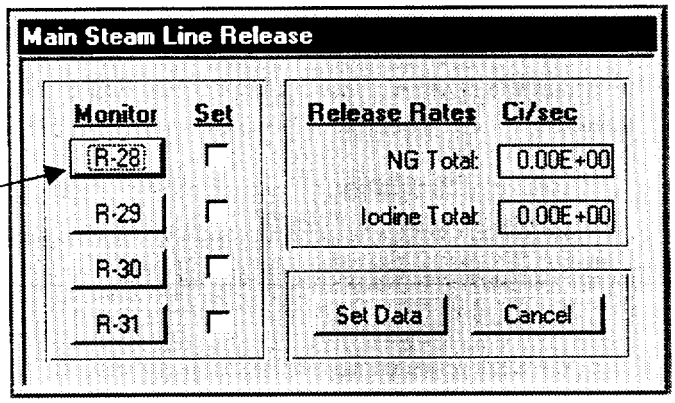
Attachment 10.3
MEANS User Guide #3
Dose Assessment and Protective Action Recommendations
Sheet 5 of 7

10.1 Once data is set for the air ejector release path the "Dose Assessment and Protective Action Recommendations" (see section 4.0) window will open again.

10.2 Press the "Calculate" button to perform dose projection calculations. The Dose Assessment and Protective Action Recommendations window shown in section 8.2 will open, press "Print / Preview" button to print data.

11.0 **IF** you choose "MSL" **THEN** enter appropriate information in the following window:

Select the monitor and enter data for each release path, multiple monitors may be chosen. (R62a-d for Unit 3)



11.1 When you press one of the monitor buttons the following window will open to enter release data for each Main Steam Line

1. Select default Noble Gas Ratio or "Chem Sample" if you have Radioiodine Data.

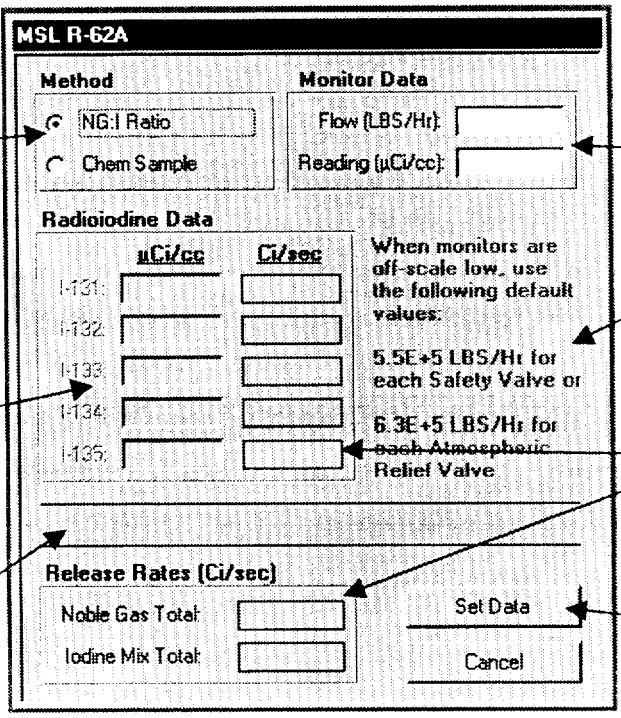
2. Enabled to enter data when "Chem Sample" is selected

3. Enter release Flow Rate and Monitor Reading

Default values listed.

Program Calculates these Values

Once data is entered "Set Data"

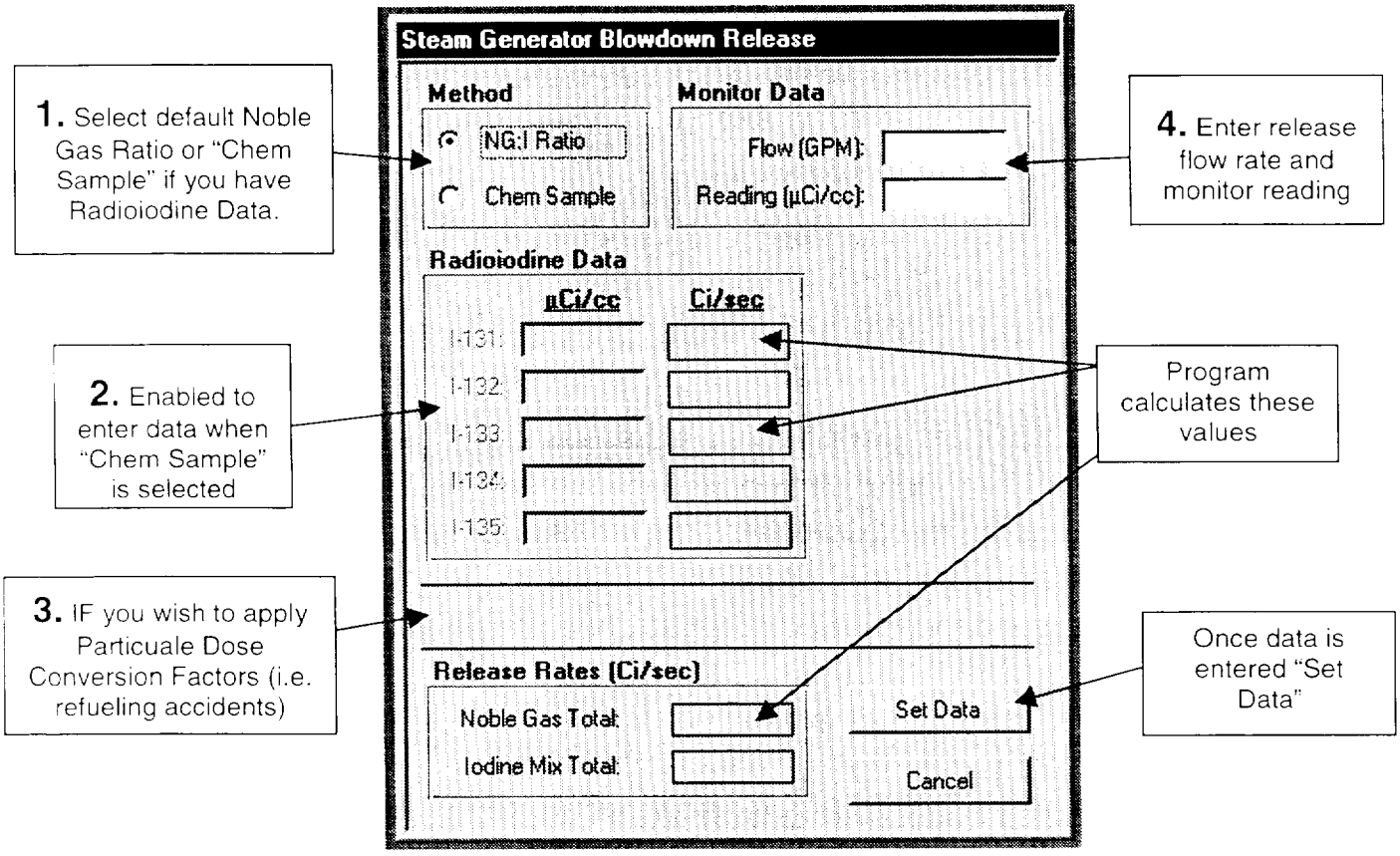


Attachment 10.3
MEANS User Guide #3
Dose Assessment and Protective Action Recommendations
Sheet 6 of 7

11.2 Once Data is set for the MSL the "*Dose Assessment and Protective Action Recommendations*" (see section 4.0) window will open again.

11.3 Press the "*Calculate*" button to perform dose projection calculations. The Dose Assessment and Protective Action Recommendations window shown under step 8.2 will open. Press "*Print / Preview*" button to print data.

12.0 **IF** you choose "*SGBD*" (Unit 2 Only) **THEN** enter appropriate information in the following window:



12.1 Once data is set for the SGBD the "*Dose Assessment and Protective Action Recommendations*" (see section 4.0) window will open again.

12.2 Press the "*Calculate*" button to perform dose projection calculations. The Dose Assessment and Protective Action Recommendations window shown under step 8.2 will open. Press "*Print / Preview*" button to print data.

Attachment 10.3
MEANS User Guide #3
Dose Assessment and Protective Action Recommendations
Sheet 7 of 7

13.0 Exporting Data

Note:
Transferring data between DAPAR and INForm is a two part process. First data is exported to memory to make it available for use, then it is imported into the notification forms as needed.

13.1 **AFTER** you have entered release path data and pressed calculate **THEN** press the "*Export*" button to save data for importing (*Load DAPAR*) into Part I and Part II or NYS Radiological Emergency Data Form.

13.2 Enter you initials into the Save Assessment Results box and click "*OK*". The export button will remain sunken to indicate that the exported data is set.

