

# INFORMATION COPY

BIG ROCK POINT NUCLEAR PLANT

SITE EMERGENCY PLAN  
IMPLEMENTING PROCEDURES

VOLUME 9A

(QA-05 1376-81)  
(QA-05-1415-81)  
(QA-05-1479-81)  
(QA-05-1503-81)  
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APPROVED:

*CJ Hartman / MS*  
(Plant Superintendent)

Date:

11-24-81

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Issued to: \_\_\_\_\_

Date: \_\_\_\_\_

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<u>EPIP Number</u>	<u>Title</u>
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3	<u>Activation of Support Centers</u>
	A. Activation of Technical Support Center
	B. Activation of the On-Site Operations Support Center
	C. Activation of the Emergency Operations Facility (Boyne City)
4	<u>Emergency Personnel Individual Implementing Procedures</u>
	A. Plant Superintendent
	B. Shift Supervisor
	C. Shift Technical Advisor
	D. Control Operator No 1
	E. Control Operator No 2
	F. Auxiliary Operator
	G. Operations and Maintenance Superintendent
	H. Technical Superintendent
	I. Nuclear Safety Technical Engineer
	J. Plant Health Physicist
	K. Operations Superintendent
	L. Shift Supervisor (Off Duty)
	M. Chemical and Radiation Protection Supervisor
	N. Maintenance Superintendent
	O. Instrument and Control Supervisor

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<u>EPIP Number</u>	<u>Title</u>
P.	Senior Engineer
Q.	Training Coordinator or Instructor
R.	Property Protection Supervisor
S.	Security Shift Leader
T.	Security Officer
U.	Technical Engineer
V.	Administrative Supervisor or Technician
W.	Plant Superintendent Secretary/Health Physics Clerk/Technical Clerk
X.	Public Affairs Director or Personnel Director
Y.	Reactor Engineer
Z.	Licensed Training Instructor or Training Instructor
AA.	Chemical and Radiation Protection Technician
BB.	Telephone Switchboard Operator
CC.	General Health Physicist
5	<u>Post-Accident Monitoring Procedures</u>
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<u>EPIP Number</u>	<u>Title</u>
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6	<u>Supplemental Procedures</u>
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	B. Personnel Monitoring Evacuation and Reassembly
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	D. Emergency Equipment and Supplies: Inventory, Maintenance and Calibration
	E. First Aid and Medical Care
	F. Communication Methods
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7	<u>General Office Nuclear Emergency Implementing Procedures</u>
	A. General Office Nuclear Emergency Implementing Procedures

ACTIVATION OF EMERGENCY PLAN  
Procedure 1

1.0 PURPOSE

- 1.1 To classify and indicate those emergency action levels which will cause activation of the Site Emergency Plan.

2.0 ATTACHMENTS

- 2.1 Attachment 1-1, Classification of Emergency Conditions with associated emergency classifications and emergency action levels.

3.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

- 3.1 Upon recognition that abnormal plant or site conditions exist, this procedure will be implemented by the Shift Supervisor and evaluated by the Site Emergency Director (or On-Call Duty Superintendent) to ensure the appropriate classification of the emergency condition and the appropriate Emergency Plan Implementing Procedures (EPIPs) have been initiated.
- 3.2 The Site Emergency Director will determine, based on reports and conditions, the classification of the emergency and whether to upgrade or downgrade the emergency classification or to secure from the Site Emergency Plan.
- 3.3 Upon activation of the Site Emergency Plan, Emergency Personnel Individual Implementing Procedures (entire EPIP-4) shall be implemented as necessary.

4.0 PROCEDURE

- 4.1 Refer to Attachment 1 of this procedure and, based on the classification of the emergency condition, initiate the required actions as listed in the appropriate Facility Action Checklist of EPIP 2.

NOTE: Some emergency conditions may be a combination of emergency classifications. In this case, perform the Facility Actions required for each classification of the emergency.

- 4.2 All actions to be performed shall be performed as required by EPIP 2, Facility Actions During an Emergency.
- 4.3 Attachments 2 a-d in EPIP 2 will serve as records of the notifications made and actions taken.

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4.4 Communications should be performed per EPIP 6F.

CLASSIFICATION OF EMERGENCY CONDITIONS

The following table defines the emergency classifications. Particular classifications can be determined by observing the various emergency action levels. The Big Rock Point Operating Procedures Manual, Volume III, describes more detailed operator action for emergency conditions. The emergency classifications were established using guidance from the Big Rock Point Probabilistic Risk Assessment (PRA). As the guidance of NUREG-0654 was in some cases not applicable to a plant of the design and vintage of Big Rock Point, certain classifications differ from those provided in NUREG-0654.

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CLASSIFICATION OF EMERGENCY CONDITIONS

Attachment 1-1

Key Words	Emergency Action Level	Event	Classification
Reactivity	Failure to SCRAM but reactor subcritical and not more than 23 notches not fully inserted	ATWS	Unusual Event
	Failure to SCRAM but reactor subcritical and more than 23 notches not fully inserted	ATWS	Alert
	Failure to SCRAM and still critical or unknown	ATWS	Site Emergency
	Failure to SCRAM and reactor water <2'9" above core	ATWS with high potential for significant core damage	General Emergency
Primary Coolant System	Exceeding primary system leak rate (T1-02) of 10 gpm total and/or 1 gpm unidentified resulting in plant shutdown	Primary system leak	Unusual Event
	Steam flow/feedwater flow mismatch, high dew cell reading, turbine or exhaust CAM alarms, area monitors high, rise in containment pressure, increased sump running times, sound of escaping steam, or observation of break (any combination of the above indications which results in a LOCA determination)	Loss of coolant accident	Alert

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CLASSIFICATION OF EMERGENCY CONDITIONS (Contd)  
Attachment 1-1

Key Words	Emergency Action Level	Event	Classification
	Reactor pressure and/or steam drum pressure $\geq$ 1535 psig	Failure of both main condenser and emergency condenser during transient	Alert
	Reactor pressure and/or steam drum $\geq$ 1800 psig	Failure of all safety relief valves to operate, potential for vessel rupture	Site Emergency
	Sustained steam drum level <17" below centerline	Possible loss of coolant in excess of makeup capacity	Alert
	Reactor water level < 2'9" above core	Loss of coolant in excess of makeup capacity	Site Emergency
	Reactor water level <2'9" above core and core spray <290 gpm	Failure of emergency core cooling during loss of coolant	General Emergency
<hr/>			
Radiological Barrier			
1. Fuel Cladding	Offgas/stack gas reading >.5 Ci/sec. Increase in offgas/stack gas reading of >100,000 $\mu$ Ci/sec over 30 minute period	Possible fuel cladding damage	Unusual event Unusual event
	Chemistry analysis shows >35 $\mu$ Ci/ml I-131 activity	Possible fuel cladding damage	Unusual event
	Offgas/stack gas reading >5 Ci/sec	Severe loss of fuel cladding	Alert

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CLASSIFICATION OF EMERGENCY CONDITIONS (Contd)

Attachment 1-1

Key Words	Emergency Action Level	Event	Classification
	Chemistry analysis shows >300 $\mu$ Ci/ml I-131 activity	Severe loss of fuel cladding	Alert
2. Containment	Failure of Local Leak Rate Test or known inability to close containment isolation valve causing plant shutdown	Loss of containment integrity	Unusual Event
3. Primary Coolant System	Exceeding primary system leak rate (T1-02) of 1 gpm unidentified and/or 10 gpm total resulting in plant shutdown	Loss of primary coolant system integrity	Unusual Event
	Steam flow/feedwater flow mismatch high dew cell reading, turbine or exhaust CAM high alarm, area monitors high, rise in containment pressure, increased sump running times, sound of escaping steam, observation of break	Loss of primary coolant system integrity	Alert
4. Loss of 2 out of 3 radiological barriers	Failure of more than one of the barriers above in the Unusual Event category	Indication of loss of 2 out of 3 radiological barriers	Site Emergency
	Failure of more than one of the three barriers above with at least one in the Alert category	Loss of 2 out of 3 radiological barriers	General Emergency
	Core Damage Monitor reading >100 R/hr as verified by other plant parameters	Loss of 2 out of 3 radiological barriers	Site Emergency

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CLASSIFICATION OF EMERGENCY CONDITIONS (Contd)

Attachment 1-1

Key Words	Emergency Action Level	Event	Classification
	Core Damage Monitor reading >900 R/hr as verified by other plant parameters	Loss of 2 out of 3 radiological barriers	General Emergency
Fuel Handling Accident	Known fuel handling accident causing evacuation of containment	Fuel Handling Accident	Alert
Radiological Effluents	Canal Monitor exceeds its alarm setpoint (excluding spurious alarms) to be verified by chemistry analysis to exceed 2x the weighted average MPC for the sample	Liquid release in excess of plant limits	Unusual Event
	Canal Monitor exceeds its alarm setpoint (excluding spurious alarms) to be verified by chemistry analysis to exceed 20x the weighted average MPC for the sample	Liquid release in excess of plant limits	Alert
	Actuation of turbine rupture disc or pipe tunnel blowout panel	Unmonitored release	Alert

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CLASSIFICATION OF EMERGENCY CONDITIONS (Contd)  
Attachment 1-1

Key Words	Emergency Action Level	Event	Classification
	Dose rate in excess 50 mr/hr for 1/2 hour or 500 mr/hr for two minutes (5 times these levels for thyroid dose) at the site boundary (per EPIP 5A or actual reading)	Gaseous release in excess of NUREG 0654 limits	Site Emergency
	Dose rate in excess of 1 Rem/hr whole body or 5 Rem/hr thyroid at the site boundary (per EPIP 5A or actual reading)	Gaseous release in excess of NUREG 0654 limits	General Emergency
Engineered Safeguards	Most or all alarms lost	Loss of annunciators	Alert
	Most or all alarms lost during plant transient	Loss of annunciators during plant transient	Site Emergency
Station Power	Loss of both 138 kv and 46 kv lines and main generator	Loss of off-site AC power	Unusual Event
	Loss of both emergency deisel generators per Technical Specifications	Loss of on-site AC power	Unusual Event
	Loss of more than one UPS channel requiring plant shutdown	Degradation of RDS	Unusual Event

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CLASSIFICATION OF EMERGENCY CONDITIONS (Contd)

Attachment 1-1

Key Words	Emergency Action Level	Event	Classification
	Loss of station batteries	Loss of on-site DC power	Alert
	Loss of on-site and off-site AC power as defined above	Same	Alert
Fires	On-site fire lasting more than 10 minutes (anywhere)	On-site fire	Unusual Event
	Possible threatening fire visible from site	Off-site fire	Unusual Event
	Fire in station power room, interior cable penetration room, exterior cable penetration room, control room or any cable tray	On-site fire potentially affecting safety systems	Alert
	Fire in the above areas combined with loss of any of the following instrumentation <ul style="list-style-type: none"> <li>- Reactor or Steam Drum Pressure</li> <li>- RDS Levels (Reactor, Steam Drum)</li> <li>- Yarway Drum Level</li> <li>- Core Spray Valve position indication</li> <li>- Isolation Valve position indication</li> </ul>	Fire compromising safety system functions	Site Emergency
Natural Phenomenon	Steady wind >80 mph	High winds	Unusual Event

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CLASSIFICATION OF EMERGENCY CONDITIONS (Contd)

Attachment 1-1

Key Words	Emergency Action Level	Event	Classification
	Wind >80 mph causing damage to turbine building, containment, or screen house	High winds potentially causing damage to safety systems	Alert
	Visible tornado not including water spouts	Tornado	Unusual Event
	Tornado striking turbine building, containment or screen house	Tornado potentially damaging safety systems	Alert
	Observation of a seiche	Potential flood	Unusual Event
	Water level >583' 6" (screenhouse floor level)	Flooding of screen house	Alert
	Intake bay water level <572'	Drought potentially affecting function of safety equipment	Unusual Event
	Intake bay water level <570'	Draught affecting function of safety equipment	Alert
	Seismic event felt in control room	Earthquake	Unusual Event
	Seismic event causing damage to turbine building, containment or screen house	Earthquake potentially affecting safety systems	Alert

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CLASSIFICATION OF EMERGENCY CONDITIONS (Contd)  
Attachment 1-1

Key Words	Emergency Action Level	Event	Classification
Miscellaneous External Events	On site aircraft crash	Air craft crash	Unusual Event
	On site train derailment	Train derailment	Unusual Event
	Any missile (ie, aircraft, train, motor vehicle, telephone pole etc.) striking turbine building, containment or screen house	Projectile potentially affecting safety systems	Alert
	On site explosion	Explosion	Unusual Event
	Explosion in turbine building, containment or screen house	Explosion potentially affecting safety systems	Alert
	On site toxic gas or flammable gas/liquid release	Explosion potentially affecting safety systems	Unusual Event
	Release of toxic gas or flammable gas/liquid in turbine building, containment or screenhouse	Release potentially affecting safety systems	Alert
Security	Attempted entry	Attempted entry	Unusual Event
	Bomb threat	Bomb threat	Unusual Event
	Attempted take over of Plant	Attempted take over of Plant	Site Emergency
	Loss of control of the Plant	Loss of control of Plant	General Emergency

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CLASSIFICATION OF EMERGENCY CONDITIONS (Contd)

Attachment 1-1

Key Words	Emergency Action Level	Event	Classification
Personnel Injury	Contaminated injured victim to hospital	Contaminated injured victim to hospital	Unusual Event
Limiting Conditions of Operation	LCO resulting in a Plant shutdown	Exceeding a Limiting Condition of Operation	Unusual Event
Evacuation of Control Room	Evacuation of control room (fuel in reactor)	Events leading to control room evacuation	Alert
	Evacuation of control room, reactor not in cold condition	Same as above	Site Emergency

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FACILITY ACTIONS DURING AN EMERGENCY  
Procedure 2

1.0 PURPOSE

- 1.1 To provide the Site Emergency Director guidance on the course of action to follow for each classification of emergency conditions.

2.0 ATTACHMENTS

- 2.1 Attachment 1A - Unusual Event.  
2.2 Attachment 1B - Alert.  
2.3 Attachment 1C - Site Area Emergency  
2.4 Attachment 1D - General Emergency

3.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

- 3.1 The Site Emergency Plan has been activated as determined by the Site Emergency Director or his alternates.  
3.2 The emergency has been classified using EPIP 1, Activation of Emergency Plan.  
3.3 Certain mandatory actions listed in the above attachments are required to be initiated within 15 minutes and/or one hour of the declaration of an emergency. These are identified in the attachments.  
3.4 As conditions warrant, variations from the requirements of the mandatory actions may be performed at the discretion of the Site Emergency Director (eg, calling Fire Department prior to other notifications in case of fire). Any variations from the Plant Notifications/Actions should be noted.

4.0 PROCEDURE

- 4.1 After determining the classification of the emergency, select the appropriate Plant Notifications/Actions form and initiate all of the mandatory items. Initiate the Supplemental items as determined by the Site Emergency Director by circling the number of the action to be taken.  
4.2 Mandatory Actions should be performed in the order listed. The Supplemental Actions should also be performed in the order listed.

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- 4.3 For each checklist performed, fill in the Time Initiated column, the Time Completed column, the Initial column and fill in any comments at the bottom of the page.
- 4.4 Initial notifications may be performed by the Site Emergency Director. Succeeding notifications (periodic updates) are made by the Technical Support Center Dedicated Off-Site Communicator.

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1A

NOTIFICATION OF UNUSUAL EVENT  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>MANDATORY NOTIFICATIONS FOR ALL UNUSUAL EVENTS</u>				
1. Notify On-Call Duty Superintendent and Site Emergency Director (15 Minutes)	<hr/> <hr/>			
D P Hoffman (SED)				
C R Abel (1st Alt. SED)				
R E Schrader (2nd Alt. SED)				
D E DeMoor (3rd Alt. SED)				
J J Popa				
D P Blanchard				
A C Sevener				
L F Monshor				
Petoskey Answering Service				
2. Jackson Power Control (15 Minutes)	<hr/>			
3. Charlevoix County Sheriff (15 Minutes)				

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1A

NOTIFICATION OF UNUSUAL EVENT  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Complete By
<u>MANDATORY NOTIFICATIONS FOR ALL UNUSUAL EVENTS</u>				
4. Michigan State Police (15 Minutes)				
5. Notify NRC (1 Hour)				
6. Michigan Department of Health (1 Hour)				
7. Public Affairs Director  or Personnel Director				

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1A

NOTIFICATION OF UNUSUAL EVENT  
 PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Complete By
<u>SUPPLEMENTAL ACTIONS AS NEEDED</u>				
1. Notify Charlevoix Fire Department				
2. Notify Petoskey Fire Department (Alternate Fire Support)				
3. First Aid and Medical Care Northern Michigan Hospital (Primary) Charlevoix Hospital (Secondary)				
4. Petoskey Ambulance Service or Charlevoix Ambulance Service				
5. Property Protection Supervisor or Property Protection Operations Supv				
6. Implement Security Procedures	Volume 7A			

## EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1A

NOTIFICATION OF UNUSUAL EVENT  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Complete By
<u>SUPPLEMENTAL ACTIONS AS NEEDED</u>				
7. Chemical & Health Physics Supt or General Health Physicist-ALARA				
8. Federal Aviation Administration				
9. Charlevoix Water Department				
10. Dispatch On-Site Monitoring Teams	EPIP's 5C and 5H			
11. Perform Laboratory Analysis of Effluents	EPIP's 5C, 5D, 5E, and 5F			
12. Implement Fire Plan	Volume 21			
13. DOE - Radiological Assistance				

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NOTIFICATION OF UNUSUAL EVENT  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Date/Time Initiated      Date/Time Completed      Completed By

Notification/Action

Method

SUPPLEMENTAL ACTIONS AS NEEDED

14. GE Emergency Assistance

15. NRC HPN

22 or 23

16. Michigan Water Resources  
Commission

COMMENTS:

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1A

NOTIFICATION OF UNUSUAL EVENT  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
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SUPPLEMENTAL ACTIONS AS NEEDED

Completed By: \_\_\_\_\_ Date: \_\_\_\_\_



EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1B

ALERT  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>MANDATORY NOTIFICATIONS FOR ALL ALERTS</u>				
1. Notify On-Call Duty Superintendent and Site Emergency Director (15 Minutes)				
D P Hoffman (SED) C R Abel (1st Alt. SED) R E Schrader (2nd Alt. SED) D E DeMoor (3rd Alt. SED) J J Popa D P Blanchard A C Sevener L F Monshor Petoskey Answering Service				
2. Jackson Power Control (15 Minutes)				
3. Site Assembly (Accountability)      Siren per EPIP 6A				
4. Charlevoix County Sheriff (15 Minutes)				

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1B

ALERT  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>MANDATORY NOTIFICATIONS FOR ALL ALERTS</u>				
5. Michigan State Police (15 Minutes)				
6. Notify NRC (1 Hour)				
7. Activate TSC	call per EPIP 3A			
8. Activate OSC	per EPIP 3B			
9. Michigan Department of Health (1 Hour)				
10. Public Affairs Director  or Personnel Director				

ALERT  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Complete By
<u>MANDATORY NOTIFICATIONS FOR ALL ALERTS</u>				
11. American Nuclear Insurers				
12. CPCo Insurance Department				
13. Update Off-Site Agencies	EPIP's 4I and 4U			

NOTE: The following agencies require updating until communications function is taken over by an EOF facility:

NRC  
Charlevoix County EOC  
Michigan State Police  
Jackson Power Controller

## EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1B

ALERT  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>SUPPLEMENTAL ACTIONS AS NEEDED</u>				
1. Notify Charlevoix Fire Department				
2. Notify Petoskey Fire Department (Alternate Fire Support)				
3. First Aid and Medical Care Northern Michigan Hospital (Primary) Charlevoix Hospital (Secondary)	EPIP 6E			
4. Petoskey Ambulance Service or Charlevoix Ambulance Service				
5. Property Protection Supervisor or Property Protection Operations Supv				
6. Implement Security Procedures	Volume 7A			

ALERT  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>SUPPLEMENTAL ACTIONS AS NEEDED</u>				
7. Federal Aviation Administration				
8. Charlevoix Water Department				
9. Dispatch On-Site Monitoring Teams	EPIP's 5C and 5H			
10. Dispatch Off-Site Monitoring Teams	EPIP's 4AA, 5A, and 5G			
11. Provide Dose Estimates and Projections (to NRC, Charlevoix EOC, and State Police)	EPIP's 5A and 5F			
12. Perform Laboratory Analysis of Effluents	EPIP's 5C, 5D, 5E, and 5F			
13. Implement Fire Plan	Volume 21			

## EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1B

ALERT  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>SUPPLEMENTAL ACTIONS AS NEEDED</u>				
14. Evacuation/Reassembly	EPIP 6B			
15. Reentry/Recovery	EPIP 6C			
16. US Coast Guard				
17. DOE - Radiological Assistance				
18. GE Emergency Assistance				
19. NRC HPN	22 or 23			
20. Michigan Water Resources Commission				
21. Liaison to Charlevoix County EOC	EPIP 4V			

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EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1B

ALERT  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
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SUPPLEMENTAL ACTIONS AS NEEDED

COMMENTS:

Completed By: \_\_\_\_\_ Date: \_\_\_\_\_

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1C

SITE EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Complete By
<u>MANDATORY NOTIFICATIONS FOR ALL SITE EMERGENCIES</u>				
1. Notify On-Call Duty Superintendent and Site Emergency Director (15 Minutes)	D P Hoffman (SED) C R Abel (1st Alt. SED) R E Schrader (2nd Alt. SED) D E DeMoor (3rd Alt. SED) J J Popa D P Blanchard A C Sevener L F Monshor Petoskey Answering Service			
2. Jackson Power Control (15 Minutes)	or			
3. Site Assembly (Accountability)	Siren per EPIP 6A			



EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1C

SITE EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>MANDATORY NOTIFICATIONS FOR ALL SITE EMERGENCIES</u>				
4. Charlevoix County Sheriff (15 Minutes)				
5. Michigan State Police (15 Minutes)				
6. Activate EOF (Call Training Instructor, 15 Minutes EOF activated in 1 hour)	per EPIP 3C			
7. Notify NRC (1 Hour)	ENS Line or			
8. Activate TSC	call per EPIP 3A			
9. Activate OSC	per EPIP 3B			

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1C

SITE EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Complete By
<b>MANDATORY NOTIFICATIONS FOR ALL SITE EMERGENCIES</b>				
10. Michigan Department of Health (1 Hour)				
11. Public Affairs Director  or Personnel Director				
12. Send Liaison to Charlevoix County EOC	per EPIP 4V			
13. American Nuclear Insurers				
14. CPCo Insurance Department				

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1C

SITE EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completer By
<hr/>				
<u>MANDATORY NOTIFICATIONS FOR ALL SITE EMERGENCIES</u>				
15. Update Off-Site Agencies	EPIP's 4I and 4U			

NOTE: The following agencies require updating until communications function is taken over by an EOF facility:

NRC  
Charlevoix County EOC  
Michigan State Police  
Jackson Power Controller

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EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1C

SITE EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Comp l	te
<u>SUPPLEMENTAL ACTIONS AS NEEDED</u>					
1. Notify Charlevoix Fire Department					
2. Notify Petoskey Fire Department (Alternate Fire Support)					
3. First Aid and Medical Care Northern Michigan Hospital (Primary) Charlevoix Hospital (Secondary)	EPIP 6E				
4. Petoskey Ambulance Service or Charlevoix Ambulance Service					
5. Property Protection Supervisor or Property Protection Operations Supv					
6. Implement Security Procedures	Volume 7A				

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1C

SITE EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>SUPPLEMENTAL ACTIONS AS NEEDED</u>				
7. Federal Aviation Administration				
8. Charlevoix Water Department				
9. Emmet County Sheriff				
10. Dispatch On-Site Monitoring Teams	EPIP's 5C and 5H			
11. Dispatch Off-Site Monitoring Teams	EPIP's 4AA, 5A, and 5G			
12. Provide Dose Estimates and Projections (to NRC, Charlevoix EOC, and State Police)	EPIP's 5A and 5F			

## EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1C

SITE EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>SUPPLEMENTAL ACTIONS AS NEEDED</u>				
13. Perform Laboratory Analysis of Effluents	EPIP's 5C, 5D, 5E, and 5F			
14. Implement Fire Plan	Volume 21			
15. Evacuation/Reassembly	EPIP 6B			
16. Reentry/Recovery	EPIP 6C			
17. US Coast Guard				
18. DOE - Radiological Assistance				
19. GE Emergency Assistance				
20. NRC HPN	22 or 23			

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1C

SITE EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>SUPPLEMENTAL ACTIONS AS NEEDED</u>				
21. Michigan Water Resources Commission				
COMMENTS:				

Completed By: \_\_\_\_\_ Date: \_\_\_\_\_

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1D

GENERAL EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>MANDATORY NOTIFICATIONS FOR ALL GENERAL EMERGENCIES</u>				
1. Notify On-Call Duty Superintendent and Site Emergency Director (15 Minutes)	D P Hoffman (SED) C R Abel (1st Alt. SED) R E Schrader (2nd Alt. SED) D E DeMoor (3rd Alt. SED) J J Popa D P Blanchard A C Sevener L F Monshor Petoskey Answering Service			
2. Jackson Power Control (15 Minutes)	Red Phone No. 3 or			
3. Site Assembly (Accountability)	Siren per EPIP 6A			
4. Charlevoix County Sheriff (15 Minutes)	Red Phone No. 1 or			



EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1D

GENERAL EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Complete By
<u>MANDATORY NOTIFICATIONS FOR ALL GENERAL EMERGENCIES</u>				
5. Michigan State Police (15 Minutes)	Red Phone in SS Office or			
6. Activate EOF (Call Training Supervisor, 15 Minutes EOF activated in 1 hour)	per EPIP 3C			
7. Notify NRC (1 Hour)	ENS Line or			
8. Activate TSC	Call per EPIP 3A			
9. Activate OSC	per EPIP 3B			
10. Michigan Department of Health (1 Hour)	:			

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1D

GENERAL EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>MANDATORY NOTIFICATIONS FOR ALL GENERAL EMERGENCIES</u>				
11. Public Affairs Director  or Personnel Director				
12. Send Liaison to Charlevoix County EOC	per EPIP 4V			
13. American Nuclear Insurers				
14. CPCo Insurance Department				
15. Update Off-Site Agencies	EPIP's 4I and 4U			
16. Evacuation/Reassembly	EPIP 6B			

NOTE: The following agencies require updating until communications function is taken over by an EOF facility:

- NRC
- Charlevoix County EOC
- Michigan State Police
- Jackson Power Controller

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1D

GENERAL EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>SUPPLEMENTAL ACTIONS AS NEEDED</u>				
1. Notify Charlevoix Fire Department				
2. Notify Petoskey Fire Department (Alternate Fire Support)				
3. First Aid and Medical Care Northern Michigan Hospital (Primary) Charlevoix Hospital (Secondary)	EPIP 6E			
4. Petoskey Ambulance Service or Charlevoix Ambulance Service				
5. Property Protection Supervisor or Property Protection Operations Supv				
6. Implement Security Procedures	Volume 7A			

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1D

GENERAL EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>SUPPLEMENTAL ACTIONS AS NEEDED</u>				
7. Federal Aviation Administration				
8. Charlevoix Water Department				
9. Emmet County Sheriff				
10. Dispatch On-Site Monitoring Teams	EPIP's 5C and 5H			
11. Dispatch Off-Site Monitoring Teams	EPIP's 4AA, 5A, and 5G			
12. Provide Dose Estimates and Projections (to NRC, Charlevoix EOC, and State Police)	EPIP's 5A and 5F			

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1D

GENERAL EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
<u>SUPPLEMENTAL ACTIONS AS NEEDED</u>				
13. Perform Laboratory Analysis of Effluents	EPIP's 5C, 5D, 5E, and 5F			
14. Implement Fire Plan	Volume 21			
15. Reentry/Recovery	EPIP 6C			
16. US Coast Guard				
17. DOE - Radiological Assistance				
18. GE Emergency Assistance				
19. NRC HPN	22 or 23			
20. Michigan Water Resources Commission				

EMERGENCY PLAN IMPLEMENTING PROCEDURE 2, ATTACHMENT 1D

GENERAL EMERGENCY  
PLANT NOTIFICATIONS/ACTIONS CHECKLIST

Notification/Action	Method	Date/Time Initiated	Date/Time Completed	Completed By
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SUPPLEMENTAL ACTIONS AS NEEDED

COMMENTS:

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Completed By: \_\_\_\_\_ Date: \_\_\_\_\_

ACTIVATION OF TECHNICAL SUPPORT CENTER  
Procedure 3A

1.0 PURPOSE

- 1.1 To describe the actions to be taken to activate the Technical Support Center and to describe the staffing and the emergency equipment available for use at the Technical Support Center.

2.0 ATTACHMENTS

- 2.1 Attachment 1, Floor Plan of the Technical Support Center.

3.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

- 3.1 The Technical Support Center (TSC) will be used for the assessment of Plant status and as the central coordination location for Plant activities.
- 3.2 The Technical Support Center is located in the Shift Supervisor's office, and as needed, the adjacent hallway, and is a part of Assembly Area I.

4.0 PROCEDURE

4.1 PERSONNEL

- 4.1.1 The following personnel are assigned emergency duties in the Technical Support Center. (Their alternates and duties are described in the referenced procedures):
- a. Plant Superintendent (EPIP 4-A)
  - b. Operations and Maintenance Superintendent (EPIP 4-G)
  - c. Technical Superintendent (EPIP 4-H)
  - d. Plant Health Physicist (EPIP 4-J)
  - e. Reactor Engineer (EPIP 4-Y)
  - f. Technical Engineer (EPIP 4-U)
  - g. Operations Superintendent (EPIP 4-K)
  - h. Nuclear Safety Technical Engineer (EPIP 4-I)
  - i. Plant Clerks (EPIP 4-W)

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BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN

4.1.2 In addition to the personnel listed in Step 4.1.1, the NRC Resident Inspectors may report to the Technical Support Center and/or Control Room. Any other NRC personnel on-site will report to Assembly Area II. NRC emergency response teams will be admitted on-site following the Site Emergency Director's approval.

4.2 COMMUNICATIONS

4.2.1 The following communication systems are available for use in the Technical Support Center (priority of use is shown on Attachment 1 in EPIP 6F):

- a. Intraplant Telephone (Extension 169)\*
- b. Walkie-Talkie and antenna
- c. Bell Telephone Company Telephones
- d. Dedicated Line to the NRC (ENS)\*
- e. Dedicated Line to the NRC Health Physics Group
- f. Dedicated Line to Michigan State Police (Petoskey)\*
- g. Dedicated Line to Licensing, Jackson\*

\*Additional jack for headset in hallway

4.2.2 The Technical Support Center also has access to the communication systems in the control room. In addition to those listed in Section 4.2.1, these systems include (priority of use is shown on Attachment 1 in EPIP 6F):

- a. RDS Panel Sound-Powered Phone
- b. Dedicated Line to the Security Building
- c. Direct Line to the Western Region Power Controller
- d. Company Radio to the Western Region Power Controller
- e. Dedicated Line to the Power Controller-Jackson
- f. Dedicated Line to the Charlevoix County Sheriff
- g. CPCo base radio



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BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN

4.2.3 The Technical Support Center will also utilize face-to-face communication between members of the team assigned to the Technical Support Center.

4.3 EMERGENCY EQUIPMENT

4.3.1 There is a Site Emergency kit stored in the Technical Support Center (containing the following equipment as a minimum:)

- a. Airborne Iodine Kit (EPIP 6D)
- b. Potassium Iodine Tablets
- c. Ratemeter (RO-2 or equivalent)
- d. Flashlight
- e. Paper for TI Computer Terminal

4.3.2 A permanent area monitor (Area Monitor No. 4) is located in the Technical Support Center.

4.3.3 The following controlled documents are available in the Technical Support Center:

- a. Plant Administrative Procedures
- b. Plant Operating Procedures
- c. Plant Emergency Operating Procedures
- d. Plant Drawings
- e. Technical Specifications
- f. Site Emergency Plan
- g. Emergency Plan Implementing Procedures
- h. General Office Nuclear Emergency Implementing Procedures
- i. Book of Tables
- j. Emergency Planning Zone Maps
- k. Radiation Dose Isopleth Overlays

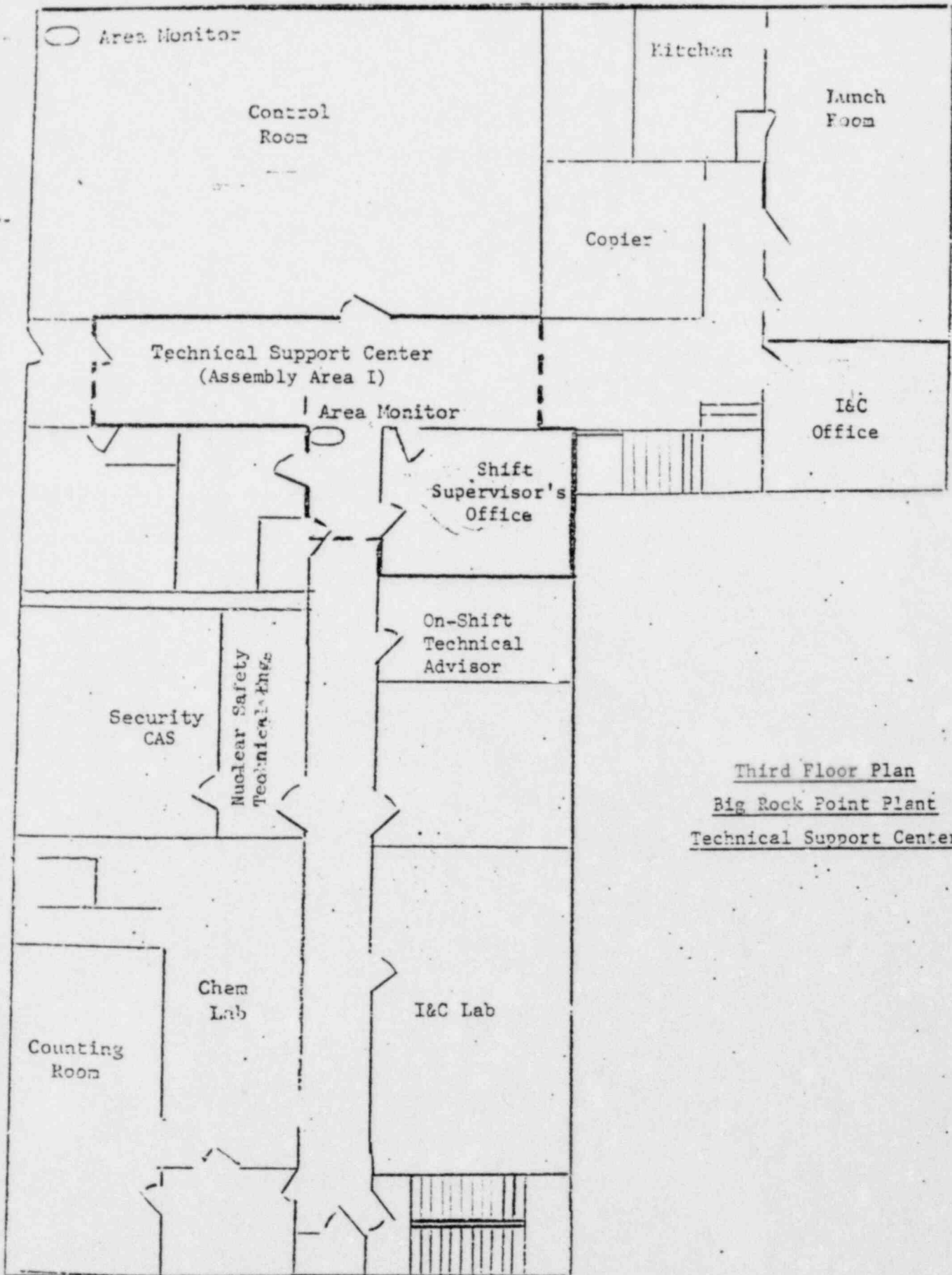
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BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN

1. Final Hazards Summary Report
- 4.3.4 Texas Instrument Silent 700 Computer Terminal
- 4.3.5 The cabinet outside the Shift Supervisors' office contains the following:
  - a. 95 bags of CO<sub>2</sub> absorber
  - b. 12 gallons of water
  - c. freeze dried food
  - d. bottle of survival tabs
  - e. two cooking pots
  - f. hot plate
  - g. holding tank deoderant
  - h. portable toilet
  - i. one package of toilet tissue
- 4.3.6 Self contained breathing apparatus (SCBA) are stored - adjacent to the TSC. There is a cascade system in the area for refilling the units.
- 4.4 ACTIVATION OF THE TECHNICAL SUPPORT CENTER
  - 4.4.1 Emergency equipment and the communication systems are always available for use.
  - 4.4.2 When the emergency siren sounds, the following actions will be performed to activate the Technical Support Center:
    - a. Personnel assigned will proceed to the Technical Support Center/Assembly Area I.
    - b. A personnel accountability check will be performed by the Site Emergency Director or designee and the results will be reported to the Property Protection Supervisor (EPIP 6A).
    - c. A radiation survey will be performed to verify the habitability of the Technical Support Center. If the radiation dose rate is greater than 100 mR/h such as

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SITE EMERGENCY PLAN

indicated by the local area monitor, the Site Emergency Director may designate an alternate location.

- d. The Emergency Data Recorder will commence recording the sequence of events per EPIP 4W.
  - e. Technical Support Center members will be directed by the Site Emergency Director in taking action to minimize the effects of the emergency condition.
- 4.4.3 During backshifts, weekends and holidays, the TSC and OSC will be activated by completing the TSC/OSC Activation Checklist (Attachment 2). Telephone numbers can be obtained from the Big Rock Point telephone directory.



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IMPLEMENTING PROCEDURES-3A  
BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN

ATTACHMENT 2  
TSC/OSC Activation Checklist

Technical Support Center

Time Contacted

1. Plant Superintendent
2. Operations and Maintenance Superintendent
3. Technical Superintendent
4. Plant Health Physicist
5. Reactor Engineer
6. Technical Engineer
7. Nuclear Safety Technical Engineer
8. Operations Superintendent
9. Clerk  
(Plant Superintendent, Technical, Health Physics)

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OSC (Personnel Required within 30 Minutes)

1. C&RP Technician (to Charlevoix EOC)
2. C&RP Technician (to Charlevoix EOC)
3. C&RP Technician
4. C&RP Technician
5. C&RP Technician
6. I&C Technician

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OSC (Personnel Required within 60 Minutes)

1. Maintenance Repairman
2. Maintenance Repairman
3. C&RP Technician
4. C&RP Technician
5. I&C Technician

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Additional Personnel

1. Shift Supervisor
2. Control Operator
3. Control Operator
4. Auxiliary Operator
5. Auxiliary Operator

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Completed by: \_\_\_\_\_

Date: \_\_\_\_\_

ACTIVATION OF THE ON-SITE OPERATIONS SUPPORT CENTER  
Procedure 3B

1.0 PURPOSE

- 1.1 To describe the actions to be taken to activate the On-Site Operations Support Center (OSC) and to describe the staffing and the emergency equipment available for use at the Operations Support Center.

2.0 ATTACHMENTS

- 2.1 Attachment 1, Floor Plan of the Operations Support Center.

3.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

- 3.1 The On-Site Operations Support Center will be used as an assembling location for shift support personnel (technicians, off-duty Shift Supervisors and Control and Auxiliary Operators) other than those assigned to the control room and Technical Support Center.
- 3.2 Personnel orders and assignments will come from the Site Emergency Director, Shift Supervisor or their designated representatives.
- 3.3 The On-Site Operations Support Center is located in the air compressor room off the machine shop.

4.0 PROCEDURE

4.1 PERSONNEL

- 4.1.1 The following personnel may be assigned emergency duties in the On-Site Operations Support Center:
- a. Off-duty operations personnel such as Shift Supervisors, Control and Auxiliary Operators.
  - b. Other personnel who may be required but not in the control room such as technicians. These personnel will be designated by the Site Emergency Director or Emergency Team Leaders as required, depending on the emergency.
- 4.1.2 Personnel assigned to the On-Site Operations Support Center will carry out the requirements of EPIP 4 (Emergency Personnel) as it pertains to them and as requested by the Site Emergency Director.

#### 4.2 COMMUNICATIONS

- 4.2.1 The following communication systems are available for use in the Operations Support Center (priority of use is shown on Attachment 1 in EPIP 6F):
- a. Intraplant Telephone
  - b. Walkie-Talkie (Available From the Control Room)
  - c. Bell Telephone Company Telephones
  - d. Face-to-Face Communication Among Members of the Emergency Teams

#### 4.3 EMERGENCY EQUIPMENT

- 4.3.1 There is an Emergency Kit stored outside the Operations Support Center in the machine shop.
- 4.3.2 Area monitors are located in the air compressor room and in the machine shop.
- 4.3.3 The Extent of Core Damage Monitor is located near the wall telephone in the air compressor room.
- 4.3.4 The Stack Gas Release Rate Monitor is located near the wall telephone in the air compressor room.
- 4.3.5 There is a gamma spectrometer located near the wall telephone in the air compressor room.

#### 4.4 ACTIVATION OF THE OPERATIONS SUPPORT CENTER

- 4.4.1 Emergency equipment and the communications systems are always available for use and do not require activation.
- 4.4.2 When the emergency siren sounds, the following actions will be performed to activate the Operations Support Center:
- a. Personnel assigned will proceed to the Assembly Area II (machine shop).
  - b. A personnel accountability check will be performed by the Maintenance Superintendent and the results will be reported to the Property Protection Supervisor (EPIP 6A).

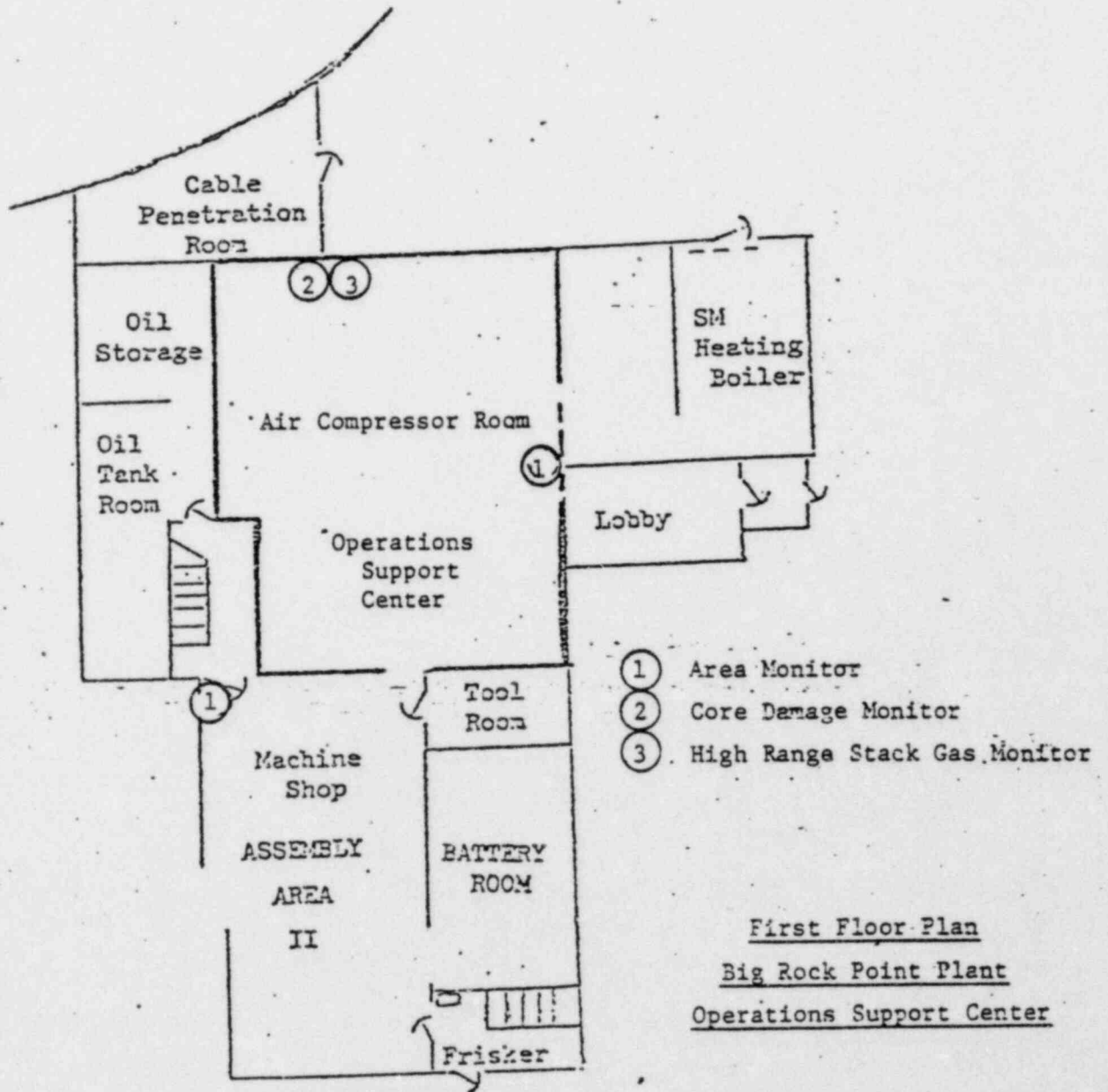
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IMPLEMENTING PROCEDURES-3B  
BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN

- c. A radiation survey will be performed to verify the habitability of the Operations Support Center. If the radiation dose rate exceeds 100 mR/h such as indicated by the local area monitor, the Site Emergency Director shall be notified and may designate an alternate location.
- d. After the accountability check in Assembly Area II, personnel assigned to the Operations Support Center will proceed to the air compressor room and assist the Site Emergency Director as requested. The off-duty Shift Supervisor or alternate designated by the Site Emergency Director will take charge in leading Operations Support Center activities.
- e. If a site evacuation is ordered, personnel will carry out the requirements of EPIP 6B (Evacuation and Reassembly).
- f. If required, the extent of core damage and the stack gas release rate will be determined (EPIP 5D and 5B, respectively).

4.4.3 During backshifts, weekends and holidays, the OSC will be activated by completing the TSC/OSC Activation Checklist (Attachment 2 to EPIP 3A). Telephone numbers can be obtained from the Big Rock Point telephone directory.



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 SITE EMERGENCY PLAN IMPLEMENTING PROCEDURE 3B, ATTACHMENT 3B-2



ACTIVATION OF THE EMERGENCY OPERATIONS FACILITY (BOYNE CITY)  
Procedure 3C

1.0 PURPOSE

- 1.1 To describe the actions to be taken to activate the Emergency Operations Facility (Boyne City) and to describe the staffing and the emergency equipment available for use at the Emergency Operations Facility (EOF).

2.0 ATTACHMENTS

- 2.1 Attachment 1, Floor Plan of the Emergency Operations Facility (Boyne City).

3.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

- 3.1 The Emergency Operations Facility is located in the Consumers Power Service Center-Boyne City. No alternate EOF is required due to the EOF being sited approximately 11 air miles from the plant.
- 3.2 The EOF will be used as a gathering point and coordination center for off-site support personnel and agencies.
- 3.3 The Licensed Training Instructor or Training Instructor has been notified to activate the Emergency Operations Facility.

4.0 PROCEDURE

4.1 PERSONNEL

- 4.1.1 The following personnel and agencies will be utilizing the EOF:
- a. Big Rock Point Plant personnel such as the Training Instructors.
  - b. General Office emergency teams and personnel.
  - c. Other Company emergency teams and personnel.
  - d. Federal agencies (including the NRC).
  - e. State and county liaison personnel.
  - f. Vendors.

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4.1.2 The EOF can also be used as the assembly area for personnel assigned to the Control Room and Technical Support Center in the event evacuation of the Control Room or Technical Support Center is required.

