Internal Correspondence

NSP

Date February 18, 1983

From G. D. Mathiasen Location Monticello

To Special Distribution of Emergency Procedures Location Various

Subject Revised Procedures for Emergency Procedures Book

Revisions to the Emergency Procedures were reviewed in a recent Operations Committee Meeting. Listed below are the procedures superseded and revised. Other pages not revised may have been reprinted with the revised pages to facilitate updating the Book.

Superseded Pages

Procedure A.2-001 (Pages 1 through 28), Revision 4
Procedure A.2-101 (Pages 1 through 46), Revision 3

Revised Pages

Procedure A.2-001 (Pages 1 through 19), Revision 5
Procedure A.2-101 (Pages 1 through 46), Revision 4

Prepared by: G D Mathiasen

Reviewed by: T L Fey

Op. Com. Final Review: Meeting # 1186 Date 2/17/83

Approved by: M Clouty Date 2-18-83

FORM 17 3467

Internal Correspondence

NSP

Date February 18, 1983

From G. D. Mathiasen Location Monticello

To Special Distribution of Emergency Procedures Location Various

Subject Revised Procedures for Emergency Procedures Book

Revisions to the Emergency Procedures were reviewed in a recent Operations Committee Meeting. Listed below are the procedures superseded and revised. Other pages not revised may have been reprinted with the revised pages to facilitate updating the Book.

Superseded Pages

Procedure A.2-107, (Pages 1 through 12), Revision 4

Revised Pages

Procedure A.2-107 (Pages 1 through 4), Revision 5

Prepared by: GD Mathiasen

Reviewed by: Wel Gallod

Op. Com. Final Review: Meeting # 1186 Date 2/17/83

Approved by: J L Fay Date 2-18-83

FORM 17 3467

Internal Correspondence

NSP

Date February 18, 1983

From G. D. Mathiasen Location Monticello

To Special Distribution of Emergency Procedures Location Various

Subject Revised Procedures for Emergency Procedures Book

Revisions to the Emergency Procedures were reviewed in a recent Operations Committee Meeting. Listed below are the procedures superseded and revised. Other pages not revised may have been reprinted with the revised pages to facilitate updating the Book.

Superseded Pages

None

Revised Pages

Procedure A.2-108, (Pages 1 through 11), Revision 0
Procedure A.2-209, (Pages 1 through 4), Revision 0

Prepared by: C D Mathiasen

Reviewed by: J W Winchell

Op. Com. Final Review: Meeting # 1186 Date 2/17/83

Approved by: L L Tey Date 2-18-83

FORM 17 3467

INTERNAL CORRESPONDENCE
FORM 17-3467

DATE Feb. 11, 1983

FROM K. P. Jepson LOCATION Monticello

TO Special Distribution of Emergency Procedures LOCATION Various

SUBJECT Revised Procedures for Emergency Procedures Book

Revisions to the Emergency Procedures were reviewed in a recent Operations Committee Meeting. Listed below are the procedures superseded and revised. Other pages not revised may have been reprinted with the revised pages to facilitate updating the Book.

Superseded Pages

A.2 - 413, Pages 1 through 6, Rev. 0
A.2 - 414, Pages 1 through 13, Rev. 0
A.2 - 415, Pages 1 through 15, Rev. 0
A.2 - 416, Pages 1 through 6, Rev. 0
A.2 - 417, Pages 1 through 3, Rev. 0

Revised Pages

A.2 - 413, Pages 1 through 6, Rev. 1
A.2 - 414, Pages 1 through 13, Rev. 1
A.2 - 415, Pages 1 through 5, Rev. 1
A.2 - 416, Pages 1 through 6, Rev. 1
A.2 - 417, Pages 1 through 3, Rev. 1
A.2 - 425, Pages 1 through 3, Rev. 0

Prepared By K P Jepson

Reviewed By K R Jacobson

Op. Comm. Final Review Mtg.# 1187 Date 2/21/83

Approved By [signature] Date 2/22/83

A.2 EMERGENCY PLAN IMPLEMENTING PROCEDURES
LIST OF CURRENT PAGES

PROCEDURE	PROCEDURE TITLE	REVISION NUMBER
000 Series	Organization	
A.2-001	Emergency Organization	5
100 Series	Activation	
A.2-101	Classification of Emergencies	4
A.2-102	Notification of an Unusual Event	3
A.2-103	Alert	4
A.2-104	Site Area Emergency	3
A.2-105	General Emergency	3
A.2-106	Activation of Technical Support Center	3
A.2-107	Activation of Operations Support Center	5
A.2-108	Access Control During Emergencies	0
200 Series	Assessment	
A.2-201	On-Site Monitoring and Protective Action Criteria	2
A.2-202	Off-Site Monitoring During an Emergency	1
A.2-203	Deleted 3-1-82	
A.2-204	Off-Site Protective Action Recommendations	2
A.2-205	Personnel Accountability	1
A.2-206	Deleted 3-1-82	
A.2-207	Sampling Priorities During an Emergency	0
A.2-208	Core Damage Assessment	0
A.2-209	Responsibilities of Radiological Emergency Coordinator	0
300 Series	Protective Actions	
A.2-301	Emergency Evacuation	1
A.2-302	Assembly Point Activation	2
A.2-303	Search and Rescue	2
A.2-304	Thyroid Prophylaxis	2
400 Series	Radiological Surveillance and Control	
A.2-401	Emergency Exposure Control	2
A.2-402	Contamination Control	1
A.2-403	In-Plant Emergency Surveys	2
A.2-404	Airborne Iodine Sampling and Analysis	3
A.2-405	Release Rate Determination	2
A.2-406	Off-Site Dose Projection	6
A.2-407	Personnel and Vehicle Monitoring	2
A.2-408	Sample Coordination During an Emergency	1
A.2-409	Self-Contained Breathing Apparatus (SCBA) Use During An Emergency	0
A.2-410	Out-of-Plant Surveys	1
A.2-411	Establishment of Secondary Access Control	0
A.2-412	Deleted 1-6-83	
A.2-413	Small Volume Liquid Sample Obtained at the Post Accident Sampling System	1
A.2-414	Large Volume Liquid Sample and/or Dissolved Gas Sample Obtained at Post Accident Sampling System	1
A.2-415	Containment Gas Sample Obtained at Post Accident Sampling System	1

A.2 EMERGENCY PLAN IMPLEMENTING PROCEDURES
LIST OF CURRENT PAGES

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd.. Yes ___ No X
ALARA Review Req'd. Yes X No ___

CONTAINMENT GAS SAMPLE OBTAINED AT POST ACCIDENT SAMPLING SYSTEM

Procedure A.2-415

Prepared by: [signature] ALARA Review: [signature] Date 2/22/83
Reviewed by: [signature] Q.A. Review: Revision 0 Date 8/16/82
Operations Committee Final Review: Meeting Number: 1157 Date 2/21/83
Approved by: [signature] Date 2-22-83
Op. Com. Results Review: Not Required Mtg. # 1100 Date 7/29/82

PURPOSE

The purpose of this procedure is to provide special instructions and precautions for collection and handling of containment gas samples during and following an emergency at Monticello Nuclear Generating Plant.

CONDITIONS AND PREREQUISITES

The Emergency Director/REC/CSL has requested analysis of torus, drywell or secondary containment (935') gas samples.

Actual or potential radiological conditions are such that special methods and/or precautions are necessary in order to collect and analyze samples under conditions which may present a much greater than normal radiation hazard to individuals performing the sampling and analyses. Unless directed otherwise, this procedure should be used in lieu of routine sampling and analysis procedures whenever an Alert or higher emergency classification is declared.

The torus and drywell gas sample line heat tracing should be on per Procedure A.2-425.

If a Group 2 isolation signal exists refer to Operations Manual Section B.4.1 for instructions to opening the samples valves in STEP 1 of this procedure.

ORGANIZATION AND RESPONSIBILITIES

Emergency Director - Overall responsibility

REC/CSL - Responsible for assigning sample priority and frequency and results review.

Chemistry Technicians - Responsible for sample collection, analysis and results reporting.

PRECAUTIONS

A. Exposures of sampling and analysis personnel shall be in accordance with A.2-401, "Emergency Exposure Control".

WP/kk

PRECAUTIONS (Cont'd.)

B. Exposure to all personnel due to sampling and analysis operations should be maintained as low as is reasonably achieveable. Techniques such as temporary shielding, remote handling and sample dilution prior to analysis should be considered to reduce exposure to personnel.

C. When actual or potential radiation levels so warrant, high range portable survey instruments, and self-reading dosimeters shall be provided to sampling and analysis personnel to permit rapid assessment of high exposure rates and accumulated personnel exposure. Alarming dosimeters should also be considered.

D. Appropriate extremity dosimeters should be provided and worn when handling samples which themselves represent high level radiation sources.

E. Calculations for exposure rates resulting from radiation within a few hours after a Loss of Coolant Accident point out the desirability of spending minimum amount of time that is necessary near the surface of the sample enclosure. Most of the operation of the Post Accident Sampling System located at 951' of Turbine Building can be performed from the control panel. With the control panel located ten or more feet away from the sample enclosure the dose rates at the control panel due to radiation from the sample enclosure will be below 100 MR/HR. The indicator for the area radiation detector RE-507 is on the PASS control panel and its reading should be noted whenever the presence of radiation is suspected.

REMARKS

1. Prior to sampling notify the Control Room and advise Shift Supervisor of your intentions.

2. The Post Accident Sampling Station is located on the south side of the 951' level of the Turbine Building. The most efficient route to the PASS is through access control and into the Turbine Building. Move to the 951' level via the east stairway.

3. Two-man teams should be used to obtain a post-accident sample when possible.

4. Obtain controlled access key 33A from R.P. Coordinator and key #153 from Shift Supervisor.

EQUIPMENT REQUIRED

1. 15 ml sample vial
2. Gas vial positioner
3. Gas vial carrying cask
4. Needles
5. Neoprene cap
6. Needle changing tool
7. Flashlight
8. Vial retainer ring crimper
9. Aluminum retainer ring

WP/kk

PROCEDURE

STEP 1 Call Control Room and request an operator open the following valves depending on the sample desired (the opening of these valves shall be documented on the attached checklist):

Sample	Valves	Control Panel
Drywell (High)	SV-4020A	C259
	SV-4001A	C259
	SV-4004A	C259
	SV-4005A	C259
Torus	SV-4002A	C259
	SV-4003A	C259
	SV-4002B	C260
	SV-4003B	C260
	SV-4004A	C259
	SV-4005A	C259

STEP 2 Open the nitrogen supply and regulate the supply pressure to 100 psi.

STEP 3 Turn on ventilation unit by depressing "START" button. Verify vacuum by feeling suction at one of the gas ports.

STEP 4 Set switch HC-600 to position A if not already done. With the "Sump Drain System Switch" (HC-715) in the off position place switch HC-700 (Liquid/Gas Selector) in the "Gas" position.

STEP 5 Install the gas filter drawer into position.

STEP 6 Place a standard 15 milliliter off-gas vial with rubber septum into the gas vial positioner, slide the positioner into the gas port (the higher of the two ports) at the sample station and turn it to lock it into place. Observe that the bottle status light changes from red to green.

STEP 7 Turn the "Gas Sample Selector Switch" (HC-723) to the desired sample location. In addition set switch HC-500 to the position corresponding to the sample desired.

STEP 8 Turn the "15 ML Gas Sample Switch" (HC-705) to position 2 and "Circulate Gas" for a minimum period of 5 minutes. Be sure that there is flow as read by the rotameter through the sample enclosure window (FI-725). Record flow and flush duration on the Containment Gas Sampling and Analysis Checklist, Form #5790-415-1.

STEP 9 Turn HC-705 to position 3 and "Evacuate" the off-gas vial. Record the pressure of the evacuated vial (PI-708) on the checklist. (Make sure the vacuum in the gas vial reaches a stable minimum reading before recording pressure.)

STEP 10 Turn HC-705 to position 4 "Take Sample". Observe that the pressure reading on PI-708 does not change as such would indicate a system leak.

PROCEDURE (Cont'd.)

STEP 11 Press the button to the left of HC-705 (HC-720 "Press for Sample") to obtain a sample. Keep this button depressed until a steady pressure is reached. This will require approximately 5 seconds. Record the final pressure of the sample (PI-708) on the checklist. This pressure corresponds to the actual pressure of the sample being obtained. Record sample temperature (TI-724) on the checklist.

STEP 12 Turn HC-705 to position 5 "FLUSH SYSTEM" and flush for approximately 1 minute or until the area radiation monitor located on the sample station reaches a minimum.

STEP 13 Turn HC-705 through position 6, 7 and 8 and then straight up to "OFF".

STEP 14 Turn to unlock and withdraw the gas vial positioner. Keep the vial at a maximum distance and quickly insert the sample bottle into the gas vial cask. Close and latch the gas vial cask. Put the gas vial positioner back into the port in the sample station.

STEP 15 Perform the Drain, Sump and Collection procedure (Procedure A.2-417).

STEP 16 Call Control Room and request that an operator close the valves that were opened in STEP 1 (the closing of these valves shall be documented on the attached checklist).

STEP 17 Turn ventilation off by depressing "STOP" button.

STEP 18 Transport the sample to the hot lab for dilution and counting per Containment Atmosphere Radiochemical Analysis, Procedure A.2-420, or for hydrogen, oxygen and nitrogen per Chemistry Procedure I.1.36.

STEP 19 Calculate the sample volume (see NOTE 1) at the sample pressure and temperature as recorded in STEP 11 and record on Containment Gas Sampling and Analysis Checklist.

NOTE 1 Temperature and pressure values must be converted to units of °Kelvin and atmospheres prior to calculating gas volume.

$$\frac{\text{psia}}{14.70} = \text{atmosphere}$$

$$\frac{5}{9} \times (°F-32) + 273.15 = °\text{Kelvin}$$

$$14.9 \times \frac{P_1}{T_1} \times 298.15 = \text{actual sample volume (cc)}$$

Where P_1 = final sx pressure (atm)-absolute pressure of vial (atm)
T_1 = TI-724 (converted to °Kelvin)

WP/kk

Form 5790-415-1
Revision 1, 02/18/83
Page 1 of 2

Example of

CONTAINMENT GAS SAMPLING AND ANALYSIS CHECKLIST

Sampling

		Initial
1.	Sample Source _____ Date _____ Time _____	_____ RPS
2.	Sample Identification No. _____	
3.	Sample Flow _____ FI-725 Flush Duration _____ Min.	_____
4.	Absolute Pressure of Vial _____ PI-708 (psia)	_____
5.	Final Sample Pressure _____ PI-708 (psia)	_____
6.	Sample Temperature _____ TI-724 (°F)	_____
7.	Calculated Sample Volume _____ cc (As Calculated)	_____

Open the following valves corresponding to the desired sample (STEP 1 of procedure).

Sample	Valves	Control Panel	Valve Opened By (Operator)	Verified By (RPS)
Drywell	SV-4020A	C259	_____	_____
(High)	SV-4001A	C259	_____	_____
	SV-4004A	C259	_____	_____
	SV-4005A	C259	_____	_____
Torus	SV-4002A	C259	_____	_____
	SV-4003A	C259	_____	_____
	SV-4002B	C260	_____	_____
	SV-4003B	C260	_____	_____
	SV-4004A	C259	_____	_____
	SV-4005A	C259	_____	_____

WP/kk

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Close the following valves corresponding to the desired sample (STEP 16 of procedure).

