Emergency Response Plan Implementation Procedures

Rev. 8 Instruction

Using the instructions below, incorporate this revision into your binder.

1) Retain present record of page changes
2) Document revision entry on record of page changes

3) Page(s) to be Removed	Page(s) to be Inserted
Approval & Revision Sheet	Approval and Revision Sheet with Rev. 8 entry
List of Effective pages 1-19	List of effective pages 1-19
iii thru iv	iii-iv
2.0-9 - 2.0-10	2.0-9 - 2.0-10
3.1-3 - 3.1-6	3.1-3 - 3.1-6
3.1-11 - 3.1-16	3.1-11 - 3.1-16
3.3-1 - 3.3-2	3.3-1 - 3.3-2
3.5-1 - 3.5-4	3.5-1 - 3.5-4
3.6-5 - 3.6-8	3.6-5 - 3.6-8
3.6-11 - 3.6-12	3.6-11 - 3.6-12
3.6-15	3.6-15
4.1.5-1 - 4.1.5-2	4.1.5-1 - 4.1.5-2
4.1.5-5 - 4.1.5-10	4.1.5-5 - 4.1.5-10
4.1.14-1 - 4.1.14-2	4.1.14-1 - 4.1.14-2
4.1.15-1 - 4.1-15-2	4.1.15-1 - 4.1-15-2
4.2-1 - 4.2-2	4.2-1 - 4.2-2
4.2-7 - 4.2-12	4.2-7 - 4.2-12
4.3.1-9 - 4.3.1-10	4.3.1-9 - 4.3.1-10
4.3.1.1-5 - 4.3.1.1-6	4.3.1.1-5 - 4.3.1.1-6
4.4.1-1 - 4.4.1-4	4.4.1-1 - 4.4.1-4
4.4.1-7 - 4.4.1-8	4.4.1-7 - 4.4.1-8
4.4.2.1 - 4.4.2-6	4.4.2.1 - 4.4.2-6
4.4.3-1 - 4.4.3-8	4.4.3-1 - 4.4.3-8
4.4.4.1 - 4.4.4-4	4.4.4.1 - 4.4.4-4
4.4.5.1 - 4.4.5-9	4.4.5.1 - 4.4.5-9
4.4.6-3 - 4.4.6-4	4.4.6-3 - 4.4.6-4
4.4.7.1-3 - 4.4.7.1-4	4.4.7.1-3 - 4.4.7.1-4
4.4.8-1 - 4.4.8-3	4.4.8-1 - 4.4.8-3
4.4.8.1-3 - 4.4.8.1-4	4.4.8.1-3 - 4.4.8.1-4
4.4.9-1 - 4.4.9-20	4.4.9-1 - 4.4.9-21
4.5.1-5	4.5.1-5
4.5.2-1 - 4.5.2-6	4.5.2-1 - 4.5.2-6
4.5.3-3 - 4.5.3-4	4.5.3-3 - 4.5.3-4
4.5.4.1-1 - 4.5.4.1-2	4.5.4.1-1- 4.5.4.1-2
4.6.1-5 - 4.6.1-6	4.6.1-5 - 4.6.1-6
4.8.1-1 - 4.8.1-6	4.8.1-1 - 4.8.1-6
4.8.1-9 - 4.8.1-10	4.8.1-9 - 4.8.1-13b
4.8.1-15 - 4.8.1-16	4.8.1-15 - 4.8.1-16
4.8.1-18	4.8.1-18
5.0-1 - 5.0-12	5.0-1 - 5.0-6
5.1-5 - 5.1-6	5.1-5 - 5.1-6
5.1-17 - 5.1-19	5.1-17 - 5.1-19
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5.4-23 - 5.4-27	5.4-23 - 5.4-27
5.5-1 - 5.5-2	5.5-1 - 5.5-2
Appendix	
B.1-1 - B.1-4	B.1-1 - B.1-4
B.1-11 - B.1-18	B.1-11 - B.1-18
B.1-23 - B.1-38	B.1-23 - B.1-38
C.1-3 - C.1-4	C.1-3 - C.1-4
C.1-11 - C.1-12	C.1-11 - C.1-12
C.1-15 - C.1-20	C.1-15 - C.1-20
C.2-1 - C.2-4	C.2-1 - C.2-4
C.3-1 - C.3-2	C.3-1 - C.3-2
C.3-5 - C.3-6	C.3-5 - C.3-6
C.3-13	
C.4-5 - C.4-6	C.4-5 - C.4-6
	D.3.2-1 - D.3.2-3

4) Upon completion of Revision 8 entry, sign and return receipt acknowledgement.

BALTIMORE GAS AND ELECTRIC COMPANY

CALVERT CLIFFS NUCLEAR POWER PLANT

EMERGENCY RESPONSE PLAN IMPLEMENTATION PROCEDURES

APPROVAL AND REVISION SHEET

SUBMITTED: E. T. REINER
Plant Health Physicist

REVIEWED: N. L. MILLER
General Supervisor-Radiation Safety

POSRC: 80-164

APPROVED: J. B. RUSSELL
Plant Superintendent
Calvert Cliffs Nuclear Power Plant

11/23/80 Revision 0
Date Effective Date: December 15, 1980

POSRC Annual Review Sheet *Update only in Master, Control Room, S. Service Bldg., and Farm Demo. Bldg. Copies). Required yearly.

POSRC #	SIGNATURE	POSRC #	SIGNATURE
82-32	J B Russell		

Revision Record:

REV. NO.	DATE	POSRC #	SIGNATURE	REV. NO.	DATE	POSRC #	SIGNATURE
1	3/6/81	81-49	J B Russell	6	11/10/81	81-144	J B Russell
2	9/9/81	81-117	J B Russell	7	1/20/82	82-07	John Carroll
3	10/2/81	81-126	J B Russell	8	6/9/82	82-72	John Carroll
4	10/30/81	81-139	J B Russell				
5	11/11/81	81-142	J B Russell				

CALVERT CLIFFS NUCLEAR POWER PLANT
EMERGENCY RESPONSE PLAN
IMPLEMENTATION PROCEDURES

LIST OF EFFECTIVE PAGES

ERPIP PAGE	REV.	ERPIP PAGE	REV.
i	4	1.0-8	4
ii	5	1.0-9	4
iii	5	1.0-10	4
iv	8	1.0-11	5
v	4	1.0-12	5
vi	5	1.0-13	5
vii	5	2.0-1	1
viii	5	2.0-2	1
ix	5	2.0-3	3
x	4	2.0-4	3
xi	6	2.0-5	3
xii	4	2.0-6	3
xiii	4	2.0-7	2
1.0-1	1	2.0-8	2
1.0-2	1	2.0-9	2
1.0-3	6	2.0-10	8
1.0-4	4	2.0-11	2
1.0-5	4	2.0-12	2
1.0-6	4	2.0-13	2
1.0-7	4	2.0-14	2

CALVERT CLIFFS NUCLEAR POWER PLANT
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ERPIP PAGE	REV.	ERPIP PAGE	REV.
2.0-15	2	3.1-11	8
2.0-16	2	3.1-12	8
2.0-17	5	3.1-13	8
2.0-18	5	3.1-14	3
2.0-19	2	3.1-15	8
2.0-20	3	3.1-16	3
2.0-21	3	3.2-1	3
2.0-22	3	3.2-2	3
2.0-23	3	3.2-3	2
3.0-1	2	3.2-4	2
3.1-1	3	3.2-5	2
3.1-2	3	3.2-6	2
3.1-3	8	3.2-7	2
3.1-4	3	3.2-8	2
3.1-5	3	3.2-9	2
3.1-6	8	3.3-1	8
3.1-7	3	3.3-2	3
3.1-8	3	3.3-3	3
3.1-9	3	3.4-1	3
3.1-10	3	3.4-2	3

CALVERT CLIFFS NUCLEAR POWER PLANT
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ERPIP PAGE	REV.	ERPIP PAGE	REV.
3.4-3	5	3.7-1	5
3.5-1	8	3.7-2	5
3.5-2	8	3.8-1	4
3.5-3	8	3.8-2	4
3.5-4	3	3.8-3	5
3.6-1	3	3.9-1	3
3.6-2	5	3.9-2	4
3.6-3	5	3.9-3	5
3.6-4	5	3.10-1	3
3.6-5	8	3.10-2	4
3.6-6	8	3.10-3	5
3.6-7	8	4.0-1	6
3.6-8	2	4.1-0	4
3.6-9	2	4.1.1-1	5
3.6-10	2	4.1.1-2	5
3.6-11	2	4.1.1-3	5
3.6-12	8	4.1.1-4	5
3.6-13	3	4.1.2-1	3
3.6-14	3	4.1.2-2	5
3.6-15	8	4.1.2-3	5

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LIST OF EFFECTIVE PAGES

ERPIP PAGE	REV.	ERPIP PAGE	REV.
4.1.2-4	3	4.1.7-1	1
4.1.2-5	3	4.1.7-2	6
4.1.2-6	3	4.1.8-1	2
4.1.2-7	3	4.1.9-1	2
4.1.3-1	7	4.1.9-2	6
4.1.3-2	5	4.1.10-1	2
4.1.4-1	6	4.1.10-2	6
4.1.4-2	6	4.1.11-1	1
4.1.5-1	8	4.1.12-1	1
4.1.5-2	8	4.1.12-2	2
4.1.5-3	6	4.1.12-3	2
4.1.5-4	6	4.1.12-4	2
4.1.5-5	6	4.1.12-5	2
4.1.5-6	8	4.1.12-6	6
4.1.5-7	8	4.1.13-1	6
4.1.5-8	8	4.1.13-2	5
4.1.5-9	8	4.1.14-1	6
4.1.5-10	4	4.1.14-2	8
4.1.6-1	1	4.1.15-1	8
4.1.6-2	6	4.1.15-2	6

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LIST OF EFFECTIVE PAGES

ERPIP PAGE	REV.	ERPIP PAGE	REV.
4.1.15-3	5	4.1.21-1	6
4.1.15-4	5	4.1.21-2	6
4.1.15-5	5	4.1.21-3	6
4.1.15-6	5	4.1.21-4	6
4.1.15-7	5	4.1.22-1	6
4.1.15-8	2	4.1.23-1	6
4.1.16-1	3	4.1.24-1	5
4.1.16-2	3	4.1.25-1	4
4.1.16-3	6	4.1.25-2	4
4.1.17-1	2	4.1.25-3	4
4.1.17-2	2	4.1.25-4	6
4.1.17-3	4	4.1.25-5	1
4.1.17-4	6	4.1.25-6	1
4.1.18-1	2	4.1.25-7	1
4.1.18-2	1	4.1.25-8	1
4.1.18-3	2	4.1.25-9	4
4.1.18-4	6	4.1.25-10	4
4.1.19-1	6	4.1.25-11	4
4.1.20-1	2	4.2-1	8
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LIST OF EFFECTIVE PAGES

ERPIP PAGE	REV.	ERPIP PAGE	REV.
4.2-3	6	4.3.1-4	3
4.2-4	6	4.3.1-5	3
4.2-5	6	4.3.1-6	3
4.2-6	3	4.3.1-7	4
4.2-7	8	4.3.1-8	4
4.2-8	3	4.3.1-9	4
4.2-9	8	4.3.1-10	8
4.2-10	3	4.3.1.1-1	2
4.2-11	8	4.3.1.1-2	3
4.2-12	5	4.3.1.1-3	5
4.2-13	3	4.3.1.1-4	5
4.2-14	3	4.3.1.1-5	2
4.2-15	3	4.3.1.1-6	8
4.2.1-1	2	4.3.1.1-7	5
4.2.1-2	1	4.3.2-1	2
4.3-0	4	4.3.2-2	7
4.3-1	2	4.3.2-3	2
4.3.1-1	6	4.3.2-4	7
4.3.1-2	4	4.3.2-5	7
4.3.1-3	3	4.3.2-6	1

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ERPIP PAGE	REV.	ERPIP PAGE	REV.
4.3.2-7	1	4.4.2-5	8
4.3.3-1	7	4.4.2-6	2
4.3.3-2	3	4.4.3-1	8
4.3.4-1	7	4.4.3-2	8
4.3.4-2	2	4.4.3-3	8
4.3.4-3	2	4.4.3-4	8
4.4-1	6	4.4.3-5	8
4.4.1-1	8	4.4.3-6	1
4.4.1-2	8	4.4.3-7	8
4.4.1-3	8	4.4.3-8	4
4.4.1-4	8	4.4.3-9	4
4.4.1-5	3	4.4.4-1	8
4.4.1-6	3	4.4.4-2	8
4.4.1-7	2	4.4.4-3	8
4.4.1-8	8	4.4.4-4	8
4.4.1-9	5	4.4.5-1	8
4.4.2-1	8	4.4.5-2	8
4.4.2-2	8	4.4.5-3	8
4.4.2-3	8	4.4.5-4	8
4.4.2-4	2	4.4.5-5	8

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4.4.5-7	8	4.4.7.3-3	4
4.4.5-8	8	4.4.7.3-4	4
4.4.5-9	8	4.4.7.3-5	4
4.4.6-1	2	4.4.7.3-6	4
4.4.6-2	2	4.4.7.3-7	4
4.4.6-3	2	4.4.7.3-8	4
4.4.6-4	8	4.4.7.3-9	4
4.4.6-5	6	4.4.7.3-10	4
4.4.6-6	6	4.4.7.3-11	4
4.4.7-1	1	4.4.7.3-12	4
4.4.7.1-1	2	4.4.7.3-13	4
4.4.7.1-2	2	4.4.7.4-1	4
4.4.7.1-3	8	4.4.7.4-2	4
4.4.7.1-4	2	4.4.7.4-3	4
4.4.7.1-5	2	4.4.7.4-4	4
4.4.7.1-6	1	4.4.7.4-5	4
4.4.7.1-7	2	4.4.7.4-6	4
4.4.7.2-1	7	4.4.7.4-7	4
4.4.7.3-1	4	4.4.7.4-8	4

CALVERT CLIFFS NUCLEAR POWER PLANT
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LIST OF EFFECTIVE PAGES

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4.4.7.4-9	4	4.4.9-10	8
4.4.7.4-10	4	4.4.9-11	8
4.4.8-1	8	4.4.9-12	8
4.4.8-2	8	4.4.9-13	8
4.4.8-3	8	4.4.9-14	8
4.4.8.1-1	2	4.4.9-15	8
4.4.8.1-2	2	4.4.9-16	8
4.4.8.1-3	2	4.4.9-17	8
4.4.8.1-4	8	4.4.9-18	8
4.4.8.1-5	2	4.4.9-19	8
4.4.9-0	6	4.4.9-20	8
4.4.9-1	6	4.4.9-21	8
4.4.9-2	8	4.5-1	4
4.4.9-3	8	4.5.1-1	2
4.4.9-4	6	4.5.1-2	2
4.4.9-5	6	4.5.1-3	2
4.4.9-6	8	4.5.1-4	2
4.4.9-7	8	4.5.1-5	8
4.4.9-8	8	4.5.1.1-1	4
4.4.9-9	8	4.5.1.2-1	8

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4.5.1.2-2	8	4.5.4.2-2	2
4.5.1.2-3	2	4.5.5-1	2
4.5.1.3-1	4	4.5.5-2	2
4.5.1.3-2	4	4.5.5-3	2
4.5.2-1	4	4.5.5-4	2
4.5.2-2	4	4.5.6-1	2
4.5.2-3	8	4.5.6-2	3
4.5.2-4	8	4.5.6-3	2
4.5.2-5	8	4.5.6-4	2
4.5.2-6	2	4.5.6-5	2
4.5.3-1	2	4.5.6-6	2
4.5.3-2	2	4.5.6-7	2
4.5.3-3	5	4.5.6-8	2
4.5.3-4	8	4.5.6-9	2
4.5.3-5	2	4.5.6-10	2
4.5.3-6	2	4.6-1	4
4.5.4-1	2	4.6.1-1	2
4.5.4.1-1	8	4.6.1-2	7
4.5.4.1-2	5	4.6.1-3	2
4.5.4.2-1	5	4.6.1-4	2

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4.6.1-5	2	4.6.4-7	2
4.6.1-6	8	4.6.4-8	2
4.6.1-7	2	4.7-1	3
4.6.2-1	2	4.8-0	4
4.6.2-2	2	4.8-1	2
4.6.2-3	2	4.8-2	2
4.6.2-4	2	4.8-3	2
4.6.2-5	1	4.8.1-1	2
4.6.2-6	2	4.8.1-2	8
4.6.3-1	1	4.8.1-3	8
4.6.3-2	2	4.8.1-4	4
4.6.3-3	2	4.8.1-5	8
4.6.3-4	4	4.8.1-6	5
4.6.3-5	4	4.8.1-7	4
4.6.4-1	2	4.8.1-8	4
4.6.4-2	2	4.8.1-9	4
4.6.4-3	2	4.8.1-10	4
4.6.4-4	2	4.8.1-11	4
4.6.4-5	2	4.8.1-12	4
4.6.4-6	2	4.8.1-13	4

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4.8.1-14	4	5.0-5	8
4.8.1-15	8	5.0-6	8
4.8.1-16	4	5.1-1	2
4.8.1-17	5	5.1-2	2
4.8.2-18	8	5.1-3	2
4.9-1	3	5.1-4	2
4.9-2	2	5.1-5	2
4.9.1-1	2	5.1-6	8
4.9.1-2	2	5.1-7	2
4.9.1-3	2	5.1-8	2
4.9.2-1	2	5.1-9	2
4.9.2-2	2	5.1-10	2
4.9.2-3	2	5.1-11	2
4.9.2-4	2	5.1-12	2
4.10-1	2	5.1-13	2
4.10-2	2	5.1-14	2
5.0-1	8	5.1-15	4
5.0-2	8	5.1-16	4
5.0-3	8	5.1-17	8
5.0-4	8	5.1-18	4

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ERPIP PAGE	REV.	ERPIP PAGE	REV.
5.1-19	8	5.4-11	5
5.2-1	1	5.4-12	5
5.2-2	2	5.4-13	5
5.2-3	2	5.4-14	5
5.3-1	2	5.4-15	5
5.3-2	2	5.4-16	5
5.3-3	2	5.4-17	5
5.3-4	1	5.4-18	5
5.3-5	2	5.4-19	5
5.3-6	2	5.4-20	5
5.4-1	8	5.4-21	5
5.4-2	8	5.4-22	5
5.4-3	8	5.4-23	5
5.4-4	8	5.4-24	8
5.4-5	8	5.4-25	8
5.4-6	5	5.4-26	8
5.4-7	5	5.4-27	8
5.4-8	5	5.5-1	8
5.4-9	5	5.5-2	1
5.4-10	5	5.5-3	4

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ERPIP PAGE	REV.	ERPIP PAGE	REV.
5.5-4	4	A.1-17*	8
5.5-5	4	A.1-18*	7
5.5-6	1	A.1-19*	8
A.1-0*	8	A.1-20*	6
A.1-1*	5	A.1-21*	8
A.1-2*	5	A.1-22*	8
A.1-3*	8	A.2-1*	1
A.1-4*	8	A.3.1-1*	2
A.1-5*	8	A.3.1-2*	5
A.1-6*	8	A.3.1-3*	8
A.1-7*	5	A.3.1-4*	8
A.1-8*	8	A.3.1-5*	4
A.1-9*	8	A.3.2-1*	8
A.1-10*	8	A.3.2-2*	8
A.1-11*	8	A.4-1*	7
A.1-12*	8	A.4-2*	8
A.1-13*	8	A.5-1*	8
A.1-14*	8	A.5-2*	2
A.1-15*	8	A.5-3*	8
A.1-16*	8	A.5-4*	8

CALVERT CLIFFS NUCLEAR POWER PLANT
EMERGENCY RESPONSE PLAN
IMPLEMENTATION PROCEDURES

LIST OF EFFECTIVE PAGES

ERPIP PAGE	REV.	ERPIP PAGE	REV.
A.5-5*	2	B.1-19	2
A.5-6*	8	B.1-20	2
B.1-1	8	B.1-21	2
B.1-2	2	B.1-22	4
B.1-3	8	B.1-23	8
B.1-4	2	B.1-24	2
B.1-5	2	B.1-25	8
B.1-6	2	B.1-26	8
B.1-7	2	B.1-27	8
B.1-8	2	B.1-28	4
B.1-9	2	B.1-29	4
B.1-10	4	B.1-30	8
B.1-11	8	B.1-31	4
B.1-12	8	B.1-32	8
B.1-13	8	B.1-33	8
B.1-14	4	B.1-34	8
B.1-15	4	B.1-35	8
B.1-16	8	B.1-36	8
B.1-17	8	B.1-37	8
B.1-18	8	B.1-38	8

CALVERT CLIFFS NUCLEAR POWER PLANT
EMERGENCY RESPONSE PLAN
IMPLEMENTATION PROCEDURES

LIST OF EFFECTIVE PAGES

ERPIP PAGE	REV.	ERPIP PAGE	REV.
B.2-0	4	B.2-20	4
B.2-1	1	B.2-21	4
B.2-2	1	B.2-22	4
B.2-3	1	B.2-23	4
B.2-4	1	B.2-24	4
B.2-5	1	B.2-25	4
B.2-6	1	B.2-26	4
B.2-7	1	B.2-27	4
B.2-8	1	B.2-28	4
B.2-9	1	B.2-29	4
B.2-10	1	B.2-30	4
B.2-11	1	B.2-31	4
B.2-12	4	B.2-32	4
B.2-13	4	B.2-33	4
B.2-14	4	B.2-34	4
B.2-15	4	B.2-35	4
B.2-16	4	B.2-36	4
B.2-17	4	B.2-37	4
B.2-18	4	B.2-38	4
B.2-19	4	B.2-39	4

CALVERT CLIFFS NUCLEAR POWER PLANT
EMERGENCY RESPONSE PLAN
IMPLEMENTATION PROCEDURES

LIST OF EFFECTIVE PAGES

ERPIP PAGE	REV.	ERPIP PAGE	REV.
B.2-40	4	B.2-60	4
B.2-41	4	B.2-61	4
B.2-42	4	B.2-62	4
B.2-43	4	B.2-63	4
B.2-44	4	B.2-64	4
B.2-45	4	B.2-65	4
B.2-46	4	B.2-66	4
B.2-47	4	B.2-67	4
B.2-48	4	B.3-0	5
B.2-49	4	B.3-1	5
B.2-50	4	B.3-2	2
B.2-51	4	B.3-3A	1
B.2-52	4	B.3-3B	2
B.2-53	4	B.3-4	2
B.2-54	4	B.3-5	5
B.2-55	4	B.3-6	6
B.2-56	4	B.3-7	6
B.2-57	4	C-1	6
B.2-58	4	C.1-1	2
B.2-59	4	C.1-2	4

CALVERT CLIFFS NUCLEAR POWER PLANT
EMERGENCY RESPONSE PLAN
IMPLEMENTATION PROCEDURES

LIST OF EFFECTIVE PAGES

ERPIP PAGE	REV.	ERPIP PAGE	REV.
C.1-3	2	C.2-2	8
C.1-4	8	C.2-3	8
C.1-5	2	C.2-4	6
C.1-6	6	C.2-5	6
C.1-7	2	C.2-6	2
C.1-8	2	C.3-1	2
C.1-9	2	C.3-2	8
C.1-10	6	C.3-3	6
C.1-11	8	C.3-4	2
C.1-12	3	C.3-5	8
C.1-13	3	C.3-6	2
C.1-14	2	C.3-7	2
C.1-15	8	C.3-8	2
C.1-16	8	C.3-9	2
C.1-17	8	C.3-10	2
C.1-18	2	C.3-11	2
C.1-19	2	C.3-12	2
C.1-20	8	C.3-13	8
C.1-21	2	C.4-1	6
C.2-1	2	C.4-2	6

CALVERT CLIFFS NUCLEAR POWER PLANT
EMERGENCY RESPONSE PLAN
IMPLEMENTATION PROCEDURES

LIST OF EFFECTIVE PAGES

ERPIP PAGE	REV.	ERPIP PAGE	REV.
C.4-3	6		
C.4-4	6		
C.4-5	6		
C.4-6	8		
C.4-7	6		
C.4-8	6		
C.4-9	6		
C.4-10	6		
D.1-1	2		
D.1-2	2		
D.2-1	2		
D.2-2	1		
D.3-1	2		
D.3-2	1		
D.3-2-1	8		
D.3-2-2	8		
D.3-2-3	8		

ERPIP MANUAL CONTENTS

PROCEDURE OR SECTION

ERPIP MANUAL CONTENTS

Gate and Access Monitoring Team Leader
ECC Monitoring Team Leader
EFADT Leader
Emergency Reentry Monitoring Team Leader
Dosimetry Team Leader
See EXHIBIT 2.0-B

2.2.6.3 Basic Functions:

Responsible for coordinating the onsite radiological monitoring teams from the Emergency Control Center.

2.2.6.4 Primary Responsibilities:

1. Determines the areas of potential onsite radiation exposure and dispatches and coordinates the radiological monitoring (onsite) teams for surveys and sampling for radioactive airborne contaminations.
2. Arranges for additional onsite measurement surveys to ensure that conditions are closely monitored.
3. Directs radiological support for search and rescue teams.
4. Directs qualified personnel to be members of the Emergency Reentry Team and assists in coordinating the activities of the team during the performance of their duties during the initial emergency reentry.
5. Directs the Emergency Reentry Team on initial entry and all subsequent entries until radiation areas are defined and posted.
6. Directs monitoring of personnel and evaluates their exposures.
7. Directs personnel as necessary in accordance with Rad-Chem procedures to support radwaste operations.

2.2.6.5 Principal Working Relationships:

1. Site Emergency Coordinator
2. Radiological Assessment Director
3. Emergency Reentry Team Leader

4. All Emergency Radiation Teams (see EXHIBIT 2.0-B)

2.2.7 Radiological Assessment Director

2.2.7.1 Reports to:

Site Emergency Coordinator

2.2.7.2 Supervises:

Offsite Monitoring Team Leader and Team

2.2.7.3 Basic Functions:

Responsible for assessing, mapping and coordinating calculation of all radiological data required to accurately depict plant onsite and offsite radiation doses and/or exposure rates.

2.2.7.4 Primary Responsibilities:

1. Obtains information on the status of the unit releases from process monitors and the meteorological conditions.
2. Estimates the whole body dose from the radioactive material release data and notifies the Site Emergency Coordinator.
3. Determines the projected radiation exposure from the results of field measurements surveys and notifies the Site Emergency Coordinator.
4. Evaluates radiological conditions and recommends shelter/evacuation of onsite and offsite personnel to Site Emergency Coordinator.

2.2.7.5 Principal Working Relationships:

1. Site Emergency Coordinator
2. Radiation Protection Director
3. Offsite Monitoring Team Leader
4. Environmental Services Coordinator

2.2.8 Emergency Fire Team Leader

2.2.8.1 Reports to:

Site Emergency Coordinator

2.2.8.2 Directs:

Emergency Fire Team personnel and outside fire fighting organizations called in to assist in fighting the fire.

2.2.8.3 Basic Functions:

EXHIBIT 3.1-A
INITIAL NOTIFICATION CHECKLIST

Use to initially notify, in the following sequence, Calvert County Communications Center, St. Mary's Communications Center, Dorchester County Central Alarm, Maryland Emergency Management and Civil Defense Agency, NRC and the Security Control Monitor. Use also if upgrading of the emergency class occurs. Notify offsite agencies of items 1 through 11, sequentially. If plume is heading easterly notify Dorchester County after Calvert County.

1. This is (is not) an exercise (circle one)
2. Name of Caller: _____
3. Title/Organization: _____
4. Location of Incident: Calvert Cliffs Nuclear Power Plant
5. Emergency Class*: ( ) Unusual Event ( ) Alert
   ( ) Site Emergency ( ) General Emergency
6. Date/Time Declared: _____ / _____ h
7. Radioactivity: ( ) Has Not Been Released ( ) Is Being Released ( ) Has Been Released
   ( ) In the Plant ( ) From the Plant
8. Type of Release: ( ) None ( ) Airborne ( ) Waterborne ( ) Surface Spill
9. Protective Actions*: ( ) None ( ) As Below (item 11B)
10. Affected Population and Area ( ) None ( ) As Below (item 11A)

11A Location (Sector/Zone)	11B Protective Actions Recommended

SEC SIGNATURE

To	Date	Time	Person Receiving Call
CC EOC			
ST.M EOC			
DOR EOC			
MD EOC			
DRC			

- NOTE -

Contact of DRC is only possible during normal working hours until the accident assessment control center is activated.

NRC			
SECURITY CONTROL			
OTHERS (specify)			

Caller Telephone Numbers: ( ) Calvert Cliffs Hot Line
( ) Radio-telephone _____ MHz (call signal _____)
( ) Other (specify) _____

*The SEC is responsible for classifying emergencies, making the decision to make initial notifications and making the decision to recommend Protective Actions (non-delegatable). Recommendations on Protective Actions must be based on measured data except in core melt sequences.

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EXHIBIT 3.1-B
EMERGENCY ACTION LEVELS (EALS)

EMERGENCY CLASSIFICATIONS

A. Unusual Event

B. Alert

C. Site Emergency

D. General Emergency

EAL CATEGORIES

EXHIBIT 3.1-B
EMERGENCY ACTION LEVELS (EALS)

I. RADIOACTIVITY RELEASE

A. Unusual Event

1. Prior to augmentation: Any of the following valid RMS readings for longer than one hour which are greater than:

   1-RE-5415: 8.9E3 cpm Unit 1 Main Vent Radio Gas
   2-RE-5415: 1.0E4 cpm Unit 2 Main Vent Radio Gas
   1-RE-5410: 2.3E4 cpm Unit 1 Waste Process Vent Radio Gas
   2-RE-5410: 2.3E4 cpm Unit 2 Waste Process Vent Radio Gas
   1-RE-5406: 2.0E5 cpm Unit 1 ECCS PP Room Vent Radio Gas
   2-RE-5406: 2.0E5 cpm Unit 2 ECCS PP Room Vent Radio Gas
   O-RE-5420: 1.4E5 cpm Fuel Handling Area Vent Radio Gas
   O-RE-5425: 8.4E4 cpm Access Control Area Vent Radio Gas

   NOTE: These estimated values correspond to the technical specification limit of 0.5 mR/h at the site boundary.

2. Liquid Waste Discharge Monitor

   O-RI-2201 - high alarm trip fails to shut either isolation valve when monitor exceeds 10^5 cpm.

B. Alert

1. Prior to augmentation: Any of the following valid RMS readings for longer than 15 minutes and expected to continue for greater than one hour which are greater than:

   1-RE-5415: 8.9E4 cpm Main Vent Radio Gas
   2-RE-5415: 1.0E5 cpm Main Vent Radio Gas
   1-RE-5410: 2.3E5 cpm Unit 1 Waste Process Vent Radio Gas
   2-RE-5410: 2.3E5 cpm Unit 2 Waste Process Vent Radio Gas
   1-RE-5406: 2.0E6 cpm Unit 1 ECCS PP Room Vent Radio Gas
   2-RE-5406: 2.0E6 cpm Unit 2 ECCS PP Room Vent Radio Gas
   O-RE-5420: 1.4E6 cpm Fuel Handling Area Vent Radio Gas
   O-RE-5425: 8.4E5 cpm Access Control Area Vent Radio Gas

   NOTE: These estimated values, correspond to 10 times the technical specification limit of 5 mR/h at the site boundary.

2. A calculated actual or potential dose rate at site boundary $\geq$ 5.0 mrem/h based on actual meteorological conditions (perform calculation if Main Vent Monitor exceeds 1000 cpm).

3. *Other plant conditions resulting in an actual or potential dose $\geq$ 0.1 rem W.B. or $\geq$ 0.5 rem Thyroid on-site but outside the confines of Controlled Area.

EXHIBIT 3.1-B
EMERGENCY ACTION LEVELS (EALS)

d. Containment average temperature is > 120° F; or

e. Containment pressure is < -1.0 psig or > 1.8 psig; or

f. Containment structural integrity exceeds the acceptance criteria of TS 4.6.1.6;

AND g. The reactor is required to be placed is a lower mode of operation.

B. Alert

Containment pressure ≥ 4 psig or containment average temperature greater than 150° F.

C. Site Emergency

Containment pressure ≥ 25 psig or containment average temperature greater than 180° F.

D. General Emergency

None

VI. STEAM LINE BREAK

A. Unusual Event

None

B. Alert

Main Steam Line Break which results in the implementation of EOP-4 (Steam Line Rupture Emergency Procedure).

C. Site Emergency

None

D. General Emergency

None

EXHIBIT 3.1-B
EMERGENCY ACTION LEVELS (EALS)

VII SYSTEM DEGRADATION OR LOSS

A. Unusual Event

1. Any of the following:

   a. One of the two off-site circuits and one of the two diesel generators inoperable; or

   b. One of two diesels lost or one of the off-site power sources lost; or

   c. Both off-site power sources inoperable; or

   d. Both of the unit's diesel generators inoperable:

AND e. The unit is required to be placed in a lower mode of operation.

2. Any of the following:

   a. One ESFAS instrumentation channel inoperable as shown in TS 3.3-3; or

   b. One safety injection tank inoperable; or

   c. One ECCS subsystem inoperable with $T_{avg.} \geq 300^{o}$ F; or

   d. No ECCS subsystems operable with $T_{avg.} < 300^{o}$ F; or

   e. Refueling water tank inoperable;

AND f. The reactor is required to be placed in a lower mode of operation.

B. Alert

A loss of AC power capability which results in the implementation of EOP-15 (loss of AC power emergency procedure.)

C. Site Emergency

Loss of all station AC Power for longer than 15 minutes.

D. General Emergency

None

EXHIBIT 3.1-B
EMERGENCY ACTION LEVELS (EALS)

VIII. AIRCRAFT OR MISSLE

A. Unusual Event

On-site aircraft crash outside the protected area fence and not impacting on plant structures. /

B. Alert

An aircraft crash within the protected area or onto any permanent plant structure. /

C. Site Emergency

Any aircraft crash, missle impact or explosion that causes severe damage to the:

a. Containment or
b. Auxiliary Building or
c. Intake Structure or
d. Condensate Storage Tank 12 or
e. Diesel Fuel Oil Tank 21 or
f. 13 KV Switchyard or
g. 500 KV Switchyard or
h. Refueling Water Tank(RWT) /

D. General Emergency

None

IX CONTROL ROOM EVACUATION

A. Unusual Event

None

B. Alert

Conditions in the control room that result in the implementation of EOP-8 Control Room Evacuation.

C. Site Emergency

1. Implementation of EOP-8 Control Room Evacuation but shutdown control not re-established in 15 minutes.

D. General Emergency

None

EXHIBIT 3.1-B
EMERGENCY ACTION LEVELS (EALS)

X. FIRE

A. Unusual Event

A confirmed fire in an area containing safety related equipment that is not extinguished within 10 minutes after fire fighting efforts commence.

B. Alert

A confirmed fire in an area containing safety related equipment that requires off-site fire fighting assistance to extinguish.

C. Site Emergency

Fire affecting safety related equipment that is not extinguished within 15 minutes after off-site fire fighting personnel commence fire fighting efforts.

D. General Emergency

None

XI NATURAL EVENT OR HAZARD

A. Unusual Event

None

B. Alert

Severe natural phenomena being experienced:

a. Earthquake greater than OBE (0.08g) levels, but less than SSE (0.15g) levels.

b. Flood or wave surge greater than approximately 40 ft. MSL but less than 45 Ft. MSL.

c. Any tornado striking facility.

d. Extreme winds near design basic level.

e. Wind speed greater than 90 mph but less than 150 mph.

EXHIBIT 3.1-B
EMERGENCY ACTION LEVELS (EALS)

C. Site Emergency

Severe natural phenomena being experienced or projected:

a. Earthquake greater than SSE levels.

b. Flood or wave surge exceeding 45 Ft. MSL.

c. Winds in excess of design levels. Greater than 150 mph on-site.

D. General Emergency

None

XII. SECURITY

A. Unusual Event

Requirements for declaring inplant "Security Emergency" met (as defined in Calvert Cliffs Security Contingency Plan).

B. Alert

On-going severe security threat involving physical attack on the protected area.

C. Site Emergency

On-going severe security threat involving physical attack on facility that results in damage to safety related equipment.

D. General Emergency

On-going severe security threat involving physical attack on facility that results in a physical loss of control of the facility.

EXHIBIT 3.1-B
EMERGENCY ACTION LEVELS (EALS)

XIII. OTHER HAZARDS

A. Unusual Event

1. Observation or notification of an unplanned release of toxic or flammable gas or liquid that may affect the safety of personnel or equipment in vital areas.

2. Observation or notification of an unplanned explosion that may affect vital areas.

B. Alert

1. A toxic or flammable gaseous or liquid release that is rendering safety-related equipment inoperable.

2. LNG ALERT PER ERPIP 3.2

C. Site Emergency

1. Entry of toxic or flammable gases above toxic or explosive levels into vital areas which involve a significant degradation of Plant safety.

2. Entry of toxic or flammable gases above toxic (_____TLVs) or explosive levels into:

   a. Control Room; or
   b. Cable Spreading Rooms; or
   c. Containment; or
   d. Switchgear Room; or
   e. Safe Shutdown Panels; or
   f. Emergency Diesel Generator Rooms; as detected by portable instrumentation, and which renders safety-related system inoperable.

3. Unplanned entry of gas into facility area requires evacuation of vital areas.

D. General Emergency

None

TITLE: **IMMEDIATE ACTION - FIRE EMERGENCY**

RESPONSIBLE INDIVIDUAL: SITE EMERGENCY COORDINATOR (SEC)

-NOTE-

The Emergency Fire Team Leader is responsible to control, contain and extinguish any fires that occur within the plant protected area. Individual members of the Emergency Fire Team are responsible to the team leader to ensure that all fires are controlled and extinguished.

1.0 Record the following information: Fire Type:_____

Size:_____Location:_____

Damage:_____Personnel Injuries:_____

_____/_____
Initials Time

- NOTE -

Complete the following steps if fire is within the Protected Area. Small fires easily extinguishable and not requiring the use of the Emergency Fire Team do not require the completion of this procedure.

2.0 Sound a 5 second burst of the emergency alarm.

Use the P.A. System to announce "THERE IS A FIRE" and give location.

Give specific protective actions and instructions to emergency personnel.

If a drill, state "THIS IS A DRILL".

Repeat this step again.

Emergency Alarm Sounded and Message Announced and repeated: _____/_____
Initials Time

3.0 Establish communications with the Emergency Fire Team.

Communications Established: _____/_____
Initials Time

4.0 Direct the Emergency Fire Team Leader to:

4.1 Proceed to the scene of the fire and direct the fire fighting efforts.

-NOTE-

Fire extinguishers and fire hoses are strategically located throughout the plant and should be used as appropriate to combat fires.

4.2 De-energize electrical equipment as appropiate before combating fire. Base the de-energizing on an evaluation of the components involved and the existing plant conditions.

-NOTE-

Refer to Calvert Cliffs "Fire Fighting Strategies" manual.

Electrical Equipment De-energized: _____ / _____
Initials Time

4.3 Evaluate need for outside fire fighting assistance (circle one):

Needed: _____ / _____
Initials Time

Not Needed:

-NOTE-

The primary concerns are extinguishing the fire and personnel safety. Although Rad-Con efforts will not hinder fire fighting, the minimum number of men needed should be used for the shortest length of time possible in potential radiation areas. If radioactive material is involved, attempt to fight the fire upwind and use available shielding.

4.4 Ensure all personnel and equipment are monitored for contamination when leaving a fire area within a controlled area.

_____ / _____
Initials Time

4.5 Have Fire Protection Inspector commence investigation as to cause of the fire. _____ / _____
Initials Time

4.6 Ensure all personnel contamination and radiation doses are properly reported to the RPD. _____ / _____
Initials Time

4.7 Ensure The Emergency Fire Team Members Use self-contained breathing apparatus as needed at the scene for protection from smoke inhalation. Report personnel injuries to the EFADTL immediately upon occurrence.