Attachment 10.4

Use of MEANS for EAL Information Functions

Sheet 1 of 2

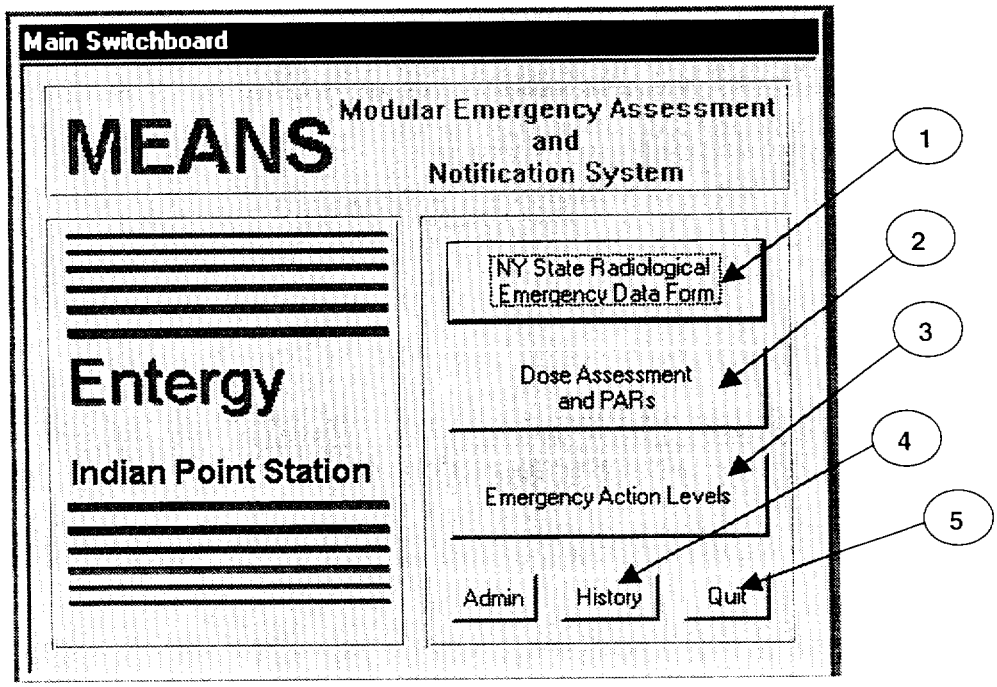
1.0 **IF** the MEANS program is NOT running **THEN** start the MEANS program by one of the following:

1.1 Double clicking icon on desktop

1.2 Selecting Means from the start memo

1.3 Locating Means program on the "Public Drive (R) Drive" EPlan Folder.

2.0 The following window will open:



3.0 Description of Choices (buttons) on Main Switchboard:

3.1 Button 1 – Opens up the NYS Radiological Emergency Data Form Input Screen (INForm).

3.2 Button 2 – Opens up DAPAR input screens to perform Dose Assessments.

3.3 Button 3 – Opens up Database of Emergency Action Levels (EAL), which allows review of EAL Descriptions and Technical Basis.

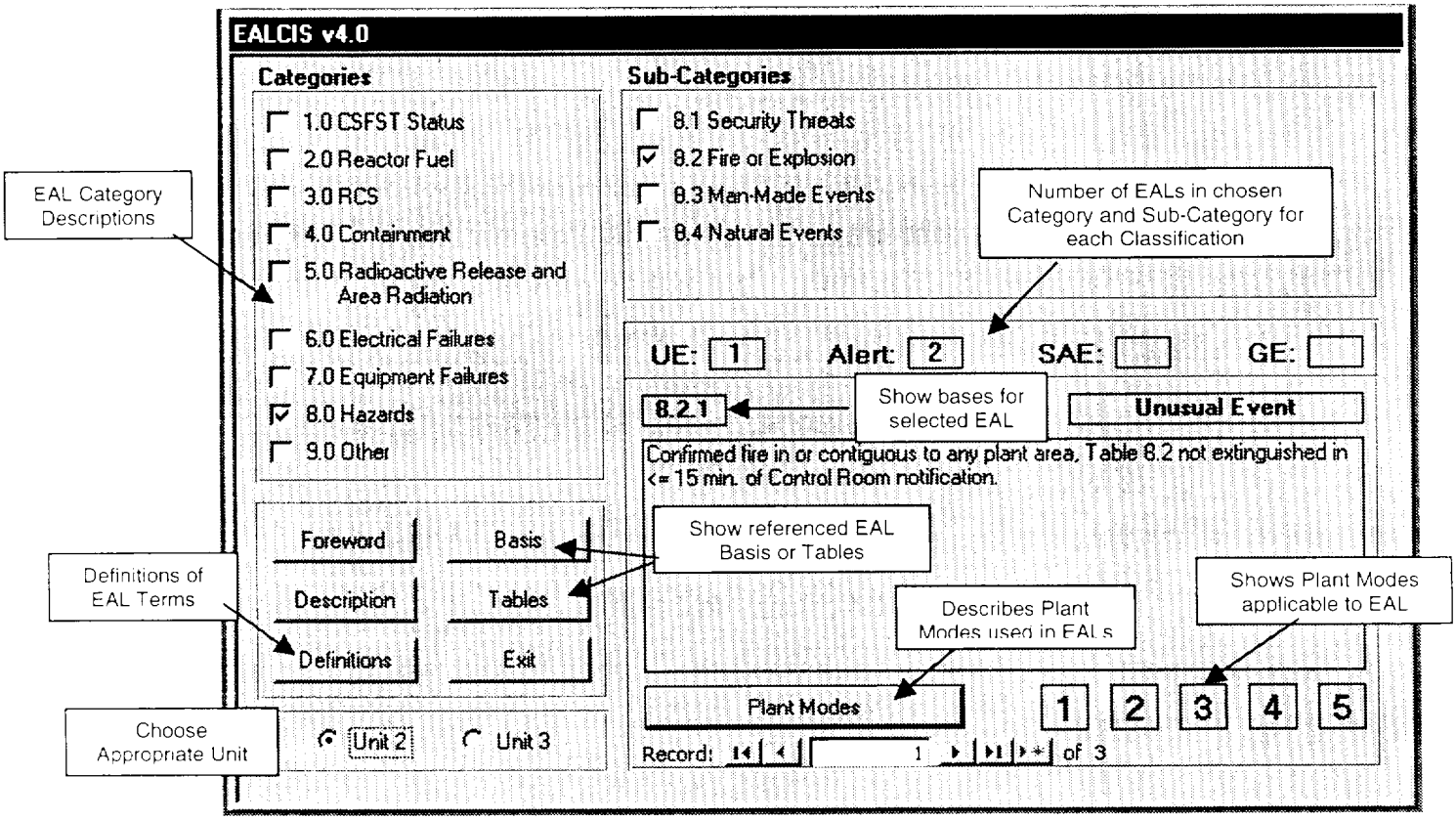
3.4 Button 4 – Opens up access to historical notification and dose assessment forms. Forms are stored when the *"print/save"* button is pressed from within the modules to print forms. Copies of historical forms can be printed from this window.

Attachment 10.4
Use of MEANS for EAL Information Functions
Sheet 2 of 2

3.5 Button 5 -- Closes program.

The Admin button is used by Emergency Planning Staff to edit EAL information.

4.0 Choose **Button 3** to access the Emergency Action Level Information module:



5.0 Choose the EAL "Category" and "Sub Category" to select only those record of interest.

6.0 To locate the record desired, use the "Record" selection buttons to page through all EALs in a sub-category

7.0 Press appropriate button as described above to obtain desired information about chosen EAL.

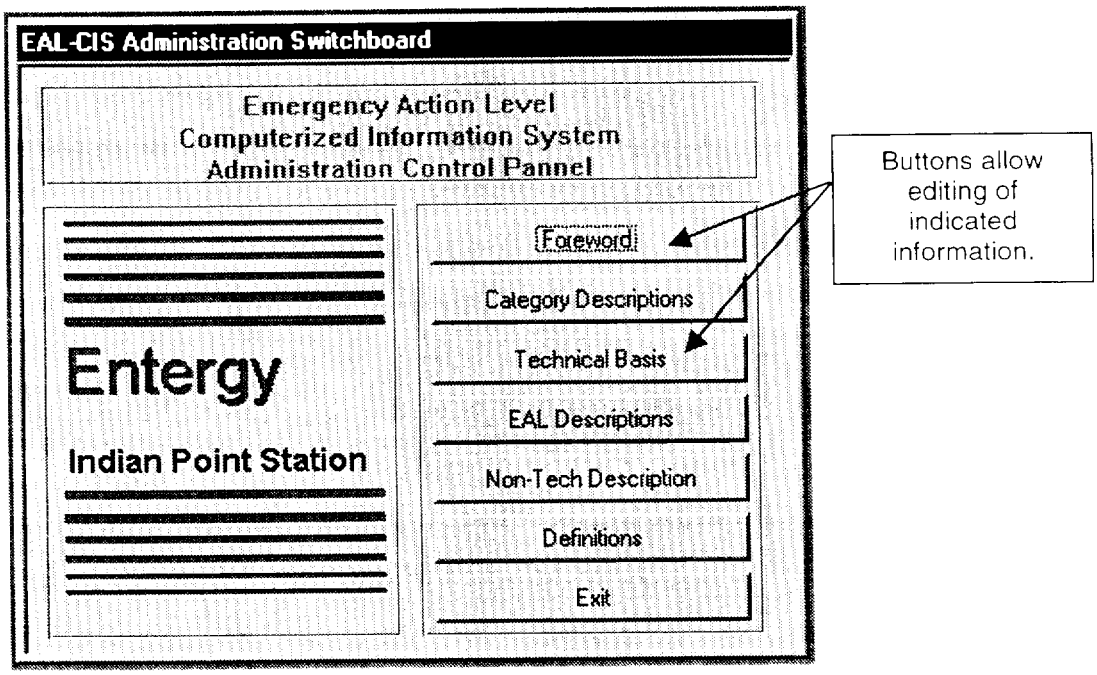
8.0 Press the "Exit" button to return to main switchboard.

Attachment 10.5
System Administration
Sheet 1 of 1

1.0 **IF** the MEANS program is NOT running **THEN** start the MEANS program.

2.0 On the Main Switchboard select **"Admin"** to access administrative functions of program.

3.0 You will be ask to enter a password, enter the appropriate password and the following window will open:



4.0 Edit EAL information as necessary and exit administration controls.

Attachment 10.6

MEANS Windows Summary

Sheet 1 of 15

MEANS Program Information and Functions

Object **Type** **Information or Functional Description**

Main Switchboard

INForm	Command Button	Opens the New York State Radiological Emergency Data Forms application.
DAPAR	Command Button	Opens the Dose Assessment and Protective Action Recommendation application.
EALCIS	Command Button	Opens the Emergency Action Level Computerized Information System application.
Admin	Command Button	Opens the administration windows to allow changes to the EALCIS data tables. (This area is password protected)
History	Command Button	Opens the administration windows for historical application form printing and maintenance.
Quit	Command Button	Closes all applications, resets all data inputs, quits out of the MEANS interface and returns to the Windows desktop.