Sample	Valves	Control Panel	Valve Closed By (Operator)	Verified By (RPS)
Drywell	SV-4020A	C259		
	SV-4001A	C259		
	SV-4004A	C259		
	SV-4005A	C259		
Torus	SV-4002A	C259		
	SV-4003A	C259		
	SV-4002B	C260		
	SV-4003B	C260		
	SV-4004A	C259		
	SV-4005A	C259		

Analysis

1. Spectrum Ran (Dilution Factors _____ x _____) _____
2. Spectrum Analyzed _____
3. Activity Calculated _____ µCi/cc _____
4. % H_2 - O_2 - N_2 _____ (See Chemistry Procedure I.1.36) _____
5. Other analysis results as requested and comments:

_____

_____

_____

_____

Performed By: _____ Date: _____

Reviewed by: CSL or REC _____ Date: _____

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes X No ___

CONTAINMENT IODINE AND PARTICULATE SAMPLES OBTAINED AT POST ACCIDENT SAMPLING SYSTEM

Procedure A.2-416

Prepared by: [signature] ALARA Review: [signature] Date 2/22/83
Reviewed by: [signature] Q.A. Review: Revision 0 Date 8/4/82
Operations Committee Final Review: Meeting Number: 1157 Date 2/21/83
Approved by: [signature] Date 2-22-83
Op. Com. Results Review: Not Required Mtg. # 1100 Date 7/29/82

PURPOSE

The purpose of this procedure is to provide special instructions and precautions for collection and handling of iodine and particulate samples during and following an emergency at Monticello Nuclear Generating Plant.

CONDITIONS AND PREREQUISITES

The Emergency Director/REC/CSL has requested iodine/particulate analysis of torus, drywell or secondary containment (935') gas samples.

Actual or potential radiological conditions are such that special methods and/or precautions are necessary in order to collect and analyze samples under conditions which may present a much greater than normal radiation hazard to individuals performing the sampling and analyses. Unless directed otherwise, this procedure should be used in lieu of routine sampling and analysis procedures whenever an Alert or higher emergency classification is declared.

The torus and drywell gas sample line heat tracing should be on per Procedure A.2-425.

If a Group 2 isolation signal exists refer to Operations Manual Section B.4.1 for instructions to opening the sample valves in STEP 1 of this procedure.

ORGANIZATION AND RESPONSIBILITIES

Emergency Director - Overall responsibility

REC/CSL - Responsible for assigning sample priority and frequency and results review.

Chemistry Technician - Responsible for sample collection, analysis and results reporting.

PRECAUTIONS

A. Exposures of sampling and analysis personnel shall be in accordance with A.2-401, "Emergency Exposure Control".

PRECAUTIONS (Cont'd.)

B. Exposures to all personnel due to sampling and analysis operations should be maintained as low as is reasonably achieveable. Techniques such as temporary shielding, remote handling and sample dilution prior to analysis should be considered to reduce exposure to personnel.

C. When actual or potential radiation levels so warrant, high range portable survey instruments, and self-reading dosimeters shall be provided to sampling and analysis personnel to permit rapid assessment of high exposure rates and accumulated personnel exposure. Alarming dosimeters should also be considered.

D. Appropriate extremity dosimeters should be provided and worn when handling samples which themselves represent high level radiation sources.

E. Calculations for exposure rates resulting from radiation within a few hours after a Loss of Coolant Accident point out the desirability of spending minimum amount of time that is necessary near the surface of the sample enclosure. Most of the operation of the Post Accident Sampling System located at 951' of Turbine Building can be performed from the control panel. With the control panel located ten or more feet away from the sample enclosure the dose rates at the control panel due to radiation from the sample enclosure will be below 100 MR/HR. The indicator for the area radiation detector RE-507 is on the PASS control panel and its reading should be noted whenever the presence of radiation is suspected.

REMARKS

1. Prior to sampling notify the Control Room and advise Shift Supervisor of your intentions.

2. The Post Accident Sampling Station is located on the south side of the 951' level of the Turbine Building. The most efficient route to the PASS is through access control and into the Turbine Building. Move to the 951' level via the east stairway.

3. Two-man teams should be used to obtain a post-accident sample when possible.

4. Obtain controlled access key 33A from R.P. Coordinator and key #153 from Shift Supervisor.

EQUIPMENT REQUIRED

1. Silver zeolite cartridges (4)
2. Particulate filters
3. Sample carrying cask
4. Poly bag (medium)
5. Radector III or equivalent

PROCEDURE

STEP 1 Call the Control Room and request that an operator open the following valves depending on the sample desired (the opening of these valves shall be documented on the attached checklist):

PROCEDURE

Sample	Valves	Control Panel
Drywell (High)	SV-4020A	C259
	SV-4001A	C259
	SV-4004A	C259
	SV-4005A	C259
Torus	SV-4002A	C259
	SV-4003A	C259
	SV-4002B	C260
	SV-4003B	C260
	SV-4004A	C259
	SV-4005A	C259

STEP 2 Open the nitrogen supply and regulate the supply pressure to 100 psi.

STEP 3 Turn on ventilation unit by depressing "START" button. Verify vacuum by feeling suction at one of the two gas ports.

STEP 4 Set switch HC-600 to position A if not already done. Set switch HC-500 to the position corresponding to the sample desired.

STEP 5 Verify that the "Sump Drain System" (switch HC-715) is in the OFF position. Place switch HC-700 (Liquid/Gas Selector) in the Gas position.

NOTE 1 See Attachment 1 for a description of filter cartridge retainer.

STEP 6 Pull out the gas filter drawer and check the filter cartridges. If not already in place, put the 4 filter cartridges (numbered 1 through 4) into the cartridge retainer, and a particulate filter paper in the cap of the cartridge retainer. Then put the cartridge retainer into the gas filter drawer and put the drawer into the sample station and verify that the drawer position light is green.

STEP 7 If a high activity condition exists or is suspected a timed sample should be taken. For a timed sample set the timer KC-712 between the range of 0 to 30 seconds. Select a low enough time so that the activity on the filter cartridge will not be unnecessarily high and cause special handling problems. It is suggested that 5 seconds be used for the first try. Observe the RE-704 reading to determine if there is a rapid activity buildup. (This reading will also include non-adsorbing gases.) If the activity level does not exceed a preset value of 10 mR/hr, another timed flow through the cartridges can be made. Record the selected time on the Iodine/Particulate Sampling and Analysis Checklist, Form #5790-416-1 or record that the sample is untimed. Set the switch located to the left of the timer labeled "Time Sample" on either yes or no as appropriate. If the activity

PROCEDURE (Cont'd.)

of the first filter is > 10 mR/hr the 2nd, 3rd or 4th filters may be used for counting assuming previous filters are 99% efficient.

STEP 8 Turn the "Gas Sample Selector Switch" (HC-723) to the desired sample source.

STEP 9 Turn the "Iodine Cartridge Sample Switch" (HC-712) to position 2 and "Circulate Gas" for a minimum period of 5 minutes. Record the flush time on the checklist.

STEP 10 Observe flow as read by the rotameter which is visible through the window in the sample station enclosure. Record the flow (FI-725), temperature (TI-724) and pressure PI-726 and PI-727 on the checklist. The two pressure gauges (PI-726 and PI-727), as read through the window, should be the same.

When the switch HC-712 is turned to position 3 the sample gas will start to flow through the filter cartridges. When the upstream pressure (PI-727) is $\geq$ 16 inches of Hg. and PI-726 is about 0 inches of Hg, the flow will be "critical". For a short duration timed cycle it will be necessary to have one technician ready to read the downstream pressure gauge at the sample station while another turns the selector switch at the control panel in order to verify that the flow is "critical". When ready, turn switch HC-712 to position 3. On the checklist record pressure PI-727, PI-726 and the sample time duration in seconds. If flow is not critical record flow as indicated by FI-725.

STEP 11 After the timer has timed out for a timed sample or after the appropriate time has elapsed for a non-timed sample, turn selector switch HC-712 to position 4 to evacuate the filter cartridge.

STEP 12 After approximately 10 seconds turn switch HC-712 to position 5 which will admit an air or nitrogen flush through the filter cartridge to remove Krypton and Xenon gases. This purge should last approximately 20 seconds or until RI-704 is stable. Read and record RI-704 on the checklist.

STEP 13 Rotate HC-712 to its up and off position. Turn other switches off. Withdraw the filter drawer and remove the cartridge retainer and put it into a plastic bag. Close the bag and tie or tape it closed. Put the filter drawer back into the sample enclosure.

CAUTION: No shielding cask is provided for the cartridge retainer and filter(s). Survey the plastic bag which contains the sample and determine the dose rate. Use tongs to increase your distance from the sample. At the hot lab remove the filter cartridges.

STEP 14 Perform the Drain of Trap, Sump and Collector Procedure (Procedure A.2-417).

WP/kk

PROCEDURE (Cont'd.)

STEP 15 Call Control Room and request that an operator close the valves that were opened in STEP 1 (the closing of these valves shall be documented on the attached checklist).

STEP 16 Turn ventilation off by depressing "STOP" button.

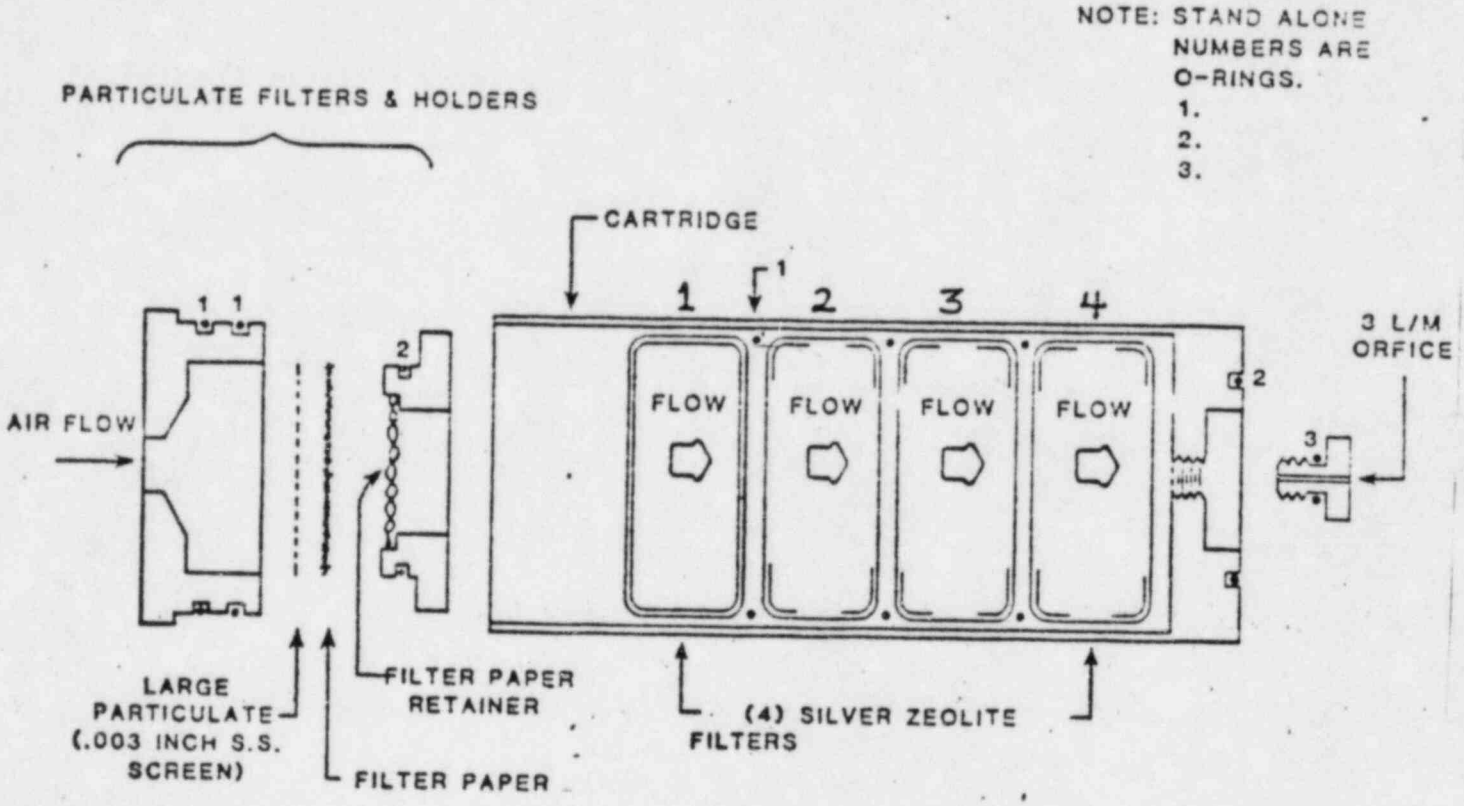
STEP 17 Transport the cartridge retainer to the hot lab for preparation for radiochemical analysis per Procedure A.2-421.

STEP 18 Remove the filter cartridges and label 1, 2, 3 and 4. Install new particulate and silver zeolite cartridges into the cartridge retainer for the next sample.

WP/kk

Attachment 1
Page 1 of 1

CUT AWAY VIEW OF FILTER CARTRIDGE



NOTE: Place cartridge into sample drawer with orifice end to the fixed butting surface.

WP/kk

Form #5790-416-1
Revision 1, 02/18/83
Page 1 of 2

Example of

IODINE/PARTICULATE SAMPLING AND ANALYSIS CHECKLIST

SAMPLING

1. Sample Source _____ Date _____ Time _____ _____ RPS
2. Sample Identification No. _____
3. Time Sample YES or NO _____
4. Flush Time in Minutes _____
5. Sample Flow _____ SCFM FI-725 (not through cartridge)
   Temperature _____ TI-724 (°F)
   Pressure _____ PI-726 (psia)
   Pressure _____ PI-727 (psia)
6. Pressure _____ PI-726 (flow through cartridge)
   Pressure _____ PI-727 (flow through cartridge)
   If flow not critical,
   Sample Flow _____ SCEM FI-725
   If flow critical flow is 3 liters/min.
   Flow Duration _____ Seconds
8. Radiation _____ RI-704 (mR/hr)

Open the following valves corresponding to the desired sample (STEP 1 of Procedure):

Sample	Valves	Control Panel	Valve Opened by (Operator)	Verified by (RPS)
Drywell	SV-4020A	C259		
	SV-4001A	C259		
	SV-4004A	C259		
	SV-4005A	C259		
Torus	SV-4002A	C259		
	SV-4003A	C259		
	SV-4002B	C260		
	SV-4003B	C260		
	SV-4004A	C259		
	SV-4005A	C259		

WP/kk

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Revision 1, 02/18/83
Page 2 of 2

Close the following valves corresponding to the desired sample (STEP 15 of procedure):

Sample	Valves	Control Panel	Valve Closed by (Operator)	Verified by (RPS)
Drywell	SV-4020A	C259		
	SV-4001A	C259		
	SV-4004A	C259		
	SV-4005A	C259		
Torus	SV-4002A	C259		
	SV-4003A	C259		
	SV-4002B	C260		
	SV-4003B	C260		
	SV-4004A	C259		
	SV-4005A	C259		

ANALYSIS

		Initial
A.	IODINE	
1.	Spectrum Collected	
2.	Spectrum Analyzed	
3.	Sample Volume _____ cc	
4.	Activity Calculated _____ µCi/cc	
5.	Filter Number Counted (1-4) _____	
B.	PARTICULATE	
1.	Spectrum Collected	
2.	Spectrum Analyzed	
3.	Sample Volume _____ cc	
4.	Activity Calculated _____ µCi/cc	

C. Other Analysis Results as Requested and Comments:

_____

Performed by: _____ Date _____

Reviewed by: CSL or REC _____ Date _____

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Reco

WP/kk

A.2 EMERGENCY PLAN IMPLEMENTING PROCEDURES
LIST OF CURRENT PAGES

A.2 EMERGENCY PLAN IMPLEMENTING PROCEDURES
LIST OF CURRENT PAGES

PROCEDURE	PROCEDURE TITLE	REVISION NUMBER
400 Series	Radiological Surveillance and Control (Cont'd.)	
A.2-416	Containment Iodine and Particulate Samples Obtained at Post Accident Sampling System	1
A.2-417	Draining the Trap, Sump and Collector of Post Accident Sampling System	1
A.2-418	Post Accident Sampling Station Demin Water Tank Fill Procedure	0
A.2-419	Liquid Radiochemical Analysis	0
A.2-420	Containment Atmosphere Radiochemical Analysis	0
A.2-421	Containment Atmosphere Iodine/Particulate Analysis	0
A.2-422	Stack Iodine/Particulate Sampling & Analysis	1
A.2-423	Reactor Building Vents Iodine/Particulate Sampling and Analysis	1
A.2-424	EOF Count Room Counting Procedure	0
A.2-425	Post-Accident Gas Sample Line Heat Trace	0
500 Series	Communications and Documentation	
A.2-501	Communication During an Emergency	1
A.2-502	Recordkeeping During an Emergency	0
A.2-503	Emergency Reports and Documentation	0
600 Series	Re-Entry and Recovery	
A.2-601	Re-Entry	0
A.2-602	Deleted 11-19-81	
A.2-603	Repair and Corrective Action	1
700 Series		
A.2-702	Response to an Emergency at Prairie Island	2
A.2-703	Response to Off-Site Situation Involving Radioactive Materials	0

Op. Com. Rev. Req'd. Yes X No ___
Q. A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes ___ No X

EMERGENCY ORGANIZATION
A.2-001

REVIEW AND APPROVAL

Prepared by: G D Mathiasen ALARA Review: G. D. Mathiasen Date 11/17/81
Reviewed by: [signature] Q.A. Review: R. L. Scheinost Date 11/17/81
Operations Committee Final Review: Meeting Number 1156 Date 2/17/83
Approved by: [signature] Date 2-18-83
Op. Com. Results Review: Not Required Mtg. 1086 Date 5/27/82

PURPOSE

The purpose of this procedure is to describe the on-site Emergency Response Organization (ERO) and to provide an orderly method of staffing the positions of which the ERO is comprised.