_____ / _____
Initials Time

TITLE: **IMMEDIATE ACTION - PERSONNEL INJURY**

RESPONSIBLE INDIVIDUAL: SITE EMERGENCY COORDINATOR/(SEC)
RADIATION PROTECTION DIRECTOR (RPD)
(For Alert, Site Emergency or General Emergency)

SEC

1.0 If the First Aid and Decontamination Team is needed to provide assistance.

Sound a 5 second burst of the emergency alarm.

Notify all personnel over P.A. System:

a. "A PERSONNEL INJURY EXISTS."

b. "EMERGENCY FIRST AID AND DECONTAMINATION TEAM REPORT TO (Location of Accident)."

If a drill, state "THIS IS A DRILL."

Repeat this step again.

Emergency Alarm Sounded and Message Announced and repeated: _____ / _____
Initials Time

2.0 Establish communications with the Emergency First Aid/Decontamination Team at the scene of the accident.

- NOTE -

In absence of the Emergency First Aid/Decontamination Team Leader (EFADTL), the SEC/RPD will assume the EFADTL immediate action responsibilities or assign the shift Rad-Chem Technician to this function.

SEC/RPD

3.0 Define the nature and extent of injuries, as follows:

Number of individuals _____

Whether or not radioactively contaminated(externally). _____

Extent of injuries, if known. _____

4.0 Medical Doctor's Assistance Required:

Yes ( ) No ( ) _____ / _____
Initials Time

Emergency Transportation to Hospital Required:

Yes ( ) No ( ) _____ / _____
Initials Time

5.0 Call for ambulance if needed (911)

_____ / _____
Initials Time

5.1 If the patient cannot be moved, contact the Calvert Cliffs Physician Assistant and local rescue service for onsite rescue assistance (Phone Nos. in Appendix A.4).

Physician Assistance Contacted:

_____ / _____
Initials Time

6.0 IF HOSPITAL ASSISTANCE IS NOT REQUIRED, SKIP SECTION 7.0

6.1 Make an ALERTING telephone call to Calvert Memorial Hospital and relay the information above (535-4000).

- NOTE -

Stress to Calvert Memorial Hospital whether THERE IS EXTERNAL RADIOACTIVE CONTAMINATION OR THERE IS NO EXTERNAL RADIOACTIVE CONTAMINATION involved. Calvert Memorial Hospital wil automatically activate their Radiation Emergency Area if they assume radioactive contamination is involved with injuries.

Alerting Call Made:

_____ / _____
Initials Time

7.0 Complete the actions under Step 7.1 if NO External Radioactive Contamination is present with injuries OR complete the actions under Step 7.2 if External Radioactive Contamination IS present with injuries.

7.1 Personnel Injury With No External Radioactive Contamination

7.1.1 Notify Security that rescue service personnel and vehicle will require immediate entry into Protected Area and should be directed to (location of injury).

Security Notified:

_____ / _____
Initials Time

7.1.2 Direct Security or ERT member to issue dosimeters (TLDs and SRDs) to ambulance driver and attendants if entry into Controlled Areas is required.

Security or ERT Directed: _____ / _____
Initials Time

7.1.3 Call BG&E Medical Department or Medical Director giving details and treatment given thus far (Phone Nos. in Appendix A.4).

BG&E Medical Department Called: _____ / _____
Initials Time

7.1.4 Make "NOTIFICATION" call to Calvert Memorial Hospital that injured personnel are being transported to Calvert Memorial Hospital (535-4000). Stress that NO contamination is involved.

Calvert Memorial Hospital Notified: _____ / _____
Initials Time

7.2 Personnel Injury With Radioactive Contamination

7.2.1 Unless there is a minor injury with easily removed contamination, notify BG&E Medical Department or Medical Director immediately (Phone Nos. in Appendix A.4).

BG&E Medical Department Notified: _____ / _____
Initials Time

7.2.2 If it will not compound injuries, direct the transfer of the patient to the Controlled Area Medical Treatment Room (or Farm Demo Building, if necessary), and decontaminate in accordance with ERPIP 4.5.5 (check as appropriate).

Patient Decontamination Ordered ( )
Patient Decontamination Deferred ( )

_____ / _____
Initials Time

7.2.3 Direct EFADTL to consult with contracted physician if injury is serious. (Phone nos. Appendix A.4).

Consultation With Physician Directed: _____ / _____
Initials Time

7.2.4 When decision is reached to transport patient(s), make "NOTIFICATION" call to Calvert Memorial Hospital. Stress that External Radioactive contamination IS involved (535-4000).

Calvert Memorial Hospital Notified: _____ /

7.2.5 Notify Security that rescue service personnel and vehicle will require immediate entry into protected area and should be directed to (location of injury).

Security Notified: _____ / _____
Initials Time

7.2.6 Direct Security or ERT member to issue dosimeters (TLDs & SRDs) to ambulance driver and attendants.

Security or ERT Directed: _____ / _____
Initials Time

7.2.7 Notify the contracted consulting physician-on-call (Phone Nos. in Appendix A.4) that patient is being sent to Calvert Memorial Hospital Radiation Emergency Area.

Physician Notified: _____ / _____
Initials Time

7.2.8 Direct the EFADTL to assist rescue squad personnel while onsite and to dispatch an EFADT member, equipped with an Ambulance Kit (see Appendix B.1) from the Controlled Area Medical Treatment Room, to accompany patient to hospital.

EFADTL Directed: _____ / _____
Initials Time

8.0 Secure from "PERSONNEL INJURY" condition.

Secured: _____ / _____
Initials Time

9.0 Direct EFADTL to restore emergency First Aid equipment to original emergency preparedness condition (equipment and supplies replenished and restored to proper location).

EFADTL Directed: _____ / _____
Initials Time

EXHIBIT 3.6-A

RADIOLOGICAL ASSESSMENT FORM

OFFSITE RELEASE AND DOSE CALCULATION

PART A (OPERATIONS)

INITIAL DATA

1.0 Event Start: Date_____ Time_____

2.0 Estimated Event Duration (Minutes)_____

3.0 Off Normal Radiation Indications (monitor or exposure rate measurement)
Initially take readings every 15 minutes to establish trends.

- NOTE -

If release conditions are stable - repeat measurements every hour for confirmation of release activity and projected dose.

If main vent radio-gas monitor increases by 25% or more - repeat measurements every half hour.

3.1 Main Vent Radiation Levels (cpm)

Unit 1	Unit 2	Time Read

3.2 Area Radiation Monitors (R/h)

Monitor No.	R/h @ time	R/h @ time	R/h @ time

4.0 Wind Direction :_____

Wind Speed :_____ mph x (.45) = _____ m/s.

ΔT (200') : ____ ° F.

EXHIBIT 3.6-A

RADIOLOGICAL ASSESSMENT FORM

OFFSITE RELEASE AND DOSE CALCULATION

PART B (RAD)

1.0 CALCULATING DOSE RATES

IF INDICATION IS (TO CALCULATE)	USE
U1 & U2 MAIN VENT MONITORS ONSCALE	
1. Estimated Dose Rate using average annual meteorology (Site Boundary or T.S. Limit)	1. EXHIBIT 3.6-C thru 3.6-F
2. Calculated Dose Rate (Site Boundary)	2. EXHIBIT 3.6-G&H
AREA RADIATION MONITOR ONSCALE & MAIN VENT MONITOR OFFSCALE	
1. Calculated Dose Rate (Site Boundary)	1. EXHIBIT 3.6-G & I
2. Measured Dose Rate (Inplant)	2. Monitor Reading
PORTABLE RADIATION MONITOR ONSCALE & MAIN VENT AND AREA MONITOR OFFSCALE	
1. Calculated Dose Rate (Site Boundary)	1. EXHIBIT 3.6-G & I
2. Measured Dose Rate (Inplant)	2. Monitor Reading
3. Measured Dose Rate (Site Boundary or Protected Area Fence)	3. ERPIP 4.3.1 & 4.3.2

2.0 INITIAL CLASSIFICATION

NOTE - For initial classification prior to augmentation (only), suggest Emergency Classification by Shift Supervisor if duration is estimated to last 1 hour and dose rates below are met or exceeded and conditions are met.

EMERGENCY CLASSIFICATION USING DOSE RATES (mrem/h)

DOSE RATE LOCATION MEASURED	UNUSUAL EVENT	ALERT	SITE EMERGENCY	GENERAL EMERGENCY
Inplant		100		
Protected Area Fence			500	1000*
Site Boundary		0.5	250	1000

3.0 Refer to Protective Action Guidelines, ERPIP Exhibit 4.5.6 D, F for recommendations to the state and counties.

*Combined with an actual or potential degradation of Two of the Three following fission product boundaries: (a) nuclear fuel, (b) reactor coolant system, or (c) Containment Building.

EXHIBIT 3.6-B

UNPLANNED RADIATION & RADIOLOGICAL EVENT CONDITIONS

RADIOLOGICAL EVENT CRITERIA

	GENERAL	SPECIFIC
	(Events to assess condition. If evaluation indicates, declare Radiological Event.)	
1.	Unplanned or uncontrolled Radiation Monitor Alarm	-Area radiation monitor alarm -Containment radiation monitor alarm -Ventilation monitor alarm -Any other RMS alarm
2.	Unplanned or uncontrolled Radiation field	General field of 100 mR/h unplanned in a local area General Field of 100 mR/h unplanned beyond the confines of a room or work area
3.	Unplanned or uncontrolled Airborne Radioactivity	10^{-9}uCi/cm^3 unevaluated within the confines of a room or work area 10^{-9}uCi/cm^3 unevaluated beyond the confines of a room or work area
4.	Loose Surface Contamination	10,000 dpm/100 cm^2 beta-gamma in an unposted area beyond the confines of the Controlled Area 1,000 dpm/100 cm^2 alpha in an unposted area beyond the confines of the Controlled Area
5.	Spill	Any large or uncontrolled spill of Reactor Coolant

-NOTE-

After initial alarm requiring declaration of a Radiological Event Condition, subsequent alarms occurring on the same monitor and recurring over a period of hours or days do not constitute a Radiological Event Condition when monitor indications observed are within 25% of the initial alarm indications.

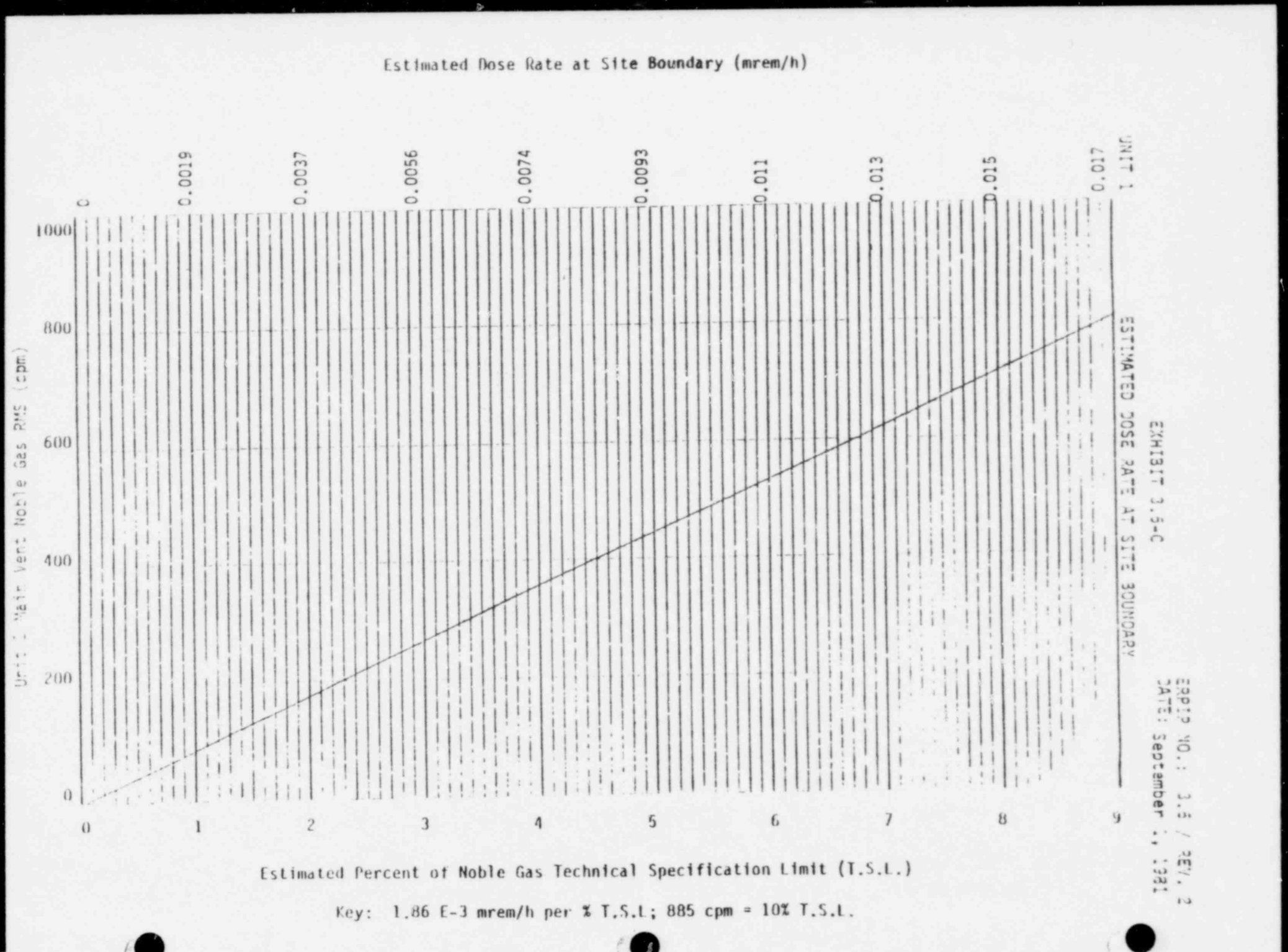

Estimated Dose Rate at Site Boundary (mrem/h)
0
0.0019
0.0037
0.0056
0.0074
0.0093
0.011
0.013
0.015
0.017
UNIT 1
ESTIMATED DOSE RATE AT SITE BOUNDARY
EXHIBIT 3.6-C
ERPIP NO.: 3.6 / REV. 2
DATE: September ., 1991
Unit 1 Main Vent Noble Gas RMS (cpm)
1000
800
600
400
200
0
0
1
2
3
4
5
6
7
8
9
Estimated Percent of Noble Gas Technical Specification Limit (T.S.L.)
Key: 1.86 E-3 mrem/h per % T.S.L; 885 cpm = 10% T.S.L.

EXHIBIT 3.6-F
UNIT-2 ESTIMATED DOSE RATE AT SITE BOUNDARY

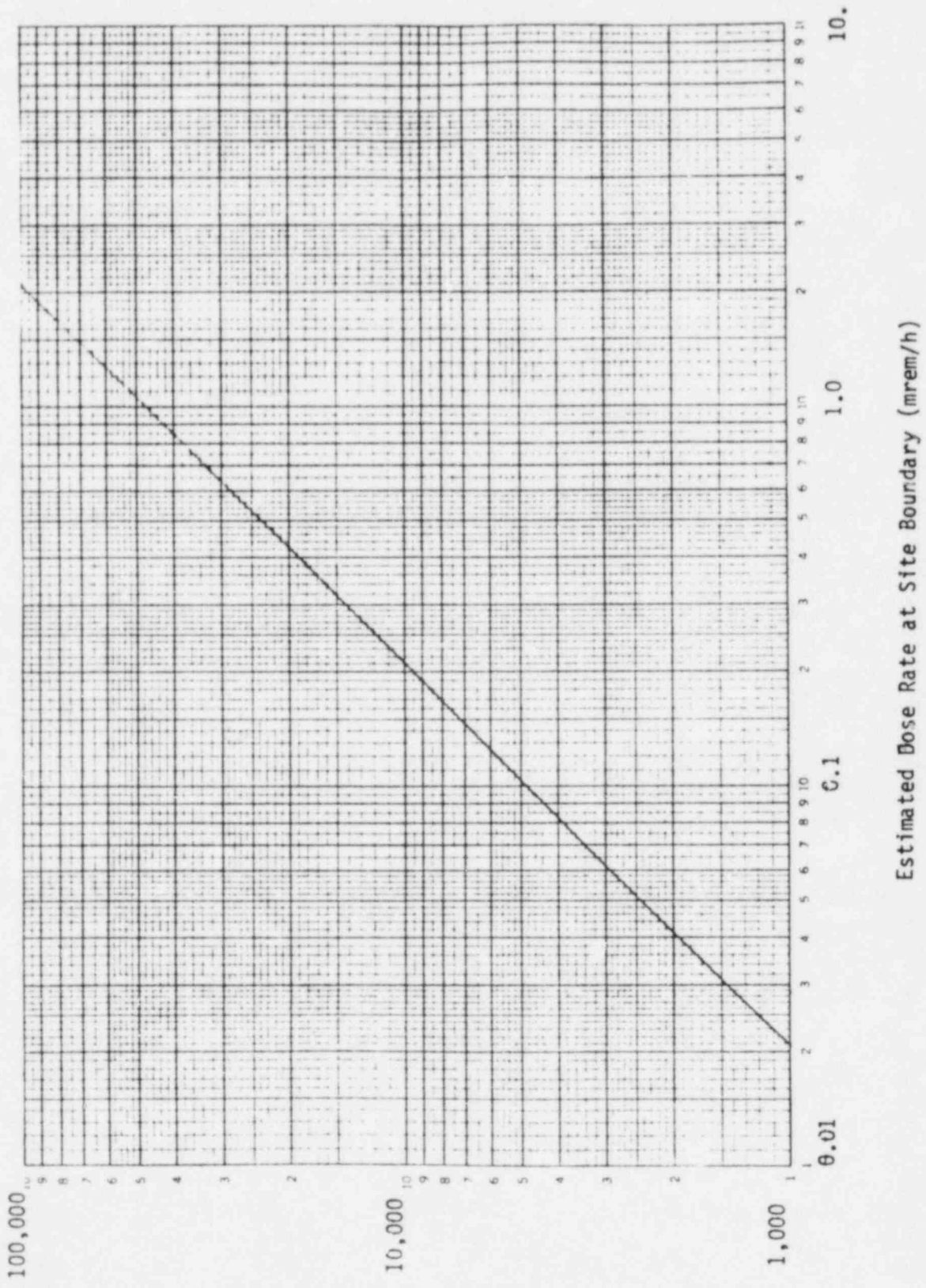


EXHIBIT 3.6-G

STABILITY CLASS, OVERLAY & CONVERSION FACTOR DETERMINATION

1.0 COMPLETE 1.1 (1st PRIORITY), OR 1.2 (2nd PRIORITY), OR 1.3 (3rd PRIORITY)

1.1 IF MET TOWER TEMPERATURES AT 30 FEET & 200 FEET ARE AVAILABLE

Step 1. Record the temperature reading from the meteorological tower temperature at 200 feet minus the temperatures at 30 feet.
ΔT=_____ ^{o}F @ _____ time

Step 2. Circle the conversion factor and stability class in 2.0 (below) that corresponds to the value obtained.

1.2 IF TEMPERATURES ARE NOT AVAILABLE BUT WIND DIRECTION FLUCTUATIONS ARE

Step 1. Estimate the average band width of wind direction fluctuations over the last 15 to 60 minutes, from the wind direction strip chart recorder.

_____ Band Divisions or _____ Degrees

Step 2. Circle the conversion factor and stability class in 2.0 (below) that corresponds to the value obtained.

1.3 IF NEITHER TEMPERATURE NOR WIND DIRECTION IS AVAILABLE

Step 1. Estimate atmospheric stability conditions based on conditions below.

	Sunny Day	Cloudy Day	Cloudy Night	Clear Night
Light wind or calm ($\leq$ 4m/s)=($<$ 9.8 mi/h)	B	C	E	F
Moderately strong wind ($\geq$ 4m/s)=($\geq$ 9.8 mi/h)	C	C	D	D

Step 2. Circle the conversion factor and stability class in 2.0 (below) that corresponds to the value obtained.

2.0 DETERMINE STABILITY CLASS, OVERLAY & CONVERSION FACTOR FROM 1.1, 1.2 OR 1.3.

1.1 Value Temp. Difference	1.2 Value Stripchart Band Width Division or Degrees		Overlay & Stability Class	Conversion Factors Main Vent Dose Rate	(RMS)
less than -1.73°F	2 1/2	75	A	1	2×10^{-5}
-1.73°F to -1.55°F	2	60	B	5	1×10^{-4}
-1.55°F to -1.35°F	1 1/2	45	C	10	2×10^{-4}
-1.35°F to -0.45°F	1	30	D	30	5×10^{-4}
-0.45°F to +1.35°F	1/2	15	E	90	2×10^{-3}
+1.35°F to +3.63°F	1/4	7 1/2	F	300	6×10^{-3}
more than +3.63°F	1/6	5	G	1000	3×10^{-2}

NOTE: CONVERSION FACTORS ARE BASED ON FULL VENT FLOW.

EXHIBIT 3.6-J

AREA AND PROCESS RADIATION MONITORS*

1.0 AREA RADIATION MONITORS

	Monitor Location	Monitor No.	Room No.
(1)	Unit #1 ECCS Pump Rooms	1-RE-5406	Rooms 118 & 119
(2)	Unit #2 ECCS Pump Rooms	2-RE-5406	Rooms 101 & 102
(3)	Decontamination Room	O-RE-5425	Room 210
(4)	Spent Fuel Pool Area	O-RE-5420	Room 530
(5)	Unit#1 Containment	1-RI-5316 A&B 1-RI-5317 A&B	69' Elevation Adjacent to Refueling Pool
(6)	Unit#2 Containment	1-RI-5316 C&D 1-RI-5317 C&D	69' Elevation Adjacent to Refueling Pool

Detector: (1) Type G.M., (2) 90 mg/cm^2 cathode wall, (3) Check source 1 uCi Sr-90, (4) Shielding - thin sheet of lead for energy response, (5) Range 10^{-4} to 10 R/h, except for 1-RI-5317,A,B,C,&D which has a range of 10^{0}-10^{8} R/h.

2.0 PROCESS RADIATION MONITORS

	MONITOR LOCATION	MONITOR NO.	ROOM NO.
(1)	Unit #1 Main Vent	1-RE-5415	Room 524
(2)	Unit #2 Main Vent	2-RE-5415	Room 526
(3)	Unit #1 Waste Processing	1-RE-5410	Room 524
(4)	Unit #2 Waste Processing	2-RE-5410	Room 526
(5)	Unit #1 Condenser Vacuum Pump Discharge	1-RE-1752	Room 524
(6)	Unit #2 Condenser Vacuum Pump Discharge	2-RE-1752	Room 526
(7)	Unit #1 Containment Purge Exhaust	1-RE-5281	Room 224
(8)	Unit #2 Containment Purge Exhaust	2-RE-5281	Room 203
(9)	Gaseous Waste Discharge	O-RE-2191	69' El. Aux. Bldg. by U2 Containment Personnel Access

Detector: (1) Type G.M, (2) 30 mg/cm^2 cathode wall, (3) Check source 100 uCi Cs-137, (4) Shielding - 6 inches of lead, (5) Range 10^{0} to 10^{6} cpm.

*Partial listing

TITLE: **RADIATION PROTECTION DIRECTOR CHECKLIST**

1.0 RESPONSIBLE INDIVIDUAL

The Radiation Protection Director (RPD) is responsible to the Plant Superintendent (PS) for:

1.1 Performance of radiation surveys inplant and onsite (ERPIP 4.3.2).

1.2 Obtaining appropriate liquid and gaseous samples for radioanalysis, including post-accident sampling of containment atmosphere and reactor coolant (ERPIP 4.3.3, 4.4.7.2, 4.4.7.3).

1.3 Establishing controlled access areas to contain or limit the spread of contamination (ERPIP 4.5.2).

1.4 Prescribing protective equipment and clothing to personnel (ERPIP 4.5.3, 4.5.4.1).

1.5 Establishing and posting radiation and contamination (controlled) area boundary requirements (ERPIP 4.3.2).

1.6 Personnel monitoring and exposure evaluation (ERPIP 4.3.4, 4.5.5).

1.7 Providing qualified personnel to be members of the Emergency Reentry Team (ERPIP 4.8).

1.8 Directing the activities of the Emergency Reentry Team during the initial emergency reentry (ERPIP 4.8, 4.8.1).

1.9 Directing the activities of Emergency First Aid and Decontamination Team during Alert, Site Emergency and General Emergency.

1.10 Assessing the need for and distribution of Radioactive Drugs (ERPIP 4.5.4)

2.0 CONDITIONS AND PREREQUISITES

2.1 Declaration of an Alert, Site Emergency or General Emergency

2.2 Detection of a Radiological Event (per ERPIP 3.6)

2.3 As directed by the Plant Superintendent

3.0 ACTIONS AND LIMITATIONS

(In Emergency Control Center, Technical Support Center, Radiation Safety Laboratory, as appropriate.)

-NOTE-

Review ERPIP 4.0 when assuming or relinquishing a Key Personnel position. Checklists are to be used as determined by the RPD. Spaces for initials and times are to be utilized for initial actions, as necessary, to clarify the status. Utilize EXHIBIT 5.2-A, Emergency Actions Form, to document all repetitive actions taken.

3.1 Announce to the other emergency workers your name and that you are the RPD.

3.2 Receive briefing from PS on existing plant or site conditions and record the Emergency Action Level (EAL) classification below (write "none" if no EAL has been met):

EAL Classification:

Received Briefing: _____ / _____
Initials Time

3.3 Use EXHIBIT 4.1.5-A, ERT ACTIVATION PRIORITY & ASSEMBLY FORM to determine which Emergency Radiation Teams must be activated (in the order listed on the form) and to record the data.

Emergency Radiation Teams Recorded on EXHIBIT 4.1.5-A:

_____ / _____
Initials Time

-NOTE-

All Emergency Radiation Teams must be activated for Alerts, Site Emergencies and General Emergencies. For a Radiological Event (ERPIP 3.6), the Offsite Monitoring Teams (activated by the Radiological Assessment Director) and Onsite Monitoring Teams must be activated, and others as necessary.

3.4 Ensure that the required Emergency Radiation Team members are notified as identified in Appendix A.1, Emergency Organization Members and Telephone Numbers, and enter data on EXHIBIT 4.1.5-A.

Teams Members Notified and Data Recorded on EXHIBIT 4.1.5-A:

_____ / _____
Initials Time

-NOTE-

The Emergency Radiation Team Leaders may be delegated the responsibility to notify their respective team members.

3.5 Require the Emergency Radiation Team members to assemble at a designated assembly area.

3.5.1 Report the availability of the teams to the PS. Emergency Radiation Teams Availability Reported to PS: _____ / _____
Initials Time

_____3M Soft Cap

_____Other _____

3.9.3 Personnel Monitoring and Survey Instrumentation

_____TLD and SRD

_____High Range SRD (0-5R, 0-10R, 0-100R, 0-200R)

_____Special (RCP 3-303-4.5)

_____Gamma Exposure Rate Meter (0.1 R/h to 20 KR/h)

_____Neutron REM-Ball

_____Neutron Dosimeter

_____Alarming Dosimeter (0-200R)

_____Portable Air Samplers (4 h power supply - minimum)

Team Members Equipped: _____ / _____
Initials Time

-NOTE-

Assign tasks to the Emergency Radiation Teams in accordance with the priority list EXHIBIT 4.1.5-A. Record all assigned tasks on EXHIBIT 5.2-A, EMERGENCY ACTIONS FORM.

3.10 If the nature of gaseous release indicates the potential for significant levels of iodine (greater than 40 MPC-h of exposure is possible), consider immediate administration of radioprotective drugs to all affected onsite emergency personnel in accordance with ERPIP 4.5.4.1 if adequate respiratory protection devices are not available.

3.11 If a release of airborne radioactivity is detected, immediately dispatch at least one Onsite Monitoring Team in accordance with ERPIP 4.3.2.

ERPIP 4.3.2 Initiated: _____ / _____
Initials Time

-NOTE-

If a release of radioactivity is detected, the only delay allowed for the Onsite Monitoring Teams is an operational check of exposure rate meters which should take 2 minutes at most.

3.12 Have radiation surveys performed in Assembly Areas and around the Protected Area Fence.

3.12.1 Record results on EXHIBIT 5.2-A, EMERGENCY ACTIONS FORM.

3.12.2 Notify PS of the results.

Surveys Performed and Results Reported to PS: _____ / _____ Initials Time

3.13 Establish control points as necessary in accordance with ERPIP 4.5, Protective Actions.

3.13.1 Record access control point locations on EXHIBIT 5.2-A.

3.13.2 Report results to the PS.

Access Control Points Established and PS Notified: _____ / _____ Initials Time

3.14 Have gaseous and air particulate samples analyzed per ERPIP 4.3.2.

3.14.1 Record results on EXHIBIT 5.2-A.

3.14.2 Notify PS of the results.

Samples Analyzed & Results Reported to PS: _____ / _____ Initials Time

3.15 Notify RAD of air sampling results obtained inplant and onsite.

_____ / _____ Initials Time

3.16 Restrict access into Auxiliary Building or other potential high Radiation Areas by unauthorized or unprepared individuals to hazardous radiation environment.

3.16.1 Establish positive access control by instituting the use of Emergency Work Permits (ERPIP 4.8.1) for all Controlled Area entries during the occurrence, emergency and recovery phases of the accident.

Positive Access Control Established _____ / _____ Initials Time

3.17 When notified by one of the following: (check one)

( ) Control Room

( ) TSC

( ) RAD

( ) R 202 Alarm (on 1C07 or 2C07 board)

Have the LRMT and REMT members prepare to perform Post-Accident Reactor Coolant Sampling per ERPIP 4.4.7.3.

3.17.1 Commence monitoring per ERPIP 4.4.7.3 requirements.

- CAUTION -

Review App. B.2, pages B.2-7 through B.2-11, "POST Accident Radiation Doses (Aux. Bldg.)," Area Monitor (R/h) Alarms and other available information to determine accessible and appropriate routes to ingress/egress R/C Sampling Room.

3.17.2 Report analysis results to PS, RAD & TSC immediately. (Initial mR/h at 1 ft. from RCS sample to be reported immediately after obtained).

Reported Results to ( ) PS
( ) SEC
( ) RAD
( ) TSC

_____ / _____
Initials Time

3.18 Consult with the RAD and the PS and implement the following as necessary:

3.18.1 Have liquid effluent samples collected, analyzed per ERPIP 4.3.3.

Results Recorded on EXHIBIT 5.2-A and Reported to SEC:

_____ / _____
Initials Time

-NOTE-

If the discharge concentration of Gross Beta and/or Tritium is greater than the intake concentration by a factor 10, the RPD, as directed by the SEC shall:

1. Warn persons away from the Circulating Water discharge.

   Persons Warned: _____ / _____
   Initials Time

2. Notify the Maryland Department of Health and Mental Hygiene.

   Maryland Department of Health & Mental Hygiene Notified:

   _____ / _____
   Initials Time

3. As necessary, contact the Maryland Marine Police (see Appendix

A.4) and request assistance in evacuation of portions of Chesapeake Bay.

Marine Police Contacted: _____ / _____
Initials Time

4. Notify the Director - Environmental Studies & Monitoring at BG&E to commence an intensive monitoring program.

BG&E Chief Env. Engr. Notified: _____ / _____
Initials Time

5. Institute measures to determine the source of contamination and mitigate releases.

Measures to Determine Sources & Mitigate Releases Implemented:

_____ / _____
Initials Time

6. Monitor releases and review EALs in EXHIBIT 3.1-B to determine need for Emergency classification.

If EALs have been met or are being approached, confer with the PS to determine appropriate actions.

3.18.2 Have Containment Atmosphere sampled per ERPIP 4.4.7.2.
Results Recorded on EXHIBIT 5.2-A and Reported to PS:

_____ / _____
Initials Time

3.18.3 Have RCS Samples taken per ERPIP 4.4.7.3.
Results Recorded on EXHIBIT 5.2-A and Reported to PS and RAD:

_____ / _____
Initials Time

-NOTE-

Repeat RCS Sampling on a routine basis (every hour) as necessary, to determine activity levels and trends.

3.19 Determine the inplant and onsite projected exposure durations by obtaining expected time for continuous release from Control Room and notify the PS and RAD.

PS and RAD Notified of Projected Exposure Duration and results Recorded on EXHIBIT 5.2-A: _____ / _____
Initials Time

3.20 Direct the repetition of radiological surveys and RCS, Circ Water, and Containment Samples as necessary to determine release projected dose trends at the Protected Area Fence, Site Boundary or into Bay.

-NOTE-

It is important to obtain confirmation data and to determine trends. Record all results, both positive and negative, on EXHIBIT 5.2-A as determined, and report them to the PS as described above.

Projected Dose Trends Determined and Results Reported to PS and RAD: _____ / _____
Initials Time

EXHIBIT 4.1.5-A
ERT ACTIVATION PRIORITY & ASSEMBLY FORM

Priority	ERT	Notified (if Yes)	Assembly Point	Accountability of Teams and Members
1.	Offsite Monitoring Team*, # (2 individuals/team)			
2.	Onsite Monitoring Team # (2 individuals/team-add to when manpower becomes available)			
3.	Assembly Area Monitoring Team			
4.	Gate and Access Monitoring Team			
5.	ECC Monitoring Team (May initially be combined with Assembly Area Monitoring Team)			
6.	Liquid Release Monitoring Team			
7.	Emergency F/A and Decontamination Team			
8.	Emergency Reentry Monitoring Team			
9.	Dosimetry Team			

*Activated by the Radiological Assessment Director (ERPIP 4.1.15)

Mandatory activation for Unusual Event or higher emergency classes if radiological event occurred (ERPIP 3.6). Negative findings are important to identify.

-CAUTION-

INDIVIDUALS SHALL NOT BE ASSIGNED TO PERFORM TASKS OF A TEAM UNLESS ALL ASSEMBLED TEAMS HIGHER ON THE LIST ARE MANNED BY ASSIGNED TEAM MEMBERS (NOT INTERIM MEMBERS). UPON FULL AUGMENTATION, ALL EMERGENCY TEAMS MUST BE ACTIVATED AND PREPARED TO PERFORM THEIR ASSIGNED RESPONSIBILITIES.

TITLE: **DOSIMETRY TEAM LEADER CHECKLIST**

1.0 RESPONSIBLE INDIVIDUAL

Under emergency conditions the Dosimetry Team Leader (DTL) is responsible to assure that existing procedures, RCP 3-300 through 3-310, are appropriately implemented. Complete exposure records of persons within the protected area shall be kept by the Dosimetry Team Leader in accordance with 10CFR20.

2.0 CONDITIONS AND PREREQUISITES

2.1 As directed by the RPD.

2.2 On occurrence of a Radiological Event.

3.0 ACTIONS AND LIMITATIONS

(In the Rad Chem area or ECC)

3.1 During an Alert, Site Emergency or General Emergency have DT members report to the Operational Support Center (or as designated by the DTL) and implement ERPIP 4.8.1.

-NOTE-

Checklists are to be used as determined by the DTL. Spaces for initials and times are to be utilized, as necessary, to clarify the status.

3.2 Periodically establish communication with the ECC, TSC, Control Room and ERT Leaders or Members to assure all personnel involved in emergency actions are equipped with necessary SRDs and TLD badges in areas of high radiation and are monitored at appropriate intervals.

ECC, TSC, CONTROL ROOM AND ERT LEADERS CONTACTED: _____ / _____
Initials Time

3.3 Ensure an ample supply of the following equipment is operable and readily available when requested for emergency use:

3.3.1 Mid-range self-reading dosimeters (0-5R)

3.3.2 TLDs

EQUIPMENT AVAILABLE: _____ / _____
Initials Time

3.4 Record and maintain the emergency Dosimetry Issue Logs, EXHIBITs 4.1.14-A. Consider assigning Dosimetry Team members to plant (Traffic Control) Access Control Points for Dosimetry issue, recovery and documentation operations.

3.5 Accumulated doses of persons within the radiologically controlled areas are to be recorded as per RCP 3-300 series.

ALL DOSES RECORDED: _____ / _____
Initials Time

TITLE: **RADIOLOGICAL ASSESSMENT DIRECTOR CHECKLIST**

1.0 RESPONSIBLE INDIVIDUAL

The Radiological Assessment Director (RAD) is responsible to the Site Emergency Coordinator (SEC) for:

1.1 Assessing, mapping and coordinating the calculations of all radiological data to accurately depict offsite radiation dose projections.

1.2 Monitoring the Plume and Ingestion Exposure Pathways to determine the appropriate protective actions to be implemented for the protection of the Population-at-Risk.

1.3 Determining appropriate downwind locations for exposure rate and air sample surveys of the projected plume.

1.4 Dispatching the Offsite Monitoring Teams to selected downwind locations.

1.5 Assuring air sampling survey effectiveness.

1.6 Reassigning the Offsite Monitoring Teams, as necessary.

1.7 Coordinating Environmental Monitoring efforts with Emergency Services Coordinator (ESC).

1.8 Assessing the need for and the Distribution of Radioactive Drugs (ERPIP 4.5.4)

2.0 CONDITIONS AND PREREQUISITES

2.1 Declaration of an Alert, Site Emergency or a General Emergency.

2.2 Suspicion or recognition of an uncontrolled release of radioactive material (A Radiological Event, ERPIP 3.6).

2.3 As directed by the SEC.

3.0 ACTIONS AND LIMITATIONS

-NOTE-

Checklists are to be used as determined by the RAD. Spaces for initials and times are to be utilized for initial actions as necessary to help clarify the status. Appropriate repetitive actions and information is to be recorded on EXHIBIT 5.2-A, EMERGENCY ACTIONS FORM.

3.1 Announce to the other emergency workers your name and that you are the RAD.

Announced: _____ / _____

Initials Time

3.2 Receive briefing from SEC on existing plant or site conditions, record the Emergency Action Level classification below (if classified).

Briefing Received: _____ / _____
EAL Classification: _____ Initials Time

3.3 Implement appropriate sections of ERPIP 3.6, Radiological Event, and/or ERPIP 4.4, Assessment Actions, as necessary.

ERPIP 3.6 or ERPIP 4.4 Initiated: _____ / _____
(circle one) Initials Time

3.4 Obtain wind direction data from the Control Room strip chart and estimate wind direction and average band width as recorded over the last 15 to 60 minutes.

Average Band Width (in degrees): _____
Wind Direction From: _____
Wind Data Recorded: _____ / _____
Initials Time

3.5 Obtain from RPD the following plant or onsite dose rate and air sampling survey results to estimate radioiodine released from plant for offsite dose projections.

Location Area	Time of Sample (h)	Dose Rate (R/h)	Charcoal Air Sample (uCi/cm^3)	Ag Zeolite Air Sample (uCi/cm^3)	Particulate Air Sample (uCi/cm^3)

TITLE: NOTIFICATIONS AND COMMUNICATIONS

1.0 EMERGENCY ALARMS AND P.A. SYSTEM ANNOUNCEMENTS

Sounding of the emergency alarm coupled with notification of an emergency using the P.A. System is the responsibility of the Shift Supervisor although this function may be delegated. The emergency alarm shall be sounded continuously for approximately 5 seconds. Emergency notifications over the P.A. System shall consist of message segments similar to the following messages:

"A (AN) (type of emergency or condition) EXISTS"

"(Specific information of any casualties)"

"(Specific protective actions)" (See ERPIP 4.5.1)

"(Specific instructions to required emergency response personnel)"

If a drill, state "THIS IS A DRILL"

The alarm and message is to be repeated one time.

Examples of these emergency notifications are included in "Immediate Action" procedures.

2.0 ON SITE NOTIFICATIONS OF PLANT STAFF AND OPERATIONS PERSONNEL

The notification of plant staff and operations personnel during emergency conditions is made by the Interim Emergency Communicator as directed by the SEC. The persons to be called are listed in Appendix A.1. Messages to be relayed are dependent on the specifics of the emergency.

3.0 INITIAL NOTIFICATIONS OF EOCs AND OFFSITE AGENCIES

- CAUTION -

1. THE DECISION TO MAKE INITIAL NOTIFICATION OF EOCs AND OFFSITE AGENCIES MUST BE MADE BY THE SITE EMERGENCY COORDINATOR; IT CANNOT BE DELEGATED.