4.2 COMMUNICATIONS

4.2.1 The following communication systems are available for use at the EOF (priority of use is shown on Attachment 1 in EPIP 6F):

- a. Intraplant Telephone
- b. Bell Telephone Company Telephones
- c. Dedicated Line to the NRC Health Physics Group
- d. Radio to the Control Room

4.2.2 The EOF will also use face-to-face communication between EOF personnel.

4.3 Emergency Equipment

4.3.1 The following manuals are available at the EOF:

- a. Volume 9, Site Emergency Plan
- b. Volume 9A, Site Emergency Plan Implementing Procedures
- c. Radiation Dose Isoplath Overlays (2 copies)
- d. Book of Tables (2 copies)
- e. BRP Technical Specifications
- f. BRP Operating Procedures
- g. BRP FHSR
- h. P&IDs
- i. Technical Data Book
- j. Instrument Data Book
- k. Equipment Data Base

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- l. Raceway Schedule
- m. Circuit Schedule
- n. General Office Nuclear Emergency Implementing Procedures
- o. Michigan State Emergency Preparedness Plan
- p. Charlevoix County Emergency Plan
- q. Emmet County Emergency Plan

These manuals will be revised on a weekly basis and are the responsibility of the Administrative Supervisor.

- 4.3.2 There is a CRT computer terminal connected to the CPCo computer system at the EOF.
- 4.3.3 Radiological monitoring equipment is stored at the Charlevoix County EOC for use by CPCo off-site monitoring teams.

#### 4.4 ACTIVATION OF THE EMERGENCY OPERATIONS FACILITY

- 4.4.1 The Licensed Training Instructor or Training Instructor (EPIP 4Z) shall activate the EOF by performing the following:
  - a. Open the door(s) to the EOF. (Extra keys to the EOF are available in the Shift Supervisor's office.)
  - b. Turn on all overhead lighting.
  - c. Commence arranging the furniture to agree with the floor plan of the EOF (Attachment 1).
  - d. Plug in additional telephones as shown on the floor plan, Attachment 1, telephones are stored in the closet near the Receptionist area. Telephone jacks are stored above the suspended ceiling near the respective phone location.
  - e. Energize the radio and establish communication with the Control Room and Technical Support Center.

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- f. Establish communication capability with the NRC Health Physics Group.
  - g. Establish communications with the General Office Control Center.
- 4.4.2 After activating the EOF, the person(s) designated will stand by and await further direction from the Site Emergency Director (or designated representative) or a representative from the General Office.
- 4.4.3 The Licensed Training Instructor or Training Instructor or a person in charge shall appoint someone to record and maintain a log of all activities and important data.

# EMERGENCY OPERATIONS FACILITY (EOF) BOYNE CITY SERVICE CENTER

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BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN

100 N. EAST STREET

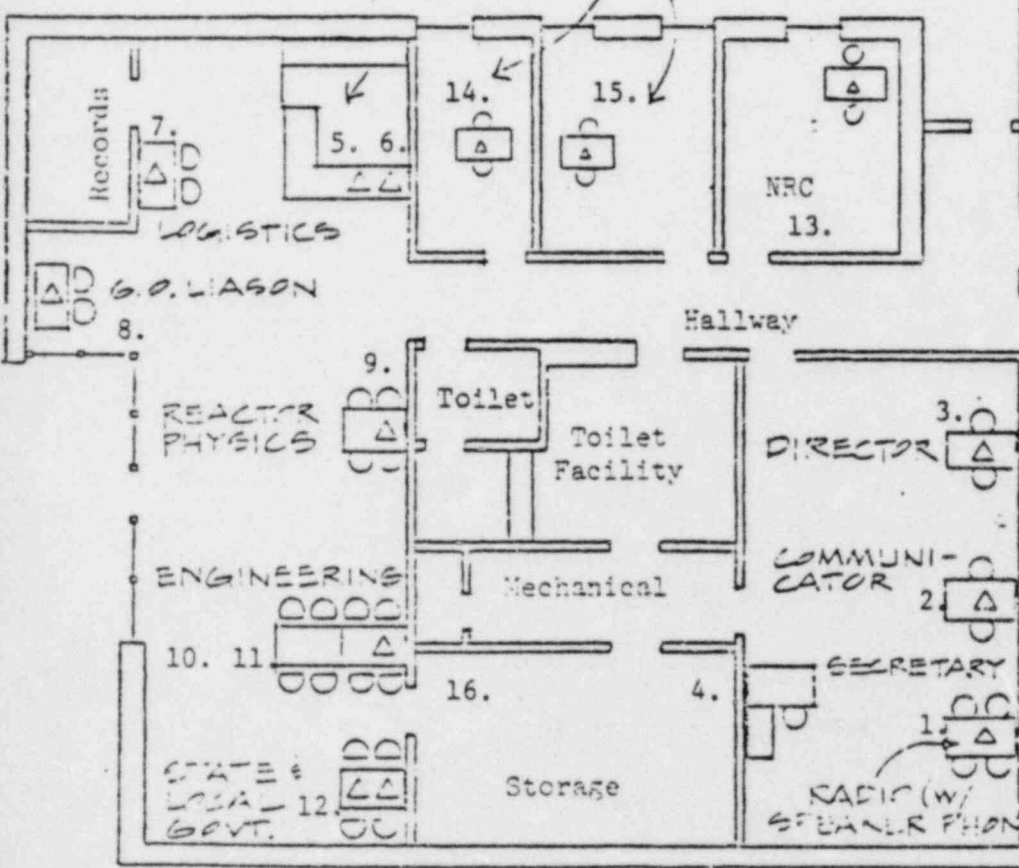
ATTACHMENT 3C-1



PUBLIC RELATIONS  
(USE AS IS)

HEALTH PHYSICS

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.



Hot Line - Big Rock TSC  
Hot Line - State Police Pet.

- 2.
- 1.
- 16.

NEW EMERGENCY TELEPHONE SERVICE LOCATIONS

PLANT SUPERINTENDENT  
Procedure 4A

Principal Position - Site Emergency Director.

Alternate Position - N/A

Responsibilities - As the Senior plant management official on-site, the Site Emergency Director (SED) is responsible for directing all of the actions taken by the plant during the emergency.

Immediate Actions

1. Review the plant operating status and conditions to determine if the initial classification of the incident is appropriate (EPIP-1).
2. Verify that the Shift Supervisor has ordered the appropriate corrective and mitigating actions to deal with the consequences of the emergency.
3. Initiate any Immediate Actions not already performed, which are detailed for the appropriate emergency classification (EPIP-2, Attachments 2A-D).
4. When the Technical Support Center is activated (optional at Notification of Unusual Event - mandatory at Alert and above), initiate a personnel accountability check of Assembly Area I (EPIP-6A) and report to the Site Accountability Leader.
5. Receive the report of the plant accountability check from the Site Accountability Leader.
6. Direct the Property Protection Supervisor (or alternate) to key out all personnel from the control room who are not issued an emergency key card status number. The SED may request that additional personnel be issued emergency key card status numbers as required.
7. If appropriate plant members cannot be contacted, call an alternate for each position.

Subsequent Actions

8. Follow the Supplemental Actions described in Attachments 2A-D of EPIP 2 for recommended courses of action which may need to be initiated for each classification of emergency.
9. Those actions which the SED (including the Shift Supervisor when acting as SED) cannot delegate are:
  - a. Classification of the emergency and activation of the emergency plan.

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- b. Providing protective action recommendations to authorities responsible for implementing off-site emergency measures.
- c. Authorizing personnel to receive greater than their quarterly dose in emergency and lifesaving actions.

- 1. This authorization should not exceed:

"Lifesaving Actions"

Whole body -	75 Rems
Hands and Forearms -	300 Rems
Thyroid -	No Limit

"Less Urgent Emergencies"

Whole body -	25 Rems
Hands and Forearms -	100 Rems
Thyroid -	125 Rems

- 2. Cost/Benefit comparison of risks is to be used when considering emergency limits.
- 3. "Lifesaving Actions" apply to search and rescue of injured persons, and to entries to prevent conditions that would probably injure numbers of people. Actions during emergency conditions shall be well planned in order to maintain reasonable radiation exposure to workmen.
- 4. "Less Urgent Emergency" applies to less serious circumstances where it is still desirable to enter a hazardous area to protect facilities, to decrease the further escape of effluents, to control fires, or to perform assessment actions.
- 5. Rescue personnel should be volunteers or professional rescue personnel (eg, firemen who "volunteer" by choice of employment) who are broadly familiar with the consequences of exposure.
- 6. Women capable of reproduction should not take part in these actions.
- 7. Other things being equal, volunteers above the age of 45 should be selected.



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SITE EMERGENCY PLAN

8. Normally, exposure under these conditions shall be limited to once in a lifetime.
10. Direct that all on-site plant assembly areas be monitored for radiation activity. If the surveys and/or area monitors indicate levels of activity exceeding 100 mR/h that area may be evacuated and personnel and functions relocated.
  - a. If the TSC area exceeds 100 mR/h the SED and designated staff may relocate into the control room. The other staff will relocate to a safe area on-site or to the EOF (Boyne City).
  - b. If the OSC area exceeds 100 mR/h all non-essential personnel may be evacuated off-site, and remaining personnel will relocate to a safe area on-site.
11. Continuously monitor plant conditions and status and provide updated recommended protective actions to off-site agencies. Attachment 4-A1 summarize recommended protective actions to be taken for various levels of radiological releases.
12. In the event of an extended emergency, establish a duty schedule so that all essential positions are filled on a continuous basis.
13. Coordinate the initiation of reentry and recovery operations with the EOF Director and GOCC Director to ensure an efficient transition into the Long Term Recovery Organization.

ENVIRONMENTAL PROTECTION AGENCY - PROTECTIVE ACTION GUIDES  
 Recommended Protective Actions To Avoid Whole Body and Thyroid Dose From Exposure to a Gaseous Plume

Projected Dose (Rem) to the Population	Recommended Actions (a)	Comments	Additional Notes
Whole Body < 1 Thyroid < 5	-No protective action required. -State may issue an advisory to seek shelter and await further instructions or to voluntarily evacuate. -Monitor environmental radiation levels.	Previously recommended protective actions may be reconsidered or terminated.	If the condition is classified as General Emergency, the following shall be considered:  1. For sequences where significant releases are not yet taking place and large amounts of fission products are not yet in the containment atmosphere, consider 2-mile precautionary evacuation. Consider 5-mile downwind evacuation (45° to 90° sector) if large amounts of fission products are in the containment atmosphere. Recommend sheltering in other parts of the plume exposure Emergency Planning Zone under this circumstance.
Whole Body 1 to < 5 Thyroid 5 to < 25	-Seek shelter and wait further instructions. -Consider evacuation particularly for children and pregnant women. -Monitor environmental radiation levels. -Control access.		
Whole Body 5 and Above Thyroid 25 and Above	-Conduct mandatory evacuation of populations in the predetermined area. -Monitor environmental radiation levels and adjust area for mandatory evacuation based on these levels. -Control access.	Seeking shelter would be an alternative if evacuation were not immediately possible.	2. For sequences where significant releases are not yet taking place and containment failure leading to a direct atmospheric release is likely in the sequence but not imminent and large amounts of fission products in addition
Projected Dose (Rem) to Emergency Team Workers	Recommended Actions (a)(b)	Comments	

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

(b) For Rescue and Emergency Team Personnel - When external gamma radiation is present, a total dose of 75 Rem may be accepted, but only if the saving of human life may result. If the saving of life is not involved, a total dose should be kept below 25 Rem and, if possible, below 12 Rem (DOE) (Appendix 0524, Part III, D.1.3). The dose received should be kept to the minimum practically attainable. It is assumed that all rescue personnel will be acting as volunteers, and that rescue personnel will be wearing personnel monitoring devices capable of measuring the suspected dose rates. If personnel monitoring devices are not available, legal questions regarding the actual dose received will likely arise. For this reason, persons without personnel monitoring devices should be severely restricted in their exposure to provide an extra margin of safety.

ENVIRONMENTAL PROTECTION AGENCY - PROTECTIVE ACTION GUIDES  
 Recommended Protective Actions To Avoid Whole Body and Thyroid Dose From Exposure to a Gaseous Plume (Contd)

Projected Dose (Rem) to Emergency Team Workers	Recommended Actions	Comments	Additional Notes
Whole Body 25 Thyroid 125	-Control exposure of emergency team members to these levels except for lifesaving missions. (Appropriate controls for emergency workers, include time limitations, respirators, and stable iodine.)	Although respirators and stable iodine should be used where effective to control dose to emergency team workers, thyroid dose may not be a limiting factor for lifesaving missions.	to noble gases are in the containment atmosphere, consider precautionary evacuation to 5-mile and 10-mile downwind evacuation (45° to 90° sector).  3. For sequences where large amounts of fission products other than noble gases are in the containment atmosphere and containment failure is judged imminent, recommend shelter for those areas where evacuation cannot be completed before transport of activity to that location.
Whole Body 75	-Control exposure of emergency team members performing lifesaving missions to this level. (Control of time of exposure will be most effective.)		

Emergency Plan Implementing Procedure 4A-1 (Contd)  
 ATTACHMENT 4A-1

5. Food Limitation Criteria, State of Michigan

Protective Actions for Contaminated Human and Animal Food	
PROJECTED DOSE (REM) TO INDIVIDUALS IN THE POPULATION	PROTECTIVE ACTIONS
WHOLE BODY, BONE MARROW OR OTHER ORGAN 5 and above  THYROID 15 and above	The Department of Agriculture, with the assistance of the Department of Public Health, will isolate food containing radioactivity to prevent its introduction into commerce and determine whether condemnation or another disposition is appropriate.  The Department of Public Health in coordination with the Department of Agriculture, will monitor food, especially milk, as required.
WHOLE BODY, BONE MARROW, OR OTHER ORGAN <sup>(2)</sup> 0.5 to <5  THYROID <sup>(3)</sup> 1.5 to <15 <sup>(2)</sup>	The Department of Agriculture in coordination with the Department of Public Health, will divert, condemn or dispose of food and issue advisories regarding home-grown foods, as necessary.  The Department of Public Health in coordination with the Department of Agriculture, will monitor food, especially milk, as required.
WHOLE BODY, BONE MARROW, OR OTHER ORGAN Less than 0.5  THYROID <sup>(3)</sup> Less than 1.5	No protective action required.  The Department of Public Health in coordination with the Department of Agriculture will monitor food, especially milk, as required.

(1) Factors for consideration: (a) the availability of other possible protective actions, (b) relative proportion of the total diet by weight represented by the item in question, (c) the importance of the particular food in nutrition and the availability of uncontaminated food or substitutes having the same nutritional properties, (d) the relative contribution of other foods and other radionuclides to the total projected dose, (e) the time and effort required to effect corrective action.

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Emergency Plan Implementing Procedure 4A-1 (Contd)  
ATTACHMENT 4A-1

- (2) The lower value is a level at which the Department of Agriculture in coordination with the Department of Public Health will consider initiating the suggested protective action, particularly the milk pathway. The higher value is a level at which effective action will be taken to protect the general public unless the action would have greater risk than the projected dose.
- (3) The newborn infant is the critical segment of the population for Iodine-131.

SHIFT SUPERVISOR  
Procedure 4B

Principal Position - Shift Supervisor in charge of plant operations.

Alternate Position - Site Emergency Director pending arrival of the Plant Superintendent or one of his alternates (Site Emergency Director, Fourth Alternate).

Responsibilities - Supervise plant post accident operations to a safe condition.

Immediate Actions

1. Direct Control Operator 1 to announce with PA system the location and conditions (including plant areas to avoid while assembling) of the emergency.
2. If necessary, direct CO-1 to actuate the emergency siren (continuous two-minute blast).
3. For bomb threats:
  - a. Avoid use of emergency siren and radios.
  - b. Require plant personnel report to and search respective work areas.
  - c. Require nonplant personnel to report to Machine Shop.
4. Notify the Site Emergency Director or one of his alternates as provided in checklist of EPIP 2. When contact is made, give a brief description of plant conditions and actions taken.
5. Ensure immediate notifications are performed as required by EPIP 1. (Do not make calls during emergency siren.) Use EPIP 6F for notification requirements.
6. Assume the responsibilities of the Site Emergency Director per EPIP 1 and EPIP 4A pending arrival in the Control Room of the Plant Superintendent or one of his alternates.
7. Conduct a personnel accountability check of on-shift personnel.
8. Depending on accident conditions, notify the security force to evacuate the security building and assemble at the entrance to the plant access road.

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9. Delegate Control Operator duties during plant post accident operations. For example, if necessary, require monitoring of radiation processes and weather conditions. Readings should be taken at approximately 15-minute intervals or specify frequency of readings.
10. Delegate Auxiliary Operator duties during plant post accident operations such as performing initial radiation surveys.

Subsequent Action

11. In the event the Control Room must be evacuated, designate an alternate assembly area and delegate operating crew duties as necessary.
12. If an ambulance is required for injured personnel and Health Physics personnel are not present, an Auxiliary Operator with an RWP exemption should be designated as "Ambulance Escort" to accompany injured personnel to the hospital per EPIP 6E. The Ambulance Emergency Kit in the lobby and the battery-operated air sampler located next to the portal monitor in Access Control should also be taken to the hospital.
13. Maintain Shift Supervisor logs during and after the emergency.

SHIFT TECHNICAL ADVISOR/SHIFT ENGINEER  
Procedure 4C

Principal Position - Technical Advisor/Shift Engineer.

Alternate Position - None.

Responsibilities - Ensure plant is maintained in a safe condition.

Immediate Actions

1. Upon sounding of the emergency siren, proceed to the Control Room and provide technical advice/support as needed to the Shift Supervisor.
2. Ensure Immediate Actions of EPIP 1 have been performed.
3. Monitor the Control Room instrumentation as the accident situation evolves, assess the condition of the plant; eg, shut down and being cooled, containment integrity established and provide advice/guidance to the Shift Supervisor as required.

Subsequent Actions

4. During the early stages of an emergency, the STA may be requested to assist in the performance of Site Emergency Director duties to support timely implementation of the plan. Assistance in the following areas may be expected:
  - a. Off-site dose calculations and updates (EPIP 5A), and
  - b. core damage calculations and release rates to support emergency classifications.

While supporting the above efforts, the STA should remain cognizant of plant evaluations, his primary responsibility as defined in action 3 above.

5. In the event the Control Room must be evacuated, report to the alternate assembly area as designated by the Shift Supervisor.



LIST OF EFFECTIVE PAGES

<u>Page</u>	<u>Rev No</u>	<u>Date</u>
EPIP 5D - Procedure to Determine Extent of Core Damage (For 0% to 100% Core Meltdown)		
5D-1	20	05/04/82
5D-2	20	05/04/82
5D-3	20	05/04/82
5D-4	20	05/04/82
5D-5	20	05/04/82

PROCEDURE TO DETERMINE EXTENT OF CORE  
DAMAGE (FOR 0% TO 100% CORE MELTDOWN)  
Procedure 5D

1.0 PURPOSE

- 1.1 To provide a method for estimating the degree of core damage and dose rates at containment centerline during accident conditions.

2.0 METHOD

- 2.1 The degree of core damage and the dose rate at containment centerline will be estimated using the ionization chambers readouts (in the control room) and the attached graph (Attachment 1) of dose rate versus time.

3.0 TECHNICAL SPECIFICATIONS AND OTHER REQUIREMENTS

- 3.1 Letter from D P Hoffman to D K Ziemann, dated December 27, 1979; Big Rock Point Plant - Requirements Resulting from Review of Three Mile Island 2 Accident. Actions taken in response to Section 2.1.8.a, Page 21.
- 3.2 Technical Specification Change Request dated December 15, 1981.
- 3.3 Letter to D M Crutchfield from T C Bordine dated March 8, 1982; Big Rock Point - NUREG-0737, Item II.F.1(3) Containment High Range Monitor.

4.0 SPECIAL EQUIPMENT

- 4.1 Two high range ionization chambers (located in the cable penetration room, approximately six feet from the containment on ceiling).
- 4.2 Two readouts with annunciator located in control room (RI-8324 and RI-8325).
- 4.3 Graph of ionization chamber readout and containment centerline dose rate for 100% fuel failure in R/h versus time (Attachment 1).

5.0 PRECAUTIONS AND LIMITATIONS

- 5.1 If radiation levels are low enough, sampling of core spray heat exchanger water may be performed (per EPIP 5E) for determining up to 10% core meltdown.

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6.0 PROCEDURE

6.1 In the control room, record the following ionization chamber information on the Extent of Core Damage Data Sheet (Attachment 2):

6.1.1. Date (Column 1).

6.1.2. Time (Column 2).

6.1.3. Initials of person obtaining information (Column 3).

6.1.4. Reading of ionization chamber (Column 4).

NOTE: If the readouts (RI-8324 and RI-8325) are reading approximately the same, use the average of the two readings. If one channel has obviously failed, use the other reading. These instruments read in R/h.

6.1.5. Time elapsed from reactor trip (time elapsed since  $t=0$ ) (Column 5).

6.2 Using the graph of R/h for high range ionization chamber with 100% fuel failure versus time - post accident (Attachment 1), record on Attachment 2 (Column 6) the R/h value at the time elapsed since reactor trip ( $t=0$  at reactor trip).

6.3 Divide the control room reading (Column 4) by the graph reading (Column 6) and multiply by 100 to determine the percent of core damage. Record this on Attachment 2 (Column 7).

6.4 This step is optional; may be used to determine centerline dose rate. Using the graph (Attachment 1) read the dose rate for the containment centerline at the time elapsed since reactor trip. Multiply this R/h value by the percent of core damage and divide by 100 to get the dose rate at the containment centerline. Record the dose rate in Column 8 of Attachment 2.

NOTE: If the percentage of core damage is found to be less than 10%, it may be possible to obtain a sample from the core spray heat exchanger in accordance with procedure EPIP 5E.

6.5 Example:

An accident has occurred that requires an estimation of the percentage of core damage and the corresponding dose rate in containment.

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- a. The ionization chamber readout is  $1 \times 10^3$  R/h at two hours after reactor trip (Step 6.14).
- b. The attached graph gives a value of  $4.3 \times 10^3$  R/h for high rangegamma monitor at two hours from reactor trip (Step 6.2).
- c.  $\frac{1.0 \times 10^3 \text{ R/h}}{4.3 \times 10^3 \text{ R/h}} = 0.23$

$$(0.23)(100) = 23\% \text{ (Step 6.3)}$$

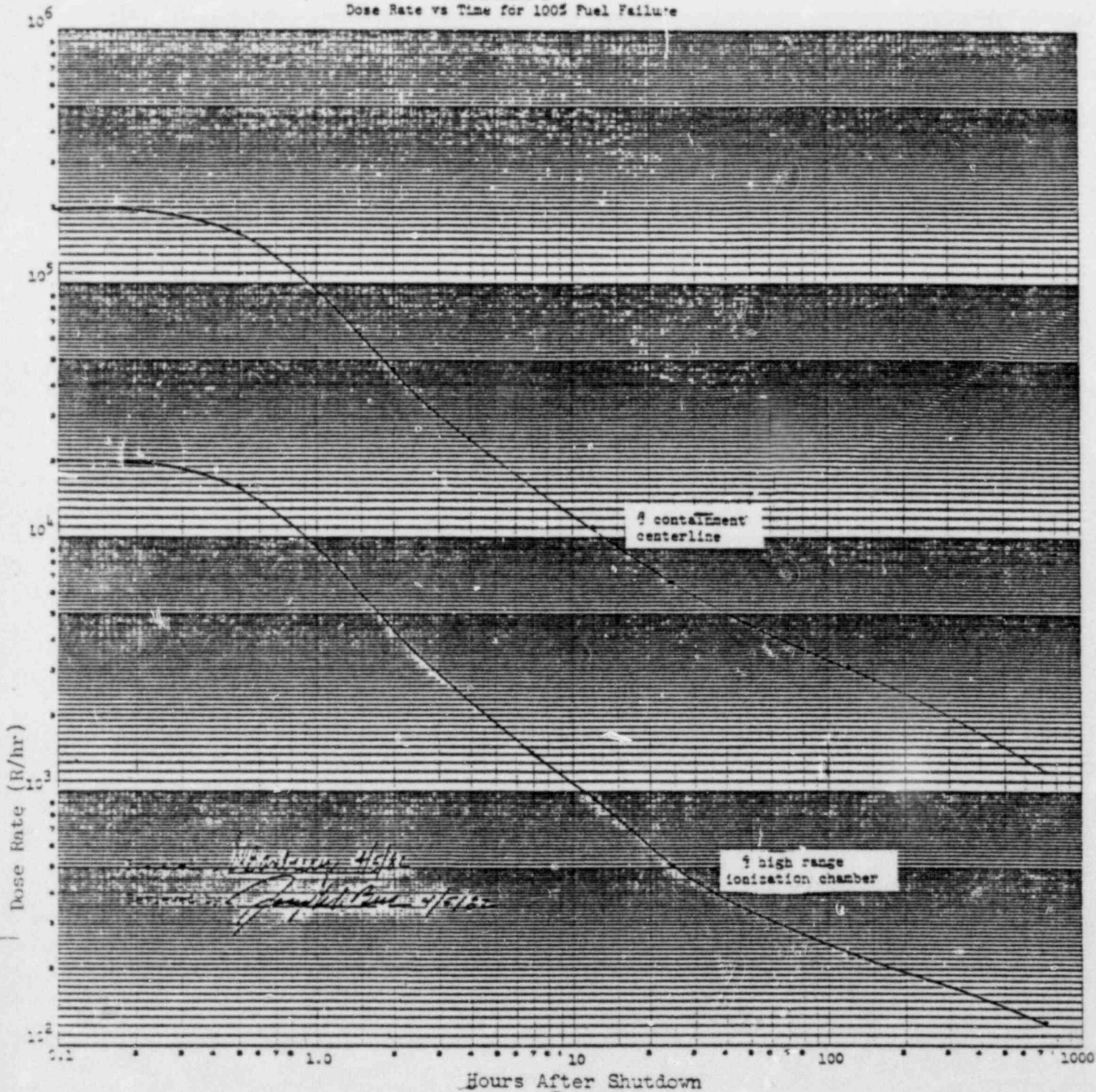
The extent of core damage is 23%.

The attached graph gives a value of  $4.6 \times 10^4$  R/h for containment centerline at two hours from reactor trip (Step 6.4). Actual containment centerline dose rate is

$$4.6 \times 10^4 \left( \frac{23\%}{100} \right) = 1.06 \times 10^4 \text{ R/h.}$$

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ATTACHMENT 1  
 Dose Rate vs Time for 100% Fuel Failure



ATTACHMENT 2 TO IMPLEMENTING PROCEDURE 5D

EXTENT OF CORE DAMAGE DATA SHEET

Date 1	Time 2	Initial 3	Monitor Reading (R/h) 4	Time From Reactor Trip 5	Graph Reading (R/h) 6	$\left( \frac{\text{Column 4}}{\text{Column 6}} \right) 100 = \% \text{ Core Damage}$ 7	Containment Centerline (R/h) (Optional) 8

Calculated by

Reviewed by Plant Health Physicist

Reviewed by Site Emergency Director

CONTROL OPERATOR NO 1  
Procedure 4D

Principal Position - Control Operator No 1.

Alternate Position - None.

Responsibilities - Establish and maintain plant post accident operations in a safe condition.

Immediate Actions

1. If applicable, initiate "Immediate Operator Actions" of the corresponding Emergency Operating Procedure to mitigate the consequences of the accident.
2. If required by Shift Supervisor or Site Emergency Director, with the PA system, announce the location and conditions (including plant areas to avoid while assembling) of the emergency.
3. If required by Shift Supervisor or Site Emergency Director, actuate the emergency siren (continuous two-minute blast). For fire, the siren is a series of short blasts for 30 seconds. For bomb threat, the emergency siren shall not be actuated. There will be a PA announcement only..

Subsequent Actions

4. Assist Shift Supervisor as directed.
5. In the event the control room must be evacuated, report to the alternate assembly area as designated by the Shift Supervisor.
6. Maintain control room logs during and after the emergency.

CONTROL OPERATOR NO 2  
Procedure 4E

Principal Position - Control Operator No 2.

Alternate Position - None.

Responsibilities - Establish and maintain plant post accident operations in a safe condition.

Immediate Actions

1. Initiate appropriate "Immediate Operator Actions" of the corresponding Emergency Operating Procedure to mitigate the consequences of the accident.
2. As requested by the Shift Supervisor:
  - a. Monitor the area monitor readout panel, including radiation levels and area monitor location and record on Attachment 1. Report to the Shift Supervisor any monitors giving high radiation alarms.
  - b. Monitor the process monitor readout panel, including process monitor location and record on Attachment 2. Report to the Shift Supervisor any monitors giving high radiation alarms.
  - c. Monitor and record on Attachment 2, wind speed and wind direction from the Control Room meteorological instrumentation. These readings should be taken at approximately 15-minute intervals or as specified by the Shift Supervisor.

Subsequent Actions

3. Assist the Shift Supervisor as directed.
4. In the event the Control Room must be evacuated, report to the alternate assembly area as designated by the Shift Supervisor.



VOLUME 9A: SITE EMERGENCY PLAN  
ATTACHMENT 4E-1

COMPLETE FOR ANY EMERGENCY INCIDENT INVOLVING AREA MONITORS

AREA MONITOR LOCATION	Monitor Number	Time																		
	Date																			
Personnel	1																			
Lock																				
Spent Fuel	*2																			
Storage Pool																				
Condenser	3																			
Access Area																				
Office	4																			
Corridor																				
Air Comp	5																			
Room																				
Steam Drum Encl	*6																			
Wall																				
Rod Drive Room	7																			
(Not Used)																				
Condensate	8																			
Demin Entr																				
Shop Area	9																			
Control Room	10																			
NW Wall Sphere	11																			
Elev 607'																				
NW Wall Sphere	12																			
Elev 573'																				
Condenser	*13																			
Access Control	14																			
Exhaust																				
Plenum	15																			
Locker Room	16																			
Turbine																				
Shield Wall	17																			
Radwaste	*18																			
Vault Entr																				
Access Control	19																			
Entrance																				
Emergency Cond	20																			
Vent (East)																				
Emergency Cond	21																			
Vent (West)																				

\*If off-scale readings are observed, note by the use of ">" symbol.

PROCESS MONITORS - WIND SPEED AND DIRECTION

Complete for Any Emergency Incident Involving Process Monitors

Date	Time	*Gross Stack Gas, c/m	Stack Gas $\mu\text{Ci}/\text{sec}$	Off Gas Units	Off Gas $\mu\text{Ci}/\text{sec}$	Sphere Service Water	Sphere Cooling Water	Radwaste Discharge	Main Condenser	Canal Discharge	Wind Speed	Wind Direction

\*Purge system as often as necessary.

If off-scale readings are observed, note by the use of ">" symbol.

AUXILIARY OPERATOR  
Procedure 4F

Principal Position - Auxiliary Operator.

Alternate Position - None.

Responsibilities - Assist in establishing and maintaining plant post accident operations in a safe condition.

Immediate Actions

1. Upon sounding of the emergency siren, proceed to the Control Room and await delegation of duties by the Shift Supervisor.
2. If Radiation Protection personnel are not available, perform the initial radiation surveys as required by the Shift Supervisor.

Subsequent Actions

3. Perform any operational or assessment functions as directed by the Control Room operators and Shift Supervisor.
4. If Radiation Protection personnel are not available and if necessary, act as "Ambulance Escort" for injured person(s) per EPIP 6E. When escorting injured individual to hospital in emergency vehicle, take the Emergency Hospital Kit located in main lobby and the battery-operated air sampler located next to the portal monitor in Access Control to the hospital.
5. In the event the Control Room must be evacuated, report to the alternate assembly area as designated by the Shift Supervisor.

OPERATIONS AND MAINTENANCE SUPERINTENDENT  
Procedure 4G

Principal Position - Emergency Team No 9 Leader.

Alternate Position - Site Emergency Director - First Alternate.

Responsibilities - Assist the Site Emergency Director as directed or assume the duties of the Site Emergency Director (EPIP 4A) during the absence of the Plant Superintendent.

Immediate Actions

1. Upon sounding of the emergency siren, proceed to Assembly Area I (Technical Support Center) and assist the Site Emergency Director as directed.

Subsequent Actions

2. Coordinate operations and maintenance activities as requested by the Site Emergency Director.
3. When instructed by the Site Emergency Director, activate Emergency Team No 9 and perform duties assigned to the team.
4. Emergency Team No 9 consists of the following personnel:
  - a. Technical Superintendent
  - b. Nuclear Safety Technical Engineer
  - c. Technical Engineer
  - d. Plant Health Physicist
  - e. Operations Superintendent
  - f. Reactor Engineer
5. In the event the Technical Support Center must be evacuated, report to the alternate assembly area as designated by the Site Emergency Director.

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TECHNICAL SUPERINTENDENT  
Procedure 4H

Principal Position - Emergency Team No 9 Member.

Alternate Position - Site Emergency Director, Second Alternate.

Responsibilities - Assist the Site Emergency Director as directed or assume the duties of the Site Emergency Director (EPIP 4A) during absence of the Plant Superintendent and preceding alternate.

Immediate Actions

1. Upon sounding of the emergency siren, proceed to Assembly Area I (Technical Support Center) and assist the Site Emergency Director as directed.

Subsequent Actions

2. Activate necessary technical assistance.
3. During the emergency, coordinate the activities of the emergency teams.
4. Ensure all Immediate and Subsequent Actions of EPIPs 1 and 2 and any other necessary actions have been performed.
5. In the event the Technical Support Center must be evacuated, report to the alternate assembly area as designated by the Site Emergency Director.

NUCLEAR SAFETY TECHNICAL ENGINEER  
Procedure 4I

Principal Position - Emergency Team No 9 Member.

Alternate Position - None.

Responsibilities - Assist Site Emergency Director in the areas of reactor operations, nuclear safety and emergency planning.

Immediate Actions

1. Upon sounding of the emergency siren, proceed to Assembly Area I (Technical Support Center) and assist Site Emergency Director as directed.

Subsequent Actions

2. Assist in planning the reentry and recovery of the plant.
3. In the event the Technical Support Center must be evacuated, report to the alternate assembly area as designated by the Site Emergency Director.
4. Provide periodic updates of emergency conditions to the Emergency Operations Facility (Boyne City) in coordination with the Technical Engineer.

PLANT HEALTH PHYSICIST  
Procedure 4J

Principal Position - Emergency Team No 9 Member.

Alternate Position - None.

Responsibilities - Ensures proper radiation protection measures are taken during and after emergency conditions.

Immediate Actions

1. Upon sounding of the emergency siren, proceed to Assembly Area I (Technical Support Center) for personnel accountability check and assist the Site Emergency Director as directed.

Subsequent Actions

2. As conditions dictate or as directed by the Site Emergency Director perform the following:
  - a. Review EPIP 5A, Estimation of Off-Site Dose.
  - b. Review EPIP 5B, Procedure to Determine High Stack Gas Releases..
  - c. Review EPIP 5C, Airborne Monitoring Under Accident Conditions and, if necessary, issue potassium iodide tablets (stored in Emergency Kits) to plant personnel if airborne iodine activity exceeds  $4E-08$   $\mu\text{Ci/cc}$  as calculated per EPIP 5C.
  - d. Review EPIP 5D, Procedure to Determine Extent of Core Damage (for 0% to 100% core meltdown).
  - e. Review EPIP 5E, Procedure to Determine Extent of Core Damage (for less than 10% core meltdown).
  - f. Review EPIP 5F, Environmental Monitoring.
3. Assist in organizing and equipping reentry teams, if required (EPIP 6C).
4. Make necessary recommendations to the Site Emergency Director pertaining to radiation health and safety.
5. Perform necessary calculations to determine the radiological impact of the emergency.

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6. Interface with Department of Health on off-site radiation monitoring.
7. In the event the Technical Support Center must be evacuated, report to the alternate assembly area as designated by the Site Emergency Director.
8. Ensure personnel exposure is maintained below 10CFR20 limits. Under accident conditions, the iodine carbon cartridge and particulate filter in the stack base may be unretrievable because of dose rates from the filter system and/or containment sphere.
9. Update Technical Support Center Status Board with respect to radiological information.

NOTE: All environmental samples collected will be deposited at the EOF in Boyne City for further/future analysis. As determined by the EOF Health Physics personnel, sample analysis will be performed at the EOF as feasible or desired. If analysis cannot be performed at the EOF, the following facilities are available which contain full laboratory and counting facilities:

- a. Midland Nuclear Power Plant
- b. Palisades Nuclear Power Plant
- c. Eberline Instrument Corporation, 234 Roosevelt Road, West Chicago, IL 60185.

The contract with Eberline for performing sample analysis is kept current by the Jackson Health Physics Department.

- d. A possible option is the MDHP mobile laboratory and counting van which would be positioned on or near the site during emergency conditions.

All environmental samples collected per EPIP 5F, Environmental Monitoring, shall be deposited at the EOF, Boyne City.

Attachments

1. Attachment 1 is general information concerning the Weather Information System and can be used for weather forecasting (long term) after an accident.
2. Attachment 2 clarifies the Weather Services Computer Printout Codes.



Emergency Plan Implementing Procedure 4J  
ATTACHMENT 1

INFORMATION CONCERNING THE WEATHER INFORMATION SYSTEM

If you encounter problems at any time, call the WSI Bedford Systems Consulting Group at

To print the data for the current hour at a selected weather station, type "USDATA" followed by a 3-letter-station-code and hit the return key. The following are the 3-letter-station-codes for the weather stations that should be used by Big Rock and Palisades Nuclear Plants. They are given in the order in which they should be used. The first one is the primary and the second one should be used if the primary is not available.

Big Rock

1. Pellston - PLN
2. Traverse City - TVC

Palisades

1. Benton Harbor - BEH
2. Muskegon - MKG

For example, the following command would give the current hourly meteorological data at Pellston:

USDATA PLN

The data would appear in the following format:

OBSERVATIONS FOR 1PM (17Z) 30-JUL-80

<u>STA</u>	<u>PRS</u>	<u>TMP</u>	<u>DEW</u>	<u>WIND</u>	<u>G</u>	<u>VIS</u>	<u>WX</u>	<u>SKY</u>
PLN	142	73	55	2710		25		C120 BKN
+								

To print the current data for more than one station, type each station separated by a comma. For example, to print the current data for Pellston and Traverse City, type:

USDATA PLN, TVC

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Data can also be printed from previous hours or a set of hours. Data for most stations are stored for 3 days (72 hours). The command format is the same as for the current hour except a time period is added after the station name(s). The following codes are used to specify time periods:

A	AM
P	PM
Z	GMT
Y	Yesterday
YY	2 Days ago
YYY	3 Days ago

The format for specifying the time periods is:

start time-end time

12 AM Represents Midnight  
12 PM Represents Noon

To print the hourly Pellston data from 1 AM thru 7 AM, type:

USDATA PLN 1A-7A

If you want the data from all the hours since a certain time, leave the end time blank. To print all the hours at Pellston since 1 AM, type:

USDATA PLN 1A-

To print data from yesterday, add a Y after the A or P, YY for data from 2 days ago or YYY for data from 3 days ago:

USDATA PLN 1AYYY-7PY

The same format is used for multiple stations:

USDATA PLN,TVC 1AYYY-7PYY

When requesting a series of stations and the time is omitted, the heading will be printed only once. If the time is included, the heading for each station will be included unless the time is following by /X.

To see the same data for the above two stations grouped by time period instead of by station, type:

USDATA PLN,TVC 1AYYY-7PYY/X

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To display a weather map for the State of Michigan, type "MIC" followed by the appropriate weather concept. The system will respond with "OK" to indicate that it is processing the command. The following is a list of all available weather concepts.

WEATHER CONCEPTS

Weather Concept	Map Code	Units	
		English	Metric
Barometric Pressure	B	Inches	Millimeters
Ceiling	G	Feet	Meters
Cloud Layer (Lowest)	K	Feet	Meters
Dew Point	D	Fahrenheit	Celsius
Maximum Temperature	I	Fahrenheit	Celsius
Minimum Temperature	O	Fahrenheit	Celsius
Precipitation - 6 Hourly	(	Inches	Millimeters
Precipitation - Daily	)	Inches	Millimeters
Precipitation - Monthly Actual	:	Inches	Millimeters
Precipitation - Monthly Normal	@	Inches	Millimeters
Precipitation - % Monthly Normal	%	Inches	Millimeters
Pressure	P	Millibars	Kilopascals
3-Hour Pressure Change	C	Millibars	Kilopascals
Relative Humidity	H	Percent	Percent
Snow Depth - On Ground	[	Inches	Centimeters
Snow Fall - Daily	]	Inches	Centimeters
Station Names	N	-	-
Temperature	T	Fahrenheit	Celsius
THI	J	Fahrenheit	Celsius
24-Hour Temperature Change	Z	Fahrenheit	Celsius
Visibility	V	Miles	Kilometers
Weather Only	R	-	-
Weather & Sky Condition	X	-	-
Wet Bulb	U	Fahrenheit	Celsius
Wind - Cardinal Directions	A	Miles/Hour	Meters/Second
Wind - Tens of Degrees	W	Knots	Meters/Second
Wind Chill	L	Fahrenheit	Celsius
Wind Gusts	S	Knots	Meters/Second

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For example, the following would display the temperatures (°F) for the entire State:

MIC T

The maps can be displayed with data in either English or metric units. If no unit is specified when requesting a map, then English units are used. To display a temperature map in °C for the State, type:

MIC TM

The previous portions of this map section have explained how to display current data. The system also has the capability to display data for past hours.

To display data for previous hours, the system must be instructed how many hours back in time to go. The value for the number of hours back can be a one- or two-digit number. However, an asterisk (\*) will instruct the system to go back 24 hours and display the data for the previous day.

To display a map of temperatures (°F) in the State for 6 hours ago, type:

MIC T6

To display this same map with data for the previous day (24 hours ago), type:

MIC T\*

One feature of the map programs is its ability to compute and display the change in any variable over time or the tendency. There are preset map concepts for 3-hour pressure change and 24-hour temperature change. This portion of the system allows you to display the tendency for any variable over a period of time. This period of time must be a multiple of 3 hours and cannot be greater than 24 hours. This means that the time periods available are 1, 3, 6, 9, 12, 15, 18, 21 and 24 hours. Each time period has a one-digit number to indicate the time period. They are:

- 0 1-Hour Tendency
- 1 3-Hour Tendency
- 2 6-Hour Tendency
- 3 9-Hour Tendency
- 4 12-Hour Tendency
- 5 15-Hour Tendency
- 6 18-Hour Tendency
- 7 21-Hour Tendency
- 8 24-Hour Tendency
- \* 24-Hour Tendency

To display a map with the 3-hour temperature change for the State, type:

MIC T#1

This will only work with concepts that have numerical values; you can't display changes in the weather or station names.

The State of Michigan is divided into a number of forecast zones. A map of the location of the forecast zones for the Lower Peninsula is contained in Attachment 4. These zone forecasts are prepared by the Ann Arbor National Weather Service station at 5:00 AM, 11:00 AM, 5:00 PM and are updated at 10:00 PM (Eastern Standard Time), if needed. Access to these forecasts from the previous 12 hours to the present is obtained by typing:

-ZONES MI 12-

#### Correcting Typing Mistakes

If you make a mistake while typing a command, there are two methods to correct the mistake. One corrects the characters on the line and one erases the entire line and lets you start again.

1. To correct mistakes on a line, you use the "Rubout" key. To correct an error, type the rubout key once for each character that you would like to erase. The system will indicate the use of this function by typing a back slash "/" followed by the characters that are being erased. (In some modes, the system will only type the characters that are being erased and not the back slash). Now type the correct characters. These characters can include spaces, letters and numbers. Once the return key has been typed, you cannot erase any characters from that line.

If you were trying to type "USDATA" and mistakenly typed "USDSFR," you could do the following:

USDSFR/RFS/ATA or

USDSFRFRFSATA

The rubout key was typed three times, followed by the correct characters. If at anytime you would like to see the corrected portion of the line before you hit the return key, hit the paper adv key and then hit the CTRL key while at the same time hitting the letter "R".

2. To erase an entire line, hit the CTRL key at the same time hit the letter "U". The terminal will return to a new line. Even though the system does not type a "+" you may enter the command.

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Stopping Programs and Output

If at anytime you wish to cancel a command, stop a program execution, completely halt a printout or stop anything else on the system, hit the CTRL key and the letter C simultaneously two times. Note that it might take a few seconds before the system recognizes the command. If after a few seconds the system fails to halt execution, retype the above sequence.

Problem Assistance

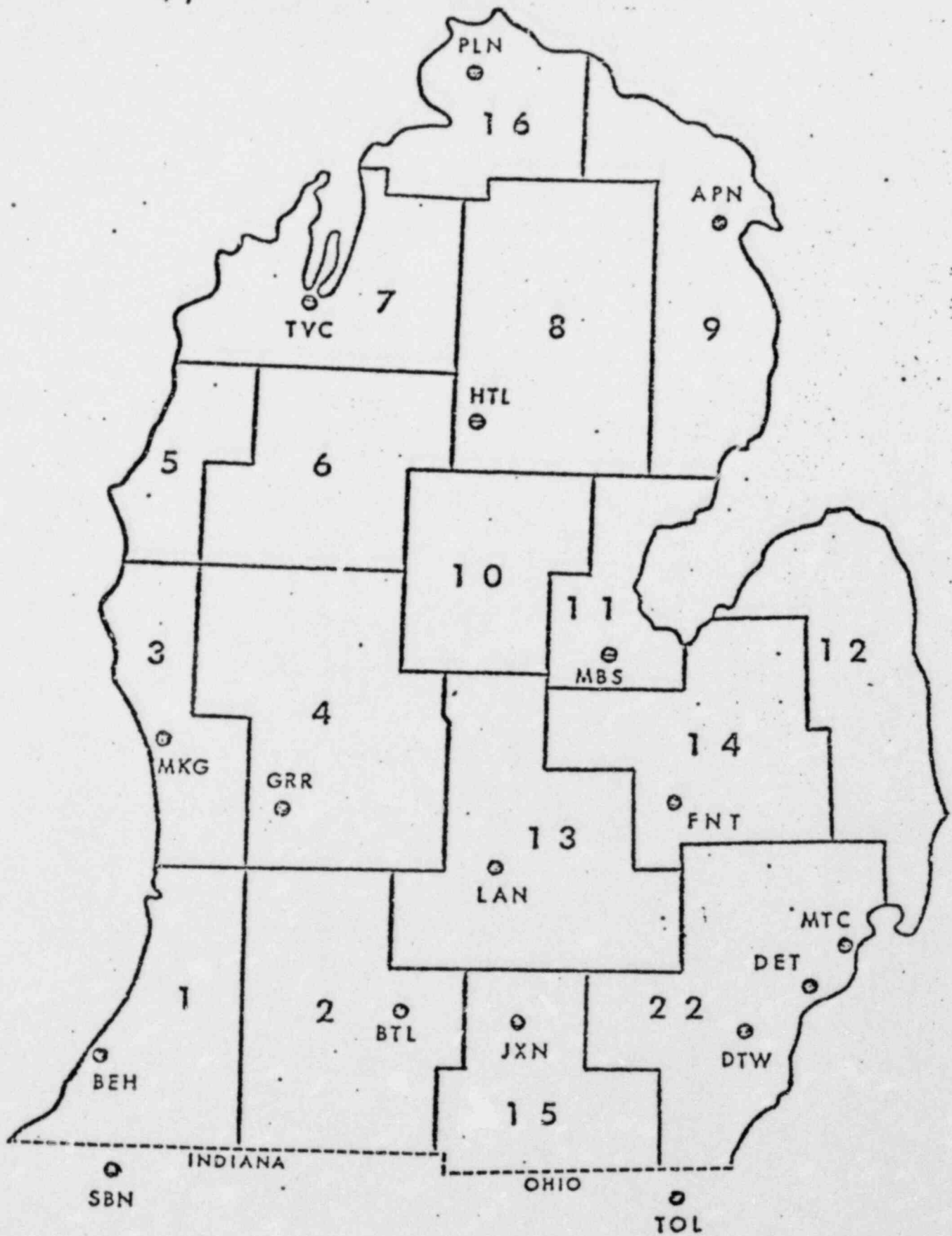
If you encounter problems at any time, call the WSI Bedford Systems Consulting Group at

Alternate Telephone Numbers

Detroit  
Chicago  
Direct Access to WSI

Milwaukee  
Cleveland

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Emergency Plan Implementing Procedure 4J  
ATTACHMENT 2

WEATHER SERVICES COMPUTER PRINTOUT CODES

STA 3-Letter-Station-Code

TIME Time of the observation in local time. The Greenwich Meridian Time or Z time is listed in parentheses.

DATE Day of the month

PRS Sea level pressure in millibars. Only the last 3 digits of the pressure is listed. Either a 9 or 10 should be placed in front of the 3 digits listed to get the pressure in tenths of millibars. A decimal point should also be placed before the last digit. A good rule of thumb is to add a 10 if the 3 digits are less than 500 and a 9 if they are above 500. If 064 was listed, then the correct pressure is 1006.4 millibars. If 546 is listed, then the correct pressure is 954.6 millibars.