PRECAUTIONS

No Monticello Nuclear Generating Plant personnel shall make any information releases to members of the news media or the general public during an emergency unless cleared through the Emergency Manager, if established, or Emergency Director. Direct all inquiries to the Communications Department at NSP Headquarters or at the EOF.

DISCUSSION

A. Although it is not practical to develop detailed procedures encompassing every conceivable emergency situation, advance planning should create a high order of preparedness and ensure an orderly and timely decision-making body. Advance planning of the Emergency Organization ensures that during an emergency the duties of the plant staff members, who are required to direct the emergency effort, are defined. (See Figure 1)

B. The Emergency Organization is herein described. The duties and responsibilities of the individual Emergency Organization members are defined.

C. The Tag Boards are used to make speedy personnel duty assignments during the initial stage of an emergency, to insure that qualified personnel fill the positions in the ERO, and insure that the more important positions in the ERO are filled first.

The Main Tag Board consists of a board with a layout of the Emergency Response Organization. Under each position on the board is a list of the individuals who are qualified to fill that position, and a tag with the necessary instruction for filling that position. There is also a sign-in sheet that serves to indicate who has taken a specific tag from the Tag Board.

The Main Tag Board is located outside the Supt. of Operations office. The RP Tag Board is at access control. All personnel who are members of the ERO have the responsibility of checking the Tag Boards when it is announced that ERO personnel are to report to their duty stations.

The Tag Board system is designed to work as follows:

When an announcement is made to activate the ERO duty assignments, ERO personnel should pass by the appropriate Tag Boards (see below lists). If an individual's name is on one of the lists for a position in the ERO, and the tag for that position has not been removed, he should remove that tag, read the instructions on the tag, and sign the sign-in sheet indicating the position in the ERO that is being filled. If an individuals name appears on more than one list the individual must determine which of the positions should be filled first and remove the appropriate tag. (If you have a question as to the priority of filling positions contact the Emergency Plan Coordinator.)

If an individual arrives at the Tag Board and finds the tag is removed for a position they are qualified to fill, the person should check the sign-in sheet and determine if they are higher on the order of succession than the person performing that job. If so they should relieve that individual.

Main Tag Board	RP Tag Board
Emergency Director	RPS Personnel
Radiological Emergency Coord.	
Group Leaders	
STA's	
SEC's	

D. It is the Emergency Director's responsibility to ensure 24-hour coverage of key positions in the emergency organization. He must consider that the emergency may continue for some time and "pace" the utilization of personnel resources (e.g., ensure rotation of personnel to allow time for eating and sleeping).

E. While the qualification criteria listed in this procedure will be used to determine who may be qualified to fill a given emergency organization position, it is not intended that a person who is not qualified may not be assigned to that position. The goal should be to have several people qualified to fill each position, but if there is no one available from the qualified list, the most qualified person available should be selected.

Requalification, when applicable, will be required on an annual (± 3 months) basis. This procedure will be reviewed quarterly, and revised if necessary.

F. In the periods between revisions of this procedure, personnel who become qualified may be used to staff these positions.

WP/kk

QUALIFICATION, ORDER OF SUCCESSION AND DUTIES

I. Coordination and Direction Group

A. Emergency Director

1. Qualifications

a. Five years experience at Monticello Nuclear Generating Plant

NOTE: This requirement does not apply during initial phase of emergency when the Duty Shift Supervisor is Emergency Director.

b. Experience as Plant Manager Designee

NOTE: This requirement does not apply during initial phase of emergency when the Duty Shift Supervisor is Emergency Director.

c. Knowledgeable or qualified in following areas:

- Corporate Emergency Plan
- Monticello Emergency Plan
- Emergency Implementing Procedures:

A.2 - 001	
A.2 - 101	A.2 - 303
A.2 - 102	A.2 - 304
A.2 - 103	A.2 - 401
A.2 - 104	A.2 - 501
A.2 - 105	A.2 - 502
A.2 - 204	A.2 - 503
A.2 - 205	A.2 - 601
A.2 - 301	A.2 - 603

- Safeguards Contingency Plan Implementing Procedures

SCPIP - 1	SCPIP - 8
SCPIP - 2	SCPIP - 12
SCPIP - 4	

2. Qualified Personnel in Order of Succession

DELETED

WP/kk

3. Duties

a. Coordinates the response of the plant emergency organization;

b. Evaluates plant and radiological conditions;

c. Ensures assessment of offsite radioactivity releases;

d. Recommends offsite protective actions;

e. Determines emergency classification;

f. Calls in additional plant personnel;

g. Assumes control of Technical Support Center personnel and activities;

h. Makes decisions regarding habitability of emergency response centers and location of assembly areas;

i. Approves radiation exposures in excess of normal limits;

j. Ensures all injured personnel receive medical assistance; and

k. Ensures 24-hour coverage for key positions of plant emergency organization.

B. Shift Technical Advisor

1. Qualifications

Qualified per 4 AWI-4.7.1

2. Qualified Personnel

DELETED

3. Responsibility

Provide technical operational advice to the Shift Supervisor.

C. Shift Emergency Communicator

1. Qualifications

a. Six months experience at Monticello

b. Ability to communicate verbally in clear, concise manner

c. Knowledgeable or qualified in following areas:

- Emergency Implementing Procedures:

A.2 - 101	A.2 - 105
A.2 - 102	A.2 - 106
A.2 - 103	A.2 - 501
A.2 - 104	A.2 - 502

- Emergency Plan (Knowledgeable to degree necessary to be able to direct others in use of procedures)

d. Other administrative qualifications as determined by Plant Management.

2. Qualified Personnel

DELETED

3. Duties

a. Assists Emergency Director in emergency classification;

b. Conducts initial and followup notification in accordance with procedures;

c. Coordinates all incoming and outgoing communications;

d. Ensures proper logging and recording of communications.

e. Assist Emergency Organization in use of procedures.

II. Operations Group

A. Operations Group Leader

1. Qualifications

a. Current SRO License for Monticello

b. Demonstrated ability in supervisory skills.

c. Knowledgeable or qualified in following areas:

- Monticello Emergency Plan
- Emergency Implementing Procedures:

A.2 - 101	A.2 - 205
A.2 - 102	A.2 - 301
A.2 - 103	A.2 - 502
A.2 - 104	
A.2 - 105	
A.2 - 107	

2. Qualified Personnel in Order of Succession

a. DELETED
b. Senior Site Superintendent present, not on duty shift
c. Senior Shift Supervisor present, not on duty shift
d. Duty Site Superintendent
e. Duty Shift Supervisor

3. Duties

a. Coordinates response of Operations Group;

b. Evaluates plant and radiological conditions;

c. Ensures Emergency Director is informed of plant status;

d. Directs operation of the plant in compliance with all normal plant procedures, directives, technical specifications and emergency procedures;

e. Monitors plant parameters and conditions.

B. Fire Brigade

1. Qualifications

a. Currently qualified in accordance with 4 AWI-3.13.2, including SCBA training and qualification.

b. Currently qualified in accordance with Appendix R, 10CFR50:

1.) The Team Leader and #2 & #3 Team Members shall have sufficient training in or knowledge of plant safety-related systems to understand the effects of fire and fire suppressants on safe shutdown capability.

2.) The Team Leader shall be competent to assess the poten-

tial safety consequences of a fire and advise control room personnel. This shall be evidenced by current SRO or RO or current enrollment in license training program.

c. Qualified physically in accordance with Tab 7 of the NSP Medical Policy and Procedure Manual (annual requirement).

2. Qualified Personnel

a. Team Leader (Normally Site Superintendent or Shift Supervisor)

DELETED

b. Team Members #2 & #3

DELETED

c. Team Members #4 & #5

DELETED

III. Maintenance Group

The Maintenance Group consists of the Plant Superintendent, Operations and Maintenance; the Superintendent, Maintenance; the Maintenance Supervisors; all maintenance crew people; the plant electricians; plant helpers and the Instrument & Control Group including supervisors and coordinators.

A. Maintenance Group Leader

1. Qualifications

a. Five years experience at Monticello Nuclear Generating Plant
b. Demonstrated ability in supervisory skills

c. Knowledgeable or qualified in following areas:

- Emergency Plan
- Emergency Implementing Procedures:
  - A.2 - 001
  - A.2 - 106
  - A.2 - 107
  - A.2 - 603

2. Order of Succession

a.
b.
c.
d. DELETED
e.
f.
g.

B. OSC Coordinator

1. Qualifications - (Same as Maintenance Group Leader)

2. Order of Succession - (Same as Maintenance Group Leader)

C. Responsibilities

1. Maintenance Group - primary responsibility for emergency repairs and corrective actions.

2. Maintenance Group Leader:

a. Responsible for participating in discussions regarding emergency response and for formulating specific tasks in the categories of emergency repair and corrective action.

b. Responsible for implementing emergency repair and corrective action tasks by relaying task information to OSC Coordinator and requesting that a team be dispatched to accomplish task.

c. Responsible for notifying Monitoring Section Leader of impending tasks.

3. OSC Coordinator:

Responsible for coordinating and assigning personnel to tasks designated by TSC personnel.

IV. Engineering Group

The Engineering Group consists of the Superintendent, Technical Engineering and the Technical Engineering Group, plus the Superintendent, Operations Engineering and the Operations Engineering Group.

A. Engineering Group Leader

1. Qualifications

a. Five years experience at Monticello Nuclear Generating Plant
b. Demonstrated ability in supervisory skills
c. Knowledgeable or qualified in following areas:
- Emergency Plan
- Emergency Implementing Procedures:
A.2 - 106
A.2 - 502

2. Order of Succession
a.
b.
c. **DELETED**
d.
e.

B. Group Responsibilities

The group shall have the responsibilities for providing technical support for emergency repairs and corrective actions.

V. Health Physics Group

The Health Physics Group consists of the Supt., Radiation Protection and all Members of the Radiation Protection Group.

The group is divided into two sections: The Offsite Dose Assessment and Chemistry Section and the Monitoring Section. The group leader is the Radiological Emergency Coordinator (See Figure 2).

A. Radiological Emergency Coordinator

1. Qualifications

a. Five years experience at Monticello Nuclear Plant;
b. Demonstrated ability in supervisory skills;
c. Knowledgeable or qualified in following areas:
- Health Physics
- Emergency Plan
- Emergency Plan Implementing Procedures:

A.2 - 101	A.2 - 301	A.2 - 405
A.2 - 106	A.2 - 302	A.2 - 406
A.2 - 107	A.2 - 303	A.2 - 407
A.2 - 201	A.2 - 304	A.2 - 409
A.2 - 202	A.2 - 401	A.2 - 410
A.2 - 204	A.2 - 403	A.2 - 502
A.2 - 205	A.2 - 404	A.2 - 702
A.2 - 207		

2. Order of Succession

a.
b.
c. DELETED
d.
e.

3. Duties

a. Coordinate assessment of radiological aspects of accident, including offsite surveys prior to EOF activation.

b. Formulate protective action recommendations

c. Ensure radiological surveillance and control measures are implemented.

d. Advise Emergency Director on health physics matters

B. Offsite Dose Assessment and Chemistry Section Leader

1. Qualifications

a. One year experience at Monticello Nuclear Generating Plant

b. Knowledgeable or qualified in following areas:

- Chemistry and radiochemistry, including Monticello Chemistry Manual
- Emergency Plan Implementing Procdures:

A.2 - 207
A.2 - 208
A.2 - 404
A.2 - 405
A.2 - 406
A.2 - 408
A.2 - 412
A.2 - 502

2. Order of Succession

a.
b.
c.
d. DELETED
e.

3. Duties

a. Offsite dose projection

b. Release rate determination

c. Sampling and analysis of reactor coolant, containment atmosphere and plant effluents

d. Sample coordination and recording

C. Monitoring Section Leader

1. Qualifications

a. One year experience at Monticello Nuclear Generating Plant

b. Knowledgeable or qualified in following areas:

- Monticello Radiation Safety Procedures

- Emergency Plan Implementing Procedures:

A.2 - 107	A.2 - 403
A.2 - 201	A.2 - 404
A.2 - 202	A.2 - 407
A.2 - 301	A.2 - 409
A.2 - 302	A.2 - 410
A.2 - 303	A.2 - 411
A.2 - 304	A.2 - 501
A.2 - 401	A.2 - 502
A.2 - 402	A.2 - 601

2. Order of Succession

a.
b.
c.
d. DELETED
e.

3. Duties

a. Emergency exposure control

b. Contamination Control

c. Emergency surveys

d. Personnel and vehicle monitoring

e. Personnel and equipment decontamination

VI. Support Group

The Support Group consists of all plant office personnel and all plant QA personnel.

WP/kk

A. Support Group Leader

1. Qualifications

a. One year experience at Monticello Nuclear Generating Plant;

b. Demonstrated ability in supervisory skills;

c. Knowledgeable or qualified in following areas:

A.2 - 501	A.2 - 503
A.2 - 502	A.2 - 106

2. Order of Succession

a.
b.
c.
d. DELETED
e.

3. Duties

a. Assign group personnel to provide administrative support, document control and document retrieval;

b. Assure that TSC is staffed adequately.

c. Coordinate and provide personnel for logistics functions

d. Act as TSC Coordinator and be responsible for conduct of Procedure A.2-106, Activation of the Technical Support Center.

B. Emergency Document Control Coordinator

1. Qualifications

a. Thorough understanding of Monticello document and record control system;

b. Knowledge of physical storage locations of plant documents and records;

c. Knowledgeable or qualified in following areas:

A.2 - 502
A.2 - 503

2. Order of Succession

a.
b.
c. DELETED
d.
e.