2. INITIAL NOTIFICATION MUST BE MADE TO THE APPROPRIATE STATE AND LOCAL AGENCIES WITHIN 15 MINUTES OF THE DECLARATION OF AN UNUSUAL EVENT, ALERT, SITE EMERGENCY, OR GENERAL EMERGENCY. NOTIFICATION OF NRC MUST BE MADE IMMEDIATELY THEREAFTER USING THE EMERGENCY NOTIFICATION SYSTEM (REF. 10CFR 50.72 AND APPENDIX E, SECTION D) AS THE PRIMARY MEANS(ERPIP 5.1, SECTION 3.8.1). IF INOPERATIVE, USE HEALTH PHYSICS NETWORK (ERPIP 5.1 SECTION 3.8.2), COMMERICAL PHONE (APPENDIX A.5) OR ANY OTHER METHOD TO MAKE NOTIFICATION.

Actions required for Initial Notification include:

3.1 Using information initially reported and data obtained in initial assessment of the reported conditions, complete EXHIBIT 3.1-A, INITIAL NOTIFICATION CHECKLIST.

3.2 Refer to Appendix A.3 and A.5, as necessary to determine the telephone numbers of the EOCs and agencies to be contacted.

3.3 Contact the EOCs and agencies in the order listed on the INITIAL NOTIFICATION CHECKLIST, EXHIBIT 3.1-A, circle each acronym as called, communicate the information, and document the call on EXHIBIT 4.2-C, EMERGENCY COMMUNICATION FORM.

4.0 COMMUNICATIONS

4.1 Communication Equipment Priorities

Communications shall be made using the following communications devices in the listed priority sequence:

1. Telephone, thru the Baltimore exchange dialing 8-dial tone-9-dial tone-1 then the appropriate number.
2. Telephone, thru the Annapolis Exchange dialing 7-dial tone-1 then the appropriate number.
3. Telephone, thru the Local Exchange dialing 9-dial tone-1 then the appropriate number.
4. Telephone, thru the Company trunk line and operator, dialing 8-dial tone-0- then the appropriate number.
5. Radiotelephone using Call Sign and frequency MHZ (Prince Frederick) or backup call number and frequency MHZ (Load Dispatcher) per ERPIP 5.1.

EXHIBIT 4.2-A

FOLLOW-UP COMMUNICATIONS CHECKLIST

Use for Follow-Up Communication with County Emergency Operation Centers (EOCs), MD-EOC, DRC, NRC and others, as needed, if information is known and appropriate. Notify offsite agencies of items 1 through 19 sequentially and document communications on Exhibit 4.2-C, EMERGENCY COMMUNICATION FORM. If plume is headed easterly notify Dorchester County after Calvert County.

Call to:	Date	Time	Call Received By	Phone Number
CC EOC	_____	_____	_____	_____
ST. M EOC	_____	_____	_____	_____
DOR EOC	_____	_____	_____	_____
MD EOC	_____	_____	_____	_____
DRC	_____	_____	_____	_____

(Contact of DRC is only possible during normal working hours until the Accident Assessment Control Center is activated.)

NRC	_____	_____	_____	_____
SECURITY CON.	_____	_____	_____	_____
OTHERS	_____	_____	_____	_____
(specify)	_____	_____	_____	_____
	_____	_____	_____	_____

. . . . . .

1. Name of Caller: _____

Caller ( ) Calvert Cliffs EOC Hot Line

Caller Phone No.:

CCNPP Hotline ( ) ( ) Radiotelephone MHz (call sign( )

_____ ( ) ( )

( ) Other (specify) _____

2. Location of incident: Calvert Cliffs Nuclear Power Plant

3. Class of Emergency (check one): ( ) Unusual Event ( ) Alert ( ) Site Emergency ( ) General Emergency

4 Date/Time Declared: _____ / _____

5. Nature of Incident (EAL,etc.): _____

_____

_____

_____

EXHIBIT 4.2-A (Continued)

_____

_____

*6. Reactor Status (check one): ( ) Has Not Tripped ( ) Has Tripped

- NOTE -

Asterisks designate those items that do not need to be transmitted to the counties unless requested.

*7. Emergency Safeguards System actuated: _____
(e.g., SIAS, CIS, etc.)

*8. Reactor Emergency Response Actions underway: _____

_____

_____

_____

*9. Plant Status (check one): At Power( ) Hot Standby( ) Hot Shutdown( )
Cooling Down( ) Cold Shutdown( )

*10. Off-Site Power (check one): Is Available( ) Is Not Available( )

*11. Status of Emergency Power Diesel Generators:

Diesel-Generator	Operable	Non-Operable
#11	( )	( )
#12	( )	( )
#21	( )	( )

12. Personnel Status (Injuries/Contamination):

Name	Status	Extent/Levels of Exposure or Contamination

13. Radioactivity (check one): ( ) Has Not Been Released ( ) Is Being Released
( ) Has Been Released ( ) In the Plant ( ) From the Plant

*Data Required by DRC for Release Calculations

Type of actual or potential release:

*A. Airborne: Noble Gases, Composite (Xe, Kr) _____ Ci/s
Iodines (I-131 equivalent) _____ Ci/s
Particulates _____ Ci/s
Others _____ Ci/s
_____ Ci/s

_____ Ci/s

_____ _____ Ci/s

		Date	Time
1)	Time of Reactor Shutdown:	_____ /	_____
2)	Time released to containment building:	_____ /	_____
3)	Time released from Plant:	_____ /	_____

4) Wind Speed: _____ mi/h; _____ m/s

5) Wind direction (from): _____ °, (to): _____ °

6) Plume centerline X/Q at _____ miles. _____ s/m^3

7) Estimated duration of release: _____ h.

8) Atmospheric Stability Class: A B C D E F G (circle one)

9) Form of precipitation (if any): _____; Location: _____

Impact Times:

Sector	Zone	Impact Times Date/Time (h)
_____	_____	_____
_____	_____	_____
_____	_____	_____

B. Surface Spill: V= _____ gal.

A= _____ uCi/cm^3

Spill (circle one): Inplant Outside plant

Release Rate: _____ Ci/s

Date/Time (h) occurred: _____ / _____

C. Waterborne: _____ gal.; _____ uCi/cm^3

Date/Time (h) occurred: _____ / _____

14. Measured or (projected) Exposure Rates and Integrated Dose: (circle one)

Location	Sector/Zone	Exposure Rate (R/h)	Dose (rem) W.B.	Thyroid Adult	Thyroid Child	Date/Time (h)
Site Boundary						
2 miles						
5 miles						
10 miles						

15. Estimated Surface Contamination:

Sector/Zone	General Area dpm/100 cm^2	Hot Spots dpm/100 cm^2	Date/Time (h)

16. Offsite Emergency Response Actions Underway:

_____

_____

_____

17. Recommended Protective Actions:

Sector	Zone	Action	Date/Time (h)

18. On-Site Assistance: Required Not Required Request Standby

Personnel: _____

Supplies: _____

Equipment: _____

19. Prognosis of Incident Worsening Terminating

Based on Plant Information (circle one): Improving No Change

_____ / _____

Communicator Signature Time

LOG NO:_____

EXHIBIT 4.2-B

EMERGENCY MESSAGE FORM

DATE: ___/___/___

TIME: _____

TYPE OF RECEPTION: ( ) RADIO
(check one) ( ) DEDICATED PHONE
( ) _____

FROM: ( ) SEC
( ) RAD
( ) TSC
( ) RPD
( ) CR
( ) PS
( ) _____

TO: ( ) SEC
( ) RAD
( ) TSC
( ) RPD
( ) CR
( ) PS
( ) _____

(Distribute copies of this form to Personnel checked. Maintain white copy for file.)

MESSAGE: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Communicator Signature

EXHIBIT 4.2-C

EMERGENCY COMMUNICATION FORM

Date of Initial Communications: _____

LOG NO.	Time of Call	FROM	TO	REMARKS

-NOTE-

Complete this form when time permits using communication information logged on Exhibit 3.1-A, 4.2-A, and 4.2-B.

EXHIBIT 4.3.1.1-A
MONITORING TEAM ACTION FORM

Action Taken/Date	Time / Name	Findings

EXHIBIT 4.3.1.1-B

GROUND DEPOSITION SURVEY FORM

E-520
SERIAL NUMBER _____

Survey Location	Time/Date of Survey	GROSS Beta-Gamma (mR/h) (OPEN WINDOW)	- BACKGROUND GAMMA (mR/h) (CLOSED WINDOW)	= NET BETA (mR/h)	RAD NOTIFIED TIME / NAME

MS-2/SPA-3
SERIAL NUMBER _____

Survey Location	Time/Date of Survey	GROSS Gamma (cpm)	- BACKGROUND GAMMA (cpm)	= NET GAMMA (cpm)	RAD NOTIFIED TIME / NAME

GROSS	- BKGRND	= NET (cpm)	

GROSS	- BKGRND	= NET (cpm)	

GROSS	- BKGRND	= NET (cpm)	

EXHIBIT 4.3.1-D

EXPOSURE RATE FORM

TEAM DESIGNATION: _____ DATE: _____
INSTRUMENT S/N _____

MONITORING LOCATION DESIGNATION	TIME/DATE OF SURVEY	MEASURED EXPOSURE RATE (mR/h) SHIELD CLOSED	RAD NOTIFIED NAME/TIME

EXHIBIT 4.3.1-E
MONITORING TEAM SURVEY FORM
(AIRBORNE ACTIVITY)

MONITORING TEAM # ________

MS-2 SERIAL # ______ INSTRUMENT EFFICIENCY 0.______

MONITOR-ING LOCATION	TIME/DATE OF SURVEY	(GROSS CTs)-(BKGRND CTS.) / (CT. TIME) (Vol.)(Inst. Eff)(2.22 E6)	AIRBORNE ACTIVITY	RAD NOTIFIED TIME/NAME
		( ) cts. - ( ) cts. / (min) (E cc) (0.) (2.22 E6)	E- uCi/cc	
		( ) cts. - ( ) cts. / (min) (E cc) (0.) (2.22 E6)	E- uCi/cc	
		( ) cts. - ( ) cts. / (min) (E cc) (0.) (2.22 E6)	E- uCi/cc	
		( ) cts. - ( ) cts. / (min) (E cc) (0.) (2.22 E6)	E- uCi/cc	
		( ) cts. - ( ) cts. / (min) (E cc) (0.) (2.22 E6)	E- uCi/cc	
		( ) cts. - ( ) cts. / (min) (E cc) (0.) (2.22 E6)	E- uCi/cc	
		( ) cts. - ( ) cts. / (min) (E cc) (0.) (2.22 E6)	E- uCi/cc	
		( ) cts. - ( ) cts. / (min) (E cc) (0.) (2.22 E6)	E- uCi/cc	
		( ) cts. - ( ) cts. / (min) (E cc) (0.) (2.22 E6)	E- uCi/cc	

Contents of Procedure 4.4.1

TITLE: **INITIAL CLASSIFICATION OF EMERGENCY CONDITION BASED ON DOSE CALCULATION**

TITLE: **INITIAL CLASSIFICATION OF EMERGENCY CONDITION BASED ON DOSE CALCULATION**

1.0 RESPONSIBLE INDIVIDUAL

The RAD is responsible to the SEC to provide a basis for determining, based on projected doses, whether conditions exist which may correspond to an Unusual Event, Alert, Site Emergency or General Emergency.

2.0 CONDITIONS AND PREREQUISITES

2.1 As directed by the RAD per ERPIP 4.1.15.

2.2 Recognition of an uncontrolled release of radioactive material.

3.0 ACTIONS AND LIMITATIONS

-NOTE-

This procedure utilizes only information readily available in the Control Room. The actions listed below are in their order of preference. That is Method 3.1 is recommended over Method 3.2, 3.3 and 3.4. Method 3.2, 3.3 and 3.4 are included for situations where some instrumentation is not operable.

All procedures can be performed by staff not otherwise trained in radiological assessments. This procedure also may be used as a quick check to verify dose estimates based on overlays, detailed hand calculations or computer programs, but it is not intended to replace them.

Dose projections must be made every 15 minutes while the emergency condition exists.

Method 3.1 STATION VENT MONITOR ON-SCALE, METEOROLOGICAL TOWER TEMPERATURES AT 30 FEET AND 200 FEET ON SCALE.

INFORMATION NEEDED: Combined counts per minute (CPM) from Station Vent Monitor (Add U-1 and U-2 readings).

Temperature difference (Δ T in degrees F) between 200 foot and 30 foot levels on meteorological tower.

3.1.1 Follow the steps on EXHIBIT 4.4.1-A.

3.1.2 Compare the results to the values in Steps 3.5 through 3.8.

3.1.3 Repeat procedure 3.1 if applicable every 15 minutes while the emergency condition exists.

Method 3.2 STATION VENT MONITOR ON-SCALE, ONE OR MORE METEOROLOGICAL TOWER TEMPERATURE READINGS INOPERABLE, WIND DIRECTION RANGE RECORDING OPERABLE.

INFORMATION NEEDED: Combined counts per minute (CPM) from Station Vent Monitor (Add U-1 and U-2 readings).
Wind direction reading fluctuations at 200 foot level on meteorological tower.

3.2.1 Follow the steps on EXHIBIT 4.4.1-B.

3.2.2 Compare the results to the values in Steps 3.5 through 3.8.

3.2.3 Repeat procedure 3.2 if applicable every 15 minutes while the emergency condition exists.

Method 3.3 STATION VENT MONITOR ON-SCALE, METEOROLOGICAL TOWER DATA UNAVAILABLE.

INFORMATION NEEDED: Combined counts per minute (CPM) from Station Vent Monitor (Add U-1 and U-2 readings).

3.3.1 Follow the steps on EXHIBIT 4.4.1-C.

3.3.2 Compare the results to the values in Steps 3.5 through 3.8.

3.3.3 Repeat procedure 3.3 if applicable every 15 minutes while the emergency conditions exists.

Method 3.4 STATION VENT MONITOR INOPERABLE/OFF-SCALE, BUT RELEASE DIRECTED THROUGH STATION VENT.

INFORMATION NEEDED: R/h measured at about 30 feet from the main exhaust duct or vent.

3.4.1 Follow the steps on EXHIBIT 4.4.1-D.

3.4.2 Compare the results to the values in steps 3.5 through 3.8.

3.4.3 Repeat procedure 3.4 if applicable every 15 minutes while the emergency conditions exists.

Emergency Classification 3.5 If the estimate of the whole body dose at the site boundary is less than 0.5 mrem/h the conditions corresponding to an Alert, Site Emergency or General

Emergency have not been met. However, the results may be useful information in notifications to responsible public officials.

3.6 If the estimate of the whole body dose at the site boundary is greater than 0.5 mrem/h but less than 5 mrem/h, conditions corresponding to an Unusual Event may exist. More detailed evaluations of the accident source term and potential consequences may be appropriate.

3.7 If the estimate of the whole body dose at the site boundary is greater than 5 mrem/h but less than 250 mrem/h, conditions corresponding to an Alert may exist. More detailed evaluations of the accident source term and potential consequences may be appropriate.

3.8 If the estimate of the whole body dose at the site boundary is greater than 250 mrem/h but less than 1000 mrem/h, conditions corresponding to a Site Emergency may exist.

3.9 If the estimate of the whole body dose at the site boundary is greater than 1000 mrem/h, conditions corresponding to a General Emergency may exist.

-NOTE-

This procedure assumes that noble gases are the principal constituents of the accidental release (a reasonable assumption for virtually every accident condition, including the first phases of core melt accidents). Subsequent, more detailed calculations can be used to determine the quantities and projected consequences of iodines or other radioactive material released.

EXHIBIT 4.4.1-8, continued

Part B

QUICK DOSE ESTIMATE BASED ON STATION VENT MONITOR AND METEOROLOGICAL TOWER DIRECTION READINGS

Step 3. Circle the conversion factor below that corresponds to the band width.

Band Width Divisions	or	Band Width Degrees	Stability Class	Conversion Factor
2-1/2		75	A	2×10^{-5}
2		60	B	1×10^{-4}
1-1/2		45	C	2×10^{-4}
1		30	D	5×10^{-4}
1/2		15	E	2×10^{-3}
1/4		7-1/2	F	6×10^{-3}
1/6		5	G	3×10^{-2}

Step 4. Multiply the sum of the vent monitor reading in Step 1 by the circled conversion factor in Step 3. This value represents the projected whole body exposure rate (mrem/h) at the site boundary. Conversion factor _____ times monitor reading ___ = ____ mrem/h.

Step 5. This procedure if applicable must be repeated every 15 minutes while the emergency condition exists.

EXHIBIT 4.4.1-C

QUICK DOSE ESTIMATE BASED ON STATION VENT MONITOR, NO METEOROLOGICAL DATA READILY AVAILABLE

Step 1. Record the combined station vent monitor readings for U-1 and U-2 (U1-RE-5415 and U2-RE-5415) and note whether monitor readings (over the last five minutes) appear to be increasing, decreasing or staying about the same.

U-1 Vent Monitor Reading ____ Counts per minute @ ____ time

U-2 Vent Monitor Reading ____ Counts per minute @ ____ time

Sum of Readings ____ Counts per minute @ ____ time

Check as appropriate:

	U-1	U-2
increasing	___	___
holding steady	___	___
decreasing	___	___

Step 2. Estimate the Atmospheric Stability Conditions based on the conditions listed below:

	Sunny Day	Cloudy Day	Cloudy Night	Clear Night
light wind or calm ($\leq$ 4m/s) =($\leq$ 9.8 mph)	B	C	E	F
moderately strong wind ($\geq$ 4m/s) = ($\geq$ 9.8 mph)	C	C	D	D

Step 3. Circle the conversion factor below that corresponds to the estimated atmospheric stability conditions.

Condition	Conversion Factor
B	1×10^{-4}
C	2×10^{-4}
D	5×10^{-4}
E	2×10^{-3}
F	6×10^{-3}

Step 4. Multiply the sum of the monitor readings in Step 1 by the circled conversion factor in Step 3. This value represents the projected whole body dose rate (mrem/h) at the site boundary.

Conversion Factor ____ x monitor reading ____ = ____ mrem/h

Step 5. This procedure if applicable must be repeated every 15 minutes while the emergency condition exists.

Contents of Procedure 4.4.2

TITLE: **USE OF MAP OVERLAYS (ISOPLETHS)**

TITLE: **USE OF MAP OVERLAYS (ISOPLETHS)**

1.0 RESPONSIBLE INDIVIDUAL

The RAD is responsible to provide a visual aid to the Site Emergency Coordinator (SEC). This visual aid will enhance communications with responsible public officials and will aid ir the direction and evaluation of offsite monitoring programs.

2.0 DISCUSSION

2.1 As directed by the RAD per ERPIP 4.1.15.

2.2 Recognition of an uncontrolled release of radioactive material.

3.0 ACTIONS AND LIMITATIONS

-NOTE-

Predrawn overlays may be articulated (hinged) to permit the user to display shifts in the direction of the radioactive cloud (e.g., initially from the plant east onto the bay, then up or down the bay). Those that are not hinged may not give reliable indications of the sector affected at some distance.

Method 3.1 GENERAL PROCEDURES FOR OVERLAYS

3.1.1 Select overlay corresponding to atmospheric dispersion condition as determined by ERPIP 4.4.1 or 4.4.4.

3.1.2 Examine the readout of 200 foot level wind direction and estimate the mean wind direction.

-NOTE-

The weather instruments give the direction from which the wind is blowing, so the overlays will be oriented towards the exact opposite direction.

3.1.3 Position the overlay so that the center line of the isopleths is 180° away from (exactly opposite) the recorded wind direction.

3.1.4 Secure the overlay with tape. The overlay is now ready for use.

Method 3.2 OVERLAYS WITH Xu/Q VALUES MARKED ON THE ISOPLETHS

3.2.1 Select the overlay corresponding to the stability class that exists. If the measured T corresponds to Class "A" conditions use the overlay for Class B. If the measured T corresponds to Class "G" conditions, use the overlay for Class F conditions. The smaller overlays are for

the 50 mile map, the larger overlays for the 10 mile planning zone map.

3.2.2 The first use of these overlays may be to estimate dispersion to selected points.

a. If the selected point is on, or nearly on, one of the contour lines or isopleths, read off the number associated with that line. That number represents Xu/Q at the point of interest.

b. If the selected point is outside but close to the outermost isopleth, use that value.

c. If the selected point is between two isopleths, read off the higher of the two numbers (which will be the innermost of the two isopleths).

d. If the selected point is well inside the innermost isopleth (no higher values given) this procedure cannot be used. Go to Appendix C.2 for alternate methods of computing atmospheric dispersion and dose.

Record all values on EXHIBIT 4.4.2-A.

3.2.3 If the Xu/Q values in EXHIBIT 4.4.2-A are to be used as part of the procedure to hand calculate projected doses, go to ERPIP 4.4.5, Procedure 3.2.

Method 3.3 OVERLAYS WITH UNMARKED ISOPLETHS, BLANK OVERLAYS OR OVERLAYS USED TO DISPLAY PROJECTED VERSUS ACTUAL DOSES

3.3.1 "Grease-Pencil" the projected whole body doses from ERPIP 4.4.5 at the appropriate locations, mark each such with a P to denote projected.

3.3.2 "Grease-Pencil" the cloud arrival time at various distances from the plant.

-NOTE-

To avoid clutter, it is suggested that information of this type be penciled in a tabular form or marked on the section 180° away from the downwind. sector.

3.3.3 At one extreme of the overlay, pencil in the time at which the dose projections were made.

3.3.4 Record field measured gamma dose rates at the appropriate location,

noting time of measurement and mark each with an A to denote actual data.

-NOTE-

Before erasing or cleaning any overlay in preparation for updating the data, record all information on EXHIBIT 4.4.2-B.

EXHIBIT 4.4.2-A

$X\bar{u}/Q$ VALUES ESTIMATED FROM ISOPLETHS

_____ @ _____

Estimated by Time

Sector Location	Approximate Distance from Plant (miles)	Isopleth Letter	$X\bar{u}$ Value / Q

EXHIBIT 4.4.2-B

DATA FROM OVERLAYS (FOR RECORD)

Location Indentifies Sector, Distance	Additional Location Data	Projected Dose or Dose Rate (if any)	Time, Estimated	Actual Dose or Dose Rate if Measured	Time Measured	Explanatory Comment/ Note

Contents of Procedure 4.4.3

TITLE: **INITIAL DETERMINATION OF ACCIDENT RADIOACTIVITY RELEASE RATES**

TITLE: **INITIAL DETERMINATION OF ACCIDENT RADIOACTIVITY RELEASE RATES**

1.0 RESPONSIBLE INDIVIDUAL

The RAD is responsible to the SEC for developing interim estimates (early phases of the accident) of the radioactivity being released to the atmosphere.

2.0 CONDITIONS AND PREQUISITES

2.1 As directed by the RAD per ERPIP 4.1.15.

2.2 Recognition of an uncontrolled release of radioactive material.

3.0 ACTIONS AND LIMITATIONS

-NOTE-

The detector responses (counts per minute per uCi/cc of radioactivity) will depend on the specific isotopic mixture being released at various times. Grab samples must be taken and analyzed to provide an exact relationship but the predetermined relationships used below should be sufficiently accurate to guide emergency response actions and assessments.

Method 3.1 STATION VENT MONITOR IN ALARM MODE BUT ON-SCALE

Follow the steps set forth in EXHIBIT 4.4.3-A. As noted on that table, enter the results in EXHIBIT 4.4.5-B Part A, Step 1 of ERPIP 4.4.5 to generate projected doses.

Method 3.2 EXHAUST GAS MONITOR UPSTREAM OF STATION VENT MONITOR IN ALARM MODE BUT ON-SCALE

Where a single source of the release can be readily identified, the rate of release can be estimated at a point before the effluent is diluted with other station air. To do so, follow steps set forth in EXHIBIT 4.4.3-C. As noted on the exhibit, enter the results in EXHIBIT 4.4.5-B Part A, Step 1 of ERPIP 4.4.5 to generate projected doses.

Method 3.3 EXHAUST MONITORS NOT ON-SCALE, RADIATION LEVELS NEAR EXHAUST MEASURED

Determine radiation level reading about 10 meters (30 ft.) from the main

vent or main exhaust duct. Multiply the value of the reading in R/h by 5×10^5 to obtain the approximate release rate of Xe-133 in uCi/s.

Enter in ERPIP 4.4.5, EXHIBIT 4.4.5-B Part A, Step 1.

Method 3.4 ALTERNATIVE MEANS OF ESTIMATING RELEASE RATES

ERPIP 4.4.5 provides a procedure for projecting dose at various downwind locations, even in the absence of in-plant data. Appendix C.1 provides additional tools and guidelines that may be helpful in estimating the rate of release based on non-effluent plant data (in containment dose rate, coolant activity, etc.).

Method 3.5 MAIN VENT HIGH RANGE MONITOR ON-SCALE

Step 1.0 Use Exhibit 4.4.3-D (Unit 1 Monitor Response) and/or Exhibit 4.4.3-E (Unit 2 Monitor Response) as appropriate.

Step 2.0 Determine the time post accident: _____ days or _____ hours

Step 3.0 Use the Exhibits mentioned in step 1.0 to determine the corresponding R/h per Ci/s.

Unit 1: _____ $\frac{R/h}{Ci/s}$; Unit 2: _____ $\frac{R/h}{Ci/s}$

Step 4.0 Read the appropriate main vent high range monitor indication located in the 69' laundary room to obtain a R/h value.

Unit 1: _____ R/h ; Unit 2: ___ R/h

Step 5.0 Divide the step 4.0 value by the corresponding step 3.0 value to obtain the release rate, Ci/s.

Unit 1: _____ Ci/s ; Unit 2: _____ Ci/s

Total Plant Release Rate = _____ Ci/s

Step 6.0 Use the step 5.0 release rate for the plant in step 1.0 of Exhibit 4.4.5-B. Be careful to convert step 5.0 Ci/s to uCi/s as required in Exhibit 4.4.5-B.

EXHIBIT 4.4.3-A

NOBLE GAS RELEASE ESTIMATES BASED ON STATION VENT MONITOR READINGS

Step 1. Circle the condition best thought to represent cause of release:

	Cause	Release Coefficient
a.	Unknown, unidentified	3.0×10^{-4}
b.	Major damage to fuel cladding	3.0×10^{-4}
c.	RCS leaks, including S-G tube rupture but no major clad failure	6.0×10^{-4}
d.	Accidental discharge of waste gas	1.2×10^{-3}
e.	Fuel handling accident	1.8×10^{-3}

Step 2. Record the Net counts per minute at each vent monitor (current cpm less pre-accident count rate).

U1-RE-5415 _____ cpm at _____ time.

U2-RE-5415 _____ cpm at _____ time.

Step 3. Record the station vent flow rate (if unknown use 131, 500 cfm- the full flow rate of U1-RE-5415 and118 , 500 cfm - the full flow rate of U2-RE-5415).

U1 Main Vent _____ cfm at _____ time.

U2 Main Vent _____ cfm at _____ time.

Step 4. Multiply the net counts per minute values in Step 2 by the respective flow rate values in Step 3 and by the release coefficients in Step 1. The results is uCi/s from each vent. Add the two release rates and enter this result in ERPIP 4.4.5 (Step 1 of EXHIBIT 4.4.5-B, Part A) and enter this result in EXHIBIT 4.4.3-B of this procedure.

(_____cpm U1-RE-5415) x (_____cfm U-1) x (_____ Step 1 Factor) equals uCi/s release rate from U-1.

(_____cpm U2-RE-5415) x (_____cfm U-2) x (_____ Step 1 Factor) equals uCi/s release rate from U-2.

Total release rate (uCi/s) = _____uCi/s U-1 + _____ uCi/s U-2

= _____uCi/s.

EXHIBIT 4.4.3-B

RECORD OF NOBLE GAS RELEASE RATES VERSUS TIME

Source of Data	Release Rate in uCi/s	Time of Vent Monitor Reading	Cumulative (Total) Release = uCi (see note)

-NOTE-

To obtain the uCi of noble gases released during the measured interval, multiply the average station vent release rate by the time in seconds between the two reading times (e.g. 500 uCi/s @ 1440, 600 uCi/s @ 1455; release = 550 uCi/s x 15 minutes x 60 s /min = 495,000 microcuries, or about 0.5 curies).

EXHIBIT 4.4.3-C

PART A

NOBLE GAS RELEASE ESTIMATES BASED ON SELECTED EXHAUST POINTS

Step 1. Record the Counts per minute _____ CPM.
Monitor _____ RE _____ @ _____ time.

Step 2. Enter the appropriate ventilation flow rate (if unavailable use the value listed below):

_____ ft^3 /min

Monitor	Location	Rated Flow Rate (ft^3 /min)	Actual (enter one)
RE-1752	Condenser Vacuum Discharge		
RE-5410	Waste Process Area	50,000	
RE-5281	Containment Purge Exhaust	50,000	
RE-2191	Gaseous Waste Discharge		
RE-5406	ECCS Room	3,000	
RE-5420	Fuel Pool Area	32,000	
RE-5425	Access Control	14,000	

EXHIBIT 4.4.3-C (cont'd)

PART B

Step 3. Multiply the CPM value in Step 1 by ft ^{3}/min in Step 2 and enter here _____.

Step 4. Enter the detector response factor listed below that corresponds to the monitor alarm _____.

Monitor Number *	Detector Response Factor
RE-1752	6.0×10^{-4}
RE-5410	1.2×10^{-3}
RE-5281	1.2×10^{-3}
RE-2191	1.2×10^{-3}
RE-5406	6.0×10^{-4}
RE-5420*	1.8×10^{-3}
RE-5425	6.0×10^{-4}

-NOTE-

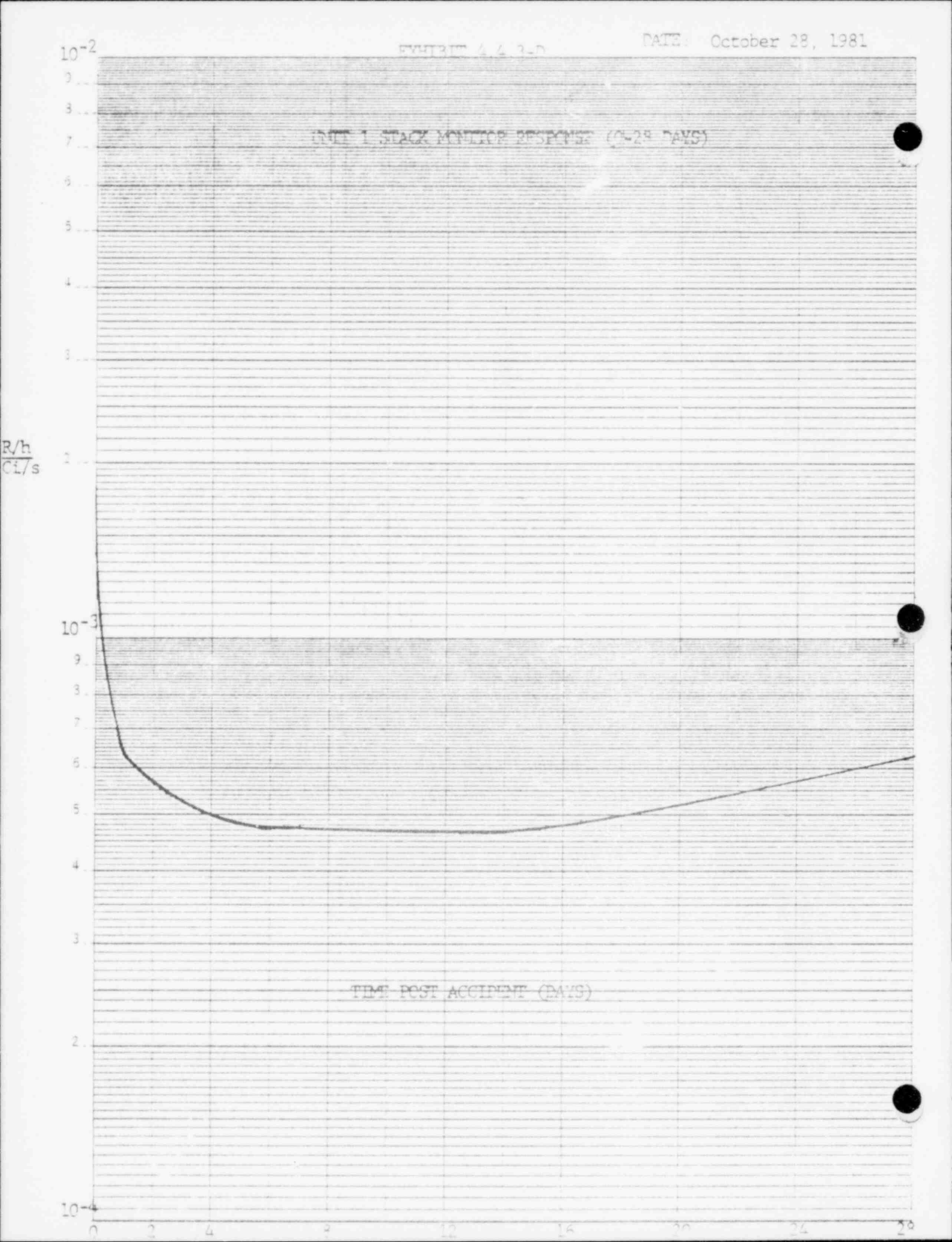
* If any fuel cladding failures are thought to have occured, all values should be 3.0×10^{-4} except for RE-5420.

Step 5. Multiply Step 3 value times Step 4 value equals _____ uCi/s.

Record value on Record of Noble Gas Release Rates vs. time, Exhibit 4.4.3-B.

DATE: October 28, 1981

EXHIBIT 4.4.3-D



Contents of Procedure 4.4.4

TITLE: **DETERMINATION OF ATMOSPHERIC DISPERSION (X/Q)**

TITLE: **DETERMINATION OF ATMOSPHERIC DISPERSION (X/Q)**

1.0 RESPONSIBLE INDIVIDUAL

The RAD is responsible to determine the general dispersion characteristic of the atmosphere and specific values of X/Q to be used for emergency planning purposes.

2.0 CONDITIONS AND PREQUISITES

2.1 As directed by the RAD per ERPIP 4.1.15.

2.2 Recognition of an uncontrolled release of radioactive material.

3.0 ACTIONS AND LIMITATIONS

-NOTE-

1. None of these methods should be regarded as very precise; it is generally believed that actual dispersion can be factors of 3 to 5 above or below the estimates based on these methods.
2. Building wake, "hot" clouds, high vent exhaust flow rates, terrain effects can all mc actual dispersion from that estimated by standard methods. Comparison of projections to actual measurements in the field are the best way to determine the extent to which any of these factors are significant.
3. These estimates are reasonable only if the basic meteorological conditions remain steady. If the vertical temperature profile changes or if the magnitude of variation in horizontal wind changes, new dispersion estimates should be developed.
4. Appendix C.2 provides supplemental information, including explanatory information and convenient tables and charts.

Method

3.1 ATMOSPHERIC DISPERSION CONDITIONS BASED ON TEMPERATURE PROFILE

-NOTE-

If time is of the essence, assume that the dispersion conditions have not changed since the emergency class was determined, use the stability class circled in Step 4 of EXHIBIT 4.4.1-A.

Step 1. Record the Δ T reading from the meteorological tower (temperature at 200 feet minus temperature at 30 feet).

Step 2. Circle the stability class below that corresponds to the value of Step 1.

Range		Stability Class
Step 1 value is less than	-1.73°F	A
Step 1 value is between	-1.73°F and -1.55°F	B
Step 1 value is between	-1.55°F and -1.35°F	C
Step 1 value is between	-1.35°F and -0.45°F	D
Step 1 value is between	-0.45°F and +1.35°F	E
Step 1 value is between	+1.35°F and +3.63°F	F
Step 1 value is greater than	+3.63°F	G

Step 3. If the overlay method is to be used, go to ERPIP 4.4.2. Otherwise go to ERPIP 4.4.5, subsection 3.2.2 (for dose projections), or go to ERPIP 4.4.6 (for dose estimates based on environmental data).

Method 3.2 ATMOSPHERIC DISPERSION CONDITIONS BASED ON WIND DIRECTION READINGS

-NOTE-

1. If time is of the essence, assume that the dispersion conditions have not changed since the emergency class was determined and use the stability class circled in Step 2 of EXHIBIT 4.4.1-A.
2. The stripchart of wind direction will show a trace where the direction fluctuates, but over a period of time will generally be from a single direction (e.g., the trace could show a general direction from ENE with frequent fluctuation of 10 degrees or so on either side of that direction).

Step 1. Estimate the average band width of wind direction fluctuations over the last 15 to 60 minutes, based on the strip chart recording of wind direction range. (See EXHIBIT 4.4.1-B, Step 1). As an alternative the wind direction range may be read directly from the chart that

parallels the wind direction recording (which is the same as band width degrees).

_____ vertical line divisions or degrees. Estimated @ _____ time.

Step 2.

Band Width Divisions	Band Width Degrees	Stability Class
2-1/2	75	A
2	60	B
1-1/2	45	C
1	30	D
1/2	15	E
1/4	7-1/2	F
1/6	5	G

Step 3. If the overlay method is to be used, go to ERPIP 4.4.2, otherwise, go to ERPIP 4.4.5, subsection 3.3.2 (for dose projections), or go to ERPIP 4.4.6 (for source term estimates based on environmental data).

Method 3.3 ATMOSPHERIC CONDITIONS BASED ON TIME OF DAY/CLOUD COVER.

Step 1. If circumstances require, the atmospheric dispersion conditions can be inferred from simple observation. The following table may be used to select the current dispersion conditions.

	Sunny Day	Cloudy Day	Cloudy Night	Clear Night
light winds or calm ($\leq$4m/sec)=($\leq$9.8mph)	B	C	E	F
moderately strong winds ($\geq$4m/sec)=($\geq$9.8mph)	C	C	D	D

Step 2. If the overlay method is to be used, go to ERPIP 4.4.2, otherwise, go to ERPIP 4.4.5, subsection 3.3.2 (for dose projections), or go to ERPIP 4.4.5 (for source term estimates based on environmental data).

TITLE: **INITIAL DETERMINATION OF PROJECTED WHOLE BODY DOSES**

Methods	Titles
3.1	PROJECTED DOSE BASED ON RELEASE ESTIMATES
3.2	PROJECTED DOSES BASED ON OVERLAYS
3.3	PROJECTED DOSE BASED ON MEASURED OR PROJECTED DOSE AT ANOTHER LOCATION.
EXHIBIT 4.4.5-A	AVERAGE RELATIVE AXIAL CONCENTRATION BY STABILITY CLASS FOR GROUND LEVEL RELEASES
EXHIBIT 4.4.5-B	DOSE PROJECTIONS
EXHIBIT 4.4.5-C	DOSE CONVERSION FACTORS

TITLE: **INITIAL DETERMINATION OF PROJECTED WHOLE BODY DOSES**

1.0 RESPONSIBLE INDIVIDUAL

The RAD is responsible to develop interim estimates (early phases of the accident) of the radiation exposures that may occur at offsite locations.

2.0 CONDITIONS AND PREREQUISITES

2.1 As directed by the RAD per ERPIP 4.1.15.

2.2 Recognition of an uncontrolled release of radioactive material.

3.0 ACTIONS AND LIMITATIONS

In this procedure, the calculation of dose or dose rate involves a four step multiplication:

$$\underset{\text{Rate}}{\text{Release}} \text{ times } \underset{}{\text{Dispersion}} \text{ times } \underset{}{\text{Windspeed}^{-1}} \text{ times } \underset{\text{Factor}}{\text{Dose Rate Conversion}} = \underset{}{\text{Dose Rate}}$$

$$\left(\text{uCi/s}\right) \times \left(\frac{X\bar{u}}{Q}\right) \times \left(\frac{1}{\bar{u}(\text{m/s})}\right) \times \left(\text{mrem/h per uCi/m}^3\right) = \frac{\text{mrem}}{\text{h}}$$

Several alternative ways of performing this calculation are set forth below:

Method

3.1 PROJECTED DOSES BASED ON RELEASE ESTIMATES

INPUT: Release rates in uCi/s from ERPIP 4.4.3. Atmospheric Stability Conditions (Class A-G) from ERPIP 4.4.4.