TMP Temperature in degrees Fahrenheit

DEW Dew point in degrees Fahrenheit

WIND Wind direction in tens of degrees from true north and speed in knots. The first two digits are the wind direction and the second two digits are the speed. 2213 would be listed when the wind is blowing from 220 degrees at 13 knots.

G Wind gust (if any) in miles per hour

VIS Visibility in miles

WX Weather and/or obstruction to visibility. The weather codes are:

A	Hail
BD	Blowing Dust
BN	Blowing Sand
BS	Blowing Snow
D	Dust
F	Fog
GF	Ground Fog
H	Haze
IC	Ice Crystals
IF	Ice Fog
IP	Ice Pellets (Sleet)
IPW	Ice Pellets Showers
K	Smoke



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L	Drizzle
R	Rain
RW	Rain Showers
S	Snow
SG	Snow Grains
SP	Snow Pellets
SW	Snow Showers
T	Thunderstorms
T+	Severe Thunderstorm
ZL	Freezing Drizzle
ZR	Freezing Rain

Precipitation intensities are indicated:

-	Light
No Sign	Moderate
+	Heavy

Signs may be combined; TRW+ would mean heavy thundershower.

SKY This column lists the ceiling (if one exists), height of clouds and the sky cover.

The first letter will be "C" if a ceiling exists.

The figures are the heights of the base of the cloud layers in hundreds of feet. Thus, 11 would be 1100 feet; 250 would be 25,000 feet.

The next three letters are the sky cover:

CLR	Clear: 0% sky cover
SCT	Scattered: 10-50% sky cover
BKN	Broken: 60-90% sky cover
OVC	Overcast: 100% sky cover

The cloud ceiling height will be the cloud height immediately following the letter "C." If the letter "C" does not appear, then there is no ceiling and the Pasquill stability category can be found assuming a ceiling height of 18,000 feet.

- Thin, when prefixed to the above symbols. -OVC means thin overcast.
- X Partial obscuration: 10% to less than 100% of the sky is hidden by precipitation, fog or low clouds.

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X      Obscuration: 100% of sky hidden by precipitation or obstruction to  
vision at the ground. Indefinite (W) ceiling.

OPERATIONS SUPERINTENDENT  
Procedure 4K

Principal Position - Emergency Team No 9 Member.

Alternate Position - Shift Supervisor (EPIP 4B).

Responsibilities - Assist the Site Emergency Director as directed and assist the on-duty Shift Supervisor in determining accident classification and measures to control the accident.

Immediate Actions

1. Upon sounding of the emergency siren, proceed to Assembly Area I (Technical Support Center) and assist the Site Emergency Director as directed.
2. Assist the on-duty Shift Supervisor in controlling the emergency.
3. Assist Site Emergency Director in controlling number of personnel in the Control Room area.

Subsequent Actions

4. In the event the Technical Support Center must be evacuated, report to the alternate assembly area as designated by the Site Emergency Director.
5. Provide periodic updates of emergency conditions to Control Room and/or Operations Support Center.

SHIFT SUPERVISOR (OFF DUTY)  
Procedure 4L

Principal Position - Emergency Team No 2, 3, 4, or 5 Member.

Alternate Position - None.

Responsibilities - Assist the Site Emergency Director as directed.

Immediate Actions

1. If notified to report for duty by Site Emergency Director:
  - a. Notify your shift crew of emergency conditions, if necessary, and instruct them to report to the On-Site Operations Support Center (air compressor room).

Subsequent Actions

2. If notified for standby duty by Site Emergency Director:
  - a. If necessary, notify your shift crew of emergency conditions.
  - b. Request your crew remain on call for possible later notification to assemble at plant.
  - c. Remind your shift crew that, if possible, shift rotation will be performed as scheduled.

RADIATION PROTECTION AND CHEMICAL SUPERVISOR  
OR  
CHEMICAL AND RADIATION PROTECTION SUPERVISOR  
Procedure 4M

Principal Position - Emergency Team No 5 Leader.

Alternate Position - Alternate leader for Assembly Area II (EPIP 4N).

Responsibilities - Group leader of Team No 5, assists the Site Emergency Director as directed.

Immediate Actions

1. Upon sounding of the emergency siren, proceed to Assembly Area II for personnel accountability check.

Determine on-site radiological conditions to assure habitability of expected work areas. Post work areas as conditions dictate.

Subsequent Actions

2. When instructed by the Site Emergency Director, or his designated representative, activate Emergency Team No 5 and perform duties assigned to the team. The duties for this team are outlined in EPIP 5B-5F.
3. Upon completion of accountability check, appoint off-site survey teams as requested by the Site Emergency Director and inform them of preliminary routes that should be taken to perform assigned surveys if Procedures EPIP 5A-F are to be performed.
4. If evacuation is necessary, dispatch a Radiation Protection Technician to the appropriate reassembly area (either plant access road or railroad spur as designated by Site Emergency Director) to collect film badges and dosimeters and assist in personnel monitoring and decontamination per EPIP 6B. Pick-up spare dosimetry from the Health Physics clerk's office and take to the reassembly location for later plant reentry.
5. Emergency Team No 5 consists of the following personnel:
  - a. Chemical and Radiation Protection Supervisor
  - b. Senior Chemical and Radiation Protection Technician (2)
  - c. Chemical and Radiation Protection Technician

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6. In the absence of the Plant Health Physicist, assume the duties of the Plant Health Physicist (EPIP 4J).

MAINTENANCE SUPERINTENDENT  
Procedure 4N

Principal Position - Assembly Area II Leader (Machine Shop)

Alternate Position - Emergency Team No 8 Leader

Responsibilities - Group Leader of Team No 8, assist the Site Emergency Director as directed and performs the duties of Assembly Area II Leader

Immediate Actions

1. Upon sounding of the emergency siren, proceed to Assembly Area II for personnel accountability check per EPIP 6A. Report the results of the accountability check to the Property Protection Supervisor.
2. If dose rates exceed 100 mR/hr, as measured by survey instrument in the Emergency Kit or as detected by local area monitors, notify the Site Emergency Director for evacuation instructions of nonessential personnel. Emergency conditions may require Chemical and Radiation Protection personnel to remain on site as essential personnel.

Subsequent Actions

3. When instructed by the Site Emergency Director, or his designated representative, activate Emergency Team No 8 and perform duties assigned to the team.
4. Emergency Team No 8 consists of the following personnel:
  - a. Maintenance Superintendent
  - b. Qualified Welder
  - c. Machinist
  - d. Plant Repairman A (2)
  - e. Plant Repairman B (2)
  - f. Plant Repairman Helper (2)
5. If evacuation is necessary and essential personnel are to remain on site as designated by the Site Emergency Director, maintain a list of nonessential personnel to be evacuated and report this list to the Property Protection Supervisor.

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INSTRUMENT AND CONTROL SUPERVISOR  
Procedure 4-0

Principal Position - Emergency Team No 7 Leader.

Alternate Position - None.

Responsibilities - Assist the Site Emergency Director as directed.

Immediate Actions

1. Upon sounding of the emergency siren, proceed to Assembly Area II for personnel accountability check.

Subsequent Actions

2. When instructed by the Site Emergency Director, or his designated representative, activate Emergency Team No 7 and perform duties assigned to the team.
3. Emergency Team No 7 consists of the following personnel:
  - a. Instrument and Control Supervisor
  - b. Senior Plant Technician (2)
  - c. Plant Technician



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SENIOR ENGINEER  
Procedure 4P

Principal Position - Emergency Team No 6 Leader. (This individual will be designated at the time of the emergency.)

Alternate Position - Emergency Team No 5 Leader (FPIP 4M).

Responsibilities - Assist the Site Emergency Director as directed.

Immediate Actions

1. Upon sounding of the emergency siren, proceed to Assembly Area II for personnel accountability check. Serve as accountability leader for Project Engineers (Engineers, Technologists and Engineering Analysts).

Subsequent Actions

2. Activate Emergency Team No 6 as directed by the Site Emergency Director or his designated representative.
3. Emergency Team No 6 consists of the following personnel:
  - a. Senior Engineer
  - b. Senior Chemical and Radiation Protection Technicians (2)
  - c. Chemical and Radiation Protection Technician

TRAINING COORDINATOR OR INSTRUCTOR  
Procedure 4Q

Principal Position - Assembly Area III (Service Building Annex) Leader.

Alternate Position - Dispatched Individual to County Emergency Operations Center (EPIP 4W).

Responsibilities - Accountability leader for Assembly Area III.

Immediate Actions

1. Assemble personnel in the area and perform a personnel accountability check per EPIP 6A. Provide this information to the Property Protection Supervisor.
2. Determine dose rate in the assembly area from instruments in the Site Emergency Kit located in the whole body counting room.
3. Shut off ventilation, if necessary.
4. If dose rates exceed 100 mR/h, notify the Site Emergency Director and he may cause personnel to evacuate to the plant access road entrance or the railroad spur with the Site Emergency Kit, Site Emergency Plan and extra supply of anti-C clothes.

Subsequent Actions

5. If evacuation is necessary and essential personnel are to remain on site as designated by the Site Emergency Director, maintain a list of nonessential personnel to be evacuated, and report this list to the Property Protection Supervisor.
6. If evacuation is ordered, set up the personnel monitoring and change station and assist in any monitoring of any potentially contaminated evacuating personnel or equipment.

PROPERTY PROTECTION SUPERVISOR  
(Site Accountability Leader)  
Procedure 4R

Principal Position - Emergency Security Coordinator and Site Accountability Coordinator.

Alternate Position - None.

Responsibilities - Supervise plant security operations during emergency situation and act as Site Accountability Coordinator for all assembly areas.

Immediate Actions

1. Upon the sounding of the emergency siren, (Alert emergency classification) proceed to the guardhouse.
2. Halt all vehicular traffic through the protected area gate.
3. Prevent personnel entry into the protected area, except for key emergency personnel and specific individuals authorized by the Site Emergency Director.
4. Dispatch a security officer to give vital area door keys, one set of electric lock gate keys, and one protected area gate key, to Shift Supervisor and dispatch available security officers to check and clear unauthorized personnel from known trespass areas such as the beach area. All CPCo property must be kept clear of visitors until a specific authorization is given by the SED to return to normal activities.
5. Dispatch a security officer to Assembly Area II (with visitor sign in log) to assist with personnel accountability and to maintain order.
6. Account for all personnel assembling in Assembly Areas I, II and III and, as Site Accountability Leader, report the final results of the personnel accountability check to the Site Emergency Director.

Subsequent Actions

7. Assist the Site Emergency Director as required by the nature of the emergency at hand. Be prepared to perform any or all of the following actions:
  - a. Assign security officers to strategic positions around the controlled and protected areas as required by emergency circumstances, such as dispatching a security officer to the access road entrance to establish radio contact between CAS/SAS and the

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- control room and to control incoming traffic. (No one shall be allowed to enter the access road unless authorized by the Site Emergency Director.)
- b. Investigate personnel locations by examining hardcopy card reader printout for last known entry into a vital area. Report unaccounted for personnel to the Site Emergency Director.
  - c. Remove all statuses from particular vital door to initiate absolute lock out if requested by Site Emergency Director.
  - d. Remove all statuses from control room door but 2 and 5 if requested by Site Emergency Director; this allows only designated personnel in the control room.
  - e. Assign security officers to the railroad spur gate to collect key cards in the event of evacuation via the railroad spur. A security officer shall assist in collection of key cards at the guardhouse if evacuation is to the plant access road entrance.
8. If evacuation is necessary and essential personnel are to remain on site as designated by the Site Emergency Director, account for all essential personnel remaining on site by comparing the final accountability list to the lists of nonessential personnel to be evacuated (provided by the Assembly Areas II and III leaders). Report the list of final list of personnel remaining on site (essential personnel) to the Site Emergency Director.
  9. When the emergency siren is sounded, fisherman (onshore and offshore) and tourists should be requested to leave the area immediately. The Coast Guard at the Charlevoix Station may be summoned for assistance if required. These fishermen and visitors will not be allowed to return until the conclusion of the emergency.
  10. If an emergency condition exists that requires complete guard force evacuation, the Property Protection Supervisor or Security Shift Leader shall designate appropriate action, such as ensuring positive lockout of protected areas. The bypassing of alarms on all alarm panels in CAS and SAS to reduce a possible fire hazard and the turning on of Protected area Security lighting:
    - a. Primary Security equipment needs for complete guard force evacuation should include the following items:
      1. Hard keys, one set of vital area door keys, one set of electronic lock gate keys from Security Key Safe #1, marked loan set and the two sets of inside Security pass keys from the ID Station.

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2. ID Station Access and Escort Authorization book, which includes a packet of Security logs for an emergency.
  3. All magnetic key cards, including Security Personnel and visitor key cards, will be placed in the metal cabinet with visitors 819's for Access Control.
  4. All operative Security portable radios.
  5. One plant radio from Sr. Lieutenant's office.
  6. Two portable external antenna systems for radios.
  7. Radio battery charger and spare radio batteries.
  8. One rifle, two shotguns and a spare ammo bag for each.
  9. One vehicle.
- b. Secondary Security equipment needs that could be obtained on a return trip to the Security building after initial evacuation:
1. Additional vehicles to patrol controlled area or for Security related needs.
  2. Portable bull horn.
  3. Flashlights and batteries.
  4. Rain clothing, winter parkas and hard hats.
  5. Closure chain and chain stand for plant access road.
  6. Riot helmets and night sticks.
  7. Additional logs as needed.
  8. Additional revolver, rifles, shotguns and ammo for each as needed.
  9. Binoculars.
  10. One copy of the Security Implementing Procedures and Safeguards Contingency Plan.
  11. One copy of the Site Emergency Implementing Procedures.

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- c. Items to be considered for long term Security personnel evacuation from plant Protected area:
1. Porta-Jon within 24 hours.
  2. Electrical power for radio battery chargers, lights, etc., at the end of the plant access road or any other control area.
  3. Portable shelters, one office trailer.
  4. Portable flood lights and extension cords.
  5. Telephone service for portable office.

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SECURITY SHIFT LEADER  
Procedure 4S

Principal Position - Shift Leader.

Alternate Position - Property Protection Supervisor (Alternate).

Responsibilities - Assist the Property Protection Supervisor as directed or assume duties of the Property Protection Supervisor (EPIP 4S) in his absence.

Immediate Actions

1. Upon the sounding of the emergency siren (Alert classification), proceed to the guardhouse.
2. Notify Property Protection Supervisor of emergency condition.

Subsequent Actions

3. Maintain control of site security and assist the Property Protection Supervisor as directed.
4. Do not allow personnel to enter the protected or CPCo controlled areas unless authorized by the Site Emergency Director. Have the beach area checked for fishermen or tourists and have these people leave the area until the conclusion of the emergency.
5. If an emergency condition exists that requires complete guard force evacuation, the Security Shift Leader or Property Protection Supervisor shall designate appropriate action such as ensuring positive lockout of protected areas.

NOTE: Picture badges and TLD's are stored in the Security Building to accommodate the Charlevoix or Petoskey Fire Departments' personnel if asked to respond to emergency situations.

SECURITY OFFICER  
Procedure 4T

Principal Position - Security Officer.

Alternate Position - None.

Responsibilities - Maintain site security as directed by the Property Protection Supervisor or his designated representative.

Immediate Actions

1. Upon the sounding of the emergency siren, report to the guardhouse, and assist the Property Protection Supervisor as requested.
2. Proceed to Assembly Area II with the visitor sheet to assist in personnel accountability and to maintain order.
3. A security officer shall be dispatched to give jail door keys, one set of electric lock gate keys and protected area keys, to the Shift Supervisor.
4. A security officer will be dispatched to check the beach area for fishermen. Anyone located will be requested to leave the area for the duration of the emergency.
5. If evacuation is necessary to the plant access road entrance, assist in the collection of key cards of evacuating personnel at the guardhouse.
6. If requested by the Site Emergency Director or Property Protection Supervisor, assist in evacuating personnel to Personnel Monitoring and Change Station II via railroad spur. Assistance will consist of unlocking and relocking gate and collection of key cards.
7. When instructed by the Property Protection Supervisor, proceed to the highway entrance of the plant access road, establish radio contact with CAS/SAS and the control room and control traffic coming on site as directed. No one shall be allowed to enter the access road unless authorized by the Site Emergency Director.
8. All Security officers shall report immediately to the Security Building unless they are involved in one of the following duties:
  - a. Monitoring a vital area door - stay there and notify CAS for further instructions.
  - b. On roving patrol - continue roving patrol and notify CAS for further instructions.



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- c. On visitor escort - escort the visitor to the Machine Shop for accountability check; turn visitor over to a CPCo employee; notify CAS and return to the Security Building.
  - d. On vehicle escort - park the vehicle, removing keys and escort the driver to the Machine Shop; turn over escort to a CPCo employee; notify CAS and return to the Security Building.
  - e. Opening a perimeter gate - halt all vehicular traffic into the protected area. Close the gate, clear and verify alarms and return to the Security Building.
  - f. On key punch rounds - break off the key punch rounds and return immediately to the Security Building.
9. The identification operator shall prohibit all entries into the protected area unless authorized by the Site Emergency Director. Halt all vehicular traffic through the protected area. The I-Dent operator will also ensure that when personnel exit the protected area, all badges are retained in the I-Dent station and that all personnel use the portal monitor unless other arrangements have been made by Health Physics.
10. CAS and SAS operators will continue to monitor Security status and stand by for further instructions from the Site Emergency Director.

TECHNICAL ENGINEER  
Procedure 4U

Principal Position - Technical Support Center Dedicated Off-Site Communicator.

Alternate Position - Site Emergency Director (Third Alternate).

Responsibilities - Provide communications with Federal, State and local agencies including periodic updating as delegated by the Site Emergency Director and to assist the Site Emergency Director as directed or assume the duties of the Site Emergency Director (EPIP 4A) during the absence of the Plant Superintendent and preceding alternates.

Immediate Actions

1. Upon sounding of the emergency siren, proceed to Assembly Area I (Technical Support Center) and assist the Site Emergency Director as directed and update off-site authorities required to be notified per EPIP 1 as requested by the Site Emergency Director every fifteen minutes or as directed.

Subsequent Actions

2. When updating Federal, State and local authorities, refer to EPIPs 1 and 2 for telephone numbers.
3. Use EPIP 6F for notification requirements.
4. Assist in planning the reentry and recovery of the plant.
5. In the event the Technical Support Center must be evacuated, report to the alternate assembly area as designated by the Site Emergency Director.
6. Provide periodic updates of emergency conditions to the Public Affairs, Director/Personnel Director who will be located per EPIP 4X.

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AGENCY UPDATE CHECKLIST  
IMPLEMENTING PROCEDURE 4U, ATTACHMENT 4U-1  
Date \_\_\_\_\_

Agency	Contact Made Yes/No	Time Contact Made	Person Contacted Title/Position	Comments/Discussion

EMERGENCY PLAN IMPLEMENTING PROCEDURE 4U, ATTACHMENT 4U-2  
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Priority of Communication Systems  
Communications to:

	Control Room	Tech Supp Center	Ops Supp Center	Emergency Ops Facility	Control Ctr Jackson	NRC	Mich State Police/Dept of Health	Char Cnty Emer Ser
Communications From	Control Room	1 _____ 2 _____	1 F to F 2 IntP Tel	1 IntP Tel 2 Walkie-T	1 IntP/Bell 2 Radio	1 Dedi Tel 2 Bell Tel (Power Control)	1 Bell Tel 2 *	1 Dedi Tel 2 Bell Tel
	Technical Support Center	1 F to F 2 IntP Tel	1 _____ 2 _____	1 IntP Tel 2 Walkie-T	1 IntP Tel 2 Bell Tel	1 Bell Tel 2 _____	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 _____
	Operations Support Center	1 IntP Tel 2 Walkie-T	1 IntP Tel 2 Walkie-T	1 _____ 2 _____	1 IntP Tel 2 Bell Tel	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 _____	1 Dedi Tel 2 Bell Tel
	Emergency Operations Facility	1 IntP/Bell 2 Radio	1 IntP Tel 2 Bell Tel	1 IntP Tel 2 Bell Tel	1 _____ 2 _____	1 Bell Tel 2 _____	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 *
	Control Center, Jackson	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 _____ 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____
	NRC	1 Dedi Tel 2 Bell Tel	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 _____	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 _____	1 _____ 2 _____	1 Bell Tel 2 _____
	Michigan State Police/Dept of Health	1 Bell Tel 2 *	1 Bell Tel 2 *	1 Bell Tel 2 *	1 Bell Tel 2 *	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 2
	Charlevoix County Emergency Services	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____

Key: F to F - Face to Face, IntP Tel - Intraplant Telephone, Dedi Tel - Dedicated Telephone, Walkie-T - Walkie-Talkie, \* - State Police Radio Band (Available through Plant security)

NOTE: Personnel assembling in the Control Room, Technical Support Center or Operations Support Center can communicate face-to-face within approximately 30 seconds. Walkie-talkies are available in the Control Room for communications to and from any area within the Plant. In addition, since the Control Room is the principal communication center at the Plant, all methods of communication available in the Control Room can be used as backup for any Plant assembly area to communicate to offsite locations.

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ADMINISTRATIVE SUPERVISOR OR TECHNICIAN  
Procedure 4V

Principal Position - Dispatched Individual to County Emergency Operations Center.

Alternate Position - None.

Responsibilities - Ensures communications between the Plant and Charlevoix County Emergency Operations Center have been established and coordinates future communications between the Site Emergency Director and the Charlevoix County Emergency Operations Center or State Police Post in Petoskey.

Immediate Actions

1. Upon arrival at the Charlevoix County Emergency Operations Center, the Administrative Supervisor or Technician will verify that communication between the Plant and Charlevoix County Emergency Operations Center has been established using the dedicated telephone line in the Sheriff's office.

Subsequent Actions

2. Provide periodic updates of activities at the Charlevoix County Emergency Operations Center to the Technical Support Center.
3. Proceed to the State Police Post in Petoskey when requested by the Site Emergency Director (approximately four hours post-accident) and coordinate communications between the Plant and the State Police Post in the same manner as in Step 2.
4. Other Chemical and Radiation Protection Technicians will perform duties as assigned by the Site Emergency Director or respective supervisor.

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PLANT SUPERINTENDENT SECRETARY/HEALTH PHYSICS CLERK/TECHNICAL CLERK  
Procedure 4W

Principal Position - Emergency Data Recorder.

Alternate Position - The Health Physics Clerk and Technical Clerk shall be the first and second alternates, respectively, in the absence of the Plant Superintendent Secretary.

Responsibilities - To maintain a log of actions taken during an emergency to ensure actions listed in EPIP 1 are performed.

Immediate Actions

1. Upon sounding of the emergency siren, the Plant Superintendent Secretary shall proceed to the Technical Support Center. The remaining clerks shall report to Assembly Area II for a personnel accountability check.
2. When requested by the Site Emergency Director, proceed to the Technical Support Center and maintain the emergency log for the Site Emergency Director.
3. Check periodically throughout the emergency that Facility Actions required by EPIP 1 are performed.

Subsequent Actions

4. Throughout the emergency, receive and record reports transmitted to the Site Emergency Director.
5. Report data and information received to the Site Emergency Director.
6. Maintain the Emergency Log (Attachments 1 and 2) detailing actions taken, personnel involved, reports and data received and other information as directed.
7. Report to work on the schedule as required by EPIP 6B.

EMERGENCY PLAN IMPLEMENTING PROCEDURE 4W  
ATTACHMENT 4W-1

Date: \_\_\_\_\_

Time Emergency Declared: \_\_\_\_\_

Site Emergency Director: \_\_\_\_\_

Hour	Individual Taking Action/ Making Contact	Individual/ Agency Contacted	Action, Remarks, Comments

PUBLIC AFFAIRS DIRECTOR OR PERSONNEL DIRECTOR  
Procedure 4X

Principal Position - Post-Accident Media Communicator.

Alternate Position - The Personnel Director shall assume these duties in the absence of the Public Affairs Director.

Responsibilities - To maintain public awareness of any emergency condition through the use of media briefings, press releases and interviews.

Immediate Actions

1. Upon notification of an emergency condition requiring contact with the press, the Public Affairs Director will contact the plant to determine the cause, corrective actions being performed, projected magnitude and projected problems associated with the condition.

Subsequent Actions

2. If required, proceed to the Holiday Inn, Petoskey, to activate the media center and carry out the requirements of the Nuclear Emergency Public Information Policies and Procedures Manual.



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IMPLEMENTING PROCEDURES-4Y  
BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN

REACTOR ENGINEER  
Procedure 4Y

Principal Position - Reactor Engineer.

Alternate Position - None.

Responsibilities - Assist the Site Emergency Director as directed in determining accident conditions and measures to control the accident.

Immediate Actions

1. Upon sounding of the emergency siren, proceed to Assembly Area I (Technical Support Center) and assist the Site Emergency Director as directed.
2. Advise the Site Emergency Director on reactor and fuel performance, if necessary.

Subsequent Actions

3. In the event the Technical Support Center must be evacuated, report to the alternate assembly area as designated by the Site Emergency Director.
4. Maintain current information on the Technical Support Center Status Board with the exception of radiological data.

LICENSED TRAINING INSTRUCTOR OR TRAINING INSTRUCTOR  
Procedure 4Z

Principal Position - Activator of Emergency Operations Center (Boyer City).

Alternate Position - Assembly Area III Leader.

Responsibilities - To activate (open doors, etc) the Emergency Operations Center and coordinate activities and communications of the Emergency Operations Center.

Immediate Actions

1. Upon notification of an emergency condition requiring activation of the Emergency Operations Center, proceed to the Emergency Operations Center and perform the requirements of EPIP 3C.

Subsequent Actions

2. Coordinate activities and communications of the Emergency Operations Center.

CHEMICAL AND RADIATION PROTECTION TECHNICIAN  
Procedure 4AA

Principal Position - Dispatch individual to Charlevoix County Emergency Operations Center for Off-Site monitoring.

Alternate Position - None.

Responsibilities - Performs off-site monitoring activities as requested by the Site Emergency Director or Health Physicist and provides data for EPIP 5A-F.

Immediate Actions

1. Upon notification by the Site Emergency Director or Health Physicist proceed to Operations Center for possible use of the off-site emergency environmental kits stored there for environmental monitoring.

NOTE: Chemical and Radiation Protection technicians are expected to use their personal vehicles in performing the duties of this procedure.

Subsequent Actions

2. Upon arrival at the Charlevoix County Emergency Operations Center, the Chemical and Radiation Protection Technician will receive directions from the Plant by using the dedicated telephone line in the Sheriff's office.
3. Other Chemical and Radiation Protection Technicians will perform duties as assigned by the Site Emergency Director or respective supervisor.

TELEPHONE SWITCHBOARD OPERATOR  
Procedure 4BB

Principal Position - Switchboard operator.

Alternate Position - a. Security ID Station night phone  
b. Emergency evacuation - Control Room

Responsibilities - Extend incoming and outgoing telephone calls

Immediate Actions

1. Upon sounding of the emergency siren, be prepared to screen all calls for proper extending and to transfer switchboard to Control Room if ordered to evacuate.
2. Nonemergency personnel calls shall not be extended to insure that incoming and outgoing lines are available for emergency calls.
3. The following information shall be obtained from the Site Emergency Director:
  - a. What calls, if any, shall be forwarded to the Control Room?
  - b. Where news media calls should be forwarded.
  - c. Where the Technical Support Center can be reached.

Subsequent Actions

4. Upon receiving orders to evacuate, the switchboard operator will depress the night mode button on her switchboard. All calls coming into the Plant will then be transferred to the night station (ID Station, Extension 208). The ID Station operator shall then program extension 208 to forward all calls to the Plant Control Room (163) by picking up the handset, dialing #2, dialing 163 and then hanging up the handset. The officer shall then pick up extension 235 and dial: \_\_\_\_\_ to insure that all incoming calls to the Plant are being properly forwarded to extension 163 (Control Room)

\*It should be noted that after normal working hours, the ID Station operator need not wait for the switchboard to be put on the night mode, as it has already been done.

If a complete power failure occurs during a site evacuation, all incoming calls to the Plant will automatically divert to the default station (162).

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IMPLEMENTING PROCEDURES-4BB  
BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN

\*\*NOTE: If Station 163 is requested to be reprogrammed to receive incoming calls after power has been restored, the person sent to reprogram shall first reprogram the switchboard so that the night mode light is not flashing. He will do this by following these instructions:

- a. Press an idle loop (line not being used. Located in the center of the switchboard, signified by the numbers 1, 2, 3, 4, 5 and 6. When loop is depressed, a red light will go on above the loop number. You are ready to proceed.)
- b. Press the start button.
- c. Dial #6.
- d. Press the release button.
- e. Night mode light will now be steady and not flashing.

All calls are now going to extension 208 (ID Station) again. The person who reprogrammed the switchboard will then go into the ID Station and reprogram extension 208 to forward all calls to extension 163 (Control Room). This is done by picking up the handset on extension 208, dialing #2, dialing 163 and hanging up the handset. He will then pick up extension 235 and dial: \_\_\_\_\_ to insure that all incoming calls to the Plant are once again being properly forwarded to extension 163 (Control Room).

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IMPLEMENTING PROCEDURES-4CC  
BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN

GENERAL HEALTH PHYSICIST  
Procedure 4CC

Principal Position - Emergency Team No. 9 member

Alternate Position - Chemical and Health Physics Superintendent

Responsibilities - Support the Chemical and Health Physics Superintendent to ensure proper radiation protection measures are taken during and after emergency conditions.

Immediate Actions

1. Upon sounding of the emergency siren, proceed to Assembly Area I (Technical Support Center) for personnel accountability check and to assist the Chemical and Health Physics Superintendent.

Subsequent Actions

2. Perform second level reviews of completed procedures and dose calculations performed in the TSC.

ESTIMATION OF OFF-SITE DOSE  
Procedure 5A

1.0 PURPOSE

- 1.1 To estimate off-site doses during accident conditions.

2.0 METHOD

- 2.1 Isopleth overlays (ground level or elevated release) are used to determine the direction and concentration of an escaping radioactive plume at various distances from the release point. The dose to the thyroid or whole body is determined using the estimated release rates from containment. Calculations are based on AEC Publication "Meteorology And Atomic Energy - 1968" and companion workbook - see Paragraph 3.3 for further details.

3.0 TECHNICAL SPECIFICATIONS AND OTHER REQUIREMENTS

- 3.1 Letter from D P Hoffman to D K Ziemann, dated December 27, 1979; Requirements Resulting From Review of TMI-2 Accident.
- 3.2 This procedure will be used whenever the stack gas release rate exceeds  $0.47/\bar{E}$  curies per second (approximately 0.55 Ci/s or 550,000  $\mu$ Ci/s) and/or if a significant ground level release has occurred such as pipe tunnel blow-out patch rupture, turbine rupture diaphragm or if off-site doses are expected to be significantly above normal.
- 3.3 Memo from E J Hart to C E Axtell No 32-80, dated June 16, 1980.

4.0 SPECIAL EQUIPMENT

- 4.1 Charlevoix County map with indicated 22.5° sectors.
- 4.2 Isopleth overlays, two sets, ground level and elevated release.
- 4.3 Site Emergency Plan, Book of Tables.
- 4.4 Texas Instrument Silent 700 computer terminal.
- 4.5 Weather Services computer system.

5.0 PRECAUTIONS AND LIMITATIONS

- 5.1 Off-site radiological surveys shall be conducted to confirm plume direction and activity concentrations.

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BIG ROCK POINT NUCLEAR PLANT  
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- 5.2 Guidelines on allowable emergency radiation exposures are provided in Attachment 1 of EPIP 4A.
- 5.3 Off-site dose calculations should be reviewed every fifteen minutes during an accident.

6.0 PROCEDURE

- 6.1 To determine wind direction, wind speed and Pasquill stability, proceed as follows:

NOTE: If at any time during this procedure it appears evident that you will be unable to get the required meteorological data from the analog strip charts, go to Attachment 1 and continue using alternate method.

NOTE: If the following conditions appear on the upper strip charts, or if the data appears questionable for any reason, go to Attachment 1 and use alternate method.

1. Nonvarying trace; ie, smooth or straight line.
2. Straight line located to the far right-hand or left-hand side of the chart.

NOTE: Each hour marked on the strip chart is divided into 4 - 15-minute time increments; ie, 5:00, 5:15, 5:30, 5:45, 6:00. Each 15-minute increment is further divided into 3 - 5-minute time intervals.

- 6.1.1 Obtain a 15-minute average wind direction (direction from which wind is blowing) from the lower left-hand strip chart. This average value can be read directly off the strip chart across from the time at which the 15-minute period of interest ends. Record value on Attachment 3.

NOTE: If the average wind direction is greater than 70° and less than 160°, then go to Attachment 1 and use alternate method to obtain values of wind direction, wind speed and Pasquill stability.

- 6.1.2 Obtain a 15-minute average of wind speed (mph) from the upper right-hand strip chart located in the technical support center. This average is estimated from the center of the trace over the 15-minute time period of interest.

NOTE: If the average wind speed is below 2.9 mph, go to Attachment 1 and use the alternate method to estimate wind direction, wind speed and Pasquill stability.



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 BIG ROCK POINT NUCLEAR PLANT  
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- 6.1.3 Obtain a 15-minute average of sigma theta from the lower right-hand strip chart. This value can be read directly off the strip chart across from the time at which the 15-minute period of interest ends.

<u>Pasquill Stability Category</u>	<u>15-Minute Average Sigma Theta Value</u>
A	Greater Than or Equal to 22.5°
B	Less Than 22.5° and Greater Than or Equal to 17.5°
C	Less Than 17.5° and Greater Than or Equal to 12.5°
D	Less Than 12.5° and Greater Than or Equal to 7.5°
E	Less Than 7.5° and Greater Than or Equal to 3.8°
F	Less Than 3.8° and Greater Than or Equal to 2.1°
G	Less than 2.1°

- 6.1.4 If a meteorological forecast is desired, use the procedures as described in Attachment 1.

- 6.2 To determine the location of maximum ground concentration, proceed as follows:

- 6.2.1 Determine if the release is ground level or elevated.

- a. If the activity is going out the stack, it is an elevated release record wind speed from 6.1.2 above on Attachment 3.
- b. If the release is due to a major loss of reactor coolant, outside containment, or if the activity is not going out the stack, it is a ground level release. If release is ground level, multiply wind speed from 6.1.2 above by 0.76 and record on Attachment 3.
- c. Record the type of release on Attachment 3.

- 6.2.2 Select the Pasquill contour overlay for the stability condition (A-G) and type of release (ground level or elevated), to be used with the area map. (Overlays and the area map are located in the Technical Support Center.)

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BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN

- 6.2.3 Place the overlay over the area map and orient to the wind direction to which the plume will travel.
- 6.2.4 Dispatch the emergency monitoring technician, stationed at the Charlevoix County Sheriff's Department, as requested by the Site Emergency Director, in the direction of anticipated maximum off-site ground concentration.

NOTE: If a second technician is available, dispatch him to the area of second highest anticipated ground concentration.

- 6.3 For Elevated Releases the noble gas release rate (QN) may be determined while awaiting the technician's report.
- 6.3.1 The control room stack gas monitor (or if offscale procedure EPIP 5B) is capable of determining the noble gas release rate (QN).
- 6.3.2 Record the value of QN (Ci/sec) on Attachments 3 and 4.
- 6.3.3 If time permits compute the whole body dose at the point the tech will take his measurement per Step 6.9 while awaiting the technician's report.
- 6.4 It may be desirable at this time to calculate the time when the plume will reach various locations. Spaces are provided on the Pasquill Contour Overlay to record the plume arrival time as needed.

Plume arrival times are calculated as follows:

$$\frac{(\text{distance} \quad \text{miles})}{(\text{windspeed} \quad \text{mi/hr})} = \text{Arrival Time}$$

- 6.5 The monitoring technician will relay the following information to the Plant:
- 6.5.1 Sampling location
- 6.5.2 Noble gas dose rate, DR (in R/hr)
- 6.5.3 Iodine concentration, CI (in Ci/m<sup>3</sup>)
- NOTE: Ci/m<sup>3</sup> = μCi/cc
- 6.5.4 The Technical Support Center should ask the technician for a report of raw sample data (record on blank copy of

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Attachment 2 to EPIP 5C) for subsequent sample verification if it should become necessary.

- 6.5.5 Record the reported values of the noble gas dose rate (DR) and iodine concentration (CI) on Attachment 3.
- 6.6 Convert wind speed in mph to meters/second as follows:
- 6.6.1 Wind Speed (\_\_\_\_\_ mph) (.447) = Wind Speed \_\_\_\_\_ m/Sec.
- 6.6.2 Record the wind speed (in m/Sec) on Attachments 3 and 4.
- 6.7 Determine the plume dispersion factor, X/Q, from the point on the Pasquill Contour Overlay where the off-site sample was taken. Record the value of X/Q on Attachments 3 and 4.
- 6.8 If not determined previously, calculate the noble gas release rate as follows:
- 6.8.1 Noble Gas Release Rate:

$$QN = \frac{(6.92E-04) (DR) (u)}{(X/Q)}$$

WHERE:

QN = Noble gas release rate (in Ci/s),

u = Wind speed (in m/sec), as recorded on Attachment 3

DR = Off-site dose rate (in R/h), as recorded on Attachment 3

6.92E-04 = Constant From Equation in Regulatory Guide 1.3 relating dose to a semi-infinite cloud (Dose rate in R/sec = .25 E $\lambda$ ).  
6.92E-04 = 0.25/3600  $\frac{\text{sec}}{\text{hr}}$  and E = 1 mev

X/Q = Plume dispersion factor (Units: sec/m<sup>3</sup>) as recorded on Attachment 4

- 6.8.2 Record the computed value of QN on Attachments 3 and 4.

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- 6.9 Calculate the whole body dose in REM for a two-hour exposure to the maximum plume concentration of noble gas as follows:

$$6.9.1 \text{ Dose in REM} = (1.3E03) (X/Q) \frac{(QN)}{(u)}$$

WHERE:

1.3 E03 = Constant = 0.25 (3600 sec/hr)(0.7)(2.0 hr) -  
This comes from the equation which relates  
dose rate due to a semi-infinite cloud.  
(Dose rate in R/sec = 0.25 EX, where  
in this case E = 0.7 mev)

X/Q = Plume dispersion factor (Units: sec/m<sup>3</sup>), as  
recorded on Attachment 4

Q/N = Noble Gas Release Rate (in Ci/s), as recorded on  
Attachment 4

u = Wind speed in (m/s), as recorded on Attachment 4

- 6.9.2 Record the computed whole body dose in REM on Attachment 4  
and on the applicable Pasquill Contour Overlay in the space  
corresponding to the sample point.

- 6.10 Calculate the iodine release rate as follows:

- 6.10.1 Iodine Release Rate:

$$QI = \frac{(CI) (u)}{(X/Q)}$$

WHERE:

QI = Iodine release rate (in Ci/s)

CI = Off-site iodine ground concentration (in Ci/m<sup>3</sup>), as  
recorded on Attachment 3

X/Q = Plume Dispersion Factor (Units: sec/m<sup>3</sup>), as  
recorded on Attachment 3

u = Wind speed (m/sec) as recorded on Attachment 3

- 6.10.2 Record the computed value of QI on Attachments 3 and 4.

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6.11 Calculate the thyroid dose in REM for a two-hour exposure to the maximum plume concentration of iodine as follows:

$$6.11.1 \text{ Dose in REM} = (3.69 \text{ E06}) (X/Q) \frac{(QI)}{(u)}$$

WHERE:

$$3.69 \text{ E06} = \text{Constant} = (2.5\text{m}^3 \text{ inhaled in 2 hours}) \\ (1.48 \text{ E06 Rem/Curie inhaled})$$

X/Q = Plume dispersion factor (Units: sec/m<sup>3</sup>), as recorded on Attachment 4

QI = Iodine release rate (in Ci/Sec), as recorded on Attachment 4

u = Wind speed (in m/s), as recorded on Attachment 4

6.11.2 Record the computed thyroid dose in REM on Attachment 4 and on the applicable Pasquill Contour Overlay in the space corresponding to the sample point.

6.12 When the 2 hour whole body and/or thyroid exposure estimates are completed:

6.12.1 The Plant Health Physicist and the Site Emergency Director shall evaluate the results.

6.12.2 Issue an initial advisory to the Charlevoix County Sheriff and Michigan State Police to, if necessary, evacuate or shelter the off-site population in downwind areas. This initial recommendation is based on a two hour exposure to maximum plume concentrations. Final decision to evacuate/shelter lies with the State and Local officials.

6.12.3 Prior to evacuating, ensure the plume location has been confirmed.

6.12.4 Refer to EPIP 4A, Attachment 1, EPA - Protection Action Guides, for detailed information in determining actions based on off-site dose rates.

6.13 Subsequent protective actions to minimize off-site exposures.

6.13.1 Additional protective actions should be considered to maintain off-site exposures below the Protective Action Guides during the entire course of the accident.

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Considerations should include exposure to the plume for longer periods of time and the anticipated termination of the release.

- 6.13.2 Advise off-site authorities of recommendations for long term responses to plant release conditions.

Emergency Plan Implementing Procedure 5A  
ATTACHMENT 1

ALTERNATE PROCEDURE FOR OBTAINING METEOROLOGICAL DATA

1.0 PURPOSE

To obtain meteorological data when the onsite meteorological data is not available.

2.0 METHOD

The Texas Instrument Silent 700 Computer Terminal is connected, via telephone, to the Weather Information System. The wind speed, wind direction, and Pasquill stability are obtained for completion of Procedure 5A of the Big Rock Point Site Emergency Plan Implementing Procedures, Volume 9A. A meteorological forecast may also be obtained for possible use during a site emergency.

3.0 TECHNICAL SPECIFICATIONS AND OTHER REQUIREMENTS

3.1 Memo from D L Fugere to M G Dickson dated March 19, 1981 (DCC 740-72\*10\*08).

3.2 Procedures for Assessing the Weather Information System Using a Texas Instrument Silent 700 Computer Terminal supplied by Environmental Services, Jackson.

3.3 Memo from D L Fugere to M G Dickson/R J Clendenning dated March 23, 1981 (DCC 740-22\*06\*01).

3.4 10CFR50, Appendix E

3.5 NUREG-0654, Appendix 2, Annex 1

4.0 Special Equipment

4.1 110 volt AC power

4.2 Telephone

4.3 Texas Instrument Silent 700 Computer Terminal

4.4 Weather Services Computer System

5.0 Precautions and Limitations

- 5.1 It is essential the commands be entered free of typographical errors. If an error is made, erase it (see Step 6.6 of this attachment) and retype the line if desired.
- 5.2 Line noise on the telephone can cause problems. If a command is being typed correctly and the system responds with a negative response such as "NO SUCH PROGRAM" or "NO MESSAGE FOUND," erase the line if desired (see Step 6.6) and retype it.
- 5.3 A sample printout is provided for reference in Attachment 2.

6.0 PROCEDURE

NOTE: If at any time during this procedure it appears evident that you will be unable to get the required meteorological information from the Weather Information System, proceed to the end of this attachment for alternate methods.

- 6.1 Go to the Shift Supervisor's office where the Texas Instrument Silent 700 Computer Terminal is located.
- 6.2 Insert the power cord into the rear of the terminal.
- 6.3 Move the toggle switch located on the rear right-hand side of the terminal to the "ON" position. You should be able to hear the terminal fan motor start up.
- 6.4 On the telephone dial \_\_\_\_\_ (or portion needed for call) and wait for a tone.
- 6.5 Place the telephone receiver into the acoustic coupler located on the back part of the terminal. The orientation of the telephone receiver in the acoustic coupler is pictured on the rear of the terminal by the acoustic coupler.
- 6.6 The green light located on the front right-hand side of the terminal should light up. If the green light does not light up in about 20 seconds, try dialing again or use one of the following telephone numbers:

(Detroit)  
(Cleveland)  
(Chicago)  
(Milwaukee)  
(Direct to WSI)

NOTE: If the green light goes out at any time during this procedure, hang up the telephone, go back and re-dial.



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IMPLEMENTING PROCEDURES-5A  
BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN - ATTACHMENT 1

NOTE: If a typographical error is made, depress the "CTRL" key and while holding the "CTRL" key down hit the "U" key.

CODES: Ⓔ = return key    □ = space bar

- 6.7 Hit the return key twice and continue entries as indicated.

Computer responds:

TELENET

313 5F (NOTE: number and letter may vary)

TERMINAL =

Enter: TI45 Ⓔ

Computer responds:

@

Enter: □617133 Ⓔ

- 6.8 Computer will respond with either:

617133A CONNECTED (letter may vary - continue with Step 6.9)-

or

617133A NOT REACHABLE

If the not reachable message is given, hang up the phone and dial 9-1-617-275-5860 and proceed to 6.9 after the green light comes on.

- 6.9 Enter: Ⓔ

Computer responds:

PLEASE LOGIN

+

Enter: LOGIN□BGR Ⓔ

Computer responds:

PASSWORD

xxxxxxxxxx (field of overprinting)

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IMPLEMENTING PROCEDURES-5A  
BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN - ATTACHMENT 1

Enter:

Computer responds:

"bracketed information"

+

6.10 TO OBTAIN METEOROLOGICAL DATA:

Enter: -PASQPLN,TVC @

Computer responds:

"weather information for Pellston and Traverse City"

+

6.11 Proceed to next step if a weather forecast is not desired. To obtain weather forecast:

Enter: -MOSEGR @

Computer responds:

"weather prediction"

+

IF THE WEATHER FORECASTING DATA IS NOT AVAILABLE, AN ALTERNATE METHOD IS AVAILABLE AT THE END OF THIS ATTACHMENT.

6.12 Enter: LOGOUT @

Computer responds:

"bracketed information"

617133A DISCONNECTED

6.13 Press the "PAPER ADV" key until the paper advances to where you can tear it off.

6.14 Hang up the telephone and move the toggle switch located at the rear right-hand side of the terminal to the "OFF" position.

6.15 Explanation of Pertinent Weather Services Computer Printout Codes

WIND Wind direction by Sector; ie, N, NE, etc (direction from which wind is blowing), and speed in mph.

PS Pasquill stability category (A-G).

NOTE: Alternate Sources of Meteorological Information

- a. If unable to obtain a weather forecast, the National Weather Service Forecast Office at Ann Arbor may be contacted. This is an unlisted number manned 24 hours a day.
- b. Weather information may be available at the Pellston Airport
- c. An additional source of information is the National Weather Service Class A Station, for this area, in Sault Ste. Marie. This is an unlisted number manned 24 hours a day.

ATTACHMENT 2 TO IMPLEMENTING PROCEDURE 5A (CONTINUED)  
WEATHER SYSTEMS INTERNATIONAL WEATHER INFORMATION SYSTEM  
SAMPLE PRINTOUT

TELEMET  
013 5F

TERMINAL=TI45

90 617133

617 133F CONNECTED

PLEASE LOGIN

+LOGIN BGR  
PASSWORD:  
#####

\*\*\*\*\*  
\* WELCOME TO WEATHER SERVICES COMPUTER SYSTEM C \*  
\* MONDAY 30-MAR-81 \*  
\* ALL REPORTS - COPYRIGHT WEATHER SERVICES \*  
\* ALL RIGHTS RESERVED \*  
\*\*\*\*\*

NYC DROUGHT CONTINUES... TYPE: -INFO NEWS

+ -PASS PLN:TVC

STATION: PLN

TODAY'S DATE: 30-MAR-81

TIME	DATE	PRS	TMP	DEW	WIND	G	VIS	WX	SKY
9AM(13Z)	30	929	51	49	2407		4	R-F	C 10 BKN 50 OVC
9AM(14Z)	30	925	51	50	3007		7		C 8 BKN 50 OVC

STATION: TVC

TODAY'S DATE: 30-MAR-81

TIME	DATE	PRS	TMP	DEW	WIND	G	VIS	WX	SKY
9AM(13Z)	30	928	50	46	0000		10		10 SCT C120 BKN 250 BKN
9AM(14Z)	30	928	52	48	1808		10		10 SCT C 80 BKN 250 BKN

+LOGOUT

\*\*\*\*\*  
\* LOGGED OUT FROM THE WEATHER SERVICES COMPUTER SYSTEM \*  
\* THANK YOU \*  
\*\*\*\*\*

617 133F DISCONNECTED

IMPLEMENTING PROCEDURE 5A, ATTACHMENT 3  
RELEASE RATE CALCULATION DATA SHEET

Date	Time	Wind Speed (mph) and Direction	Iodine Concentration in (Ci/m <sup>3</sup> ) = (CI)	Dose Rate in (R/h) = (DR) (See Note 1)	Overlay = X/Q	Wind Speed	QI = $\frac{CI \cdot u}{X/Q}$
			in (m/s) = u = (mph) (.447) (See Note 3)			QN = $\frac{(6.92 \text{ E-04}) (DR) (u)}{X/Q}$ (See Note 2)	

Type of Release Ground Level/Elevated

Calculated by

- NOTE: 1. Dose rate (DR) not applicable for elevated releases.
2. For elevated releases, enter value of QN determined by stack gas monitor or EPIP 5B.
3. For ground level releases, wind speed must be corrected by 0.76 before recording.