Non-Tab (appears on each tab) Emergency Data Forms

Transmission Date	Text Box	Date the form is transmitted to offsite authorities entered as **MM/DD/YY**. The system date is entered as a default value.
Transmission Time	Text Box	Time the form is transmitted to offsite authorities entered as **HHMM**.
Transmission Via	Option Button	Available selections are: • RECES • Other
This Is	List Box	Available selections are: • NOT an Exercise • An Exercise
Report Selector	Option Buttons	Available selections to set the preview or print commands are: • Part 1 • Part 2 • Both
Preview	Command Button	Opens a print preview window for the selected Part 1 and/or Part 2 report.
Print/Save	Command Button	Prints the selected Part 1 and/or Part 2 report and saves the data to the historical file.

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MEANS Program Information and Functions

Object	Type	Information or Functional Description
Load DAPAR	Command Button	Loads meteorological, dose assessment and protective action recommendation data. **NOTE:** The data must have been saved while running the DAPAR application **AND** a release to the atmosphere must be selected to enable this feature.
Reset	Command Button	Clears all the data and restores BOTH Emergency Data Forms to their initial startup default states.
Exit	Command Button	Closes the emergency data forms window and returns to the main switchboard.

Emergency Data Form -- Part 1 Tab

EAL #	Text Box	EAL number entered as **X.X.X**. Improper EAL numbers are not accepted. The classification will be automatically selected when an EAL is entered. Entry of an EAL number inconsistent with a previously selected classification will prompt for user direction. Entry of a General Emergency EAL will select the default PARs provided met data has been entered.
Declaration Date	Text Box	Date the event was declared entered as **MM/DD/YY**. The system date is entered as the default value.
Declaration Time	Text Box	Time the event was declared entered as **HHMM**.
Reactor Status	List Box	Available selections are: • Critical • Hot Shutdown • Cold Shutdown
Shutdown Date	Text Box	Date the reactor was shutdown entered as **MM/DD/YY**. This control is disabled until either the hot or cold shutdown status is selected.
Shutdown Time	Text Box	Time the event was declared entered as **HHMM**. This control is disabled until either the hot or cold shutdown status is selected.

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MEANS Windows Summary

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MEANS Program Information and Functions

Object	Type	Information or Functional Description
Conditions	List Box	Available selections are: • Stable • Improving • Degrading
Release Status	List Box	Available selections are: • No Release • Above TS to Atmosphere • Below TS to Atmosphere • Above TS to Water • Below TS to Atmosphere • Unmonitored **NOTE:** A release to the atmosphere must be selected to enable the Load DAPAR command button.
Speed	Text Box	Wind speed value between **0 - 45** m/sec. Wind speed is automatically entered when DAPAR data is loaded. Entering wind speed will select the default PARs provided the other met data has been entered and a General Emergency classification is selected.
Direction	Text Box	Wind direction entered as degrees from in the range of **000º to 360º**. Wind direction is automatically entered when DAPAR data is loaded. Entering wind direction will select the default PARs provided the other met data has been entered and a General Emergency classification is selected.
Stability Class	Text Box	Pasquil category entered as **A-G** describing the applicable stability class. Stability class is automatically entered when DAPAR data is loaded. Entering stability class will select the default PARs provided the other met data has been entered and a General Emergency classification is selected.

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MEANS Program Information and Functions

Object	Type	Information or Functional Description
Classification	Option Buttons	Available selections are: • Unusual Event Disables PARs • Alert Disables PARs • Site Area Emergency Disables PARs • General Emergency Enables PARs • Recovery Enables PARs • Emergency Terminated Disables PARs • Transport Enables PARs The classification will be automatically selected when an EAL is entered. Selection of a General Emergency will set the default PARs provided met data has been entered. Selection of a classification inconsistent with an entered EAL number will prompt for user direction.
PARs	Option Buttons	Available selections are: • Issued • Not Issued Disabled and set at 'Not Issued' for UE, Alert, SAE and Termination. Disabled and set at 'Issued' for GE. Enabled for Recovery and a Transportation Incident.
ERPAs	Toggle Buttons	On or Off buttons for each ERPA. A depressed button is 'on' (indicating evacuate). Buttons are disabled unless a classification of GE, Recovery or Transportation Incident is selected. Default ERPAs are automatically selected whenever (1) a new General Emergency EAL is entered, (2) a General Emergency event is selected or (3) any met data field is updated. Changing a classification from a General Emergency will clear any selected ERPAs.

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MEANS Program Information and Functions

Object	Type	Information or Functional Description

Emergency Data Form -- Description Tab

Description	Text Box	Provides an editable area for event information. Text for the brief non-technical description is automatically loaded whenever an EAL # has been entered.

Emergency Data Form -- Part 2 Tab

Duration	Text Box	Projected release duration entered as greater than **0 to 96** hours. The default value is four (4.00) hours. The release duration is automatically entered when DAPAR data is loaded.
Start Date	Text Box	Date the release of radioactive materials began entered as **MM/DD/YY**. The system date is entered as the default value.
Start Time	Text Box	Time the release of radioactive materials began entered as **HHMM**.
Finish Date	Text Box	Date the release of radioactive materials ended entered as **MM/DD/YY**.
Finish Time	Text Box	Time the release of radioactive materials ended entered as **HHMM**.
Bases	List Box	Available selections are: • In-Plant Measurements • Field Measurements • Assumed Source Term 'Assumed Source Term' is automatically selected when DAPAR data is loaded.
Xu/Q(s)	Text Boxes	Xu/Q values for Site Boundary, 2 miles, 5 miles and 10 miles downwind. Xu/Q values are automatically entered when DAPAR data is loaded.
TEDE(s)	Text Boxes	TEDE values for Site Boundary, 2 miles, 5 miles and 10 miles downwind. TEDE values are automatically entered when DAPAR data is loaded.
TODE(s)	Text Boxes	TODE values for Site Boundary, 2 miles, 5 miles and 10 miles downwind. TODE values are automatically entered when DAPAR data is loaded.
Noble Gas	Text Box	Noble Gas Release Rate for an airborne release in Ci/sec. The text box is enabled when an airborne release is chosen. The Noble Gas release rate is automatically entered when DAPAR data is loaded.

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MEANS Program Information and Functions

Object	Type	Information or Functional Description
Iodine	Text Box	Radioiodine Release Rate for an airborne release in Ci/sec. The text box is enabled when an airborne release is chosen. The radioiodine release rate is automatically entered when DAPAR data is loaded.
Particulate	Text Box	Particulate Release Rate for an airborne release in Ci/sec. The text box is enabled when an airborne release is chosen.
Total	Text Box	Information only (non-editable). Gives the total airborne radioactive release rate in Ci/sec.
NG:I Ratio	List Box	Available selections are: • Assumed • Actual
Isotopes	Text Box	List of the primary isotopes identified or presumed to be in the release. Entries can be made beyond the length of the text box however, information printed on the report will be limited by the amount of space provided on the form itself.
Volume	Text Box	Volume of radioactive liquid for a waterborne release in gallons. The text box is enabled when a waterborne release is chosen.
Concentration	Text Box	Concentration of gross radioactivity of the liquid for a waterborne release in µCi/cc. The text box is enabled when a waterborne release is chosen.
Total	Text Box	Information only (non-editable). Gives the total waterborne radioactive release in Curies.

Emergency Data Form -- Field Data Tab

Vector	Text Box	Location of the radiological sample or survey in reference to the plant. Entered as distance from plant in miles and direction from plant as sector or degrees (miles/sector or miles/degrees).
Location	Text Box	Brief physical description of the radiological sample or survey location.

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MEANS Program Information and Functions

Object	Type	Information or Functional Description
Time	Text Boxes	Time the radiological survey or sample was performed entered as **HHMM.**
Reading	Text Boxes	Value of the radiological survey or sample reading.
Units	Option Buttons	Available selections are: • mR/hr • $\mu Ci/cm^2$

DAPAR -- Main Data

Time After S/D	Text Box	Time since reactor shutdown from **0 to 270** hours. Zero is used to indicate the reactor is still critical.
Wind Speed	Text Box	Wind speed value between **0 - 45** m/sec. Wind speed is automatically entered when Load Met data is selected.
Wind Direction	Text Box	Wind direction entered as degrees from in the range of **000º to 360º**. Wind direction is automatically entered when Load Met data is selected.
Stability	Text Box	Pasquil category entered as **A-G** describing the applicable stability class. Stability is automatically entered when Load Met data is selected.
Unit	Option Buttons	Choose the affected Unit to ensure proper constants and conversion factors are used to calculate Release Rate.
Plant Vent	Command Button	Opens the plant vent release data window. Disabled until the meteorological information has been entered.
Air Ejector	Command Button	Opens the air ejector release data window. Disabled until the meteorological information has been entered.
MSL	Command Button	Opens the main steam line master data window. Disabled until the meteorological information has been entered.
SGBD	Command Button	Opens the steam generator blow down release data window. Disabled until the meteorological information has been entered.
Data Set(s)	Check Box	Information only (non-editable). A checked box indicates data has been entered for the applicable release point. The check box is cleared when Cancel is selected from the release point's data entry window.

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MEANS Program Information and Functions

Object	Type	Information or Functional Description
Calculate	Command Button	Calculates dose and determines PARs. Opens the dose rate data window. Disabled until meteorology and at least one release point have been entered.
Exit	Command Button	Closes the DAPAR main data window and returns to the main switchboard. All entries and selections are retained until the MEANS application is exited (quit).

Release Point Data

Method	Option Button	Available selections are: • NG:I Ratio • Chem Sample Establishes the method for which the radioiodine concentration is determined. NG:I Ratio is the default selection.
Flow	Text Box	Effluent flow rate in: • CFM (cubic feet per minute for plant vent and air ejector) • Lbs/Hr (pounds per hour for main steam line) • GPM (gallons per minute for steam generator blow down)
Noble Gas Reading	Text Box	Monitor or sample reading in µCi/cc or survey results in mR/Hr.
Vent[2]	Option Buttons	Available selections are: • R-44 / R-14 • R-27 • Survey • Sample Selecting the Survey option changes the reading prompt from µCi/cc to mR/Hr.

[2] The vent option buttons are only applicable to the plant vent monitored release point.