Step 1.* Select the distance (s) at which the projected dose is to be determined (e.g., the site boundary at 1150 meters or Eastern Boundary at 6.7 miles).

Step 2. Refer to EXHIBIT 4.4.5-A of this procedure and determine the value of $X\bar{u}/Q$ (the vertical axis) that corresponds to the distance of interest and the stability conditions estimated from ERPIP 4.4.4 (e.g., the $X\bar{u}/Q$ value at a distance of 6 miles for a stability class "C" condition is 10^{-6}).

Step 3. Obtain the current wind speed reading at the 200 foot level. It is

recorded as miles per hour. Multiply the value by 0.45 to obtain the wind speed in units of meters per second.

Step 4. Divide the Xu/Q value of Step 2 by the wind speed value of Step 3 (in m/s). This X/Q is in $^{s}/m^{3}$.

Step 5. Multiply the value of X/Q (Step 4) by the release rate in uCi/s from ERPIP 4.4.3. This product is the maximum concentration in uCi/m^{3} that is calculated to occur at the distance of interest and for the release rate and atmospheric conditions specified.

*EXHIBIT 4.4.5-B provides a tabular form of these instructions, so that data can be entered on that Table, and the mathematical manipulations can be simplified and followed easily on a single piece of paper.

Step 6. Using EXHIBIT 4.4.5-C, select the dose rate conversion factor(mrem/h per uCi/m^{3}) that corresponds to the type of accident assumed in estimating the release rate per ERPIP 4.4.3. As an alternative (EXHIBIT 4.4.5-C section2), select a dose rate conversion factor that corresponds to the "age" of the fission products being released. Applies to accident type A or B only.

-NOTE-

If this option is selected, make sure the conversion factor ERPIP 4.4.3 (used to convert radiation monitor readings to uCi/s release rates) is consistent with the dose rate conversion factor.

Step 7. Multiply the dose rate conversion factor by the concentration value of Step 5.
This product is the projected whole body dose rate in mrem/h at the distance of interest.

Step 8. To obtain total dose, estimate the total duration of the release in hours that will occur during the time when the wind is blowing in the direction of interest and when the atmospheric dispersion conditions remain the same.

the direction of interest and when the atmospheric dispersion conditions remain the same.

-NOTE-

The calculated dose represents the dose to an individual standing at the centerline of an assumed semi-infinite cloud. If the distance of interest is within about 2 miles of the plant and the atmospheric conditions are Class D, E, F, or G, this calculation may over-estimate doses by factors of 2 to 5. See Appendix C.3 for special factors to correct for finite clouds. Appendix C.2 also provides methods for estimating doses at locations away from the centerline of the cloud (e.g., away from the direction of the wind). Overlays can also be used, as shown in the next section.

Method

3.2 PROJECTED DOSES BASED ON OVERLAYS

INPUT: Release rates in uCi/s from ERPIP 4.4.3 Atmospheric Stability Conditions (Class A-G) from ERPIP 4.4.4.

Step 1. Select the $X\bar{u}/Q$ value that best corresponds to the location of interest (using the overlay method of ERPIP 4.4.2).

Step 2. Obtain the current wind speed readings at the 150 foot level. It is recorded as miles per hour. Multiply the value by 0.45 to obtain the wind speed in units of meters per second.

Step 3. Divide the $X\bar{u}/Q$ value of Step 1 by the wind speed value of Step 2 (in m/s). This is X/Q in s/m^3.

Step 4. Multiply the value of X/Q (Step 3) by the release rate in uCi/s from ERPIP 4.4.3. This product is the concentration in uCi/m^3 that is estimated to occur at the location of interest, for the release rate and atmospheric conditions specified.

Step 5. Follow steps 6, 7, and 8 of Procedure 3.1 above to convert uCi/m^3 to dose.

Method

3.3 PROJECTED DOSE BASED ON MEASURED OR PROJECTED DOSE AT ANOTHER LOCATION.

3.3.1 Overlays

If overlays have been used, the dose at one location can be estimated from the dose at another location by simply taking the ratio of the relative isopleth values at the two locations, as follows:

$$\text{Dose at location of interest (Distance 2)} = \text{Dose Already Calculated at Distance 1} \times \frac{\text{Isopleth value of } X\bar{u}/Q \text{ most representative of Distance 2}}{\text{Isopleth value of } X\bar{u}/Q \text{ most representative of Distance 1}}$$

-NOTE-

If the two distances are substantially different in terms of relative distance from the plant (say 5-10 miles), the dose conversion factors may be different for the two locations by the value of the decay corresponding to the time it takes for the cloud to pass from one point to another. This can also be accomplished if desired, by ratioing the dose conversion factors appropriate to each distance.

3.3.2 EXHIBIT 4.4.5-A

If desired, the dose at one distance can be projected to that of another distance by simply taking the ratio of the relative $X\bar{u}/Q$ values corresponding to the two distances using EXHIBIT 4.4.5-A instead of overlays.

Thus: Peak dose at distance of interest = peak dose at distance where measurement was obtained (Step 3) times relative dilution ($X\bar{u}/Q$) at distance of interest divided by relative dilution ($X\bar{u}/Q$) at distance where dose was measured.

EXHIBIT 4.4.5-A AVERAGE RELATIVE AXIAL CONCENTRATION BY STABILITY CLASS

FOR GROUND LEVEL RELEASES (h = 0)

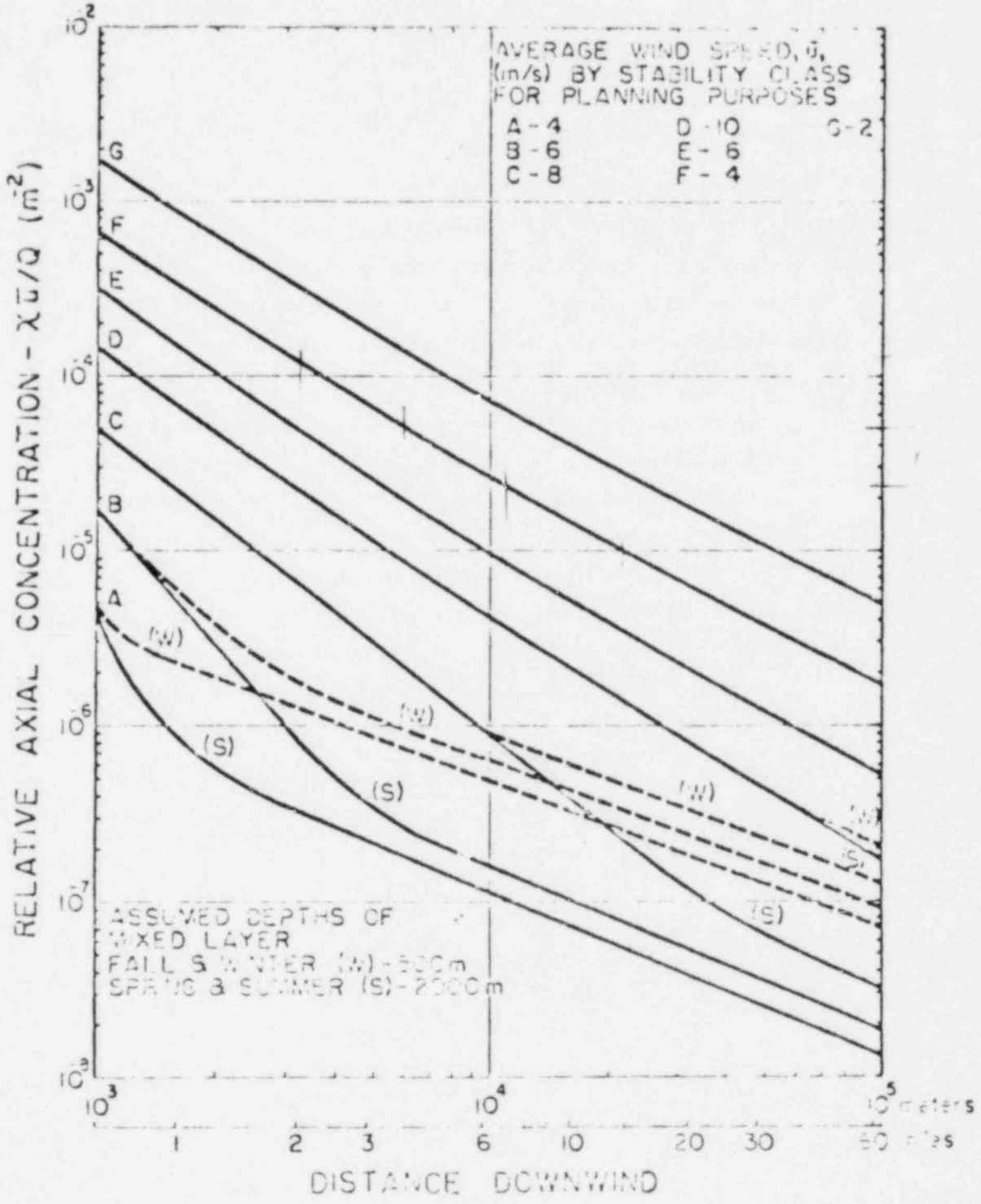


EXHIBIT 4.4.5-B

PART A

DOSE RATE PROJECTIONS

Step 1. Enter, in Column 1 below, estimated uCi/sec release rates (from EXHIBIT 4.4.3-C, or from EXHIBIT 4.4.3-C Step 5 or Method 3.5, page 4.4.3-3).

Step 2. Enter, in Column 2 below, Xu/Q estimates from EXHIBIT 4.4.5-A corresponding to the stability conditions determined in ERPIP 4.4.4 and the distance of interest.

Step 3. Multiply the values in Step 1 and Step 2 and enter the result in Column 3.

Step 4. Determine the wind speed at the 200 foot level (in meters per second) and enter the value in Column 4. Meters per second = 0.45 x mph.

Step 5. Divide the value in Column 3 by the value of wind speed in Column 4. Enter the result in Column 5.

Step 6. Multiply the value in Column 5 by the appropriate Dose Rate Conversion Factor from EXHIBIT 4.4.5-C to obtain projected dose rate in mrem/h. Enter the value in Column 7.

Step 7. Enter, in Column 8, the time at which the release estimate applies.

Step 8. Enter, in Column 9, the sector location at which the dispersion estimate (and hence projected dose) applies.

-NOTE-

If total projected dose is desired, multiply the projected dose rate by the projected duration of the release in hours.

Column 1 Release Rate (uCi/s)	Column 2 Dispersion $X\bar{u}/Q(m^{-2})$	Column 3 1 x 2	Column 4 Wind Speed(m/s) (0.45 x mph)	Column 5 3/4	Column 6 Dose Conversion Factor (From EXHIBIT 4.4.5-C)	Column 7 6 x 5 Yield Dose Rate	Column 8 Time Distance	Column 9 Sector

EXHIBIT 4.4.5-B, (continued)

PART B

DOSE RATE PROJECTIONS

Work Sheet

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9
Release Rate uCi/s	Dispersion $X\bar{u}/Q\ m^{-2}$	1 x 2	Wind Speed m/s (0.45 X mph)	3/4	Dose Conversion Factor (From EXHIBIT 4.4.5-C)	6 x 5 Dose Rate	Time	Sector/ Distance

EXHIBIT 4.4.5-C
DOSE CONVERSION FACTORS

1. For Dose Rate Projections made promptly after onset of releases

Accident Type	Factor (mrem/h per uCi/m^3)
a. Unknown/unidentified	0.49
b. Major damage to fuel cladding	0.49
c. RCS leaks, including SGTR, but no major clad failures	0.34
d. Accidental discharge of waste gas	0.15
e. Fuel handling accident	0.15

2. For Dose Rate Projections based on age of fission gases (time since decay begun) For use with 1 a & b above.

Time (hours)	Dose Rate Conversion Factor (mrem/h per uCi/m^3)
0	0.650
0.5	0.490
1	0.435
1.5	0.400
2	0.370
2.5	0.340
3	0.335
3.5	0.330
4	0.290
4.5	0.270
5	0.260
6.5	0.210
8	0.180
10	0.150
12.5	0.120
15	0.100
24	0.086
48	0.040
72	0.030

Step 7. At this point read the relative source term value (curies per second per mrem/h) on the horizontal axis.

Step 8. Multiply the exposure rate measurement (value in Step 3 above) by the relative source term value (value in Step 7) to obtain the release rate in curies per second.

-NOTE-

This release rate corresponds to the release from the plant at an earlier time. To compare this estimated source term with plant data: source term time = exposure measurement time minus (distance from plant) divided by (windspeed).

If appropriate, correction for decay of the material enroute may be performed. (See Appendix C.3).

3.2 SOURCE ESTIMATES BASED ON GAMMA DOSE - PUFF RELEASE

Step 1. Use a dosimeter (a low range pocket dosimeter may be adequate for this purpose) that is shielded for beta activity.

Step 2. Position the dosimeter in the expected path of the cloud (according to the mean wind direction) at a convenient distance downwind.

Step 3. Read the total exposure (mR) after the cloud passes this location.

Step 4. From EXHIBIT 4.4.5-A read the relative axial concentration value ($X\bar{u}/Q$) for the appropriate stability class and distance downwind at which the exposure measurements are made (the appropriate stability class can be determined from any of the methods in ERPIP 4.4.1 or ERPIP 4.4.4).

Step 5. Using EXHIBIT 4.4.6-A, locate the $X\bar{u}/Q$ value, found through the use of EXHIBIT 4.4.6-A, on the vertical axis and proceed horizontally across the figure until the curve for the source height (or a suitably interpolated value) is intersected. If source height is unknown use height = 0 meters.

Step 6. From the point of intersection proceed vertically downwind until the $\bar{u}$ = 1m/s (2.2 miles per hour) line is intersected.
Then proceed horizontally from this point until the line representing the actual wind speed is intercepted.

Step 7. At this point read the relative source term value (curies per second per mrem/h) on the horizontal axis.

Step 8. Multiply the relative source term value by the total exposure and multiply this value by 3600 to obtain the gamma source strength (curies).

3.3 RELEASE RATE ESTIMATES SOURCE ESTIMATES BASED ON IODINE OR PARTICULATE MEASUREMENTS

-NOTE-

Do not use tables or figures that convert gamma dose to radioiodine concentrations. Such conversion estimates are too unreliable and unrepresentative to serve any useful purpose.

Step 1. Obtain and analyze an air sample (see ERPIP 4.3.1).

Step 2. Convert the sample results into Ci sec/m^3.
(uCi on the sample divided by the sampler flow rate in cm^3/sec).

Step 3. From EXHIBIT 4.4.5-A, read the relative axial concentration value ($X\bar{u}/Q$) for the appropriate stability class and the distance downwind at which the sample was taken (the appropriate stability class can be determined from any of the methods in ERPIP 4.4.1 or ERPIP 4.4.4).

Step 4. Divide the $X\bar{u}/Q$ value by the wind speed to obtain the dilution factor (s/m^3).

Step 5. Divide the value in Step 2 by the value in Step 4 to obtain the source term in curies corresponding to a puff release. (See note following Step 8 of Section 3.1).

Step 6. If the rate of release is reasonably continuous, divide the result in Step 5 by the sampling period in seconds to obtain a release rate, in Ci/sec.

-NOTE-

This procedure assumes that the sample is taken at the cloud centerline. If this is not the case, the calculated source term must be adjusted upward by the ratio:

$$\frac{X\bar{u}/Q \text{ value at the cloud centerline}}{X\bar{u}/Q \text{ value at the sample location}}$$

This may be done by comparing the isopleth values for the two locations or, more accurately, through the methods in Appendix C.2.

EXHIBIT 4.4.7.1-A

GAMMA EXPOSURE RATES AT CONTAINMENT CENTER

Time (h)	Exposure Rate (R/h)
0	3.3×10^6
0.03	3.1×10^6
0.5	9.8×10^5
0.75	8.7×10^5
1	7.8×10^5
2	5.8×10^5
8	1.9×10^5
24	4.6×10^4
60	1.6×10^4
96	1.2×10^4

Assumptions:

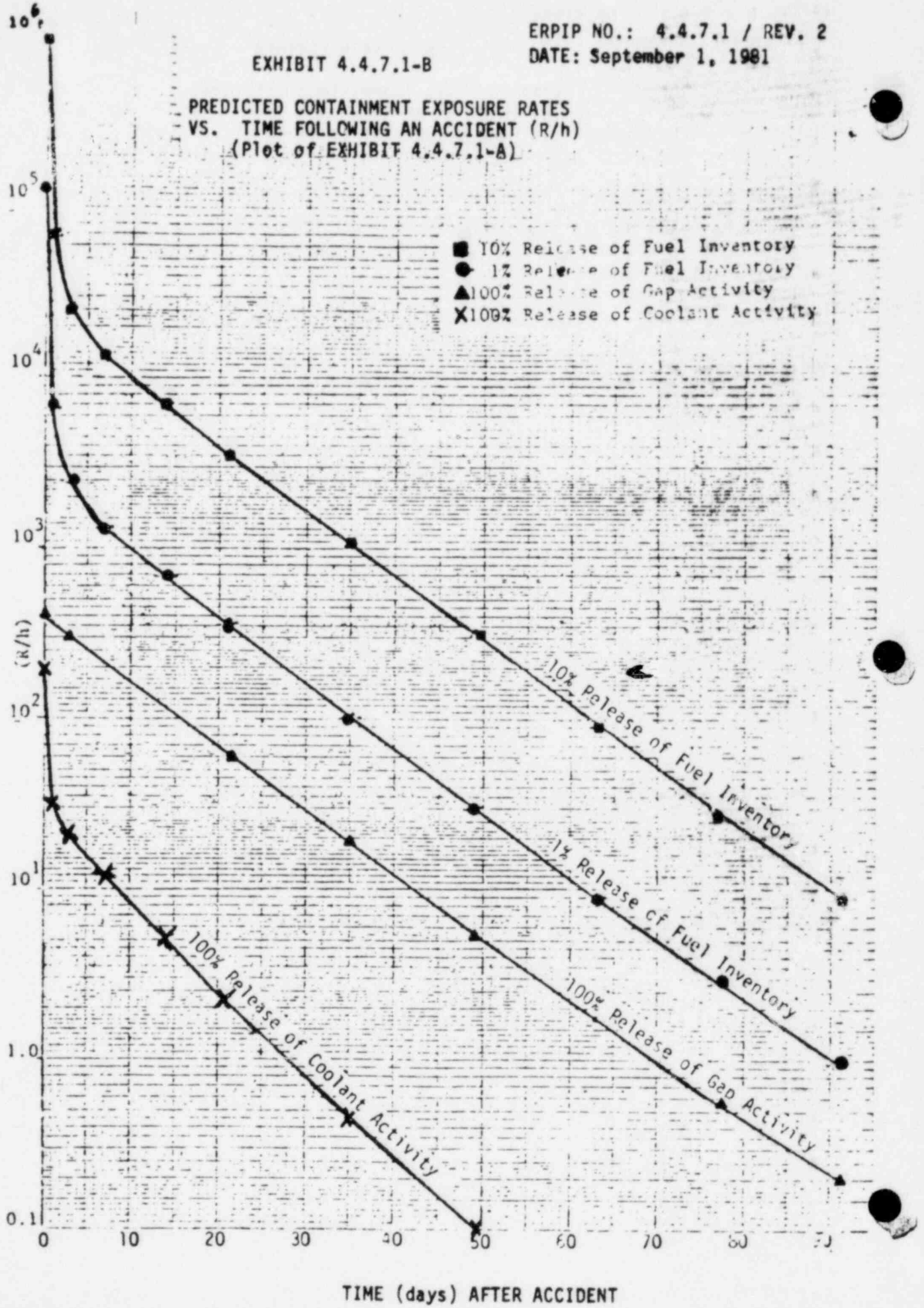
(1) Power level - 2700 Mwt

(2) Release at T = 0, 100% of core inventory of noble gases, 50% of the iodines (Chemical form of iodine 91% I_2, 5% particulate bound, 4% organic).

(3) Containment sprays actuate, removing elemental iodine at rate of 27%/h, removing particulate iodine at rate of 0.43 %/h

EXHIBIT 4.4.7.1-B

PREDICTED CONTAINMENT EXPOSURE RATES
VS. TIME FOLLOWING AN ACCIDENT (R/h)
(Plot of EXHIBIT 4.4.7.1-A)



TITLE: **GROUND DEPOSITION (SOIL CONTAMINATION)**

1.0 RESPONSIBLE INDIVIDUAL

The Chemical Engineering and Test Section Representative is responsible to the ESC for monitoring and tests of the environment.

2.0 CONDITIONS AND PREREQUISITES

Notification by the BG&E Administrative Services Director or Environmental Services Coordinator of a CCNPP emergency condition with radiological releases affecting or potentially affecting the environment.

3.0 ACTIONS AND LIMITATIONS

-NOTE-

The rate at which radioactivity is deposited from the plume to the ground and other surfaces (curies/sec-m^2) is given by the product of the source term, Q (curies/sec), and the deposition factor, D/Q (m^{-2}).

3.1 Calculate approximate D/Q by determining the product of:

$\bar{X}/Q$ and .01 for elemental iodine _____ m^{-2};

$\bar{X}/Q$ and methyl iodine calculated D/Q from Note Below _____ m^{-2};

$\bar{X}/Q$ and 0.002 for particulate material _____ m^{-2};

-NOTE-

State procedures use D/Q = $X\bar{D}/Q$ (0.0025 for iodine) and (0.005 for Cs, Sr). $\bar{X}/Q$ is determined from ERPIP 4.4.4 or obtained from the RAD in the ECC.

_____ / _____
Initials Time

3.2 Contact the RAD in the ECC to obtain the duration of the release and the estimated source term.

Duration: _____ h Source Term: _____ Ci/h _____ / _____
Initials Time

3.3 Using EXHIBIT 4.4.8-A, the D/Q source term, and accident duration, convert to activity deposited.

-NOTE-

This method used with ten mile $X\bar{u}/Q$ overlays yields D/Q's within the 10 mile radius.

3.4 Take samples of pasture soil, leafy vegetation, fruit, vegetables, water supplies, etc., from any region where radioactivity deposition is suspected, being careful to uniquely log the identification, specific location (or sector), time, and special conditions of each sample. Refer to ERPIP Appendix B.2 for maps.

-NOTE-

If deposition is predicted to be significant out to 10 miles, then it is advisable to take and analyze samples from the region beyond 10 miles where radioactivity deposition is suspected. Similar sampling and analysis out to 50 miles from CCNPP in any direction shall also be undertaken if necessary.

3.5 Complete analysis of each sample per normal analysis procedures.

3.6 Recommend protective actions based on findings, the results obtained from implementation of ERPIP 4.3.2, and on PAG applicability as stated in EXHIBITS 4.5.6-A through 4.5.6-E.

EXHIBIT 4.4.8-A

DEPOSITION CALCULATIONS

Radionuclide	Duration of D/Q from Step 3.1	x	Total Release (s)	=	Deposition (Ci/m^2)
Elemental Iodine					
Methyl Iodide					
Particulate Material					

Date _____ Calculated by _____

Time _____ Checked by _____

Location _____ (Sector-Distance)

State procedures use $D/Q = X\bar{u}/Q$ (0.0025 for iodine) and (0.0005 for Cs, Sr)

3.6.2 EXHIBIT 4.4.8.1-B is used to determine whether or not Emergency or Preventive PAG's are exceeded. Both the adult and infant levels are given.

3.6.3 After determining the PAG level for each reduced data case, circle the appropriate case(s) on EXHIBIT 4.4.8.1-B and 4.4.8.1-A.

3.7 Protective Actions

3.7.1 If an Emergency or Preventive PAG's are exceeded advise the SEC on appropriate protective actions to be recommended to offsite governmental agencies as described in EXHIBIT 4.5.6-E, RECOMMENDED PROTECTIVE ACTIONS FOR AGRICULTURAL PRODUCTS.

EXHIBIT 4.4.8.1-A

DEPOSITION MONITORING DATA REDUCTION

Monitoring Location: _____
Monitoring Data: _____

Net Beta (mrem/h _____	x (1.3E-3) = ( ) microcuries/m^2 Strontium-90	Emergency Adult Infant	Preventive Adult Infant
	x (3.4E-2) = ( ) microcuries/m^2 Strontium-89	Emergency Adult Infant	Preventive Adult Infant
Average Gamma (CPM) _____	x (6.48E-5) = ( ) microcuries/m^2 Iodine-131	Emergency Adult Infant	Preventive Adult Infant
	x (9.36E-5) = ( ) microcuries/m^2 Cesium-137	Emergency Adult Infant	Preventive Adult Infant

( ) sum ÷ 3 = ( ) Average CPM

Monitoring Location: _____
Monitoring Data: _____

Net Beta (mrem/h) _____	x (1.3E-3) = ( ) microcuries/m^2 Strontium-90	Emergency Adult Infant	Preventive Adult Infant
Net CPM Observed 1. _____ 2. _____ 3. _____	x (3.4E-2) = ( ) microcuries/m^2 Strontium-89	Emergency Adult Infant	Preventive Adult Infant
Average Gamma (CPM) _____	x (6.48E-5) = ( ) microcuries/m^2 Iodine-131	Emergency Adult Infant	Preventive Adult Infant
Net CPM Observed 1. _____ 2. _____ 3. _____	x (9.36E-5) = ( ) microcuries/m^2 Cesium-137	Emergency Adult Infant	Preventive Adult Infant

( ) sum ÷ 3 = ( ) Average CPM

TITLE: ASSESSMENTS OF OFFSITE RADIOLOGICAL CONSEQUENCES USING DOSE ASSESSMENT COMPUTER (DAC) SYSTEM

1.0 OBJECTIVES

The purpose of this procedure is to describe the steps necessary to use the DAC system as a means of performing and coordinating the full range of radiological assessment that may be required in the event of an emergency.

2.0 DISCUSSION

The Calvert Cliffs Nuclear Power Plant Emergency Response Plan requires three basic series of calculations. The first are those to classify or reclassify the severity of the event based on an actual or projected release of radioactivity to the environment (ERPIP 4.4.1). The second series comprise calculations made to project the consequences of a release of noble gases at various offsite locations; these initial estimates are based on the reasonable expectation that the immediate consequences of an accident will be dominated by noble gas releases (ERPIPs 4.4.2, 4.4.5). The third series includes any calculation used to make more refined estimates, to take into account releases of halogens or nongaseous fission products (or to infer the extent of core damage based on inplant or offsite measurements) (ERPIP 4.4.6, 4.4.7 and Appendix C).

The DAC system can be used to perform each of these assessments quickly without the need to perform calculations manually and without the need to manually log input and output at each step. Moreover, the DAC has capabilities that can be used to perform quantitative assessments (such as the effect of changes in wind direction or stability conditions) that can generally be done only qualitatively by manual methods of analysis.

3.0 ACTIONS AND LIMITATIONS

A brief summary of the use of DAC to perform accident dose assessments is provided in Appendix C.4. A series of six control "keys" (or pushbuttons) are used. Each key represents a station point for a different type of calculation. The procedures for using each menu line item appears in Exhibit 4.4.9-G. EXHIBIT C.4-1 provides an overall summary list of the options for each pushbutton "menu" item.

The DAC system is programmed to minimize the input required by users. The procedures that follow are intended to address the kinds of calculations that will be required under ERPIP 4.4.1 through ERPIP 4.4.7. The system is also capable of performing very complex calculations, which may be required when releases are very large and extend over many hours. In such instances, a specialist should be consulted to permit full utilization of the system in aid of emergency actions (See Appendix A.3.2).

3.1 INITIAL CLASSIFICATION OF EMERGENCY CONDITIONS BASED ON DOSE CALCULATED FROM RELEASE DATA

3.1.1 Using the phone at the computer console, access the DAC by dialing any of the following 1200 BAUD numbers(See Appendix A.3.2):

_____, _____, or _____.

3.1.2 Enter ID and Password.

3.1.3 If both the meteorological tower and the station vent monitor are operable, follow the steps in Exhibit 4.4.9-A.

3.1.4 If a source term and/or meteorological conditions have been provided (as in an exercise or test of the Plan), follow the steps in Exhibit 4.4.9-B for a quick dose estimate. Step 3.3 of this procedure (DAC Calculation) provides a better (more accurate) calculation, and should be used after the initial assessment has been performed.

3.1.5 ERPIP 4.4.1 provides rapid procedures for estimating either the source term or the meteorological conditions, if normally available instrumentation is out of service.

3.2 COMPUTER CALCULATED ISOPLETHS

Note: DAC is capable of calculating simple isopleths such as those used on the board-mounted 10 and 50 mile maps. It is also capable of accounting for more complex meteorological effects such as plume rise, terrain effects and shifts in wind direction. It is recommended that before offsite emergency actions are initiated that comparisons be made (if practicable) between DAC estimated isopleths and those predrawn isopleths used on the board-mounted maps.

3.2.1 Using the phone at the computer console, access the DAC by dialing any of the following 1200 BAUD numbers(See Appendix A.3.2):

_____, _____, or _____.

3.2.2 Enter ID and Password.

3.2.3 Follow the steps set forth in Exhibit 4.4.9-C. This will generate isopleths analogous to the predrawn isopleths used in ERPIP 4.4.2.

3.2.4 If more complex calculations are required, obtain specialists knowledgeable in the use of the DAC (Appendix A.3.2)

3.3 BEST ESTIMATE DETERMINATION OF PROJECTED DOSES

Note: Procedure 3.1 assumes for purposes of an initial calculation that the relative abundances of release isotopes remains with time. The detector response will vary with changing isotopic mixtures. This procedure accounts for that effect. Further, if vent radiation monitors are inoperable or off-scale, it will be necessary to obtain estimates of the source term from other inputs (See ERPIP 4.4.3).

3.3.1 Using the phone at the computer console, access the DAC by dialing any of the following 1200 BAUD numbers(See Appendix A.3.2):

_____, _____, or _____.

3.3.2 Enter ID and Password.

3.3.3 If the release is from the main vent and is being monitored by the main vent monitor proceed to Exhibit 4.4.9-D and follow steps listed.

3.3.4 If the release is from the main vent and is being measured by any one of the monitors in ERPIP 4.4.3 Exhibit 4.4.3-C, Part C, note the ventilation flow rate from that area and the monitor reading and use these as inputs to Exhibit 4.4.9-E.

3.3.5 If release rates must be inferred from plant measurements such as RCS activity levels, or if release rates are to be determined based on estimated fuel failures and RCS leakage rates, follow the steps in Exhibit 4.4.9-E.

3.3.6 If a release rate has been estimated from ERPIP 4.4.7 or from Appendix C.1, use that value as input to Exhibit 4.4.9-E.

3.3.7 DOSES BASED ON ACCIDENT TYPE ONLY

Note: There may be a need to develop a preliminary perspective on the consequences of an accident, in advance of analyses of the source term. It may also be useful to compare actual estimates with pre-accident estimates. This is included as Release Option 4 of Exhibit 4.4.9-C. To perform this calculation follow the steps in Exhibit 4.4.9-E.

3.3.8 If the user wishes to input both release data and meteorological data, follow the steps in Exhibit 4.4.9-F (in lieu of Exhibit 4.4.9-E).

3.4 MODIFYING OR ESTIMATED RELEASES BASED ON FIELD DATA

Note: Any estimates based on plant measurements are subject to uncertainty. There may be systematic errors in instrument calibration, deviations from actual dispersion versus that computed, etc.

3.4.1 Obtain field measured dose rates corresponding to the maximum (peak center line) dose rates at that distance.

3.4.2 Obtain estimates of dose rates from 3.1 or 3.3 of this ERPIP, corresponding to the locations of field measurements.

Note: If the field measurements do not correspond to estimated peak center line dose rates, either (1) develop an estimated center line concentration, using the methods outlined in Appendix C.2, or (2) compare the field measured data directly with a DAC calculated dose rates isopleth corresponding to the location of interest.

3.4.3 Divide the values in 3.4.2 by the corresponding values in 3.4.1. These constitute correction factors which may be used as standard correction factors in the projection of doses. Separate correction factors for gamma dose and iodine concentration are entered via the menu lines 14 and 15, respectively.

3.5 ESTIMATING OFFSITE CONSEQUENCES BASED ON INPLANT RADIATION LEVELS

3.5.1 If estimates are available in terms of isotopic activity in the RCS or in containment atmosphere (from direct samples or from analyses - as from ERPIP 4.4.7 or Appendix C.1, Table C.1.1-II, page C.1-14), convert those values into a "leak rate" as follows:

Containment Atmosphere Activity

Containment air activity (uCi/cc) x 8 x 10^3 x percent per day leak rate = uCi/sec released.

Reactor Coolant Activity

- o Noble Gases

  RCS activity in uCi/ml x gpm leaked ex-containment x 63 = uCi/s released.

- o Halogens - steam line break or steam generator tube rupture RCS (uCi/ml) x gpm leaked ex-containment x 6.3 = uCi/s released.

- o Halogen - other accidents
  RCS (uCi/ml) x gpm leaked ex-containment x 0.0063 = uCi/s released.

3.5.2 The resultant values should be used as source term input in procedure 3.3.6 of this ERPIP (CRISO Release Option 3). If meteorological data is also being manually entered follow the steps in Exhibit 4.4.9-F and use release option 3.

EXHIBIT 4.4.9-A

QUICK DOSE ESTIMATE BASED ON STATION VENT
MONITOR READINGS

Note: Computer will prompt user to perform needed actions. This Exhibit is only provided as a quick refresher. (Refer to Exhibit 4.4.9-G and Appendix C.4) for the general procedures and to Table C.4-1 for an overall list of preset pushbutton options.

Step 1. Enter CNTL A (hold both keys down at the same time, release both). Then enter RETURN.

Step 2. Repeat call if displays shows "No Answer, Calvert Cliffs".

Step 3. Confirm met option is set to 1 and enter RETURN.

Note: If necessary to stop calculation at this or at any point, (as when meteorological data are bad or not current) enter RETURN until a prompt for the option to stop occurs. At that point, enter S for stop and then go to Step 1 of Exhibit 4.4.9-B.

Step 4. Enter RETURN (Effluent Release option should be set to 2).

Step 5. Enter RETURN (Accident Type should be set to 9).

Step 6. Enter RETURN (assumes Release Duration is 8 hours).

Step 7. Enter RETURN (99 sets Time Of Trip to clock time).

Step 8. Enter RETURN (only if Main Vent Flow Rates are normal.They cannot be off for this option; otherwise, the Monitor reading would be bad).

Step 9 Proceed to Step 10 (This step reserved for Exhibits F, G)

Step 10. Enter RETURN to continue with menu print or edit or enter S to stop (if

proceeding to another Exhibit)

Step 11 Enter RETURN to complete the source term calculation.

Step 12 Is bypassed in this Exhibit.

Step 13 Inspect source term printout for reasonableness and RETURN to record answers (about 1 minute). Compare and report calculated offsite whole body dose rates with those corresponding to the following emergency classes:

< 0.5 mrem/h	not an emergency
0.5-250 mrem/h	Alert
250-1000 mrem/h	Site Emergency
> 1000 mrem/h	General Emergency

Note: If isopleths are used for this purpose, just determine if an isopleth corresponding to any of the named values is displayed. The peak values and their distance beyond the site boundary are printed in the upper righthand corner of the isopleth plot.

Step 14. Enter RETURN to display projected doses.

EXHIBIT 4.4.9-B

QUICK DOSE ESTIMATE
(USER INPUT OF METEOROLOGY AND RELEASES-TEST OR DRILL)

Note: Computer will prompt user to perform needed actions. This exhibit is only provided as a quick refresher. Refer to Exhibit 4.4.9-G and Appendix C.4 for an overall list of preset pushbutton conditions.

Step 1. Enter CNTL and B (hold both keys down at the same time, release both) then enter RETURN.

Step 2. Proceed to Step 3 (Reserved for Exhibits A, C, E, and G.)

Step 3. Confirm met option is set to 2 and enter RETURN.

Step 4. Enter RETURN "Emergency Release Option" should be 3. ("Use Manual Entry of Release Data, Accident Type MCA") for manual entry.

Step 5. Enter RETURN ("Accident Type" should be set to 9). ("LOCA Best Estimate").

Step 6. Enter RETURN ("Remaining Duration of Release (hours") assumes 8 h remaining.
Duration can be changed if shorter release is anticipated).

Step 7. Enter RETURN ("Time of Reactor Trip or Accident") (99 sets time of trip to clock time).

Step 8. Enter RETURN (only if vent flow rates are normal, change to 0 if fans are off).

Step 9. Enter RETURN (for date of 99 which causes the meteorological data stored in workspace to be used which is nearest the clock time).

Note: The test meteorological scenarios should have been keyed into workspace using the DAC EM task prior to this run. If the data in the workspace file are bad, the user will be prompted in Step 13 for input.

Step 10. Enter RETURN to print the menu, S to start over.

Step 11. Enter RETURN to continue after confirming that menu contains correct entries, or edit the menu.

Step 12. Manual entry of effluent data will be prompted in this step. Meteorological data should not be prompted unless it was bad in the workspace file. (See Exhibit 4.4.9-G and example of CRISO run in Appendix C.4).

Step 13. Check input data print. Enter RETURN to compute, S to stop.

Step 14. Enter RETURN after each display.

Step 15. Compare and report calculated gamma doses with those corresponding to the following emergency classes:

< 0.5 mrem/h	not an emergency
0.5-250 mrem/h	Alert
250-1000 mrem/h	Site Emergency
> 1000 mrem/h	General Emergency

Note: If isopleths are used for this purpose, just determine if an isopleth corresponding to any of the named values is displayed. The peak values and their distance beyond the site boundary are printed in the upper righthand corner of the isopleth plot.

Step 16. Enter RETURN to display projected doses.

EXHIBIT 4.4.9-C

STANDARD DISPERSION ISOPLETHS (X/Q ESTIMATES)
(USING CURRENT METEOROLOGICAL DATA)

Step 1. Enter CNTL C and RETURN.

Step 2. Repeat call if necessary.

Step 3. Enter RETURN (meteorology option should be 1) can be set to a 2 for historical or 3 for manual entry.

Step 4.
Step 5.
Step 6.
Step 7. These four steps are automatically bypassed (no prompt will occur).

Step 8. Enter RETURN (for normal flow rates) Change to 0 if fans are not operational.

Step 9. There should normally be no prompt for historical date unless selected in Step 3.

Step 10. Enter RETURN to see menu or S to stop.

Step 11. Enter RETURN to continue if okay. Edit menu if necessary.

Step 12. Edit of meteorological or radiological data is automatically bypassed unless manual entry is required.

Step 13. Check data print.
Enter RETURN to compute or S to stop.

Step 14. Enter RETURN after each display.
A separate X/Q isopleth will be plotted for each active release point.

EXHIBIT 4.4.9-D

ENHANCED ASSESSMENT OF OFFSITE DOSES FROM MONITORED VENT RELEASES

Step 1. Enter CNTL D and RETURN. An automatic phone call should be made to bring in the current data.

Step 2. Repeat call if necessary.

Step 3. Enter RETURN (meteorology option should be set to 1.)

Step 4. Enter RETURN (release option should be 1.)
(Option 2 can be selected. If the accident type is known, this would allow vent readings to be weighted by a more appropriate MCA spectrum.)

Step 5. Enter RETURN
(Normally Set to 9 if option 1 is used in Step 4. Otherwise, enter appropriate accident type.)

Step 6. Enter 3.0 (example).
(Your actual estimated remaining time of release in hours.)

Step 7. Enter 8 1 1 0 0 3 1 2 4 3 (example).
(The actual time of trip including minutes.)

(Date of reactor trip if source term is from fuel failure, otherwise, estimate time by counting back from the time of the start of the release based on the estimated age of the fission products; (e.g., from ERPIP Exhibit 4.4.5-C) RCS leaks, assume "reactor trip" was 2.5 hours before release began; waste gas, assume "reactor trip" was 10 hours before release began; fuel handling accident, assume "reactor trip" was 10 hours before release began.)

Step 8. Enter RETURN (if flow rates are normal.)

Step 9. Prompt for historical data should be automatically bypassed for menu "D".

Step 10.
Enter RETURN to continue or S to stop.

Step 11. Edit menu if necessary or continue on.

Step 12. No manual entry of data should be required.

Step 13. Check source term print.
Enter RETURN to compute or S to stop.