3. Duties

a. Provide document retrieval support for TSC and OSC;
b. Assist Support Group Leader with records control in TSC area

VII. Security Group

The Security Group consists of all plant Security and Services personnel and the contract security force.

A. Security Group Leader

1. Qualifications

a. Two years experience at Monticello Nuclear Generating Plant

b. Knowledgeable or qualified in following areas:

- Monticello Security Plan

- Safeguards Contingency Plan & Implementing Procedures

- Emergency Plan Implementing Procedures:

A.2 - 206
A.2 - 301
A.2 - 302

2. Order of Succession

a. DELETED
b.
c.
d.

3. Duties

a. Carry out plant security and access control functions

b. Maintain strict personnel accountability onsite.

VIII. Emergency Team Personnel

If required by procedure or for other purposes, an Emergency Team will be selected from the list of available candidates. (In special cases, however, exceptions to this procedure may be authorized by the Emergency Director.)

WP/kk

A. Qualifications

1. Current Red Cross Multi-Media First Aid training (i.e. within last three years).

2. Currently qualified under respiratory protection program, including training for use of SCBA equipment.

3. One year experience in current general work classification.

B. Qualified Personnel

Personnel who are qualified for emergency team are identified with an asterisk in the green section of the NUCLEAR EMERGENCY PREPAREDNESS TELEPHONE DIRECTORY. (NOTE: The second sort in the green section is more useful if specific skills are being sought.)

IX. Miscellaneous Positions

A. Emergency Planning Coordinator

1. Qualifications

a. Health physics background or health physics expertise on staff.

b. Five years experience at nuclear power plant.

c. Two years experience at Monticello.

2. Designated Emergency Planning Coordinator

Mathiasen, G.

B. Emergency Preparedness Instructors

1. Qualifications

a. Knowledgeable in Plant and Corporate Plans and Implementing Procedures.

b. Demonstrated ability in instructing methods.

c. Thoroughly familiar with subject matter of instruction.

2. Qualified Personnel

Personnel approved by Monticello Training Superintendent

C. Assembly Point Coordinator

1. Qualifications

See Qualifications for Shift Emergency Communicator

WP/kk

2. Qualified Personnel

See Qualified Personnel for Shift Emergency Communicator

3. Duties

a. Assume control of operational Assembly Point

b. Ensure proper radiological surveys are conducted

c. Conduct accountability procedure as required

d. Maintain communications between Assembly Point and TSC

D. TSC Coordinator (See Support Group Leader)

E. Radiation Protection Coordinator

1. Qualifications - Experience as Radiation Protection Coordinator during normal operation.

2. Qualified Personnel

a.
b.
c. DELETED
d.
e.

3. Duties

Responsible for conduct of Procedure A.2-108, Access Control During Emergencies.

F. Technical Communicator

1. Qualifications

a. Experience at Monticello
b. Systems expertise

2. Qualified Personnel

This position will be filled by designating the most qualified person from among available candidates. The Emergency Director will be responsible for assuring that this position is adequately staffed.

3. Duties

a. Continuously maintains an open telephone communications link between the Control Room, TSC, and EOF.

b. Communicate technical information between response centers.

c. If located in TSC, post information on Status board.

X. Response Center Staffing

A. TSC Staffing

1. Emergency Director - In charge

2. Group Leaders

a. Radiological Emergency Coordinator
b. Engineering Group Leader
c. Operations Group Leader *
d. Maintenance Group Leader
e. Support Group Leader (TSC Coordinator)
f. Security Group Leader

* If primary designate is not available, this individual may be required to stay in Control Room.

3. Communicators

a. Lead TSC Communicator
b. Assistant TSC Communicator (offsite notification) (2)
c. Technical Communicator (3-way to EOF and CR)
d. Assistant TSC Communicator (for Emergency Director)

4. Auxiliary Staff

a. Monitoring Section Leader
b. Offsite Dose Assessment and Chemistry Section Leader
c. Engineering Assistant
d. Security Assistant
e. Emergency Document Control Coordinator
f. Recorder
g. Off-Site Survey Team Controller
h. Dose Projection Communicator

B. OSC Staffing

1. OSC Coordinator - In Charge

2. Standby Personnel

a. All unassigned RPS

b. Extra Operators (i.e., not assigned to Control Room)

c. I&CS Supervisor, Coordinator and Specialists

d. Maintenance Supervisors, Chief Electrician, Station Electricians, Machinists, Welders, Repairmen, and Riggers.

3. Communicator (To be designated by OSC Coordinator if needed)

C. Control Room Staffing

1. Site Superintendent - In Charge

2. Assistance

a. Shift Supervisor
b. Shift Operators
c. Additional operators assigned to Control Room
d. STA

3. Technical Communicator (CR to TSC)

4. Technical Support Center personnel as directed by Emergency Director

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan

2. Monticello Nuclear Generating Plant Operations Manuals

3. NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plan and Preparedness in Support of Nuclear Power Plants".

FIGURE 1

ON-SITE EMERGENCY ORGANIZATION

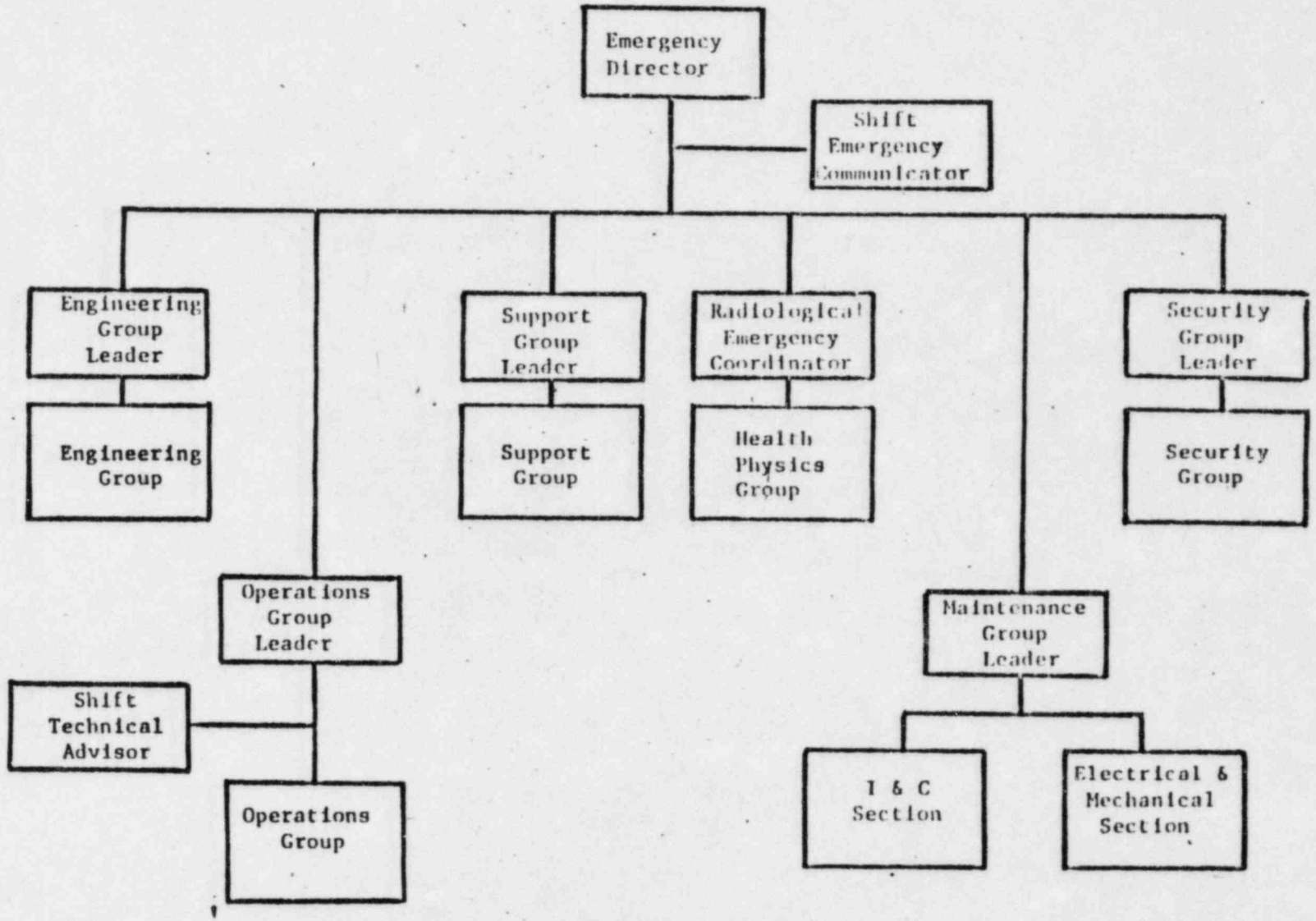
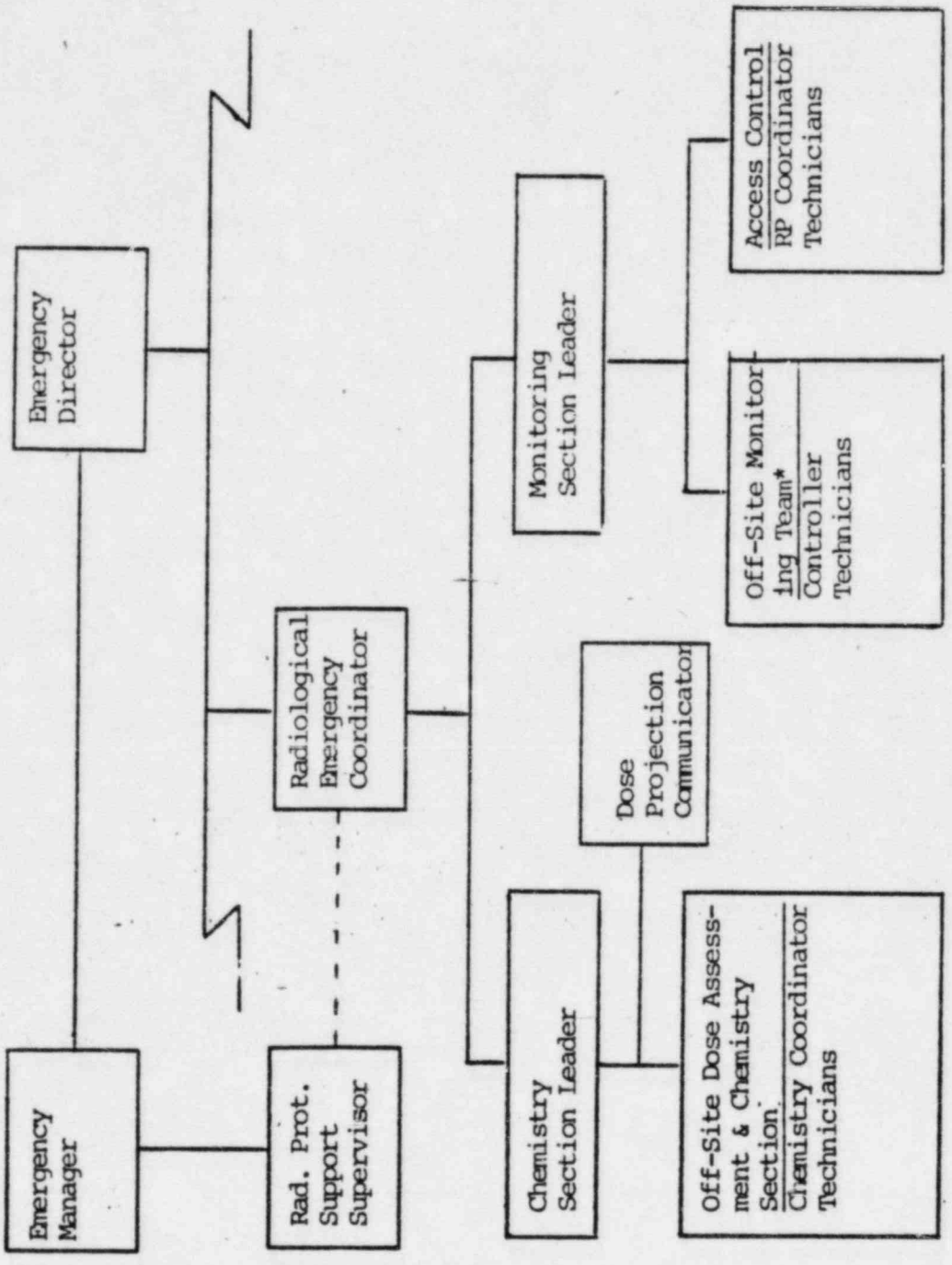


FIGURE 2

HEALTH PHYSICS GROUP ORGANIZATION



* Staffed during initial stage of emergency. After EOF activation, Off-Site Monitoring Team dissolves.

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes ___ No X

CLASSIFICATION OF EMERGENCIES

A.2-101

Prepared by: C.S. Mathias ALARA Review: Revision 0 Date 03/31/81
Reviewed by: T.L. Tedesco Q.A. Review: Revision 0 Date 03/31/81
Operations Committee Final Review: Meeting Number 1186 Date 2/17/83
Approved by: W.H. Clark Date 2-18-83
Op. Com. Results Review: Not Required Mtg. # 946 Date 03/20/81

PURPOSE

The purpose of this procedure is to specify conditions or groups of conditions that indicate an emergency exists and the actions to be taken by the Shift Supervisor or Control Room Operators to verify and classify the type of emergency condition.

CONDITIONS AND PREREQUISITES

An off-normal condition corresponding to one of the initiating events described in the appendices of this procedure is occurring or has occurred.

PRECAUTIONS

A. There are many indications of an emergency condition that may occur either individually, in group events or sequentially. The operator or Shift Supervisor must be careful not to rely on any one indication as being absolutely indicative of an emergency condition. Although the operator should believe indications and take action based on those indications, he shall attempt to verify indications by checking secondary or coincident indicators. Continued surveillance and assessment of plant conditions is necessary to ensure that the emergency classification is appropriately revised as conditions change, or as more definitive information is obtained.

B. None of the actions specified in the EPIP's shall take precedence over the actions that are necessary to comply with Technical Specifications.

ORGANIZATION

A. Overall Responsibility - Emergency Director

B. In Charge

Control Room - Shift Supervisor

WP/kk

C. Assistance

Reactor Operator
Shift Technical Advisor when assigned
Shift Emergency Communicator

DISCUSSION

A. Definitions

1. Emergency Condition - An occurrence, or combination of events and indications that fall into one of the following classifications:

a. Notification of Unusual Event

Unusual events are in process or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring off-site response or monitoring are expected unless further degradation of safety systems occurs.

b. ALERT

Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

c. SITE AREA EMERGENCY

Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to exceed EPA Protective Action Guideline exposure levels except near site boundary.

d. GENERAL EMERGENCY

Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels off-site for more than the immediate site area.

2. Emergency Action Levels (EAL) - Numerical or qualitative values for the operational or radiological parameters, (radiological dose rates; water borne or surface deposited concentrations of radioactivity; specific instrument indications or changes in indications) that may be used as threshholds for initiating procedures or actions to assess and verify plant conditions and may require initiating specific emergency procedures as designated by a particular class of emergency.

B. Recognition

Attached to this procedure is Attachment 2, Event Recognition Guidelines (1-28). These guidelines identify the four emergency classifications, the possible initiating event(s), emergency action levels for each classification, and, where applicable, specific instruments and indications to be used to detect and classify an emergency. The identified instruments and alarms are a representative listing of various instruments that may be used to verify an emergency condition. There are many process variables referred to in the guidelines.