Reviewed by Plant Health Physicist

Reviewed by Site Emergency Director



PROCEDURE TO DETERMINE HIGH STACK GAS RELEASES  
Procedure 5B

1.0 PURPOSE

- 1.1 To provide a method for determining noble gas release rates from the stack during accident conditions.

2.0 METHOD

- 2.1 The release rate (curies per second) is determined using the stack gas sample line readout (located in the Operations Support Center near the wall telephone) and the plots of stack gas GM probe monitor reading versus time, Attachments 1 and 2.

3.0 TECHNICAL SPECIFICATIONS AND OTHER REQUIREMENTS

- 3.1 Letter from D P Hoffman to D K Ziemann, dated December 27, 1979; Big Rock Point Plant - Requirements Resulting From Review of Three Mile Island 2 Accident: Actions Taken in Response To; Section 2.1.8.b, Page 26.
- 3.2 The stack gas monitoring system shall normally be in service. Adequate spare parts shall be on hand to allow necessary repairs to be made promptly.
- 3.3 The calibration of the stack gas monitoring system shall be checked at least monthly.
- 3.4 At least one stack exhaust fan shall be operating.

4.0 SPECIAL EQUIPMENT

- 4.1 Dosimeter Incorporated Model 3090 Alarming Gamma Monitor (detector strapped to the stack gas sample line in the radwaste area) having local indication (in air compressor room) with a visual alarm indicator (red beacon light), an audible alarm indicator (sonalert) and dial indication of stack gas release rate.
- 4.2 Lead shielding of sufficient quantity to reduce general area radiation of the GM probe from 50 R/h to approximately 15 mR/h.
- 4.3 Graphs of meter response R/h for release rate of 10,000 Ci/s vs time after reactor trip (Attachments 1 and 2).

5.0 PRECAUTIONS AND LIMITATIONS

- 5.1 The monitoring unit is set to alarm at 12 R/h.
- 5.2 This procedure will be used if the stack monitor, located in the Control Room, is off-scale high ( $\sim 40$  Ci/s).
- 5.3 Stack gas release rate calculations should be performed every 15 minutes during an accident.
- 5.4 The Stack Gas Release Rate Data Sheet, Attachment 3, will be used for all calculations.

6.0 PROCEDURE

- 6.1 In the air compressor room, record the following stack gas monitor information on Attachment 3.
  - 6.1.1 Date (Column 1).
  - 6.1.2 Time (Column 2).
  - 6.1.3 Initials of person recording probe readout (Column 3).
  - 6.1.4 Reading of the probe monitor (Column 4).
  - 6.1.5 Time elapsed since reactor trip (time elapsed since  $t=0$ ) (Column 5).
- 6.2 Using the appropriate graph (Attachment 1 or 2) of R/h at 10,000 Ci/s vs time after reactor trip, record on Attachment 3, Column 6, the R/h value at the time elapsed since reactor trip ( $t=0$  at reactor trip).
- 6.3 Divide Step 6.1.4 by Step 6.2 and multiply by 10,000 Ci/s to determine the stack gas release rate in curies per second. Record this on data sheet, Column 7. If the release rate has changed, return to EPIP 5A Step 6.5.b and evaluate the off-site exposures.
- 6.4 Example:

An accident has occurred, the stack gas recorder is off scale and this procedure must be used to determine the stack gas release rate.

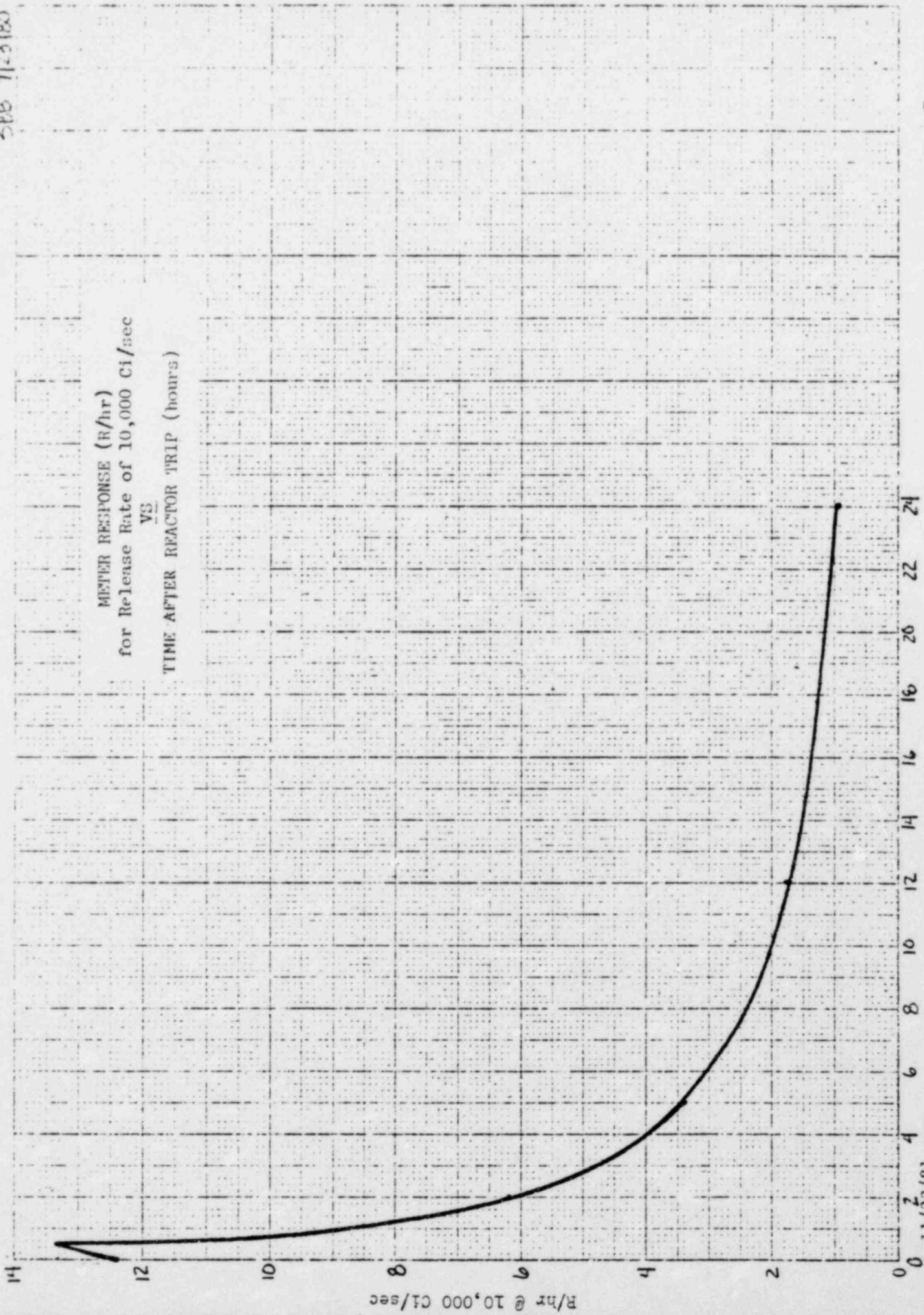
  - a. The GM probe readout in the air compressor room is 6 R/h at one hour from  $t=0$  (Step 6.1.4).



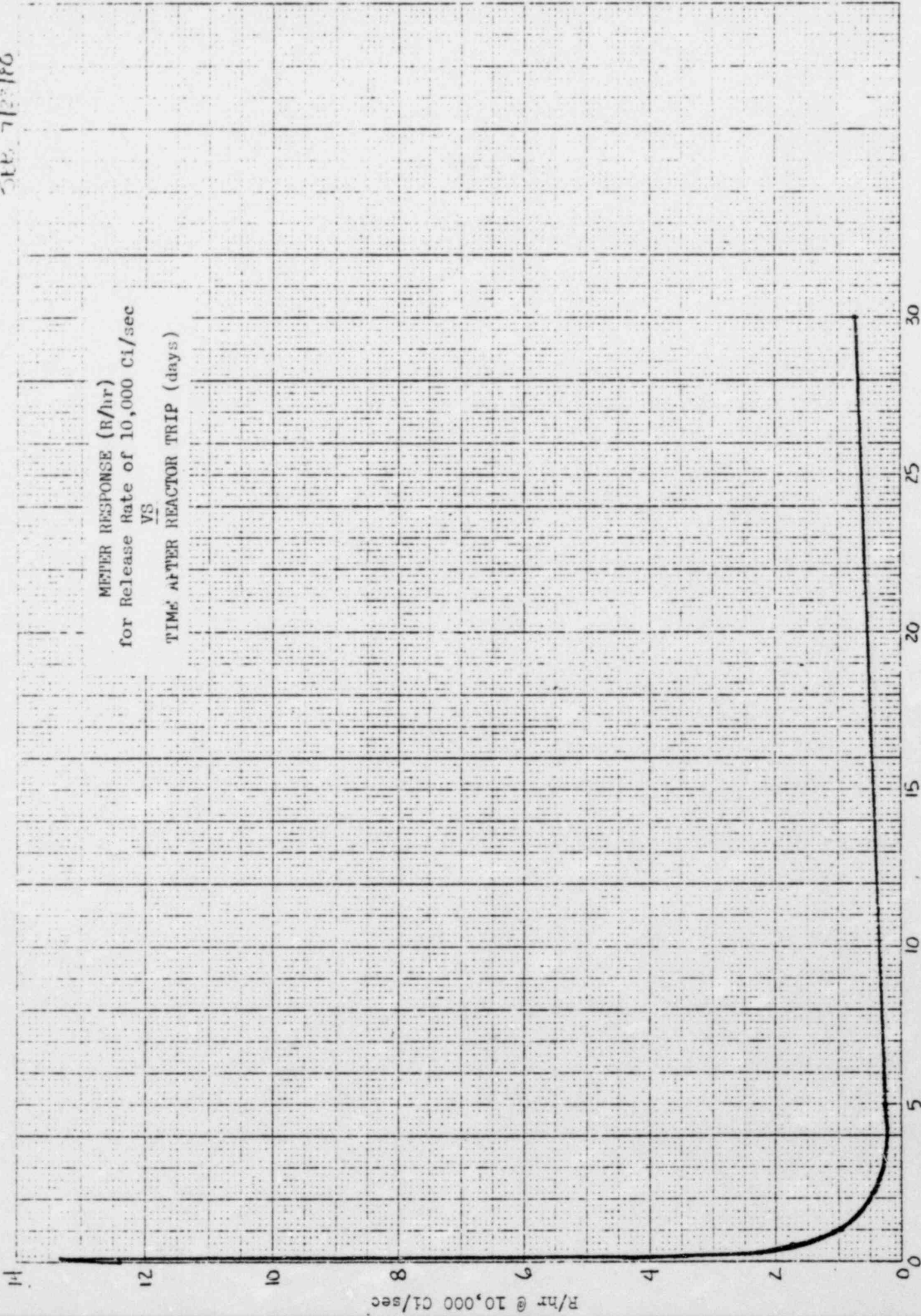
VOLUME 9A  
IMPLEMENTING PROCEDURES-5B  
BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN

- b. The attached graph gives a value of 8.6 R/h at one hour from  $t=0$  (Step 6.2).
- c.  $\frac{6 \text{ R/h}}{8.6 \text{ R/h}} = 0.70$
- d.  $(0.70)(10,000 \text{ Ci/s}) = 7,000 \text{ Ci/s}$  (Step 6.3). The release rate is 7,000 Ci/s.

SEP 7/23/80



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DAYS AFTER REACTOR TRIP 5B-5

REV 15

ATTACHMENT 3 TO IMPLEMENTING PROCEDURE 5B

STACK GAS RELEASE RATE DATA SHEET

Date 1	Time 2	Initial 3	Monitor Reading (R/h) 4	Time From Reactor Trip 5	Graph Reading (R/h) 6	(Column 4) (Column 6) 7 10,000 = Ci/s

Calculated by

Reviewed by Plant Health Physicist

Reviewed by Site Emergency Director

AIRBORNE IODINE MONITORING UNDER ACCIDENT CONDITIONS - IN PLANT  
Procedure 5C

1.0 PURPOSE

- 1.1 To provide a procedure for determining airborne iodine concentrations in areas within the plant under accident conditions. The procedural scope includes methodology for airborne iodine sampling and sample evaluation with minimal noble gas interference.

2.0 METHOD

- 2.1 The monitoring for iodine is accomplished by drawing a known volume of air through a silver zeolite filter with a high volume air sampler and determining the air concentration with a GM pancake probe and appropriate efficiency and correction factors.

3.0 TECHNICAL SPECIFICATIONS AND OTHER REQUIREMENTS

- 3.1 Letter from H R Denton to All Operating Nuclear Power Plants, dated October 30, 1979.

4.0 SPECIAL EQUIPMENT

- 4.1 High Volume Air Sampler - If power to electrical receptacles is off, use battery-operated high volume-air sampler Radeco Model H-809C.
- 4.2 Two-inch particulate filter and iodine cartridge holder.
- 4.3 Silver zeolite cartridge (Radeco Model GY-130).
- 4.4 Rate meter with Eberline 210 pancake probe or equivalent.

5.0 PRECAUTIONS AND LIMITATIONS

- 5.1 This procedure is applicable to iodine sampling only during accident or post accident condition. For purposes of this procedure, an accident shall be defined as radiological related events initiating implementation of the Site Emergency Plan.
- 5.2 This procedure does not address the frequency, duration or location of sampling since they are contingent on the radiological status of the plant and areas occupied by personnel. However, presently known areas of surveillance are the Technical Support Center, Control Room and the Operations Support Center.

6.0 PROCEDURE

- 6.1 Load the silver zeolite cartridge and prefilter into the sample head and sample as follows:
  - 6.1.1 Disassemble the sample head.
  - 6.1.2 Prior to loading the cartridge, clearly mark an arrow on the cartridge label to indicate direction of airflow.
  - 6.1.3 Place cartridge into sample head and screw assembly together. Ensure that the cartridge is loaded with the arrow pointed in the direction of airflow through the cartridge.
  - 6.1.4 Position filter media into place on the sample head and screw on retaining ring. The prefilter must be used when taking the sample to prevent buildup of radioactive particulates on the cartridge. Attach the sample head to the air sampler.
  - 6.1.5 When power is supplied to the sampler, turn the sampler on. The airflow should be 1.0-2.0 CFM. Note the initial airflow reading and the time when sample collection is started on the Sample Analysis Sheet (Attachment 2). A ten-minute sample should be taken.
  - 6.1.6 At the end of the ten-minute sample period, again note airflow reading and time, and turn off the sampler.
  - 6.1.7 Remove the cartridge and prefilter from the sample head and place each in a clear poly bag and seal. The following information should be marked on each bag or on a piece of paper and enclosed in each bag:
    - a. Date
    - b. Time Sample Started and Ended
    - c. Initial and Final Airflow Readings
    - d. Location Sample Was Taken

6.2 EVALUATION OF IODINE CARTRIDGE

- 6.2.1 For accurate determination of airborne concentrations, the cartridge should be analyzed on gamma spectrum analysis equipment. If the counting laboratory is not available, additional equipment is located in the air compressor room (Operations Support Center).
- 6.2.2 In the event that the gamma spectrum analysis equipment is not available or an on-the-spot evaluation is desired, portable instrumentation can be utilized, as described in 6.3 to determine airborne iodine levels.

6.3 A rate meter and pancake probe can be used to estimate airborne iodine concentrations in the following manner:

- 6.3.1 Remove sample (enclosed in the plastic bag) to a lower background area or utilize lead bricks to shield the pancake probe if background radiation levels are greater than 300 cpm on the rate meter.
- 6.3.2 Make a count rate measurement on the cartridge by placing the pancake probe in contact with the side away from which the arrow is pointing. Allow the rate meter to stabilize and note the reading.
- 6.3.3 In order to determine the actual iodine concentrations, a sample count rate within the range of the rate meter must be obtained. Repeat the air sample if the count rate meter is exceeded as described in Section 5.2, but decrease the sample time as appropriate.
- 6.3.4 Airborne concentrations can be calculated using the following equation:

$$\text{Conc} = (6.7\text{E-}11) \left[ \frac{\text{Rs} - \text{Rb}}{\left( \frac{\text{F}_1 + \text{F}_2}{2} (\text{Ts}) \right)} \right]$$

in  $\mu\text{Ci/cc}$

Where:

Conc = Concentration ( $\mu\text{Ci/cc}$ )

Rs = Sample Count Rate

Rb = Background Count Rate

$\text{F}_1$  = Flow Rate at Beginning of Sampling (CFM)

$\text{F}_2$  = Flow Rate at Termination of Sampling (CFM)

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Ts = Elapsed Sampling Time (Minutes)

6.7E-11 = Factor accounting for instrument and filter efficiency and units conversion.

$$6.7E-11 = \frac{\left(\frac{100}{25}\right)\left(\frac{1.00}{.95}\right)}{(2.22 \times 10^6)(2.83 \times 10^4 \text{cc/Ft}^3)}$$

$\frac{100}{25}$  = GM Probe Efficiency Factor

0.95 = Ag Zeolite Cartridge Efficiency

- 6.3.5 Results of airborne iodine evaluations should be reported and recorded on the Airborne Concentration Log Sheet or in the Shift Supervisor's Logbook. Sample cartridges and particulate filters should be properly labeled and retained for future analysis. Log serial numbers of all instruments used in this procedure in the Radiation Protection Logbook or the Shift Supervisor's Logbook.

## 7.0 WORKER PROTECTION

- 7.1 The procedure in 6.3.4 will result in a calculated figure with units of  $\mu\text{Ci/cc}$ . If the measured radioiodine concentration as calculated in 6.3.4 is greater than  $4E-08 \mu\text{Ci/cc}$ , thyroid blocking agents and respiratory equipment will be considered for workmen protection.
- 7.2 The thyroid blocking agent is in the form of potassium iodide (KI) tablets in the amount of 130 mg per tablet. These tablets should be made available on a basis of one tablet per day per workman for a maximum of 10 days.
- 7.3 Thyroid blocking involves the administration of stable iodine to prevent the uptake of radioactive iodine by the thyroid. Potassium iodide administered two to three hours following the exposure can reduce the ultimate thyroid dose by a factor of three and would be much more effective if administered earlier.
- 7.4 The NRC requires that 10 CFR 20 limits be adhered to under accident conditions with a few exceptions. Therefore, the iodine concentration in air cannot exceed 540 MPC hours without workmen protection (iodine MPC for 40 hours per week for 13 weeks).
- 7.5 The figure of  $4.0 \times 10^{-8} \mu\text{Ci/cc}$  in Step 7.1 was derived as follows: |  
520 MPC hours (40 hours for 13 weeks) times the MPC for Iodine-131



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$(9 \times 10^{-9} \text{ } \mu\text{Ci/cc})$  divided by 120 hours (12 hours on shift, 12 hours off shift for 10 days).

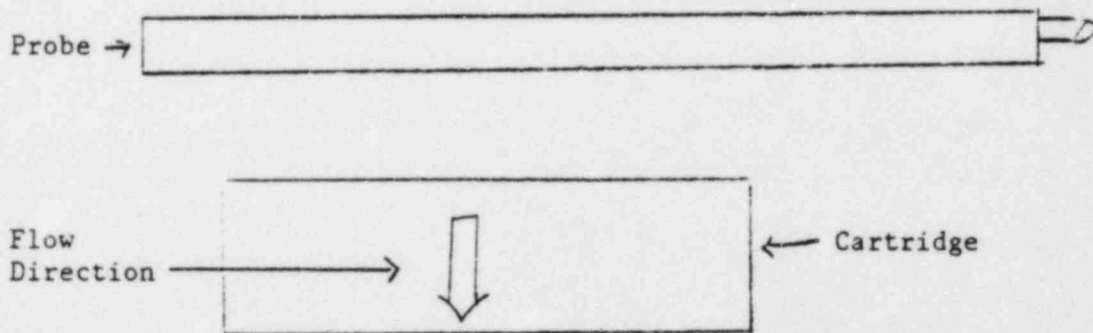
$$4 \times 10^{-8} \text{ } \mu\text{Ci/cc} = \frac{(40)(13)(9\text{E-}09)}{120}$$

NOTE: People with known iodide allergy should receive a suitable substitute such as "Propylthiouracil." Possible side effects from potassium iodide are unlikely but could include skin rash, swelling of the salivary glands, metallic taste with possible burning of the mouth or throat, sore teeth and gums, symptoms of head cold, stomach upset and diarrhea and allergic reactions with fever and joint pains.

Side effects are usually found only in individuals taking the potassium iodide tablets for longer periods than the recommended ten days.

More information can be obtained from the National Commission on Radiation Protection Report No 55, Protection of the Thyroid Gland in the Event of Releases of Radioiodine.

ATTACHMENT 1 TO IMPLEMENTING PROCEDURE 5C  
PROBE-CARTRIDGE POSITIONING FOR IODINE MONITORING



Position of detector probe and cartridge for gross iodine concentration.

ATTACHMENT 2 TO IMPLEMENTING PROCEDURE 5C

SAMPLE ANALYSIS DATA SHEET

Date \_\_\_\_\_ Sample Location \_\_\_\_\_ Calculated by \_\_\_\_\_ Time \_\_\_\_\_

Sample Time			Sample Volume		
Time Sampler Stopped	Time Sampler Started	Sample Time (Min)	Sample Time (Min)	Sampler Flow Rate (Ft <sup>3</sup> /Min) Beg Flow Ending Flow	Sample Volume (Ft <sup>3</sup> )
_____	_____	_____	_____	( _____ ) + ( _____ ) 2	_____

Background Count Rate (Must Be Less Than 300 CPM) \_\_\_\_\_ CPM  
Count Rate Meter Serial Number \_\_\_\_\_

Particulate Activity (Ci/M<sup>3</sup>) \_\_\_\_\_ Gross CPM (Sample & Bkgd) = \_\_\_\_\_

$$6.7E^{-11} \times \frac{\text{Gross CPM} - \text{Bkgd CPM}}{\text{Sample Volume (Ft}^3\text{)}} = \frac{\text{Ci}}{\text{M}^3}$$

Gross Iodine Activity (Ci/M<sup>3</sup>) \_\_\_\_\_ Gross CPM (Sample & Bkgd) = \_\_\_\_\_

$$6.7E^{-11} \times \frac{\text{Gross CPM} - \text{Bkgd CPM}}{\text{Sample Volume (Ft}^3\text{)}} = \frac{\text{Ci}}{\text{M}^3}$$

Air Particulate Activity \_\_\_\_\_ Ci/M<sup>3</sup> Gross Iodine Activity \_\_\_\_\_ Ci/M<sup>3</sup>

Reviewed by Plant Health Physicist

Reviewed by Site Emergency Director

PROCEDURE TO DETERMINE EXTENT OF CORE  
DAMAGE (FOR 0% TO 100% CORE MELTDOWN)  
Procedure 5D

1.0 PURPOSE

- 1.1 To provide a method for estimating the degree of core damage during accident conditions. If radiation levels are low enough, sampling of core spray heat exchanger water may be performed (per EPIP 5E) for determining up to 10% core meltdown.

2.0 METHOD

- 2.1 The degree of core damage will be estimated using the ionization chamber readout (in the air compressor room) and the attached graphs (Attachments 1 and 2) of dose rate versus time.

3.0 TECHNICAL SPECIFICATIONS AND OTHER REQUIREMENTS

- 3.1 Letter from D P Hoffman to D K Ziemann, dated December 27, 1979; Big Rock Point Plant - Requirements Resulting from Review of Three Mile Island 2 Accident. Actions taken in response to Section 2.1.8.a, Page 21.
- 3.2 The containment monitor shall be calibrated at least quarterly.

4.0 SPECIAL EQUIPMENT

- 4.1 A high range ionization chamber (located in the cable penetration room, approximately four feet off the floor and six feet from the containment).
- 4.2 A local readout with range switch (located in the air compressor room).
- 4.3 Graphs of ionization chamber readout for 100% fuel failure in R/h versus time (Attachments 1 and 2).

5.0 PRECAUTIONS AND LIMITATIONS

- 5.1 Radiological surveys shall be conducted as necessary to ensure the radiation limits of 10 CFR 20 are not exceeded during the performance of this procedure.

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SITE EMERGENCY PLAN

6.0 PROCEDURE

6.1 In the air compressor room, record the following ionization chamber information on the Extent of Core Damage Data Sheet (Attachment 3):

6.1.1. Date (Location 1).

6.1.2. Time (Location 2).

6.1.3. Initials of person obtaining information (Location 3).

6.1.4. Reading of ionization chamber (Location 4).

NOTE: This instrument reads in KR/h. Multiply KR/h by 1,000 to obtain R/h.

6.1.5. Time elapsed from reactor trip (time elapsed since t=0) (Location 5).

6.2 Using the appropriate graph of R/h with 100% fuel failure versus time - post accident (Attachment 1 or 2), record on Attachment 3 (Location 6) the R/h value at the time elapsed since reactor trip (t=0 at reactor trip).

6.3 Divide Step 6.1.4 by Step 6.2 and multiply by 100 to determine the percent of core damage. Record this on Attachment 3 (Location 7).

6.4 Example:

An accident has occurred that requires an estimation of the percentage of core damage.

a. The ionization chamber readout is  $1 \times 10^3$  R/h at two hours after reactor trip (Step 6.14).

b. The attached graphs give a value of  $4.4 \times 10^3$  R/h at two hours from reactor trip (Step 6.2).

c. 
$$\frac{1.0 \times 10^3 \text{ R/H}}{4.4 \times 10^3 \text{ R/h}} = 0.23$$

$(0.23)(100) = 23\%$  (Step 6.3)

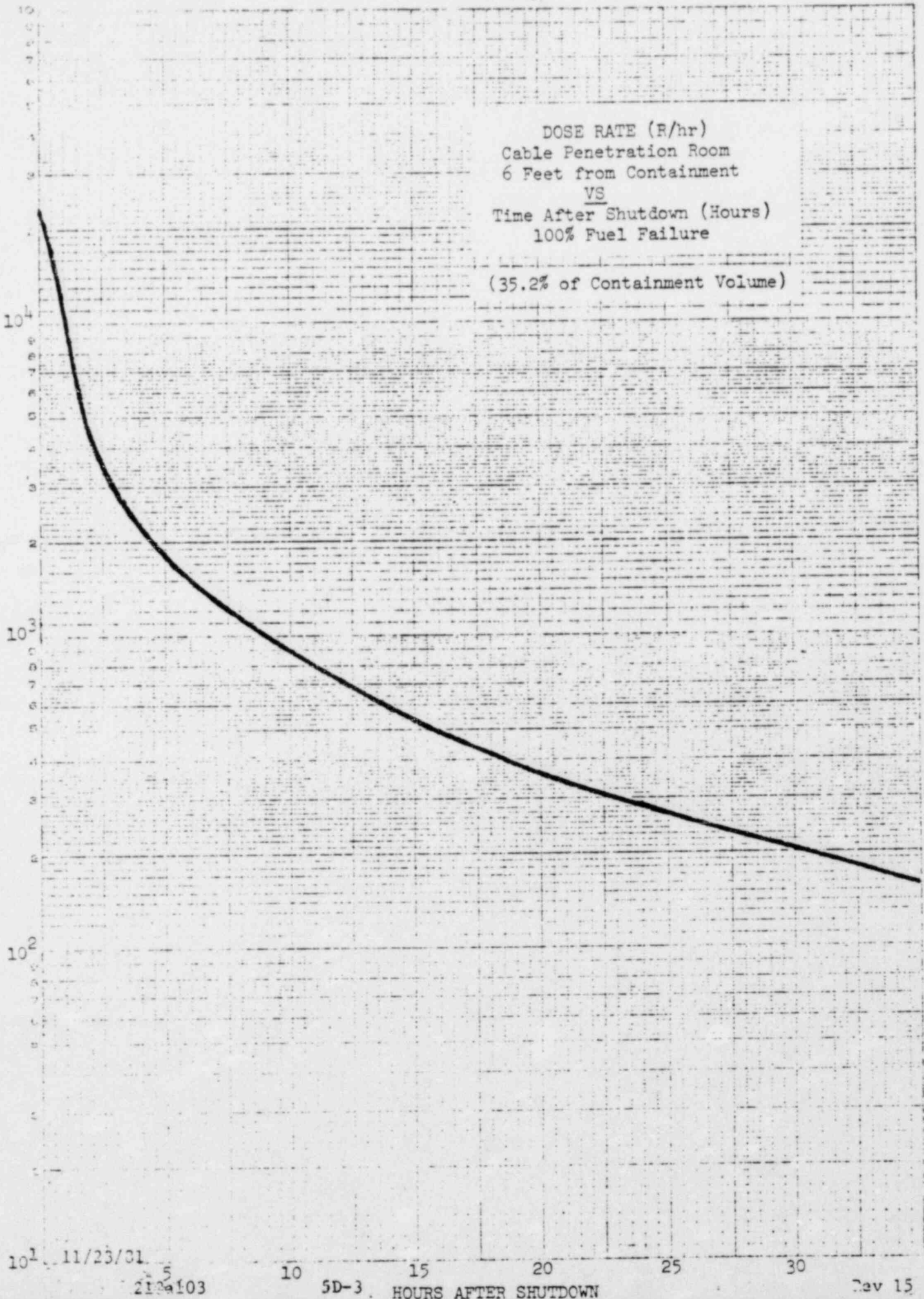
The extent of core damage is 23%.

EQUINE DIST. GEN. EG  
 PAGE 10 OF 10

R/hour

4L 3-11-01 TO THE STATE EMERGENCY GROUP  
 FROM THE OPERATOR  
 1. 10/15/01 2. 10/15/01 3. 10/15/01

DOSE RATE (R/hr)  
 Cable Penetration Room  
 6 Feet from Containment  
 VS  
 Time After Shutdown (Hours)  
 100% Fuel Failure  
 (35.2% of Containment Volume)



10<sup>1</sup> 11/23/01

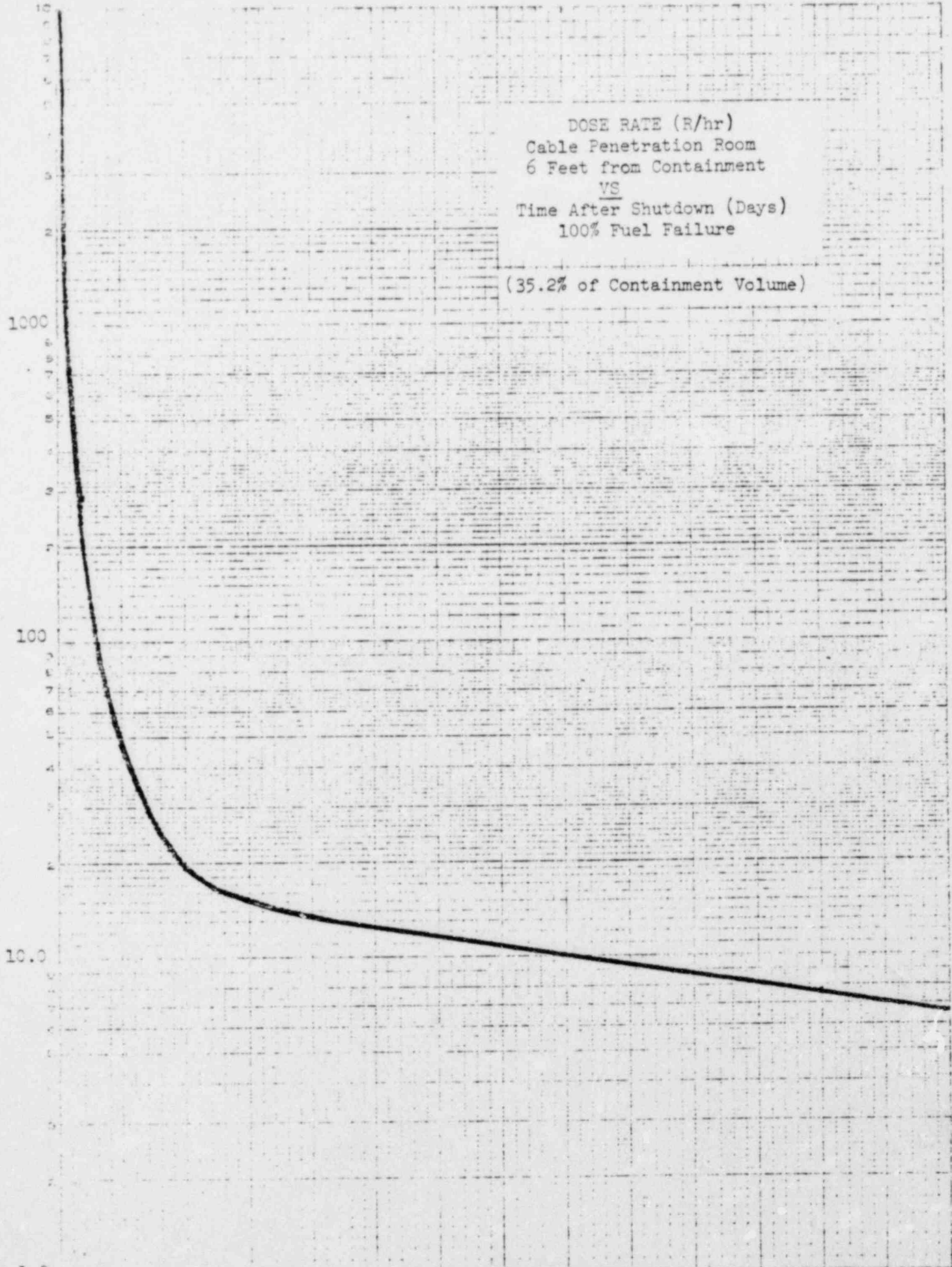
2100103

10 5D-3 HOURS AFTER SHUTDOWN

Rev 15

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ATTACHMENT 3 TO IMPLEMENTING PROCEDURE 5D

EXTENT OF CORE DAMAGE DATA SHEET

Date 1	Time 2	Initial 3	Monitor Reading (R/h) 4	Time From Reactor Trip 5	Graph Reading (R/h) 6	$\left( \frac{\text{Location 4}}{\text{Location 6}} \right) \times 100 = \% \text{ Core Damage}$ 7

Calculated by

Reviewed by Plant Health Physicist

Reviewed by Site Emergency Director



PROCEDURE TO DETERMINE EXTENT OF CORE DAMAGE  
(FOR LESS THAN 10% CORE MELTDOWN)  
Procedure 5E

1.0 PURPOSE

- 1.1 To provide a procedure for an emergency monitoring technician to sample and analyze reactor water under accident conditions from the core spray heat exchanger. Based on predicted radiation levels for various postulated accidents, personnel sampling of core spray heat exchanger water can be performed for accidents resulting in up to 10% core meltdown. EPIP 5D can be used for determining 0% to 100% core meltdown.

2.0 METHOD

- 2.1 A 3/4" drain line on the core spray heat exchanger will be used for obtaining the sample of primary coolant and Ge(Li) procedures will be used for the isotopic analysis.

3.0 TECHNICAL SPECIFICATIONS AND OTHER REQUIREMENTS

- 3.1 NRC commitment, memo from W L Roberts/F A Turski to distribution list, dated November 15, 1979, entitled "NUREG-0578, Nuclear Plant Projects Listing."

4.0 SPECIAL EQUIPMENT

- 4.1 Volume II Procedures RP-7, "Entry Control for High-Radiation Areas" and RP-10, "Use of High-Radiation and Airborne Area Work Sheet."
- 4.2 Personnel and extremity dosimetry including, as necessary, TLDs, high- and low-range pocket dosimeters.
- 4.3 Respiratory protection equipment, anti-contamination clothing and plastic wet suits.
- 4.4 Radiological survey instruments and air sampler.
- 4.5 Lead shielding and extension tools for handling, obtaining and storing sample containers.
- 4.6 Print M-123, "Post-Incident Cooling System."
- 4.7 Sample and flush containers.
- 4.8 Demineralized water for dilution.

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SITE EMERGENCY PLAN

4.9 Key for valve VPI-111, available in the Shift Supervisor's office.

5.0 PRECAUTIONS AND LIMITATIONS

5.1 This procedure is applicable to primary coolant sampling during accident and post accident conditions.

5.2 Procedures RP-7 and RP-10 from Volume 11 will be thoroughly reviewed by the sampling team and the Plant Health Physicist or his designated alternate. The review shall be logged in the Radiation Protection logbook.

5.3 No person shall receive greater than 3 Rem whole body, 18-3/4 Rem to the extremities or 7-1/4 Rem skin (beta) exposure during the sampling process or subsequent analysis. This limit includes transit to and from the sampling location.

5.4 Two persons will be assigned to the sampling team, one to sample and one to perform radiological surveys.

6.0 PROCEDURE

6.1 Conduct a radiological survey including air activity where necessary to and from the sampling location including the counting laboratory area. Note the readings on the area monitors.

6.2 Record the survey results in the Radiation Protection logbook and document the review of the survey results by the Plant Health Physicist (or alternate) and the sampling team.

6.3 Using the results of the survey, determine the optimum sampling methods based on current conditions. The following should be considered in an effort to minimize exposure.

6.3.1 Determine protective equipment to be utilized, respiratory protection, anti-c clothing, wet suit?

6.3.2 Determine the best route to and from the core spray heat exchanger room?

6.3.3 Determine the appropriate sample volume? Under some conditions 50 ml will be necessary. Record in Step 6.4.3.

6.3.4 Determine the appropriate counting volume? Under high activity conditions a few ml will be adequate.

6.3.5 Determine the optimum sample collection technique. If the dose rate at the 3/4" drain line exceeds 4 R/hr, long handled tools should be considered.

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IMPLEMENTING PROCEDURES-5E  
BIG ROCK POINT NUCLEAR PLANT  
SITE EMERGENCY PLAN

- 6.3.6 Locate an area to perform the volume reduction/dilution. Under certain conditions the condensate demin area may be preferable to the core spray heat exchanger room.
- 6.3.7 The method to dilute or reduce the sample volume should be determined. A pipette may be appropriate if a small sample volume is desired.
- 6.3.8 The excess sample should be stored in a secure location. It may be desirable to store the sample in the core spray heat exchanger room or the condensate demin area. Consider any shielding requirements.
- 6.3.9 Determine how the sample should be transported to the laboratory area. Long handled tools or the laboratory shield cask should be considered.

NOTE: If the background in the counting lab is greater than 10 mR/hr (making isotopic analysis meaningless), store and shield the sample for analysis off-site.

- 6.3.10 Anticipate storage and dilution methods to be used in the laboratory.
- 6.4 Using the results of the survey, determine an estimate of the following:
- 6.4.1 Estimated whole body individual dose received during transit from access control to the core spray heat exchanger room. \_\_\_\_\_ Roentgen
  - 6.4.2 Estimated extremity and whole body dose received while drawing sample.  
\_\_\_\_\_ Extremities-Roentgen \_\_\_\_\_ Whole  
Body-Roentgen

NOTE: Additional dose due to the release of noble gases from the opened 3/4" drain line may be encountered.

- 6.4.3 Estimated extremity and whole body dose received while transporting sample to the laboratory area.  
\_\_\_\_\_ Extremities-Roentgen \_\_\_\_\_ Whole  
Body-Roentgen
- 6.4.4 Estimated whole body dose received while the sample is in the laboratory area. \_\_\_\_\_ Roentgen

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 IMPLEMENTING PROCEDURES-5E  
 BIG ROCK POINT NUCLEAR PLANT  
 SITE EMERGENCY PLAN

6.4.5 Based on the above evaluations, the expected doses and stay times are as follows:

	<u>Exposure</u>	<u>Stay Times</u>
Access Control to Sample Location	_____	_____
Draw Sample and Dilute/Reduce volume		
Whole Body	_____	_____
Extremities	_____	_____
Return to Laboratory	_____	_____
Dose Rate in Laboratory	_____	_____
Dilute Sample to 4 mR/h for Spectrum Analysis	_____	_____ Roentgen

Other items reviewed and comments: (Consider involving different teams of personnel to perform the different phases of the sample/analysis procedure.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Prepared by \_\_\_\_\_

Reviewed by Plant Health Physicist or Alternate \_\_\_\_\_

Reviewed by Sampling Team \_\_\_\_\_

Reviewed by Laboratory Analysis Team \_\_\_\_\_

6.5 To sample the core spray heat exchange, proceed as follows:

6.5.1 Remove the 3/4" pipe plug from VPI-111. A tee handle is attached to ease removal.

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 BIG ROCK POINT NUCLEAR PLANT  
 SITE EMERGENCY PLAN

- 6.5.2 Place the flush container under the drain line, unlock chain, open the root valve and flush the sample line. Close the root valve.
- 6.5.3 Place the sample container under the drain connection, open the root valve and draw off approximately \_\_\_\_\_ ml of sample. Close the root valve.
- 6.5.4 Survey the sample container.
- 6.5.5 Perform the appropriate dilution/volume reduction.

<u>Aliquot Size</u>	<u>Aliquot Diluted to (mls)</u>	<u>Volume Reduced to (mls)</u>	<u>Initial</u>
---------------------	-------------------------------------	------------------------------------	----------------

- 6.5.6 Transport the sample to the counting laboratory.
- 6.6 Document all radiological and isotopic analysis information in the Radiation Protection logbook.