EXHIBIT 4.4.9-D (continued)

Step 14. Enter RETURN after each display to continue to the next one.

ACTION

The following displays should ensue:

Gamma dose isopleth
Thyroid inhalation dose isopleth
Thyroid milk pathway dose isopleth
Projected gamma and thyroid dose plot
Summary print

EXHIBIT 4.4.9-E

ENHANCED ASSESSMENT OF OFFSITE DOSES FROM UNMONITORED RELEASES - CURRENT METEOROLOGICAL DATA

Step 1. Enter CNTL E and RETURN. An automatic call will be made if data are not current.

Step 2. Repeat call if necessary.

Step 3. Enter RETURN (meteorology option should be 1).
(If meteorological data are not current or are bad, stop the run as soon as possible and schedule pushbutton "F" which will prompt for missing data.)

Step 4. Enter RETURN.
(If manual entry of data, option 3 is desired. Two other choices, options 4 and 5, are also available.)

Step 5. Enter RETURN.
(IF the accident type does not change, a new accident type can be selected here or later in the menu edit.)

Step 6. Enter _____.
(A current estimate of remaining duration of release.)

Step 7. Enter time of trip.

Step 8. Enter RETURN.
(If vent flows are normal, otherwise enter correct flows).

Step 9. There should be no prompt for historical dates.

Step 10. Enter RETURN to continue or S to start over.

Step 11. Edit menu if necessary or compute source term

Step 12. Manual entry of meteorological data is automatically bypassed since current data are being used.

Entry of release data is required if release option 3 or 5 is selected. See the description in Exhibit 4.4.9-G and examples in Appendix C.4.

Step 13. Check data print.

Step 14. Enter RETURN after each display.
The same displays as for menu "D" will ensue.

EXHIBIT 4.4.9-F

ENHANCED ASSESSMENT OF OFFSITE DOSES FROM
UNMONITORED RELEASES - TEST OR DRILL
METEOROLOGICAL DATA

Note: Computer will prompt user to perform needed actions. This exhibit is only provided as a quick refresher. Refer to Exhibit 4.4.9-G and Appendix C.4 for an overall list of preset pushbutton conditions.

Step 3. Confirm met option is set to 2 and enter RETURN.

Step 4. If manual entry of release is intended (option 3) Enter RETURN.
Enter 4 if only accident type is known (no data or releases).
Enter 5 for user assessment of releases based on fuel failures and RCS leakage.

Step 5. Enter RETURN. (If the accident type does not change, a new accident type can be selected here or later in the menu edit).

Step 6. Enter _____. (A current estimate or remaining duration of release).

Step 7. Enter time of trip.

Step 8. Enter RETURN, if vent flow rates are normal otherwise, enter new values.

Step 9. Enter RETURN (99 indicates that the meteorological data prestored in workspace for the current time will be used, otherwise enter desired historical data).

Step 10. Enter RETURN to continue S to stop.

Step 11. Edit menu if necessary or continue with calculation.

Step 12. Manual entry of effluent data will be prompted in this step. Meteorological data should not be prompted unless it was bad in the workspace file. (See Exhibit 4.4.9-G and example of CRISO run in Appendix C.4).

Step 13. Check release data print and enter RETURN to continue.

Step 14. Enter RETURN after each display.

EXHIBIT 4.4.9-F (continued)

Step 15. Compare and report calculated gamma doses with those corresponding to the following emergency classes:

< 0.5 mrem/h	not an emergency
0.5-250 mrem/h	Alert
250-1000 mrem/h	Site Emergency
> 1000 mrem/h	General Emergency

Note: If isopleths are used for this purpose, just determine if an isopleth corresponding to any of the named values is displayed. The peak values and their distance beyond the site boundary are printed in the upper righthand corner of the isopleth plot.

Step 16. Enter RETURN to display projected doses.

EXHIBIT 4.4.9-G

GENERAL PROCEDURE FOR DOSE
ESTIMATES USING "PUSHBUTTON" OPTIONS.

(Note: See Appendix C.4 for refresher summary of the use of DAC)

It is assumed that the user has already accessed(dialed) the DAC system and responded to the log in procedure.

To begin, simply answer the questions that appear on the screen.

PROMPT: ENTER USER ID

ENTER: (enter valid ID)

PROMPT: ENTER PASSWORD

ENTER: (enter valid password)

PROMPT: ENTER NUM: UNIT: NAME
(You are now ready to make a run. This calculation uses the CRISO program. Several preset versions can be scheduled by pressing a single key ("pushbutton") as follows).

Step 1 - (example for pushbutton "A")

Enter CNTL A (hold both keys down at the same time) and then RETURN (this schedules CRISO with the "A" menu. Six pushbuttons are available from A through F.)

Monitor the following displays (no user entry is needed). The program will display messages describing the options set in the "A" (or appropriate) menu. Some options require current meteorological and effluent data which will cause a call to be automatically made to the computer at the meteorological tower. Additional print will indicate when the data are current (see examples attached to Appendix C.4).

Step 2

If a print appears that says "no answer Calvert Cliffs", the user can schedule another call in response to the following prompt:

PROMPT: IF NO ANSWER, SCHEDULE ANOTHER CALL (0=NO, 1=YES)

ENTER: 1 (Repeat until data are current or an obvious problem exists)

Step 3

Mandatory entry or verification (Steps 6-11). Certain key questions about available options and plant condition must be acknowledged next. (Note: There are the first six items in the menu). Following are examples (refer to Exhibits A-F for specifics).

PROMPT: METEOROLOGICAL DATA OPTION IS: 1
"MOST RECENT MET"
ENTER C TO CHANGE, RETURN FOR NO CHANGE

ENTER: Return
(to keep the same)
(Note: if meteorological data are not good or not current, the option "3" manual entry should be chosen after entering a "C" or the run terminated)

Step 4

PROMPT: RELEASE OPTION IS 1
"USE CURRENT MONITOR DATA AND DEFAULT MCA"

ENTER: Return
(Note: if effluent data are bad or not current, option "3" should be entered after selecting "C" to change to enable manual entry or the run terminated)

Step 5

PROMPT: ACCIDENT TYPE IS 0

ENTER: Return
(This prompt will only occur if release mode 2, 3 or 4 is selected)

Step 6

PROMPT: REMAINING DURATION OF RELEASE (HOURS)
ENTER C TO CHANGE, RETURN FOR NO CHANGE

ENTER: Return
(This value is preset or compute. Check it for reasonableness and return or enter "C" and change it)

Step 7

PROMPT: TIME OF REACTOR TRIP OR ACCIDENT
(YRMODYHRMN) 99

ENTER: Return
(A value of 99 will set the start to the current time)

Step 8

PROMPT: VENT FLOW RATE FOR REL PTS 1-4 . . . . .
ENTER C TO CHANGE, RETURN FOR NO CHANGE

ENTER: Return or C

(This is an important question since the flow rate controls plume rise. This values printed from the menu are normal "fans operating" flows. If the fans are off, set these to 0. Enter all four values separated by commas.)

Step 9

PROMPT: METEOROLOGICAL DATA TYPE (0=RAW, 1=WORKSPACE)

ENTER: 1
(Generally workspace would be used)

PROMPT: DATE FOR HISTORICAL DATA

ENTER: 8101..... (as appropriate)

If historical meteorological data are being used, a prompt for the file and date will occur. These must be answered to proceed. A "99" in the date field means that the value nearest the clock time is to be used.

Step 10 - Menu Print

If RETURN is entered the menu will now print. Check it briefly to be sure the proper options are set.

PROMPT: EDIT OR PRINT

ENTER: Enter EDIT or PRINT as desired

Step 11 - Menu Edit or Compute

Edit the menu and reprint if necessary (refer to Appendix C.4)

Step 12 - Manual Data Entry

If all required data are current and good the calculation can proceed. The user will be prompted for data entry at this point only if necessary data are missing.

Data prompts are of threee types (1) meteorological, (2) effluent (from option 3) in units of CPM, uCi/cm^3, mR/h, uCi/s (total) and uCi/s of each isotope and (3) user assessment of conditions (option 5 effluent).

Meteorological prompts are as follows:

PROMPT: ELEV. DIR IS BAD, (NO DEFAULT ALLOWED, INPUT NEW VALUE)

ENTER: Enter appropriate value of wind direction

PROMPT: ELEV. SPD IS BAD, DEFAULT IS 1.0 MPH
INPUT VALUE (RETURN=USE DEFAULT)

ENTER: Enter appropriate value of wind speed or use default value

PROMPT: ELEV. DT IS BAD, WANT SIGMA THETA? (0=NO, 1=YES)

ENTER: Enter desired option for determining stability conditions

PROMPT: ELEV. DT IS BAD, DEFAULT IS .1 DEGF
INPUT VALUE (RETURN=USE DEFAULT)

ENTER: Enter appropriate value of Δ T

(May have to be repeated for ground level releases)

Effluent prompts occur for release options 3 and 5.
If Option 3 is selected the following probts occur:

PROMPT: ENTER 0=MONITOR READING IN PROPER UNITS
1=ACTUAL RELEASES (UCI/SEC) BY ISOTOPE

ENTER: 0,(for input by channel)

The following prompts will occur for all active channels:

PROMPT: EMERGENCY RELEASE OPTION 3 INPUT:
ENTER VENT RADIATION READING

ENTER: Enter appropriate value

PROMPT: ENTER FLOW MONITOR READING

ENTER: Enter appropriate value

PROMPT: CURRENT VENT CONVERSION FACTOR TO UCI/CC IS 7.6E-7
ENTER NEW VALUE, RETURN FOR NO CHANGE

ENTER: Enter appropriate value

Start of prompts for next monitor channel follows:

PROMPT: ENTER VENT RADIATION READING

ENTER: Enter appropriate value

PROMPT: ENTER FLOW MONITOR READING

ENTER: Enter appropriate value

PROMPT: CURRENT VENT CONVERSION FACTOR TO UCI/CC IS 7.6E-7
ENTER: NEW VALUE, RETURN FOR NO CHANGE

ENTER: Enter appropriate value

If Option 3 had been selected where direct entry of Ci/sec by isotope is to be made (by entering a "1" in response to the first Option 3 prompt), the following prombts will occur:

PROMPT: ENTRY OF DATA FOR RELEASE POINT 1 ENTER ISOTOPE NAME

RESPONSE: (enter desired isotope name)

PROMPT: ENTER RELEASE RATE FOR ISOTOPE XE133 (UCI/SEC):

RESPONSE: (enter desired release rate)

PROMPT: ENTER ISOTOPE NAME

RESPONSE: (enter desired isotope name)

PROMPT: ENTER RELEASE RATE FOR ISOTOPE I131 (UCI/SEC):

RESPONSE: (enter desired release rate)

Prompts for the second release point start here.

PROMPT: ENTRY OF DATA FOR RELEASE POINT 2 ENTER ISOTOPE NAME

RESPONSE: (enter desired isotope name)

PROMPT: ENTER RELEASE RATE FOR ISOTOPE XE133 (UCI/SEC):

RESPONSE: (enter desired release rate)

PROMPT: ENTER ISOTOPE NAME

RESPONSE: (enter desired isotope name)

PROMPT: ENTER RELEASE RATE FOR ISOTOPE I133 (UCI/SEC):

RESPONSE: (enter desired release rate)

Prompts for additional release points, if active, will start here.

If Option 5 (user assessment of releases) is selected a series of up to 8 questions must be answered.

PROMPT: ENTER FRACTION OF CORE INVOLVED

RESPONSE: (Enter appropriate fraction)

PROMPT: ENTER GAP RELEASE OR FUEL MELT (0=GAP, 1=MELT)

RESPONSE: (0 or 1 as appropriate)

PROMPT: ENTER RCS LEAK RATE IN GPMTO CONTAINMENT

RESPONSE: (enter value in GPM)

PROMPT: ENTER RCS SYSTEM VALUE IN GALLONS (0=DEFAULT OF 100,000 GALLONS, OR ENTER NUMBER)

RESPONSE: Enter spray or non-spray (0=spray, 1=non-spray) (enter if containment sprays are on or not)

PROMPT: ENTER CONTAINMENT LEAK RATE IN %/DAY

RESPONSE: (enter design leak rate unless greater rate is known to be occuring)

PROMPT: ENTER RCS LEAK RATE TO OUTSIDE CONTAINMENT (RCS)

RESPONSE: Enter leak rate in spur to location other than containment atmosphere)

PROMPT: ENTER IF SL BREAK OR SG TUBE RUTURE (0=NO, 1=YES)

RESPONSE: This directs the leakage to the stream generator or tube rupture rather than the auxiliary building.

Step 13 - Data Print

A one page summary of the meteorological and release data will be printed. A prompt will occur to proceed with calculation. Enter RETURN to continue.

Step 14

A pause will occur while the calculations are being made and then the selected displays will occur in sequence with a prompt for C to continue or S to stop after each display.

Step 15

Compare results with action level doses if appropriate.

Step 16

ENTER: RETURN
(To continue to next display or S to stop program)

EXHIBIT 4.5.1-A AFFECTED AREA EVACUATION CRITERIA

AREA	OUTSIDE CONTROLLED AREA	INSIDE CONTROLLED	
Personnel		Unessential Personnel	Essential
Precautionary Removal of Personnel from Area			
Exposure Rate (mR/h)	≥ 0.5 (lasting 10h)	≥ 2.5	≥ 1000(a)
Airborne Activity (uCi/cm^3) unevaluated	≥ 1.0E-10	≥ 9.0E-09	≥ 3.6E-07(c)
Mandatory Evacuation			
Exposure rate (mR/h)	≥ 2.5 (lasting 10h)	≥ 100	
Airborne Activity (uCi/cm^3) unevaluated	≥ 4.2E-09 (b)	≥ 9.0E-09	≥ 4.6E-06(d)

Notes:

(a) As deemed necessary, the SEC may elect to utilize higher exposure rates for emergency response personnel for life-saving and facility saving actions based on pre-planned occupational radiation exposures under emergency conditions. Assessment actions should be planned within regulatory and administrative exposure limits. (See ERPIP 4.6.1).

(b) Equal to 25% of weekly limit (unrestricted area).

(c) Equal to 40 MPC h unevaluated. Respiratory protection should be utilized unless unfeasible.

(d) Equal to 520 MPC h unevaluated (Quarterly Limit 10CFR20.103(a)(1)). Respiratory protection should be utilized unless unfeasible.

3.1.2.6 Establish Controlled Areas within the protected area or plant if areas are found which exceed Clean Area limits.

3.1.2.7 Isolate Controlled Areas as directed by the RPD, RAD or SEC with physical barriers to restrict access and hang signs stating "CAUTION-RADIATION AREA-RADIOACTIVE MATERIALS-AUTHORIZED ENTRY ONLY."
Isolated & Posted: _____ / _____
Initials Time

3.1.2.8 Establish a control point for access into each contaminated area if access to the area will be required prior to decontamination.

3.1.2.9 Request RPD to notify ESTL of newly established Controlled Area and security requirements.

3.1.2.10 Contact the Dosimetry Team Leader, RPD or other monitoring team leaders to verify that each person requiring entry into a Controlled Area:

(1) Has not exceeded and is not anticipated to exceed allowable exposure limits.

(2) Is properly badged.

(3) Is familiar with the information contained in ERPIP 4.6.1.

(4) Is properly equipped based on the specific isotopes and forms of contamination.

3.1.2.11 Monitor individuals leaving a Controlled Area, record results and report to the RPD.

3.2 On declaration of either a "SITE EMERGENCY" or "GENERAL EMERGENCY" and orders to evacuate the Site (and Guard Houses), the following Access Control actions must be carried out:

3.2.1 Emergency Security Team Members shall:

3.2.1.1 Implement ERPIP Appendix D.3, Traffic Control.

3.2.1.2 Collect all TLD badges, SRDs, logs, buttons, cards, pens and equipment necessary to continue basic security access control (both entry and exit) and load into a security vehicle.

-NOTE-

TLDs and SRDs shall have first priority for removal from the guard house and shall be taken to a low exposure rate area.

3.2.1.3 Proceed to the perimeter control point/Assembly Area established on the straight section of the plant access road (just before passing under transmission lines) as directed by the ESTL or RPD.

3.2.1.4 Conduct site evacuation and accountability in accordance with ERPIP 4.5.1.2 or 4.5.1.3, as appropriate, and 4.10.

3.2.1.5 As requested by the ESTL, report to an Emergency Center to assist in communication with and coordination of State, Federal and local police agencies.

3.2.1.6 Provide the necessary direction to State and local police to unify the concurrent enforcement of access control efforts to the CCNPP site.

(1) Assure all vehicles are stopped at the perimeter control point.

-CAUTION-

ENSURE THAT MAXIMUM EFFORT IS MADE TO CONTACT THE OSC, PLANT EMERGENCY STAFF, CONTROL ROOM OR A PLANT CONTACT REQUESTED BY THE PERSON SEEKING ACCESS PRIOR TO DISALLOWING ACCESS TO THE PLANT.

(2) Ensure that all persons leaving the perimeter control point for the plant are properly equipped with dosimeters and ID badges and are properly directed and cautioned. Document the Dosimetry Issuance on Table B.3-3, Dosimetry Issue Log.

(3) Ensure that escorts are provided (by Security or personnel qualified to escort) as applicable.

-NOTE-

Only the first of several emergency vehicles proceeding to a single location at the plant requires escort. Additionally, searches of emergency vehicles may be waived.

3.2.1.7 Assist the Emergency Radiation Team members as directed by the ESTL or SEC to assure the proper establishment,

moving and reestablishment of the perimeter control boundary.

3.2.1.8 Control access to newly established Controlled Areas both inside and outside the protected area fence when requested by the RPD or RAD.

3.2.1.9 If Dosimetry Team members are assigned to an Access Control Point, assist in the Dosimetry issue, recovery, and documentation.

3.2.2 Onsite Monitoring Team Members shall:

3.2.2.1 Perform radiation surveys onsite as requested by the RPD or SEC in accordance with ERPIP 4.3, then document and report all results to the ECC.

3.2.2.2 Periodically reevaluate the location of the perimeter control point and relocate when local activity levels are anticipated to exceed Clean Area limits.

3.2.2.3 Establish Controlled Areas onsite but outside the protected area fence based upon projected doses and radiation surveys by identifying the specific boundaries of the area, setting up physical barriers and signs where practicable, and reporting these areas to the ECC.

3.2.2.4 Request RPD to notify ESTL of newly established Controlled Area and security requirements.

3.2.2.5 Contact the Dosimetry Team Leader or other monitoring team leaders to verify that each person requiring entry into a Controlled Area:

(1) Has not exceeded and is not anticipated to exceed allowable exposure limits.

(2) Is properly badged.

(3) Is familiar with the information contained in ERPIP 4.6.1.

(4) Is properly equipped based on the specific isotopes and forms of contamination.

3.2.2.6 Monitor all persons leaving Controlled Areas, record, and report results obtained to the RPD.

3.2.3 Gate and Access Monitoring Team Members shall perform actions in Step 3.1.2 as necessary.

-CAUTION-

ENSURE THAT RWPs ARE COMPLETED PRIOR TO ENTRY OF AREAS NORMALLY UNDER ACCESS CONTROL. ALSO, ENSURE SWPs ARE COMPLETED FOR ENTRY INTO AREAS WITH CONTROLLED ACCESS DUE TO EMERGENCY STATUS AND THAT QUALIFIED MONITORING PERSONNEL ARE PRESENT AS NECESSARY.

attached to the mask itself.

3.3.8 Take care to insure that regulators are not damaged while working in confined areas.

3.3.9 Use glove boxes, hoods, contamination containment devices or other engineering controls whenever practical to eliminate or minimize the need for respiratory equipment.

3.3.10 Refer to RCP 3-805 for specific adjustments to be made on flow rates for respirator maintenance.

3.4 Documentation

3.4.1 Fill out Form RCP 3-805-1 whenever a respirator is used.

3.4.2 Fill out Form RCP 3-805-2 if an individual is exposed to 0.1 MPC or greater airborne activity.

EXHIBIT 4.5.3-A

GUIDANCE FOR RESPIRATORY PROTECTION

Consider Particulate and Iodine separately in mixed airborne fields and select respiratory protection to meet the most restrictive case. Table 6.9.1 of the Technical Specifications shall also be used as a guide.

(C_i/MPC_i)	Recommended (2)	Acceptable (2)
A. Particulate		
< 1/10	No respirator	Use respirator if other conditions warrant.
≥ 1/10 but< 5	Cartridge or cannister with PF (1) = 50	No respirator but record MPC-h < 10 h /wk.
≥ 5 but< 100	Atmosphere - supplying Respirator PF = 1000	Cartridge or cannister and record MPC-h < 10 h /wk.
≥ 100	Atmosphere-supplying Respirator and record MPC-h < 10 h /wk.	--
B. Iodine		
< 1/10	No respirator	Use respirator if other conditions warrant.
≥ 1/10 but< 10	Filter cartridge (PF=1) and record MPC-h < 10 h wk.	No respirator but record MPC-h< 10 h /wk.
≥ 10 but< 100	Atmosphere-supplying respirator PF = 1000	Filter cartridge PF = 1, record MPC-h≤ 10 h /wk
≥ 100	Atmosphere-supplying respirator. PF = 1000 record MPC-h< 10 h /wk.	--

(1) PF = protection factor

(2) Form RCP 3-805-1 is to be filled out whenever a respirator is issued.

(3) A log will be kept to ensure that no individual normally exceeds 10 MPC-h/wk. airborne exposure. Form RCP 3-805-2 is to be filled out if an individual is exposed to 0.1 MPC or greater airborne activity.

TITLE: **ONSITE ADMINISTRATION OF RADIOPROTECTIVE DRUGS**

1.0 RESPONSIBLE INDIVIDUAL

1.1 The Radiation Protection Director and/or Radiological Assessment Director are responsible to evaluate need for administration of radioprotective drugs to "high risk" onsite emergency personnel.

1.2 The Calvert Cliffs Physician Assistant or the Plant Health Physicist is responsible for dispensing the radioprotective drugs for use in an emergency.

2.0 CONDITIONS AND PREREQUISITES

A release of gaseous radioactive materials from which any onsite individual is expected to receive thyroid dose greater than 0.9 rem (40 MPC h for

$$\sum \frac{\text{CIodine}}{\text{MPCIodine}}$$

from airborne radioiodine.

3.0 ACTIONS AND LIMITATIONS

-NOTE-

If the nature of the gaseous release indicates the potential for significant levels of iodine consider immediate administration of radioprotective drugs to Offsite Monitoring Teams prior to survey initiation.

3.1 Remove personnel from areas of high radioiodine concentration (as advisable considering personnel and plant safety) and/or consider making stable iodine as a thyroid blocking agent available for proper administration.

3.2 If a thyroid blocking agent is to be administered, assure that single doses consisting of: (1st Priority) 2 or 3 drops (or 100 mg) of Saturated Solution of Potassium Iodide (SSKI) in a glass of water, or (2nd Priority) 1 tablet (130 mg) are administered to affected individuals as soon as possible.

-NOTE-

Administration of SSKI is preferably done within two hours of exposure; however, if this time is impractical, administration beyond two hours will still reduce the biological half life of the radioiodine. Approximately 300 doses of SSKI are located in the Controlled Area First Aid Room at El.69' of the Auxiliary Building. Approximately 5000 doses are located in the Service Building Medical Office.

3.3 Consult the BG&E Medical Director (phone no. in Appendix A.3) for continued or subsequent usage of KI.

EXHIBIT 4.5.4.1-1

RADIOPROTECTIVE DRUG ADMINISTRATION RECORD

DATE	TIME	ADMINISTERED TO	Emp. CONTROL #	DRUG	DOSE	COMMENTS

DISPENSED BY: (Signature)

2. Women capable of reproduction shall not take part in these actions.
3. Internal exposures shall be minimized by respiratory protection and contamination controlled by the use of protective clothing.
4. If the retrospective dose from these actions is a substantial fraction of the prospective limits, the actions shall be limited to once in a lifetime.
5. Entry into high radiation areas shall not be permitted unless instrumentation capable of reading radiation levels of up to 1000 R/h (gamma) is provided.
6. Each emergency worker entering a high radiation area shall wear pocket dosimeters capable of measuring the expected exposure to be received.
7. Entry into radiation fields of greater than 10R/h shall not be permitted unless specifically authorized by the Site Emergency Coordinator and Radiation Protection Director.
8. Planned exposures in excess of 3 rem shall be approved by the SEC and RPD.

2.1.2 DURING RECOVERY PHASE

2.1.2.1 Recovery of Deceased Victims

Normally, the SEC and RPD shall not allow recovery personnel to exceed the regulatory radiation exposure limits for the recovery of deceased victims; however, in special circumstances the SEC may approve a wavier of these limits.

2.1.2.1.1 In those situations where the bodies are located in areas inaccessible becuase of high direct radiation fields, and where the recovery mission would result in exposures in excess of 10CFR20 limits, special remote recovery devices should be used to retrieve the bodies.

2.1.2.1.2 Where it is impossible to recover bodies without the entry of emergency personnel into an area, the SEC may determine

it necessary to exceed the regulation exposure limits. The planned exposure of an individual participating in the recovery should stay within 10 CFR 20 guidelines.

3.0 ACTIONS AND LIMITATIONS

3.1 Brief personnel on expected dose rates, stay time and other hazards and precautions including the following:

3.1.1 Every reasonable effort will be made to minimize Reentry Team personnel exposure.

3.1.2 Under emergency conditions not requiring action to prevent serious injury or to prevent substantial loss of property, reentry team personnel exposure shall not exceed 10CFR20 limits. (Exposure limit specified on Emergency Work Permit and for access control card RCP 3-7054).

3.1.3 Under emergency conditions where immediate action is necessary to prevent serious injury or to prevent substantial loss of property, reentry team personnel exposures authorized by the Site Emergency Coordinator, with consent of the individuals to be exposed shall not exceed a maximum planned body dose of 25 rad whole body except for life saving purposes. (Section 2.1.1.1.2)

3.1.4 Under emergency conditions where the hazards are such that life would be in jeopardy or there would be severe effects on health of public, reentry team volunteers may receive a maximum planned whole body dose of up to 100 rad. (Section 2.1.1.1.1)

3.1.5 Use of protective clothing, dosimeters, respiratory devices and other protective devices as spcified on Emergency Work Permit.

3.1.6 Dangers in deviating from the planned route, unless required by unanticipated conditions such as rescue or performing an operation that would minimize the emergency condition.

3.1.7 Requirements for immediately communicating with the Site Emergency Coordinator or the RPD or returning to the area from where they were dispatched when the monitored dose rates or stay times encountered during the reentry exceed the limits set for the reentry operation.

3.1.8 On egress from a contaminated area, follow self-monitoring and personnel decontamination procedures as specified by the RPD and then

TITLE: EMERGENCY WORK PERMITS AND EXPOSURE CONTROL

1.0 RESPONSIBLE INDIVIDUALS AND OBJECTIVES

The Radiation Protection Director is responsible to the Site Emergency Coordinator to ensure that this procedure is appropriately implemented and acts as the Emergency Reentry Monitoring Team Leader for initial entry and all subsequent entries until radiological conditions are defined and posted.

The Emergency Reentry Monitoring Team Leader/Member is responsible to the Radiation Protection Director for the preparation of Emergency Work Permit (EWP).

Emergency workers and team leaders are responsible to the Site Emergency Coordinator for ensuring that emergency worker exposures are maintained within the guidelines of this procedure and ALARA to the extent possible.

2.0 CONDITIONS AND PREREQUISITES

2.1 As directed by the SEC following declaration of Alert, Site Emergency, or General Emergency.

2.2 ERPIP 4.6.1 provides guidelines on "Emergency Personnel Radiation Exposures."

3.0 ACTIONS AND LIMITATION

3.1 PRIOR TO AUGMENTATION OF SITE'S SHIFT EMERGENCY ORGANIZATION (i.e. PRIOR TO ARRIVAL OF RPD)

3.1.1 LIFESAVING (RESCUE) MISSIONS - under plant accident conditions with suspected abnormally high exposure rates (> 10 R/h) and/or airborne activity.

- CAUTION -

THIS GUIDELINE APPLIES TO THE REMOVAL OF INJURED PERSONS IF THE SAVING OF LIFE IS POSSIBLE, OR ENTRY TO PREVENT CONDITIONS THAT, IF LEFT UNCORRECTED, COULD LEAD TO DAMAGE OR RELEASES THAT WOULD PROBABLY INJURE NUMBERS OF PEOPLE ON OR OFF SITE.

IT MAY BE NECESSARY TO LIMIT DRASTICALLY AN EXTENSIVE RESCUE ATTEMPTS OR FIRST AID ACTIONS TO THE MORIBUND. DOSE ESTIMATES OF OVER 2000 RAD FOR EXTERNAL RADIATION OR OVER 2000 R/h FOR SKIN CONTAMINATION WOULD INDICATE THAT LITTLE COULD BE OFFERED TO SUCH CASUALTIES.

3.1.1.1 Entry to be made under pre-approved Emergency Work Permit, EWP#001 shown in EXHIBIT 4.8.1-B for life saving missions when radiological conditions are unknown. When conditions are known the ERMTL shall prepare a new EWP prior to the entry. (See Section 3.1.1.4 for exception).

3.1.1.2 Ensure that all entry personnel are wearing the proper protective equipment and personnel dosimetry. Complete EXHIBIT 4.8.1-H and/or Exhibit 4.8.1-I. Obtain from Emergency Reentry Equipment Locker located at the 69' Elevation, Auxiliary Building.

- CAUTION -

DONNING OF PROTECTIVE CLOTHING AND EQUIPMENT SHOULD NOT INTERFERE WITH IMMEDIATE LIFE-SAVING (RESCUE) EFFORTS BY FIRST REPORTING PERSONNEL. PROPERLY EQUIPPED TEAM MEMBERS WHEN AVAILABLE SHOULD PROMPTLY RELIEVE FIRST REPORTING PERSONNEL.

3.1.1.2.1 Clothing requirements may be notified by Interim RPD based on suspected conditions.

3.1.1.3 Obtain authorization from the interim RPD and SEC when exposures are expected to exceed the limits set forth in 10 CFR 20 (> 3 rem/qtr).

- NOTE -

Guidelines for exposure control in excess of 3 rem/qtr are found in ERPIP 4.6.1 for lifesaving cases.

3.1.1.4 The SEC may, at his discretion and as conditions warrant, defer requirements for an EWP, or portions thereof, prior to entry into a radiation area and give his authorization verbally.

3.1.1.4.1 An EWP shall be completed by the ERMTL for a verbally

authorized entry, as time permits, after the entry.

3.1.1.5 Entry shall be made such that radiation exposures are maintained as low as possible commensurate with radiation levels and lifesaving task.

3.1.1.5.1 Preplanned exposure limit for entry personnel shall be set prior to entry.

3.1.1.5.2 The maximum preplanned emergency personnel radiation exposure limit shall not exceed 100 rad. (ERPIP 4.6.1)

3.1.1.6 Entry personnel must be supervised and escorted by a ERMT member.

3.1.2 ACCIDENT MITIGATION OR PLANT SAVING MISSION - under plant accident conditions with suspected abnormally high exposure rates ($\geq$ 10R/h) and/or airborne activity.

- CAUTION -

THIS GUIDELINE APPLIES TO ENTRIES WHERE IT IS NECESSARY TO ENTER A HAZARDOUS AREA TO PROTECT THE FACILITY, ELIMINATE FURTHER ESCAPE OF EFFLUENTS, OR TO CONTROL FIRES.

3.1.2.1 Entry to be made under pre-approved Emergency Work Permit, EWP#002 shown in EXHIBIT 4.8.1-C, for Accident Mitigation or Plant Saving Missions when radiological conditions are unknown. When conditions are known the ERMTL shall prepare a new EWP prior to the entry (See Section 3.1.2.4 for exception).

3.1.2.2 Ensure that all entry personnel are wearing the proper protection equipment and personnel dosimetry. Complete EXHIBIT 4.8.1-H and/or Exhibit 4.8.1-I. Obtain from Emergency Reentry Equipment Locker located at the 69' Elevation, Auxiliary Building.

3.1.2.2.1 Clothing requirements may be modified by the Interim RPD based on suspected conditions.

3.1.2.3 Obtain authorization from the Interim RPD and SEC when exposures are expected to exceed the limits set forth in 10CFR20 (3 rem/qtr).

- NOTE -

Guidelines for exposure control in excess of 3 rem/qtr are found in ERPIP 4.6.1 for facility protection actions.

3.1.2.4 The SEC may, at his discretion and as conditions warrant, defer requirements for an EWP, or portions thereof, prior to entry into a radiation area and give his authorization verbally.

3.1.2.4.1 An EWP shall be completed by the ERMTL for a verbally authorized entry, as time permits, after the entry.

3.1.2.5 Entry shall be made such that radiation exposures are maintained as low as possible commensurate with radiation levels and facility saving task.

3.1.2.5.1 Preplanned exposure limit for entry personnel shall be set prior to entry.

3.1.2.5.2 The maximum preplanned emergency personnel radiation exposure limit shall not exceed 25 rad (see ERPIP 4.6.1).

3.1.2.6 Entry personnel are to be supervised and escorted by ERMT member.

3.1.3 Other RE-ENTRY MISSIONS

3.1.3.1 Post Accident Reactor Coolant Sampling - See EWP #003, EXHIBIT 4.8.1-D.

3.1.3.2 Post Accident Reactor Coolant Analysis - See EWP #004, EXHIBIT 4.8.1-E.

3.1.3.3 Post Accident Containment Sampling & Analysis - See EWP #005, EXHIBIT 4.8.1-F.

3.2 UPON AUGMENTATION OF SITE'S SHIFT EMERGENCY ORGANIZATION

3.2.1 Members of the Dosimetry Team, as designated by the Team Leader, shall perform the following actions:

3.2.1.1 Set up a dosimetry area in the Operational Support Center (or where designated by the Team Leader) containing the following items:

A supply of TLDs

A supply of Self Reading Pocket Dosimeters

A supply of the dosimetry forms including:

RCP 3-301-1 Weekly Dosimetry Record

RCP 3-302-3 Visitors Dosimetry Check

Sheet In/Out

RCP 3-705-1 Access Control Card

A supply of pencils and/or pens

3.2.1.2 Complete personnel dosimetry forms and issue proper dosimetry at the Operational Support center for incoming personnel in accordance with RCP 3-302, Exhibit 4.8.1-G, Exhibit 4.8.1-H, and Exhibit 4.8.1-I, as time permits.

3.2.1.3 The RPD may at his direction and as conditions warrant, defer requirements of RCP 3-302, or portions thereof, prior to specific individual's entry into a radiation area and give his authorization verbally. In this event, the exposure limitations of EXHIBIT 4.8.1-G apply.

3.2.1.4 Place TLD's in various areas outside the Protected Area, as specified by the Team Leader.

- NOTE -

The RPD may utilize other available personnel for this function. The DT then would be required to supply TLDs to those persons.

3.2.1.4.1 Record location of TLD(s) on EXHIBIT 4.8.1-J.

3.2.1.4.2 Periodically replace TLDs per team Leader's direction and record readings obtained from TLDs on 4.8.1-J.

3.2.1.5 Collect all "Access Control Cards, "RCP 3-705-1, and all TLDs for exiting personnel for processing, as directed by the Team Leader.

3.2.1.6 Record any and all additional dosimetry on RCP 3-705-1 for each person entering the radiation area.

3.2.2 Members of the Emergency Reentry monitoring Team, as designated by the Team Leader, shall perform the following:

3.2.2.1 Report to the Operational Support Center (or where designated by the Team Leader).

3.2.2.2 Established positive access control to prevent entry of unprepared and unauthorized individuals into hazardous radiation environments.

3.2.2.3 Obtain and complete Emergency Work Permits (i.e. EWP, EXHIBIT 4.8.1-A) prior to allowing personnel to enter a radiation area in accordance with RCP 3-603.

- NOTE -

1. EWPs vice RWPs or SWPs are to be used during the Occurrrence, Emergency and Recovery Phases of the accident. RWP and SWP requirements will be reestablished upon entry into the Restoration Phase of the accident.
2. Preapproved EWP #003, #004, #005 are included as EXHIBITS 4.8.1-D, E & F for Post Accident Reactor Coolant Sampling and Containment Atmospheric Sampling.

3.2.2.4 Require the wearing of high range dosimeters when:

3.2.2.4.1 Entering a radiation field greater than or equal to 10R/h.

3.2.2.4.2 Entering a radiation field of unknown intensities.

3.2.2.5 Require the use of SCBA or iodine-absorbing cartridges, when available, to reduce the intake of iodine if conditions are unknown or if iodine release on site has developed.

- NOTE -

PF for iodine-absorbing cartridges is 1.

3.2.2.6 Direct entry personnel to obtain dosimeters (W.B. TLD, Special dosimetry & SRD's) from the Dosimetry Team in accordance with RCP 3-303 requirements.

3.2.2.7 Obtain authorization for the RWP from the RPD and SEC when exposures are expected to exceed the limits setforth in 10 CFR 20 (> 3 rem/qtr).

- NOTE -

Guidelines for exposure control in excess of 3 rem/qtr may be found in ERPIP 4.6.1.

3.2.2.8 The SEC may, at his discretion and as conditions warrant, defer requirements, for an EWP or portions thereof,prior to entry into a radiation area and give his authorization verbally.

3.2.2.8.1 An Emergency Work Permit shall be completed by the ERMT for a verbally authorized entry, as time permits, after the entry.

- NOTE-

Any person that has received a whole body dose totaling greater than or equal to 5 rem by TLD for the year shall not be permitted to enter a controlled radiation area without approval of the Site

EXHIBIT 4.8.1-B
EMERGENCY WORK PERMIT

EWP # 001

EMERGENCY EXPOSURES LIMITS MAY APPLY

DATE & TIME INITIALED: _____ JOB DESCRIPTION: Life saving (rescue) missions under plant accident conditions with suspected abnormally high exposure rates (greater than 10R/h) and Airborne activity, must be escorted by Reentry Monitoring Team member. Use restricted to emergency phase only prior to emergency organization augmentation (arrival of RPD).

SPECIFIC LOCATION: Controlled Area

ESTIMATED REQUIRED DURATION IN AREA: 5 MIN (1)

(1) Minimizing stay time required.

ESTIMATED RADIOLOGICAL CONDITIONS

GEN. AREA DOSE RATE (1) rem/h EST. AIR ACTIVITY: (1) MPC I'; (1) MPC PART. (1)
EST. BASED ON: (1) Unknown, if known, interim RPD prepare new EWP.

PROTECTIVE DEVICES REQUIRED

- X Coveralls (1, 2 Pair)
- X Hood
- X Plastic (Pants, Shirt)
- X Rubber Overshoes
- X Plastic Shoecovers (1, 2 Pair)
- X Rubber Gloves
- X MSA 401/B10PAK-60 SCBA (PF = 10,000/5,000)
- ___ MSA Particulate (PF = 50)
- ___ MSA Char.-Part. (PF = 1)

Clothing requirements may be modified by interim RPD based on suspected conditions

SPECIFIED ROUTE TO WORK LOCATION (list radiological conditions expected and attach map showing route)
(Use ERPIP 3.5, 4.1.12, 4.6.1, and 4.6.2, and Appendix B2-7 thru B-11) Take route of lowest dose rates. Do not enter areas with exposure rates greater than 1200 R/h.

CONTINUOUS RADIATION SAFETY COVERAGE (Required) ~~(Not required)~~ Supervise entry personnel
Breif entry personnel on ERPIP 4.6.1 - Emergency Personnel Limits.

PERSONNEL MONITORING AND RADIAC EQUIPMENT REQUIRED

- ___ E520 (0-2000 mR/h)
- X PIC-6 (1mR/h-1000R/h), or equiv.
- ___ Teletector (0-1000R/h)
- (1) X RO-7 (0-2R/h, 0-200R/h, 0-20 kR/h)
- ___ PNR-4 REMBALL (0-5 rem/h)
- ___ Air Sampler (Portable, Lapel)
- X Radio (Portable)
- X Stop Watch

(Obtain from Emergency Reentry Equipment Locker 69' Aux.)