The instruments, indications, or alarms listed for any particular event are not necessarily a complete list of all those that will show abnormal indications or be useful in classifying the event. There is typically more than one instrument or instrument channel that monitors a specific parameter. The redundant channels and coincident indicators should all be used to verify the emergency condition.

The emergency action levels specified in the guidelines do not necessitate initiation of any particular phase of the emergency plan but rather signify a need for assessment and classification of conditions. In many cases, the proper classification will be immediately apparent from in-plant instrumentation. In others, further assessment is necessary to determine the applicable emergency classification.

The plant operating staff should consider the effect that combinations of initiating events have, that if taken individually would constitute a lower emergency classification but collectively may exceed the criteria for a higher classification.

In the Unusual Event classification, numerous EALs are related to limiting conditions for operation (LCOs) as specified in Technical Specifications. In these cases, the EAL is not considered exceeded and an emergency condition does not exist if the appropriate corrective action for exceeding the LCO is taken. The EAL is exceeded and an Unusual Event has occurred if the event results in a forced shutdown by the LCO.

RESPONSIBILITIES

A. Emergency Director (Shift Supervisor)

1. Prior to EOF activation, the Emergency Director shall declare the appropriate emergency condition as soon as the event has been indicated and verified.

   After EOF activation, the Emergency Director shall notify the Emergency Manager when change in classification is indicated and verified.

2. After the emergency condition has been declared, the Emergency Director is responsible for implementing the actions as specified in the following procedures:

   a. Notification of an Unusual Event, A.2-102
   b. Alert, A.2-103
   c. Site Area Emergency, A.2-104
   d. General Emergency, A.2-105

B. Control Room Operator

1. The control room operator shall immediately notify the Shift Supervisor of any events that may be classified as emergency conditions.

2. The operator shall attempt to verify any indications.

3. The operator shall assist the Shift Supervisor in assessing the indicati[illegible] and determining the classification of emergency.

4. The operator shall take immediate actions as dictated by plant procedures and his general knowledge to control the event and place the plant in a safe condition.

C. Shift Technical Advisor

The Shift Technical Advisor shall advise the Shift Supervisor in identifying the event.

D. Shift Emergency Communicator

The Shift Emergency Communicator shall assist the Shift Supervisor in event classification.

PROCEDURE

STEP 1: Verify the initial indication by comparing the indication to redundant instrument channels or to related parameters, physical observations, and field reports, as applicable. If not already present, notify the STA and/or SEC as appropriate. Initiate Form 5790-101-1, EMERGENCY CLASSIFICATION CHECKLIST (Attachment 3).

STA:

DELETED

SEC:

DELETED

STEP 2: Use Attachment 1 to identify any Guidelines applicable to the initiating condition.

STEP 3: Locate the applicable guideline sheets in Attachment 2.

STEP 4: Determine the appropriate emergency classification by comparing the verified plant parameters to the EALs for each emergency condition. If more than one guideline is applicable to the initiating condition, use the guideline which indicates the most severe classification.

STEP 5 If the EOF is not activated, declare the appropriate emergency and implement the corresponding response procedure. If the EOF is activated, contact the Emergency Manager for consultation on whether or not to change the emergency classification. If a change is to be made, implement the corresponding procedure. (The Emergency Manager will declare the new classification.)

a. Notification of Unusual Event, A.2-102
b. Alert, A.2-103
c. Site Area Emergency, A.2-104
d. General Emergency, A.2-105

STEP 6: Continue to assess the events and, if necessary, the emergency classification, as more definitive information becomes available or if plant conditions change significantly.

REFERENCES

1. NSP Monticello Nuclear Generating Plant, Plant Emergency Plan

2. NUREG-0654/FEMA-REP 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plan and Preparedness in Support of Nuclear Power Plants"

3. Title 10, Code of Federal Regulation Part 50, Appendix E

ATTACHMENTS

1. Attachment 1, List of Initating Condition Categories

2. Attachment 2, Guidelines for Classification of Emergency Conditions

3. Example of Emergency Classification Checklist

WP/kk

Attachment 1
List of Initiating Condition Categories

Initiating Condition	Guideline
Radioactive effluents-high release rate or unmonitored	1
Increase in plant radiation levels	2
Release or loss of control of radioactive material within plant	2
Fuel handling accident	2
Reactor pressure high	3
Reactor coolant leak	4
Main steam line break	5
Fuel cladding degradation	6
High coolant or off-gas activity	6
FSAR transient (Control Rod Drop)	6
Safety relief valve failure	7
ECCS initiation	8
Loss of primary containment	10
Loss of engineered safety or fire protection features	11
Failure of RPS to initiate or complete scram	12
Loss of plant shutdown or shutdown cooling capability	13
Loss of indicators or alarms (annunciators)	14
Control room evacuation	15
Toxic or flammable gas	16
Security compromise	17
Loss of AC power	18
Loss of DC power	19
Tornado or sustained winds	20
Flood or low water	21
Earthquake	22
Fire	23
Explosion	24
Aircraft or missiles	25
Train accident	26

WP/kk

Attachment 1 (Cont'd.)

List of Initiating Condition Categories

Initiating Condition	Guideline
Contaminated injury	26
Turbine failure	26
General emergency	28
Other plant conditions	29
Spent fuel, major damage to	30

WP/kk

ATTACHMENT 2

Guideline 1 — RADIOACTIVE EFFLUENT

UNUSUAL EVENT

Radiological effluent technical specification limits exceeded.

EAL's

1. Discharge Canal Monitor exceeds 20 cps.

   (High alarm annunciated on C04-A-22, DISCHARGE CANAL RADIATION, and recorded by C02-17.358)

   or

2. Unmonitored liquid release to river which exceeds 10CFR20 App. B limits.

   or

3. Stack Effluent Monitor (Ch A or B) exceeds 90,000 µCi/sec.

   (Hi-Hi alarm annunciated on C259-A-1, STACK EFFLUENT HI-HI RADIATION; recorded on C257 and C258 (RR 7858A and RR 7858B), STACK NOBLE GAS RELEASE RATE; and alarmed by computer point D-061.)

   or

4. Reactor Building Vent Noble Gas Monitor exceeds 4500 µCi/sec.

   or

5. Unmonitored gaseous release to the atmosphere which is estimated or suspected to exceed Appendix I Tech. Spec. limits.

ALERT

Radiological effluents greater than 10 times technical specification instantaneous limits (an instantaneous rate which, if continued over 2 hours, would result in about 1 mR at the site boundary under average meteorological conditions).

EAL's

1. Discharge Canal Monitor exceeds 200 cps.

   or

ATTACHMENT 2 (Cont'd.)

Guideline 1 (Cont'd.) RADIOACTIVE EFFLUENT

2. Unmonitored liquid release to river which is 10 times the limits in 10CFR20 Appendix B.

or

3. Stack Effluent Monitor (Ch A or B) exceeds 9.0E+5 µCi/sec.

or

4. Reactor Building Vent Noble Gas Monitor exceeds 45,000 µCi/sec.

or

5. Unmonitored gaseous release to the atmosphere which is estimated or expected to exceed 10 times Appendix I Tech Spec limits.

SITE AREA

a. Effluent monitors detect levels corresponding to greater than 50 mR/hr for ½ hour or greater than 500 mR/hr Whole Body for two minutes (or five times these levels to the thyroid) at the site boundary for adverse meteorology,

b. These dose rates are projected based on other plant parameters (e.g., radiation level in containment with leak rate appropriate for existing containment pressure) or are measured in the environs; or

c. EPA Protective Action Guidelines are projected to be exceeded outside the Site Boundary.

EAL's

1. Stack Effluent Monitor (Ch A or B) exceeds 9.0E+5 µCi/sec for 30 minutes

or

2. Stack Effluent Monitor (Ch A or B) exceeds 9.0E+6 µCi/sec for 2 minutes

or

3. Stack release rate of radioiodines exceeds 1.7E+4 µCi/sec for 30 minutes

or

4. Stack release rate of radioiodines exceeds 1.7E+5 µCi/sec for 2 minutes

or

5. RBV Noble Gas Monitor exceeds 2.1E+4 µCi/sec for 30 minutes

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 1 (Cont'd.) RADIOACTIVE EFFLUENT

or

6. RBV Noble Gas Monitor exceeds 2.1E+5 µCi/sec for 2 minutes.

or

7. RBV release rate of radioiodines exceeds 2100 µCi/sec for 30 minutes

or

8. RBV release rate of radioiodines exceeds 2.1E+4 µCi/sec for 2 minutes

or

9. Whole body doses greater than 1 Rem or thyroid doses of greater than 5 Rem are projected beyond the site boundary.

or

10. Containment Radiation Monitor reading indicates above the .01% curve when plotted versus time after shutdown on the graph shown in Figure 1.

or

11. Measured W.B. dose rates at site boundary or beyond exceed 50 mR/hr for 30 minutes or 500 mR/hr for 2 minutes

or

12. Radioiodine concentrations measured at site boundary or beyond exceed 7.0E-8 µCi/cc for 30 minutes or 7.0E-7 µCi/cc for 2 minutes.

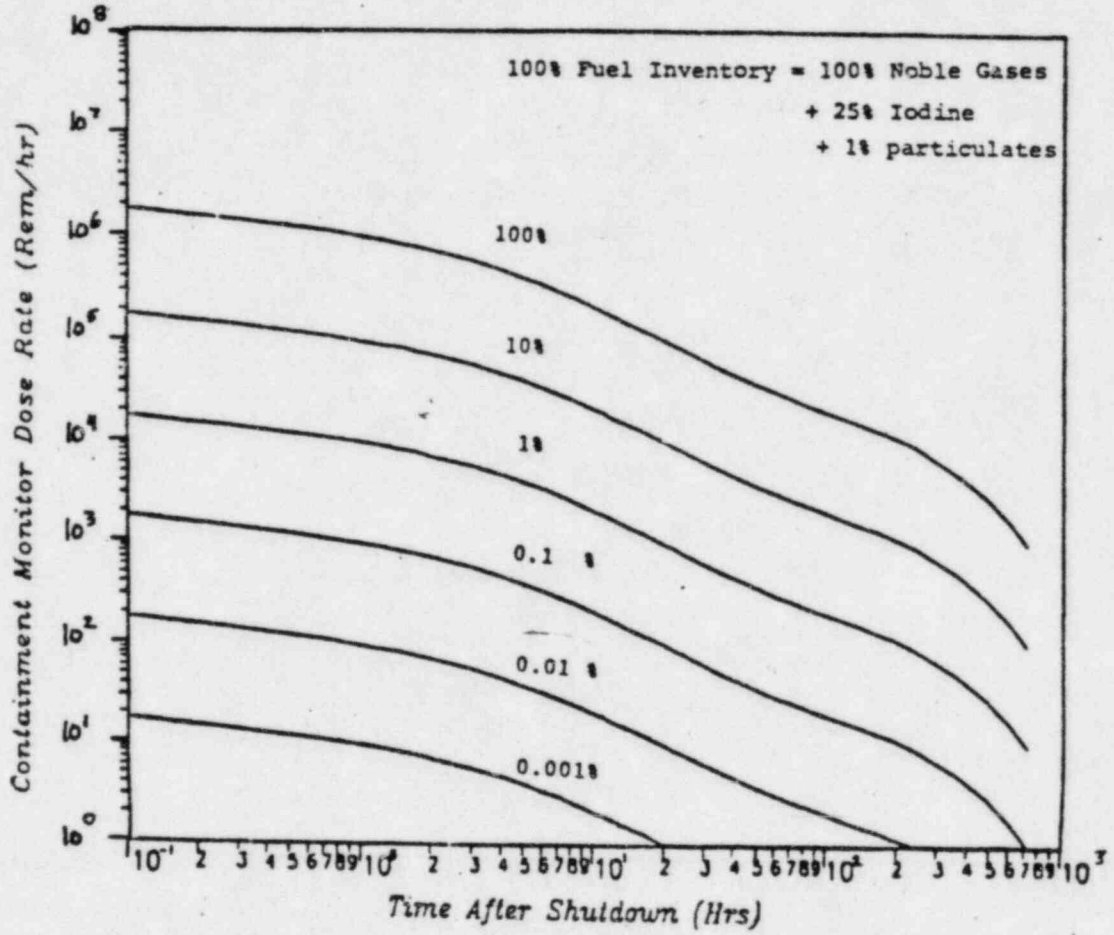
GENERAL

As specified in Guideline 28.

WP/kk

FIGURE 1

Percent of Fuel Inventory Airborne in the Containment



% Fuel Inventory Released	Approximate Source and Damage Estimate
100.	100% TID-14844, 100% fuel damage, potential core melt.
50.	50% TID noble gases, TMI source.
10.	10% TID, 100% NRC gap activity, total clad failure, partial core uncovered.
3.	3% TID, 100% WASH-1400 gap activity, major clad failure.
1.	1% TID, 10% NRC gap, Max. 10% clad failure.
.1	.1% TID, 1% NRC gap, 1% clad failure, local heating of 5-10 fuel assemblies.
.01	.01% TID, .1% NRC gap, clad failure of 3/4 fuel element (36 rods).
10^{-3}	.01% NRC gap, clad failure of a few rods.
10^{-4}	100% coolant release with spiking.
5×10^{-6}	100% coolant inventory release.
10^{-6}	Upper range of normal airborne noble gas activity in containment.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 2 — IN-PLANT RADIATION LEVELS

UNUSUAL EVENT

Not Applicable

ALERT

Severe degradation in control of radioactive materials.

EAL

1. Increase by factor of 1000 in plant radiation levels as indicated by Area Radiation Monitoring System:

Panel		Description	Normal	EAL
C-11	A-1	Refuel Floor Low Range	2	Full scale
C-11	A-2	Refuel Floor High Range	5	5000
C-11	A-3	Refuel Floor S.W. Stairway	1	1000
C-11	A-4	New Fuel Storage	20	Full scale
C-11	A-5	Fuel Pool Skimmer Tk Area	20	Full scale
C-11	A-6	1001' Rx South	3	Full scale
C-11	A-7	985' Sample Hood	5	Full scale
C-11	A-8	Rx Cleanup System Access	0.25	250
C-11	A-9	962' Rx Tool Storage Area	0.8	800
C-11	A-10	East CRD Module Area	7	Full scale
C-11	A-11	West CRD Module Area	3	Full scale
C-11	A-12	TIP Drive Area	2	Full scale
C-11	A-13	TIP Cubicle	30	Full scale
C-11	A-14	HPCI Turbine Area	2	Full scale
C-11	A-15	Rx. Bldg Drain Tk Area	25	Full scale
C-11	A-16	RCIC Pump Area	1	1000
C-11	A-17	East C.S. and RHR Area	10	Full scale
C-11	A-18	West C.S. and RHR Area	5	Full scale
C-11	A-19	Hot Lab	0.25	250
C-11	A-20	Control Room Low Range	0.02	20

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 2 (Cont'd.)