7.0 LABORATORY ANALYSIS

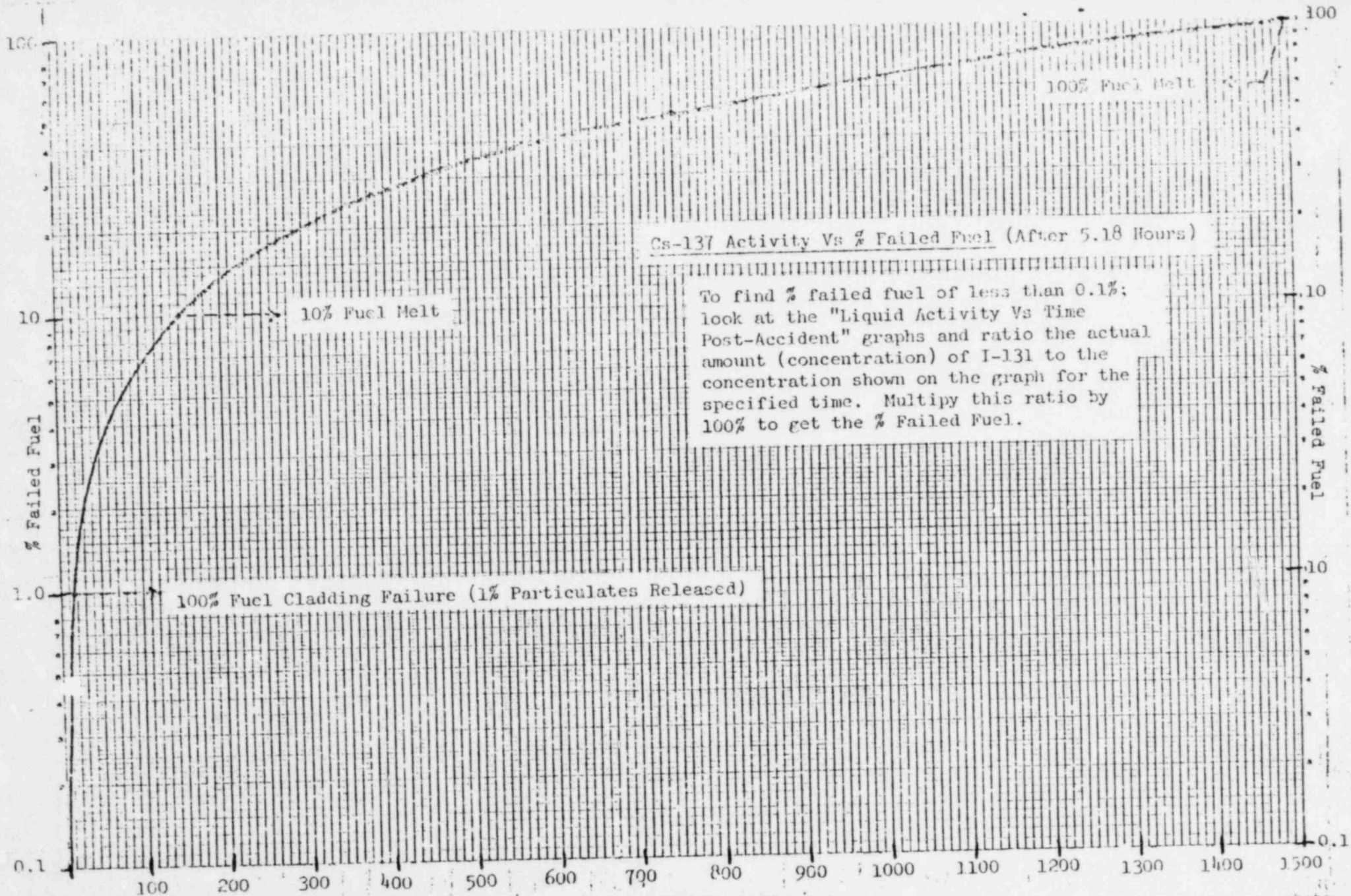
- 7.1 Dilute the sample to  $\leq 4$  mR/h and spectrum analyze.
- 7.2 Determine the extent of core damage from the activity measured in Step 7.1 by using the appropriate graph on Pages 5E8, 5E9 or 5E10.
- 7.3 % Fuel Melt \_\_\_\_\_%

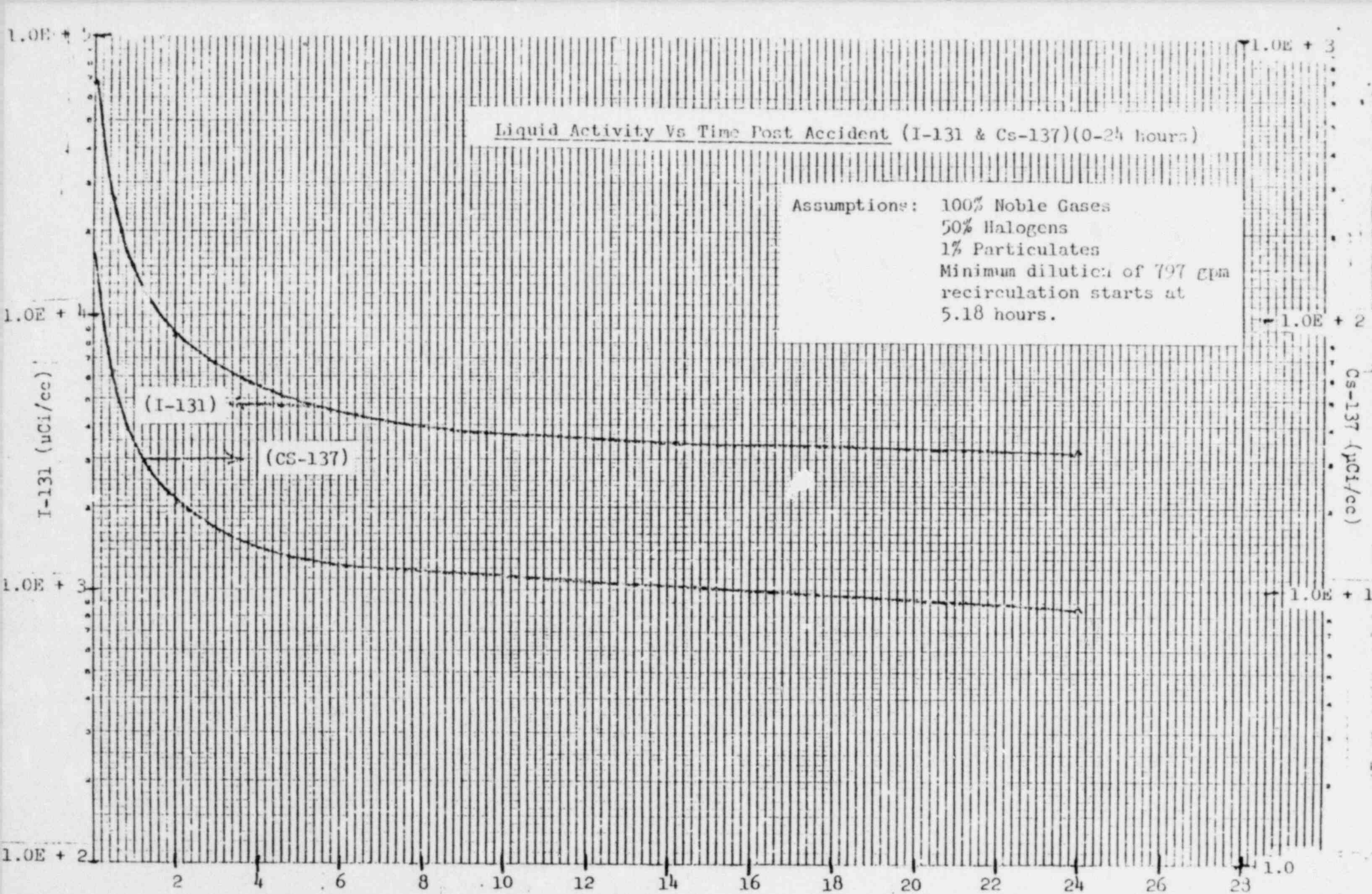
Determined by \_\_\_\_\_

Reviewed by

\_\_\_\_\_  
 Plant Health Physicist

\_\_\_\_\_  
 Site Emergency Director



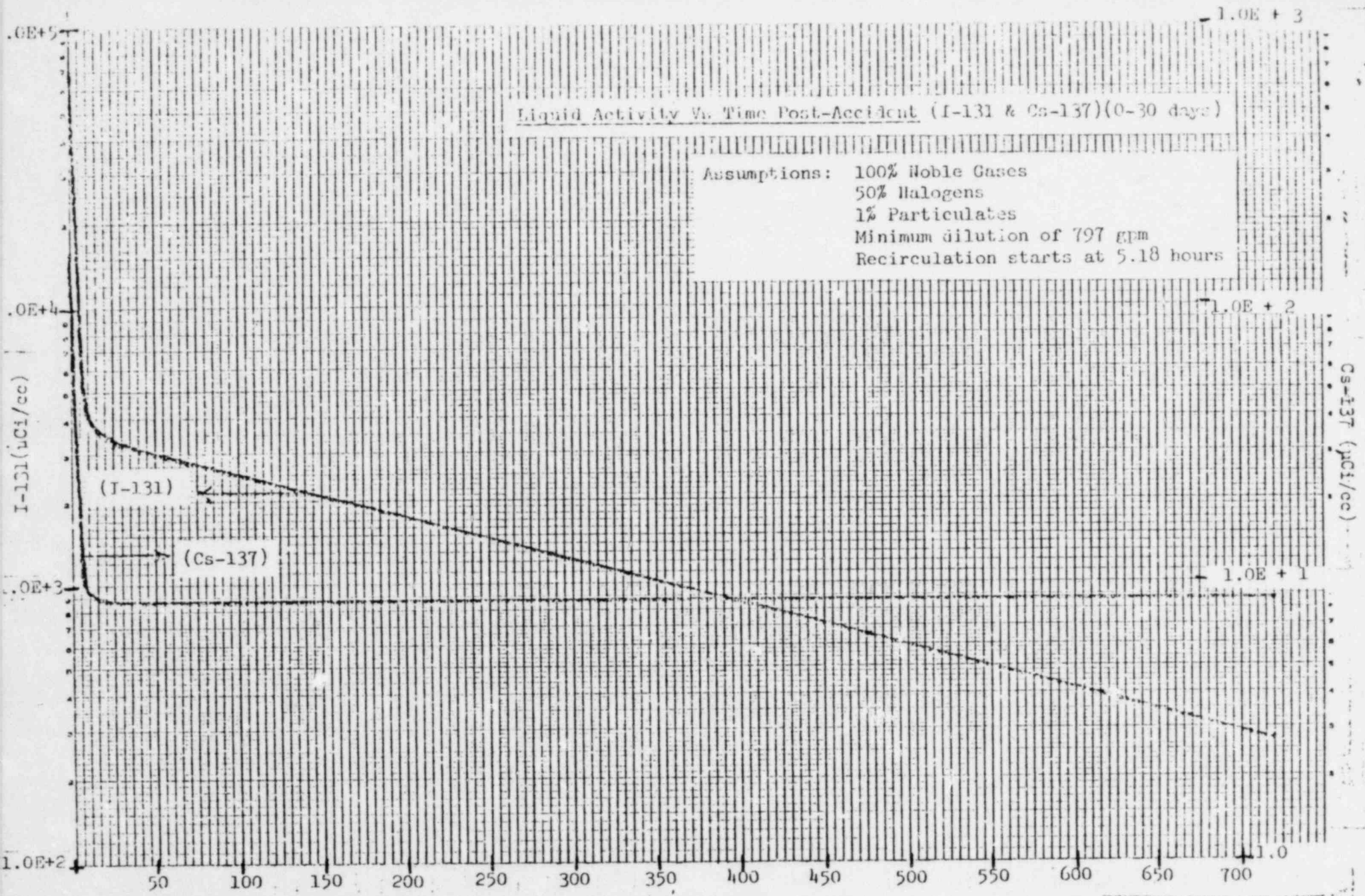


VOLUME 9A: SITE EMERGENCY PLAN  
 IMPLEMENTING PROCEDURES  
 ATTACHMENT 2 TO IMPLEMENTING PROCEDURE 5E

Time Post-Accident (Hours)

Orig Dwg JLB  
 Redrawn SBB 7/17/80

11/23/81  
 pr1181-2214a103



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 IMPLEMENTING PROCEDURES  
 ATTACHMENT 3 TO IMPLEMENTING PROCEDURE 5E  
 11/23/81  
 pr1181-2214a103

Time Post-Accident (Hours)  
 5E-8

Orig Dwg JJB  
 Redrawn SBB 7/17/80  
 Rev. 15



ENVIRONMENTAL MONITORING  
Procedure 5F

1.0 PURPOSE

1.1 To provide guidelines for environmental monitoring during emergency conditions.

2.0 ATTACHMENTS

- 2.1 Attachment 1, On-Site Environmental Monitoring Stations.
- 2.2 Attachment 2, Off-Site Environmental Monitoring Stations.
- 2.3 Attachment 3, Sampling Locations.
- 2.4 Attachment 4, Off-Site TLD Rings.
- 2.5 Attachment 5, Air Particulate - Air Iodine Collection Sheet.
- 2.6 Attachment 6, Miscellaneous Radiological Environmental Samples.
- 2.7 Attachment 7, Environmental Sample Collection Form.
- 2.8 Attachment 8, Environmental TLD Report.

3.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

- 3.1 NRC submittal for Big Rock Point on "Requirements Resulting From Review of Three Mile Island 2 Accident: Actions Taken in Response To," dated December 2, 1979, Section 26, Item (4).
- 3.2 Collection of environmental samples under accident conditions will require knowledge of anticipated dose rates due to prevailing meteorological conditions to ensure ALARA is met.
- 3.3 TLDs will be read by the General Office.
- 3.4 Environmental samples may be collected by the environmental sample contractor - Wayne Woods,
- 3.5 During collection of TLDs, ensure the quarterly and annual TLDs are left in place. These will be collected as scheduled.
- 3.6 All environmental samples collected per this procedure shall be deposited at the EOF in Boyne City for futher/future analysis.

4.0 PROCEDURE

4.1 RADIATION DOSE RATES

4.1.1 Monitoring exposures from noble gases and iodine activity levels should commence at the location of maximum concentration as directed by the Plant and will be performed in accordance with EP-1 Airborne Iodine Monitoring Under Accident Conditions/Off-site.

- a. The plume may remain some distance overhead and not touch down near the site boundary.

4.2 LIQUID AND ATMOSPHERIC RELEASE SAMPLING

4.2.1 Following a major liquid or atmospheric release, initiate collection of environmental samples. These samples may include, but are not limited to:

- a. Replace the monthly TLD and monthly film dosimeters (refer to Section 4.3 for more detailed information).
- b. Replace the air particulate and iodine filters at the environmental air monitoring stations. Record the information on Attachment 5 and have the filters analyzed immediately.
- c. Collect one gallon of representative milk samples from the dairy herds listed on Attachment 3 and analyze the samples. Record required information on Attachment 6.
- d. Collect one liter of representative vegetation (including crops in season) within a 15-mile radius of the plant. Record required information on Attachment 6 and have sample analyzed.
- e. Collect one liter water samples from:
  1. Charlevoix City drinking water.
  2. Plant discharge canal and 1/4 mile east and west of the discharge canal. Record the required information on Attachment 6.

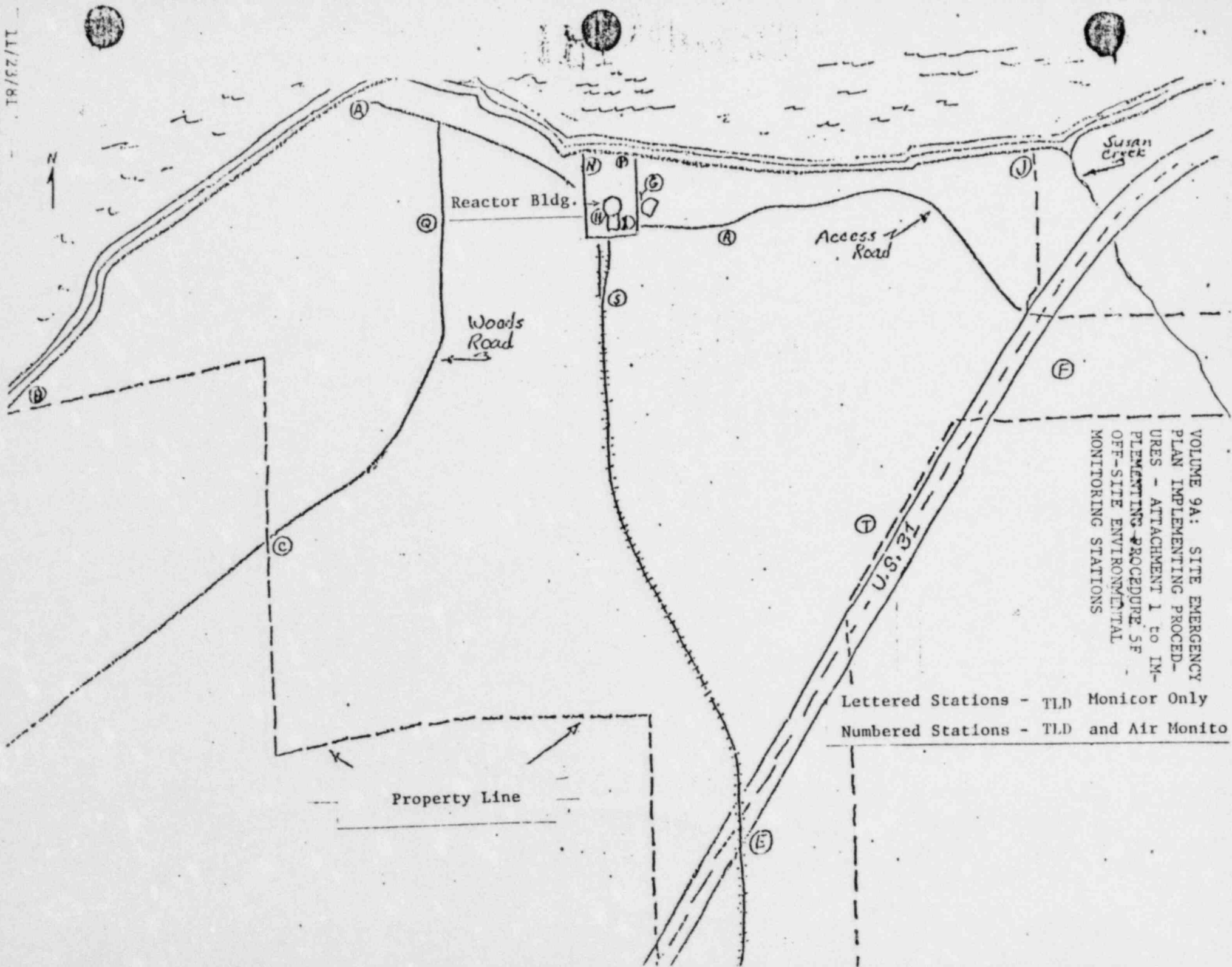
4.2.2 Prior to sending environmental samples off site for analysis, perform a gross contamination check. If analysis is performed on site, record the sample data on Attachment 7.

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4.3 ENVIRONMENTAL TLD

- 4.3.1 Environmental TLD placement is described and shown on Attachments 1-4.
- 4.3.2 Each station contains three TLD. Replacement TLD are stored at the environmental contractor's residence.
- 4.3.3 For accidents involving the release of radioactive material, one TLD at each station will be replaced daily (for example, on the first day, TLD 1 will be replaced by TLD 4; on the second day, TLD 2 will be replaced by TLD 5, etc).
- 4.3.4 TLD will be changed daily by the environmental contractor or as designated by the Plant Health Physicist. TLD will continue to be changed until the Plant Health Physicist requires otherwise.
- 4.3.5 Persons collecting TLD shall record the required information on Attachment 8.
- 4.3.6 TLD removed during accident conditions shall be delivered to the Emergency Operations Center, Boyne City\*, for collection by General Office Health Physics personnel. Replacement TLD will also be supplied at the Emergency Operations Center.

\*CPCo Service Center, 100 N. East Street, Boyne City.



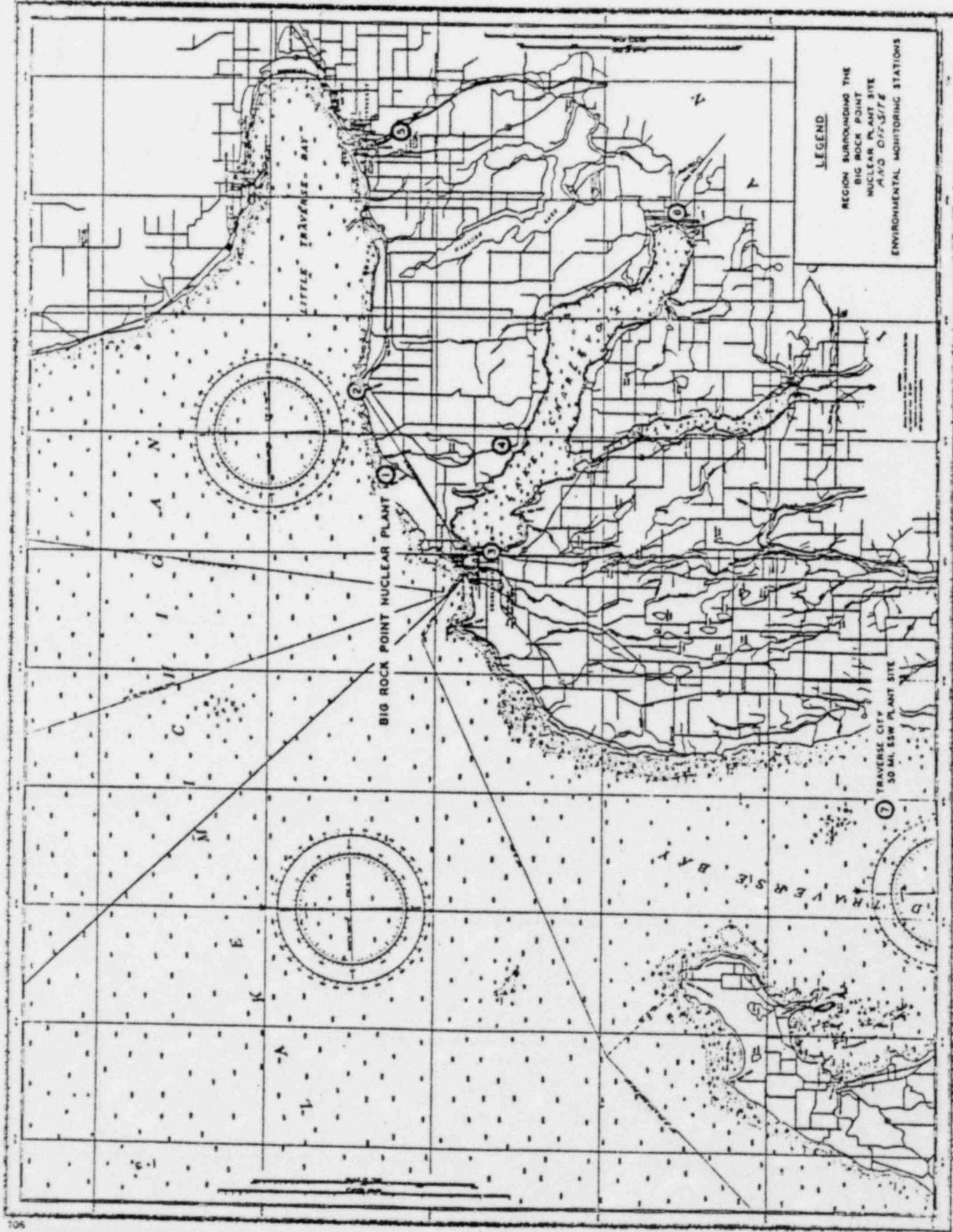
VOLUME 9A: SITE EMERGENCY  
PLAN IMPLEMENTING PROCED-  
URES - ATTACHMENT 1 to IM-  
PLEMENTING PROCEDURE SF  
OFF-SITE ENVIRONMENTAL  
MONITORING STATIONS

Lettered Stations - TLD Monitor Only  
Numbered Stations - TLD and Air Monito

SITE EMERGENCY PLAN IMPLEMENTING PROCEDURES  
ATTACHMENT 2 TO IMPLEMENTING PROCEDURE 5F

OFF-SITE ENVIRONMENTAL MONITORING STATIONS

501



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700

Station	Code	Location	Sample						
			Air Particulates	Air Iodine	Lake Water	Well Water	Milk	Biota-AQUATIC	TLD*
1	ST	Big Rock Point Nuclear Plant	X	X	X	X		X	X
2	NM	Nine Mile Point, 3 Miles E	X	X				X	X
3	CE	Charlevoix, Michigan 4- $\frac{1}{2}$ Miles SW	X	X	X				X
4	SL	Ferry Ave. Beach Burgess Road 3.5 Miles, SE	X	X					X
5	PT	Burgess Road Petoskey, Michigan 10- $\frac{1}{2}$ Miles E	X	X					X
6	BC	River Road Boyer City, Michigan 12 Miles SE	X	X					X
7	TR	CPCo Service Center Traverse City, Michigan 50 Miles SSW	X	X					X
	MS	CPCo Service Center Mt McSauba, PE 3 Miles W.						X	
	FM1	G. Smith - Old Highway 31N Charlevoix, Michigan					X		
	FM2	DL Kuebler, Upper Bay Shore Rd, Charlevoix, Michigan					X		
	FM3	RMCCraney, 2000 McCraney, Horton Bay Road Charlevoix, Michigan					X		
	FM4	B. Bockniak, Resort Pike Rd, Petoskey, Michigan					X		

\* Additional Placement of Off-Site TLDs:

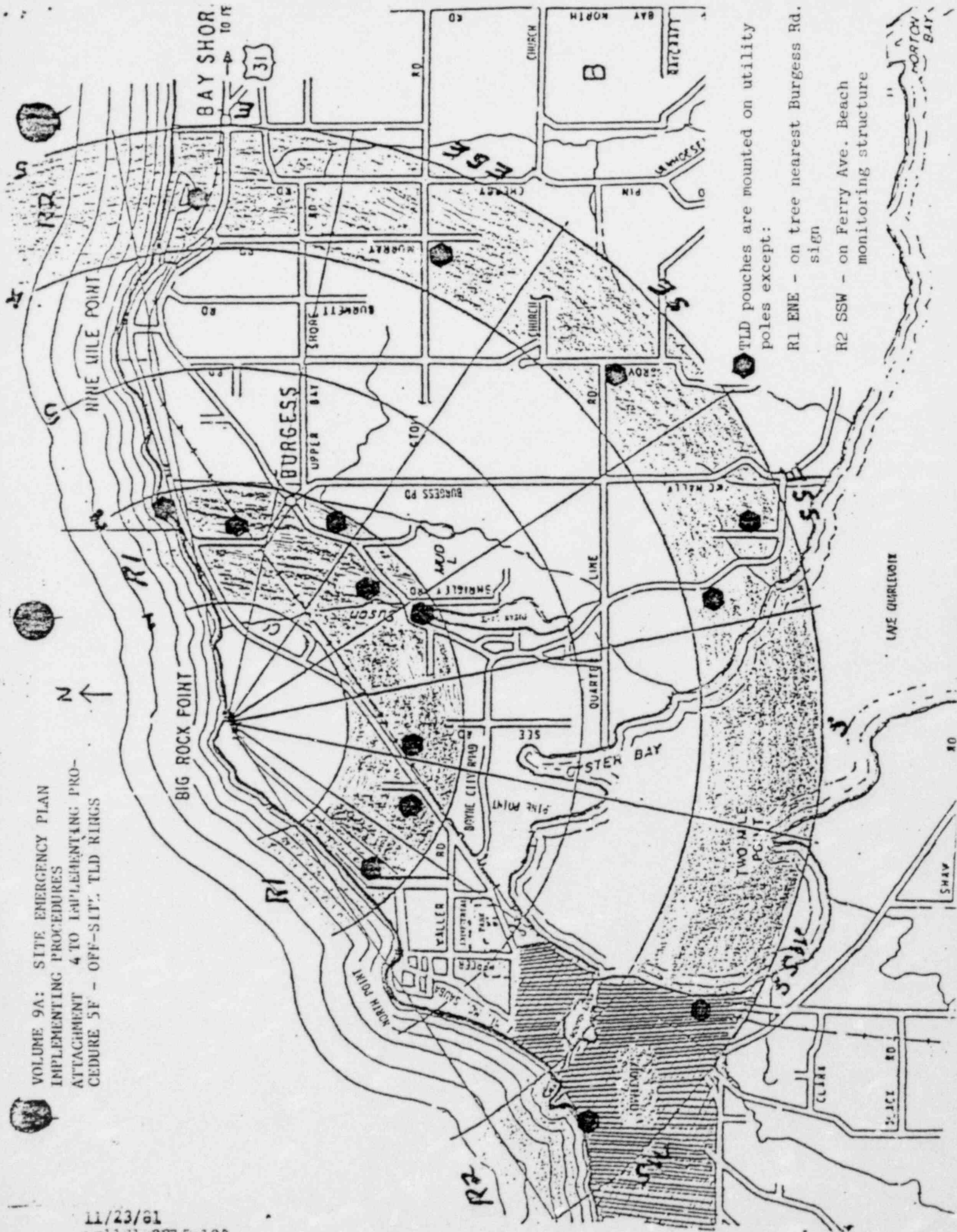
Additional TLDs are placed in two rings. Ring One is from 1-2 miles and Ring Two is from 4-5 miles from the plant site (designated R1 and R2 on the TLDs).

One station is located within each sector of each ring (Ring One has eight sectors, Ring Two has seven sectors). Attachment 4 indicates the sectors within each ring.

Three TLDs are located at each station and are labeled accordingly. A backup supply of TLDs for three days (change) of one TLD per day per station is kept in a shielded storage location at the environmental contractors' house for accident conditions.

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 IMPLEMENTING PROCEDURES  
 ATTACHMENT 4 TO IMPLEMENTING PRO-  
 CEDURE 5F - OFF-SITE TLD RINGS

11/23/61  
 pr1161-2215a103



TLD pouches are mounted on utility poles except:  
 R1 ENE - on tree nearest Burgess Rd. sign  
 R2 SSW - on Ferry Ave. Beach monitoring structure

Date: \_\_\_\_\_  
Collector: \_\_\_\_\_

Location Number	Code	Date/Time (Mo/Day)	Removed Time	Integrated Gas Meter Reading		Vacuum (In Hg)			Remarks
				A3 Installed (Cu Ft)	A3 Removed (Cu Ft)	A1 Installed	A2 Removed	A3 Total	





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IMPLEMENTING PROCEDURES

ATTACHMENT 7 TO IMPLEMENTING PROCEDURE 5F  
ENVIRONMENTAL SAMPLE COLLECTION  
FORM

DIG HOCK POINT PLANT

Date

Collector

Environmental Sample Collection Form

Sample Site (number or description)	Time of Sample	Type of Sample	Volume of sample (collected/ counted)	Sample count rate	Sample activity	Exposure rate (TLD/ survey meter)	Remarks:



AIRBORNE IODINE MONITORING UNDER ACCIDENT CONDITONS  
OFF PLANT SITE  
Procedure 5G

1.0 PURPOSE

To provide a procedure for determining airborne iodine concentrations in areas off plant site under accident conditions. The procedural scope includes methodology for airborne iodine sampling and sample evaluation with minimal noble gas interference.

2.0 METHOD

The monitoring for iodine is accomplished by drawing a known volume of air through a silver zeolite filter with a high volume air sampler and determining the air concentration with a GM pancake probe and appropriate efficiency and correction factors.

3.0 TECHNICAL SPECIFICATIONS AND OTHER REQUIREMENTS

3.1 Letter from HRDenton to All Operating Power Plants dated October 30, 1979.

4.0 SPECIAL EQUIPMENT

4.1 High volume air sampler. If power to electrical receptacles is off, use battery operated high volume air sampler Radeco Model H-809C.

4.2 Two inch particulate filter and iodine cartridge holder.

4.3 Silver zeolite cartridge (Radeco Model GY-130).

4.4 Rate meter with Eberline 210 pancake probe or equivalent.

5.0 PRECAUTIONS AND LIMITATIONS

5.1 This procedure is applicable to iodine sampling only during accident or post accident conditions. For purposes of this procedure, an accident shall be defined as radiological related events initiating implementation of the Site Emergency Plan.

5.2 Off site radiological surveys shall be conducted to confirm plume direction and activity concentrations. Until such time that the off site isotopic analysis system (multi-channel analyzer and detector) becomes available, off site accident particulate and iodine samples will be sent to Palisades for analysis after initial quantification of portable instrumentation.

6.0 PROCEDURE

6.1 Load the silver zeolite cartridge and prefilter into the sample head and sample as follows:

6.1.1 Disassemble sample head.

6.1.2 Prior to loading the cartridge, clearly mark an arrow on the cartridge label to indicate direction of air flow.

6.1.3 Place cartridge into sample head and screw assembly together. Ensure that the cartridge is loaded with the arrow pointed in the direction of air flow through the cartridge.

6.1.4 Position filter media into place on the sample head and screw on retaining ring. The prefilter must be used when taking the sample to prevent build-up of radioactive particulates on the cartridge. Attach the sample head to the air sampler.

6.1.5 When power is supplied to the sampler, turn the sampler on and adjust the air flow to 1.0 - 2.0 CFM. The DC powered samplers are not adjustable and normally sample at 1.0 - 2.0 CFM. Note the initial air flow reading and the time when sample collection is started. A ten (10) minute sample should be taken.

6.1.6 At the end of the ten (10) minute sample period, note air flow reading and time, and turn the sampler off.

6.1.7 Remove the cartridge and prefilter from the sample head and place each in a clear poly bag and seal. The following information should be marked on each bag or on a piece of paper and enclosed in each bag:

1. Date
2. Time sample started and ended
3. Initial and final air flow readings
4. Location sample was taken

6.2 Evaluation of Iodine Cartridge

6.2.1 For accurate determination of airborne concentrations, the cartridge should be analyzed on gamma spectrum analysis equipment if available.

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- 6.2.2 In the event that the gamma spectrum analysis equipment is not available, or an on-the-spot evaluation is desired, portable instrumentation can be utilized, as described in Section 6.3 to determine airborne iodine levels.
- 6.3 A rate meter and pancake probe can be used to estimate airborne iodine concentrations in the following manner:
- 6.3.1 Remove sample (enclosed in the plastic bag) to a lower background area or utilize lead bricks to shield the pancake probe if background radiation levels are greater than 300 cpm on the rate meter.
- 6.3.2 Make a count rate measurement on the cartridge by placing the pancake probe in contact with the side away from which the arrow is pointing. Allow the rate meter to stabilize and note the reading.
- 6.3.3 In order to determine the actual iodine concentrations, a sample count rate within the range of the rate meter must be obtained. Repeat the air sample if the count rate meter is exceeded, as described in Section 6.1, but decrease the sample time as appropriate.
- 6.3.4 Airborne concentrations can be calculated using the following equation:

$$\text{Conc} = (6.7E^{-11}) \left[ \frac{R_s - R_b}{\left( \frac{F_1 + F_2}{2} \right) (T_s)} \right]$$

in  $\mu\text{Ci/cc}$

Where:

- Conc = concentration ( $\mu\text{Ci/cc}$ )  
Rs = sample count rate  
Rb = background count rate  
F<sub>1</sub> = flow rate at beginning of sampling (CFM)  
F<sub>2</sub> = flow rate at termination of sampling (CFM)  
T<sub>s</sub> = elapsed sampling time (minutes)  
6.7-11 = factor accounting for instrument and filter efficiency and units conversion

$$6.7E^{-11} = \frac{\left(\frac{100}{25}\right)\left(\frac{1.00}{.95}\right)}{(2.22 \times 10^6) (2.83 \times 10^4 \text{cc/Ft}^3)}$$

$\frac{100}{25}$  = GM Probe Efficiency Factor

.95 = Ag Zeolite Cartridge Efficiency

- 6.3.5 Results of airborne iodine evaluations should be reported and recorded on the attached Sample Analysis Data Sheet. Sample cartridges should be properly labeled and retained for future analysis. Log serial numbers of all instruments used in this procedure on the Sample Analysis Data Sheet.

NOTE:All samples and data sheets shall be saved and turned in at the EOF (Boyne City) for further/future analysis. The EOF is the main collection point for all environmental samples.

- 6.3.6 Results of the analysis shall be reported to the TSC by walkie-talkie. If this means of communication is not available use the nearest telephone available.

## 7.0 WORKER PROTECTION

- 7.1 The procedure in 6.3.4 will result in a calculated figure with units of  $\mu\text{Ci/cc}$ . If the measured radiiodine concentration as calculated in 6.3.4 is greater than  $4 \times 10^{-8} \mu\text{Ci/cc}$ , thyroid blocking agents will be issued for workmen protection.
- 7.2 The thyroid blocking agent is in the form of potassium iodide (KI) tablets in the amount of 130 mg per tablet. These tablets should be made available on a basis of one tablet per day per workman for a maximum of 10 days.
- 7.3 Thyroid blocking involves the administration of stable iodine to prevent the uptake of radioactive iodine by the thyroid. Potassium iodide administered two (2) to three (3) hours following the exposure can reduce the ultimate thyroid dose by a factor of 3 and would be much more effective if administered earlier.
- 7.4 The NRC requires that 10 CFR 20 limits be adhered to under accident conditions with a few exceptions. Therefore, the iodine concentration in the air cannot exceed 540 MPC hours without workmen protection (iodine MPC for 40 hours per week for 13 weeks).
- 7.5 The figure of  $4.0 \times 10^{-8} \mu\text{Ci/cc}$  in Step 7.1 was derived as follows: 520 MPC hours (40 hours for 13 weeks) times the MPC for Iodine-131

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$(9 \times 10^{-9} \mu\text{CI/cc})$  divided by 120 hours (12 hours on shift, 12 hours off-shift for 10 days).

$$4 \times 10^{-8} \mu\text{CI/cc} = \frac{(40)(13)(9 \times 10^{-9})}{120}$$

NOTE: People with known iodide allergy should receive a suitable substitute such as, "Propylthiouracil". Possible side effects from potassium iodide are unlikely but could include skin rash, swelling of the salivary glands, metallic taste with possible burning of the mouth or throat, sore teeth and gums, symptoms of head cold, stomach upset and diarrhea and allergic reactions with fever and joint pains.

Side effects are usually found only in individuals taking the potassium iodide tablets for longer periods than the recommended 10 days.

More information can be obtained from the National Commission on Radiation Protection Report No. 55, Protection of the Thyroid Gland in The Event of Releases of Radioiodine.



OFF-SITE IODINE AND PARTICULATE SAMPLES

Sample Analysis Data Sheet

Date \_\_\_\_\_ Sample Location \_\_\_\_\_ Calculated by \_\_\_\_\_ Time \_\_\_\_\_

<u>Sample Time</u>	<u>Sample Volume</u>				
Time Sampler Stopped	Time Sampler Started	Sample Time (Min)	Sample Time (Min)	Sampler Flow Rate (ft <sup>3</sup> /Min) Bag Flow Ending Flow	Sample Volume (ft <sup>3</sup> )
_____	_____	_____	_____	( _____ ) + ( _____ ) 2	_____

Background Count Rate (Must Be Less Than 300 CPM) \_\_\_\_\_ CPM  
 Count Rate Meter Serial Number \_\_\_\_\_

Particulate Activity (CI/M<sup>3</sup>) \_\_\_\_\_ Gross CPM (Sample & Bkgd) = \_\_\_\_\_

$$[6.7E^{-11}] \times \left[ \frac{\text{Gross CPM} - \text{Bkgd CPM}}{\text{Sample Volume (ft}^3\text{)}} \right] = \text{_____ CI/M}^3$$

Gross Iodine Activity (CI/M<sup>3</sup>) \_\_\_\_\_ Gross CPM (Sample & Bkgd) = \_\_\_\_\_

$$[6.7E^{-11}] \times \left[ \frac{\text{Gross CPM} - \text{Bkgd CPM}}{\text{Sample Volume (ft}^3\text{)}} \right] = \text{_____ CI/M}^3$$

Air Particulate Activity \_\_\_\_\_ CI/M<sup>3</sup> Gross Iodine Activity \_\_\_\_\_ CI/M<sup>3</sup>

Reviewed by Plant Health Physicist \_\_\_\_\_

Reviewed by Site Emergency Director \_\_\_\_\_

NOTE: CI/m<sup>3</sup> = μCi/cm<sup>3</sup>  
 03/17/82

ON-SITE (OUT-OF-PLANT) RADIOLOGICAL SURVEYS  
Procedure 5H

1.0 PURPOSE

To provide on-site (out-of-plant) radiological data to the TSC during accident conditions.

2.0 METHOD

The monitoring of dose rates and airborne activity will be performed similar to daily, routine plant surveys except a battery operated air sampler will be used to sample the air.

3.0 TECHNICAL SPECIFICATIONS AND OTHER REQUIREMENTS

3.1 NUREG 0654

3.2 NRC Inspection Report No. 50-155, 81-17

4.0 SPECIAL EQUIPMENT

4.1 Dose rate measuring instrument.

4.2 Battery operated air sampler with silver zeolite filters.

4.3 Normal laboratory and access control counting equipment.

5.0 PRECAUTIONS AND LIMITATIONS

5.1 For a ground level release of radioactivity, respiratory protection equipment located in access control shall be worn.

5.2 Use attached data sheets to log information gathered.

5.3 Wear appropriate range dosimetry.

6.0 PROCEDURE

6.1 Monitor dose rates at the cyclone fence and log on data sheets. Speed in performing this work is essential because of possible dose rates that may be encountered. In any case, accumulated radiation exposure should not exceed 3 rem whole body.

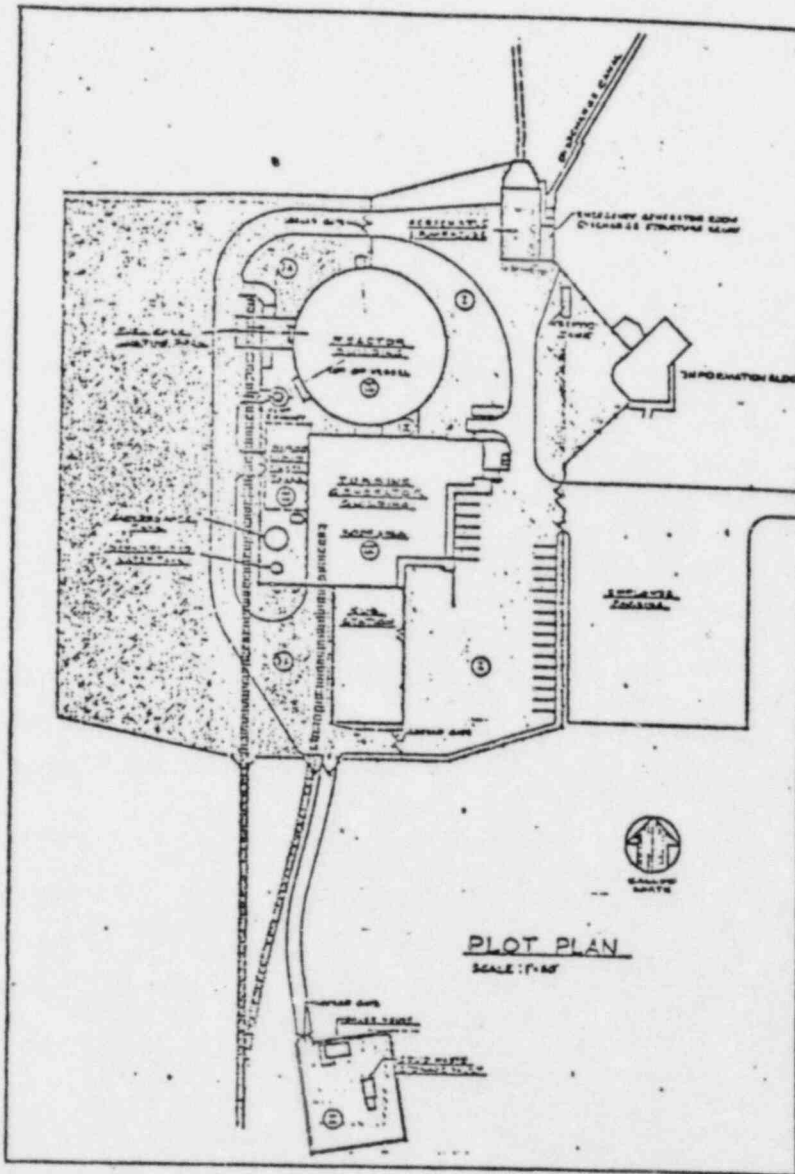
6.2 Dose rate measurements shall be taken approximately every 50 feet along the cyclone fence.

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- 6.3 One air sample from each side of the cyclone fence (north side, south, east, west) shall be taken.
- 6.4 Monitor dose rates near plant buildings as dose rates and ALARA considerations allow.
- 6.5 Air samples are to be analyzed by a multi-channel analyzer and logged.
- 6.6 Plastic bag all samples and label with date, time, air sample flow, minutes sampled, location sampled and initial and store for possible future analysis.
- 6.7 Walkie talkies should not be used by the survey teams to radio information to TSC since this will require additional and unnecessary stay time in the radiation field. Walkie talkies will be used if TSC personnel require immediate radiological information.
- 6.8 Return all data sheets to the TSC.
- 6.9 Radiological surveys conducted inside plant buildings will be logged on the daily, weekly, or monthly Radiation Survey Sheets and returned to the TSC.

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 BIG ROCK POINT PLANT  
 SITE EMERGENCY PLAN

Attachment 2 - Procedure 5H



NOTE: Write in the number on the map for each air sample taken.

- |         |        |         |        |
|---------|--------|---------|--------|
| 1 _____ | μCi/cc | 5 _____ | μCi/cc |
| 2 _____ | μCi/cc | 6 _____ | μCi/cc |
| 3 _____ | μCi/cc | 7 _____ | μCi/cc |
| 4 _____ | μCi/cc | 8 _____ | μCi/cc |

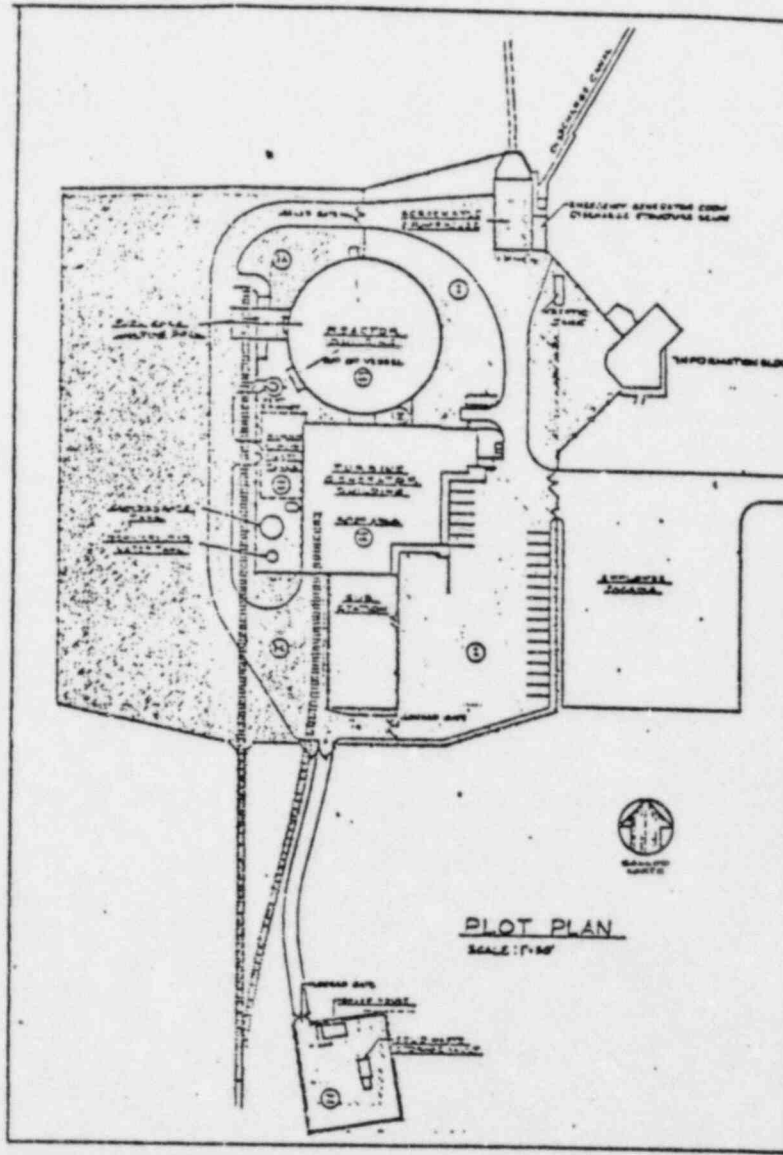
\_\_\_\_\_  
 Technician Initial

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

\_\_\_\_\_  
 Reviewed By

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Attachment 1 - Procedure 5H



NOTE: Write in the number on the map for each dose rate measurement taken.

1 _____	mR/hr	7 _____	mR/hr	13 _____	mR/hr
2 _____	mR/hr	8 _____	mR/hr	14 _____	mR/hr
3 _____	mR/hr	9 _____	mR/hr	15 _____	mR/hr
4 _____	mR/hr	10 _____	mR/hr	16 _____	mR/hr
5 _____	mR/hr	11 _____	mR/hr	17 _____	mR/hr
6 _____	mR/hr	12 _____	mR/hr	18 _____	mR/hr

\_\_\_\_\_  
 Technician Initial

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

\_\_\_\_\_  
 Reviewed By

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Attachment 3 - Procedure 5H

Log any unusual observations, additional radiological information and calculations:

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PERSONNEL ACCOUNTABILITY/SEARCH AND RESCUE  
Procedure 6A

1.0 PURPOSE

- 1.1 To provide guidelines for the assembly area leaders to perform a for personnel accountability check.

2.0 ATTACHMENTS

- 2.1 Attachment 1, Personnel Accountability Checklist.

3.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

- 3.1 All personnel are assembled at their designated assembly areas.

NOTE: Onsite personnel are normally notified of plant emergencies by a continuous two minute siren and a public address system announcement.

Two exceptions are fires announced with a 30 second series of short siren blasts, and bomb threats announced only over the public address system.

- 3.2 The Property Protection Supervisor or his designated representative is responsible for ensuring personnel accountability is completed within 30 minutes of the announcement.

4.0 PROCEDURE

- 4.1 The personnel assigned to each assembly area and the people in charge are:

4.1.1 Assembly Area I - Control Room and Technical Support Center:

- a. Site Emergency Director (In Charge)
- \*b. Operations and Maintenance Superintendent (First Alternate)
- \*c. Technical Superintendent (Second Alternate)
- \*d. Technical Engineer (Third Alternate)
- \*e. Shift Supervisor (Fourth Alternate)
- \*g. Nuclear Safety Technical Engineer

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- \*h. Plant Health Physicist
- \*i. Reactor Engineer
- j. Operators On-Duty
- k. Shift Technical Advisor
- l. If the Vice President-Nuclear Operations (normal GO Control Center Director) is on site, he should report to the control room to assist the Site Emergency Director in coordinating activities.
- \*m. Plant Superintendent Secretary, Health Physics Clerk or Technical Clerk
- \* These persons shall assemble in the corridor/Shift Supervisor's office, outside the control room, designated as the Technical Support Center and await instructions from the Site Emergency Director.

- 4.1.2 Assembly Area II - Machine Shop (or Compressor Room for LOCA) - Alternate Area - Screenhouse
  - a. Maintenance Superintendent (In Charge)
  - b. Radiation Protection and Chemical Supervisor (First Alternate)
  - c. Instrument and Control Supervisor (Second Alternate)
  - d. Maintenance Supervisor and Engineers
  - e. Chemical and Radiation Protection and Instrument Technicians. Technicians are to report to Assembly Area I when working on the backshifts.
  - f. Clerks, Janitors, Stockmen and Repairmen
  - g. QA Personnel/QC Personnel
  - h. All Other Nonplant Staff Personnel
- 4.1.3 Assembly Area III - Service Building Annex:
  - a. Training Coordinator (In Charge)
  - b. Instructors



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- c. Personnel outside the plant perimeter fence
  - 4.1.4 The Security force shall check in with Personnel at the Central Alarm System (CAS)/Secondary Alarm System (SAS) either in person or, if this is not possible, via portable radio.
  - 4.1.5 Persons outside the plant perimeter fence at the onset of an emergency shall assemble at the Service Building Annex.
- 4.2 All assembly areas have emergency kits stored in the area. Upon arrival at the assembly area, personnel will perform radiation surveys of the area to ensure radiation levels warrant occupancy.
- 4.3 Supervisors are responsible for knowing the location of personnel not able to proceed to their designated assembly areas.
- 4.4 Personnel at the assembly areas will remain at the assembly areas until directed by the assembly area leader or alternate to:
  - a. Directed to return to their work area.
  - b. Directed to evacuate.
- 4.5 Assembly area leaders will record on the Personnel Accountability Checklist (Attachment 1) all persons missing at the assembly area.
- 4.6 When the Personnel Accountability Checklist has been completed, the assembly area leader will report the results of the accountability by telephone to the Property Protection Supervisor. Relay names of people missing from each assembly area.
- 4.7 The Property Protection Supervisor will compare the list of personnel within the protected area to the badges removed for personnel within the protected area. The Personnel Accountability Checklist will be preserved along with other emergency documents by the scribe (clerk).
- 4.8 After verifying the accountability list, the Property Protection Supervisor will report the results of the accountability check to the Site Emergency Director via the telephone.
- 4.9 If individual(s) are discovered missing, the Site Emergency Director or his designee shall order the Property Protection Supervisor to contact the individual's supervisor to determine last known location. If unknown, contact the assembly area leaders to attempt to determine the last known location. Immediately start checking card reader print outs in CAS or SAS.

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4.9.2 Page missing person on plant paging system:

ATTENTION - The following personnel report your location immediately to Security for accountability.

(Name(s) \_\_\_\_\_ )  
\_\_\_\_\_ )

(Repeat)

- 4.9.3 If the missing personnel have not reported to Security within 5 minutes, notify the Site Emergency Director that these individuals cannot be accounted for.
- 4.10 The Site Emergency Director will designate an individual to assemble a Search and Rescue Team consisting of at least two people including one trained in Health Physics and First Aid.
- 4.11 Determine areas to be searched based upon the last known location.
- 4.12 Ensure that the teams shall be outfitted with the minimum dosimetry and protective clothing requirements established by the Plant Health Physicist for the areas to be searched. They should also be equipped with monitoring instruments, and a portable radio.
- 4.13 Provide the Search and Rescue Teams with the following information:
- The name(s), description, and affiliation of the missing person(s).
  - Last known location.
  - Job last being performed by the individual.
  - Plant conditions that may affect the rescue effort.
- 4.14 Designate a team leader for the search and rescue team, and instruct the team as follows:
- Search for the missing individual(s) quickly, but thoroughly.  
NOTE: The team leader shall be assigned keys should certain suspected areas be locked.
  - Maintain communications between the Search and Rescue Teams and the TSC/Control Room.