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MEANS Program Information and Functions

Object	Type	Information or Functional Description
Isotopic Concentrations	Text Boxes	Monitor or sample reading in µCi/cc or survey results in mR/Hr. The text boxes are disabled until the Chem. Sample option button is selected. Data for any or all isotopes can be entered after the text box has been enabled.
Isotopic Release Rate	Text Boxes	Information only (non-editable). Shows the calculated isotopic radioiodine release rates based on the inputs for vent flow rate and isotopic concentrations when Chem. Sample is selected.
Noble Gas Release Rate	Text Box	Editable only when a R-27 vent release is selected, otherwise the field is for information only (non-editable). Shows the calculated Noble Gas release rate in Ci/sec based on the inputs for effluent flow rate and monitor reading or survey/sample results.
Total Iodine Release Rate	Text Box	Information only (non-editable). Shows the total radioiodine release rate based on the inputs for vent flow rate and method selected.
Set Data	Command Button	Accepts the information in the active release point data window and returns to the main data window.
Cancel	Command Button	Deletes any release data entered in the active window and returns to the DAPAR main data window.

MSL Summary Data

Monitor	Command Buttons	Closes the MSL master data window and opens the selected MSL release point data window.
Set	Check Box	Information only (non-editable). A checked box indicates data has been entered for the applicable release point. The check box is cleared when Cancel is selected from the release point's data entry window.
Release Rate	Text Boxes	Information only (non-editable). Indicates the total Noble Gas and radioiodine release rates in Ci/sec.
Set Data	Command Button	Accepts all of the entered MSL release data and returns to the main data window.
Cancel	Command Button	Deletes all of the entered MSL release data and returns to the main data window.

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MEANS Program Information and Functions

Object **Type** **Information or Functional Description**

Dose Assessment and PAR Summary

Release Duration	Text Box	Projected release duration entered as greater than **0 to 96** hours. The default value is four (4.00) hours.
Source	Check Boxes	Information only (non-editable). Indicated the source term release point(s).
Affected Sectors	Check Boxes	Information only (non-editable). Describes the downwind sectors which are affected under the provided meteorological data.
ERPAs	Text Button	Information only (non-editable). Illustration of the ERPAs which meet the dose criteria for evacuation.
Release Rates	Text Boxes	Information only (non-editable). Indicates the total Noble Gas release rate and the amount of radioiodine released which is used to determine the TODE dose rates.
Dose Rates	Text Boxes	Information only (non-editable). Indicates the downwind Xu/Q, TEDE and TODE (in units of Rem/Hr) values.
Print/Preview	Command Button	Opens another window which allows printing a summary . NOTE: Only printing saves saves dose assessments in historical data.
Export	Command Button	Saves the meteorological, dose projection and protective action recommendation information for export to the radiological emergency data forms. The export button will automatically reset whenever any information is changed.
Done	Command Button	Closes the PAR summary window and returns to the main data window.

Reports Information and Functions

Report Type	Option Buttons	Available selections are: • Dose Assessment and PAR Summary • Dose Rate Assessments: Summary Form Affects the choices for the release points

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MEANS Program Information and Functions

Object	Type	Information or Functional Description
Release Point	Option Buttons	Available selections are: • Plant Vent • MSL R-28 through R-31 (Unit 2) R-62a-d (Unit 3) • Air Ejector • SG Blowdown • All When Summary type is selected, individual release points can not be chosen.
Preview	Command Button	Opens a print preview window for the selected report type.
Print/Save	Command Button	Prints the selected report. Saves Historical Data
Done	Command Button	Closes the Reports window and returns to the DAPAR Summary window.

EAL Selection

Category	Option Buttons	Available selections are: 1.0 CSFST Status 2.0 Reactor Fuel 3.0 RCS 4.0 Containment 5.0 Radioactive Release and Area Radiation 6.0 Electrical Failures 7.0 Equipment Failures 8.0 Hazards 9.0 Other
Unit	Option Button	Chooses appropriate Unit to display data for.
Sub-Category	Option Buttons	The available selection depends on the selected category.
Classifications	Text Boxes	Information only (non-editable). Describes the number of event EALs for each classification level based on the selected sub-category.

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MEANS Program Information and Functions

Object	Type	Information or Functional Description
EAL #	Text Box	Information only (non-editable). Provides the EAL number of the current EAL record.
EAL Classification	Text Box	Information only (non-editable). Provides the classification level of the current EAL record.
Description	Text Box	Information only (non-editable). Provides the EAL description of the current EAL record.
Plant Modes	Command Button	Opens an information window which provides the definitions for each plant mode. This control is not visible until a category and sub-category have been selected.
Applicable Modes	Text Boxes	Information only (non-editable). Provides the applicable plant modes of the current EAL record.
EAL Area	N/A	Provides an area within the EAL selection window where individual EAL information is provided. Controls common to windows based applications within this area include: • Navigation Buttons: Allows navigation among records within the table. They include 'Go To First', 'Go To Previous', Go To Next' and 'Go To Last'. • Record #: A record number can be entered directly to go to the desired record. • Of #: Displays the number of records found to match the search criteria.
Foreword	Command Button	Opens a text window which allows scrolling through the foreword section of the EAL technical bases manual.
Description	Command Button	Opens a text window which allows scrolling through the discussion of the selected category. This control is disabled until a category has been selected.
Definitions	Command Button	Opens a window which provides a list box of definitions for key words and phrases of the EAL technical bases manual.
Basis	Command Button	Opens a window which allows for text and numeric searches of the EAL technical Bases.
Tables	Command Button	Opens a window which allows the display the tables and attachments associated with or referenced by the EALs.

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MEANS Program Information and Functions

Object	Type	Information or Functional Description
Exit	Command Button	Closes the EALCIS window and returns to the MEANS interface. All entries and selections are retained until the interface itself is exited (quit).

Foreword

Text View Area	Vertical Scroll Bar	Allows for scrolling through the foreword. Enabled when the text area is selected by using a pointing device or the tab key.
OK	Command Button	Closes the foreword window and returns to the EAL selection window.

Category Description

Text View Area	Vertical Scroll Bar	Allows for scrolling through the description. Enabled when the text area is selected by using a pointing device or the tab key.
OK	Command Button	Closes the category description window and returns to the EAL selection window.

Definitions

Word List	List Box	Allows selection of the desired word or phrase by: • Direct selection from the drop-down list • Typing directly into the text area of the list box.
OK	Command Button	Closes the definitions window and returns to the EAL selection window.

EAL Basis

EAL Number	Text Box	Search criteria based on a desired EAL number or portion. Entry can consist of a category, subcategory or individual EAL number. Can be utilized alone or with text criteria.
Text	Text Box	Search criteria based on a desired text string. Can be utilized alone or with EAL Number criteria.
Search	Command Button	Conducts the record search based on the provided EAL number and text criteria.

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MEANS Program Information and Functions

Object	Type	Information or Functional Description
Done	Command Button	Closes theEAL Basis window and returns to the EAL selection window.
Search Results Area	N/A	Provides an area within the EAL Basis window where search results can be viewed. Controls common to windows based applications within the search area include: • Navigation Buttons: Allows navigation among records within the table. They include 'Go To First', 'Go To Previous', Go To Next' and 'Go To Last'. • Record #: A record number can be entered directly to go to the desired record. • Of #: Displays the number of records found to match the search criteria. • Vertical Scroll Bar: Allows scrolling through the record when the text extends beyond the length of the viewing area.

EAL Tables

Table Buttons	Command Buttons	Available selections are: • Table 4.1 • Table 4.2 • Table 4.3 • Table 5.1 • Table 5.2 • Table 5.3 • Table 8.2 • Attachment A
OK	Command Button	Closes the tables window and returns to the EAL selection window.

Admin. Main Switchboard

Object	Type	Information or Functional Description
Foreword	Command Button	Opens a text window which allows editing of the foreword section of the EAL technical bases manual.
Category Description	Command Button	Opens a text window which allows editing of the category descriptions.
Technical Basis	Command Button	Opens a window which allows for text and numeric searches and editing of the EAL technical Bases.
Non-Technical Description	Command Button	Opens a window which allows for text and numeric searches and editing of the EAL non-technical descriptions.

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MEANS Program Information and Functions

Object	Type	Information or Functional Description
Definitions	Command Button	Opens a text window which allows the editing and addition of definitions for key words and phrases of the EAL technical bases manual.
Exit	Command Button	Closes the application and returns to the MEANS main switchboard.

CONTROLLED

COPY # 25

EMERGENCY
TERMINATION AND RECOVERY

Prepared by:	Al Lee (Print Name)	(Signature)	6/27/02 (Date)
Approval:	Frank Inzirillo (Print Name)	(Signature)	7/11/02 (Date)

Effective Date: 7/11/02

Table of Contents

Emergency Termination and Recovery

1.0 PURPOSE

1.1 This procedure provides guidance for the transition into, conduct of operations while in, and termination of the recovery phase of a classified emergency event involving the implementation of the Indian Point Energy Center Emergency Plan.

1.2 This procedure is entered when:

1.2.1. An event has been classified as an emergency in accordance with Unit 2 and Unit 3 Emergency Classification procedure.

1.2.2. Conditions have stabilized and the Emergency Director is preparing to terminate the emergency.

2.0 PRECAUTION AND LIMITATIONS

Prior to entry into the Recovery Phase procedures must be in place to assure safety of plant personnel for the current conditions within the plant.

3.0 REFERENCES

3.1 Indian Point Energy Center Emergency Plan(S)

3.2 Referenced Emergency Plan Implementing Procedures

3.3 Other References

3.3.1. NUREG-0654,

3.3.2. Reportability Determination Procedures

4.0 DEFINITIONS

4.1 Recovery Goals

4.1.1. To assess the on and off site consequences of the emergency.

4.1.2. Identify and plan for clean up and repair operations as necessary to return plant to pre-event conditions.

4.1.3. Investigate the causes of the event and plan actions to prevent reoccurrence.

4.2 Federal Response

4.2.1. The NRC and/or FEMA will coordinate support from multiple federal government agencies.

4.2.2. Federal Agencies may request Entergy provide logistical resources (space, phones, etc.) to aid in their recovery efforts.