Panel		Description	IN-PLANT RADIATION LEVEL Normal	EAL
C-11	A-21	Control Room High Range	3	3000
C-11	B-1	Turbine Operating Floor	20	Full scale
C-11	B-2	Turbine Front Standard	10	Full scale
C-11	B-3	Cond Demin Operating Area	1	1000
C-11	B-4	Mechanical Vacuum Pump Rm	9	Full scale
C-11	B-5	Feedwater Pump Area	1	1000
C-11	C-1	Radwaste Control Room	0.2	200
C-11	C-2	Sample Tank Area	2	Full scale
C-11	C-3	Conveyor Operating Area	0.2	200
C-11	D-1	Hot Machine Shop	0.2	200
C-252	E-1	Recombiner Instrument Room	2	Full scale
C-252	E-2	Recombiner Pump Room	2	Full scale
C-252	F-1	Offgas Storage Foyer	0.1	100
C-11	F-2	Offgas Storage Foyer High Range	<100	100
C-257 & C-258		Containment Radiation Monitor		50 R/hr

NOTE: EAL's shown as FULLSCALE indicate that an increase by a factor of 1000 is beyond the range of the particular monitor. In these cases, a fullscale reading combined with the Shift Supervisor's concurrence, shall meet the criteria for the ALERT classification.

or

2. Direct measurement of radiation levels corresponding to an increase by a factor of 1000.

SITE AREA

Not applicable

GENERAL

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 3 — REACTOR PRESSURE HIGH

UNUSUAL EVENT

1. Reactor Pressure exceeds safety limit (1335 psig).

Instrument	Description	EAL
C05-FPR 6/97	Reactor Wide Range Pressure Recorder	1200
C05-6.90 A/B	Reactor Pressure Indicators	1200

Verify 1335 psig exceeded by checking pressure indicator PI 2-3-60B on C56.

ALERT

Not Applicable

SITE AREA EMERGENCY

Not Applicable

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 4

REACTOR COOLANT LEAK

UNUSUAL EVENT

Primary system leak rate exceeds technical specification.

EAL's

1. Unidentified leakage calculated from C4-FQ2543 or by computer point D-122, Floor Drain Sump Rate of Change, exceeds 5 gpm

   OR

2. Identified leakage calculated from C4-FQ 2544 or from computer point D-120, Equipment Drain Sump Rate of Change, exceeds 20 gpm.

   OR

3. Unidentified leakage rate increases 2 gpm within any 4 hour period as determined from Test #0381, CONTAINMENT COOLANT LEAKAGE LOG.

ALERT

Primary coolant leak rate greater than 50 gpm.

EAL

1. Total leakage calculated from C4-FQ2543 and FQ-2544 or from computer points D-120, Equipment Drain Sump Rate of Change, D-122, Floor Drain Sump Rate of Change, exceeds 50 gpm.

SITE AREA

Known loss of coolant accident greater than makeup pump capacity.

EAL's

1. Reactor water level (C05-2.3.85 A/B) decreasing below 1 foot above active fuel (-114 inches)

GENERAL

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 5

MAIN STEAMLINE BREAK

UNUSUAL EVENT

Not Applicable

ALERT

Steamline break with MSIV malfunction causing leakage to secondary containment.

EAL's

1. Shift Supervisor's opinion that MSIV is malfunctioning or continuing steam flow with evidence that steam line break is outside of primary containment (e.g. visual observation, radiation or temperature),

and

2a. Annunciator alarms on MAIN STEAM LINE HIGH FLOW A/B (C05-A-25/26) and RX WATER LEVEL HI/LO (C05-B-24),

or

2b. Annunciator alarm MAIN STEAM TUNNEL HIGH TEMPERATURE A/B (C05-A17/18)

or

2c. Annunciator alarm MAIN STEAM LINE LEAKAGE (C05-B-32).

SITE AREA

Main steam line break with failure of MSIV's to isolate leak and causing leakage outside of secondary containment.

EAL's

1. Shift Supervisor's opinion that MSIV is malfunctioning or continuing steam flow with evidence that steam line break is outside of primary containment

and

2a. Annunciator alarms on MAIN STEAM LINE HIGH FLOW A/B (C05-A-25/26) and RX WATER LEVEL HI/LO (C05-B-24)

or

ATTACHMENT 2 (Cont'd.)

Guideline 5 (Cont'd.) MAIN STEAMLINE BREAK

2b. Annunciator alarm on MAIN STEAM TUNNEL HIGH TEMPERATURE (C-5-A-17/18)

or

2c. Annunciator alarm on MAIN STEAM LINE LEAKAGE (C05-B-32)

and

3a. Annunciator alarm on TURBINE BUILDING HIGH RADIATION ALARM (C04-A-21)

or

3b. High airborne radioactive material levels in Turbine Bldg. indicated by air monitors or direct measurement

or

3c. Visual observation that blow-out panels between steam chase and turbine building have been ruptured.

GENERAL

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 6

FUEL CLADDING DEGRADATION

UNUSUAL EVENT

Fuel damage indication

EAL's

1. Offgas Radiation Monitor exceeds 20,000 mR/hr
   or
2. Offgas Radiation Monitor increases by 4000 mR/hr within 30 minutes at steady power
   or
3. Reactor coolant I-131 dose equivalent exceeds 5 μCi/gram as determined by sample and analysis.

ALERT

Severe loss of fuel cladding.

a. High offgas at air ejector monitor (greater than 5 ci/sec; corresponding to 16 isotopes decayed 30 minutes)
   or
b. Very high coolant activity sample (e.g., 300 μCi/cc equivalent of I-131)

EAL's

1. Offgas Radiation Monitor exceeds 200,000 mR/hr
   or
2. Reactor coolant I-131 dose equivalent exceeds 300 μCi/gm as determined by sample and analysis.
   or
3. Main Steam Line monitor initiates trip due to high radiation.
   NOTE: Resin intrusion may cause high radiation without fuel cladding damage.

SITE AREA

Degraded Core with possible loss of coolable geometry

EAL's

1. More than 1/3 of core uncovered as indicated by reactor water level below -174 inches and
2. a. Reactor coolant I-131 dose equivalent exceeds 3000 μCi/gm as determined by sample and analysis.
   or
   b. Inability to insert control rods fully
   or
   c. Inability to position SRM's or IRM's within core.

GENERAL

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 7

SAFETY RELIEF VALVE FAILURE

UNUSUAL EVENT

Failure of a safety relief valve to close following reduction of applicable pressure.

EAL's

Auto Blowdown Relief Valve Leakage Alarm, C03-A-09

or

SRV Open Alarm, C05-A-54

ALERT

Not applicable

SITE AREA EMERGENCY

Not applicable

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 8

ECCS INITIATION

UNUSUAL EVENT

Emergency Core Cooling System (ECCS) initiated and discharge to vessel.

EAL's

1a. RHR flow to reactor as indicated by RHR FLOW A/B Indicator, C03-10.139A/B

or

1b. Core spray flow to reactor as indicated by CORE SPRAY FLOW A/B Indicator, C03-14.50A/B

or

1c. HPCI flow to reactor as indicated by HPCI FLOW Indicator, C03-FIC 23-108

or

1d. APRS actuation as indicated by annunciator AUTO BLOWDOWN TIMERS ACTIVATE (3-A-25) and subsequent S/RV OPEN (5-A-54) annunciator

and

2. Shift Supervisor's opinion that an emergency should be declared.

ALERT

Not Applicable

SITE AREA EMERGENCY

Not Applicable

GENERAL EMERGENCY

See Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 10

LOSS OF CONTAINMENT INTEGRITY

UNUSUAL EVENT

Loss of containment integrity requiring shutdown in accordance with Technical Specifications.

EAL's

Plant shutdown is required by any one of the following limiting conditions for operation:

a. TS 3.7.A - Primary Containment; or

b. TS 3.7.B - Standby Gas Treatment System; or

c. TS 3.7.C - Secondary Containment; or

d. TS 3.7.D - Primary Containment Isolation Valves

ALERT

Not Applicable

SITE AREA EMERGENCY

Not Applicable

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 11

LOSS OF ESF OR FIRE PROTECTION SYSTEM

UNUSUAL EVENT

1. Loss of Engineered Safety Features (ESF) or fire protection system requiring shutdown by Technical Specifications. The following is a list of operable ESF and fire protection subsystems necessary to meet LCO:

   Core Spray System

   Low Pressure Coolant Injection Subsystem

   Containment Cooling Capability
   (RHR Service Water System)

   High Pressure Coolant Injection System

   Automatic Pressure Relief

   Diesel Generator System

   Fire Protection System

   Standby Liquid Control System

ALERT

Not Applicable

SITE AREA EMERGENCY

Not Applicable

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 12

REACTOR PROTECTION SYSTEM FAILURE

UNUSUAL EVENT

Not Applicable

ALERT

Failure of the reactor protection system to initiate and complete a scram which brings the reactor subcritical.

EAL's

Valid Scram Signal

and

Neutron count rate indicates reactor critical.

SITE AREA EMERGENCY

Transient requiring operation of shutdown systems with failure to scram (continued power operation but no core damage immediately evident.)

EAL's

Failure to bring reactor subcritical with control rods

and

Failure of the standby liquid control system

and

Shift Supervisor's opinion that a transient is in progress

and

No indication of core damage (if core damage indicated, call a general emergency)

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 13

LOSS OF PLANT SHUTDOWN OR SHUTDOWN COOLING CAPABILITY

UNUSUAL EVENT

Not Applicable

ALERT

Complete loss of ability to achieve or maintain cold shutdown.

EAL's

1. Loss of both RHR SW Loops
   or
   Loss of both RHR Systems Shutdown cooling mode of operation
   or
   Loss of both RHR LPCI modes of operation and loss of both core spray systems.

   AND/OR

2. Shift Supervisor's opinion that plant cannot reach or maintain cold shutdown.

SITE AREA

Complete loss of ability to achieve or maintain hot shutdown

EAL's

1. Inability to SCRAM and inoperable Standby Liquid Control System

   and

2. Loss of all safety relief valve capability
   or
   Inoperable RHR System
   or
   Inoperable RHR heat sink

   and

3. Loss of main condenser cooling
   or
   No makeup capability from either HPCI or RCIC systems.

   AND/OR

4. Shift Supervisor's opinion that plant cannot reach or maintain hot shutdown.

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 14

LOSS OF INSTRUMENTATION

NOTE: Indication of alarm or instrumentation failure may be difficult to determine. A failure of normally lighted indicators or the failure of certain alarms to annunciate during a surveillance procedure may provide an initial warning. A cause of annunciator failure, and thus an indication of failure, could be a loss of the uninterruptable MG set and no transfer to CKT Y10.

UNUSUAL EVENT

Indications or alarms on process or effluent parameters not functional in the Control Room to an extent requiring plant shutdown.

ALERT

Loss of most or all annunciators (on panels C03, C04, C05, C08) sustained for > 15 minutes with the plant not in cold shutdown.

SITE AREA EMERGENCY

1. Loss of most or all annunciators (on panels C03, C04, C05, C08) > 15 minutes and plant transient initiated or in progress.

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 15 — CONTROL ROOM EVACUATION

UNUSUAL EVENT

Not Applicable

ALERT

Evacuation of the Control Room is required or anticipated and control of shutdown systems has been established at local stations. (If local control has not been established in 15 minutes, go to SITE AREA.)

EAL

As determined by on-duty Shift Supervisor.

SITE AREA EMERGENCY

Evacuation of Control Room and control of shutdown systems not established from local staticns in 15 minutes.

EAL

As determined by on-duty Shift Supervisor.

GENERAL EMERGENCY

As specified in Guideline 28.

ATTACHMENT 2 (Cont'd.)

Guideline 16 — TOXIC/FLAMMABLE GASES

UNUSUAL EVENT

Near or onsite toxic or flammable gas release.

EAL

Gaseous hazards being experienced or projected onsite (out-of-plant) as indicated by visual observation, physical measurement or notification.

ALERT

Entry into facility environs of uncontrolled toxic or flammable gases.

EAL's

Gaseous hazards being experienced or projected within the plant as indicated by measured concentrations equal to or greater than:

(a) 3 ppm chlorine; or
(b) explosive levels (as detected by explosive meter).

SITE AREA

Entry of uncontrolled flammable gases into vital areas or entry of uncontrolled toxic gases into vital areas where lack of access to the area constitutes a safety problem and plant is not in cold shutdown.

EAL's

1. Gaseous hazards being experienced or projected within vital areas of the plant as indicated by measured concentration equal to or greater than:

   a) 3 ppm chlorine; or
   b) explosive levels (as detected by explosive meter)

   and

2. Plant not in cold shutdown.

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 17 SECURITY COMPROMISE

UNUSUAL EVENT

Security threat or attempted entry or attempted sabotage.

EAL

Shift supervisor's opinion.

ALERT

Ongoing security compromise.

EAL

Security safeguards contingency event that results in adversaries commandeering an area of the plant, but not controlling shutdown capability or any vital areas.

SITE AREA

Imminent loss of physical control of the plant.

EAL

Physical attack on the plant involving imminent occupancy of the control room, auxiliary shutdown panels, and any other vital areas.

GENERAL

Loss of physical control of the facility.

EAL

Physical attack on the plant has resulted in unauthorized personnel occupying the control room or any other vital areas.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 18 LOSS OF AC POWER

UNUSUAL EVENT

Loss of offsite power or loss of onsite AC power capability.

EAL's

1. Loss of all offsite power as indicated by annunciators:

   C08-B-7 No. 1R Res Trans to No. 13 Bus Bkr Trip; and
   C08-C-08 No. 1AR Res Trans to No. 15 Bus Bkr Trip; and
   C08-C-11 No. 1AR Res Trans to No. 16 Bus Bkr Trip; and
   C08-C-19 No. 14 4160V Bus to No. 16 Bus Bkr Trip

   and verified by zero voltage indicated on Bus 11, Bus 12, Bus 13, Bus 14, and 1AR Transformer voltage meters on panel C8.

   or

2. Loss of both Emergency Diesel Generators when they are required to be operable by Technical Specifications.

ALERT

Loss of offsite power and loss ofall onsite AC power. (see Site Area Emergency for extended loss)

EAL's

1. Loss of all offsite power as indicated by annunciators:

   C08-B-7 No. 1R Res Trans to No. 13 Bus Bkr Trip; and
   C08-C-08 No. 1AR Res Trans to No. 15 Bus Bkr Trip; and
   C08-C-11 No. 1AR Res Trans to No. 16 Bus Bkr Trip; and
   C08-C-19 No. 14 4160V Bus to No. 16 Bus Bkr Trip

   and verified by zero voltage indicated on Buss 11, Bus 12, Bus 13, Bus 14 and 1AR Transformer voltage meters on panel C8.

   and

2. Loss of both Emergency Diesel Generators when they are required to be operable by Technical Specifications.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 18 (Cont'd.) LOSS OF AC POWER

SITE AREA

Loss of all offsite power and loss of onsite AC power for more than 15 minutes.

EAL's

1. Loss of all offsite power as indicated by annunciators:

   C08-B-7 No. 1R Res Trans to No. 13 Bus Bkr Trip; and
   C08-C-08 No. 1AR Res Trans to No. 15 Bus Bkr Trip; and
   C08-C-11 No. 1AR Res Tras to No. 16 Bus Bkr Trip; and
   C08-C-19 No. 14 4160V Bus to No. 16 Bus Bkr Trip

   and verified by zero voltage indicated on Buss 11, Bus 12, Bus 13, Bus 14 and 1AR Transformer voltage meters on panel C8.

   and

2. Loss of both Emergency Diesel Generators when they are required to be operable by Technical Specifications.

   and

3. 15 minute time lapse.

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 19 LOSS OF DC POWER

UNUSUAL EVENT

Not applicable.

ALERT

Loss of all vital DC power. (See Site Area Emergency for extended loss.)

EAL's

Loss of both 125V DC power sources and loss of 250V DC power source as indicated by:

1. Annunciators C08-A-20 250V Bus Low Voltage; and
   C08-B-13 No. 12 125V DC Bus Low Voltage; and
   C08-C-13 No. 11 125V DC Bus Low Voltage
   AND
2. Shift Supervisors opinion that all vital DC power is lost or degraded voltages are measured at battery terminals.

SITE AREA

Loss of all vital onsite DC power for more than 15 minutes.