- X TLD
- X Special TLD (Hands, Feet, Head, _____)
- ___ Neutron TLD
- X SRD (0-200mR, 0-5R, 0-50R, 0-200R)
- X Alarming Dosimeter (0-200R) Set @ _____ R (2)
- ___ Other

(1) Required if exposure rates expected over 500 R/h (2) 50% of planned limit.

MAX DOSE LIMIT* ≤ 100 ~~rem~~ rad

AUTHORIZATION: (RPD) / (SEC)

Assigned Limit rad (Interim)

MAINTAIN EXPOSURES ALARA COMMENSURATE WITH RADIATION LEVELS AND TASK.
*EXPOSURES LIMIT FOR ONE ENTRY ONLY. FURTHER EXPOSURE REQUIRES NEW EWP. ADDITIONAL EXPOSURES MUST BE APPROVED BY THE RPD.

APPROVED D A Miller (RPD) 6/16/82 0930 (Date / Time) L. T. (SEC) 16/16/82 1130 (Date / Time)

Personnel Assigned to work under this entry permit must read and understand its requirements and conditions.
SIGNATURE BELOW INDICATES YOU HAVE READ AND UNDERSTAND THIS PERMIT.

EXHIBIT 4.8.1-C
EMERGENCY WORK PERMIT

EWP # 002

EMERGENCY EXPOSURE LIMITS MAY APPLY

DATE & TIME INITIALED: _____ JOB DESCRIPTION: Accident mitigation or plantsaving mission under plant accident condition with suspected abnormally high exposure rates (greater than 10R/h) and airborne activity, must be escorted by Reentry Monitoring Team member. Use restricted to emergency phase only prior to emergency organization augmentation (arrival of RPD).

SPECIFIC LOCATION: Controlled Area

ESTIMATED REQUIRED DURATION IN AREA: 5 MIN. (1)

(1) Minimizing staytime required.

ESTIMATED RADIOLOGICAL CONDITIONS

GEN. AREA DOSE RATE (1) rem/h EST. AIR ACTIVITY: (1) MPC I*: (1) MPC PART. (1)

EST. BASED ON: (1) unknown; if known, interim RPD prepare new ERP.

PROTECTIVE DEVICES REQUIRED (obtain from Emergency reentry locker 69' Aux. Bldg.)

- X Coveralls (1 2 Pair)
- X Hood
- ___ Plastic (Pants Shirt)
- X Rubber Overshoes
- X Plastic Shoecovers (1 2 Pair)
- X Rubber Gloves
- X MSA 401/B10PAK-60 SCBA (PF = 10,000/5,000)
- ___ MSA Particulate (PF = 50)
- ___ MSA Char.-Part. (PF = 1)

Clothing requirements may be modified by interim RPD based on suspected conditions.

SPECIFIED ROUTE TO WORK LOCATION (list radiological conditions expected and attach map showing route)

Use ERPIP 4.6.1 and Appendix B2-7 thru B2-11. Take route of lowest exposure rates. Do not enter areas with exposure greater than 300R/h.

CONTINUOUS RADIATION SAFETY COVERAGE (Required) (~~Not required~~) Supervise entry personnel. Brief entry personnel on ERPIP 4.6.1 - Emergency Personnel Radiation Exposure Limits

PERSONNEL MONITORING AND RADIAC EQUIPMENT REQUIRED (Obtain from Emergency Reentry Equip. Locker 69' Aux. Bldg.)

- ___ E520 (0-2000 mR/h)
- X PIC-6 (1mR/h-1000R/h), or equiv.
- (1) X Teletector (0-1000R/h)
- (1) X RO-7 (0-2R/h, 0-200R/h, 0-20 kR/h)
- ___ PNR-4 REMBALL (0-5 rem/h)
- ___ Air Sampler (Portable, Lapel)
- X Radio (Portable)
- X Stop Watch
- X TLD
- X Special TLD (Hands, Feet, Head, _____)
- ___ Neutron TLD
- X SRD (0-200mR (0-5R) (0-50R) 0-200R)
- X Alarming Dosimeter (0-200R) Set @ _____ R (2)
- ___ Other

(1) as required (2) 50% of Planned Limit

MAX DOSE LIMIT* ≤ 25 ~~rem~~ rad

AUTHORIZATION: (RPD) / (SEC)

Assigned Limit _____ rad (Interim)

MAINTAIN EXPOSURES ALARA COMMENSURATE WITH RADIATION LEVELS AND TASK.

*EXPOSURES LIMIT FOR ONE ENTRY ONLY. FURTHER EXPOSURE REQUIRES NEW EWP. ADDITIONAL EXPOSURES MUST BE APPROVED BY THE RPD.

APPROVED D Willis 16/16/82 0930 (RPD) (Date / Time) J. H 16-16-82 1130 (SEC) (Date / Time)

Personnel Assigned to work under this entry permit must read and understand its requirements and conditions. SIGNATURE BELOW INDICATES YOU HAVE READ AND UNDERSTAND THIS PERMIT.

EXHIBIT 4.8.1-D
EMERGENCY WORK PERMIT

EWP # 003

10 CFR 20.101 EXPOSURE LIMITS APPLY

DATE & TIME INITIALED: _____ JOB DESCRIPTION: Post-Accident Coolant sampling per ERPIP 4.4.7.3 involving very high level radioactivity (≥2.0R/h on contact) sample and transport of such samples by LRMT member (Use restricted to <35R/h (580 mR/min) in sampling room area subsequent to VCT recirculation commencement.

SPECIFIC LOCATION: Affected Units Sampling Room 45' Elev. Aux Bldg.

ESTIMATED REQUIRED DURATION IN AREA: 5 MIN. (1)

(1) Minimize stay time required.

ESTIMATED RADIOLOGICAL CONDITIONS

GEN. AREA DOSE RATE (2) ____ rem/h EST. AIR ACTIVITY: (2)(3) MPC I*; (3) MPC PART. (3)

EST. BASED ON: VCT recirc. line and sample sink may reach ≥1000 R/h on contact (2) Unknown (3) Airborne activity may be present during sampling.

PROTECTIVE DEVICES REQUIRED

X Coveralls (1) 2 Pair)	X Rubber Overshoes	X MSA 401/B10PAK-60 SCBA (PF = 10,000/5,000)
X Hood	X Plastic Shoecovers (1, (2 Pair))	____ MSA Particulate (PF = 50)
X Plastic (Pants) (Shirt) (Hood)	X Rubber Gloves	____ MSA Char.-Part. (PF = 1)
	X Lead Apron	X Lead Gloves

SPECIFIED ROUTE TO WORK LOCATION (list radiological conditions expected and attach map showing route)

CONTINUOUS RADIATION SAFETY COVERAGE (Required) ~~(Not required)~~ Supervise and control LRMT and ONMT radiation exposure per 4.4.7.3

PERSONNEL MONITORING AND RADIAC EQUIPMENT REQUIRED

____ E520 (0-2000 mR/h)	X TLD (at chest)
X PIC-6 (1mR/h-1000R/h), or equiv. (RO-4)	X Special TLD (Hands) (Feet) (Head) (Gonads)
____ Teletector (0-1000R/h)	____ Neutron TLD
X RO-7 (0-2R/h, 0-200R/h, 0-20 kR/h)	X SRD (0-200mR) (0-5R) (0-50R) (0-200R)
____ PNR-4 REMBALL (0-5 rem/h)	X Alarming Dosimeter ~~(0-200R)~~ Set @ (4) R
X Air Sampler (Portable, Lapel)	____ Other
____ Radio (Portable)	____
X Stop Watch (time expsoure per ERPIP 4.4.7.3)	____

(4) 50% of dose limit

MAX DOSE LIMIT* ≤ 3.000 rem /qtr. _____ / _____

AUTHORIZATION (RPD) (SEC)

Assigned Limit _____ rem/qtr. (total)

MAINTAIN EXPOSURES ALARA COMMENSURATE WITH RADIATION LEVELS AND TASK.

*EXPOSURES LIMIT FOR ONE ENTRY ONLY. FURTHER EXPOSURE REQUIRES NEW EWP. ADDITIONAL EXPOSURES MUST BE APPROVED BY THE RPD.

APPROVED D K Mullin 6/16/82 0930 _____ / _____

(RPD) (Date / Time) (SEC) (Date / Time)

Personnel Assigned to work under this entry permit must read and understand its requirements and conditions. SIGNATURE BELOW INDICATES YOU HAVE READ AND UNDERSTAND THIS PERMIT.

EXHIBIT 4.8.1-E
EMERGENCY WORK PERMIT

EWP # 004

10 CFR 20.101 EXPOSURE LIMITS APPLY

DATE & TIME INITIALED: _____ JOB DESCRIPTION: Post-Accident Reactor Coolant Analysis per ERPIP 4.4.7.4 involving very high radioactivity (≥2.0 R/h on contact) samples by LRMT members.

SPECIFIC LOCATION: Hot lab. - under exhaust hood with fan turned on and lead shielding in place.

ESTIMATED REQUIRED DURATION IN AREA: 120 MIN.

ESTIMATED RADIOLOGICAL CONDITIONS

GEN. AREA DOSE RATE (1) rem/h EST. AIR ACTIVITY: (1) (2) MPC I*: (2) MPC PART. (2)

EST. BASED ON: Projected accident scenario conditions (1) Unknown. (2) Airborne activity may be present during venting of PASCA/PASA, and during boron analysis

PROTECTIVE DEVICES REQUIRED

X Coveralls (1 2 Pair)	X Rubber Overshoes	X MSA 401/B10PAK-60 SCBA (PF = 10,000/5,000)
X Hood	X Plastic Shoecovers (1 2 Pair)	___ MSA Particulate (PF = 50)
X Plastic (Pants, Shirt)	X Rubber Gloves	___ MSA Char.-Part. (PF = 1)
X Lead Apron	X Lead Gloves	

SPECIFIED ROUTE TO WORK LOCATION (list radiological conditions expected and attach map showing route)

CONTINUOUS RADIATION SAFETY COVERAGE (Required) ~~Not Required~~ Supervise and control LRMT & ONMT radiation exposure per 4.4.7.4

PERSONNEL MONITORING AND RADIAC EQUIPMENT REQUIRED

___ E520 (0-2000 mR/h)	X TLD(at chest)
X PIC-6 (1mR/h-1000R/h), or equiv. (RO-4)	X Special TLD (Hands Feet Head Conads) (4)
___ Teletector (0-1000R/h)	___ Neutron TLD
X RO-7 (0-2R/h, 0-200R/h, 0-20 kR/h)	X SRD (0-200mR 0-5R 0-50R 0-200R)
___ PNR-4 REMBALL (0-5 rem/h)	X Alarming Dosimeter ~~(0-200R)~~ Set @ (3) ___ R
X Air Sampler (Portable, Lapel)	___ Other
___ Radio (Portable)	___
X Stop Watch	___

(3) 50% of Assigned Limit (4) Ring TLD

MAX DOSE LIMIT* ≤ 3.000 rem _____ / _____

AUTHORIZATION: (RPD) (SEC)

Assigned Limit _____ rem/qtr. (total)

MAINTAIN EXPOSURES ALARA COMMENSURATE WITH RADIATION LEVELS AND TASK.

*EXPOSURES LIMIT FOR ONE ENTRY ONLY. FURTHER EXPOSURE REQUIRES NEW EWP. ADDITIONAL EXPOSURES MUST BE APPROVED BY THE RPD.

APPROVED _____ 16/16/82 0930 _____ / _____

(RPD) (Date / Time) (SEC) (Date / Time)

Personnel Assigned to work under this entry permit must read and understand its requirements and conditions. SIGNATURE BELOW INDICATES YOU HAVE READ AND UNDERSTAND THIS PERMIT.

EXHIBIT 4.8.1-F
EMERGENCY WORK PERMIT

EWP # 005

10 CFR 20.101 EXPOSURE LIMITS APPLY

DATE & TIME INITIALED: _____ JOB DESCRIPTION: Performance of RPD required ONMT initial radiation surveys under unknown accident radiological conditions. (Use restricted ≤ 10R/h (167 mR/min). This permit is void in cases where radiological conditions are known.

SPECIFIC LOCATION: As defined by RPD

ESTIMATED REQUIRED DURATION IN AREA: Determined by RPD MIN. (1)

(1) Minimize stay time required through expeditious surveying

ESTIMATED RADIOLOGICAL CONDITIONS

GEN. AREA DOSE RATE < 10 rem/h EST. AIR ACTIVITY: (2) (3) MPC I*; (2) MPC PART. (3)
EST. BASED ON: (2) Unknown; if known, prepare new EWP. (3) Airborne activity may be present inside protected area and down wind in plume within site boundry.

PROTECTIVE DEVICES REQUIRED

X Coveralls (1) 2 Pair)	X Rubber Overshoes	X MSA 401/B10PAK-60 SCBA (PF = 10,000/5,000)
X Hood	X Plastic Shoecovers (1 (2 Pair)	___ MSA Particulate (PF = 50)
___ Plastic (Pants, Shirt)	X Rubber Gloves	___ MSA Char.-Part. (PF = 1)

SPECIFIED ROUTE TO WORK LOCATION (list radiological conditions expected and attach map showing route)
Do not enter areas ≥ 10R/h. Prepare map prior to use of this EWP.

CONTINUOUS RADIATION SAFETY COVERAGE (Required) ~~(NOT REQUIRED)~~ ONMT member provides self-coverage, if appropriate and if ANSI qualified.

PERSONNEL MONITORING AND RADIAC EQUIPMENT REQUIRED

___ E520 (0-2000 mR/h)	X TLD (at chest)
X ~~PIC~~ (1mR/h-1000R/h), or equiv. (RO-4)	X Special TLD (Hands, Feet, Head, _____) (4)
___ Teletector (0-1000R/h)	___ Neutron TLD
X RO-7 (0-2R/h, 0-200R/h, 0-20 kR/h)	X SRD (0-200mR) (0-5R) 0-50R, 0-200R)
___ PNR-4 REMBALL (0-5 rem/h)	X Alarming Dosimeter (0-200R) Set @ (4) R
X Air Sampler (Portable, Lapel)	___ Other
X Radio (Portable)	___
X Stop Watch (time exposures, when required)	___

(4) Determined by RPD

MAX DOSE LIMIT* ≤ 3.000 rem/qtr. (Total)

AUTHORIZATION (RPD) / (SEC)

MAINTAIN EXPOSURES ALARA COMMENSURATE WITH RADIATION LEVELS AND TASK.
*EXPOSURES LIMIT FOR ONE ENTRY ONLY. FURTHER EXPOSURE REQUIRES NEW EWP. ADDITIONAL EXPOSURES MUST BE APPROVED BY THE RPD.

APPROVED J. Phillips (RPD) 6/14/82 0930 (Date / Time) _____ (SEC) / / (Date / Time)

Personnel Assigned to work under this entry permit must read and understand its requirements and conditions. SIGNATURE BELOW INDICATES YOU HAVE READ AND UNDERSTAND THIS PERMIT.

EXHIBIT 4.8.1-C
EMERGENCY WORK PERMIT

EWP # 006

10 CFR 20.101 EXPOSURE LIMITS APPLY

DATE & TIME INITIALED: _____ JOB DESCRIPTION: Performance of RAD required OFMT initial and follow-up radiation surveys offsite in EPZ under unknown accident conditions (Use restricted to < 5R/h (83 mR/min) this permit is void in cases where radiological conditions are known and for personnel radiation exposures greater than 10 CFR 20.101 limits.

SPECIFIC LOCATION: As defined by RAD

ESTIMATED REQUIRED DURATION IN AREA: Determined by RAD MIN. (1)

(1) Minimize stay time through expeditions and accurate surveying.

ESTIMATED RADIOLOGICAL CONDITIONS

GEN. AREA DOSE RATE (2) rem/h EST. AIR ACTIVITY: (2) MPC I*; (2) MPC PART. (2)

EST. BASED ON: (2) Unknown - airborne activity may be present within and adjacent to the plume; if known, use EWP #007 or new EWP.

PROTECTIVE DEVICES REQUIRED (when determined by RAD)

X Coveralls (1 2 Pair)	X Rubber Overshoes	X MSA 401/B10PAK-60 SCBA (PF = 10,000/5,000)
X Hood	X Plastic Shoecovers (1 2 Pair)	___ MSA Particulate (PF = 50)
___ Plastic (Pants, Shirt)	X Rubber Gloves	___ MSA Char.-Part. (PF = 1)

SPECIFIED ROUTE TO WORK LOCATION (list radiological conditions expected and attach map showing route)
As directed by RAD. Remain outside plume unless directed by RAD. Utilize ERPIP App. B.2 maps (Offsite Survey Points) pgs. B.2-12 through B.2-67.

CONTINUOUS RADIATION SAFETY COVERAGE (Required) ~~(Not required)~~ OFMT member provides self-coverage if appropriate and if ANSI qualified.

PERSONNEL MONITORING AND RADIAC EQUIPMENT REQUIRED

X	E520 (0-2000 mR/h)	X	TLD (at chest)
X	~~PIC-6~~ (1mR/h-1000R/h), or equiv. (RO-4)	___	Special TLD (Hands, Feet, Head, _____)
___	Teletector (0-1000R/h)	___	Neutron TLD
___	RO-7 (0-2R/h, 0-200R/h, 0-20 kR/h)	X	SRD (0-200mR) (0-5R) 0-50R, 0-200R)
___	PNR-4 REMBALL (0-5 rem/h)	(4) X	Alarming Dosimeter (0-200R) Set @ _____ R
X	Air Sampler (Portable, Lapel)	___	Other
(4) X	Radio (Portable) (Vehichular)	(4) X	MS-2/SPA-3 (for ground deposition)
___	Stop Watch	___	

(4) As directed by RAD

MAX DOSE LIMIT* < 3,000 rem/qtr.

AUTHORIZATION: _____ (RPD) _____ / _____ (SEC)

MAINTAIN EXPOSURES ALARA COMMENSURATE WITH RADIATION LEVELS AND TASK.
*EXPOSURES LIMIT FOR ONE ENTRY ONLY. FURTHER EXPOSURE REQUIRES NEW EWP. ADDITIONAL EXPOSURES MUST BE APPROVED BY THE RPD.

APPROVED D Wills (RPD) 6/16/82 / 0930 (Date / Time) _____ (SEC) / _____ (Date / Time)

Personnel Assigned to work under this entry permit must read and understand its requirements and conditions. SIGNATURE BELOW INDICATES YOU HAVE READ AND UNDERSTAND THIS PERMIT.

EXHIBIT 4.8.1-H
EMERGENCY WORK PERMIT

EWP # 007

EMERGENCY EXPOSURE LIMITS MAY APPLY

DATE & TIME INITIALED: _____ JOB DESCRIPTION: Performance of RAD required OFMT radiation surveys offsite in EPZ under unknown accident radiological conditions with suspected abnormally high exposure rates (>5R/h (83mR/min) only for the purpose of aiding offsite protective action decision making in accordance with ERPIP 4.5.6 and 4.6.1 (lifesaving actions).

SPECIFIC LOCATION: As directed by RAD

ESTIMATED REQUIRED DURATION IN AREA: Determined by RAD MIN. (1)

(1) Minimize staytime through expeditious and accurate surveying

ESTIMATED RADIOLOGICAL CONDITIONS

GEN. AREA DOSE RATE (2) rem/h EST. AIR ACTIVITY: (2) MPC I"; (2) MPC PART. (2)
EST. BASED ON: (2) Unknown

PROTECTIVE DEVICES REQUIRED

- X Coveralls (1 2 Pair)
- X Hood
- ___ Plastic (Pants, Shirt)
- X Rubber Overshoes
- X Plastic Shoecovers (1 2 Pair)
- X Rubber Gloves
- X MSA 401/B10PAK-60 SCBA (PF = 10,000/5,000)
- ___ MSA Particulate (PF = 50)
- ___ MSA Char.-Part. (PF = 1)

SPECIFIED ROUTE TO WORK LOCATION (list radiological conditions expected and attach map showing route)
As directed by RAD. Remain outside plume unless directed by RAD. Utilize ERPIP App. B.2 Mass (offiste survey points) pgs. B.2-12 through B.2-67.

CONTINUOUS RADIATION SAFETY COVERAGE (Required) ~~(Not required)~~ Continuous control and coverage via communication links.

PERSONNEL MONITORING AND RADIAC EQUIPMENT REQUIRED

- X E520 (0-2000 mR/h)
- X ~~RO-6~~ (1mR/h-1000R/h), or equiv. (RO-4)
- ___ Teletector (0-1000R/h)
- ___ RO-7 (0-2R/h, 0-200R/h, 0-20 kR/h)
- ___ PNR-4 REMBALL (0-5 rem/h)
- X Air Sampler (Portable, Lapel)
- X Radio (Portable)
- X Stop Watch
- X TLD (at chest)
- ___ Special TLD (Hands, Feet, Head, _____)
- ___ Neutron TLD
- X SRD (0-200mR 0-5R 0-50R 0-200R)
- X Alarming Dosimeter (0-200R) Set @ (3) R
- ___ Other
- X MS-2/SPA-3

(3) 50% of assigned dose limit.

MAX DOSE LIMIT* 100 ~~500~~ rad AUTHORIZATION: (RPD) / (SEC)

Assigned Limit _____ rad

MAINTAIN EXPOSURES ALARA COMMENSURATE WITH RADIATION LEVELS AND TASK.
*EXPOSURES LIMIT FOR ONE ENTRY ONLY. FURTHER EXPOSURE REQUIRES NEW EWP. ADDITIONAL EXPOSURES MUST BE APPROVED BY THE RPD.

APPROVED [signature] (RPD) 6/16/82 0930 (Date / Time) [signature] (SEC) 6-21-84 1600 (Date / Time)

Personnel Assigned to work under this entry permit must read and understand its requirements and conditions. SIGNATURE BELOW INDICATES YOU HAVE READ AND UNDERSTAND THIS PERMIT.

- NOTE -

Emergency personnel radiation exposure limits are described in ERPIP 4.6.1.

c. Documentation required by RCP 3-301 shall be obtained, as time permits, after the entry or exposure occurrence.

Step 3. Fill out Exhibit 4.8.1-H and/or Exhibit 4.8.1-I, Emergency Dosimetry Issue Log Sheet (Print).

Step 4. Fill out an Access Control Card, RCP 3-705-1, for individual.

Step 5. Fill out Weekly Dosimetry Record, RCP 3-301-1, for entry.

Step 6. Give individual their required Dosimetry as per Emergency Work Permit (EWP).

Step 7. Upon exit, collect the individual's dosimetry and log them out on the Weekly Dosimetry Record, on their Access Control Card, and the Date and Time dosimeters returned on the Emergency Dosimetry Issue Log Sheet.

EXHIBIT 4.8.1-H

Emergency Dosimetry Issue Log Sheet

Name (Last, Initials)	SSN	TLD # Assigned	SRD # Assigned	Range Of SRD Assigned	Plant Staff (Y/N)	EWP #	Date/Time Issued	Tech. Init	Date/Time Returned	Tech. Init	Remark

EXHIBIT 4.8.1-J

TLD LOCATION AND LOG SHEET

TLD Location	TLD#	Time/Date Placed	Time/Date Retrieved	Reading

Signature

REVIEW:

General Supervisor, Operations QA

For Supervisor, EPU

8-2-73
POSRC MTG

Plant Superintendent

TITLE: PREPARATION AND CONTROL OF EMERGENCY RESPONSE PLAN IMPLEMENTING PROCEDURES

1.0. INTRODUCTION

The purpose of this procedure is to control the preparation, review, approval, issue and distribution of Emergencey Response Plan Implementation Procedures(ERPIP) and revisions and changes thereto.

2.0. PREPARATION

2.1. Anyone associated with the Emergency Organization may prepare an ERPIP.

2.2. The first page of each ERPIP shall conform to the layout of page one of this ERPIP (ERPIP 5.0), except for the review/approval provision.

2.3. All subsequent pages, including attachments, shall be marked with: ERPIP (no.); Revision; Page number.

2.4. Outline and Topics

2.4.1. ERPIP'S shall be written utilizing the following format:

1.0 Major Heading
1.1 ...
1.2 ...
1.2.1 ...
2.0 ...
etc.

2.4.2. Topics to be covered in the ERPIP are dependent on its intended use and hence are at the discretion of the writer.

2.5. Attachments shall be identified by a number designation (ie. Attachment 1; Attachment 2 ...) in addition to the markings required in Section 2.3 above.

2.6. Draft ERPIP's shall be submitted to the Supervisor-Emergency Planning

3.0. REVIEW

3.1. ERPIPs shall be reviewed by a member of the Emergency Planning Unit to verify compliance with the requirements of this procedure and the Emergency Reponse Program commitments.

3.1.1. The reviewer shall consider whether the ERPIP can be used conveniently in a stressful environment.

3.1.2. The reviewer shall establish a liason with other plant staff to verify the technical accuracy of the ERPIP.

3.2. ERPIP 5.0, Preparation and Control of Emergency Response Plan Implementing Procedures, shall be submitted to the General Supervisor-Operations Quality Assurance for review and determination that it meets Quality Assurance requirements.

3.3. Review comments/recommendations will be considered by the Supervisor-Emergency Planning, for determining ERPIP approval. ERPIPs not approved shall be returned to the originator.

4.0. APPROVAL

4.1. ERPIPs approved by the Supevisor, Emergency Planning shall be typed, and, signed and dated on the review/approval sheet (attachment 1).

4.2. All ERRIP shall be subject to review by the Plant Operations and Safety Review Committee(POSRC). Each ERPIP shall be presented to POSRC which then shall decide whether the document is within the purview of the Committee. If the Committee decides not to review the ERPIP, this

decision shall be recorded in the minutes of the meeting and the meeting number with "N/A" referenced on the review/approval sheet of the ERPIP. Should the Committee decide that a review of the ERPIP is necessary, this decision shall be noted in the minutes. Inclusion of the POSRC meeting number on the review/approval sheet block of the ERPIP shall also indicate this review.

4.3. Changes or Revisions to ERPIP's which were originally approved by the POSRC shall also be reviewed by this Committee. The POSRC shall not be required to review changes or revisions to ERPIP's which were originally noted N/A by the Committee. However, if the orginator of the revision ot the Plant Superitendent belives the alteration will place the ERPIP under the purview of the POSRC, he shall then refer the change/revision to the POSRC for review.

4.4. The Plant Superintendent shall endorse the POSRC review by signing the ERPIP review/approval sheet (indicating approval) or not signing (indicating disapproval).

5.0. DISTRIBUTION

5.1. The Supervisor, Emergency Planning shall maintain the master of all approved ERPIPs and ERPIP review/approval sheets in the Emergency Plannng Unit Files.

5.2. The Supervisor Emergency Planning shall ensure the ERPIPs are available at the locations where they will be used.

5.3. A distribution sheet shall be maintained in the Emergency Planning Unit to account for all controlled copies of ERPIPs.

5.4. An index shall be maintained listing all effective ERPIPs and their revisions and change status.

5.5. For distribution to individuals, an acknowledgement transmittal shall be used to verify receipt of the ERPIP. Acknowledgment return will be recorded on the distribution sheet. The acknowledgment itself will not be retained.

5.6. For distribution to locations, placement of the ERPIP shall be recorded on the distribution sheet by the person assigned distribution responsiblity by the Supervisor-Emergency Planning.

6.0. CHANGES

6.1. A change is published to alter only a portion of the ERPIP. Anyone associated with the Emergency Organization may submit change recommendations to the Supervisor-Emergency Planning.

6.2. Except for names and telephone numbers, ERPIP changes shall be reviewed/approved the same as for draft ERPIPs. No review/approval is required for name/telephone number changes.

6.3. Changes shall be marked in the master copy on the affected page(s); denoted by a vertical line in the right hand margin; annoted as CH-1 (CH-2; CH-3;...) under the revision number; copied and distributed in accordance with the distribution list.

6.4. When a change is effected by removing an old page and inserting a new one, the new pages shall be transmitted with the change instruction as attachments.

6.5. A maximum of four changes may be issued for any single page of an ERPIP.

7.0. REVISIONS

7.1. Anyone associated with the emergency organization may submit revision proposals to the Supervisor, Emergency Planning.

7.2. Revisions shall be reviewed/approved/distributed the same as for draft ERPIPs.

7.3. Each line of text that has been revised shall be marked by a vertical line in the margin. Marginal indications shall be used to indicate the current revision only. Marginal indications are not required for a major revision.

7.4. The revision status of all pages of the ERPIP shall be updated whenever an ERPIP is revised. The entire ERPIP shall be distributed after each revision.

8.0. RECORDS

The Emergency Planning Unit shall retain the following:

8.1. Index of ERPIPs

8.2. Distribution List (current list only)

8.3. Original ERPIP and ERPIP review/approval sheet and revisions thereto.

8.4. ERPIP changes (until incorporated in a revision).

9.0. IMPLEMENTATION

9.1. The requirments of this procedure shall be effective for all ERPIP's developed/revised/changed after the issue date of this ERPIP. No back fitting will be done to make existing ERPIP's comply.

ATTACHMENT 1

ERPIP REVIEW/APPROVAL

REVISION	CHANGE	REVIEWER SIG/ DATE	SUPERVISOR EPU SIG/DATE	POSRC MTG	PLANT SUPERINTENDENT /DATE

DPA and DRC. The system utilizes desk type C and P telephones. The locations of these phones and numbers are:

(a) (6 PLNT 23) Control Room
(b) (6 PLNT 152) Technical Support Center
(c) (6 PLNT 171) Emergency Control Center
(d) (6 PLNT 431) Civil Defense
(e) (6 PLNT 432) Calvert County EOC
(f) (6 PLNT 433) St. Mary's County EOC
(g) (6 PLNT 434) Dorchester County EOC
(h) (6 PLNT 446) Div. Rad Control
(i) (6 PLNT 453) Media Comm. Center

These C and P phones are desk type and allow user to push one appropriate button to contact any of the other dedicated phone areas.

3.7 LNG COVE POINT HOT LINE

A special phone line between the Cove Point LNG Terminal; and the CCNPP Control Room has been established. This line is to be used by Cove Point Personnel to notify CCNPP of expected tanker arrivals and serious LNG spills or problems.

Cove Point LNG Terminal ⟷ CCNPP Control Room

- Red Phones
- C&P - Power Source
- Dedicated Line - Automatic Connection

Communications with Cove Point are established by lifting the receiver.

3.8 NRC Hotlines

The direct hotlines to Nuclear Regulatory Commission (NRC) are of two types: Emergency Notification System and the Health Physics Network.

3.8.1 Emergency Notification System (ENS)

This system uses C&P Red Phone Hotlines (301-GPO-1475) and is the primary means of communication between CCNPP and NRC. The phones are located at the station listed. The NRC may be contacted

directly from any of these stations by simply lifting the receiver of the Red Phone Hotline.

STATION		
	A	Control Room
	B	Shift Supervisor's Office
	C	Emergency Control Center (ECC)
	D	Alternate Emergency Control Center
	E	Technical Support Center
	F	NRC Resident Office

→ Nuclear Regulatory Commission (NRC)

3.8.2 **HEALTH PHYSICS NETWORK (HPN)**

This NRC System consists of four C and P Black Dial Phones (301-GDA-2060). These phones are used to reach NRC Headquarters (Dial 22) or Region I Office (Dial 23). No dial tone or ringing is heard when using these phones. Phone locations are as follows:

STATION		
	A	Radiation Safety Office
	B	Emergency Operational Facility
	C	Alternate ECC
	D	NRC Resident Office

* NOTE: Notify NRC Operations Center per 10 CFR 50.72

*

Dial 22 → NRC: HQ

Dial 23 → NRC: Region I

Figure 2-C
TRANSMISSION MODE SELECTION

MODE	FUNCTION
CLR. PVT.	Open communicator to company Units
CLR. PAG.	Open (for personnel recali)
Cd 1	Scrambled (mobile & portable units)
Cd 2	Scrambled (civil defense EOC's)

-NOTE-

When transmitting in the scrambled mode it is necessary to switch to clr. mode every ten minutes and identify station by call sign.

3. MOBILE AND PORTABLE RADIO OPERATION

a. Turn power switch to "ON" position.

b. Select F1 (emergency channel) on frequency dial.

c. Place mode selection in Cd 1 scrambled ( ) or Clr. Pvt. ( ) position. (Figure 3-A)

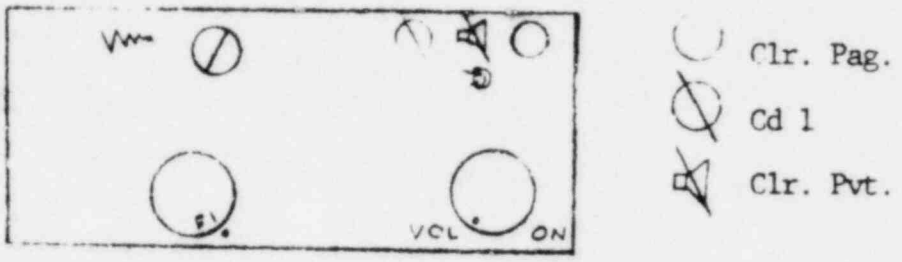
d. Turn squelch so it is no longer heard.

e. Depress key on hand mike to transmit. Speak in a normal voice.

f. Identify station by Vehicle or Portable number and state name of station being called; e.g., "Portable #1 to ECC".

g. Upon completion of transmission, sign off by identifying unit and end with "OUT"; e.g., "Portable #1 Out".

Figure 3-A
PORTABLE RADIO CONTROL PANEL



4. RECALL PAGING OPERATION

a. Place Radio Console power switch in "ON" position.

b. Select Channel 3, Clr. Page mode.

c. Turn on AC power switch located on rear of pager transmitter.

d. Each pager has an identifying code of two 3-digit numbers; e.g., (123/456)

1. If the individual is to be paged, the last two numbers of the first code will be entered on the pager transmitter key board; e.g., (23).

2. If the entire group were to be called in, then the last two numbers of the second code would be used; e.g., (56).

e. Push the P on the transmitter and signal will be sent.

f. Wait for talk light to come on and give verbal message thru handset on radio transmitter if desired. The talk mode will shut off after approximately 10 seconds.

g. Insert the next number into pager transmitter and repeat steps 4 through 6.

5. RECALL ANSWERING SERVICE OPERATION

A. To respond to page for recall:

1. Dial designated recall number (586-XXXX) (This number given to authorized personnel only).

2. Wait until recorded message is delivered and tone sounds.

3. State your pager number (first three digits code), last name, and estimated time of arrival (ETA) at designated assembly location. e.g., ("123, Smith, ETA 15 minutes").

4. Hang up immediately.

B. Verification of call-in.

1. Dial designated number (586-XXXX). This number will normally by answered by the Unit 1 recorded drill to roll-over mechanism. Unit 2 will answer if Unit 1 is busy.

2. Tape will identify itself as Unit 1 or Unit 2, then recorded message will start to play. After hearing unit number, place the tone mechanism near to the mouth piece and sound tone for 5 seconds by depressing small button on back side. The tape will rewind and play back call-in messages.

3. After first recall with tone, the tape will only rewind to where the previous messages end; e.g., (if seven calls were made before the first check was made and nine more calls were made between the first and second check) when the second check is made, the tape will only replay the last nine calls and not the total of sixteen. If all sixteen calls are to be replayed, the tone needs to be kept on until tape is rewound.

4. It is important for the communicator to record which unit answered the call. If Unit 1 answers its will be necessary for the ECOM to dial the Unit 2

TITLE: **TRAINING**

1.0 OBJECTIVES AND RESPONSIBILITIES

1.1 The primary objectives of the Calvert Cliffs Nuclear Power Plant Emergency Response Plan Training Program are to:

1.1.1 Familiarize appropriate individuals with the Emergency Response Plan and Implementation Procedures.

1.1.2 Instruct individuals, prior to assignment, in their specific roles in order to assure effective assistance during an emergency.

1.1.3 Periodically present significant changes in the scope or content of the ERP and ERPIP.

1.1.4 Provide initial training and annual retraining to ensure that personnel are familiar with their duties and responsibilities assigned by the ERP and ERPIP

1.1.5 Assure proper response to ensure the continued safe operation of the uneffected unit.

1.1.6 Provide classroom lectures and practice drills in which participants demonstrate acceptable ability to perform their assigned emergency functions.

1.2 Individuals responsible for assuring training objectives are met include:

1.2.1 General Supervisor-Training and Technical Support - is responsible to the Manager-NPD for the overall administrative responsibility for ERP training at CCNPP. Periodic training exercises must be approved by the General Supervisor-Training and Technical Support or a person designated by him, prior to implementation.

1.2.2 The Supervisor-Emergency Planning - is responsible to the General Supervisor-Training and Technical Support for the development, periodic review and distribution of CCNPP ERP and ERPIP. With the assistance of the Assistant General Supervisor-Training (NPD) and members of the CCNPP staff, the Supervisor-Emergency Planning will ensure that ERP training and awareness of significant ERP changes are provided to those who may be called on to assist in an emergency and that all areas of ERP training are adequate.

1.2.3 The Assistant General Supervisor-Training(NPD) - when requested by the Supervisor-Emergency Planning will schedule training sessions, maintain records to document ERP training, qualifications, and assist in the preparation of training materials, and conduct emergency response training utilizing qualified instructors from CCNPP Training Unit or others as necessary.

1.2.4 Emergency Organization Key Personnel - are responsible for the training of personnel under their direction during an emergency and for ensuring that required skills are maintained.

1.2.5 Plant Emergency Personnel - have the responsibility to ensure they become generally familiar with the ERP and specifically familiar with their authority and responsibilities as written in the ERPIPs.

2.0 TRAINING SCOPE

2.1 Individuals having emergency assignments shall be trained in the use of all equipment and functions that may be necessary during an emergency. Training shall be accomplished by formal instruction and by conducting periodic drills. Exercises will be used as a means to assess emergency personnel, their proficiency, and the adequacy of the training program.

2.2 Offsite organizations shall be trained with respect to the organization's interface with the licensee's emergency plan and in specialized radiological training.

2.3 Drills and exercises involving varying numbers of personnel and organizations shall be used to provide practical training for all emergency personnel.

2.4 Lesson plans shall be developed (outline or detail) for formal training and written scenarios will be prepared for drills and exercises.

3.0 TRAINING SCHEDULES

3.1 The Supervisor-Emergency Planning, Assistant General Supervisor Training (NPD) will schedule ERP training sessions at the CCNPP. ERP Training at the CCNPP will be conducted periodically throughout the year. Emergency organization personnel will participate in annual training sessions oriented toward specific roles within the ERPIP. Drills and exercises shall be administered throughout the year at random intervals to ensure plant and staff readiness for emergency situations and to maximize participation of individuals assigned specific responsibilities. ERPIP NO. 5.5 further delineates the requirements for the implementation of the exercise, test and drill program.

3.2 Training sessions will be so as not to disrupt the normal shift routine of the plant. Individuals failing to participate in the training session assigned for them must attend a repeat training session or complete an individual assignment which covers the same material as the training session.

3.2.1 Emergency Organization Personnel are required to update their training every year.

3.2.2 Retraining and refresher courses must contain the same (or updated) scope and contents as the original training but may be of lesser duration.

3.2.3 Additional training sessions will be conducted for Emergency Organization personnel whose responsibilities have been modified by changes to the ERPIP.

4.0 TRAINING DOCUMENTATION

The Assistant General Supervisor-Training (NPD) shall maintain a record of personnel participation in the ERP Training Program in accordance with CCI-601, Calvert Cliffs Training Memoranda.

4.1 Exercises will have written scenarios and shall be critiqued. A record of deficencies,and the assignment of responsibilities for correction of these deficiencies will be maintain as part of the plant history file

5.0 GENERAL ORIENTATION

Each individual on site, other than escorted personnel,will be required to demonstrate satisfactory knowledge of:

5.1 The location of their assembly areas.

5.2 Information concerning notification methods and communications equipment used in the event of an emergency.

5.3 Their actions in the event of an emergency at CCNPP.

6.0 INSTRUCTOR TRAINING AND CERTIFICATION

Responsibilities for Emergency Response Plan training are as specified in Section 1.2 of this procedure. Instructors of the Emergency Response Plan and Implementing Procedures must be properly trained and certified prior to conducting training sessions.

6.1 Emergency Response instructors will be certified by the Assistant General Supervisor-Training (NPD) and the Supervisor-Emergency Planning.