4.3 Critique - A fact-finding meeting with the individuals involved in the occurrence to review the event(s), cause(s) and actions leading up to and throughout the declaration of an emergency.

4.4 Root Cause Report - A written report that summarizes the facts and assigns corrective actions. The report includes the facts of the emergency, describes the root cause(s) of any emergency response problems and recommends corrective actions. This report shall be developed using approved procedures for documenting events which are deemed "significant condition adverse to quality".

4.5 Event Summary Report - A written report summarizing the incident prepared for delivery to offsite authorities (NRC, State and local). This report is required within 24 hours of terminating an Unusual Event and within 8 hours of terminating any higher event. The final Part 1, of the NYS Radiological Emergency Data Form may be used as the Event Summary Report for Unusual Events.

4.6 Investigation - An investigation is conducted to evaluate the event causes, actions and response each time the emergency plan is implemented. This will be accomplished by a close examination of the facts through critique(s), interviews, and a review of pertinent documentation and logs.

4.7 Recovery - The classification describing the plant status and organization which occurs after the emergency situation has been controlled/corrected and the event has been terminated. Recovery consists of the actions required to restore the plant to its pre-incident condition or to place the plant into a safe, long term shutdown condition.

4.8 Termination - The point at which the classified emergency event is no longer considered to be an emergency. Termination of the emergency is formally identified by transmission of change of status on a NYS Radiological Emergency Data Form and entry into Recovery.

4.9 Transition - The passage from the emergency phase into the recovery phase of an accident. Transition is the period of time following the stabilization of the emergency when plans and personnel necessary to the recovery are developed and identified. Transition activities are performed while in a classified event and immediately after termination. The emergency should not be terminated until a Recovery Plan Outline has been developed and a Recovery Organization identified.

5.0 RESPONSIBILITIES

NOTE

Once most recovery issues have been identified and a system of tracking them to completion has been established. IPEC and Corporate organizations may return to a routine organizational structure using non-recovery position titles.

5.1 The Corporate Recovery Manager is responsible for:

5.1.1. Ensuring adequate corporate support to maintain IPEC units in a safe condition.

5.1.2. Ensuring Site Recovery Manager is aware of Entergy Corporate's goals and expectations for recovery of IPEC after an event.

5.1.3. Ensuring adequate support to the site to carryout recovery activities.

5.2 The Site Recovery Manager is responsible for:

5.2.1. Ensuring IPEC units are maintained in a safe condition.

5.2.2. Managing onsite recovery activities during the initial recovery phase.

5.2.3. Keeping the Corporate Recovery Manager appraised of IPEC Site activities and requirements.

5.3 The Onsite Recovery Director is responsible for:

5.3.1. Overseeing development of plant specific recovery issues.

5.3.2. Keeping the Site Recovery Manager appraised of onsite activities and requirements.

5.4 The Offsite Recovery Director is responsible for:

5.4.1. Overseeing development of offsite (state and county) recovery issues.

5.4.2. Keeping the Site Recovery Manager appraised of offsite activities and requirements.

5.5 The Company Spokesperson is responsible for:

5.5.1. Overseeing development of public information recovery issues.

5.5.2. Keeping the Site Recovery Manager appraised of public information activities and requirements.

5.6 The Corporate Recovery Support Group Manager is responsible for:

5.6.1. Overseeing development of corporate recovery issues dealing with support of the site.

6.0 DETAILS

6.1 Transition and Recovery Following an Unusual Event

NOTE

The steps described in Sections 6.2 and 6.3 shall be used whenever the classification level has exceeded an Unusual Event.

6.1.1. The Emergency Director shall:

a. Direct the completion and distribution of a NYS Radiological Emergency Data Form Part I to signify termination of the Unusual Event. Summarize event in description section of form so this notification can also be considered the Event Summary Report.

b. Announce (or direct someone to announce) the following (or similar) message to plant personnel over the public address system:

"Attention all personnel, attention all personnel. The Unusual Event has been terminated. I repeat, the Unusual Event has been terminated."

c. Notify a qualified Emergency Director to enter this procedure upon entry into Recovery from an Unusual Event. This individual becomes the Site Recovery Manager.

6.1.2. The Site Recovery Manager shall:

NOTE:

At the discretion of the Site Recovery Manager, the start of the recovery activities following an Unusual Event may be delayed until the next morning.

a. Ensure any reportable event(s) is/are reported to the NRC per station procedures.

b. Convene an event review meeting as soon as practical following termination from the Unusual Event. The review should involve key participants from the event and focus on establishing lessons learned and the generation of follow up action items.

c. Ensure that a Root Cause Investigation is initiated, in coordination with the Licensing and Emergency Preparedness

Managers.

d. Ensure that identified corrective actions are assigned to appropriate organizations and a method is established for tracking items to completion.

6.2 Transition Following an Alert or Higher Classification

6.2.1. As conditions improve and additional personnel and resources become available, certain recovery activities should be initiated prior to termination of the emergency. The process for transition to Recovery is illustrated in Attachment 10.1, Illustrated Recovery Process.

6.2.2. The Emergency Director shall:

a. Review the EALs and document any that are still being exceeded. This review shall include a fission product barrier integrity status assessment. Develop a written explanation why exceeding the EAL no longer requires remaining in the Emergency Classification required by the EAL (e.g., plant now being cooled down, removing driving force for impact on offsite areas, etc.). Distribute the explanation to affected unit Shift Managers so that unnecessary reclassifications are avoided.

b. Verify that the following conditions are met prior to tra- tion into the recovery phase:

1. IF the plant is not currently in cold shutdowr N the plant is in process of being cooled down to cold wn with assurance of the availability of long-term oling mechanisms.

2. Releases of radioactive material to the environment have ceased.

3. Radiation levels in-plant are stable or decreasing with time.

4. Conditions do not limit site access by plant personnel or necessary support resources.

c. Determine Emergency Response Facilities staffing requirements until a Recovery Plan Outline describing the necessary Recovery Organization has been approved (see Attachment 10.2, Recovery Plan Outline).

d. For events of the Alert classification, Emergency Response Organization personnel may be adequate to perform initial recovery actions prior to returning to the normal Indian Point Organization.

e. For event classifications of a Site Area Emergency or a General Emergency, the basic Recovery Organization (as illustrated in Attachment 10.3, Typical Recovery Organization) should be established (unless the event was transitory in nature - downgraded at time of first notification). Additional positions may be assigned to perform specific recovery activities.

NOTE:

Detailed plans and procedures are not required to be developed prior to event termination and entry into Recovery. However, a Recovery Plan Outline should be completed and the recovery organization management positions identified and ready for staffing.

f. If possible, ensure that key ERO members initially responding to the event are debriefed prior to discharge from the site so their input can be captured while recollection of the event is fresh.

g. Direct the Emergency Plant Manager (EPM)/Plant Operations Manager (POM) and the Company Spokesperson (or JNC Director) to each develop an Issues/Strategies Package, Attachment 10.5 and determine the Onsite and Public Information Recovery Organization staffing requirements, Attachment 10.7. Use the attachments as guidance.

h. Develop an Offsite Issues/Strategies Package, Attachment 10.6 and determine the Offsite Recovery Organization staffing requirements using this attachment for guidance.

i. Convene a joint conference with the EPM/POM and the Company Spokesperson (or JNC Director) to:

   1. Review the Recovery Issues/Strategies Packages.
   2. Review the Recovery Organization staffing requirements.
   3. Develop and approve the Recovery Plan Outline.

j. Conduct a formal discussion with regulatory, State and local authorities to ensure coordination and agreement is met for entry into Recovery.

k. Complete and distribute a NYS Radiological Emergency Data Form Part I to signify entry into Recovery.

l. Concurrent with offsite notification, announce or direct the announcement of the following message (or similar message) to plant personnel over the public address system:

"*Attention all personnel, attention all personnel. The emergency has been terminated and we have entered Recovery. I repeat, the emergency has been terminated and we have entered Recovery.*"

m. Notify the ERO of the decision to terminate the emergency and enter into Recovery.

6.3 Recovery Following an Alert or Higher Classification

NOTE:
Select emergency response facilities or portions thereof may remain activated for some time after event termination during Recovery (for example, the JNC, Communications portions of the EOF).

6.3.1. The Corporate Recovery Manager should:

a. Work closely with the Site Recovery Manager to ensure all resources are available to maintain the plant(s) in a safe condition.

b. Coordinate with Entergy Corporate and the site, efforts return plant to pre-event conditions or identify company goals and expectations for the IPEC personnel after an event.

c. Direct the Corporate Recovery Support Group Manger to continue to identify and document issues relating to recovery operations using guidance in Attachment 10.4, Corporate Recovery Issues/Strategies Guide and to provide support as to the site as needed.

6.3.2. The Site Recovery Manager should:

a. Ensure non-emergency (10 CFR 20) limits and controls for radiation exposure are used for repair activities conducted during Recovery (see existing plant exposure control procedures for guidance).

b. Within eight (8) hours of entering Recovery, complete an Event Summary Report and transmit it to offsite authorities. Attachment 10.8, Event Summary Report Format, provides guidance on report content and format.

c. Ensure existing plant procedures, or procedures developed for specific tasks are used for plant repair activities during Recovery.

d. Maintain a log of specific recovery actions taken such as:

1. Specific actions taken per this procedure.
2. Communications with offsite authorities related to emergency and/or Recovery.
3. Meetings held to discuss conduct /close out of the recovery phase.

e. Ensure any reportable event(s) is/are reported per station procedures (events such as10CFR50.72, 10CFR20 Subpart M, or Indian Point Technical Specifications).

f. Approve any special procedures developed for recovery activities outside the plant.

g. As necessary, determine the scope and direct the Onsite Recovery Director to conduct an investigation and develop a Root Cause Investigation Report in accordance with station procedures.

h. Ensure action items identified during the transition phase are entered for tracking per the corrective action program.

i. Direct and/or coordinate all actions of the Recovery Organization, and approve any reports released to offsite authorities.

j. Continue to develop and direct the activities of the Recovery Plan and supporting procedures.

k. Continue verification and approval of information released by the Company Spokesperson which pertains to the emergency or recovery from the accident.