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- c. When found, immediately assess their condition and report the following information back to the Site Emergency Director:
  - 1. Identity of the victim.
  - 2. The individual's location.
  - 3. Physical condition.
  - 4. Requirements for the removal of the victim from the area.
- 4.14.1 If the missing individual(s) is in need of medical assistance, and/or is contaminated, implement EPIP 6E, First Aid and Medical Care.
- 4.14.2 If the missing person(s) is not in need of medical assistance, direct the Search and Rescue Team to accompany the individual to the radiological access point.

EMERGENCY PLAN IMPLEMENTING PROCEDURE-6A

Attachment 1

Personnel Accountability Checklist

Assembly Area Number (Circle One)    I    II    III

Person Performing Accountability Check \_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_ Page Number \_\_\_\_\_

Name	Badge Number	Location, If Known and Not Present

PERSONNEL MONITORING EVACUATION AND REASSEMBLY  
Procedure 6B

1.0 PURPOSE

- 1.1 To provide guidelines to be followed in the event of evacuation and subsequent reassembly of personnel on site.

2.0 ATTACHMENTS

- 2.1 Attachment 1, Evacuation Routes and Personnel Monitoring Stations.  
2.2 Attachment 2, Emergency Reassembly Schedule.

3.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

- 3.1 The Site Emergency Director is responsible for directing the evacuation of and reassembly at Big Rock Point Plant.
- 3.2 There are two egress routes available depending on wind direction:
- 3.2.1 Egress with wind direction out of the east, north or south is via the plant access road.
- 3.2.2 Egress with wind direction out of the west is via the railroad spur.
- 3.3 The Site Emergency Director will determine the egress route to be used based on current meteorological information.
- 3.4 Reasons for evacuation include:
- 3.4.1 Personnel safety.
- 3.4.2 High radiation levels (greater than 100 mR/h) as detected by Control Room, office area or machine shop area monitors and as detected by surveys performed in the Service Building Annex.
- 3.4.3 High airborne radiation levels (radioiodine concentration greater than  $4E-08$   $\mu$ Ci/cc).
- 3.5 Personnel to be evacuated are at the designated assembly areas.
- 3.6 Monitoring and decontamination shall be performed by or under the supervision of Radiation Protection and Chemistry personnel.

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4.0 PROCEDURES

4.1 EVACUATION

4.1.1 Evacuation Via Plant Access Road

4.1.1.1 Personnel at Assembly Area I (Control Room/Technical Support Center) and Assembly Area II (Machine Shop/Compressor Room or Screenhouse) will evacuate via the plant access road as follows:

- a. Proceed to guardhouse via the most direct route.
- b. Drop off security badge, retaining TLD's and pocket dosimeters.
- c. Proceed to Personnel Monitoring and Change Station I at the end of the plant access road via private vehicle.

4.1.1.2 Personnel at Assembly Area III (Service Building Annex) will proceed to Personnel Monitoring and Change Station I via private vehicle.

4.1.2 Evacuation Via Railroad Spur

4.1.2.1 Personnel at Assembly Area I (Control Room/Technical Support Center) and Assembly Area II (Machine Shop/Compressor Room or Screenhouse) will evacuate via the railroad spur as follows:

- a. Proceed to guardhouse via the most direct route.
- b. Drop off security badge, retaining TLD's and pocket dosimeters.
- c. Proceed to Personnel Monitoring and Change Station II by following the railroad spur on foot.

4.1.2.2 Personnel at Assembly Area III (Service Building Annex) will proceed on foot to Personnel Monitoring and Change Station II by passing through the parking lot to reach the railroad spur.

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- 4.1.2.3 If conditions require egress through the plant perimeter fence, the personnel will travel via foot but the security badges shall be given to the security officer stationed at the fence.
- 4.1.2.4 The Site Emergency Director shall make transportation arrangements for personnel assembled at Personnel Monitoring and Change Station II.

4.2 Monitoring of Evacuees

- 4.2.1 Upon arrival at Personnel Monitoring and Change Station I or II, personnel will be questioned and have dosimeters read to determine any cases of high external exposure. All dosimeters and TLD's will be collected by a Radiation Protection Technician who will also assist and supervise personnel monitoring decontamination.
- 4.2.2 Personnel and vehicles will be monitored to determine the need for decontamination.
  - 4.2.2.1 The maximum background at the monitoring stations should be 300 cpm. If this background cannot be achieved, the station should be moved or shielded.
  - 4.2.2.2 Personnel shall have demonstrated the ability to perform personnel/vehicle monitoring. Health Physics will provide decontamination assistance if required.
  - 4.2.2.3 Personnel monitoring shall be performed after decontamination to ensure personnel are not still contaminated.
  - 4.2.2.4 Priority for decontamination will be given persons found with the highest levels of contamination.
- 4.2.3 Contamination found on personnel/cars, etc. will be contained with plastic, cloth or disposable paper coveralls and tape. Decontamination will occur at the monitoring location as weather and decontamination facilities permit. If not, decontamination will occur at the EOF (Consumers Power Service Center) in Boyne City if the support home mobil trailers are in operation at the EOF.

If this is not possible, decontamination will occur at the State Police Post in Petoskey under the guidance of personnel qualified in decontamination procedures.

- 4.2.4 Monitoring for internal exposure can be accomplished by performing a GM probe measurement of thyroid lump and questioning. Conversion factors for cpm to dose are available. Persons suspected or known to have ingested any radioactive material will be whole-body counted as soon as conditions permit.
- 4.2.5 After personnel monitoring has been completed, visitors will be dismissed, some plant personnel will be assigned duties related to the emergency and the remainder of the plant personnel will be sent home via the safest route and will remain on call in accordance with Section 4.3 of this procedure.

4.3 Reassembly

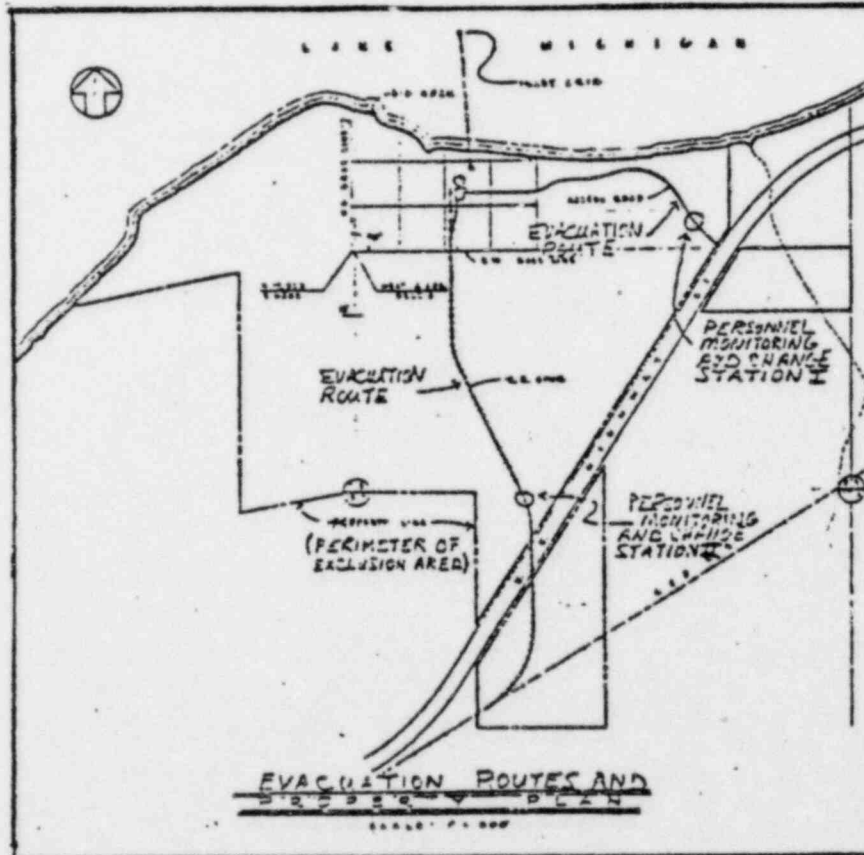
- 4.3.1 While emergency conditions exist, essential personnel (persons having an assigned emergency function, ie, operations, various chemistry and radiation personnel, security guards and others) as specified by the Site Emergency Director, shall remain on site.
- 4.3.2 Nonessential personnel (persons not having an assigned emergency function) will be sent home and will remain either "on call upon notification" or as specified in Attachment 2.
- 4.3.3 While long-term emergency conditions exist, all personnel (essential and nonessential) shall report to work on a schedule as specified in Attachment 2.

NOTE: Attachment 2, the Emergency Reassembly Schedule, is intended to provide guidance for emergency work scheduling. This is only a tentative schedule and may be altered depending on the emergency condition and requirement of the Site Emergency Director and supervisory staff.



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EMERGENCY PLAN IMPLEMENTING PROCEDURE 6B, ATTACHMENT 6B-1



EVACUATION ROUTES AND  
PERSONNEL MONITORING AND  
CHANGE STATIONS

04/02/82

6B-5

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pr1181-2171a103

IMPLEMENTING PROCEDURE 6B, ATTACHMENT 6B-2

EMERGENCY REASSEMBLY SCHEDULE

Department	Schedule
<b>Technical Support Center Staff and Technical Dept</b>	
Plant Superintendent	0800-1600
Operations and Maintenance Superintendent	1600-2400
Technical Superintendent	2400-0800
Nuclear Safety Technical Engineer	0800-1600
Technical Engineer	0800-1600
Reactor Engineer	0800-1600
Shift Technical Advisors	Normal Shift Schedule
Technical Dept Engineers/Technicians	Upon Notification by Technical Supt
<b>Operations</b>	
Shift Supervisors	Normal Shift Schedule
Control Room Operators	Normal Shift Schedule
Auxiliary Operators	Normal Shift Schedule
Operations Superintendent	Normal Schedule
<b>Health Physics</b>	
Plant Health Physicist	1200-2400
Chemistry and Health Physics Supvr	2400-1200
Radiation Protection and Chemistry Supervisor	0800-2000
Health Physics Technicians	See "NOTE"
General Health Physicist	0800-2000
<b>Maintenance</b>	
Maintenance Supvr	1200-2400
Assistant Maintenance Supvr	2400-1200
Maintenance Superintendent	0800-1600
Outage Coordinator	Upon Notification by Maint Supvr
Machinists, Welders, Repairmen A&B, Helpers	On Call
Janitors	1st Seniority - 0800-1600 2nd Seniority - 1600-2400 3rd Seniority - 2400-0800
<b>Instrument and Control</b>	
Instrument and Control Supvr	1200-2400
Assistant Instrument and Control Supvr	2400-1200
Instrument and Control Technician	See "NOTE"

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Department	Schedule
Training	
Training Coordinator	1200-2400
Licensed Instructor	2400-1200
Nonlicensed Instructor	Upon Notification by Training Coordinator
Administrative	
Administrative Supvr	Upon Notification by Site Emergency Director
Other Administrative Personnel	Upon Notification by Administrative Supvr
Clerical	
Plant Superintendent Secretary	0800-1600
Health Physics Clerk	1600-2400
Technical Clerk	2400-0800
All Clerks of All Departments Including Document Control	Upon Notification by Respective Supervisor
Property Protection	
Property Protection Supvr	Normal Schedule
Security Personnel	Normal Schedule
Personnel	
Personnel Director	Normal Schedule
Public Affairs	
Public Affairs Director	Normal Schedule
Quality Assurance/Quality Control	
Quality Assurance Supt	On Call
Others of QA/QC	Upon Notification by QA Supt
Other Plant Personnel	Upon Notification by Respective Supvr

NOTE: Health Physics and Instrument and Control Technicians shall follow the normal four-shift rotation.

- 1st Senior Person - Shift 1
- 2nd Senior Person - Shift 2
- 3rd Senior Person - Shift 3
- 4th Senior Person - Shift 4
- 5th and Lower Senior Persons - On Call or as Specified by Respective Supervisor

REENTRY/RECOVERY  
Procedure 6C

1.0 PURPOSE

- 1.1 To provide guidance for entering the Recovery phase of an emergency condition.
- 1.2 To provide guidance for reentering any area of the plant.
- 1.3 To provide guidance for and the actions during the recovery phase.
- 1.4 To describe the recovery management organization.

2.0 REFERENCES

- 2.1 Big Rock Point Site Emergency Plan.
- 2.2 NUREG-0654/FEMA-REP-1, Criteria for Preparation and Evacuation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Revision 1, published November, 1980.
- 2.3 10CFR20, Standard for Protection Against Radiation, January 1, 1981.

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 Due to the many combinations of conditions, this procedure is general in nature. At the time of the emergency specific procedures will be developed.
- 3.2 All reentry/recovery actions taken will be deliberate and preplanned.
- 3.3 Radiation exposure of personnel involved in reentry/recovery shall be ALARA. The limits imposed at the time of the reentry/recovery will be dependent upon the specific circumstances and risk versus benefit.
- 3.4 The recovery portion of the incident shall consist of at least two phases. (Phase I, 5.3 - Phase II, 5.4)
- 3.5 All actions taken during the recovery phase of any incident will be recorded on the Record of Actions Performed logsheet (Attachment 1) or the (Continuation Page to) Record of Actions Performed (Attachment 2).

3.6 Throughout the recovery phase, maintain liaison with offsite authorities and agencies to keep them fully informed.

4.0 PREREQUISITES

None.

5.0 PROCEDURE

5.1 Guidelines for Entering the Recovery Phase

5.1.1 The Site Emergency Director, with the concurrence of the Off-Site Emergency Coordinator, is the Consumers Power representative responsible for deciding when Consumers Power is ready to enter the recovery phase. This responsibility cannot be delegated.

5.1.2 The Site Emergency Director's decision to recover will be determined with the assistance of the Technical Support and Emergency Operations staff. Items to be used to determine when to commence recovery include:

- a. The condition causing the incident is controlled.
- b. Radiation levels are stable or decreasing.
- c. Releases of radioactive material are under control and if releases are occurring, the releases are within federal limits.
- d. The plant is in a controlled and stable condition.

5.1.3 The Site Emergency Director, together with the NRC will determine when to enter the Recovery Phase. When all parties agree that it is permissible to enter the recovery phase, the long term recovery organizations may be established.

5.2 Reentry Procedures

5.2.1 The Site Emergency Director will decide when it is permissible to reenter any area of the plant affected by the incident.

5.2.2 When reentry operations are to be conducted, a reentry team will be designated. The team shall consist of at least two persons and should have at least one member from the Radiation Protection group. If this is not possible, at

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least one person on the team shall be qualified to perform radiation surveys.

- 5.2.3 When the reentry team has been selected, the following information shall be gathered and given to the reentry team at the final briefing:
- a. Area of the plant that is being reentered.
  - b. Anticipated route to the area to be surveyed.
  - c. Access control procedures to be used.
  - d. Exposure limits and dosimetry requirements.
  - e. Communication equipment required.
  - f. Protective clothing and equipment required (Anti-c's, SCBA, etc.).
  - g. Radiation survey equipment required.
  - h. Anticipated radiation and contamination levels expected to and at the survey area.
  - i. Decontamination requirements of the reentry team.
- 5.2.4 The reentry team shall perform the following upon reentry as time and exposure permit (listed in order of priority):
- a. Required recovery operations.
  - b. Observation of the hazards that may be encountered during recovery operations.
  - c. Conduct a radiation/contamination survey of the area and, if possible, attempt to define the radiological problem area.
  - d. Isolate and post areas with the proper radiation warning signs and barrier rope.
- 5.2.5 Reentry teams should be sent in as long as necessary to determine the magnitude of the problem.
- 5.2.6 When the objectives of the reentry teams have been met, the Site Emergency Director will downgrade the emergency and

commence Phase 1 Recovery. Information gathered by the reentry teams will be utilized during the beginning of Phase 1 Recovery.

5.3 Recovery - Phase 1

- 5.3.1 When Phase 1 recovery has been commenced, the Site Emergency Director will ensure that all notifications, both onsite and offsite, are made.
- 5.3.2 Phase 1 recovery teams will be designated and outfitted in accordance with requirements based on the results of the reentry team surveys.
- 5.3.3 When the Phase 1 recovery team enters the recovery area, the following will be performed:
  - a. An assessment of equipment damage and the decontamination and cleanup necessary to place the plant in a stable long term configuration.
  - b. Tags necessary to commence repairs will be determined and applications made.
  - c. Radiation/contamination surveys will continue, controlled areas will be further refined and defined and shielding placement will commence.

5.4 Recovery - Phase 1

CAUTION

DO NOT INITIATE PHASE 2 RECOVERY UNTIL PHASE 1 RECOVERY HAS BEEN COMPLETED AND THE AFFECTED AREA(S) OF THE PLANT HAVE BEEN IDENTIFIED.

- 5.4.1 Phase 2 recovery teams will be designated and outfitted in accordance with requirements based on their function in the Phase 2 recovery.
- 5.4.2 The Phase 2 recovery teams will perform the following:
  - a. A detailed investigation will be conducted to determine the cause of the incident and the consequences to the plant and environment.

- b. The amount of effort required to repair and/or modify any plant equipment or procedures will be determined.
- c. The repairs and/or modifications necessary will be performed as authorization is received.
- d. Test procedures will be developed and a test program will be instituted to determine the fitness of plant components and systems for return to service.

5.4.3 During Phase 2 Recovery, any releases of radioactive materials to the environment will be planned, controlled, evaluated in advance for radiological impact, and appropriate offsite agencies and organizations will be notified of the scheduled releases and expected impact.

#### 5.5 Long Term Recovery Organizations Guidelines

- 5.5.1 Upon termination of the emergency, at the discretion of Consumers Power management and the Site Emergency Director, a long term recovery organization will be established. This organization may be established prior to, during or after the completion of Phase 1 or Phase 2 recovery operations.
- 5.5.2 The long term recovery organization will be as shown on Attachment 2.
- 5.5.3 The Recovery Manager is responsible for all recovery activities and will act as the coordinator for all groups in the recovery organization.
- 5.5.4 The Plant Operations group is responsible for recovery activities to place the plant in a safe, stable condition.
- 5.5.5 The Technical Support group is responsible for analysis and development of plans and procedures in support of the Plant Operations group. The Technical Support group acts as the central facility for the collection, retention, retrieval and transmitting of data pertaining to the incident and subsequent recovery.
- 5.5.6 The Health Physics group is responsible for the development of plans and procedures to process and control liquid, gaseous and solid wastes. The Health Physics group will also be determining the total population exposure.



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- 5.5.7 The Scheduling group will assist the Recovery Manager in the short term planning, scheduling and expediting of recovery operations. This group will be responsible for preparing the agenda for the recovery staff meetings and will follow up on any commitments made at these meetings.
- 5.5.8 The Administration and Logistics support group will provide administrative, logistic, communication and personnel support for the recovery operation.
- 5.5.9 The Advisory Support group is a staff function consisting of those senior technical personnel who will serve on the Recovery Manager's staff. They will provide independent technical assessment based on experience and engineering analysis.
- 5.5.10 The Design and Construction Support group will coordinate the design and construction activities of the A/E, NSSS supplier, construction forces, consultants/contractors/vendors and Consumers Power Company.
- 5.5.11 The Public Affairs group coordinates information at the news center with local, State and Federal agencies and the companies involved with the recovery operation and provides a means of meeting the media's needs as necessary.

ATTACHMENT 1

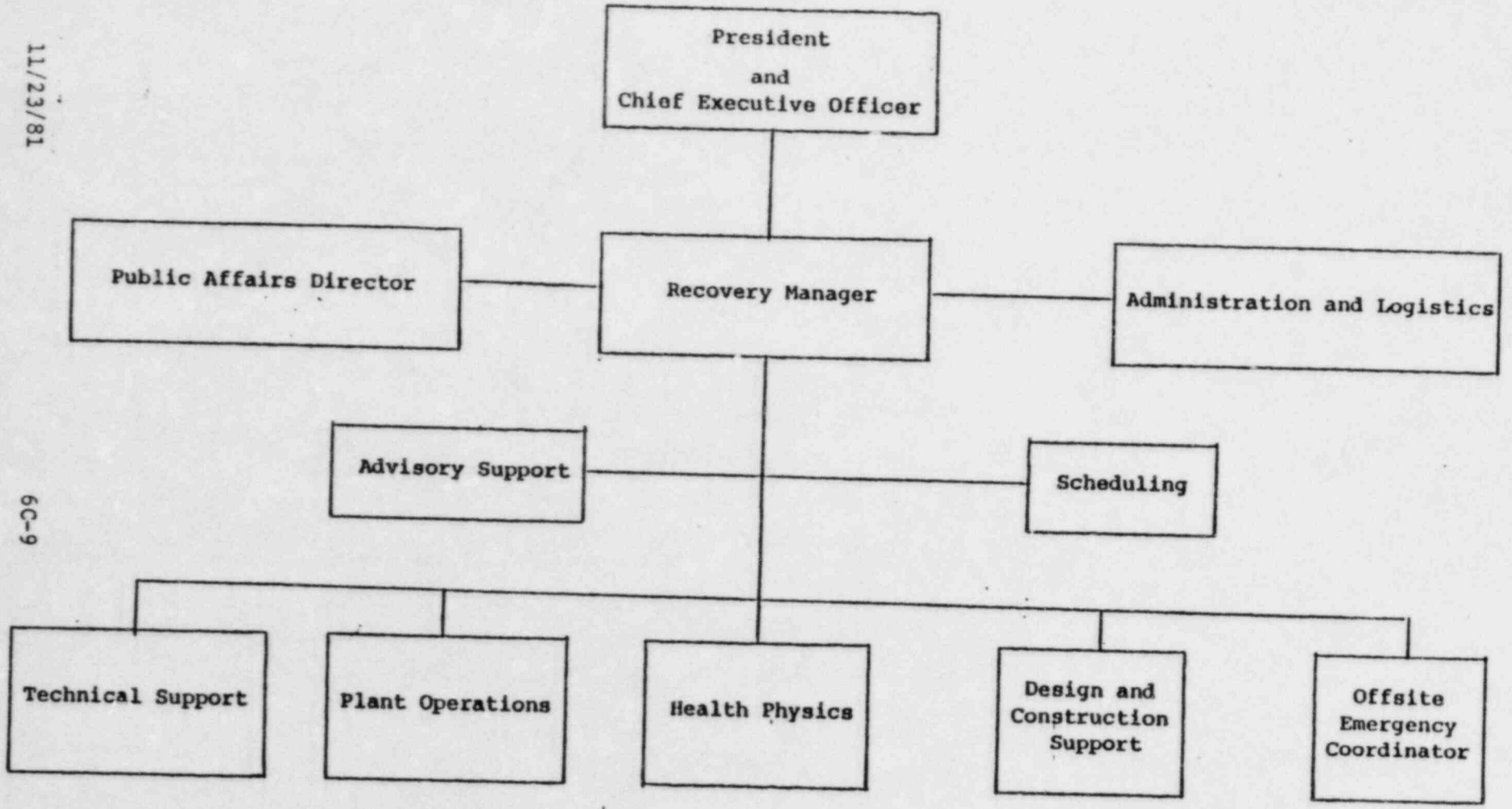
RECORD OF ACTIONS PERFORMED

Date/Time of Emergency: _____			
Date/Time	Recovery Action	Accomplished By	Reviewed By

RECORD OF ACTIONS PERFORMED (contd)

Date/Time of Emergency: \_\_\_\_\_

Date/Time	Recovery Action	Accomplished By	Reviewed By



LONG TERM RECOVERY ORGANIZATION

11/23/81

6C-9

Rev 15

EMERGENCY EQUIPMENT AND SUPPLIES:  
INVENTORY, MAINTENANCE AND CALIBRATION  
Procedure 6D

1.0 PURPOSE

- 1.1 To establish procedures for the periodic inventory, maintenance and surveillance of emergency equipment and supplies.

2.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

- 2.1 Emergency kits, equipment and supplies will be inventoried and maintained per RP-36, Emergency Equipment and Supplies Inventory.

3.0 PROCEUDRE

- 3.1 Emergency equipment kits identified in Appendix E to the Site Emergency Plan (Volume 9) and the equipment listed in RP-36 shall be inventoried quarterly and after each use. The completed inventory sheets will be returned to the Emergency Planning Coordinator.
- 3.1.1 Instruments requiring calibration shall be calibrated according to a schedule based on the manufacturer's recommendations.
- 3.1.2 Any emergency equipment found to be unusable shall immediately be reported and replaced or repaired.
- 3.1.3 Spare equipment shall replace equipment removed from emergency kits for repair or calibration.
- 3.1.4 All respirators, as stored in some kits, will be maintained in accordance with the plant respiratory protection program. All respirators and cartridges stored in emergency kits shall be replaced per manufacturer's recommendations.
- 3.2 Emergency equipment designated for use by the plant Fire Brigade, or for other fire protection use, shall be inventoried and maintained in accordance with the fire protection program. Maintenance of SCBA units is included as part of that program's surveillance procedures.

FIRST AID AND MEDICAL CARE  
Procedure 6E

1.0 PURPOSE

- 1.1 To provide guidelines for the treatment of injured or severely overexposed personnel who may or may not be contaminated.

2.0 ATTACHMENTS

- 2.1 Medical Incident Report forms.

3.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

- 3.1 This procedure shall be used for first aid and medical care of injured personnel during emergency conditions.

4.0 PROCEDURE

4.1 EQUIPMENT

- 4.1.1 The equipment used for the treatment of injured personnel is covered in EPIP 6D (Emergency Equipment and Supplies).

4.2 FACILITIES

- 4.2.1 The on site first-aid station is located in the health physics area of the auxiliary building.
- 4.2.2 Big Rock Point Plant has letters of agreement with the Little Traverse Hospital and the Charlevoix Hospital regarding the treatment of personnel injured at Big Rock Point.

4.3 PERSONNEL

- 4.3.1 At least one person having a valid first-aid certificate is on site at all times.
- 4.3.2 Both hospitals listed in Section 4.2.2 above are equipped to treat contaminated personnel. The Little Traverse Hospital is preferred.
- 4.3.3 The Charlevoix and Petoskey Fire Department and Rescue Squad personnel are qualified in first-aid practices.

#### 4.4 TRANSPORTATION FACILITIES

- 4.4.1 Company and/or private vehicles on site may be used to transport injured and/or contaminated personnel for medical treatment.
- 4.4.2 If the emergency is severe enough, ambulances from Petoskey and Charlevoix are available.

#### 4.5 DECONTAMINATION OF PERSONNEL

- 4.5.1 All reasonable efforts to decontaminate the patient prior to leaving the site will be made.
- 4.5.2 The amount of decontamination necessary will depend upon the injury's severity and the contamination levels. A severe injury will normally have priority over decontamination.
- 4.5.3 No ambulance or hospital decontamination team member should receive above 25 rems:
- 4.5.4 Decontamination solutions available for use are:
  - a. Soap
  - b. Green soap
  - c. Phosphate-based detergents (Tide or Cheer)
  - d. Chelating agents (Versenates, EDTA or DTPA)
- 4.5.5 Decontamination of personnel shall be performed in accordance with Radiation Protection procedures.

#### 4.6 TRANSPORTATION OF CONTAMINATED PERSONNEL

- 4.6.1 While awaiting the arrival of the ambulance, the person designated as "Ambulance Escort" will obtain material (poly, blotting paper, etc) to cover the interior of the ambulance and/or to wrap the victim.
- 4.6.2 Complete the applicable sections of Attachment 1, Medical Incident Report.
- 4.6.3 Upon arrival of the ambulance at the pickup point (normally the front lobby) cover the interior of the ambulance and/or wrap the victim.

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- 4.6.4 If contamination levels dictate, suit the ambulance crew in protective clothing. Respiratory devices may be worn.
- 4.6.5 Place the injured person in the ambulance.
- 4.6.6 Place the Ambulance Emergency Kit, an air sampler and Attachment 1 in the ambulance.
- 4.6.7 En route to the hospital, maintain basic contamination control.

4.7 HOSPITAL ACTIONS FOR CONTAMINATED PERSONNEL

- 4.7.1 Upon notification from the site, the emergency room nurse or doctor will perform the following:
  - a. Call additional personnel as required.
  - b. Evacuate the treatment room to facilitate handling of the injured.
  - c. Remove or cover all material or equipment not necessary for treatment. Cover the floor of the treatment area.
  - d. Move necessary additional equipment into the treatment room.
  - e. Place the contamination control supplies outside the treatment room.
  - f. Cover the route from the emergency entrance to the treatment room with blotting paper that is taped in place.
  - g. Two persons will suit up in protective clothing to assist in moving the patient into the treatment room.
- 4.7.2 A Radiation Protection Technician or representative will assist the hospital personnel in implementing contamination control procedures.
- 4.7.3 After arrival of the injured person at the hospital and transfer to the treatment room, perform the following:
  - a. Remove blotting paper while wearing gloves and place inside the treatment room.
  - b. All persons entering the treatment room will wear protective clothing. Issue TLDs and pocket dosimeters



(from ambulance emergency kit) to hospital personnel who will be handling the patient.

- c. Persons leaving the treatment room will remove the protective clothing in accordance with prescribed manner.
- d. All persons shall be monitored by CP Co technicians.
- e. During decontamination efforts, sample the air activity in the treatment room with the air sampler for 10 minutes at approximately 3 cfm. If the activity on the filter is less than 150 cpm with an open window GM tube, respirators may be removed from attending personnel.
- f. All items removed from the treatment room shall be monitored and released if uncontaminated, or sealed and marked "contaminated."
- g. Further transport of the patient will be determined by the attending physician taking reasonable precautions to control the spread of contamination.

4.7.4 After emergency treatment is complete:

- a. The patient will be thoroughly decontaminated by CP Co personnel. Liquid wastes will be collected and returned to Big Rock Point for processing.
- b. The emergency area of the hospital and all equipment and supplies will be surveyed and decontaminated by CP Co personnel.
- c. All solid contaminated waste will be sealed and transported to Big Rock Point for disposal or decontamination.

4.8 TREATMENT OF OVEREXPOSED PERSONNEL

4.8.1 Overexposure may be concurrent with injury and contamination. Care for overexposure consists of keeping the individual comfortable and observing symptoms to help determine the clinical course of events. Injury and decontamination care shall take priority over attention to overexposure. After the recovery and stabilization of an overexposed individual, the following should be performed as appropriate:

- a. Collect all dosimetry and have processed.

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- b. Assemble all information pertinent to reconstructing the accident. Interview the involved individual(s) and his associates to establish the location of the individual, his actions, the duration of the exposure, etc.
- c. Supplement dosimetry results with information from area monitors, dose rate surveys, etc.
- d. Record all symptoms exhibited by the individual.
- e. Save all biological excretions and other samples in case they are needed for later evaluation. In the case of a possible neutron exposure, collect jewelry, buttons, etc, for neutron activation analysis.
- f. Transfer the individual to the hospital in accordance with Section 4.6 or 4.9 of this procedure. Provide the hospital with a completed copy of Attachment 1, Medical Incident Report.

4.8.2 The onsite person(s) investigating the overexposure will notify the physician managing the case as soon as an estimated exposure has been determined from the information gathered.

#### 4.9 TREATMENT OF UNCONTAMINATED PERSONNEL

4.9.1 Uncontaminated personnel will be transported and treated in accordance with normal hospital procedures. Necessary first aid shall be administered by a qualified person.

ATTACHMENT 1  
Medical Incident Report

Name \_\_\_\_\_ Date of Incident \_\_\_\_\_

Company \_\_\_\_\_ Time of Incident \_\_\_\_\_

SS No \_\_\_\_\_

Location of Incident: \_\_\_\_\_

Description of Incident: \_\_\_\_\_

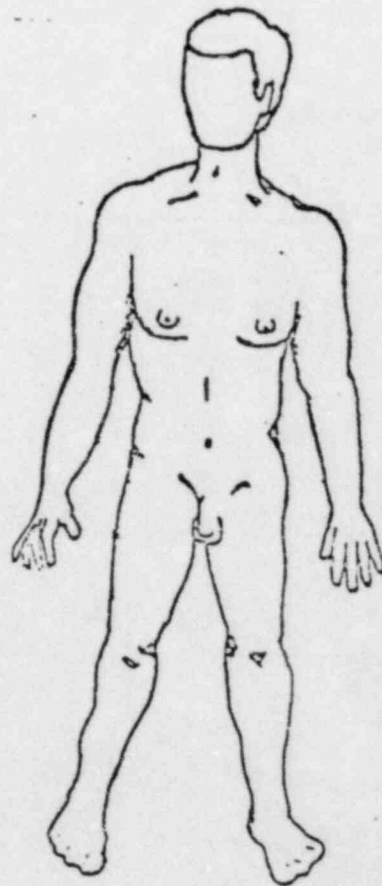
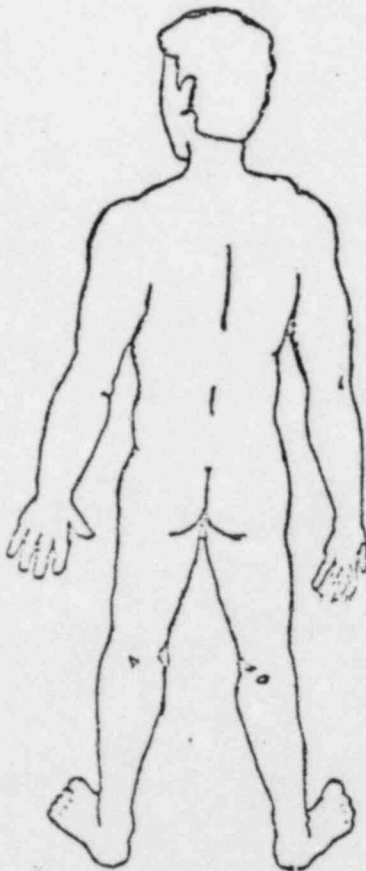
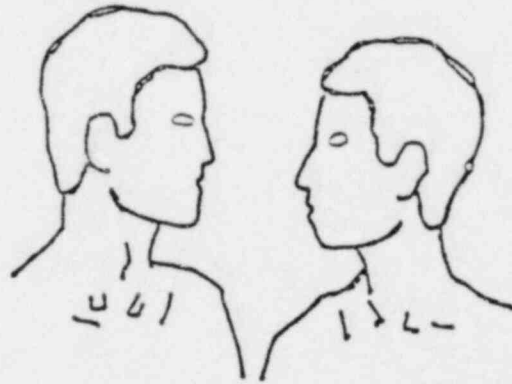
Type of Injury/Exposure	Measures Taken
Wounds (Y/N) Where? (Indicate on Page 2) Type/Severity: _____ _____ _____	First Aid: _____ _____ Wound/Decon/How: _____ Effect: _____
Exposure (Y/N) Dose: _____ rem Type(s) of Dosimeters: _____ Whole Body? (Y/N) If N, indicate location on Page 2 Type(s): (circle) Beta/Gamma/Neutron/Uncertain Symptoms: (circle) Nausea/Vomiting/Paleness/Other _____	Treatment of Symptoms: _____ _____ Blood sample taken (Y/N) Badge taken (Y/N) Dosimetry taken (Y/N)
External Contamination (Y/N) Meter Reading: _____ =: _____ Meter Used: _____ Contaminant(s): _____ Show location on Page 2	Decon: _____ Residual Contamination at time of Transfer: _____ Show location on Page 2
Internal Contamination (Y/N) Ingestion Pathway(s): (circle) Inhalation Ingestion Absorption Wounds Contaminant(s): _____ If N, indicate location on Page 2 Type(s): (circle) Beta/Gamma/Neutron/Uncertain Symptoms: (circle) Nausea/Vomiting/Paleness/Other _____	Nose blow (Y/N) Sample kept (Y/N) Decon of orifices Where _____ How _____ Decon fluids kept (Y/N) Blood sample taken (Y/N) Badge taken (Y/N) Dosimetry taken (Y/N)
External Contamination (Y/N) Meter Reading: _____ =: _____ Meter Used: _____ =: _____ Contaminant(s): _____ Show location on Page 2	Decon: _____ Residual contamination at time of transfer: _____ Show location on Page 2
Internal Contamination (Y/N) Ingestion Pathway(s): (circle) Inhalation Ingestion Absorption Wounds Contaminant(s): _____ How much? _____ _____ _____	Nose blow (Y/N) Sample kept (Y/N) Decon of orifices Where _____ How _____ Decon fluids kept (Y/N) Other samples taken: Urine (Y/N) Feces (Y/N) Other: _____

Completed by: \_\_\_\_\_ Date \_\_\_\_\_

HP Supervisor: \_\_\_\_\_ Date \_\_\_\_\_

ATTACHMENT 1  
Medical Incident Report

Indicate location and extent of:  
Wounds  
Local radiation exposure  
External contamination  
Decontamination efforts



COMMUNICATIONS METHODS  
Procedure 6F

1.0 PURPOSE

- 1.1 To identify the communications equipment and provide guidelines for communicating during an emergency.

2.0 ATTACHMENTS

- 2.1 Priority of Communications Systems, Attachment 1  
2.2 Big Rock Point Emergency Information Form, Attachment 2

3.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

- 3.1 The priority of communication system use is shown on Attachment 1.  
3.2 To ensure accuracy, have all messages repeated back to the caller.

4.0 PROCEDURE

- 4.1 Upon recognizing an emergency condition the Shift Supervisor/Site Emergency Director shall:
- 4.1.1 Complete or designate a person to complete 1 through 6 on the Big Rock Point Emergency Information Form (Attachment 2).
  - 4.1.2 Appoint a communicator to provide the information in 1 through 6 to the personnel/agencies per EPIP 1, Activation of the Emergency Plan. The communicator shall be:
    - a. Technical engineer (preferred).
    - b. Designee of the Shift Supervisor (designee should be technically trained, ie, NSTE, Off-Duty STA, or Senior Engineer).
    - c. Shift Supervisor (interim only).
- 4.2 The communicator shall transmit and receive all messages and maintain a log of all actions taken on the Emergency Log Sheet (EPIP 4U-1).
- 4.3 Follow-up notifications:
- 4.3.1 Follow-up notifications are required for all emergency classifications except Unusual Event.

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4.3.2 The communicator shall implement follow-up notifications every 15 minutes during an alert classification utilizing the Big Rock Emergency Information Form (Attachment 2) to the offsite agencies specified in Procedure 2. During a Site Area or General Emergency, offsite authorities will receive follow-up information upon changing conditions.

NOTE: Follow up notifications shall be made by the communicator until the Emergency Operations Facility (EOF) has been activated and has assumed all offsite notification responsibilities. Thereafter, the communicator will transmit updated information only to the EOF.

- 4.4 The Site Emergency Director shall direct the Emergency Data Recorder to assist the communicator. The Emergency Data Recorder shall be:
- a. Plant Superintendent's Secretary.
  - b. Health Physics Clerk (First alternate).
  - c. Technical Clerk (Second alternate).
- 4.5 Offsite Emergency Services shall be requested as warranted by the Site Emergency Director per EPIP-2 facility actions during an emergency.

EMERGENCY PLAN IMPLEMENTING PROCEDURE 6F, ATTACHMENT 3  
Volume 9a Big Rock Point Plant Site Emergency Plan

Priority of Communication Systems  
 Communications to:

Communications From	Control Room	Tech Supp Center	Ops Supp Center	Emergency Ops Facility	Control Ctr Jackson	NRC	High State Police/Dept of Health	Char Cnty Emer Ser
	Control Room	1 _____ 2 _____	1 F to F 2 IntP Tel	1 IntP Tel 2 Walkie-T	1 IntP/Bell 2 Radio	1 Dedi Tel 2 Bell Tel (Power Control)	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 *
Technical Support Center	1 F to F 2 IntP Tel	1 _____ 2 _____	1 IntP Tel 2 Walkie-T	1 IntP Tel 2 Bell Tel	1 Bell Tel 2 _____	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 *	1 Bell Tel 2 _____
Operations Support Center	1 IntP Tel 2 Walkie-T	1 IntP Tel 2 Walkie-T	1 _____ 2 _____	1 IntP Tel 2 Bell Tel	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 _____	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 _____
Emergency Operations Facility	1 IntP/Bell 2 Radio	1 IntP Tel 2 Bell Tel	1 IntP Tel 2 Bell Tel	1 _____ 2 _____	1 Bell Tel 2 _____	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 *	1 Bell Tel 2 _____
Control Center, Jackson	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 _____ 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____
NRC	1 Dedi Tel 2 Bell Tel	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 _____	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 _____	1 _____ 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____
Michigan State Police/ Dept of Health	1 Bell Tel 2 *	1 Bell Tel 2 *	1 Bell Tel 2 *	1 Bell Tel 2 *	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 2 _____	1 Bell Tel 2 _____
Charlevoix County Emergency Services	1 Dedi Tel 2 Bell Tel	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 Bell Tel 2 _____	1 2 _____

Key: F to F - Face to Face, IntP Tel - Intraplant Telephone, Dedi Tel - Dedicated Telephone, Walkie-T - Walkie-Talkie, \* - State Police Radio Band (Available through Plant security)

NOTE: Personnel assembling in the Control Room, Technical Support Center or Operations Support Center can communicate face-to-face within approximately 30 seconds. Walkie-talkies are available in the Control Room for communications to and from any area within the Plant. In addition, since the Control Room is the principal communication center at the Plant, all methods of communication available in the Control Room can be used as backup for any Plant assembly area to communicate to offsite locations.

SAGE NO: \_\_\_\_\_ PROCEDURE 6F, ATTACHMENT 2  
Big Rock Point Emergency Information Form  
Time and Date of Message: \_\_\_\_\_ : \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

1. This is \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
(Name) (Title) (Phone No)

At the Big Rock Point Plant.

\_\_\_\_\_ This is a drill, this is a drill.

\_\_\_\_\_ This is NOT a drill, this is NOT a drill.

I am reporting an emergency declared at \_\_\_\_\_ : \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
(Time) (Date)

2. Emergency Classification:

\_\_\_\_\_ Unusual Event \_\_\_\_\_ Site Area Emergency

\_\_\_\_\_ Alert \_\_\_\_\_ General Emergency

3. Description of the emergency: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Form of release:

\_\_\_\_\_ Airborne \_\_\_\_\_ Surface Spill

\_\_\_\_\_ Waterborne \_\_\_\_\_ None

Check one:

\_\_\_\_\_ Actual \_\_\_\_\_ Projected

\_\_\_\_\_ Estimated duration of actual release: \_\_\_\_\_

\_\_\_\_\_ Estimated time of anticipated release: \_\_\_\_\_



5. Has release terminated?

Yes     No     Not applicable

6. Recommended actions:

No protective actions are recommended.

Sheltering is recommended for areas: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Evacuation is recommended for areas: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

7. Meteorological conditions:

Wind Speed (mph) \_\_\_\_\_

Wind Direction: From \_\_\_\_\_

Toward \_\_\_\_\_

Stability class \_\_\_\_\_  
A,B,C,D,E,F,G

8. Precipitation (circle one): None    Light    Moderate    Heavy

9. Height of release: \_\_\_\_\_

(circle one): Ground    Stack    Other \_\_\_\_\_

10. Release rate: Noble gas \_\_\_\_\_ Ci/sec

Iodine \_\_\_\_\_ Ci/sec

Particulates \_\_\_\_\_ Ci/sec

11. (Circle one) Projected/Actual dose rate at:

Site Boundary \_\_\_\_\_ mRems/hr

2 Miles \_\_\_\_\_ mRems/hr

5 Miles \_\_\_\_\_ mRems/hr

Estimated 2-hour whole body dose commitment at:

Site Boundary \_\_\_\_\_ mRems

2 Miles \_\_\_\_\_ mRems

5 Miles \_\_\_\_\_ mRems

Estimated 2-hour infant thyroid (iodine) dose commitment at:

Site Boundary \_\_\_\_\_ mRems

2 Miles \_\_\_\_\_ mRems

5 Miles \_\_\_\_\_ mRems

12. CP Co emergency response actions underway: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

13. Prognosis for worsening or termination of event based on Plant information: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

14. Estimate of surface contamination in plant, onsite or offsite: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

15. Offsite support requested: \_\_\_\_\_  
\_\_\_\_\_

16. Other comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

TIME-DISTANCE-DOSE PREDICTIONS BASED ON PERCENT CORE MELTDOWN  
Procedure 6G

1.0 PURPOSE

- 1.1 To predict gross estimated radiation dose rates at various times and plant locations or distances based on either 10% or 100% core damage.

2.0 ATTACHMENTS

- 2.1 Attachment 1, Expected Dose Rates for LOCA Conditions and 10% Core Meltdown.
- 2.2 Attachment 2, Time to Reach Various Doses at Various Distances Based on 100% Core Meltdown.
- 2.3 Attachment 3, Expected Dose Rates On-Site for LOCA Conditions and 100% Core Meltdown.
- 2.4 Attachment 4, Dose Rates at 150 Feet from Center of Containment.

3.0 INITIAL CONDITIONS AND/OR REQUIREMENTS

- 3.1 Upon recognition that abnormal plant or site conditions exist, this procedure can be used to obtain a rough estimate of dose rates at various times and plant locations.
- 3.2 This procedure is intended to be used to provide only a rough estimate of dose rate. Actual dose rates can be obtained by using EPIP 5-A.
- 3.3 This procedure is not to be used when making recommendations to off-site authorities pertaining to protective actions for the public.

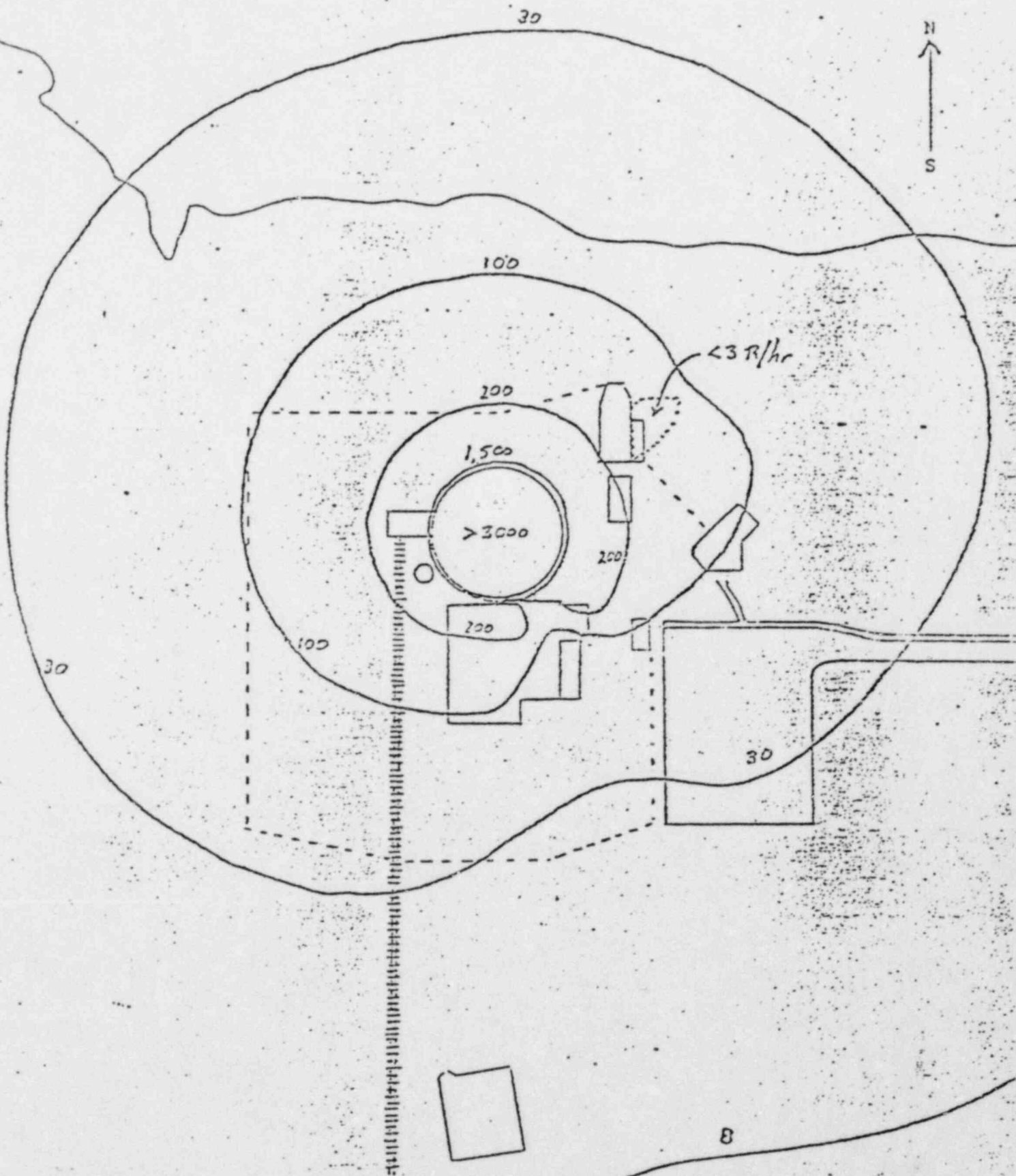
4.0 PROCEDURE

- 4.1 Determine (using EPIP 5E) or estimate (using EPIP 5D) the percent core meltdown.
- 4.2 If percent core meltdown is approximately 10%, use Attachment 1 to estimate the dose rates on-site or in any structure on-site.
- 4.3 If percent core meltdown is approximately 100%, use Attachment 2 to estimate the dose out to approximately 10 miles from the center of containment.