6.2 General Orientation Instructors will be certified by the Assistant General Supervisor-Training (NPD) in accordance with CCI-602.

6.3 The Emergency Planning Unit Members shall be considered as a certified instructor based on continuous awareness of emergency planning regulations and CCNPP ERP & ERPIP development.

7.0 EMERGENCY RESPONSE TRAINING CONTENT

This section identifies the required content for training of Emergency Response Organization Key Personnel. The Supervisor-Training (NPD) will ensure that appropriate lesson plans are developed, updated and approved by the Supervisor-Emergency Planning. Exhibit 5.4-A summarizes in matrix form the emergency procedures training and the supplementry materials training required for each Emergency Response Organization Key Person. Personnel assigned to the following ERP positions shall be responsible for learning the listed training objectives.

7.1 Shift Supervisor

7.1.1 Objectives:

(1) Initial recognition, identification and classification of actual or potential emergency threats.

(2) Initial notification of offsite support groups and the Plant Superintendent.

(3) Familiarization with the Emergency Organization and the general format of the ERP and ERPIP

7.1.2 Specific procedures and references required for emergency training and qualification include:

(1) ERPIP 2.0, Emergency Organization

(2) ERPIP 3.0 to and including ERPIP 3.10, all the immediate action procedures.

(3) ERPIP 4.1.2, Site Emergency Coordinator Checklist

(4) ERPIP 4.2, Notification

(5) ERPIP 4.3, Radiological Surveys (general familiarization)

(6) ERPIP A.1 to and including ERPIP A.5, red tabbed appendicies pertaining to onsite and offsite emergency response support groups.

7.1.3 Procedures and references suggested for general familiarization training and qualification include:

(1) ERPIP Manual, basic familiarization including all sections.

(2) ERP 3.2.2.1, Site Emergency Coordinator

(3) ERP 3.2.2, Plant Staff Emergency Assignments

(4) ERP 3.5, Local Services Support

(5) ERP 5.1.1, Control Room

7.2 Site Emergency Coordinator/Plant Superintendent

7.2.1 Objectives:

(1) Supervision of Emergency Organization personnel.

(2) Interpretation of plant and field data and how it relates to emergencies and their classification.

(3) Methods used for estimating radiation doses.

(4) A general understanding of all aspects of the ERPIP and the actions/responsibilities of offsite support groups and agencies.

(5) Initial notification of and follow-up communications with offsite and onsite emergency support groups.

7.2.2 Specific procedures and references required for emergency training and qualification include:

(1) ERPIP 2.0, Emergency Organization

(2) ERPIP 3.0 to and including ERPIP 3.10, all the immediate action procedures

(3) ERPIP 4.1.2, Site Emergency Coordinator Checklist

(4) ERPIP 4.2, Notification

(5) ERPIP 4.3, Radiological Surveys (general familiarization)

(6) ERPIP 4.4, Assessment Actions (general familiarization)

(7) ERPIP 4.5, Protective Actions (general familiarization)

(8) ERPIP 4.6.1, Emergency Personnel Radiation Exposures

(9) ERPIP 5.2, Records

(10) ERPIP A.1 to and including ERPIP A.5, red tabbed appendices pertaining to onsite and offsite emergency response support groups

7.2.3 Procedures and references suggested for general familiarization training and qualification include:

(1) ERPIP Manual, basic familiarization including all sections

(2) State of Maryland's Radiological Emergency Response Plan (RERP) Appendix 1 to Annex Q

(3) Local emergency plans for counties within 10 mile Exposure EPZ (i.e, St. Marys, Dorchester, and Calvert Counties)

(4) State of Maryland's Ingestion EPZ plan for area within 50 mile radius of CCNPP

(5) ERP 3.2.1.1, Site Emergency Coordinator

(6) ERP 3.2.2, Plant Staff Emergency Assignments

(7) ERP 3.3, Augmentation of Onsite Emergency Organization

(8) ERP 4.4.2, Criteria for Requesting Outside Assistance

(9) ERP 5.0, Emergency Facilities and Equipment

7.25.3 Procedures and references suggested for general familiarization training and qualification include:

(1) ERPIP Manual

(2) Emergency Response Plan

(4) State of Maryland Radiological Emergency Plan (Appendix 1 to Annex Q)

7.26 Offsite Liaison Representatives

7.26.1 Objectives:

(1) Interfacing with State and local agencies as directed by the SEC.

(2) In-depth knowledge of the plant and site and experience in operations.

7.26.2 Specific procedures and references required for emergency training and qualification include:

(1) ERPIP 2.0, Emergency Organization

(2) ERPIP 3, Immediate Actions

(3) ERPIP 4.2, Notifications

(4) ERPIP 5.1, Communications

(5) ERPIP Appendix B.2, Maps and Charts

7.26.3 Procedures and references suggested for general familiarization training and qualification include:

(1) ERPIP Manual

(2) ERP Manual

(3) State of Maryland Radiological Emergency Plan (Appendix 1 to Annex Q)

(4) SOP's for County assigned to

EXHIBIT 5.4-A: REQUIRED PROCEDURE TRAINING MATRIX FOR EMERGENCY RESPONSE ORGANIZATION KEY PERSONNEL

ERPIP	SS	SEC/PS	TSCD	OSCD	RPD	RAD	OFMTL	ONMTL	LRMTL	AAMTL	GAMTL	ECCMTL	EFADTL	ERMTL	DTL	EFTL	ESTL	ERETL	ERDCTL	ERRTL	AAL	ECOM	ASD	MCCC	ESC	PM	OLR
2.0	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.0	x	x																									x
3.1	x	x				x																					x
3.2	x	x																									x
3.3	x	x														x											x
3.4	x	x																									x
3.5	x	x																									x
3.6	x	x				x																					x
3.7	x	x		x																							x
3.8	x	x																									x
3.9	x	x																									x
3.10	x	x																									x
4.0																											
4.1.0																											
4.1.1																											
4.1.2	x	x																									
4.1.3			x																								
4.1.4				x																							
4.1.5					x																						
4.1.6						x	x																				
4.1.7					x			x																			
4.1.8									x																		
4.1.9										x																	
4.1.10											x											x					
4.1.11												x															
4.1.12													x														

EXHIBIT 5.4-A con't

ERPIP	SS	SEC/PS	TSCD	OSCD	RPD	RAD	OFMTL	ONMTL	LRMTL	AAMTL	GAMTL	ECCMTL	EFADTL	ERMTL	DTL	EFTL	ESTL	ERETL	ERDCTL	ERRTL	AAL	ECOM	ASD	ESC	PM	OLR
4.1.13														x												
4.1.14															x											
4.1.15						x																				
4.1.16																x										
4.1.17																	x									
4.1.18																		x								
4.1.19																			x							
4.1.20																				x						
4.1.21																					x					
4.1.22																						x				
4.1.23																							x			
4.1.24																								x		
4.1.25																										
4.2	x	x																			x	x				x
4.3.1	x	x			x	x	x	x																x		
4.3.2	x	x			x	x	x	x																x		
4.3.3	x	x			x	x	x	x	x															x		
4.3.4	x	x			x	x	x	x		x	x	x		x										x		
4.4.1		x			x	x																		x		
4.4.2		x			x	x																		x		
4.4.3		x			x	x																		x		
4.4.4		x			x	x																		x		
4.4.5		x			x	x																		x		
4.4.6		x			x	x																		x		
4.4.7		x			x	x		x	x															x		
4.4.8		x			x	x																		x		
4.5.1		x			x	x				x			x				x				x					
4.5.2		x			x	x					x		x		x		x									

EXHIBIT 5.4-A con't

ERPIP	SS	SEC /PS	TSCD	OSCD	RPD	RAD	DFMTL	DNMTL	LRMTL	AAMTL	GAMTL	ECCMTL	EFADTL	ERMTL	DTL	EFTL	ESTL	ERETL	ERDCTL	ERRTL	RAL	ECOM	ASD
4.5.3		x			x	x						x	x	x	x	x		x	x				
4.5.4		x			x	x							x										
4.5.5		x			x	x							x		x								
4.5.6		x			x	x							x										
4.6.1		x	x	x	x	x	x	x	x				x	x	x	x		x	x				
4.6.2													x										
4.6.3													x										
4.6.4													x										
4.7	x	x														x							
4.8	x	x																x					
4.9	x	x																		x			
4.10	x	x															x						
5.1							x												x	x		x	
5.2		x																					
5.3							x	x										x	x	x			
A.1	x	x	x	x	x		x	x													x	x	
A.2	x	x	x	x																		x	
A.3	x	x	x	x																		x	
A.4	x	x	x	x																		x	
A.5	x	x	x	x																		x	
B.1							x	x										x	x				
B.2										x							x	x			x		x
C.1						x																	
C.2						x																	
C.3						x																	

EXHIBIT 5.4-A con't

ERPIP	SS	SEC/PS	TSCD	OSCD	RPD	RAD	OFMTL	ONMTL	LRMTL	AAMTL	GAMTL	ECCMTL	EFADTL	ERMTL	DTL	EFTL	ESTL	ERETL	ERDCTL	ERRTL	AAL	ECOM	ASD	MCCC	ESC	PM	OLR
D.1																	x										
D.2																	x										
D.3																	x										
RCP																											
3-301															x												
3-302															x												
3-303															x												
3-304															x												
3-305															x												
3-306															x												
3-307															x												
3-308															x												
3-309													x		x												
3-310															x												
3-606													x														

TITLE: **EXERCISES, TESTS AND DRILLS**

1.0 RESPONSIBLE INDIVIDUALS

The Emergency Plannning Unit Supervisor is responsible for the development of scenario, scheduling, conducting and critiquing drills and exercises and reporting results and recommendations to the Plant Superintendent.

The Emergency Plannning Unit Supervisor is responsible for reviewing drill, exercise, and scenarios for content and accuracy. Each Emergency Organization member is independently responsible for those actions delegated to him by the ERPIP Manual.

2.0 CONDITIONS AND PREREQUISITES

2.1 Advance planning is required to conduct a successful exercise.

2.2 Agreement between onsite and offsite agencies in level of participation, date and time.

2.3 Preparation of a scenario for the exercise to be performed.

2.4 Prior to conducting any emergency drill or exercise the Emergency Plannning Unit Supervisor must obtain written approval from the Plant Superintendent.

3.0 ACTIONS AND LIMITATIONS

3.1 Conduct exercises at least annually (every 12 months plus or minus 3 months) for each of the following situations:

3.1.1 LNG Emergency

3.1.2 Fire Emergency

3.1.3 Natural Event

3.1.4 Personnel Injury (with CMH participation)

3.1.5 Radiological Event

3.1.6 Unusual Event

3.1.7 Alert Condition

3.1.8 Site Emergency

3.1.9 General Emergency

- NOTE-

One exercise may be a combination of several of the exercises listed in 3.1.1 through 3.1.9 and may therefore fulfill the annual requirement for several exercises. Exercises may be announced or unannounced, and should simulate a variety of possible emergencies that could occur. An actual emergency event is sufficient to fulfill the annual exercise for that event. An LNG Emergency Exercise will be preformed only if the LNG Plant is receiving LNG shipments.

Joint Exercises and training involving Federal, State and local response organizations will be performed within a 5 year period of program acceptance and repeated at 5 year maximum intervals.

Drills and exercises shall be scheduled on various shifts and during random times of the day and night. They shall not be scheduled for the convience of workers nor shall be terminated for the convience of workers.

- CAUTION -

ALL ACTIONS TO ALTER PLANT CONDITIONS MUST BE SIMULATED, UNLESS AUTHORIZED OTHERWISE IN WRITING BY THE PLANT SUPERINTENDENT. THE SHIFT SUPERVISOR MAY TERMINATE THE DRILL WHENEVER HE FEELS ACTUAL CONDITIONS WARRANT SUCH ACTION.

3.2 Conduct:

3.2.1 Communication tests with State and local governments within the plume exposure pathway Emergency Planning Zone, monthly.

3.2.2 Communication tests with Federal emergency response organizations and States within the ingestion pathway, quarterly.

3.2.3 Communication tests between the facility, State and local emergency operations centers and field assessment teams, annually

- NOTE -

Communication test shall include the aspect of understanding the content of messages and may be combined with exercises.

3.3 Conduct:

3.3.1 Fire drills in accordance with CCNPP technical specification.

3.3.2 Medical emergency drills involving a simulated contaminated individual which contains provisions for participation by the local support services agencies (i.e., ambulance and offsite medical treatment facility), annually. The offsite portion of the medical emergency drill may be performed as part of the required annual exercise.

3.3.3 Drills involving the Emergency Radiation Teams, quarterly. These drills shall include plant environs and radiological monitoring with provision for collection and analysis of all sample media (e.g., water,

INDEX OF EQUIPMENT CHECKLISTS

TABLE 1

CONTROLLED AREA MEDICAL TREATMENT ROOM

RAD. PROTECTION & DECONTAMINATION SUPPLIES

INVENTORY

	ITEM	UNIT	#REQ'D.	# FOUND
1.	Decontamination Table Top with 30 Gal. Holding Container	Each	1	_____
2.	1-3/4" Steel Movable Shield with Lead Glass Window	Each	1	_____
3.	Lead Container for High Activity Samples	Each	1	_____
4.	Decon & Sample Taking Kit. (Replace if opened or damaged)	Kit	1	_____
5.	Trauma II Treatment Kit (Replace if opened or damaged)	Kit	1	_____
6.	1' x 2' Lead Blanket	Each	1	_____
7.	Thermoluminescent Dosimeters (Ring Type)	Each		_____
8.	4-5 Mil Plastic Sheeting Roll (69' Hallway)	Roll	1	_____
9.	Plastic Shoe Covers (69' Locker Room)	Pair	6	_____
10.	Plastic, Disposable Aprons	Each	6	_____
11.	Ambulance Kit Contains:	Kit	1	_____
	a. E-520 Exposure Rate Survey Instrument Serial #_____ Batt Ck _____ Source Ck _____ Calibration Due Date _____	Each	1	_____
	b. Complete Anti-C Outfit Includes 1 Pair Coveralls 1 Hood 2 Pairs of Cotton Gloves 2 Pairs of Rubber Gloves 2 Pairs of Shoe Covers	Set	6	_____

TABLE 1 (Continued)

	ITEM	UNIT	# REQ'D.	# FOUND
c.	Poly Bags	Bags	5	
d.	Signs (Radiation&Contamination	Each	5	
e.	Radiation Marking Rope	Foot	50	
f.	Masking Tape (2")[1] (Replace During 1st Qtr.)	Roll	1	
g.	Cs-137 8 uCi Check Source Serial # _____	Each	1	
h.	Radiation Tape[1] (Replace During 1st Qtr)	Roll	1	
i.	Swipes (Box)	Box	1	
j.	Extra Batteries D-Cell[1] (Change out in January and July)		4	
k.	Self-Reading Dosimeters 0-50 rem Calibrations Due Date _____	Each	5	
12.	Radioprotective Drugs (Medical Cabinet)			
a.	Saturated Solution of Potassium Iodide Bottle 2 oz. Bottle @ 350 Doses Each Bottle Expiration Date _____		1	
b.	Other Radioprotective Drugs are listed on Table 1-1. Medical Supplies are inventoried & Replaced by BG&E Medical Services.			

REMARKS: _____

_____

_____

INVENTORY BY: _____ DATE: _____

REVIEWED BY[2]: _____ DATE: _____

1. Replace and discard material or use it in non-emergency planning applications.
2. Person performing the review should be the first line supervisor of the person who performed the inventory

TABLE 1-1
CONTROLLED AREA MEDICAL TREATMENT ROOM
MEDICAL EQUIPMENT AND SUPPLIES
INVENTORY

- NOTE -

Items on this list are inventoried and replaced by BG&E Medical Services.

	ITEM	UNIT	# REQ'D	# FOUND
A.	SHELF A - White Cabinet			
1.	Basin Kit	Kit	1	_____
2.	Gauze 3x3	Roll	100	_____
3.	Gauze 2x2	Roll	100	_____
4.	Surgipad 8x10	Pkg.	1	_____
5.	Laryngoscope 8/Box	Box	1	_____
6.	Ambu Bag	Each	1	_____
7.	Emesis Basin	Each	1	_____
8.	Solution Bowl	Each	1	_____
9.	Medicine Cup, Disposable, 100/Pkg.	Pkg.	1	_____
10.	Crutch Tips	Each	2	_____
11.	First Aid Book	Each	1	_____
B.	SHELF B - White Cabinet			
1.	Ammonia Ampules	Each	10	_____
2.	Zephiran Chloride Vials	Each	2	_____
3.	Tourniquet	Each	1	_____
4.	Triangular Bandage	Each	1	_____
5.	Isopropyl Alcohol, 500 ml	Bottle	1	_____

TABLE 2 (continued)

14.	Masking Tape (2")[1] (Replace During 1st Qtr.)	Roll	2	_____
15.	Radiation Warning Signs, Tape, Rope	Set	1	_____
16.	Batteries, "D" Cell [1] (Replace During 2nd & 4th Qtrs.)	Each	4	_____
17.	Batteries, 9V [1] (Replace During 2nd & 4th Qtrs.)	Each	4	_____
18.	Batteries, "AA" cell (Replace During 2nd & 4th Qtrs.)	Each	2	_____
19.	Herculite, 54" x 200' Roll	Roll	1	_____
20.	Check Source, 8 uCi Cesium-137 (in ambulance kit) Serial No._____	Each	1	_____
21.	Manual, "Decontamination & Treatment of the Radio activity contaminated patient at Calvert Memorial Hospital"	Each	1	_____

REMARKS:_____

_____

_____

_____

_____

INVENTORY BY:_____ DATE:_____

REVIEWED BY[2]:_____ DATE:_____

1. Replace and discard material or use it in non-emergency planning applications.
2. Person performing the review should be the first line supervisor of the person who performed the inventory.
3. Various other supplies are maintained and inventoried by CMH.

TABLE 3

CONTROL ROOM

EMERGENCY EQUIPMENT INVENTORY

	ITEM	UNIT	# REQ'D	# FOUND
1.	Emergency Response Plan	Copy	1	_____
2.	Emergency Response Plan Implementing Procedures	Copy	1	_____
3.	10 Mile EPZ Map & Isopleth Overlays	Set	1	_____
4.	50 Mile EPZ Map & Isopleth Overlays	Set	1	_____
5.	PIC 6A Exposure Rate Survey Instrument Serial #_____ Serial #_____ Batt Ck_____ Batt Ck_____ Source Ck_____ Source Ck_____ Calibration Due Date____ Calibration Due Date____	Each	2	_____
6.	MS-2 Mini-scaler with SPA-3 Probe and Battery Pack Serial #_____ Batt Ck_____ Source Ck_____	Each	1	_____
7.	Air Sample Particulate Filters (44 mm) Box	Each	1	_____
8.	Silver Zeolite Iodine Collection Cartridges	Each	10	_____
9.	Air Sampler Serial #_____ Flow Rate_____	Each	1	_____
10.	Full Face Negative Pressure Respirator (Replace any found to be in unsatisfactory condition)	Each	10	_____
11.	Spare Filter Cartridges for Item #11	Each	20	_____

CONTROL ROOM EMERGENCY EQUIPMENT INVENTORY

	ITEM	UNIT	# REC'D	# FOUND
12.	Self Contained Breathing Apparatus MSA-401 (with air bottle)	Each	2	_____
13.	Spare Air Bottles for MSA-401	Each	2	_____

(Pressure Gauge must Read 2200 PSIG)

14.	Self Reading Dosimeters 0 - 200 MR Calibration Due Date:_____ 0 - 1 REM Calibration Due Date:_____	Each	10	_____
15.	Thermoluminescent Dosimeters	Each	10	_____
16.	Dosimeter Charger	Each	1	_____
17.	Emergency Status Board	Each	1	_____
18.	P & ID's & Building Layout Drawings	Set	1	_____
19.	Complete Anti-C's Outfit. Includes: 1 Pair of Coveralls 1 Hood 2 Pairs of Cotton Gloves 2 Pairs of Rubber Gloves 2 Pairs of Shoe Covers	Each	10	_____
20.	Trauma II Treatment Kit (Replace if opened or damaged)	Kit	1	_____
21.	Batteries, "D" Cell [1] (Replace During 2nd & 4th Qtrs.)	Each	4	_____
22.	Batteries, 9V [1] (Replace During 2nd & 4th Qtrs.)	Each	4	_____
23.	Batteries, "AA" Cell [1] (Replace During 2nd & 4th Qtrs.)	Each	2	_____

REMARKS:_____

_____

_____

INVENTORY BY:_____ DATE:_____

REVIEWED BY[2]:_____ DATE:_____

1. Replace and discard material or use in in non-emergency planning applications.
2. Person performing the review should be the first line supervisor of the person who performed the inventory.

TABLE 4

EMERGENCY CONTROL CENTER

(SOUTH SERVICE BLDG. - Classroom 1 & 2)

EMERGENCY EQUIPMENT INVENTORY

	ITEM	UNIT	# REQ'D.	# FOUND
1.	ECC Emergency Kit (See Table 4-1 for Contents)	Each	1	_____
2.	MS-2 Mini-scaler with SPA-3 Probe and Battery Pack Serial #_____ Batt Ck_____ Source Ck_____ Calibration Due Date_____	Set	1	_____
3.	E-520 Dose Rate Survey Instrument Serial #_____ Batt Ck_____ Source Ck_____	Each	1	_____
4.	Air Sampler Serial #_____ Flow Rate_____	Each	1	_____
5.	Air Sample Particulate Filters (47 mm) Box	Box	3	_____
6.	Silver Zeolite Iodine Collection Cartridges	Each	3	_____
7.	10 Mile EPZ Map & Isopleth Overlays	Set	1	_____
8.	50 Mile EPZ Map & Isopleth Overlays	Set	1	_____
9.	Plant & Offsite Status Board	Each	1	_____
10.	Saturated Solution of Potassium Iodide 2 oz Bottles @ 350 Doses Each. Bottle 1 Expiration Date:_____ Bottle 2 Expiration Date:_____	Bottle	2	_____
11.	Disposable Medicine Cups, 100's	Pkg	2	_____
12.	Emergency Response Plan	Copy	1	_____

TABLE 4 (Continued)

	ITEM	UNIT	# REQ'D.	# FOUND
13.	Emergency Response Plan Implementing Procedures. Rev._____ Controlled Copies of ERPIP Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17	Copy	16	_____
14.	Radiation Safety Procedures RCP-3 (Controlled Copy)	Set	1	_____
15.	P & ID's and Building Layout Drawings	Set	10	_____
16.	Emergency Resources Manual (INPO)	Each	1	_____
17.	Emergency Log Books	Each	1	_____
18.	Trauma II Treatment Kit (Replace if Opened or Damaged)	Kit	1	_____
19.	Providine Scrub Solution	Bottle	1	_____
20.	Alpha Survey Instrument PRM-4A with AC-3 Probe S/N _____ Calibration Due Date _____	Set	1	_____
21.	Calculators (TI-55) Serial #_____ _____ _____ (change batteries quarterly)[1]	Each	3	_____
22.	Extra Batteries D-Cells (change out in January and July)[1]	Each	4	_____

REMARKS: _____

_____

_____

INVENTORY BY: _____ DATE: _____

REVIEWED BY[2]: _____ DATE: _____

1. Replace and discard material or use it in non-emergency planning applications.

2. Person performing the review should be the first line supervisor of the person who performed the inventory.

TABLE 4-1
EMERGENCY CONTROL CENTER
ECC KIT INVENTORY

	ITEM	UNIT	# REQ'D	# FOUND
1.	PIC-6A Exposure Rate Survey Meter Serial # _____ Battery Check _____ _____ _____ Source Check _____ Calibration Due Date _____ _____ _____	Each	2	_____
2.	Dosimeter Charger	Each	1	_____
3.	Note Pads	Pad	4	_____
4.	Pens/Pencils	Box	10	_____
5.	Wax Pencil, Blace	Box	2	_____
6.	Wax Pencil, Red	Box	2	_____
7.	Wax Pencil, Yellow	Box	2	_____
8.	Batteries, 9 Volt (Replace during 2nd & 4th quarters)[1]	Each	4	_____
9.	Batteries "AA" Cell (Replaces During 2nd & 4th Qtrs.)	Set	1	_____
10.	Emergency Vehicle Keys (2 Vehicles)	Set	2	_____
11.	Auxiliary Bldg. Elevator Key	Set	1	_____
12.	Farm Demo & Front Gate Key	Set	1	_____
13.	Poly Bags, Small	Each	5	_____
14.	Cs-137 8 uCi Check Source Serial #_____	Each	1	_____

REMARKS: _____

INVENTORY BY: _____ DATE: _____

REVIEWED BY[2]: _____ DATE: _____

1. Replace or discard material or use it in non-emergency planning applications.
2. Person performing the review should be the first line supervisor of the person who performed the inventory.

TABLE 5

SOUTH SECURITY GUARD HOUSE

EMERGENCY EQUIPMENT INVENTORY

	ITEM	UNIT	# REQ'D	# FOUND
1.	Mobile Emergency Monitoring Kits	Kit	4	_____
2.	Tranceivers (BG&E Security)	Each	4	_____
3.	Complete Anti-C's Outfit. Includes: 1 Pair Coveralls 1 Hood 2 Pairs of Cotton Gloves 2 Pairs of Rubber Gloves 2 Pairs of Shoe Covers	Set	32	_____
4.	Full Face Negative Pressure Respirators (Replace any found to be in unsatisfactory condition)	Each	32	_____
5.	Spare Filter Cartridges for Item #4	Each	32	_____
6.	Radiation Tape	Roll	2	_____
7.	Masking Tape (2") (Replace During 1st Qtr.)[1]	Roll	2	_____
8.	Dosimetry Kit Containing: 100 TLD's 100 0 - 200 MR Self Reading Dosimeters Calibration Due Date:_____	Kit	1	_____
9.	Emergency Personnel Entry Forms	Pad	1	_____
10.	SRD Charger with extra batteries	Each	1	_____
11.	Air Samplers Sampler #_____ Flow Rate _____ Sampler #_____ Flow Rate _____ Sampler #_____ Flow Rate _____ Sampler #_____ Flow Rate _____	Each	5	_____
12.	Cesium-137 check source (8 uCi) in Main Kit. Serial No. _____	Each	1	_____

TABLE 5 (Continued)

REMARKS: _____

_____

_____

_____

_____

_____

INVENTORY BY: _____ DATE: _____

REVIEWED BY[2]: _____ DATE: _____

1. Replace or discard material or use it in non-emergency planning applications.
2. Person performing the review should be the first line supervisor of the person who performed the inventory.

TABLE 6 (Continued)

	ITEM	UNIT	# REQ'D	# FOUND
25.	Radiation Tape (Replace during 1st quarter)[1]	Roll	2	_____
26.	Masking Tape, 2" (Replace during 1st quarter)[1]	Roll	4	_____
27.	Dosimeter Charger	Each	2	_____
28.	Batteries, "D" Cell (Replace during 2nd & 4th quarters)[1]	Each	_____	_____
29.	Batteries, 9 Volts (Replace during 2nd & 4th quarters)[1]	Each	_____	_____
30.	Batteries "AA" cell	Each	4	_____
31.	Cesium-137 8 uCi Check Source Serial #_____	Each	1	_____
32.	Saturated Solution of Potassium Iodide 2 oz Bottles @ 350 Doses Each. Bottle 1 Expiration Date_____ Bottle 2 Expiration Date_____	Bottle	2	_____
33.	Providine	Bottle	1	_____
34.	TI-55 Calculator with Battery Charger Serial #'s_____, _____, _____ (change batteries quarterly)[1]	Each	3	_____
35.	PRM-44 with AC-3 Probe (Alpha survey instrument) Calibration Due Date _____	Each	1	_____
36.	Air Sampler-110 Volt AC with:			
	a. Particulate Filters	Box	2	_____
	b. Charcoal Cartridges	Box	3	_____
	c. Silver Zeolite Cartridges	Each	15	_____

REMARKS: _____

_____

_____

INVENTORY BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

1. Replace or discard material or use it in non-emergency planning applications.
2. Person performing the review should be the first line supervisor of the person who performed the inventory.

TABLE 7
NORTH SERVICE BUILDING
EMERGENCY EQUIPMENT INVENTORY

	ITEM	UNIT	# REQ'D	# FOUND
1.	Self-reading Dosimeters (0-200 mr) Calibration Due Date_____	Each	5	_____
2.	Thermoluminescent Dosimeters	Each	5	_____
3.	Self Contained Breathing Apparatus MSA-401 (with Air Bottle)	Each	2	_____
4.	Spare Air Bottles for MSA-401 (Pressure Guage must read 2200 PSIG	Each	2	_____
5.	Full Face Negative Pressure Respirators (Replace any found to be in unsatisfactory condition)	Each	2	_____
6.	Spare Filter Cartridges for Item #5 (Must have QA Approval)	Each	4	_____
7.	Complete Anit-C's Outfit. Includes: 1 Pair of Coveralls 1 Hood 2 Pair of Cotton Gloves 2 Pair of Rubber Gloves 2 Pair of Shoe Covers	Set	5	_____
8.	E-520 Exposure Rate Survey Instrument Serial #_____ Batt.Ck._____ Source Ck._____ Calibration Due Date _____	Each	1	_____
9.	PIC 6A Exposure Rate Survey Instrument Serial #_____ Batt.Ck._____ Source Ck._____ Calibration Due Date _____	Each	1	_____
10.	Dosimeter Charger	Each	1	_____
11.	Tape, Masking (Replace during 1st quarter)[1]	Roll	1	_____
12.	Batteries, "D" Cell (Replace during 2nd & 4th quarters)[1]	Set	1	_____

TABLE 7 (Continued)

	ITEM	UNIT	# REQ'D	# FOUND
13.	Batteries, 9 Volts (Replace during 2nd & 4th quarters)[1]	Set	1	_____
14.	Batteries "AA" cell (Replace during 2nd & 4th quarters)[1]	Set	1	_____
15.	Cs-137 8 uCi Check Source Serial #_____	Each	1	_____

REMARKS:_____

_____

_____

_____

INVENTORY BY:_____ DATE:_____

REVIEWED BY[2]:_____ DATE:_____

1. Replace or discard material or use it in non-emergency planning applications.

2. Person performing the review should be the first line supervisor of the person who performed the inventory.

TABLE 8

EMERGENCY EQUIPMENT IN REENTRY LOCKER (45' LEVEL)

	ITEM	UNIT	#REQ'D	FOUND
1.	PIC-6A Exposure Rate Survey Meter Serial Number _____ Batt. Check _____ Cal. Due Date _____ Source Check _____	Each	1	_____
2.	E-520 Dose Rate Survey Meter Serial Number _____ Batt. Check _____ Cal. Due Date _____ Source Check _____	Each	1	_____
3.	Teletector Hi Range (G.M.) Meter Serial Number _____ Batt. Check _____ Cal. Due Date _____	Each	1	_____
4.	RO-7 High Range (Ion Chamber) Meter Serial Number _____ Batt. Check _____ Cal. Due Date _____	Each	1	_____
5.	PRN-4 Rem Ball Neutron Rate Meter Serial Number _____ Batt. Check _____ Cal. Due Date _____	Each	1	_____
6.	Lapel Air Sampling Unit	Each	2	_____
7.	Personal Alarming Dosimeter Serial Number _____ Batt. Check _____ Serial Number _____ Batt. Check _____	Each	2	_____
8.	Stop Watch	Each	1	_____
9.	Individual Dosimetry Packets (5, 50 & 200 R SRD's; special dosimetry)	Each	10	_____
10.	Dosimeter Charger	Each	1	_____
11.	Full Face Neg. Pressure Respirator	Each	10	_____
12.	Spare Filters For #11.	Each	10	_____
13.	Anti-C's complete sets	Set	10	_____
14.	Plastic Overalls	Pair	10	_____
15.	Rubber Overshoes	Pair	10	_____
16.	Lead Blanket	Each	2	_____
17.	Dosimetry Forms	Set	1	_____

TABLE 8 (Continued)

EMERGENCY EQUIPMENT IN REENTRY LOCKER (45' LEVEL)

	ITEM	UNIT	#REQ'D	FOUND
18.	ERPIP Section 4.4.7 & 4.8	Set	1	_____
19.	Lead Gloves			
20.	Batteries:			
	9 Volt	Each	2	_____
	C Cell	Each	2	_____
	D Cell	Each	2	_____
	30 Volt	Each	1	_____
	AA	Each	2	_____
				_____

Remarks:

Inventored By: _____ Date: _____

Reviewed By: _____ Date: _____

1. Person performing the review should be the first line supervisor of the person performing the inventory

TABLE 9

EMERGENCY FIRE FIGHTING EQUIPMENT LOCATED IN TURBINE BUILDING

FIRE INSPECTION	UNIT	# REQ'D	# FOUND
SMOKE EJECTORS	Each	3	
PROTECTIVE CLOTHING	Each	10	
ELECTRIC REEL	Each	3	
FOAM EJECTORS	Each	1	
PRESSURE DEMAND	Each	4	
EXPANDOL FOAM	Each	10	
LIQUID FOAM	Each	5	
SPARE BOTTLES	Each	5	
EJECTOR DUCT	Each	4	
FOAM DUCT	Each	1	
FOAM NOZZLE	Each	1	
DOOR BAR	Each	1	
FIRE EQUIPMENT BOX LEVEL			
FORCIBLE ENTRY BAR	Each	1	
PRY BARS	Each	1	
SPOTLIGHTS	Each	4	
SALVAGE COVERS	Each	3	

TABLE 9 (Continued)

EMERGENCY FIRE FIGHTING EQUIPMENT LOCATED IN TURBINE BUILDING

FIRE INSPECTION	UNIT	# REQ'D	# FOUND
GATED WYE	Each	1	
DOUBLE FEMALE	Each	1	
LIFT ROPE	Each	5	
NOZZLE 1 1/2	Each	2	
SPANNER WRENCH	Each	4	
BOLT CUTTER	Each	1	
FIRE AXE	Each	1	
REDUCER 2 1/2 & 1 1/2	Each	1	

INVENTORY BY:_____ DATE:_____

REVIEWED BY[1]:_____ DATE:_____

1. Person performing the review should be the front line supervisor of the person performing the inventory.

TABLE 10

PORTABLE RADIATION SURVEY INSTRUMENTS, AIR SAMPLERS AND DOSIMETERS FOR EMERGENCY USE ONLY

LOCATION	TYPE/QUANTITY
69' First Aid Room	E-520 (1), RO-7 ( ), RM-14 w/HP-210 (1) and HP- ( )
Calvert Memorial Hospital	Pic-6A (1), RM-14 w/HP-210 (1)
Control Room	Pic-6A (2) MS-2/SPA-3 (1) Air Sx. (1) A.C. only
North Service Building	E-520 (1), Pic-6A (1)
Primary ECC (South Service Building)	RO-7 ( ), MS-2/SPA-3 (1), E-520, Pic-6A Air Sx. (1) A.C. only
Alternate ECC (Farm Demonstration Building)	E-520 (1), Pic-6A (6), RM-14 w/HP-210 (1) MS-2/SPA-3 (1)
*Mobile Kit #1 (South G/H	E-520 (1), MS-2/SPA-3 (1) Air Sx. (1) BN type, runs off car battery

TOTAL AMOUNT OF DOSIMETRY FOR ERPIP

	SRD					TLD
LOCATION	(0-200mR)	(0-1R)	(0-5R)	(0-50R)	(0-200R)	
Small Trailer	5	0	5	5	5	5 WB
Large Trailer	50	0	50	50	50	50 WB 30 Specials
North Service Bldg.	5	0	0	0	0	0
69' First Aid Room	0	0	0	5	0	0
Calvert Memorial Hospital	10	0	10	10	10	10-Ring 10-WB
Control Room	10	10	0	0	0	10 WB
45' Reentry-Locker	0	0	10	10	10	10 Special
* Primary ECC	0	0	0	0	0	0
Mobile Kit (s) #1-4	12	0	0	0	12	12 WB
Alternate ECC(Farm Demo)	25	0	0	25	25	25 WB
South Gate Security	100	0	0	0	0	100 WB
Oper. Support Center	50	0	25	25	25	50-WB 20-Serv. 30-Specials

TABLE 10 (Continued)

-NOTE-

*Mobile Kits 1-4 are Identical

Total Amount of Equipment for ERPIP

RO-7s	E-520s	Pic-6As	Rm-14's	MS-2/SPA-3	A.C. Air SX's	Air SX's
( )	7	11	3	6	2	4 (2 extra for for back-up

TABLE B.1-1
Potentially Available Resources
PJM Utility Radiological Emergency Response Capabilities
H. P. & Radiochem Personnel & Equipment Available for
Response to Another PJM Utility

		TMI-1	TMI-2	OC	SNGS	PB	SSES	CC
A. Personnel								
1.	H. P. Supervisors	3	3	2	2	5	2	3
2.	H. P. Techs	6	6	5	5	20	5	10
3.	Radio Chem Supervisors	1	1	0	0	2	0	2
4.	Radiochem Techs	3	2	3	2	2	1	2
5.	Engr.-Effl. Ass.	2	4	0	0	1	1	1
6.	TLD Reader	2	1	0	1	1	1	1
7.	EE-RMS Specialist	1	1	1	0	1	0	1
8.	Security Sgt.			1		0		2
9.	Security Officers			8		0		1
10.								
B. Radiation Detection Equipment		Units 1 & 2 Combined						
1.	Survey Meter-Hi	2		20	0	12	5	8
2.	Survey Meter Hi-Telescoping	10		4	5	0	4	1
3.	Survey Meter-Lo	10		5	5	4	10	8
4.	SAM II	4		0	1	0	2	1*
5.	Portable GeLi	0		1	1	1	1Nal	0
6.	Shield for GeLi	0		1	1	1	1	0
7.	Computor & Output for GeLi	0		1	1	1	0	0
8.	uR.hr. ratemeter & recorder	0		0	0	0	1	0
9.	RM-14 Frisker	2		15	10	15	5	3
10.	Air Sampler - lo vol.	5 5		5 5	3 3	6 6	2 2	2 2
11.	Air Sampler - hi vol	10		10	5	3	2	2
12.	Gas Sampler (for later GeLi Analysis)	2 2		0 0	0 0	2 2	2 2	0 0
13.	Pocket Dosimeters	300		200	100	100	20	200
14.	Proportional Count	2		0	0	1	0	1
15.	Liq. Scint.	1		1	0	0	0	0
16.	Scaler-Timer + Detector	4		1	1	0	1	1
17.	Shields for above	2		1	1	0	1	0
18.	Rad tads	0		0	0	24	0	0
19.	Ion Telemetry	0		0	0	1	0	0

TABLE B.1-1, continued
Potentially Available Resources
PJM Utility Radiological Emergency Response Capabilities
H. P. & Radiochem Personnel & Equipment Available for
Response to Another PJM Utility

		TMI-1 Combined	TMI-2	OC	SNGS	PB	SSES	CC
C.	Vehicles							
1.	Station Wagon or Truck or Van for Survey Team	1		1	1	1	1	1
2.	110 generator	0		1	1	0	1	0
3.	Inverter for vehicle battery	4		0	1	0	1	1
4.	GeLi Counting Lab Van	1		0	0	0	1	1
5.	Beta Counting Lab	0		0	0	0	0	1
6.	Wind Speed & Direction Indic.	1		0	0	0	0	0
D.	Supplies	Units 1 & 2 Combined						
1.	Coverall & Access set	1000		2000	1000	500	500	0
2.	Disposable	1000		1000	1000	0	200	200
3.	Rainsuits	1000		500	50	200	250	10
4.	Respirators	250		100	150	100	100	100
5.	Respirator Cartridges	200		1000	500	400	200	100
6.	Iodine Sampler Cartridges	100		500	200	200	250	100
7.	Silver Zeolite Cartridges	10		0	200	0	0	0
8.	50 gal. plastic bags	2000		5000	500	500	2K	1000
9.	Decon Kit (skin)	1		1	0	0	0	0
10.	Absolute Filter Vacuum Cleaner	6		2	1	0	1	0
11.	Filters for above	6		2	1	0	2	0
12.	Resp. Test Booth	1		0	0	0	0	0
13.	SCBA (4.5)	25		10	20	6	5	10
14.	SCBA Tanks	25		10	20	6	10	30
15.	Port Air Comp	1		0	1	0	0	0
16.	Glove Box for Sample Prep.	1		2	0	0	0	0
17.	Lead Bricks	200		0	20	0	100	500
18.	1/4" Lead Sheet 4 x 4 x 1/4	100		50 1'x2'	10	10	20	100
19.	Lead Blankets	100		0		25	15	100
20.	Air Sample papers	1000		1000	200	200	500	10K
21.	Radiacwash-gal.	55		0	0	55	55	5
22.	Rad Cal Source	1		0	0	0	2	0
23.	Misc. Std. for Lab Equip.	1		1	0	0	1	0

TABLE B.1-2 RADIAC INSTRUMENT CHARACTERISTICS

INSTRUMENT	DETECTOR (GAMMA RESPONSE)	DETECTOR (BETA RESPONSE)	DETECTOR (ALPHA RESPONSE)	RANGE	CONVERSIONS
PIC-6A	Pressurized Ion Changer	Beta Factor = 50	None	1 - 1000 mR/h 1 - 1000 mR/h (cal to 20 mR/h)	True Beta dose = observed dose x Beta Factor
RM-14 with HP-210 Probe	G-M	---	---	0 - 500 cpm 0 - 5,000 cpm 0 - 50,000 cpm	E.F. for conversion to DPM - 5; 5000 cpm per mrem/h Co-60 3600 cpm per mrem/h Cs-137
PRM-4A with AC-3 probe	---	---	Scin-tilla-tion	0 - 200 K cpm	Alpha Efficiency Factor = 6.0
E-520 with HP-240 probe	G-M	Beta-Factor 3.0	---	0 - 0.2 mR/h 0 - 2.0 mR/h 0 - 20 mR/h 0 - 200 mR/h 0 - 2000 mR/h	Open window swipe measurement: 0.1 mR/h Bkgd = 10,000 DPM/ 1400 cpm per mR/h Co-60 1200 cpm per mR/h Cs-137
MS-2/SPA3	NaI (TL) Scintillation	---	---	0 - 500 K cpm	Values are listed on each instrument from calibration data.
RO-7	Digital readout Ion Chamber	---	None	.01-199.9 mR/h 1.0-19,999 mR/h	Automatic decimal point location on display according to detector used.
Teletector	G-M ranges - end window G-M tube	On lower 3	None	0.1 - 2.0 mR/h 0 - 50 mR/h 0 - 2 mR/h 0 - 50 mR/h 0 - 1000 mR/h	Automatic scale changing coupled to operating switch

TABLE 11
EMERGENCY TRAILERS
DOSIMETRY EQUIPMENT
CONTENTS

I. UD-702E Panasonic Manual TLD Reader
   A. Ring Adapters - 2
   B. Printer Paper - 4 Rolls
   C. Calibration Verification TLD's (10 TLD's Exposed to approximately 250 mR)

II. PROCEDURES - (In Notebook "EMERGENCY PLAN DOSIMETRY")
   A. Operations/Maintenance/Calibration TLD Reader
   B. Emergency Re-entry Pocedure
   C. Manual Computation of Exposure
      1. List of Current Chip Correction Factors
      2. Manual Calculation Work Sheets
   D. Calibration Verification TLD Exposure Verification
   E. Calibration Sheet (Copy)
   F. Associated Blank Forms - (In Notebook For Completed Forms "EMERGENCY PLAN DOSIMETRY LOG")
      1. Issue Log - 2 Sections
         a. Re-entry Issue
         b. Surveilance TLD Locations
         c. Prior To Augmentation
         d. After Augmentation

III. TLD's
   A. 20 Complete Packages(Specials)
      1. WB, Hd, Hands, Feet, Plus some controls made into packages and labeled for issue
   B. 20 WB TLD's Additional (in holders)

      Large Trailer = 50 Small Trailer = 5

EMERGENCY TRAILERS
EMERGENCY PLAN
DOSIMETRY EQUIPMENT
CONTENTS

IV. SRD'S	Large Trailer	Small Trailer
A. 0-5 R	50	5
0-50 R	50	5
0-200 R	50	5
0-200 mR	50	5

B. SRD Chargers:

Large Trailer = 4 (2 Johnson's + 12 Batt., and 2 DCA + 8"D" Batt.)