6.3.3. The Onsite Recovery Director should perform the following as required:

a. Continue to identify and document issues relating to Recovery operations using guidance in Attachment 10.5, Onsite Recovery Issues/Strategies Guide, and the corrective action program.

b. Develop and implement the Recovery Plan and procedures for onsite activities. Procedures used for outage planning should be

used to plan and schedule details of specific tasks.

6.3.4. The Offsite Recovery Director should perform the following as required:

a. Continue to identify and document issues relating to recovery operations using guidance in Attachment 10.6, Offsite Recovery Issues/Strategies Guide, and the corrective action program.

b. Develop and implement the Recovery Plan and procedures for offsite activities.

c. Communicate with offsite agencies and coordinate Entergy assistance for offsite recovery activities as needed.

d. Develop and deliver any post-accident reports to offsite agencies (such as; development of an offsite accident analysis report).

e. Coordinate Entergy environmental sampling activities. This should include calculations for total population exposure based on data from available sources and/or mathematical modeling.

f. Develop a radiological release report including an estimation of the total projected population exposure as applicable.

g. Coordinate a post-event critique with State and County Officials. This event should be held within approximately 60 days of the event.

6.3.5. The Company Spokesperson (or JNC Director) should direct the following as required:

a. Continue to identify and document issues relating to recovery operations using guidance in Attachment 10.7, Public Information Recovery Issues/Strategies Guide, and the corrective action program.

b. Construct and implement the Recovery Plan and procedures for Public Information activities.

6.4 Exit from Recovery

6.4.1. The recovery phase can be terminated for an Unusual Event, when the Station Management has ensured the following:

a. Corrective items are assigned to the responsible organizations and entered into the PCRS for tracking.

b. Plant conditions warrant exiting the recovery phase (i.e. normal station staff is now performing all required recovery actions)

6.4.2. For any event or series of events which reached an Alert classification or higher, the Site Recovery Manager should consider the following prior to terminating the recovery phase:

a. Onsite and offsite organizations involved with the emergency and the recovery have been apprised of the existing conditions and of the anticipated termination of activities.

b. The news media has received a final status report on the emergency and recovery operations.

c. The emergency response facilities are no longer required, and actions have commenced to restore them to their pre-emergency condition.

d. A thorough review of all actions taken during the emergency and recovery phases has been conducted and a Root Cause Investigation Report has been prepared.

e. Necessary revisions of the Indian Point Emergency Plan and Implementing Procedures have been identified and provided to the Emergency Planning Department Manager.

6.5 Terminate the Recovery Phase

6.5.1. Issue a Root Cause Report containing the Root Cause Investigation and a summary of major action items identified. This should be done in the form of a memo to the IPEC Site Vice President with copies going to all personnel involved in the event (use of computer distribution to all plant personnel is preferred).

6.5.2. Ensure that the Root Cause Report, along with all emergency records (position logs and forms completed per Emergency Plan Implementing Procedures), are collected and submitted for records retention.

7.0 INTERFACES

7.1 IP-EP-255, EOF Management Checklist

7.2 Referenced Emergency Plan Implementing Procedures

7.2.1. Unit 2 and 3 Emergency Classification Procedures

7.2.2. Unit 2 and 3 Emergency Notifications Procedures

8.0 RECORDS

Any logs, reports or forms completed after an emergency has been declared and the Recovery Phase is entered are permanent quality records.

9.0 REQUIREMENTS AND COMMITMENTS

None

10.0 ATTACHMENTS

10.1 Illustrated Recovery Process

10.2 Recovery Plan Outline

10.3 Typical Recovery Organization

10.4 Corporate Recovery Issues/Strategies Guide

10.5 Onsite Recovery Issues/Strategies Guide

10.6 Offsite Recovery Issues/Strategies Guide

10.7 Public Information Recovery Issues/Strategies Guide

10.8 Event Summary Report Format

Attachment 10.1

ILLUSTRATED RECOVERY PROCESS

Sheet 1 of 1

Emergency Event	• Emergency Plan is implemented. • Actions are taken to return the plant to a safe condition.
Transition	• Select Facilities are maintained at full or partial staffing. • The ED, EPM and Company Spokesperson prepare a Recovery Issues/Strategies Package. • A Recovery Plan Outline is developed. • Organizational requirements are determined. • Personnel are standing by to assume the identified recovery positions.
Recovery	• An Event Summary Report is developed and issued. • A Root Cause Investigation is conducted and action items identified • A detailed Recovery Plan is developed and implemented. • Activities to restore the plant to pre-incident conditions are identified.
Exit Recovery	• Root Cause Report is developed and issued. • Action items entered into the Corrective Action Program or other action plan to track completion. • Records collected and stored.

The above arrows represent points in time in the chronology of a classified emergency:

❶ The initiating state of emergency no longer exists.

❷ Formal termination of the emergency occurs (Notification of termination to Federal, State and County Officials by the Emergency Response Manager).

- Emergency dose limits and special exceptions to procedures no longer apply.
- Organizational titles are changed to reflect the new status.

❸ Exit from Recovery.

Attachment 10.2

RECOVERY PLAN OUTLINE

Sheet 1 of 1

SECTION I. RECOVERY ORGANIZATION

A. Organization structure

B. Assignment of authorities/responsibilities

SECTION II. CORPORATE RECOVERY PROGRAM

A. Major Goals

B. Issues and Strategies

SECTION III. ONSITE RECOVERY PROGRAM

A. Major Goals

B. Issues and Strategies

SECTION IV. OFFSITE RECOVERY PROGRAM

A. Major Goals

B. Issues and Strategies

SECTION V. PUBLIC INFORMATION RECOVERY PROGRAM

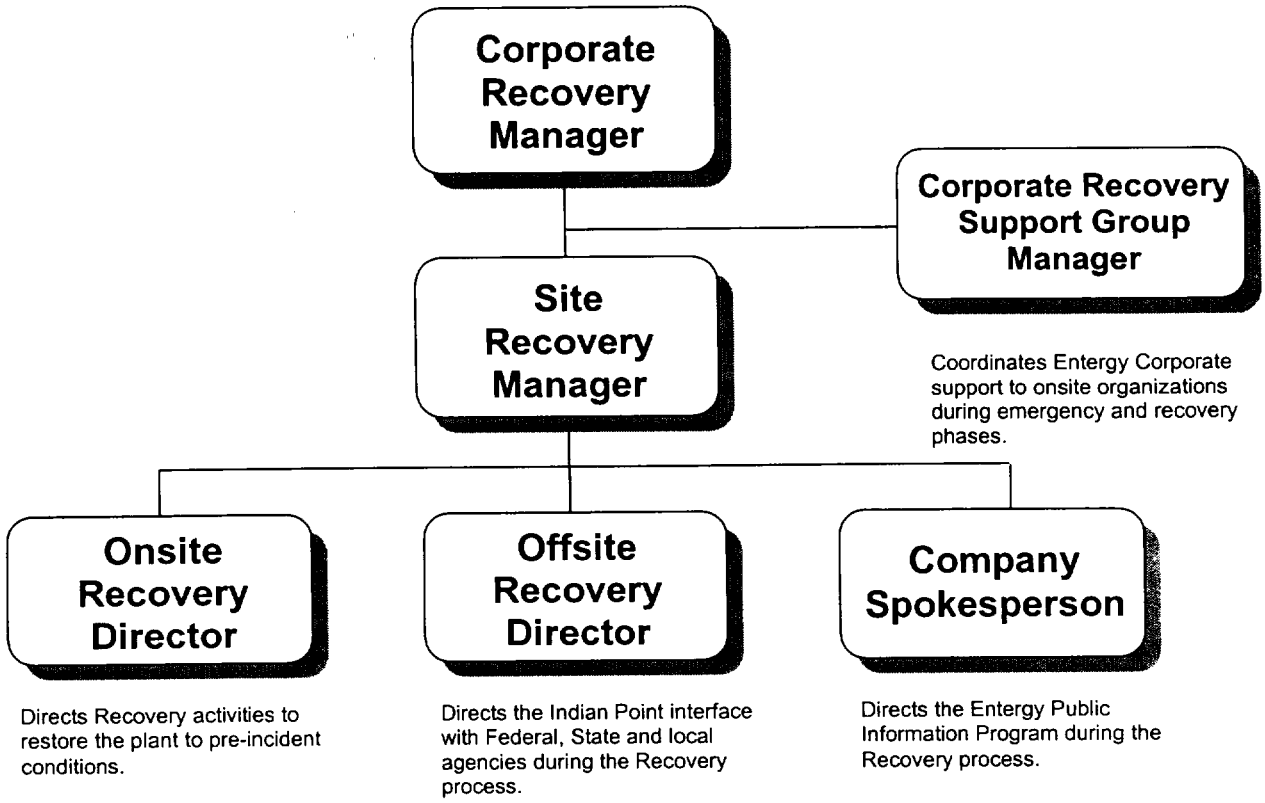
A. Major Goals

B. Issues and Strategies

Attachment 10.3

TYPICAL RECOVERY ORGANIZATION

Sheet 1 of 1



NOTES:

(1) The Corporate Recovery Manager position will normally be filled by a director level manager – or designee. The Corporate Recovery Support Group Manager assist in coordinating corporate support in the early phases of an event.

(2) The Site Recovery Manager position will normally be filled by a qualified Emergency Director or designee.

(3) The Onsite Recovery Director position will normally be filled by the Plant Manager or designee. The normal plant staff will support recovery activities as required. A special Radiological Controls Manager and/or Administrative and Logistics Manager may need to be appointed for events which involving severe plant damage or large releases of radioactive materials inside or outside the plant.

(4) The Offsite Recovery Director position will normally be filled by the Emergency Planning Department Manager or designee.

(5) The Company Spokesperson position will normally be filled by a member of the corporate public information group, Site Communications Manager or designee.