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- 4.4 Attachment 3 is to be used to determine the estimated dose rates on-site for an accident with 100% of noble gases and 25% of halogens in the containment atmosphere.
- 4.5 Attachment 4 is used to determine the approximate amount of concrete shielding needed to reduce radiation levels following a loss of coolant accident.

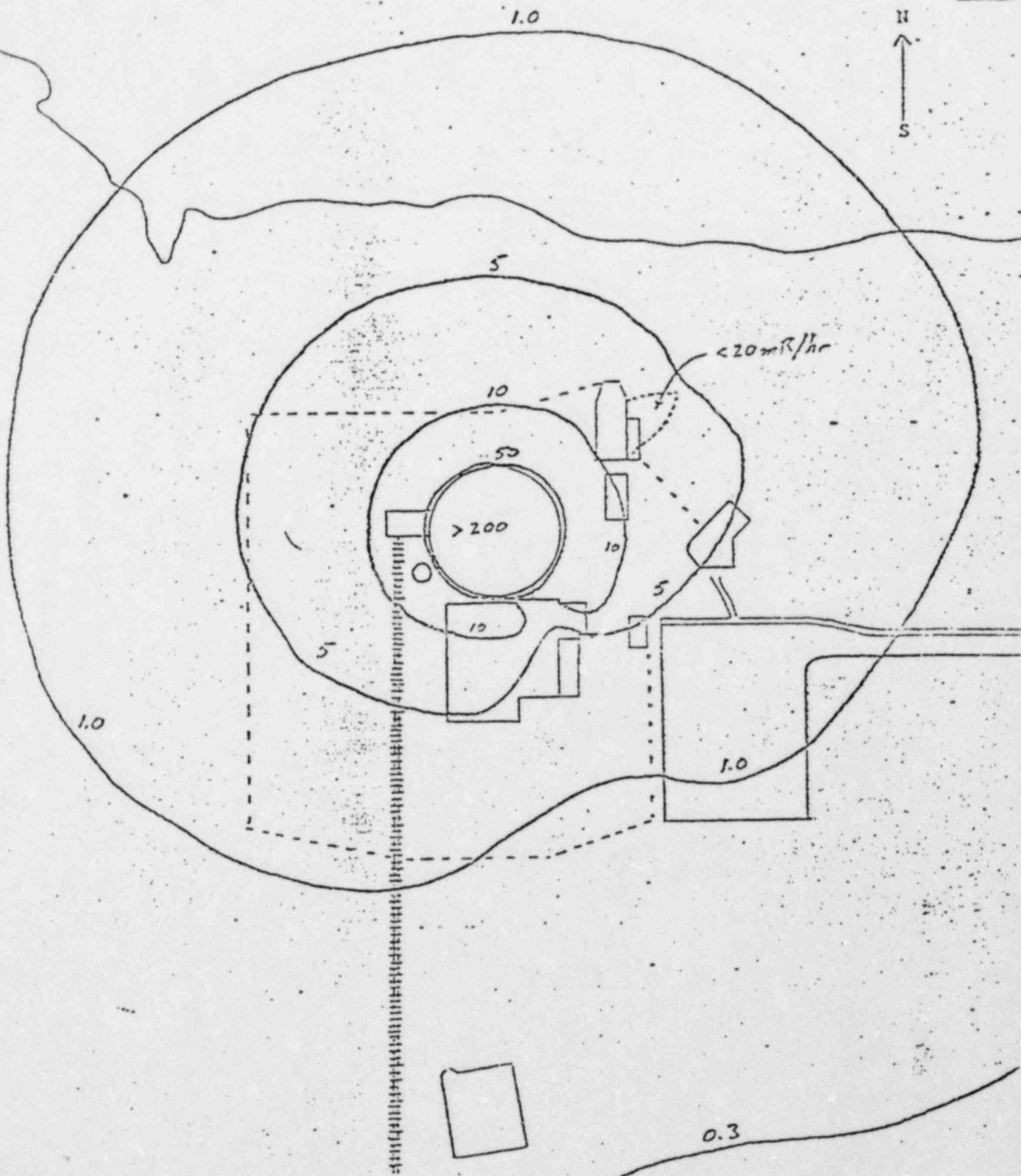
LOCA Conditions and 10% Core Meltdown



EXPECTED DOSE RATES

t = 24 Hours  
(Rad/Hour)

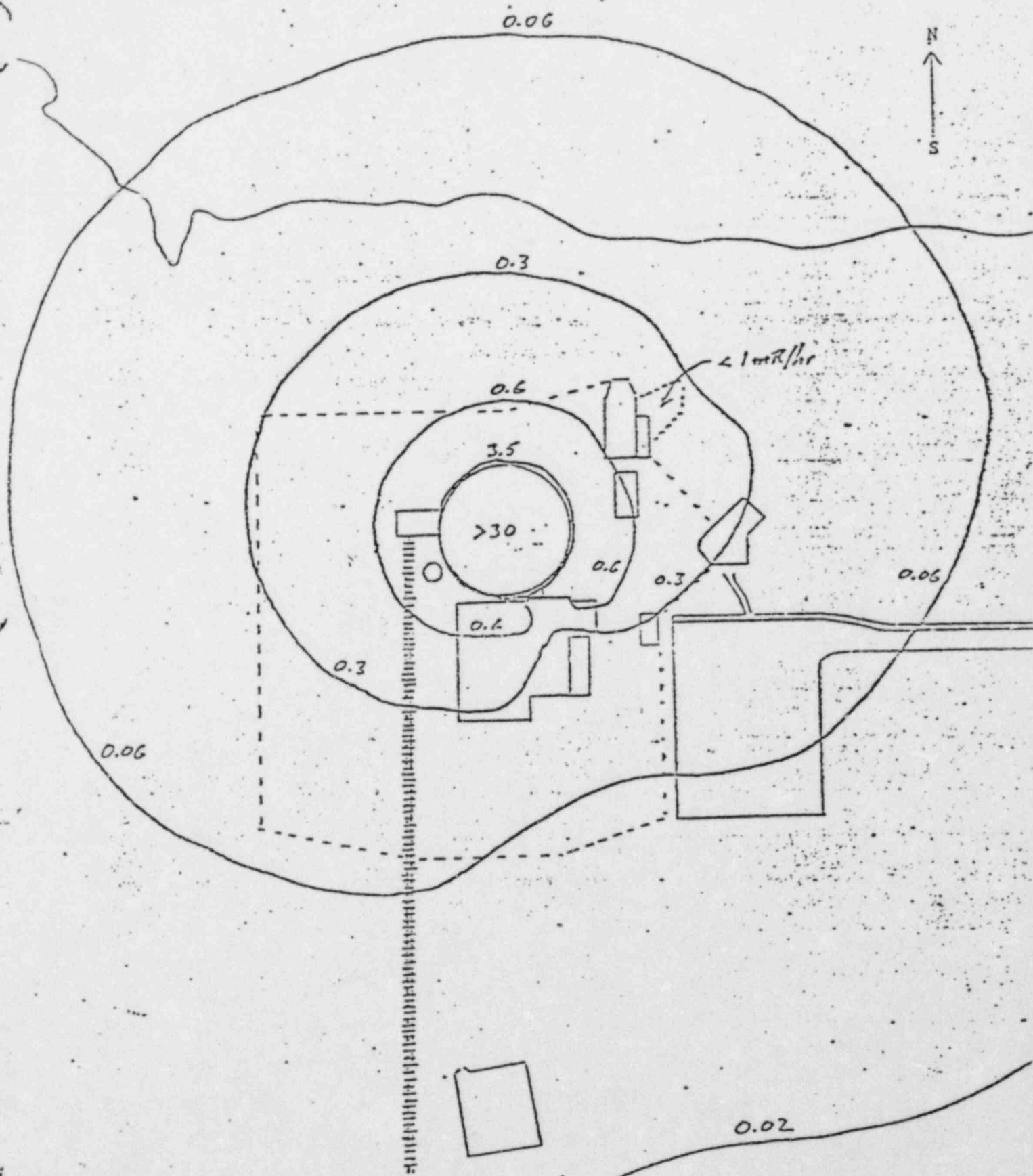
LOCA Conditions and 10% Core Meltdown



11/23/81  
pr1181-2177a103

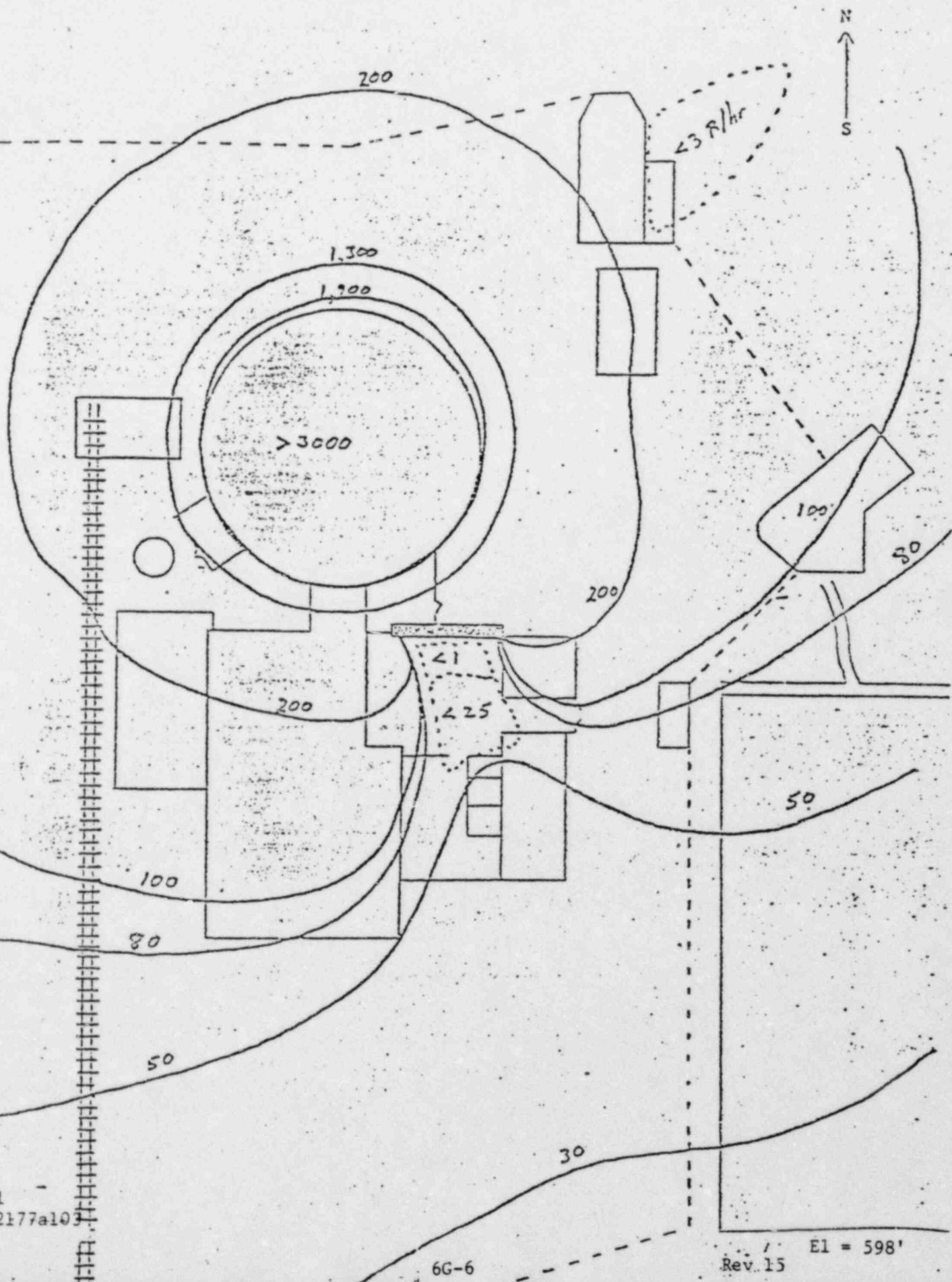
E1 = 598'  
Scale = 135' / Inch

LOCA Conditions and 10% Core Meltdown





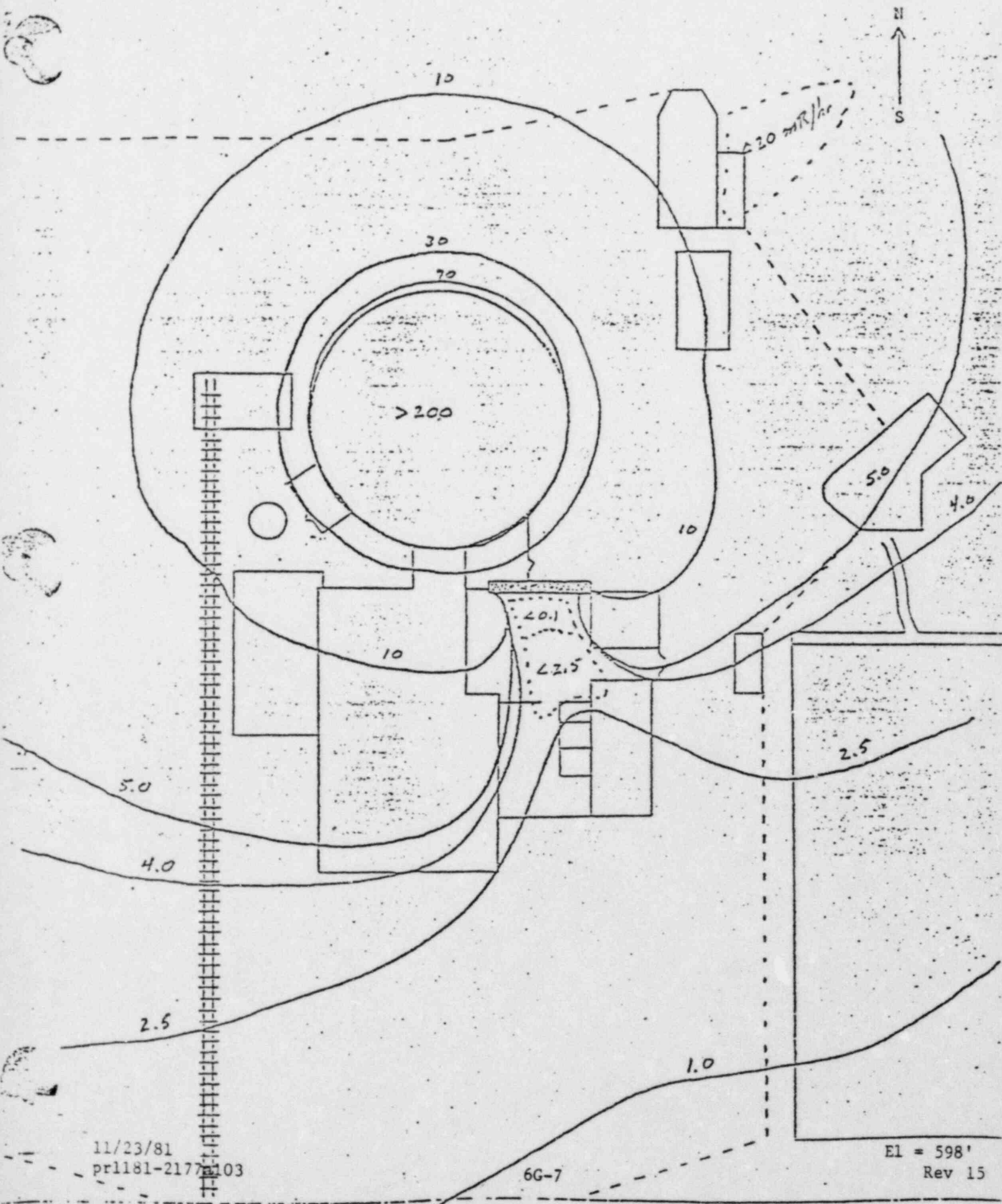
LOCA Conditions and 10% Core Meltdown



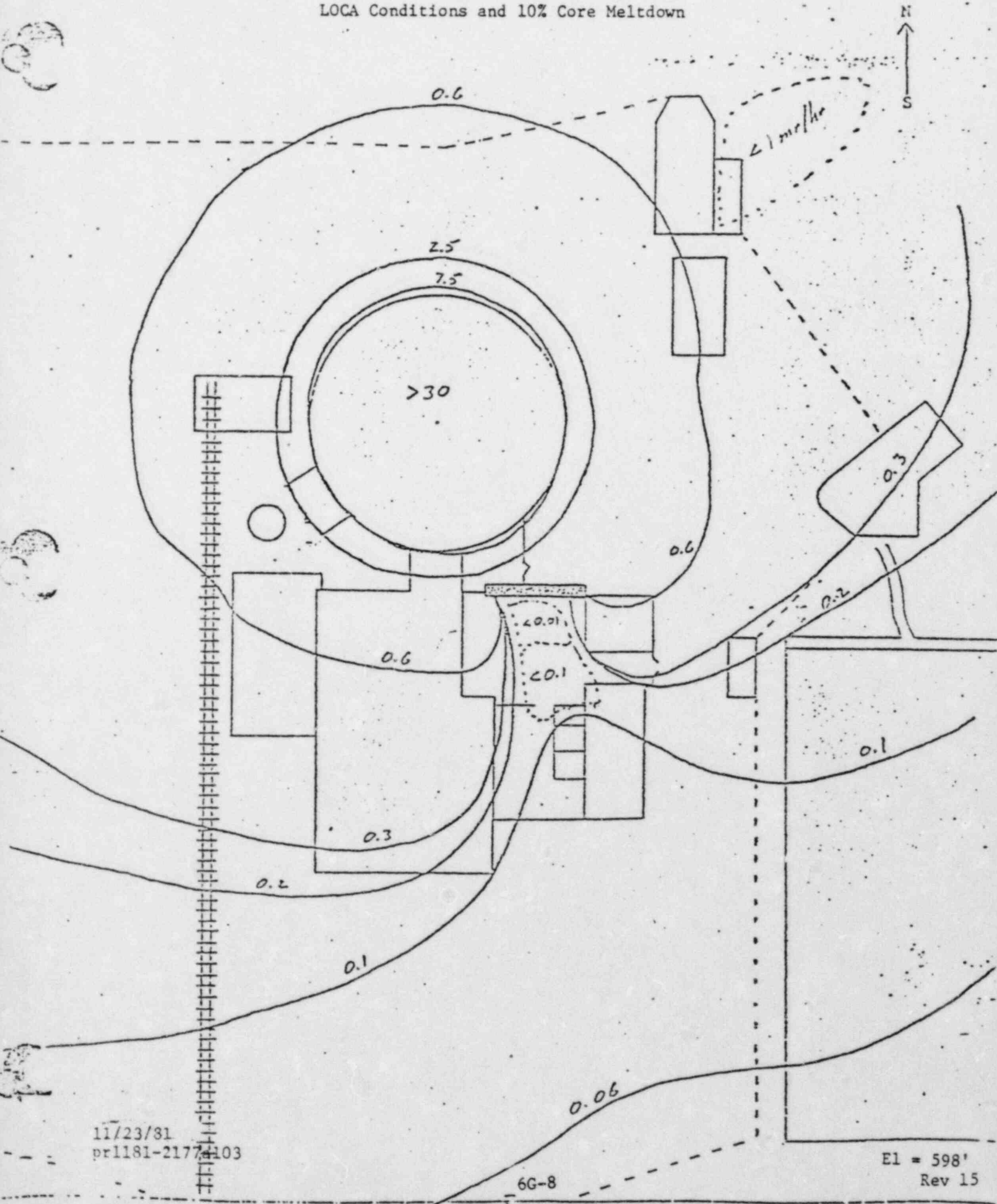
11/23/81

pr1181-2177a10

LOCA Conditions and 10% Core Meltdown



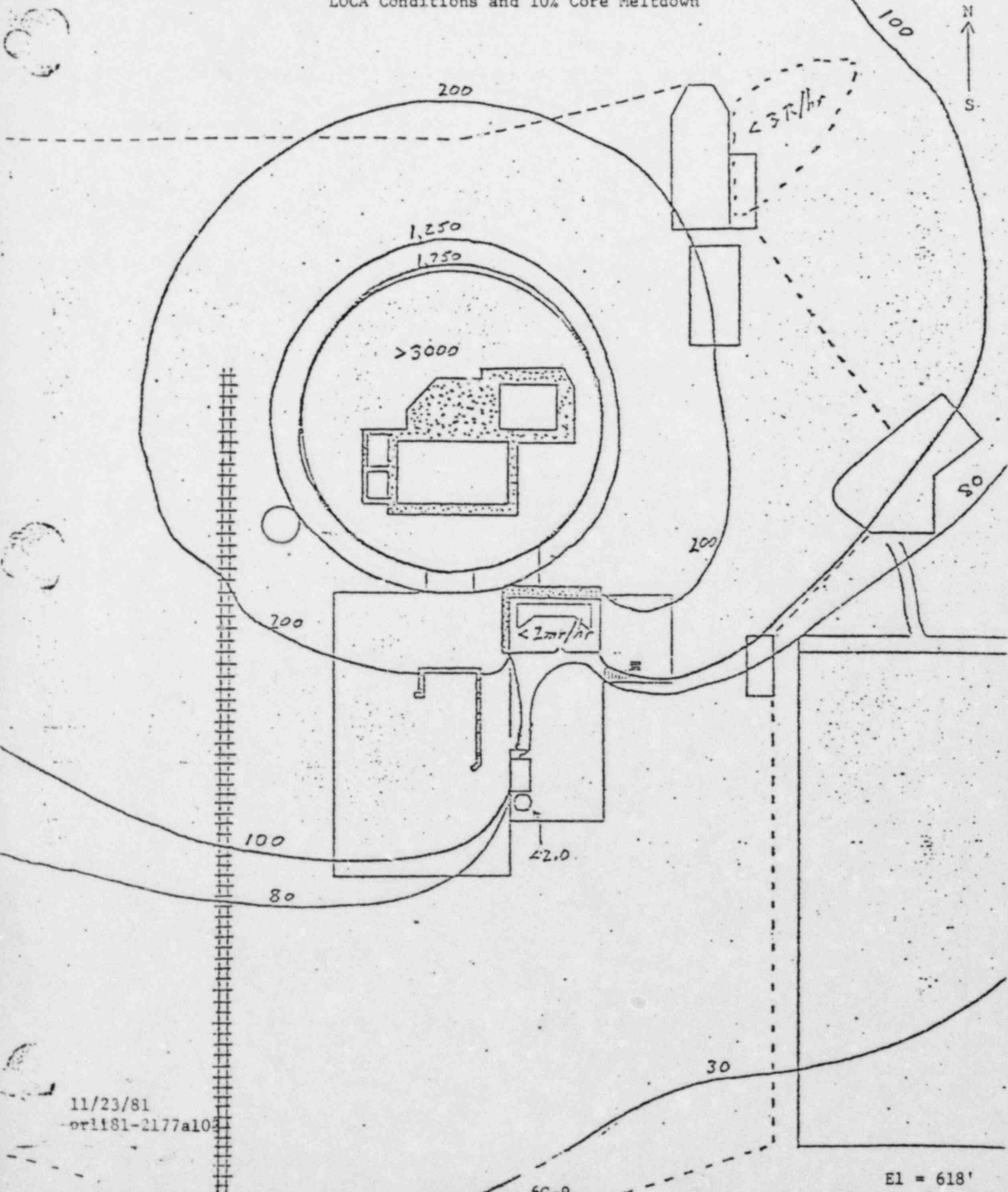
LOCA Conditions and 10% Core Meltdown



EXPECTED DOSE RATES

t = 0-3 Hours  
(Rad/Hour)

LOCA Conditions and 10% Core Meltdown

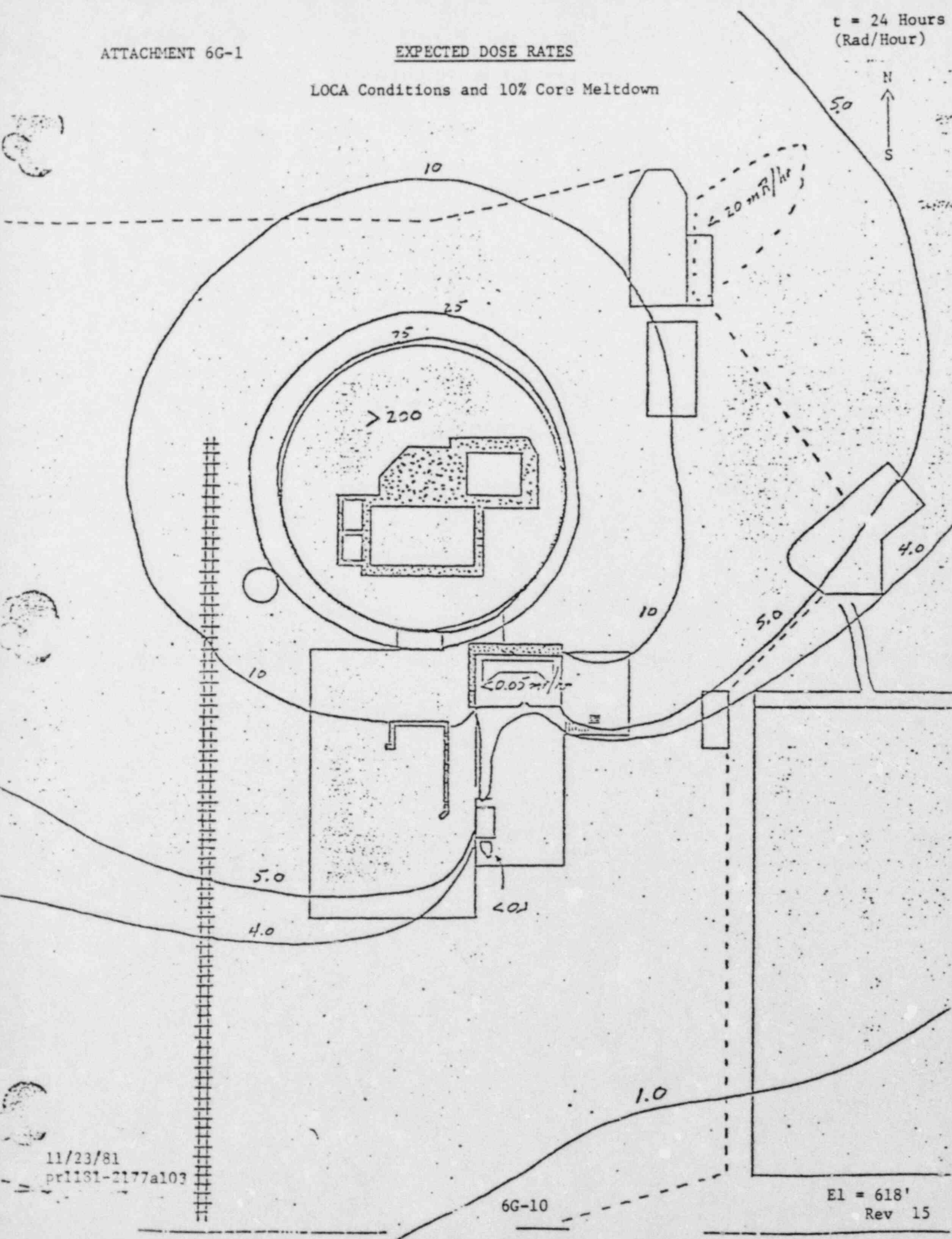


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or1181-2177a10

EXPECTED DOSE RATES

LOCA Conditions and 10% Core Meltdown

t = 24 Hours  
(Rad/Hour)

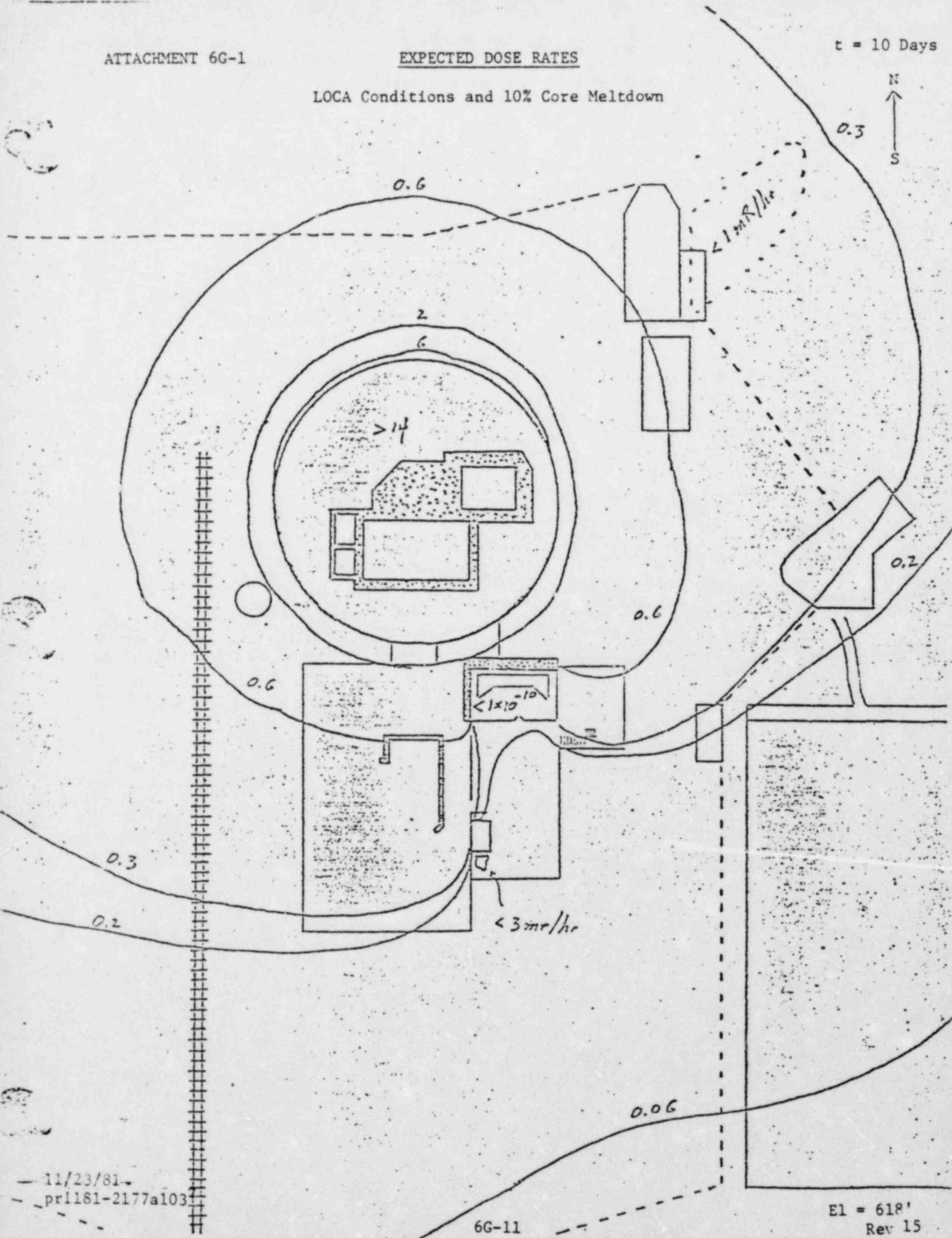


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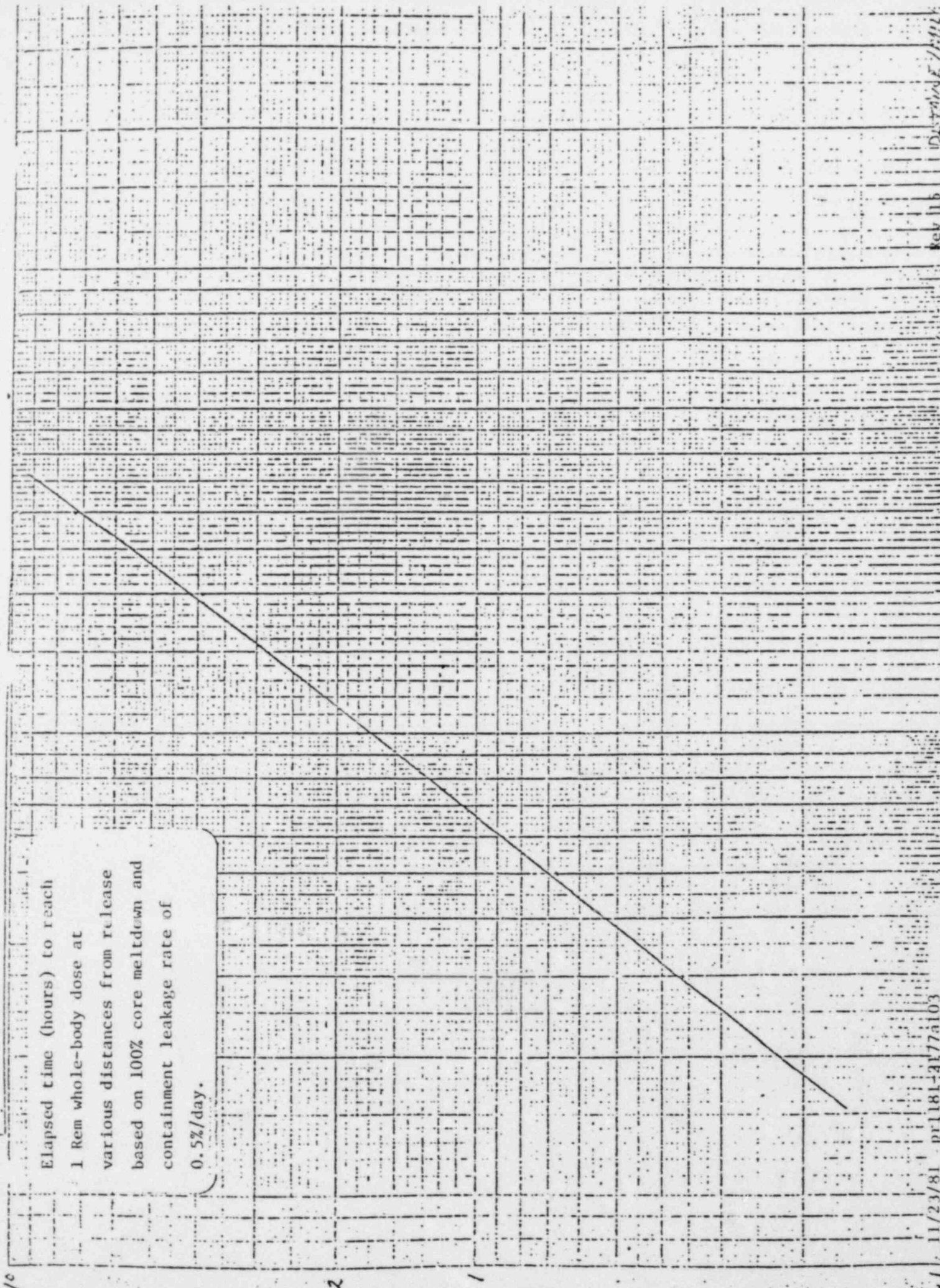
6G-10

E1 = 618'  
Rev 15

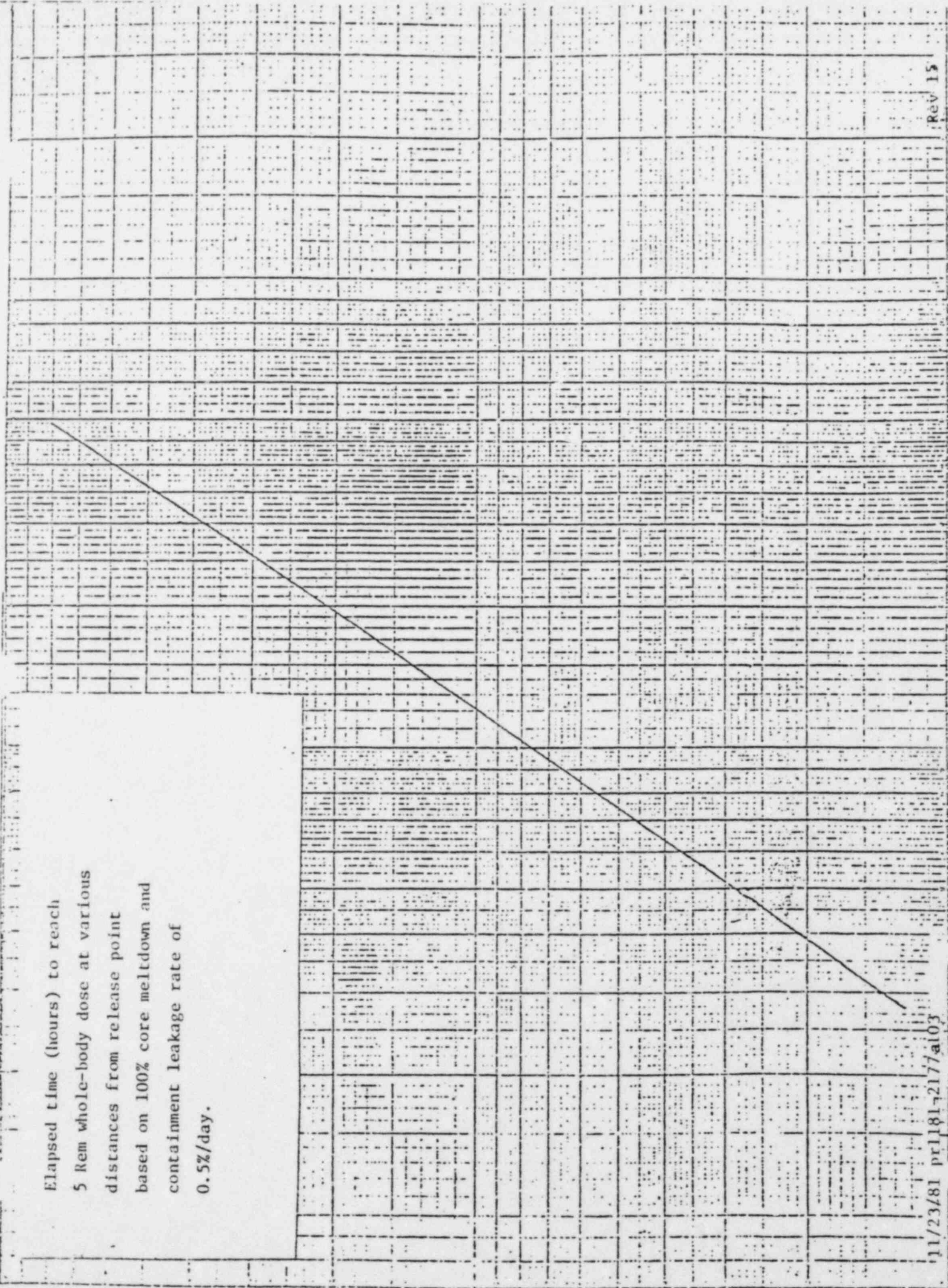
LOCA Conditions and 10% Core Meltdown



Elapsed time (hours) to reach  
 1 Rem whole-body dose at  
 various distances from release  
 based on 100% core meltdown and  
 containment leakage rate of  
 0.5%/day.



Elapsed time (hours) to reach  
5 Rem whole-body dose at various  
distances from release point  
based on 100% core meltdown and  
containment leakage rate of  
0.5%/day.





Elapsed time (hours) to reach  
25 Rem whole-body dose at  
various distances from release  
point based on 100% core meltdown  
and containment leakage rate of  
0.5%/day.

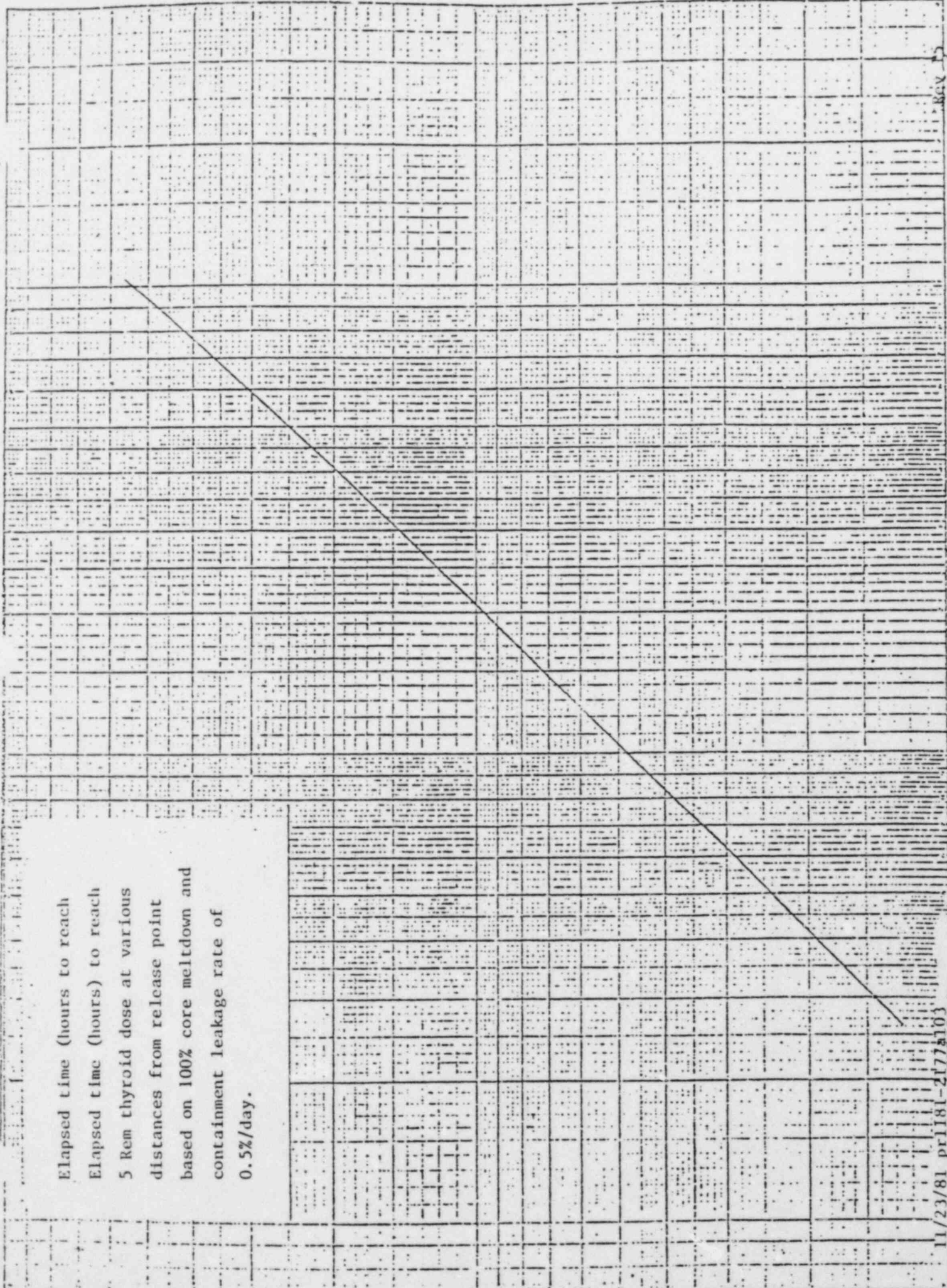
HOURS

10

LI/23/81 pr1181-2177a US

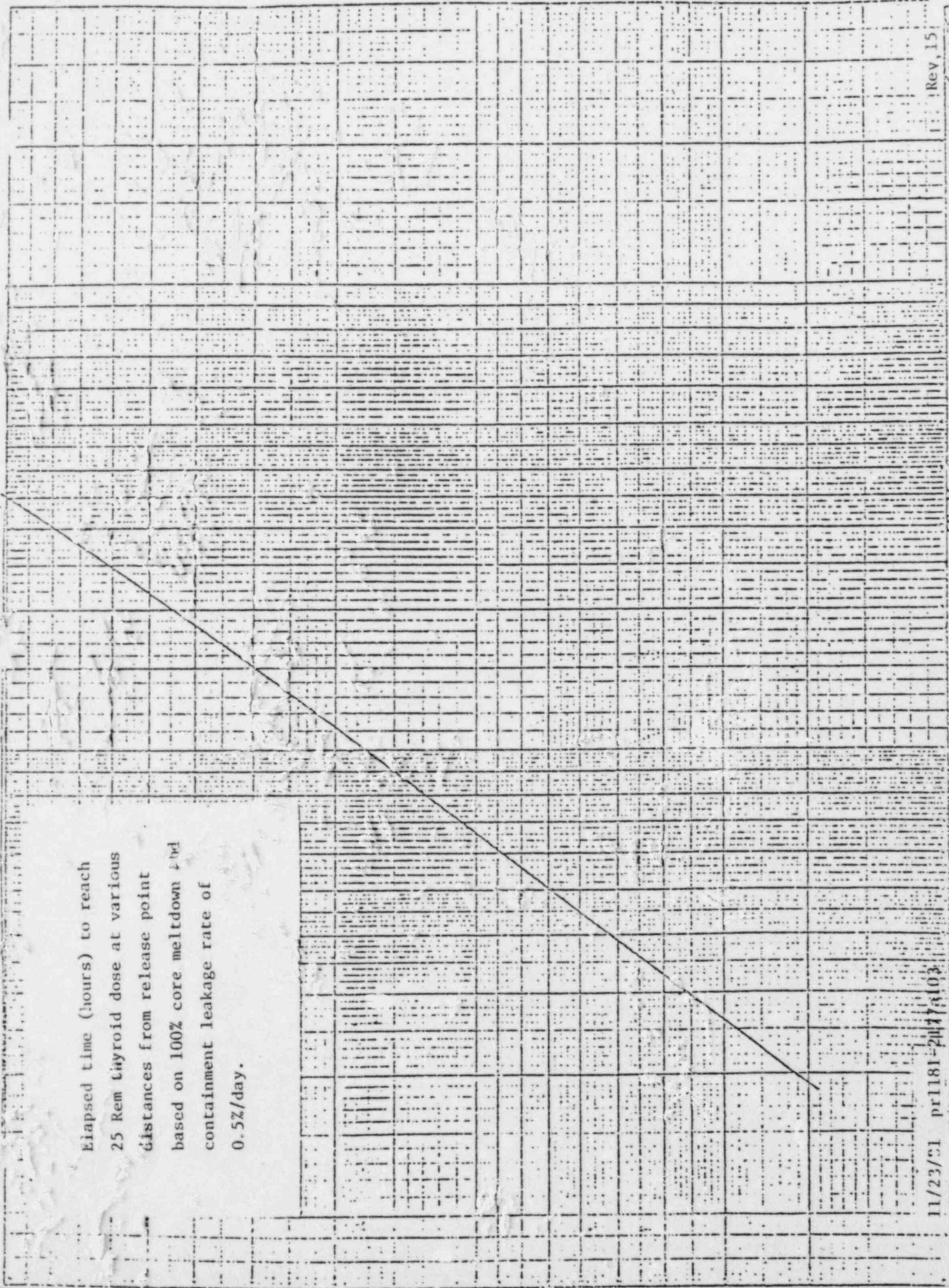
DISTANCE / MILES

Elapsed time (hours) to reach  
 Elapsed time (hours) to reach  
 5 Rem thyroid dose at various  
 distances from release point  
 based on 100% core meltdown and  
 containment leakage rate of  
 0.5%/day.