EAL's

Loss of both 125V DC power sources and loss of 250V DC power source as indicated by:

1. Annunciators C08-A-20 250V Bus Low Voltage; and
   C08-B-13 No. 12 125V DC Bus Low Voltage; and
   C08-C-13 No. 11 125V DC Bus Low Voltage
   AND
2. Shift Supervisors opinion that all vital DC power is lost or degraded voltages are measured at battery terminals.
   AND
3. Lapse of 15 minutes.

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 20

TORNADO OR SUSTAINED WINDS

UNUSUAL EVENT

Any tornado on-site.

EAL's

A tornado is observed to touch down within site boundary

or

Sustained winds above 75 mph for greater than 10 minutes at the site.

ALERT

Tornado striking facility.

EAL's

A tornado strikes a vital plant structure

or

Sustained winds above 90 mph for greater than 10 minutes at the site.

SITE AREA

Sustained winds or tornadoes in excess of design levels.

EAL's

Tornado causes damage to vital plant equipment or structures

or

Sustained winds above 100 mph for greater than 10 minutes at the site.

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 21

RIVER WATER HI/LOW

UNUSUAL EVENT

1. River water level in excess of 918 Feet
2. River flow below 240 CFS (about 902.4 FT river level)

ALERT

1. River water level between 921 and 930 FT.
2. River flow below 220 CFS (about 902.3 FT).

SITE AREA EMERGENCY

1. River water level exceeds 930 FT.
2. River water level below 899 FT.
3. Flood or low water causes damage to vital equipment.

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 22

EARTHQUAKE

UNUSUAL EVENT

Any earthquake felt in-plant or detected on station seismic instrumentation, and subsequently confirmed by one or more off-site sources.

EAL's

1. Alarm C06-C-8, EARTHQUAKE

or

2. Shift Supervisor's opinion

ALERT

Confirmed earthquake greater than OBE levels.

EAL

Alarm C06-C-13, OPERATIONAL BASIS EARTHQUAKE

SITE AREA

Confirmed earthquake greater than DBE levels and plant not in cold shutdown.

EAL's

Alarm C06-C-18, DESIGN BASIS EARTHQUAKE

and

Plant not in cold shutdown.

GENERAL EMERGENCY

As specified in Gudeline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 23 FIRE

UNUSUAL EVENT

Fire within plant lasting more than 10 minutes after initiation of fire fighting.

EAL

Fire Brigade Leader's determination.

ALERT

Fire potentially affecting safety systems.

EAL's

Observation that fire could affect safety system;

and

Shift Supervisor's opinion.

SITE AREA

Fire compromising the functions of safety systems.

EAL's

Observation of fire that affects safety systems or functions;

and

Shift Supervisor's opinion.

GENEAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 24

EXPLOSION

UNUSUAL EVENT

Near or On-site explosion.

EAL

Visual observation or notification received;

and

Shift Supervisor's opinion.

ALERT

Known explosion damage to facility affecting plant operation.

EAL

Shift Supervisor's opinion.

SITE AREA

Severe damage to safe shutdown equipment from explosion or missiles.

EAL's

Plant not in cold shutdown

and

Shift Supervisor's opinion

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 25

AIRCRAFT & MISSILES

UNUSUAL EVENT

1. Aircraft crash onsite or suspicious aircraft activity over facility.

EAL

Visual observation or notification is received.

ALERT

Aircraft crash on the facility or missile impacts on facility.

EAL

Visual observation

SITE AREA

a. Aircraft crash affecting vital structures by impact or fire.

b. Severe damage to safe shutdown equipment from missiles or explosion.

EAL

As determined by Shift Supervisor with plant not in cold shutdown.

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 26

MISCELLANEOUS

UNUSUAL EVENT

a. Transportation of contaminated injured individual from site to offsite hospital.

b. Train derailment on site.

c. Turbine rotating component failure causing rapid plant shutdown.

EAL's

1. Visual observation

or

2. Shift Supervisor's opinion

ALERT

Turbine failure causing casing penetration.

EAL's

1. Visual observation

and

2. Shift Supervisor's opinion

SITE AREA EMERGENCY

Not Applicable

GENERAL EMERGENCY

As specified in Guideline 28.

WP/kk

ATTACMENT 2 (Cont'd.)

Guideline 28

ALL GUIDELINES - GENERAL EMERGENCY

GENERAL EMERGENCY

a. Effluent monitors detect levels corresponding to 1 rem/hr W.B. or 5 rem/hr thyroid at the site boundary under actual meteorological conditions.

b. These dose rates are projected based on other plant parameters (e.g., radiation levels in containment with leak rate appropriate for existing containment pressure with some confirmation from effluent monitors) or are measured in the environs.

EAL's

1. Stack Effluent Monitor (Ch. A or B) exceeds:

   1.3E+8 µCi/sec in stability class A
   1.9E+8 µCi/sec in stability class B
   1.0E+9 µCi/sec in stability class C
   1.0E+9 µCi/sec in stability class D
   1.0E+9 µCi/sec in stability class E
   1.0E+9 µCi/sec in stability class F

   or

2. RBV Effluent Monitor exceeds:

   9.6E+7 µCi/sec in stability class A
   3.1E+7 µCi/sec in stability class B
   1.5E+7 µCi/sec in stability class C
   7.1E+6 µCi/sec in stability class D
   4.4E+6 µCi/sec in stability class E
   2.8E+6 µCi/sec in stability class F

   or

3. Stack radioiodine release rate exceeds:

   2.3E+6 µCi/sec in stability class A
   2.6E+6 µCi/sec in stability class B
   3.4E+6 µCi/sec in stability class C
   4.9E+6 µCi/sec in stability class D
   4.9E+6 µCi/sec in stability class E
   5.9E+6 µCi/sec in stability class F

   or

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 28 (Cont'd.) ALL GUIDELINES - GENERAL EMERGENCY

4. RBV radioiodine release rate exceeds:

   1.9E+6 µCi/sec in stability class A
   6.0E+5 µCi/sec in stability class B
   3.0E+5 µCi/sec in stability class C
   1.4E+5 µCi/sec in stability class D
   8.6E+4 µCi/sec in stability class E
   5.6E+4 µCi/sec in stability class F

   or

5. Release rate projection based on Containment Radiation Monitor exceeds any of the values in 1 or 2 above

   or

6. Dose rates of 1 rem/hr W.B. are measured at the site boundary or beyond

   or

7. Radioiodine concentrations measured at the site boundary or beyond exceed 7E-6 µCi/cc.

NOTE: Consider evacuation only within about 2 miles of the site boundary unless these levels are exceeded by a factor of 10 or projected to continue for 10 hours or EPA Protective Action Guideline exposure levels are predicted to be exceeded at larger distances.

c. Loss of 2 of 3 fission product barriers with a potential loss of 3rd barrier, (e.g., loss of primary coolant boundary, clad failure and high potential for loss of containment).

EAL's

1. Failure of fuel cladding as evidenced by gap activity in reactor coolant (> 300 µCi/gram I-131 dose equivalent) or presence of gap activity in primary containment atmosphere.

   and

   Failure of primary coolant boundary as evidenced by:

   high drywell pressure; or
   high drywell temperature; or
   failure of MSIV's to isolate; or
   safety relief valve stuck open; or
   gap activity in primary containment atmosphere

   and

ATTACHMENT 2 (Cont'd.)

Guideline 28 (Cont'd.) ALL GUIDELINES - GENERAL EMERGENCY

Potential loss of containment as evidenced by:

containment temperature or pressure approaching design limits (281°F and 56 psig) and increasing; or
loss of containment cooling; or
Shift Supervisor's opinion that loss of containment is likely.

NOTE 1: Failure of MSIV's to isolate constitutes a loss of both primary coolant boundary and containment. When this is combined with cladding failure, all three barriers have been lost.

NOTE 2: In situations of:

a) Small or large LOCA with failure of ECCS to perform, or
b) Loss of requisite decay heat removal systems (RHR and other heat sinks) following shutdown,

loss of containment should be judged to be likely.

2. Failure of fuel cladding (per guideline 6)

and

Failure of containment as evidenced by all containment penetrations required for isolation not valved off or closed; or Shift Supervisors opinion that containment has failed

and

Potential loss of primary coolant boundary as evidenced by reactor pressure near design limits and increasing or loss of ECCS.

3. Failure of containment as evidenced by all containment penetrations required for isolation not valved off or closed or Shift Supervisor's opinion

and

Failure of primary coolant boundary as evidenced by high drywell pressure or temperature or failure of MSIV's to isolate or stuck open safety relief valve

and

Potential for loss of cladding as evidenced by ECCS failure or reactor water level low and decreasing.

WP/kk

ATTACHMENT 2 (Cont'd.)

GUIDELINE 28 (Cont'd.) ALL GUIDELINES - GENERAL EMERGENCY

NOTE: Consider 2 mile precautionary evacuation. If more than fuel gap activity released, extend this to 5 miles downwind.

d. Loss of physical control of the plant.

NOTE: Consider 2 mile precautionary evacuation.

e. Other plant conditions exist, from whatever source, that make release of large amounts of radioactivity in a short time period possible, e.g., any core melt situation. See the example BWR sequences.

NOTE:

a. For core melt sequences where significant releases from containment 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 (greater than gap activity) are in the containment atmosphere. Recommend sheltering in other parts of the plume exposure Emergency Planning Zone under this circumstance (radius 10 miles).

b. For core melt 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 to noble gases are in the containment atmosphere, consider precautionary evacuation to 5 miles and 10 mile downwind evacuation (45° to 90° sector).

c. For core melt 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.

d. As release information becomes available adjust these actions in accordance with dose projections, time available to evacuate and estimated evacuation times given current conditions.

ATTACHMENT 2 (Cont'd.)

Guideline 28 (Cont'd.) ALL GUIDELINES - GENERAL EMERGENCY

Example BWR Sequences

1. Transient (e.g., loss of off-site power) plus failure of requisite core shutdown systems (e.g., scram or standby liquid control system). Could lead to core melt in several hours with containment failure likely. More severe consequences if pump trip does not function.

2. Small or large LOCA's with failure of ECCS to perform, leading to core degradation or melt in minutes to hours. Loss of containment integrity may be imminent.

3. Small or large LOCA occurs and containment performance is unsuccessful affecting longer term success of the ECCS. Could lead to core degradation or melt in several hours without containment boundary.

4. Shutdown occurs but requisite decay heat removal systems (e.g., RHR) or non-safety systems heat removal means are rendered unavailable. Core degradation or melt could occur in about ten hours with subsequent containment failure.

5. Any major internal or external events (e.g., fires, earthquakes, substantially beyond design basis) which could cause massive common damage to plant systems resulting in any of the above.

ATTACHMENT 2 (Cont'd.)

Guideline 29

OTHER PLANT CONDITIONS

UNUSUAL EVENT

1. Plant conditions exist that warrant increased awareness on the part of plant operating staff or State and/or local offsite authorities.

2. Plant conditions exist that require shutdown under technical specification requirements.

3. Plant conditions exist that involve other than normal controlled shutdown (e.g. cooldown rate exceeding technical specification limits or pipe cracking found during operation).

ALERT

Plant conditions exist that warrant precautionary activation of TSC and placement of EOF and other key emergency personnel on standby.

SITE AREA EMERGENCY

Other plant conditions exist that warrant activation of emergency centers and monitoring teams or precautionary notification to nearsite public.

WP/kk

ATTACHMENT 2 (Cont'd.)

Guideline 30

MAJOR DAMAGE TO SPENT FUEL

UNUSUAL EVENT

Not applicable

ALERT

Not applicable

SITE AREA

Major damage to spent fuel in containment (e.g., large object damages fuel or water loss below fuel level).

EAL's

1. a. Decrease in fuel pool level below 36'9" confirmed by LT-2787, Spent Fuel Pool Level Hi/Lo alarm

   or

   b. Dropping of heavy object onto spent fuel confirmed by direct observation

   and

2. Fuel Pool Radiation Monitor Ch A or B (Confirmed by annunciator 5-A-1 or 5-A-2) >50 mR/hr

GENERAL

As specified in Guideline 28.

WP/kk

ATTACHMENT 3

Form 5790-101-1
Rev. 1, 10/20/81
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Example of
EMERGENCY CLASSIFICATION CHECKLIST
(For Use With Procedure A.2-101)

1. Initiating Condition: _____

_____ _____ _____ _____
ED Initials Time Date

2. Attachment 1 directs use of Guideline Number(s): _____.

_____ _____ _____
ED Initials Time Date

3. Attachment 2 classification: _____

_____; Declared: _____ _____ _____
ED Initials Time Date

4. Implemented Procedure A.2- _____. _____ _____ _____
ED Initials Time Date

NOTE: If reclassification becomes necessary, start a new Emergency Classification Checklist.

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q. A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes ___ No X

ACTIVATION OF THE OPERATIONAL SUPPORT CENTER (OSC)

A.2-107

REVIEW AND APPROVAL

Prepared by: C.D. Mathiesen ALARA Review Revision 0 Date 3/28/81
Reviewed by: [signature] Q. A. Review Revision 0 Date 3/28/81
Operations Committee Final Review: Meeting Number 186 Date 2/17/83
Approved by: [signature] Date 2-18-83
Op. Com. Results Review: Not Required Mtg.# 1056 Date 1/22/82

PURPOSE AND REQUIREMENTS

This procedure provides specific information and instructions for the organization, activation, operation and de-activation of the Operational Support Center (OSC) in support of the Monticello Nuclear Generating Plant and NSP Emergency Plan.

CONDITIONS AND PREREQUISITES

An emergency condition corresponding to an Alert or a higher emergency classification has been declared at the Monticello Nuclear Generating Plant as provided in the MNGP Emergency Plan.

PRECAUTIONS

The OSC facilities may be used for normal daily operations as well as for training and emergency drills, provided that these activities do not interfere with the immediate activation of the OSC or the continuing OSC operations in the event of an accident. OSC facility use during normal operation shall be limited to activities that will not degrade the level of OSC preparedness to react to accident situations and will not reduce OSC reliability.

ORGANIZATION AND RESPONSIBILITIES

A. Emergency Director - Overall In-Charge

B. Operational Support Center Coordinator - Responsible for implementation of this procedure.

DISCUSSION

A. OSC FUNCTION

The OSC will be the onsite area separate from the Control Room where predesignated operations support personnel will assemble.

WP/kk

B. Location

The OSC location will be the I&C Shop on the second level of the Administration Building.

C. Communications

1. Two (2) plant telephone extensions

PROCEDURE

NOTE: The following is a list of procedural steps for which the OSC Coordinator is responsible. Each step which contains the word "continually" means that the steps should be repeated regularly as needed while the OSC is in operation.

STEP 1 Ensure that communication links are continuously manned. Obtain the services of a Shift Emergency Communicator, if needed.

NOTE: Extension 1224 is the published OSC number.

STEP 2 Continuously maintain accountability for OSC personnel. Ensure that a list of all persons reporting to the OSC is prepared. Update the list as additional personnel report, are dispatched, or relieved.

STEP 3 If a plant evacuation is directed, ensure that OSC personnel insert their ID cards in the TSC card reader. Provide a list of OSC personnel (names and badge numbers), not currently present in the OSC, to the Security Group Leader.

STEP 4 Continually hold briefings to update OSC personnel on plant status.

STEP 5 When a work request is received from the TSC:

a. Form up a team for the job. Try to anticipate the requisite skills, but do not over-staff.

b. Fill out a Job Description, Form 5790-107-4 (Attachment 1). Direct someone (not a team member) to make two copies and deliver the original to the RP Coordinator at Access Control.

c. Ensure that team members are instructed thoroughly and are prepared to accomplish the task. Discuss types of tools and equipment needed, where or how to obtain tools and equipment, possible alternatives for accomplishing tasks, etc. Also, ensure that the Team Leader has instructions on how and to whom to report problems or job completion.