Attachment 10.4

CORPORATE RECOVERY ISSUES/STRATEGIES GUIDE

Sheet 1 of 1

NOTE:
- Issue/Strategies Form (Form EP-8) should be used to document items identified during the meeting(s). Complete as much of the form as possible but only the 'Description of Issue' section needs to be completed during initial meeting.
- In addition to the positions listed, key members of the other corporate groups should attend the initial corporate recovery meeting to plan for necessary support to restore the plant to pre-event condition.

1. When directed, convene a meeting of key corporate personnel and key normal station department heads. It is suggested as a minimum the following members attend:
   - Corporate Recovery Group Support Manager
   - Representative from Nuclear Support
   - Representative from Nuclear Oversite
   - Representative from Nuclear Safety
   - Senior representatives of the Maintenance, I&C, Radiological and Operations Department.
2. Review existing conditions, outline the issues to be resolved, and develop an Issues/Strategies Package that will form the basis for the corporate support of the plant Recovery Plan. Issues that should be considered in the formation of the package include:

   A. Present Activities Being Performed by Corporate Staff to Support Site
   - Identify ongoing activities and determine the need to continue

   B. Procurement needs

   C. Legal Issues
   - Regulatory Requirements
   - Insurance Issues

   C. Financial Issues
   - Insurance Issues
   - Aid to affected company personnel
   - Short term budget items

Attachment 10.5

ONSITE RECOVERY ISSUES/STRATEGIES GUIDE

Sheet 1 of 3

NOTE:
- Issue/Strategies Form (Form EP-8) should be used to document items identified during the meeting. Complete as much of the form as possible but only the 'Description of Issue' section needs to be completed during initial meeting.
- In addition to the ERO positions listed, members of the Outage Planning group should attend the initial onsite recovery meeting to plan for the "Forced Outage" needed to restore plant to pre-event condition.

3. When directed, convene a meeting of key plant ERO personnel and key normal station department heads. It is suggested as a minimum the following members attend:
   - Emergency Plant Manager
   - TSC Manager
   - OSC Manager
   - Radiation Protection Coordinator / Lead
   - Senior representatives of the Maintenance, I&C, Radiological and Operations Department.
4. Review existing conditions, outline the onsite issues to be resolved, and develop an Issues/Strategies Package that will form the basis for the onsite portion of the plant Recovery Plan. Issues that should be considered in the formation of the package include:

   A. Present Activities Being Performed By Plant Staff (Onsite ERO)
   - Identify ongoing activities and determine the need to continue

   B. Equipment Status Verifications
   - Establish/document secured lineups
   - List/identify inoperable equipment
   - Hang appropriate tagouts
   - Document temporary repairs/lineup
   - Obtain appropriate samples to verify core status

   C. Stabilization Of Plant For Long Term Cooling
   - Identify present cooling lineup(s)
   - Document available back-up cooling lineup(s)

Attachment 10.5

ONSITE RECOVERY ISSUES/STRATEGIES GUIDE

Sheet 2 of 3

- Confirm condition of RHR/Service Water/Cont. Spray
- Develop a plan to transition to long term cooling if required

D. System Repairs and Restorations

- Prioritize out of service equipment for restoration
- Plan restoration process by milestones
- Determine testing to increase/ensure equipment reliability
- Determine long term resolution of temporary modifications and repairs
- Examine options for temporary systems
- Bring in industry expertise (such as INPO, Westinghouse) as necessary
- Insure proper QA on any repairs made during the emergency

E. Radiological Controls And Area Decontamination

- Perform comprehensive surveys of onsite areas
- Establish additional survey and sampling frequency requirements
- Determine if additional monitoring equipment is required
- Develop a decon plan based on prioritized recovery of plant areas
- Commence bioassay program
- Contract for large volume decontamination equipment/expertise

F. Water Management

- Identify sources, volumes and activity of water inventories
- Prioritize clean-up
- Verify/evaluate condition of existing clean-up systems
- Establish tagouts/controls to preclude inadvertent discharges
- Evaluate need to contract portable filtering systems/expertise
- Establish berms and restraints for control and mitigation of spills
- Evaluate need for additional onsite waste storage capability
- Evaluate need for additional burial space for waste

Attachment 10.5

ONSITE RECOVERY ISSUES/STRATEGIES GUIDE

Sheet 3 of 3

G. Logistics (Use guidelines for Forced Outage Scheduling)

- Identify manpower needs
- Obtain (if necessary) damage control equipment
- Consider use of outside specialist (INPO, Westinghouse)
- Set up training for off normal conditions (ALARA)
- Consider restricting site access
- Order extra HP supplies to support recovery
- Evaluate the need for additional security (crowd control)
- Evaluate the need for remote technology for inspections and cleanup
- Evaluate the need for additional communications capabilities

H. Documentation

- Initiate actions to complete any required NRC reports.
- Develop onsite portions of Root Cause Report
- Develop onsite portion of the Recovery Plan (short/long term)
- Write special procedures to perform tasks outside the scope of normal procedures

I. Other

Any item which does not fall into one of the listed categories

Attachment 10.6

OFFSITE RECOVERY ISSUES/STRATEGIES GUIDE

Sheet 1 of 2

NOTE: • Issue/Strategies Form should be used to document items identified during the meeting. Complete as much of the form as possible but only the 'Description of Issue' section needs to be completed during initial meeting.

1. Convene a meeting of key EOF Emergency Response Organization (ERO) personnel and the Emergency Plan Manager. It is suggested as a minimum the following members attend:

   - Emergency Director
   - EOF Manager
   - Offsite Radiological Manager
   - Technical Advisor to the Emergency Director
   - Emergency Planning Department Manager

2. Review existing conditions, outline the issues to be resolved, and develop an Issues/Strategies Package that will form the basis for the offsite portion of the plant Recovery Plan. Issues that should be considered include:

   A. Present Activities Being Performed by EOF Staff

   - Identify ongoing activities and determine the need to continue

   B. Radiological

   - Evaluate the need for an environmental sampling program
   - If required, estimate total population dose in accordance with IP-1036
   - Evaluate clean-up requirements
   - Evaluate the need to bring in outside expertise for radiological monitoring

   C. Support to Offsite Authorities

   - Consider outstanding requests from offsite authorities
   - Keep offsite authorities apprised of onsite conditions and activities

Attachment 10.6

OFFSITE RECOVERY ISSUES/STRATEGIES GUIDE

Sheet 2 of 2

D. Corporate Interface

- Keep corporate management apprised of conditions and activities
- Provide information to legal organization as requested
- Identify issues applicable to Human Resources and Employee Assistance

E. Logistics

- Identify manpower needs to support offsite recovery activities
- Identify all non-Entergy personnel and activities currently in place
- Review equipment and material needs for EOF recovery activities
- Assist onsite and Public Information organizations in obtaining offsite support
- Evaluate the need for additional communications capabilities

F. Documentation

- Direct that an Event Summary Report be prepared
- Develop offsite portions of Root Cause Report
- Develop offsite portion of the Recovery Plan (short/long term)

G. Other

- Any item which does not fall into one of the listed categories

Attachment 10.7

PUBLIC INFORMATION RECOVERY ISSUES/STRATEGIES GUIDE

Sheet 1 of 1

NOTE: Issue/Strategies Form should be used to document items identified during the meeting. Complete as much of the form as possible but only the 'Description of Issue' section needs to be completed during initial meeting.

1. When directed, convene a meeting of key Joint News Center Emergency Response Organization personnel. It is suggested as a minimum the following ERO members attend:

   - Company Spokesperson
   - JNC Director
   - Also include IPEC and Corporate communications representatives

2. Review existing conditions, outline the public information issues to be resolved, and develop an Issues/Strategies Package that will form the basis for the public information portion of the plant Recovery Plan. Issues that should be considered in the formation of the package include:

   A. Present Activities Being Performed by JNC Staff

   - Identify ongoing activities and determine the need to continue

   B. Offsite Interface

   - Identify activities needed to keep offsite authorities apprised of Entergy Public Information activities

   C. Documentation

   - Develop the Public Information portion of the Recovery Plan

   D. Other

   - Any item which does not fall into one of the listed categories

Attachment 10.8
EVENT SUMMARY REPORT FORMAT
Sheet 1 of 1

Date
Time

To: *Offsite Authority* (NRC, State, County)

From: *Name*

Subject: Event Summary Report of Emergency Declared at Indian Point Nuclear Plant

The Indian Point Nuclear Plant terminated from emergency status at [*time*] and entered into Recovery.

The following is a review of events and items pertaining to [*Indicate EAL and Type*] reported on [*date*].

[*Provide a narrative of the event*] (describe the event giving the facts of the emergency including as a minimum:)

1. Time and description of initiating events (i.e., "On July 4, 1999, at 0640 hours a bomb threat was received at....."). Include information on personnel injuries and status. **(DO NOT INCLUDE NAME(S) OF VICTIMS UNLESS THE FAMILY HAS BEEN NOTIFIED)**.

2. Performance of initial notifications to offsite authorities, to include time, location and mode of notification (That is: fax, radio, telephone).

3. Requests for offsite assistance, including time and type.

4. The magnitude of any radiological release and Protective Action Recommendation information as applicable.

5. Telephone numbers where people can call for any additional information (such as the Rumor Control or Media Centers).

Approval: *Signature*

CONTROLLED

COPY # 25

Estimating Total Population Exposure

Prepared by: Al Lee (Print Name) _____ (Signature) 6/27/02 (Date)

Approval: Frank Inzirillo (Print Name) _____ (Signature) 7/1/02 (Date)

Effective Date: 7/11/02

Table of Contents

ESTIMATING TOTAL POPULATION EXPOSURE

1.0 PURPOSE

To describe the method of estimating the total integrated dose to the population at large within the ten mile Emergency Planning Zone (EPZ) from the release of airborne radioactive material.

2.0 PRECAUTIONS ANS LIMITATIONS

2.1 This procedure should be implemented during the Recovery phase following the termination of a release of radioactive material.