Small Trailer = 2 (1 Johnson's + 8"AA" Batt., and 1 DCA + 4 "D" Batt.)

C. SRD CHARGER BATTERIES (SPARE)

Large Trailer = 16 "AA" 1 1/2 Volts

Small Trailer = 8 "AA" 1 1/2 Volts

V. Miscellaneous

A. 12 (1 Box) Pens, Black Ink

B. 1 Pad 8 1/2" x 11" Lined Paper

C. Dosimetry Smooth Log - Small Log Book for recording events and times

D. 2 Flashlights and 4 Spare Batteries

TABLE 12
Operational Support Center
Emergency Equipment Inventory

	ITEM	UNIT	# REC'D	# FOUND
1.	T.L.D. Specials (15 sets made to include 3 high range SRD's) (1 sets do not have high range SRD included)	Sets	30	____
2.	TLD hole Body Badges(Personnel)	Each	50	____
	TLD Badges (surveillence)	Each	20	____
3.	Self Reading Dosimeters			
	0-200 mR Calibration Due Date ____	Each	50	____
	0-5 REM Calibration Due Date ____	Each	25	____
	0-50 REM Calibration Due Date ____	Each	25	____
	0-200 REM Calibration Due Date ____	Each	25	____
4.	Dosimenter Chargers with extra batteries	Each	4	____
5.	Flashlight	Each	1	____
6.	Clipboard	Each	1	____
7.	Pens(black)	Each	12	____
8.	Scratch Pads	Each	2	____
9.	Access Control Cards	Each	100	____
10.	Dose Limit Statement	Pad	1	____
11.	Visitors Dosimetry Check In/Out Sheet	Pad	1	____
12.	NRC Form - 4	Pad	1	____
13.	Emergency Action Forms Exhibit 5.2.A		30	____
14.	Weekly Dosemetry Record(Blank)		30	____
15.	TLD Location & Log Sheet Exhibit 4.8.1-I		20	____
16.	Emergency Dosimetry Issue Log Sheet Exhibit4.8.1-H		30	____

Operational Support Center Kit (cont)

ITEM	UNIT	REC'D	# FOUND
17. CC Personnel Monitor Record		1-option 1	_____
18. Quarter Dose Listing		1-option 14	_____
19. Small Smooth Log Book		1	_____
20. Radiation Information Forms	Pad	1	_____
21. Temp. Visitor TLD Issue Forms	Pad	1	_____
22. Add/Hire Sheets	Pad	1	_____
23. Small Plastic Bags (for specials)	Each	50	_____
24. Security Card Clips	Each	25	_____

* Dose conversion factors in this column are provided for reference only. They were used together with the inventory values to develop the overall noblegas dose conversion factors of Table C.3.1.1 (see Section C-3 of this appendix).

** (Full Power inventory taken at 2700 MWt)

The Reactor Safety Study included a number of analyses of possible core melt accidents, including very severe ones involving vaporization of fuel. Based on these studies, 54 isotopes were selected as being the most significant. They are listed in Table C.1.1-2 (inventories are adjusted to 2700 MWt).

Table C.1.1-2

INITIAL ACTIVITY OF RADIONUCLIDES IN THE NUCLEAR REACTOR CORE AT THE TIME OF THE HYPOTHETICAL ACCIDENT*

No.	Radionuclide	Radioactive Inventory Source (Ci)	Half-Life (d)
1	Cobalt-58	6.6 E+05	71.0
2	Cobalt-60	2.4 E+05	1,920
3	Krypton-85	4.7 E+05	3,950
4	Krypton-85m	2.0 E+07	0.183
5	Krypton-87	4.0 E+07	0.0528
6	Krypton-88	5.7 E+07	0.117
7	Rubidium-86	2.2 E+04	18.7
8	Strontium-89	7.9 E+07	52.1
9	Strontium-90	3.1 E+06	1,030
10	Strontium-91	9.3 E+07	0.403
11	Yttrium-90	3.3 E+06	2.67
12	Yttrium-91	1.0 E+08	59.0
13	Zirconium-95	1.3 E+08	65.2
14	Zirconium-97	1.3 E+08	0.71
15	Niobium-95	1.3 E+08	35.0
16	Molybdenum-99	1.4 E+08	2.8
17	Technetium-99m	1.2 E+08	0.25
18	Ruthenium-103	9.3 E+07	39.5
19	Ruthenium-105	6.1 E+07	0.185
20	Ruthenium-106	2.1 E+07	366
21	Rhodium-105	4.1 E+07	1.50
22	Tellurium-127	5.0 E+06	0.391
23	Tellurium-127m	9.3 E+05	109
24	Tellurium-129	2.6 E+07	0.048
25	Tellurium-129m	4.5 E+06	0.340
26	Tellurium-131m	1.1 E+07	1.25
27	Tellurium-132	1.0 E+08	3.25
28	Antimony-127	5.1 E+06	3.88
29	Antimony-129	2.8 E+07	0.179
30	Iodine-131	7.2 E+07	8.05
31	Iodine-132	1.0 E+08	0.0958
32	Iodine-133	1.4 E+08	0.875
33	Iodine-134	1.6 E+08	0.0366
34	Iodine-135	1.3 E+08	0.280
35	Xenon-133	1.4 E+08	5.28
36	Xenon-135	2.9 E+07	0.384
37	Cesium-134	6.3 E+06	750
38	Cesium-136	2.5 E+06	13.0
39	Cesium-137	4.0 E+06	11,000
40	Barium-140	1.4 E+08	12.8
41	Lanthanum-140	1.4 E+08	1.67
42	Cerium-141	1.3 E+08	32.3

TABLE C.1.4-1

ESTIMATED FISSION PRODUCT RELEASES FROM MELTED FUEL

Isotope	Melted Fuel Release Fraction (2800°C) (1)
Xe-Kr	0.87
I-Br	0.88
Cs-Rb	0.76
Te,Se,Sb	0.15
Sr, Ba	0.10
Ru	0.03
Lanthanides	0.003

(1) Xe-Kr, I-Br, Cs-Rb in the gap region are not included and would be released on clad failure. See Table C.1.3-1.

C.1.5 Fission Product Releases from the RCS Associated with Steam Generator Tube Leak(s) or Rupture(s)

The secondary side may become contaminated after an accident (as it did at TMI) if there are tube leaks in one of the steam generators. This may lead to contamination of normally clean systems (including routine waste treatment systems) if there are valve leaks in the secondary system. There also may be airborne releases from steam relief valves or from the condenser air exhaust. Quantities released will depend on the amount of radioactivity in the primary system and on the extent of tube leakage*.

A general equation that can be used to approximate the quantities that may be released is:

$$\text{Release to Secondary Side} = (SGLR \times A_o \times t) + \frac{SGLR \times S \times t^2}{2}$$

Where SGLR = steam generator leak rate (gpm)

A_o = initial activity in primary system (may be either pre-accident quantities or activity associated with cladding failure)

t = elapsed time, min

S = release rate from defective cladding = Spiking factor times pre-incident release rates.

The pre-incident xenon-133 release rate is 1.4×10^8 Ci (the inventory in the core) x 6.5×10^{-8} s^{-1} (the escape coefficient from defective cladding) x failed fuel fraction x 60 s/min. The iodine-131 release rate is 7.2×10^7 Ci x 1.3×10^{-8} s^{-1} x failed fuel fraction x 60 s/min.

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* In a situation where the tube leak is near the top of the steam generator (or any dry region) and steam dump to the atmosphere is occurring, about 10% of the iodine may be released to the atmosphere. In other situations only small quantities of iodine will be released and that will be relatively harmless methyl iodine.

C.1.6 Fission Product Releases from the RCS Associated with ECCS or Letdown System Leakage

Operation of the CVCS or of the ECCS systems in the recirculation mode will transport reactor coolant outside of the reactor containment. Any leaks in this equipment will result in a fission product release. The fission products may become airborne by being carried off with any leaking steam, or by volatilization (including evaporation) of any liquid leaks. The importance of any such release will depend on the extent of clad and fuel damage and consequent releases to the reactor coolant, as noted in Table C.1.6-1 below:

TABLE C.1.6-1
ILLUSTRATION OF LEAKAGE AS A FUNCTION OF RELEASE TO THE RCS

Reactor Coolant Contamination Levels	Curies Leaked in 2hrs @ 0.1 gpm (12 gallons)
300 Ci = 1.1 uCi/ml = 0.0043 Ci/gal	0.052 Ci
10,000 Ci = 38 uCi/ml = 0.14 Ci/gal	1.7 Ci
1% failed fuel, gap release	
= 1.4×10^4 Ci I-131 = 54 uCi/ml = 0.21 Ci/gal	2.5 Ci of I-131
= 4.2×10^4 Ci Xe-133 = 160 uCi/ml = 0.6 Ci/gal	7.2 Ci of Xe-133

The accompanying tables provide results covering a broad spectrum of releases.

TABLE C.1.6-2

Xe-133 ACTIVITY IN REACTOR COOLANT FOLLOWING AN ACCIDENT (2)

Coolant Activity/Release	Initial concentration uCi/ml	Initial concentration Ci/gal	Ci/Gal Concentration at Stated Time Including Transient Release (Spiking) SF = 100 30 min	1h	2h	4h	SF = 500 30 min	1h	2h	4h
0.1 uCi/ml	0.1	0.00038								
0.01% failed fuel (3% gap except as noted(1))	1.6	0.0060	0.0083	0.011	0.015	0.025	0.018	0.029	0.053	0.10
0.1% failed fuel (gap activity = 10%)	37	0.14	0.16	0.19	0.23	0.33	0.26	0.37	0.61	1.1
1% failed fuel(gap)	160	0.60	2.9	5.3	10	19.3	(3)			
1% ff (10% gap)	370	1.4	(3)							
10% failed fuel	1600	6								
100% failed fuel	16,000	60								
TID-14844 Release	530,000	2000								

(1) @ 0.01% failed fuel the steady state release rate of Xe-133 is approximately 0.00091 curies per second. At a Spiking Factor (SF) of 100 the release rate would be 0.091 Ci/s.

(2) Volume taken at 2.72E8ml.

(3) For these more severe conditions, substantial additional releases from spiking are not expected to occur and therefore use the initial concentration values for these conditions.

TABLE C.1.6-3
I-131 ACTIVITY IN REACTOR COOLANT FOLLOWING AN ACCIDENT(2)

Coolant Activity/Release	Initial Concentration uCi/ml	Initial Concentration Ci/gal	Ci/Gal at Stated Time Including Transient Release (Iodine Spiking) SF = 100 30 min	1h	2h	4h	SF = 500 30 min	1h	2h	4h
0.1 uCi/ml	0.1	0.00038								
0.01% failed fuel (2% gap except as noted(1))	0.55	0.0021	0.0023	0.0025	0.0032	0.0040	0.0033	0.0045	0.0069	0.012
0.1% failed fuel	5.5	0.021	0.023	0.026	0.031	0.040	0.033	0.045	0.070	0.12
0.1% failed fuel (gap activity = 10%)	61	0.23	0.23	0.24	0.24	0.25	0.24	0.25	0.28	0.33
1% failed fuel	55	0.21	0.23	0.26	0.31	0.36	(3)			
1% failed fuel (10% gap)	600	2.3	(3)							
10% failed fuel	550	2.1								
100% failed fuel	5500	21								
TID-14844 Release (50%)	130,000	510								

(1) @ 0.1% failed fuel the steady state release rate of I-131 is approximately 0.000083 Ci/sec; at a spiking factor (SF) of 100, the release rate would be 0.0083 Ci/s.

(2) Volume taken at 2.72×10^8 ml.

(3) For these more severe conditions, substantial additional releases from spiking are not expected to occur and therefore use the initial concentration values for these conditions.

C.1.7 Iodine Releases of Reactor Coolant from Spills

Section C.1.6 provides estimates of the quantities of noble gases and halogens that will be released from the core under various conditions. Radioactivity in the leaked coolant will not immediately become airborne. This section provides a basis for determining the rate of release from RCS leaks.

More than 95% of the iodine should be in the elemental or ionic form and will not be readily released from water. Consequently it will pose more of a contamination problem than an inhalation hazard over a long period of time. The rate of release will be directly proportional to the rate of evaporation of the water. Water will evaporate at about 0.25 grams per square meter of surface area per second.

The equation used to estimate the fractional release rate of iodine per hour is:

$$\frac{\text{iodine release}}{\text{iodine in water}} \quad \text{(per hour)} = 1 - \left(1 - \frac{2.5 \times 10^{-7}}{d}\right)^{3600}$$

Where d = depth of water in meters

Example: Spill of contaminated RCS water onto floor
Spill depth = 2 inches = 5.08 cm = 0.051m

$$\text{Iodine release} = 1 - \left(1 - \frac{2.5 \times 10^{-7}}{0.051}\right)^{3600}$$

$$= 1 - (0.999995)^{3600} = 1 - 0.98$$

$$= 0.02 = \underline{2\% \text{ per hour.}}$$

A small fraction of the iodine and all the noble gases can be classed as volatile and as such are not significantly soluble in water. They will be released more rapidly than elemental iodine but not instantaneously.

The rate of release of these volatile species is dependent on two factors:

(1) the relative densities of water and steam, and

(2) the chemical "partition" factor of the volatile species.

It is generally assumed that the partition factor of such material is 1. That is, no effective long term retention of any of the material in water.
The equation used to estimate the fractional release rate of volatile iodine per hour is:

$$\frac{\text{volatile iodine released}}{\text{volatile iodine originally in water}} \text{ (per hour)} = 1 - \left[\left(1 - \frac{2.5 \times 10^{-7}}{d}\right)^{21}\right]^{3600}$$

The same equation can be used to represent the rate of release of noble gases from leaked RCS fluids. This was the situation that contributed to the airborne releases at TMI.

Example: Spill of contaminated RCS water onto floor.
Spill depth = 2 inches = 5.08cm = 0.051 meters

$$\text{Volatile Iodine Released} = 1 - \left[\left(1 - \frac{2.5 \times 10^{-7}}{0.051}\right)^{21}\right]^{3600}$$

$$= 1 - \left[(0.999995)^{21}\right]^{3600}$$

$$= 1 - (0.9998967)^{3600}$$

$$= 1 - 0.689$$

$$= 0.31 = 31\% \text{ per hour}$$

Thus a spill or leakage of RCS fluid will result in a release of about 30% of the "dissolved" volatile iodine or noble gases in the first hour following that spill.

C.1.8 In Plant Radiological Conditions Associated with Accidental Releases

Sections C.1.2 thru C.1.7 provide information that may be used to estimate the magnitude of a release and/or the subsequent contamination of plant equipment. It is possible to obtain rapid initial confirmation of the magnitude of the release by reference to post-accident gamma exposure rates.

Table C.1.8-1 presents the gamma exposure rates inside containment that would be associated with LOCA and subsequent large fission product release. It is more severe than predicted to result from any safely terminated pipe rupture where less than 2% of the core inventory noble gases would be released into containment. In any event, the values in that table can be adjusted downward to reflect smaller accidental releases.

Table C.1.8-2 is based on the same assumed large fission product release. However, it provides exposure rate information outside of containment and thus hand held portable meter readings can be used, as well as fixed position detectors, to infer the size of the release into containment. As with Table C.1.8-1, the magnitude of a release can be estimated by comparing measured exposure rates to the exposure rates in the table.

TABLE C.1.8-1

GAMMA EXPOSURE RATES & INTEGRATED EXPOSURES AT CONTAINMENT CENTER

Time (h)	Exposure Rate (R/h)	Cumulative Dose (R)
0	3.3×10^6	-
0.03	3.1×10^6	1.4×10^5
0.5	9.8×10^5	7.9×10^5
0.75	8.7×10^5	1.0×10^6
1	7.8×10^5	1.3×10^6
2	5.8×10^5	1.9×10^6
8	1.9×10^5	4.0×10^6
24	4.6×10^4	4.8×10^6
60	1.6×10^4	6.2×10^6
96	1.2×10^4	6.8×10^6

C.2 Dispersion Estimates

D. B. Turner's "Workbook of Atmospheric Dispersion Estimates", provides a resource base that should be adequate for almost any emergency situation. The workbook describes basic dispersion processes and provides a discussion of (including sample calculations) a variety of special problems, from plume rise to plotting concentration isopleths.

Many situations can be handled by reference to a standard chart of relative dispersion vs distance or similar curves for different types of problems. These are included below.

C.2.1 Atmospheric dilution versus distance versus stability class

Figure C.2.1-1 can be used to determine atmospheric dispersion. It is based on the equation for a ground level release with no building wake or wind meandering. That equation is:

$$\frac{X\bar{u}}{Q} = \frac{1}{\sigma_y \sigma_z}$$

where X = concentration at distance of interest (Ci/m^3) for continous releases or $Ci\text{-}s/m^3$ for short term releases

Q = source term (Ci/s for continous releases or Ci for short term releases)

$\bar{U}$ = wind speed (m/s)

σ_y = the distance which represents one standard deviation of concentration in the cross axis direction.

σ_z = the distance which represents one standard deviation of concentration in the vertical direction.

NOTE

The values from these curves must be divided by the wind speed (m/s) to obtain actual dilution factors.

C.2.2 Isopleths (Determination of areas requiring protective action)

An isopleth is simply a boundary; every point inside the boundary value (projected dose, relative atmospheric dispersion or whatever) is greater than the boundary value. A question that may be expected to arise is what area will be subjected to exposures that are greater than PAG levels. This question can be easily estimated by a two step process:

(1) determine the distance downwind beyond which PAG levels will not be exceeded

(2) determine, for closer distances, the axial distance from the cloud centerline required to obtain the same dispersion conditions as at the distance in step 1.

The areas covered by given dispersion values have been pre-calculated and the results are presented in Figure C.2.2-1.

Example:

It has been determined that at a distance of 6 miles (and a $X\bar{u}/Q$ value of 10^{-5}), the projected whole body dose will be 5 rem. The atmospheric stability conditions are "E". From Figure C.2.2-1, in an area of about 5 million square meters, the concentration will be greater than 10^{-5}.

To find the specific areas where a given value will be exceeded, reference can be made to predrawn isopleths or a simple calculation can be performed. Thus if, as in the example cited above, it was known that at 6 miles the projected whole body dose was 5 rem then it could be determined that the doses at the cloud centerline (the prevailing wind direction) at a distance of 3 miles would be 15 rem. From Figure C.2.1-1 the relative concentration is 3×10^{-5} at 3 miles vs 10^{-5} at 6 miles and thus the doses would be 3 times greater. The concentration diminishes away from the cloud centerline, as a function of atmospheric dispersion conditions.

The basic equation is:

$$\frac{\text{X isopleth value}}{\text{X cloud centerline}} = \ln\left\{-1/2\,(y/\sigma y)^2\right\}$$

where y is the distance away from the cloud centerline at any stated distance where the concentration has diminished to the isopleth value (the value of interest).

Figure C.2.2-2 shows values of y as a fraction of distance and atmospheric stability condition. It, together with Figure C.2.1-1 showing values of $X\bar{u}/Q$, can be used to solve the above equation. As a practical matter the equation to use is:

$$y^2 = -2\,(\sigma_y)^2 \ln (X\bar{u}/Q \text{ of interest}/X\bar{u}/Q \text{ at centerline})$$

Example:
At a $X\bar{u}/Q$ of 10^{-6}, the projected dose is 5 rem; how wide an area might be subjected to greater than 5 rem at a distance of 6 miles with "E" stability conditions?

From Figure C.2.1-1 ($X\bar{u}/Q$ vs. distance) the centerline $X\bar{u}/Q$ at 6 miles is 10^{-5}. From Figure C.2.2-2 (σ_y vs. distance) the σ_y at 6 miles is 400 meters. Thus

$$y^2 = -2\,(400)^2 \ln (10^{-6}/10^{-5})$$
$$= -2\,(160000)\,(-2.30) = 736827.23$$

$$y \cong 860 \text{ meters}$$

That is, at a distance of six miles, 860 meters away from the centerline of the cloud the concentration is 10% of the centerline concentration and the projected exposure rate is 5 R/h.

To construct an isopleth, perform the above for a range of distances.

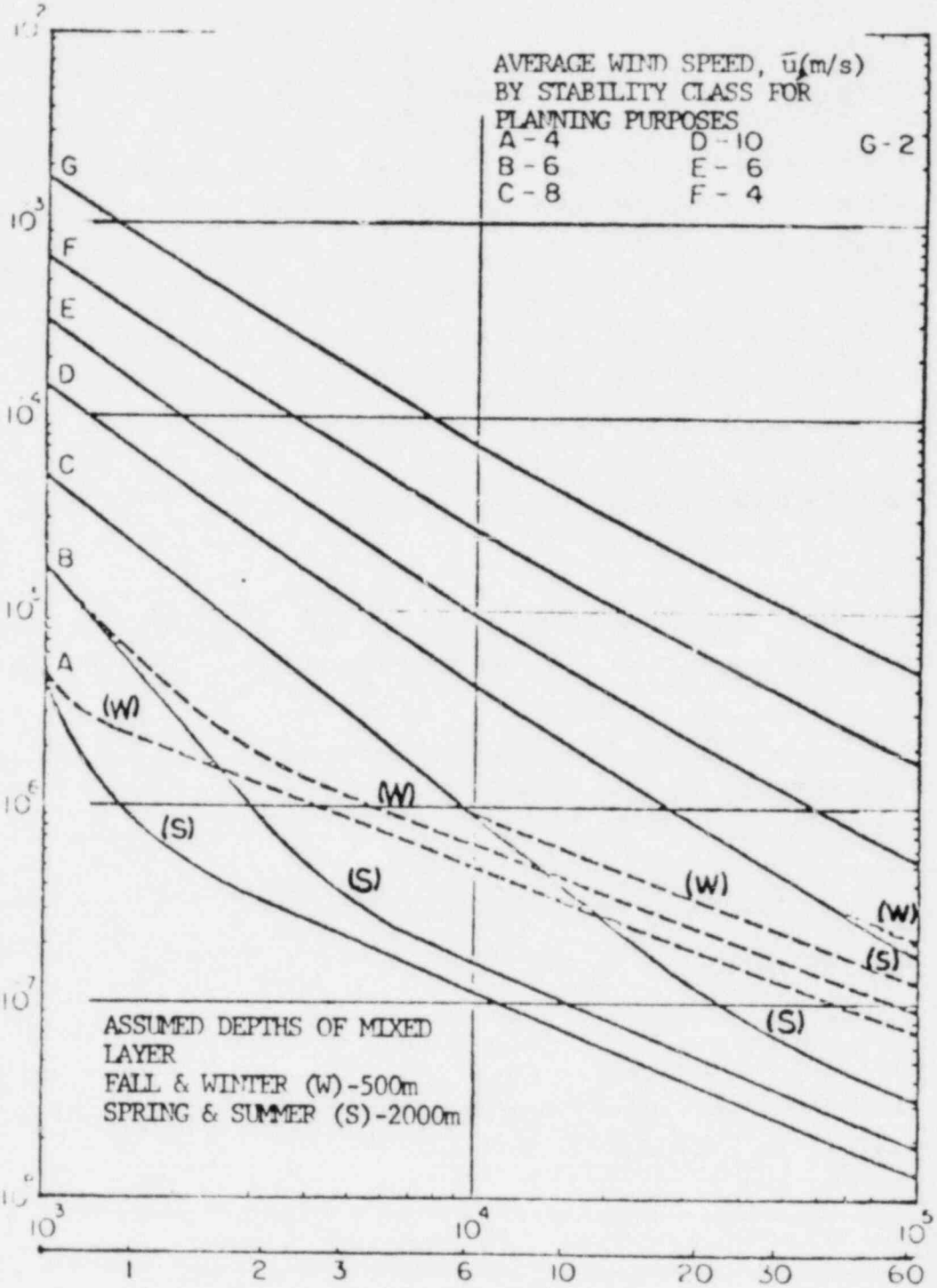

FIGURE C.2.1-1

AVERAGE RELATIVE AXIAL CONCENTRATION BY STABILITY CLASS

C.3 Dose Projections

This section contains the following subsections:

C.3.1 Whole Body Dose Projections

C.3.2 Thyroid Dose Projections

C.3 Dose Projections

C.3.1 Whole Body Dose Projections

Source Term Estimates, or Projections of doses based on field measurements will be wrong unless methods specifically tailored to gamma radiation are used.

Most assessment aids (isopleths, formulas which employ standard values of X/Q vs. distance of X/Q as a function of distance from cloud centerline) are based on air concentrations. They are generally accurate for estimating inhalation dose. They are generally inaccurate in estimating whole body dose, or in inferring a source term based on field measured gamma air exposure rates. Within 10 kilometers(~6.5 mi.) of the plant the cloud is small in extent, a factor which must be taken into account. If this factor is not taken into account (e.g., if standard assumptions of a semi-infinite cloud and isopleths based on concentrations are used) then the source term (or dose) may be under or over estimated by a factor of 10 or more.

The gamma air exposure rate (that measured by a meter or TLD - generally about 10% higher than the whole body dose) is due to the radiation from the noble gases in the air directly surrounding the receptor (the immersion dose) and to the direct radiation from material in the vicinity of the receptor. The stronger the radiation energy (higher MeV/dis), the more important will be the contribution from radioactivity some distance away. Both the energy per disintegration and the curie inventory change rapidly with time (see Figure C.3.1-1), and this should be accounted for in evaluating field measurements. For example, with a wind speed of 2(~4.4 mph) meters per second, it will take slightly more than 30 minutes for a cloud to travel 4km(~2.5 mi.) and about 5 hours for the cloud to travel out to 40km(~25 mi.). During that time, the average gamma energy will have decreased from 0.68MeV to 0.28MeV and the curie content of the cloud will have decreased by a factor of two.

The net result is that the dose at 40km will be a factor of four lower than the dose at 4km ignoring any reduction due to atmospheric dilution between the two points.

TABLE C.3.1-1

WHOLE BODY DOSE CONVERSION FACTORS FOR A SEMI-INFINITE CLOUD

Time After Reactor Shutdown (h)	Dose Conversion Factors $\frac{rem/h}{Ci/m3}$	$\frac{rem/s}{Ci/m3}$	Time Correction Factor
0	650	0.18	1
0.5	610	0.17	0.58
1	470	0.13	0.37
1.5	430	0.12	0.31
2	370	0.092	0.26
2.5	350	0.097	0.22
3	340	0.094	0.20
3.5	330	0.091	0.19
4	290	0.081	0.16
4.5	270	0.075	0.14
5	260	0.071	0.13
6.5	210	0.059	0.099
8	180	0.050	0.078
10	150	0.042	0.060
12.5	120	0.033	0.043
15	115	0.029	0.034
24	86	0.024	0.019
48	50	0.014	0.0097
72	43	0.012	0.0068

Source: RG 1.109 Table B-1, ORIGEN Run for inventories

Note: Time Correction Factor represents the product of the dose rate from a curie of mixed isotopes of noble gases and the relative curie quantity of noble gases at various times after reactor shutdown. The absolute value is 59,000 at time zero which is $\frac{rem/s}{Ci/m^3}$ x $\frac{Ci \text{ of noble gases produced.}}{Mwt \text{ of power}}$ The value of 59,000 may be used directly if the fission product release is converted into fraction of core inventory released.

TABLE C.3.1-2

FINITE CLOUD CORRECTION FACTORS (1)

Distance (km)	Ratio of Actual Centerline Cloud Doses to Assumed Semi-Infinite Cloud Dose for Various Stability Classes "A"	"B"	"C"	"D"	"E"	"F"
1	0.78	0.71	0.58	0.44	0.35	0.24
1.5	0.84	0.80	0.70	0.55	0.46	0.35
2	0.91	0.83	0.76	0.64	0.55	0.42
3	0.93	0.90	0.83	0.75	0.68	0.54
4	0.94	0.91	0.88	0.80	0.74	0.60
5	1	0.92	0.90	0.84	0.79	0.70
7	1	0.94	0.91	0.89	0.84	0.76
10	1	1	0.94	0.91	0.89	0.83
15	1	1	1	0.93	0.91	0.89

(1) Ratio of the gamma dose in a finite cloud to the gamma dose in an infinite cloud having the same concentration as the center line of the finite cloud for 0.7 MeV gamma photons.

Note: Based on 0.7 MeV (representative of first 30 minutes after shutdown). At longer times (greater than about 3-1/2h), actual dose will begin to approach semi-infinite cloud dose, and this table should no longer be used. Instead assume that all ratings are 1. (Source: Meterology & Atomic Energy, Figure 7.14)

TABLE C.3.2-2

INGESTION (MILK CONSUMPTION) DOSE POTENTIAL (rem)

FROM 1 Ci/m^3 of I-131 (a)

(Units of Rem/Ci.m^{-3})

Age	Winter	Spring	Summer	Fall
0-1	1000	3600	34,000	32,000
2-3	900	3200	31,000	29,000
4-6	900	3200	31,000	29,000
7-12	900	3200	31,000	29,000
13-19	450	1600	15,000	14,000
20	290	1000	10,000	9,400

(a)

All values must be multiplied by the mean wind speed. Thus a 1 Ci release and a dilution factor(X/Q) of 10^{-4} s/m^2 and a wind speed of 2 m/s will result in a 6.8 rem thryoid dose to a 0-1 year old child in the summer months.

(Source IDO-12053)

(i.e., it will cause doses to be over-estimated.)

Line 6 - Vent Flow Rate for Release Points 1-4 (CFM * 1000)

The vent flow rate is used to determine the exit velocity which in turn can have a dramatic affect on dispersion. The normal value will be printed and the user will be prompted for a change. If the fans are not running, a "1" should be entered.

Line 7 - Maximum Downwind Distance (miles)

This is the first of the output controls. It determines the scale of the site map to be plotted on the screen. Generally, 10 miles is sufficient but greater resolution near the plant could be achieved using a closer distance.

Line 8 - Plot or Print Results (0=plot, 1=print)

If a graphics CRT is being used, the plot should be selected. The print option is primarily for nongraphics terminals.

Line 9 - Background Map Selectors

Up to 20 different map characters can be drawn on the site map. This option enables the user to chose the appropriate ones. When the edit mode is selected for this line item, a printout of all available selectors appears. The numbers of each of those desired are then selected (e.g., 1, 3, 5, 17, 19). In the menu print either a 1 (for on) or 0 (for off) which is printed in each slot reading from left to right for 1 through 20. This is just a convenient way of providing alot of information in a small space.

Line 10 - Selected Report Options

A number of reports are available from the CRISO calculation including plots and prints. When this edit is selected, a list of those possible is printed (see example). Again, a 1 and 0 is used to indicate which is selected.

Line 11 - Selected Release Points for X/Q Print

Since values of dispersion (X/Q) cannot be added over all release points, the user may select the release points for which X/Q will be plotted or printed. Again, a 1 and 0 corresponds to release point 1 through 4 from left to right.

Line 12 - Isopleth Contour Spacing (Stability A-G)

The isopleth line values are preset in the program and result in very close spacing under certain dispersion conditions (e.g., E, F and G). To alleviate this problem for the user and make the plots more readable, he may "thin out" the number of lines for each stability group. The number printed from left to right corresponds to the number of contours skipped for the A through G stability class, respectively.

Line 13 - Gamma Dose Type (0=semi-infinite, 1=finite)

Two types of whole body gamma dose are calculated. The first involves a conservative (for ground level releases) plume submersion (semi-infinite) algorithm and the second uses a more sophisticated (finite plume) calculation attributed to Hamawi. The latter is more time-consuming but is preferred.

Line 14 - Mobile Monitor Team Gamma Dose Adjustment Factor

If offsite monitoring team data indicates that an adjustment is necessary to the plume dose calculations, a correction can be made using this factor. This should only be done under close supervision. A separate factor is provided for gamma and iodine since there is no definitive correspondence between them in any given accident.

Line 15 - Mobile Monitor Team Iodine Adjustment Factor

See discussion for line 14 above.

Line 16 - Release Points Active

Normally the ER task is used to preset active release points. However, the capability to override these is provided in this menu edit option. Always enter all four as 1's or 0's, left to right separated by commas for release point 1 through 4, respectively.

Line 17 - Meteorology Type Selection (0=Raw Data, 1=Workspace)

Enter the desired source of meteorological data. If the raw data fromthe routine collection program are to be used select "0". If for some reason, the data source is on the workspace file (e.g., data line has been edited and placed on this file), a "1" should be selected. This latter mode is useful during drills and tests.

Line 18 - Date for Historical Data (YRMODAHRMN)

Enter the historical date to be used. The date must be on the file and the proper minutes must be entered. Only 00, 15, 30 or 45 are allowable for the minute columns. If 99 is inserted the most recent hour of data (determined from the computer clock) will be used.

THE PUSH-BUTTON APPROACH

A series of function keys has been set up for scheduling CRISO with different prestored menus. This enables the user to schedule jobs with a minimum number of questions to be answered depending on the type of calculation he is making. The function keys have been set up in two groups--two for test cases in which neither the meteorology nor the effluent data are real time and four for normal operations. The matrix in Table C.4 reserves to indicate how the menu for each pushbutton is set up. A procedure for the use of each in running CRISO is provided in the appropriate exhibits numbered 4.4.9-A through 4.4.9-F. Exhibit 4.4.9-G explains each option in the run in more detail.

TITLE: EMERGENGY RESPONSE PERSONNEL VECHICLE TRAFFIC ACCESS

1.0. Introduction

The purpose of this procedure is to provide Emergency Response Personnel with guidelines to facilitate their passage through Maryland State and Local Police and Baltimore Gas and Electric Security Traffic Control Access Points to the Calvert Cliffs Nuclear Power Plant.

2.0. Prerequisites

2.1. An Emergency Condition has been declared warranting Response by Emergency Personnel.

2.2. Maryland State/Local Police and/or Baltimore Gas and Electric Security Teams have established Traffic Control Access Check Points.

3.0. Precautions

3.1. Follow directions provided by the Police and B. G. & E. Security.

3.2. Do not make comments concerning the plant status or Company to Media Personnel.

3.3. Drive safely, obey all traffic regulations.

4.0. Access Instructions

4.1. Identify yourself as an Emergency Response Person by presenting your County Civil Defense, State, Federal or B. G.& E. Identification card to the Police and B. G. & E. Security personnel. State your purpose for being granted access.

NOTE: If the Md. State Police have not received prior Notification of your arrival from the plant, you will not be granted access.

4.2. Obtain Security Badge (if applicable) and dosimetry. A mental note should be made of your TLD Number (if provided), date and time of TLD issue for future reference.

4.3. If Self Reading Dosimeters are issued, ensure they are reading near zero and on scale.

4.4. During the event period, read your Self-Reading Dosimeters frequently (if applicable).

4.5. Do not exchange or assign your dosimetry to others, unless instructed to by the Dosimetry Team Leader or member(s), the RAD or RPD.

4.6. Dosimetry is worn between your neck and waist on the outside of your clothing with your TLD number or name facing away at all times.

4.7. Once access is granted by the police/security, proceed to your repective Emergency Response Station.

4.8. If an offsite radioactive release has been or is in progress, keep all vehicle windows closed and ventilation systems off during the drive.

4.9. Where personnel contamination monitoring devices are available, monitor yourself for radioactive contaminants prior to entering any Emergency Facility.

5.0. Egress Instructions

5.1. Proceed to the Traffic Control Access Check Point, as applicable

5.2. If an offsite radioactive release has been/is in progress, keep all vehicle windows closed and ventilation systems off during the drive.

5.3. Be prepared to have the vehicle, yourself, passengers and effects, monitored for radioactive contamination.

5.4. Identify yourself to the Police/Security teams with your identification card.

5.5. Return the security badge as applicable.

5.6. Return your Dosimetry, TLD and SRDs, as applicable. On the Dosimetry Issue Log (Table B.3-3):

5.6.1. Record date and time of dosimetry return.

5.6.2. Record your Self-Reading Dosimetry reading.

5.6.3. Print your name and sign the log signifying the accuracy of the information you provided.

NOTE: If it is not possible to return your dosimetry when egressing, keep the dosimetry until you are able to return it to the Dosimetry Unit.

5.7. Proceed to your destination.