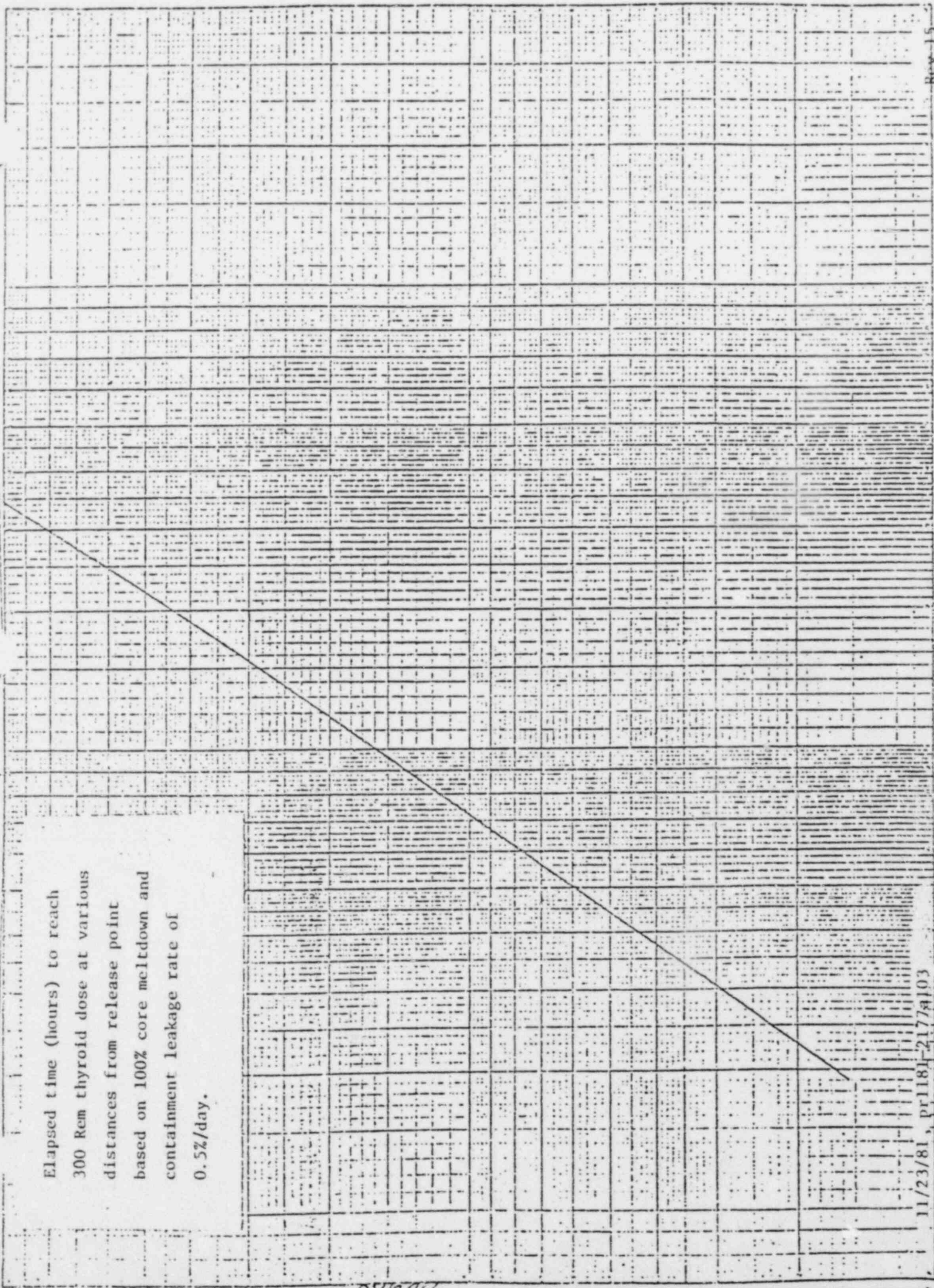
HOURS

Elapsed time (hours) to reach  
25 Rem thyroid dose at various  
distances from release point  
based on 100% core meltdown and  
containment leakage rate of  
0.5%/day.



Elapsed time (hours) to reach  
150 Rem thyroid dose at various  
distances from release point  
based on 100% core meltdown and  
containment leakage rate of  
0.5%/day.

Elapsed time (hours) to reach  
300 Rem thyroid dose at various  
distances from release point  
based on 100% core meltdown and  
containment leakage rate of  
0.5%/day.

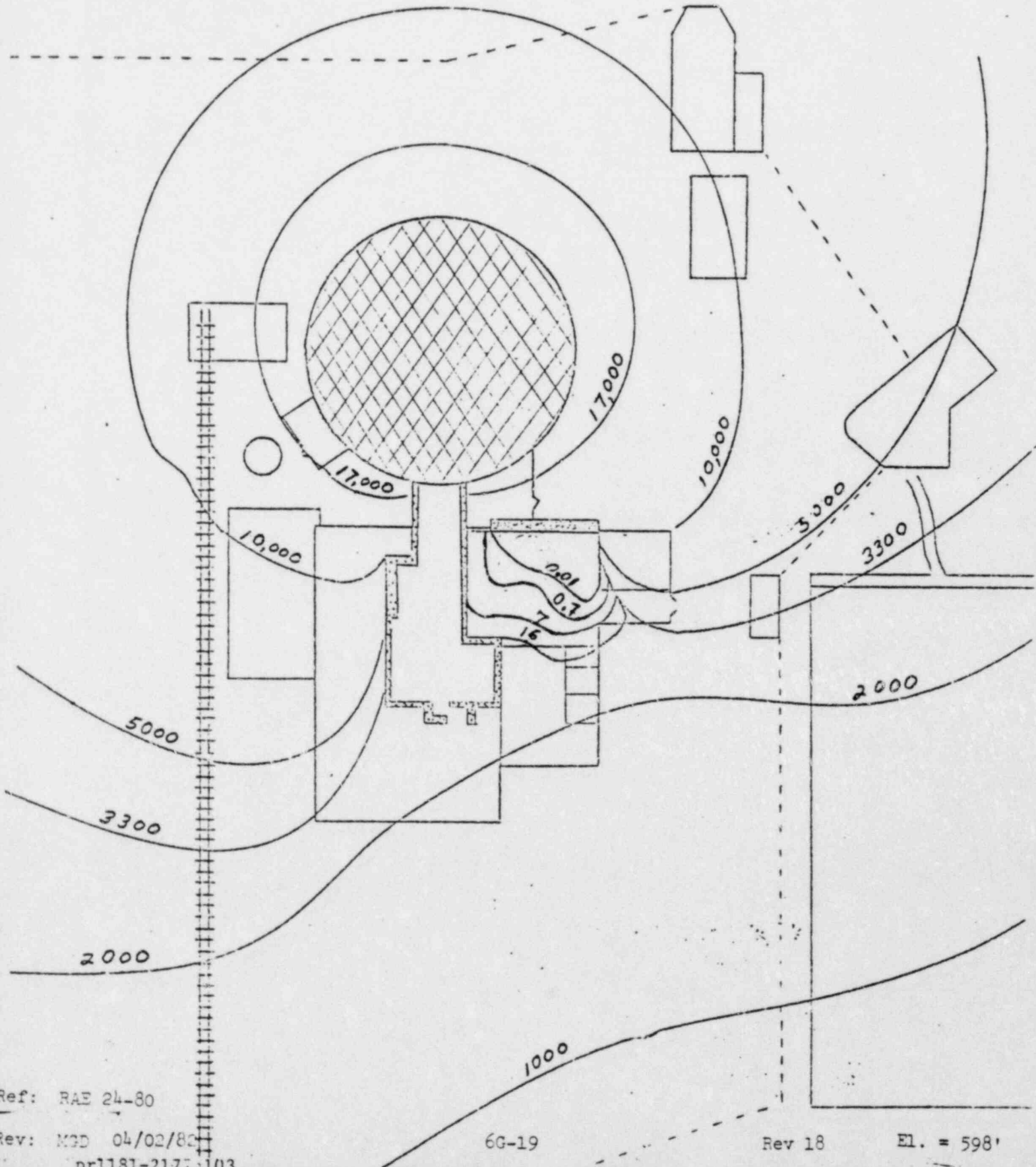


"BIG ROCK POINT -

R/hr @ T = 0

Attachment 3

PREDICTED RADIATION LEVELS AT t = 0 HOURS  
FOLLOWING AN ACCIDENT WITH FISSION PRODUCT  
FRACTIONS OF 100% NOBLE GASES AND 25%  
HALOGENS IN CONTAINMENT ATMOSPHERE"



Ref: RAE 24-80

Rev: MSD 04/02/80

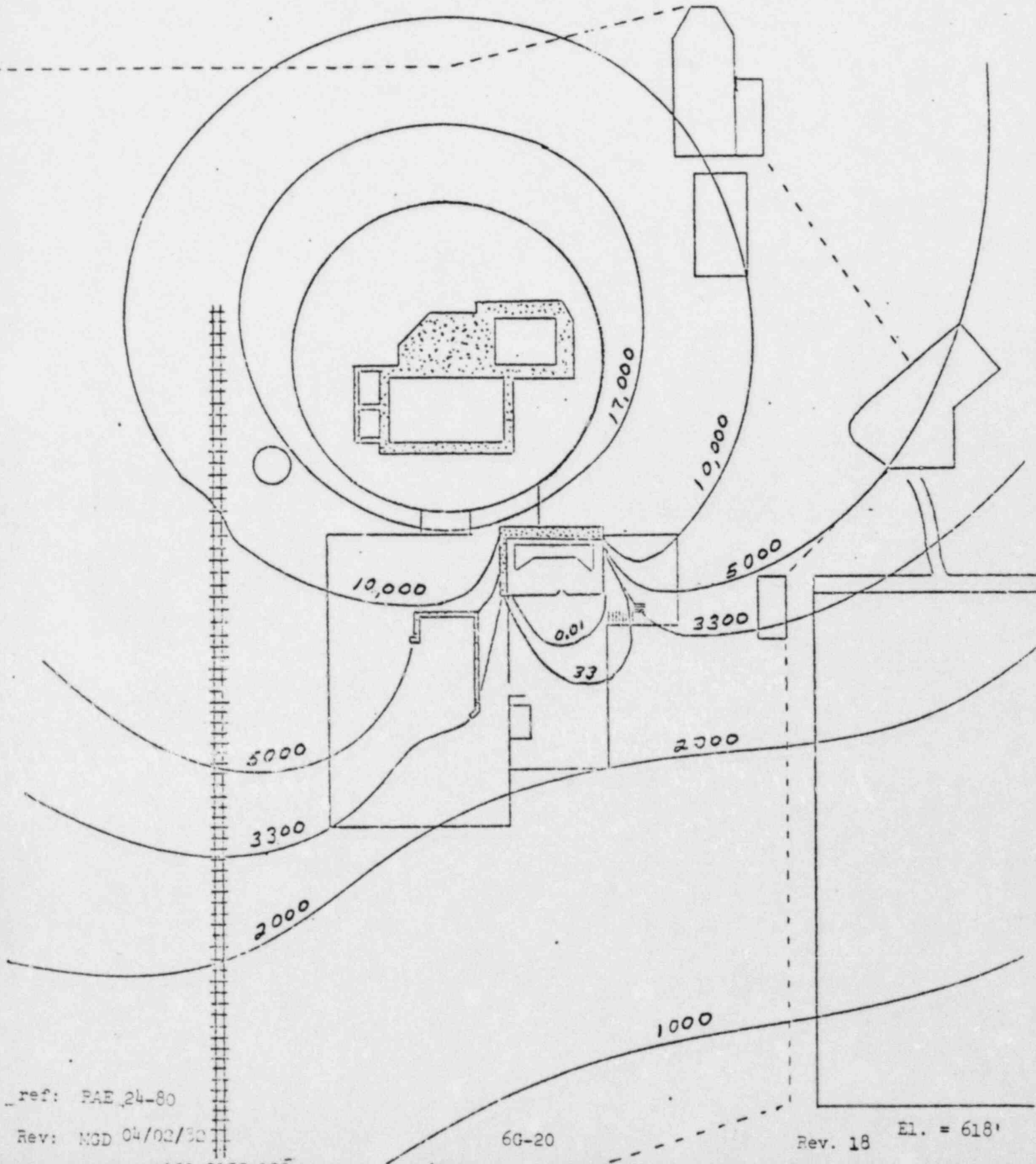
pr1181-2177:103

6G-19

Rev 18

El. = 598'

PREDICTED RADIATION LEVELS AT  $t = 0$  HOURS  
FOLLOWING AN ACCIDENT WITH FISSION PRODUCT  
FRACTIONS OF 100% NOBLE GASES AND 25%  
HALOGENS IN CONTAINMENT ATMOSPHERE"



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Emergency Plan Implementing Procedure 6G-2  
 ATTACHMENT 4

DOSE RATES AT DISTANCE EQUAL TO 150 FEET  
FROM CENTER OF CONTAINMENT AT T=0

Time Post LOCA (Hrs)	Dose Rates (R/hr) for Various Concrete Shield Thicknesses					
	(0.0 Ft)	(0.25 Ft)	(0.5 Ft)	(1 Ft)	(2 Ft)	(4 Ft)
0	9,510	7,380	3,640	760	38.0	0.128
0.5	7,100	5,280	2,750	614	31.0	0.111
2.0	1,860	1,380	738	192	12.9	0.060
5.0	774	576	290	73.8	5.05	0.024
12.0	305	236	93.7	16.4	0.88	0.004
24.0	121	96.6	30.4	2.9	0.067	2.19E-04
120.0	8.17	6.75	2.48	0.253	0.002	4.85E-07
720.0	3.25	2.45	1.10	0.146	0.001	1.72E-07

Neglecting shielding from containment internal structures.

Computer Runs: RASTUS 5 #274 through #279  
 #286 through #327

NOTE: Origin source terms attached (Table II).

Revised: Date 7/18/80  
 By SBB/MGD  
 Document RAE 22-80



EMERGENCY DOSIMETRY  
Procedure 6H

1.0 PURPOSE

- 1.1 To provide guidelines for issuing emergency dosimetry to personnel who may be entering potentially affected areas during an emergency.

2.0 ATTACHMENTS

- 2.1 Attachment 1 - Emergency Dosimetry Record Form

3.1 INITIAL CONDITIONS AND/OR REQUIREMENTS

- 3.1 All personnel who must enter a potentially affected area or routinely controlled area within the plant must be issued emergency dosimetry.
- 3.2 All personnel on the on-site and off-site monitoring teams will be issued emergency dosimetry.
- 3.3 All off-site personnel reporting to the plant will be issued emergency dosimetry.

PROCEDURE

4.1 CONSUMERS POWER COMPANY PERSONNEL

- 4.1.1 All plant personnel performing emergency actions, which could result in the exceeding of the quarterly exposure limits will be issued a TLD badge and a self-reading pocket dosimeter (5R or 50R full scale).
- a. The emergency dosimetry will be issued through the Dosimetry Office if possible. If not, it will be issued from one of the Emergency Kits and recorded on Attachment 1.
- b. Emergency dosimetry will be collected immediately after completion of the emergency task. The self-reading pocket dosimeters will be read immediately and recorded. The TLD badges will be processed at the CPCo corporate office as soon as possible and the results compared with the pocket dosimeter readings.
- c. Any cases of overexposure will be immediately reported to the Plant Health Physicist and Site Emergency

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Director. Treatment will be provided in accordance with EPIP 6E.

- d. The General Office Dosimetry Section can replenish the dosimetry supplies within a few hours.

4.2 OFF-SITE SUPPORT GROUPS

- 4.2.1 Off-site support personnel (fire, ambulance, law enforcement) responding during emergencies will be issued dosimetry following normal procedures.
- 4.2.2 If conditions prevent such routine issue, these off-site emergency support personnel will be issued dosimetry from Emergency Kits.
- 4.2.3 This dosimetry will be collected, read, and recorded. Any instances of doses exceeding quarterly exposure limits will be immediately reported to the Plant Health Physicist.

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Attachment 1 - Emergency Dosimetry Record

Name	SS #	Date/Time	Dosimeter Out	Dosimeter In	Total	TLD #	Record	Remarks

TRAINING AND DRILLS  
Procedure 6I

1.0 PURPOSE

- 1.1 To ensure the personnel responding to an emergency condition at Big Rock Point have been adequately trained and/or retrained utilizing any or all of the instructional techniques listed below:
  - 1.1.1 Classroom instruction
  - 1.1.2 Walk-through presentations
  - 1.1.3 Drills and/or exercises
  - 1.1.4 Tabletop discussions
- 1.2 To describe the drill and exercise requirements and objectives.

2.0 REFERENCES

- 2.1 Big Rock Point Plant Site Emergency Plan.
- 2.2 NUREG-0654/FEMA-REP-1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Revision 1, published November 1980.

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 All Big Rock personnel will receive training in the Site Emergency Plan (SEP) and the Emergency Plan Implementing Procedures (EPIP) to ensure their safety in the event of an emergency condition at the Plant (Attachment 1).
- 3.2 Plant personnel will be informed of changes to the SEP and EPIP by the Emergency Planning Coordinator via the scheduled safety meetings during the annual training sessions or other appropriate training sessions.
- 3.3 Personnel assigned functions in the emergency response will receive further training appropriate to their assignment.
- 3.4 The Nuclear Training Coordinator is responsible for coordinating this training. Specialty training may be delegated to persons qualified to conduct the training.

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- 3.5 An understanding of the emergency plan will be proven by satisfactory completion (>70%) of a written test upon completion of the training session.
- 3.6 An independent review of the emergency preparedness program will be conducted on an annual basis by a competent organization, either internal or external to CPCo, which is not immediately responsible for the program.

The review will include the plan and procedures, training, drills and exercises, equipment, and interfaces with off-site groups. The results of the review will be forwarded to the Plant Health Physicist, Plant Review Committee, Plant Superintendent, Nuclear Safety Technical Engineer, and cognizant General Office personnel. The documented review and recommended courses of corrective action will be maintained for at least five years.

4.0 PREREQUISITES

4.1 None.

5.0 PROCEDURE

5.1 TRAINING - EMERGENCY RESPONSE PERSONNEL

5.1.1 Emergency direction personnel, in addition to participating in the drills and exercises, will attend at least once per year a training session including, but not limited to, the following topics:

- a. Duties and responsibilities
- b. Public relations
- c. Dose assessment
- d. Health physics
- e. Emergency organizations
- f. Classification system
- g. Notification and communication systems and methods
- h. Emergency team leadership
- i. Site Emergency Plan

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- 5.1.2 Accident assessment personnel will attend at least one training session per year to receive training on the Site Emergency Plan and SEP Implementing Procedures. Detailed instruction will be given in the methods used to determine the projected whole body and thyroid dose, release rate determination and stability class determination.
- 5.1.3 The security force will, on an annual basis, be trained on the following subjects, as a minimum:
  - a. Emergency communications
  - b. Emergency classification system
  - c. Personnel accountability
  - d. Personnel and vehicle access control
  - e. Evacuation control
  - f. Interface with offsite support groups and organizations
- 5.1.4 Fire brigade training, given by qualified fire fighting instructors, will be conducted annually. As part of this training, fire brigade members will be trained in the hazards associated with fighting a radioactive fire or fighting a fire in a highly contaminated or high radiation area.
- 5.1.5 Radiological monitoring teams will be trained in their duties and responsibilities as radiological monitoring and assessment personnel, classifications of emergencies, personnel protection during emergencies, radiation protection concepts, survey procedures, location and use of emergency equipment, internal and external exposure/contamination determination techniques and personnel and vehicle decontamination techniques.
- 5.1.6 Members of the first-aid team shall receive the Red Cross Multimedia First-Aid Course (two-year certification) and the American Heart Association Cardiopulmonary Resuscitation Course. The training shall include:
  - a. Special hazards that exist during radiological emergencies,
  - b. Techniques for handling contaminated patients, and
  - c. Techniques for monitoring and decontamination.

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- 5.1.7 Repair and damage control personnel will receive specialized training in radiation exposure control and radiological work practices in addition to the normal SEP/EPIP training.
- 5.1.8 All Big Rock Point employees will receive, on an annual basis, training/retraining in the elements of the SEP and those SEP Implementing Procedures that affect them. If a person is assigned a position in the emergency organization, that person will receive the training that pertains to that position.

5.2 TRAINING - OFFSITE SUPPORT GROUP

- 5.2.1 At least annually, outside agencies who may provide radiation monitoring teams shall be invited to participate in a training session pertaining to Big Rock Point. The purpose of this training is to emphasize the importance of prior planning and demonstrate the interface between CP Co and offsite emergency organizations. The training session shall include the following topics:
  - a. Site Emergency Plan and Implementing Procedures
  - b. Classification of emergencies
  - c. Reporting requirements
  - d. Assessment, protective and corrective actions
  - e. Communications
  - f. Dose calculations/projections
  - g. Protective Action Guides
- 5.2.2 Certain offsite medical organizations and physicians will receive training that will, as a minimum and as applicable, include the following:
  - a. Access control during emergencies
  - b. Facility layout
  - c. Radiological aspects of emergency medical treatment
  - d. Support hospital radiological emergency procedures
  - e. Handling and care of contaminated patients
  - f. Decontamination of contaminated patients

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- g. Communications systems (hospital to site, hospital to ambulance, ambulance to site)

5.2.3 The local fire departments will also be invited to participate in a training program that includes the following as a minimum:

- a. Access control during emergencies
- b. The onsite fire protection system
- c. Respiratory protection procedures
- d. Basic health physics
- e. Facility layout
- f. Overview of the Site Emergency Plan and SEP Implementing Procedures
- g. Hazards of fighting a fire with radiological implications

### 5.3 TRAINING - NEWS MEDIA

5.3.1 Annually, emergency plan training will be offered to the local news media.

5.3.2 Topics covered shall include, but shall not be limited to:

- a. Concepts of emergency planning
- b. Site Emergency Plan and Implementing Procedures
- c. Basic health physics and radiation protection
- d. Emergency plan interrelationships
- e. Joint public information center procedures
- f. Consumers Power information contacts during emergencies
- g. Protective actions to be taken for the public
- h. Big Rock Point Public Warning System

### 5.4 DRILLS



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- 5.4.1 Drills are conducted periodically to meet the following objectives:
- a. Ensure participants are familiar with their duties and responsibilities
  - b. Verify the adequacy of the Site Emergency Plan and Implementing Procedures
  - c. Test communication networks and systems
  - d. Check the availability and operability of emergency equipment and supplies.
- 5.4.2 The Emergency Planning Coordinator will plan, coordinate and schedule emergency planning related drills. The emergency planning drills will be approved by the Plant Superintendent.
- 5.4.3 Communications drills will be conducted in accordance with the following schedule:
- a. Monthly between the Site, State and Charlevoix County in the plume exposure pathway
  - b. Quarterly between the Site and Federal emergency response organizations
  - c. Annually between the Site, State and local emergency operations centers and field assessment teams
- 5.4.4 Fire drills shall be conducted as follows:
- a. At least once per calendar quarter
  - b. At least one fire drill per year shall involve at least one of the local fire departments
- 5.4.5 Medical emergency drills shall be conducted at least once per calendar year. The drill shall involve the participation of the site first-aid team and the local medical support organizations and personnel. The drill may involve cases of radiation overexposure, contaminated personnel and/or contaminated/injured personnel.
- 5.4.6 Plant environmental and radiological drills shall be conducted annually. The drill shall involve the collection and analysis of all sample media, and shall have provisions for communications and record keeping.

5.4.7 Health Physics drills shall be conducted as follows:

- a. Semiannually drills will be conducted which involve the response to and analysis of simulated high activity airborne and liquid samples and elevated measurements of radiation levels in the environment.
- b. Annually drills will be conducted which involve actual elevated radiation levels and actual use of the post-accident sampling system.

5.5 EXERCISE AND MAJOR DRILLS

- 5.5.1 Exercises are conducted periodically to notify the emergency preparedness of all participating personnel, organizations and agencies. Major drills are conducted to evaluate the emergency preparedness of Consumers Power Company.
- 5.5.2 The Emergency Planning Coordinator shall plan, schedule and coordinate all exercises. The Plant Superintendent shall approve, prior to use, all exercises with the exception of the annual Radiation Emergency Drill which shall be approved by Vice President of Nuclear Operations.
- 5.5.3 Prior to the exercise/major drill, the following should be performed:
  - a. Determine the objectives.
  - b. Prepare the exercise/major drill scenario (Section 5 of this procedure).
  - c. Commence coordination of personnel, organizations and agencies that will be involved.
  - d. Determine the date and time of the exercise/major drill and inform the involved parties.
  - e. Submit the exercise/major drill objectives and scenario to the Plant Superintendent and/or Vice President of Nuclear Operations for review and approval.
  - f. Assign observers and complete the Observer Assignment Sheet (Attachment 2).

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- 5.5.4 Immediately prior to the exercise/major drill the following shall be performed:
- a. Brief all observers on the objectives of the exercise/major drill and the scenario.
  - b. Distribute the Exercise Evaluation Criteria (Attachment 3) and message forms.
  - c. Allow exercise/drill observers sufficient time to reach their assigned observation location.
- 5.5.5 After the exercise/major drill has been completed, perform the following:
- a. Critique the exercise/major drill. Each observer should use their exercise evaluation checklist and describe any major deficiencies.
  - b. Utilizing the information from the verbal critique and the exercise evaluation checklists, prepare a formal report which includes all deficiencies (Section 5.6).
  - c. Assign personnel to correct the deficiencies.
  - d. Verify deficiencies have been corrected.
  - e. Submit, to the Training Supervisor, documentation for the training conducted, personnel involved in the evaluation and the observers assigned.
- 5.5.6 An exercise of the Site Area Emergency or General Emergency classification shall be conducted annually. This exercise shall be conducted so all plans and response organizations are tested within a five-year period. The exercises shall be scheduled such that once every six years an exercise is held between 6:00 PM and 12:00 AM and another between 12:00 AM and 6:00 AM.

5.6 DRILL/EXERCISE REPORTING

- 5.6.1 Upon completion of a drill/exercise, the Emergency Planning Coordinator shall prepare a report for submission to the Plant Health Physicist.
- 5.6.2 The report shall contain as a minimum:
- a. The scenario for the drill/exercise

- b. A compilation of the Observer Evaluation Checklists
- c. A description of the deficiencies noted during the drill/exercise
- d. Personnel assigned to correct the deficiencies
- e. Recommendations pertaining to the Site Emergency Plan, Implementing Procedures or emergency equipment and supplies.

5.6.3 The Plant Health Physicist will forward the report to the Plant Superintendent and Plant Review Committee for comments.

5.6.4 Recommended changes that are approved by the Plant Superintendent will be implemented by the Emergency Planning Coordinator.

#### 5.7 DRILL/EXERCISE SCENARIO PREPARATION

5.7.1 Drill/exercise scenarios shall be prepared to simulate, as closely as possible, actual emergency operational conditions.

5.7.2 It is permissible to prepare scenarios that involve several emergency teams and all or part of the onsite and offsite emergency organizations.

5.7.3 The annual radiation emergency drill should progress through at least three of the four emergency classifications and allow for deescalation of the final classification to allow involvement of the recovery organization.

5.7.4 Message forms (Attachment 4) shall be utilized to inform the emergency organization of the steps in the drill/exercise. Message forms should be distributed at intervals of no longer than 30 minutes.

5.7.5 The scenario shall list all initiating conditions expected throughout the course of the drill/exercise.

5.7.6 Message forms shall also be utilized for tabletop discussions.

ATTACHMENT 1  
Emergency Plan Training

Emergency Plan Training Groups Index

<u>Group 1</u> (3 Hours)	Operations Personnel - Shift Supervisors, Reactor Operators, Auxiliary Operators, Shift Technical Advisors Modules: 1, 2, 3, 4, 5, 6, 7, All Procedures
<u>Group 2</u> (3 Hours)	Management, Supervisory and Emergency Personnel - Emergency Planning Coordinator, TSC Staff, EOF Staff, OSC Staff Training Supervisor Modules: 1, 2, 3, 4, 5, 6, 7, All Procedures
<u>Group 3</u> (2 Hours)	Maintenance and I & C Modules: 1, 2, 3,
<u>Group 4</u> (2 Hours)	Personnel Not Part of the Emergency Organization Modules: 1, 2, 3
<u>Group 5</u> (2 Hours)	Security Modules: 1, 2, 3 Procedures 4R, 4S, 4T
<u>Group 6</u> (3 hours)	Health Physics Personnel Modules 1, 2, 3, 4, 5, 6, Procedure 5

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Emergency Plan Training Modules and Topics

Module 1

Introduction to Emergency Planning  
Big Rock Point Emergency Organization  
Off-site CPCo Emergency Organization  
Michigan Emergency Organization  
County Emergency Organization  
Responding Federal Agencies

Module 2

Emergency Classifications  
Emergency Plan Notification Procedures  
CPCo Emergency facilities  
a. Technical Support Center  
b. Operations Support Center  
c. Emergency Operations Facility  
Emergency Communication Systems  
Emergency Equipment and Supplies

Module 3

Accountability/Evacuation/Reassembly  
Health Physics/Radiation Protection

Module 4

Onsite Radiological Monitoring - non-specific  
Offsite Radiation Monitoring - non-specific  
Dose Assessment  
Environmental Assessment  
Protective Actions for Public

Module 5

First Aid/Medical  
Entry/Exit Procedures During Emergencies  
Principles of Nuclear Power Plant Fire Protection

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Module 6

Reentry/Recovery

Module 7

Public Affairs Procedures

ATTACHMENT 2  
Drill/Exercise Observer Assignment Sheet

Drill/Exercise Type \_\_\_\_\_

Date \_\_\_\_\_

	<u>Area of Responsibility</u>	<u>Observer</u>
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		



ATTACHMENT 3  
Exercise Evaluation Criteria

GENERAL PROCEDURES

1. Each evaluator has been furnished and should be familiar with:
  - a. General Emergency Preparedness Exercise Objectives.
  - b. The Specific Objectives to test the Big Rock Point Plant, Charlevoix County, and Michigan Preparedness Plans as they pertain to the area being surveyed.
  - c. The exercise scenario, initiating events and expected courses of action to be undertaken.
2. For each area to be surveyed the following has been prepared and distributed to the evaluators.
  - a. A summary and description of the area's location, emergency mission, and personnel and their emergency responsibilities.
3. Evaluators will be at their assigned posts between 30 and 45 minutes prior to the commencement of the exercise, even though the area being evaluated may not be activated until later in the exercise.
4. If evaluators are to provide information (initiating events, instrumentation readings, environmental monitoring results, etc) to the exercise participants, the information must be provided exactly as prescribed and exactly when prescribed. Failure to provide the information appropriately may invalidate the results of the exercise.
5. A Chronological Record must be kept for areas surveyed. The record will show the actual time, the event or occurrence, the result or action taken, and elapsed time and pertinent comments.
6. Evaluators should offer no information, advice or assistance to the drill participants. Any such requests should be respectfully declined. Evaluators will only interpose themselves if the evaluatees are taking an action that will cause the exercise to go far afield of the anticipated time schedule and/or outcome. Examples of problems requiring such interpositions may include: a dose calculation/projection that is so grossly inaccurate that an action level other than the one postulated for the scenario would be instituted; an activity that is taking so much longer than predicted that the exercise scenario is in danger of not progressing as postulated.

Performance Evaluation Criteria

To ensure validity of the evaluation, all exercise evaluators must utilize the same grading criteria. The following grading standards should be utilized.

1. Recording Times of Actions

- a. For grading purposes, it will be assumed that onsite personnel have been alerted when the emergency siren is sounded.
- b. For calculating elapsed time, evaluators will be given the actual time the exercise is initiated. This will be T = 0 on all reports. All elapsed time calculations will be based on this time, regardless of when the separate evaluated activities are initiated.
- c. An EOF or other activity will be deemed to be in service when its personnel accountability check is completed and reported or when the EOF has sufficient manpower present to carry out its mission.
- d. The "Chronological Events Summary" should be the primary evaluation record; it is intended to be used to complete the evaluation form upon completion of the activity. The form calls for the actual time, the initiating event, the resultant activity, and evaluator comments and the elapsed drill time (T = ?).

2. Evaluation Standards

- a. Excellent: Personnel and equipment always functioned without error the first time, every time. There were no problems encountered, and all personnel and equipment functioned at a level much greater than could be anticipated.
- b. Good: Personnel and equipment generally performed better than expectations. Any errors or problems were minor and easily correctable.
- c. Satisfactory: Personnel and/or equipment performed according to expectations, with some minor exceptions. Any errors noted were not severe and could be corrected without undue labor and/or expense.
- d. Poor: Personnel and/or equipment generally performed below expectations and/or there were several significant deficiencies noted. The area's ability to carry out its mission was diminished.
- e. Fail: Personnel and/or equipment consistently failed to perform as required and/or there were serious deficiencies noted which severely impaired the ability of the area to carry out its mission.

3. Categories for Evaluation

a. Access and Evaluate - Mission Performance

- (1) Command Functions - did the area carry out its mission of directing the activities of other components?
- (2) Assessment and Evaluation - was information promptly and correctly received, assessed and evaluated?
- (3) Did personnel know and carry out their duties with efficiency and without undue direction?
- (4) Did the area establish and maintain communications with other components? Was the information received and/or transmitted accurate, concise, appropriate and timely?
- (5) Was the record keeping system designed and implemented to record significant events and actions for further use?

b. Assess and Evaluate - Facilities and Equipment

- (1) Physical Facilities: Was the area utilized appropriate by virtue of its size and location? Was there enough furniture, ventilation, restrooms, office supplies, etc, to support the mission? Could the area support the personnel assigned to it?
- (2) Rescue Materials: Were the resource materials readily available to assess the emergency situation and to plan corrective actions - maps, reference books, copies of emergency plans and procedures?
- (3) Communications Equipment: Was the onsite, offsite and connecting communications equipment adequate in quantity, operability and availability? Did personnel know how to utilize the equipment efficiently?
- (4) Emergency Equipment: Was emergency equipment readily available, completely operable, appropriate to the task or situation, and did personnel know how to use it efficiently? Emergency equipment includes: portable environmental monitoring equipment; personal protective equipment - clothing, respirators; decontamination supplies and equipment; first-aid and fire fighting equipment; and communications equipment.
- (5) Personnel Quantity: Were there enough trained personnel to carry out the mission? Too few? Too many?

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- (6) Area Access Control: Did all assigned personnel respond to their areas promptly and stay in assigned area for the duration of the exercise? Was the area secured against unauthorized persons being present?
- (7) Record Keeping: Was all data accurately recorded and maintained in a systematic readily retrievable manner for further reference?

c. Interface With Other Areas and Groups

Although this is not specifically addressed on all evaluation forms, obviously it is an item of extreme importance. An area that performs its own mission satisfactorily but that does not interface adequately with other areas, has not performed in an overall satisfactory manner. Any deficiencies noted in the areas interfacing with other areas should be noted. Such deficiencies may be due to inadequate communications hardware, organizational deficiencies, or inadequacies in plans and procedures.

4. Summary

- a. Describe any problems noted by the area being evaluated, a description of the problem, its outcome or effect, and any recommended corrective courses of action to mitigate or correct the deficiency.
- b. After completely filling out the evaluation form total up the actual number of points the area was awarded.
- c. The evaluator(s) is to sign the evaluation form and promptly return it as directed.
- d. A critique of the exercise will be held the following day with all participants, evaluators and NRC/FEMA observers present.

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Technical Support Center

\_\_\_\_\_  
 Evaluator

\_\_\_\_\_  
 Time Begun

\_\_\_\_\_  
 Time Ended

I. Establishment of TSC	<u>0-5</u>	<u>5-10</u>	<u>10-15</u>	<u>+15</u>
A. After the emergency was sounded how long did it take before:				
1. Site Emergency Director arrived	15	10	5	0
2. Other personnel arrive (personal acct)	15	10	5	0
3. Record keeping established	7	5	3	0
4. Offsite communications established (Jackson, NRC, Midland)	7	5	3	0
5. Onsite communications ESTABLISHED (control, security, OSC)	7	5	3	0
6. Personnel dispatched to EOF	7	6	5	3 (+20 = 0)
B. TSC Activation				
1. Was personnel accountability performed and reported?	Yes (5)		No (0)	
2. Was radiological survey made of the area (less than 100 mr/hr)?	Yes (5)		No (0)	

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II. How did the TSC carry out its:	<u>Excellent</u>	<u>Good</u>	<u>Satis</u>	<u>Poor</u>	<u>Fail</u>
A. Overall command functions	10	7	4	1	0
B. Assessment and evaluation functions	10	7	4	1	0
C. Control room support functions	10	7	4	1	0
D. Onsite communications	10	7	4	1	0
E. Offsite communications	10	7	4	1	0
F. First-aid coordination	5	4	3	1	0

III. Facilities

Rate of the adequacy of:	<u>Excellent</u>	<u>Good</u>	<u>Satis</u>	<u>Poor</u>	<u>Fail</u>
A. Physical facilities	10	7	4	1	0
B. Resource materials	10	7	4	1	0
C. Communications equipment	10	7	4	1	0
D. Emergency equipment	10	7	4	1	0
E. Personnel quantity	10	7	4	1	0
F. Area access control	10	7	4	1	0
G. Record keeping	10	7	4	1	0

IV. Mission Performance

	<u>No Problems</u>	<u>General Satis</u>	<u>Unsatis</u>
A. Did Site Emergency Director take and maintain control?	25	15	0
B. Did all assigned personnel know and carry out their duties?	25	15	0
C. Was information promptly and correctly assessed?	25	15	0
D. Were the corrective actions ordered prompt and appropriate?	25	15	0

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	<u>No Problems</u>	<u>General Satis</u>	<u>Unsatis</u>
E. Were communications established and maintained with offsite agencies adequately updated at 15-minute intervals?	25	10	0

V. Describe any problems noted with recommended corrective actions.

VI. Summary

<u>Area</u>	<u>Max Score</u>	<u>Min Score</u>	<u>Actual</u>
I	68	51	
II	55	23	
III	70	28	
IV	155	70	
Overall	308	172	

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Operations Support Center  
 General Exercise Evaluation Criteria

\_\_\_\_\_  
 Evaluator

\_\_\_\_\_  
 Time Begun

\_\_\_\_\_  
 Time Ended

I. OSC Activation

A. How long did it take after emergency was sounded for the OSC to become functional - ie, onsite personnel present?

0-5 min (20)

5-10 min (10)

10-15 min (5)

+15 min (0)

B. How long after notification did it take the OSC director to be on location and in charge?

0-10 min (10)

10-20 min (5)

+20 min (0)

C. Activation Procedures

1. Was radiation survey performed?                      Yes (5)                      No (0)

2. Was personnel accountability check performed and reported?                      Yes (5)                      No (0)

II.

Excellent    Good    Satis    Poor    Fail

A. Did assigned personnel know and carry out their assigned responsibilities?                      20                      15                      10                      5                      0



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	<u>Excellent</u>	<u>Good</u>	<u>Satis</u>	<u>Poor</u>	<u>Fail</u>
B. How did the OSC carry out its:					
1. Support functions	10	7	5	3	0
2. Assessment and evaluation	10	7	5	3	0
3. Onsite communications	10	7	5	3	0
4. Personnel control and accountability	10	7	5	3	0
III. Rate of the adequacy of:	<u>Excellent</u>	<u>Good</u>	<u>Satis</u>	<u>Poor</u>	<u>Fail</u>
A. Physical facilities	5	4	3	2	0
B. Resource materials	5	4	3	2	0
C. Communications equipment	5	4	3	2	0
D. Emergency equipment	5	4	3	2	0
E. Personnel quantity	5	4	3	2	0
F. Area access control	5	4	3	2	0
G. Recordkeeping	5	4	3	2	0
IV. Describe any problems noted with recommended corrective actions.					
V. Summary	<u>Area</u>	<u>Max Score</u>	<u>Min Score</u>	<u>Actual</u>	
	I	40	25		
	II	60	30		
	III	<u>35</u>	<u>21</u>		
	Total	135	76		

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Security Force  
 General Exercise Evaluation Criteria

I. How long after the emergency was sounded did it take for: (minutes)	<u>0-5</u>	<u>5-10</u>	<u>10-15</u>	<u>+15</u>	
A. Station Security Supervisor onsite	7	4	1	0	
B. Deputy Security Supervisor site	7	4	1	0	
C. Security Force assembled/accoun- ted	7	4	1	0	
D. Access Control established	7	4	1	0	
E. Immediate area checked for fishermen, etc	7	4	1	0	
F. Security Officer (2) dispatched to access road	7	4	1	0	
II. Did Security Force personnel know and correctly carry out their duties:	<u>Excellent</u>	<u>Good</u>	<u>Satis</u>	<u>Poor</u>	<u>Fail</u>
A. Overall	20	15	10	5	0
B. Access Control	15	10	7	3	0
C. Personnel Accountability Checks	15	10	7	3	0
D. Site Evaluation Procedures	20	15	10	5	0
E. Coordination with Offsite Emergency Response Personnel	10	7	5	2	0
III. Rate of the adequacy of:	<u>Excellent</u>	<u>Good</u>	<u>Satis</u>	<u>Poor</u>	<u>Fail</u>
A. Physical facilities	5	4	3	2	0
B. Resource materials	5	4	3	2	0
C. Communications equipment	5	4	3	2	0

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	<u>Excellent</u>	<u>Good</u>	<u>Satis</u>	<u>Poor</u>	<u>Fail</u>
D. Personnel quantity	5	4	3	2	0
E. Record keeping	10	7	4	1	0

IV. Describe any problems noted with recommended corrective actions.

V. Summary

<u>Area</u>	<u>Max Score</u>	<u>Min Score</u>	<u>Actual</u>
I	42	24	
II	80	39	
III	<u>25</u>	<u>15</u>	
Total	161	86	

First-Aid Team

- I. At what time was first-aid team notified? (T = 0 for first-aid team)
- II. At what time was first-aid team dispatched:
- T + 5 = 10
- 5 - 10 = 7
- 10 - 15 = 4
- +15 = 0
- III. At what time did first-aid team reach victim?
- IV. First Aid Procedure:
- A. Was radiological survey conducted prior to treatment? Y N \_\_\_\_\_
- B. Was primary body survey conducted immediately? Y N \_\_\_\_\_
- C. Was decontamination conducted prior to treatment? Y N \_\_\_\_\_
- D. Was secondary body survey conducted prior to treatment? Y N \_\_\_\_\_
- E. Were injuries correctly diagnosed and treated? Y N \_\_\_\_\_
- V. Transport Procedures
- A. Was ambulance requested promptly? Y N \_\_\_\_\_
- B. Was ambulance emergency kit utilized to protect crew and vehicle? Y N \_\_\_\_\_
- C. Was contamination control maintained on way to hospital? Y N \_\_\_\_\_
- D. Was portable air sampler picked up at access control? Y N \_\_\_\_\_
- VI. Hospital Procedures:
- A. Call-back for additional personnel Y N \_\_\_\_\_
- B. Evacuate treatment area Y N \_\_\_\_\_
- C. Remove/cover equipment in room Y N \_\_\_\_\_

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D. Assemble needed equipment	Y	N	_____
E. Assemble contamination control supplies	Y	N	_____
F. Cover floors between entrance and treatment	Y	N	_____
G. ER personnel in protective clothing	Y	N	_____
H. Decontamination procedures	Y	N	_____

VII. Evaluate	<u>Excellent</u>	<u>Good</u>	<u>Satis</u>	<u>Poor</u>	<u>Fail</u>
A. Personnel knew and carried out their responsibilities	20	15	10	5	0
B. Performance of first-aid treatment	5	4	3	2	0
C. Performance of contamination control	5	4	3	2	0
D. Performance of decontamination control	5	4	3	2	0
E. Adequacy of equipment	5	4	3	2	0
F. Adequacy of communications	5	4	3	2	0
G. Interface with ambulance crew	10	7	4	1	0
H. Interface with hospital	10	7	4	1	0

Summary: Maximum Points - 65  
 Minimum Points - 33  
 Actual Points -

First-Aid Scenario

	<u>Actual Time</u>	<u>Elapsed Time T+</u>	<u>Drill Time T+</u>
1. Time injured person introduced	_____	_____	_____
2. Time first-aid team alerted	_____	_____	_____
3. Time first-aid team dispatched	_____	_____	_____
4. Time first-aid team on scene	_____	_____	_____
5. Ambulance requested	_____	_____	_____
6. Hospital notified	_____	_____	_____
7. Victim moved to gate	_____	_____	_____
8. Victim loaded in ambulance	_____	_____	_____
9. Victim arrives at hospital	_____	_____	_____
10. Treatment initiated	_____	_____	_____
11. Treatment completed	_____	_____	_____
12. Decontamination initiated	_____	_____	_____
13. Decontamination completed	_____	_____	_____
14. All clear	_____	_____	_____

Note any problems encountered and recommend corrective actions:

\_\_\_\_\_  
 Evaluator

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Radiological Monitoring Teams

\_\_\_\_\_  
 Evaluator

\_\_\_\_\_  
 Time Begun

\_\_\_\_\_  
 Time Ended

I.	<u>0-5</u>	<u>5-10</u>	<u>10-15</u>	<u>+15</u>	
A. Activation - how long after the emergency was sounded did it take for					
1. Chemical and Rad Supervisor onsite	15	10	5	0	
2. Rad monitoring teams assembled	15	10	5	0	
B. At what time were:					
1. First in-plant survey reported?					
0-20 min =	20				
20-30 min =	7				
30-40 min =	3				
+40 min =	0				
2. First perimeter fence surveys reported?					
0-20 min =	10				
20-40 min =	7				
40-60 min =	3				
+60 min =	0				
II. Evaluate adequacy of:					
	<u>Excellent</u>	<u>Good</u>	<u>Satis</u>	<u>Poor</u>	<u>Fail</u>
A. Physical facilities	5	4	3	2	0
B. Resource materials	5	4	3	2	0

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	<u>Excellent</u>	<u>Good</u>	<u>Satis</u>	<u>Poor</u>	<u>Fail</u>
C. Onsite communications	5	4	3	2	0
D. Offsite communications	5	4	3	2	0
E. Portable equipment	5	4	3	2	0
F. Fixed instrumentation	5	4	3	2	0
G. Personnel quantity	5	4	3	2	0
H. Record keeping	5	4	3	2	0
III.	<u>Excellent</u>	<u>Good</u>	<u>Satis</u>	<u>Poor</u>	<u>Fail</u>
A. Appropriate direction and supervision by Radiological Assistant Coordinator	20	15	10	5	0
B. Appropriate direction and supervision by Assistant Health Physicist	20	15	10	5	0
C. Did personnel know and carry out their duties?	20	15	10	5	0
D. Was information promptly and accurately transmitted to HP	20	15	10	5	0
E. Coordination with each other rad monitoring team	20	15	10	5	0
IV. Technical Evaluation:					
A. Did personnel know location and use of equipment?	10	7	4	1	0



ATTACHMENT 4  
Sample Exercise Message Form

MESSAGE FOR: Reentry Team

SIMULATED PLANT CONDITIONS:

MESSAGE:

"Airborne levels on the 412' elevation are:

Iodine -  $3 \times 10^{-8}$   $\mu\text{Ci/cc}$

Noble gas -  $4 \times 10^{-7}$   $\mu\text{Ci/cc}$

Loose surface contamination in most areas is in excess of 2,000,000 DPM/100  $\text{cm}^2$ ."

---

CONTROLLER/OBSERVER NOTES:

1. Ensure air sample is properly taken
2. Ensure smears are properly taken.
3. Ensure samples are retained.
4. Ensure maps are used.

ACTION EXPECTED:

1. Air Sample Drawn.
2. Smear Survey performed.

GENERAL OFFICE NUCLEAR EMERGENCY IMPLEMENTING PROCEDURES  
Procedure 7A

In addition to the Technical Support Center (on-site) and the Emergency Operations Facility (Boyer City), there is also the General Office Emergency Control Center located at the Parnall Building. This Facility will be set up, as described by the General Office Nuclear Emergency Implementing Procedures, in the event of a general or site emergency. A copy of the General Office procedures can be found in the Technical Support Center.

The General Office Emergency Control Center is responsible for the following:

1. Provide support for the Technical Support Center.
2. Relieve the plant staff from activities that might interfere with their effort to control the emergency.
3. Provide a separate means of verifying the plant's notification of local, State, and Federal agencies and their responses.