2.2 Exposure computation is performed by first determining the whole body exposure as read from the TLDs which are located in each of the 16 sectors at APPROXIMATELY 1, 5 AND 10 mile distances. These exposures, which are for a specific zone in each of the sectors, are then related to exposures for the other zones by multiplying them by Xu/Q ratio obtained between the zone in question AND the TLD zone for the actual Pasquill Category during the release time. Attachment 10.1 contains the Xu/Qs for the midpoint of ALL ten miles for each Pasquill Category.

2.3 The sector/zone exposure is then multiplied by the population as listed for that sector/zone to obtain the integrated population dose for the sector/zone referenced in the Evacuation Time Travel Estimates (ETTEs). IF the population had not been present during the entire exposure period due to evacuation, then the dose must be modified to compensate for it.

2.4 The total whole body exposure to the population in the ten mile EPZ is obtained by adding the 160 sector/zone exposures.

2.5 To obtain the estimated thyroid exposure, a ratio of the Noble Gas (NG) to the radioiodines (I) must be determined from vent samples and environmental samples. WHEN the ratios are known a factor may be determined from Attachment 10.3 that WHEN multiplied by the estimated whole body exposure shall give the estimated thyroid exposure.

3.0 REFERENCES

Evacuation Travel Time Estimates

4.0 DEFINITIONS

NONE

5.0 RESPONSIBILITIES

5.1 The Offsite Radiological Assessment Director (ORAD) or Radiological Assessment Team Leader (RATL) has overall responsibilities to implement this procedure.

5.2 The Nuclear Environmental Monitoring Supervisor is responsible in assisting the ORAD or RATL in the collection and analysis of the offsite TLDs.

5.3 The Corporate Support Group will assist in the implementation of this procedure.

6.0 DETAILS

6.1 The Offsite Radiological Assessment Director (ORAD) or Radiological Assessment Team Leader (RATL) shall instruct the Nuclear Environmental Monitoring (NEM) Supervisor to collect the environmental TLDs AND replace them with new TLDs.

6.2 The NEM Supervisor shall direct the collection and replacement of ALL TLDs, taking care to record the following information for EACH .

6.2.1 Location (Sector/Zone).

6.2.2 Date of pickup.

6.2.3 Time of pickup.

6.2.4 Name of individual.

6.3 The NEM Supervisor shall have the TLDs read out onsite OR send to the Analytical Contractor for processing.

6.4 **WHEN** the NEM Supervisor receives the TLD read out data **THEN** he/she shall give it to the ORAD or RATL.

6.5 The ORAD or RATL shall assign the Dose Assessor to complete the "Estimated Population Dose" (form EP-12).

6.5.1 Record the reference TLD mrem next to the appropriate Sector/ Zones (typically in zones 1, 5, and 10). The reference TLD mrem values for zone 1 will be utilized later to interpret mrem values for zones 2, 3, and 4. The reference TLD mrem values for zone 5 will be utilized later to interpret mrem values for zones 6, 7, 8, and 9.

6.5.2 Record the appropriate Default Zone Correction Factors in the Zone Correction Factor column based on the Pasquill Category and using the meteorology during the time of the release and the factors in Attachment 10.2.

NOTE

IF the actual locations of the reference TLDs vary by more than 3 miles from the default locations of 1, 5, and 10 miles, then specific Zone Correction Factors can be derived directly from Attachment10.1 Xu/Q values.

6.5.3 Calculate the Interpreted mrem for those zones without TLDs by multiplying the reference TLD mrem by the Zone Correction Factor. Record in the appropriate space.

6.5.4 Determine if a modifier number, LESS THAN 1.0, is appropriate because the population was not exposed for the full time due to being evacuated. Record in appropriate column. Evacuation times may be obtained from the County Emergency Management Directors and can be used to develop an appropriate modifier number.

6.5.5 Multiply the interpreted mRem by the modifier number and the population to obtain the estimated total population dose for EACH Sector/Zone. Record in appropriate column.

6.5.6 Add up exposure for each Sector and record.

6.5.7 Add up the exposure for all Sectors to obtain the total estimated whole body population dose within the ten mile EPZ.

6.5.8 Determine what the ratios of Noble Gas to Iodine (131 and 133) were during the release period from vent, main steam OR air ejector samples.

6.5.9 From Attachment 10.3, using the appropriate time period and the NG/I ratios, determine the factors to multiply the whole body exposure to obtain the thyroid exposure for Iodine 131 and 133.

6.5.10 Multiply the total estimated whole body population dose by the factors for Iodine 131 and 133.

6.5.11 Add both Iodine exposures to obtain the total estimated thyroid dose to the population WITHIN the ten mile EPZ.

6.6 The ORAD or RATL shall review the completed forms and prepare a report to the State and local authorities which is sent to the Recovery Manager for review and authorization for transmittal.

7.0 INTERFACES

7.1 IP-EP-115, Emergency Plan Forms

7.2 Post Accident Environmental procedures

8.0 RECORDS

NONE

9.0 REQUIREMENTS AND COMMITMENT CROSS-REFERENCE

NONE

10.0 ATTACHMENTS

10.1 Zone Xu/Q vs. Pasquill Classification

10.2 Zone Correction Factors vs. Pasquill Classification

10.3 Factors to Multiply Whole Body Exposure by to Obtain Thyroid Exposure

Attachment 10.1

ZONE Xu/Q vs. PASQUILL CLASSIFICATION

Sheet 1 of 1

ZONE	A	B	C	D	E	F	G
1	3.5 E-6	1.9 E-5	5.2 E-5	1.4 E-4	2.6 E-4	4.8 E-4	7.0 E-4
2	6.3 E-7	1.8 E-6	9.2 E-6	3.2 E-5	6.5 E-5	1.5 E-4	2.7 E-4
3	4.4 E-7	6.9 E-7	3.8 E-6	1.5 E-5	3.1 E-5	8.0 E-5	1.5 E-4
4	3.2 E-7	4.5 E-7	2.2 E-6	8.7 E-6	1.8 E-5	5.1 E-5	9.9 E-5
5	2.6 E-7	3.6 E-7	1.4 E-6	6.1 E-6	1.3 E-5	3.7 E-5	7.6 E-5
6	2.1 E-7	3.0 E-7	1.0 E-6	4.6 E-6	1.0 E-5	2.9 E-5	6.3 E-5
7	1.9 E-7	2.6 E-7	7.8 E-7	3.6 E-6	8.6 E-6	2.3 E-5	5.3 E-5
8	1.7 E-7	2.3 E-7	6.3 E-7	3.1 E-6	7.5 E-6	2.0 E-5	4.6 E-5
9	1.5 E-7	2.1 E-7	5.2 E-7	2.6 E-6	6.5 E-6	1.8 E-5	4.1 E-5
10	1.4 E-7	1.9 E-7	4.4 E-7	2.2 E-6	5.7 E-6	1.6 E-5	3.6 E-5

The zone Xu/Q is the value that corresponds to the midpoint of the zone, e.g., zone 5 is considered 4.5 miles from the reactor building. Use average stability class for period of time of exposure.

Attachment 10.2

Default

ZONE CORRECTION FACTORS vs. PASQUILL CLASSIFICATION

Sheet 1 of 1

ZONE	A	B	C	D	E	F	G
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	0.18	0.09	0.18	0.23	0.25	0.31	0.39
3	0.13	0.04	0.07	0.11	0.12	0.17	0.21
4	0.09	0.02	0.04	0.06	0.07	0.11	0.14
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	0.81	0.83	0.71	0.75	0.77	0.78	0.83
7	0.73	0.72	0.56	0.59	0.66	0.62	0.70
8	0.65	0.64	0.45	0.51	0.58	0.54	0.61
9	0.58	0.58	0.37	0.43	0.50	0.49	0.54
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00

The zone correction factor is the ratio of :

$$\frac{\text{Xu/Q for sector}}{\text{Xu/Q for reference TLD zone}}$$

The reference zones are taken to be 1, 5, and 10 based on the approximate TLD locations.

Attachment 10.3

FACTORS TO MULTIPLE WHOLE BODY EXPOSURE BY TO OBTAIN THYROID EXPOSURE

Sheet 1 of 1

NG/I-131 RATIO	FACTOR vs. TIME AFTER SHUTDOWN				
	0 HOURS	2.5 HOURS	4.5 HOURS	6.5 HOURS	12.5 HOURS
10^1	3.0×10^2	3.7×10^2	5.2×10^2	6.2×10^2	1.33×10^3
10^2	3.0×10^1	3.7×10^1	5.2×10^1	6.2×10^1	1.33×10^2
10^3	3.0×10^0	3.7×10^0	5.2×10^0	6.2×10^0	1.33×10^1
10^4	3.0×10^{-1}	3.7×10^{-1}	5.2×10^{-1}	6.2×10^{-1}	1.33×10^0
10^5	3.0×10^{-2}	3.7×10^{-2}	5.2×10^{-2}	6.2×10^{-2}	1.33×10^{-1}
10^6	3.0×10^{-3}	3.7×10^{-3}	5.2×10^{-3}	6.2×10^{-3}	1.33×10^{-2}

NG/I-133 RATIO	FACTOR vs. TIME AFTER SHUTDOWN				
	0 HOURS	2.5 HOURS	4.5 HOURS	6.5 HOURS	12.5 HOURS
10^1	1.0×10^2	1.2×10^2	1.7×10^2	2.1×10^2	4.5×10^2
10^2	1.0×10^1	1.2×10^1	1.7×10^1	2.1×10^1	4.5×10^1
10^3	1.0×10^0	1.2×10^0	1.7×10^0	2.1×10^0	4.5×10^0
10^4	1.0×10^{-1}	1.2×10^{-1}	1.7×10^{-1}	2.1×10^{-1}	4.5×10^{-1}
10^5	1.0×10^{-2}	1.2×10^{-2}	1.7×10^{-2}	2.1×10^{-2}	4.5×10^{-2}
10^6	1.0×10^{-3}	1.2×10^{-3}	1.7×10^{-3}	2.1×10^{-3}	4.5×10^{-3}