NOTE: An Emergency Document Control Coordinator should be available to assist in finding drawings, manuals, etc. If not, contact Support Group Leader in TSC for assistance in this matter.

PROCEDURE (Cont'd.)

d. When prepared, dispatch the team to Access Control for final radiological preparations. Log the dispatch time on the Job Description form and update the accountability list.

STEP 6 Initiate and continuously maintain the OSC Log in accordance with A.2-502.

STEP 7 Keep the Maintenance Group Leader informed on status and events in OSC.

Form 5790-107-4
Revision 0, 02/15/83
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ATTACHMENT 1

Example of
JOB DESCRIPTION

JOB: _____

_____

_____

_____

LOCATION: _____

ESTIMATED DURATION: _____ Minutes

TEAM:

TLD NO.	NAME
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Team Dispatched: From OSC _____ From Access Control _____

NOTE: After this form is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q. A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes X No ___

ACCESS CONTROL DURING EMERGENCIES

Procedure A.2-108

REVIEW AND APPROVAL

Prepared by: C.S. Mathews ALARA Review C.S. Mathews Date 2/15/83
Reviewed by: K.L. Lindsley Q. A. Review R.L. Schemm Date 2/16/83
Operations Committee Final Review: Meeting Number 1186 Date 2/17/83
Approved by: J.L. Tong Date 2-18-83
Op. Com. Results Review: not required Mtg.# 1186 Date 2/18/83

PURPOSE AND REQUIREMENTS

This procedure provides specific information and instructions for the organization, activation, operation and de-activation of Access Control during emergencies.

CONDITIONS AND PREREQUISITES

An emergency condition corresponding to an Alert or a higher emergency classification has been declared at the Monticello Nuclear Generating Plant as provided in the MNGP Emergency Plan.

ORGANIZATION AND RESPONSIBILITIES

A. Overall In-Charge - Emergency Director

B. Conduct of Procedure - R. P. Coordinator

C. Direct Supervision - Radiological Emergency Coordinator/Monitoring Section Leader

D. Assistance - Assistant Coordinator/Communicator
RP Specialists assigned to exposure control and surveys

DISCUSSION

A. Access Control Function

The function of Access Control during emergencies is similar to the function during normal operation, except that positive control is established over entries to the affected area.

B. Location

The primary location for access control is the location used during normal operation. If conditions dictate, access control will be relocated according to Procedure A.2-411, Establishment of Secondary Access Control.

WP/kk

C. Data and Information Resources

The following are maintained at Access Control:

1. A complete set of up-to-date radiological survey maps.
2. Plant Emergency Procedures
3. Bechtel Accident Dose Rate Maps

D. Communications

1. Intercom for communication with TSC
2. Rad Survey Portable Radios (4)
3. Plant Extensions (2)
4. Radio Console (capable of communicating with Rad Survey and Operations portable radios)

E. Equipment and Facilities (Primary Location)

1. GDE Terminal for exposure control
2. BBA System
3. Count Room equipment
   a. Automatic Smear Counter
   b. GeLi Counting System
4. Status Board
5. Radiological Survey Maps
6. Procedure Forms
7. Portable CAM
8. Portal Monitor
9. First Aid Kits and Stretcher
10. Decon Facilities
11. Friskers
12. Respiratory Protection Equipment
13. Fire Fighting Equipment
14. Protective Clothing
15. Signs and chains for use in positively maintaining plant access control

PROCEDURE

PART I - ACTIVATION

STEP 1 Direct or perform radiological survey in Access Control and SAS. Forward result to REC. The REC will be responsible for ensuring routine surveys of the area and for evaluation of the results.

STEP 2 Position portable CAM in area outside of BBA Room and place in operation.

STEP 3 Verify Automatic Smear Counter and GeLi Detector systems in operation.

STEP 4 Obtain 4 portable radios on the OPERATIONS net, plus a gang charger, for use at Access Control. Establish radio contact with the REC.

STEP 5 Direct the removal of non-essential personnel, interferring equipment, etc. from the area.

STEP 6 Initiate the Access Control Log in accordance with A.2-502.

STEP 7 Obtain a copy of the most current exposure information for active personnel. If personnel are available, process any dosimeter cards and update the master exposure file.

PART II - OPERATION

Note: The following is a list of procedural steps for which the R.P. Coordinator is responsible. Each step which contains the word "continually" means that the steps should be repeated regularly as needed while the emergency Access Control is in operation.

STEP 1 Continually update survey floor plans. This will require review of incoming survey results, and also review of ARM data (Form No. 5790-107-3, Emergency ARM Log (Attachment 3) may be used to record ARM data.).

STEP 2 Continually maintain status board.

STEP 3 Ensure that communications are continuously attended. Obtain the services of a Shift Emergency Communicator, if needed.

NOTE: Use OPERATIONS radios for in-plant communications.
Use RAD SURVEY radios for out-of-plant activities.

STEP 4 Keep the REC apprised of events and activities.

STEP 5 Supervise personnel assigned to Access Control. All personnel should have dosimetry and current exposure information.

STEP 6 Determine the need for special supplies, equipment, etc. to support Access Control operation. Any requests should be forwarded to Support Group Leader.

STEP 7 Support emergency rescue, first aid, maintenance and survey teams by verifying their preparedness to initiate their activities and by coordinating their movements in and out of the controlled area with the Control Room and TSC. Prepare emergency RWP's i.a.w. Attachment 1 to assure that adequate precautions have been taken.

STEP 8 Maintain strict access control (signs should be used to aid in this process). Following specific direction* from REC or MSL, all entries to Controlled Area shall be approved by REC or MSL. Request Security Personnel assistance in maintaining access control, if required.

* NOTE: The REC and/or MSL will monitor controlled area status and reactor health. Based on the situation in the affected area, the MSL or REC may require that each entry to the affected area be approved. Specific directions will be relayed to Access Control in this event.

STEP 9 Coordinate the arrival and departure of offsite support services and coordinate their standby status while on site.

STEP 10 Make necessary preparations to relocate access control (Procedure A.2-411) in the event that the primary access control point becomes uninhabitable.

STEP 11 Continually maintain the Access Control Log.

STEP 12 Ensure that Radiation Protection Procedures are followed.

STEP 13 If and when directed to do so, ensure that all personnel in the Access Control area (including the SAS) insert their security badges into the accountability reader located near the portal monitor. Caution personnel to make sure they get a red light after inserting cards. As part of the accounting process, prepare a list of names, initials and TLD numbers of any personnel who are in the Controlled Area and not available to use card reader. Forward the list to the TSC.

PART III - DE-ACTIVATION

Upon termination of Emergency condition or when deemed by Emergency Director that the emergency Access Control may be deactivated perform the following:

STEP 1 Initiate Surveillance Test #1102.

STEP 2 Return Operations Radios to their storage location.

STEP 3 Return Radiation Protection Radios to their storage location.

REFERENCES

1. Monticello Nuclear Generating Plant Emergency Plan
2. Monticello Nuclear Generating Plant Operations Manual
3. NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in support of Nuclear Power Plants."

ATTACHMENTS

1. Guidelines for Use of Emergency RWP Checklist
2. Example of Emergency RWP Checklist
3. Example of Emergency ARM Log

WP/kk

ATTACHMENT 1
Guildelines for Use of Emergency RWP Checklist

PURPOSE

The purpose of this attachment is to detail the process of how emergency RWP's will be used to govern emergency work.

DEFINITIONS

An emergency RWP is defined as the process which ensures certain radiological precautions for emergency work are considered, and appropriate actions are taken. The emergency RWP checklist (Form No. 5790-107-2, Attachment 3) is the instrument that documents which actions were taken.

DISCUSSION

In general, the entire process as outlined below should be completed each time an emergency RWP is needed. However, in urgent situations, completing the whole process may hamper the timely execution of certain corrective actions. On the other hand, hazardous radiological conditions that could be present during an accident may increase the importance of ensuring the necessary precautions are taken. Therefore, each circumstance will dictate the extent to which an emergency RWP will be completed, and this procedure is intended to outline the philosophy which will be used to ensure the degree of control required by the emergency RWP is appropriate for the task at hand.

EMERGENCY RWP ISSUANCE PROCESS

To the extent that is practical, the entire emergency RWP process as outlined below should be completed. One should be able to readily determine from the urgency of the situation how much job preplanning should be done and to what extent the emergency RWP process should be completed. For all emergency RWP's, an emergency RWP checklist shall be completed, post job completion, if necessary, for items a, b, c, e, h, i, & k.

a. Determine the urgency and verify the validity of the proposed emergency work. Normally, this information will be supplied through normal channels from the TSC (e.g. phone call from MSL or approved WRA). If it has not been supplied, contact the ED, REC, or MSL to obtain this information before allowing the work to commence. The only exception to this may be if it is learned that immediate actions are necessary to save a life. If the work has been ordered to begin immediately, do not spend time completing the checklist if it will hold up the start of the job. Prescribe appropriate precautions, and ensure job begins ASAP. However, complete as much of checklist as possible while waiting for necessary precautionary steps to be taken (e.g. donning P.C.'s etc.).

b. Assess the radiological conditions to be encountered during the job. Determine if the precautions contained in the existing extended RWP's are adequate, and if they are, use the extended RWP, while still completing sections c, e, and k of the process. If the extended RWP's are not adequate, complete the rest of the process.

ATTACHMENT 1

c. For all jobs, an accurate and complete description of work, work site location and the protective equipment and dosimetry to be used shall be determined. If there is doubt as to the exact nature of the work to be performed, or the location of the work, the workers supervisor should be consulted.

d. If at all possible, ensure an RPS is in attendance for the job.

e. Log personnel in and out by completing page 2 of the emergency RWP checklist.

f. The Bechtel accident dose rate maps should be used to determine the best route to the work site in order to keep doses ALARA.

g. Ensure that all keys needed for access are obtained.

h. Emergency workers should have completed form-4's and procedure A.2-401 shall be completed for exposures which are expected to result in the individuals quarterly accumulated dose to exceed plant administrative limits.

i. For areas in which the dose rate is expected to be > 1R/hr, the expected time at the work site and the authorized individual doses for the job shall be determined (assume the current quarterly allowable, unless told otherwise). From this information, determine the highest working area dose rate which would result in the limiting individual authorized dose being received, while also taking into acc any significant doses that may be received in route. Perform timekeeping durin e job to ensure planned exposures are not exceeded. Continual radio contact should be available between emergency workers and Access Control to aid in such timekeeping. While the job is in progress, if it is determined that planned exposures will be exceeded, contact the ED immediately for further instructions.

   In addition, a maximum travel route dose rate should be determined. This dose rate should be ~ 4 times higher than any expected to be encountered enroute to the work area, up to 1000 R/hr for the worst case. The purpose of this dose rate is to serve as a caution flag to the RPS that means "Beware conditions are significantly different than originally thought". Actions to be taken if this dose rate is reached or exceeded will be determined during the job briefing and will be dependent upon job importance, duration, and the exposure limits of the individuals doing the job.

j. To increase personal safety, the buddy system should be employed in the following conditions:

   1) If the equipment needed for the job is too much for one person, slowing the job down and resulting in non ALARA exposures.

   2) If radiological conditions could change abruptly and drastically during the job, and one person is not available to watch a dose rate meter continuously.

   3) If radio contact cannot be maintained between Access Control and the emergency workers.

WP/kk

ATTACHMENT 1

k. Prior to dispatching personnel to perform emergency work, ensure adequate job planning has been performed and that emergency workers have been adequately briefed regarding the proper precautions which should be exercised to maintain worker risk to an acceptable level. Since Access Control may be a very busy place, extra effort will have to be exercised to ensure this is effectively done. The higher the expected hazards, the more important this becomes.

WP/kk

Form 5790-107-2
Revision 3, 02/14/83
Page 1 of 2

ATTACHMENT 2

Example of
Emergency RWP Checklist

WRA No. _____

Date _____

Time _____

a. Job must begin immediately. Yes No

b. Existing extended RWP used. Yes #_____ No

c. Work location _____

Work description _____

Protective equipment and dosimetry used

[ ] Hood	[ ] Rubber gloves	[ ] TLD	[ ] Front & Back
[ ] Coveralls	[ ] Canvas gloves	[ ] 200 mR SRD	
[ ] Waterproof Outer Layer	[ ] Rubbers	[ ] 1 R SRD	
	[ ] SCBA	[ ] 10 R SRD	
[ ] Full Face Part Resp	[ ] Beta Protection for Eyes	[ ] 200 R SRD	
[ ] Dose Rate Meter		[ ] Extremity TLD(s)	

d. RPS in attendance? Yes No (if NO, require Dose Rate Meter above)

e. Personnel logged in _____ (Complete the backside of this form)
Initial

f. ALARA routes specified? Yes No

If yes, record route _____

g. Any keys required? Yes No

h. A.2-401 completed? Yes No

i. Expected time to be spent at work site (x)_____ hrs
Limiting Authorized individual dose for job (y)_____ mrem
Highest allowable working area dose rate (z)_____ mrem/hr (z = y ÷ x)
Highest expected travel route dose rate: _____ mrem/hr
Timekeeping ready? Yes No
Radio contact available? Yes No

j. Buddy system employed? Yes No

k. Briefing conducted? Yes No

Completed by: _____
RPS

Approved by: _____
R. P. Coordinator

WP/kk

Form 5790-107-2
Revision 3, 02/14/83
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ATTACHMENT 2

Example of
Emergency RWP Checklist

Name	Authorized Dose	Time		Dosimeters							
		In	Out	0-200		1R		10R		200R	
				In	Out	In	Out	In	Out	In	Out

NOTE: After this form is completed and is not required for immediate use, it shall be placed in the appropriate container provided for emergency records.

WP/kk

Form #5790-107-3
Revision 1, 02/14/83
Page 1 of 2

ATTACHMENT 3

Example of
EMERGENCY ARM LOG

Date _____

ARM No.	Area Description	Normal Reading	Max. Reading	Current Reading (record time in top box)									
A-1	Refuel Floor Low Range	2	1000										
A-2	Refuel Floor High Range	5	10000										
A-3	Refuel Floor Stairway	1	1000										
A-4	New Fuel Vault (1001 North)	7	1000										
A-5	Fuel Pool Pump Room	9	1000										
A-6	Contaminated Storage Area (1001 South)	2	1000										
A-7	985 Sx Hood	5	1000										
A-8	962 N.W.	0.25	1000										
A-9	962 Tool Crib	0.65	1000										
A-10	East CRD Mod Area	7	1000										
A-11	West CRD Mod Area	5	1000										
A-12	TIP Drive Area	2	1000										
A-13	TIP Cubicle	30	10000										
A-14	HPCI Turbine Area	0.25	1000										
A-15	896 Radwaste Drain Tk Room	25	1000										
A-16	RCIC Pump Area	1	1000										
A-17	A-RHR Room (East)	10	1000										
A-18	B-RHR Room (West)	10	1000										
A-19	Chemistry Hot Lab	0.26	1000										
A-20	Control Room Low Range	0.02	100										
A-21	Control Room High Range	3	10000										

WP/kk

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Revision 1, 02/14/83
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ATTACHMENT 3

Example of
EMERGENCY ARM LOG

ARM No.	Area Description	Normal Reading	Max Reading	Current Reading (record time in top box)									
B-1	Operating Floor - 951	20	10000										
B-2	T. G. Front Standard	10	1000										
B-3	Cond Demin Operating Area	1	1000										
B-4	MVP Room	9	1000										
B-5	FW Pump Area	1	1000										
C-1	R.W. Control Area	0.2	1000										
C-2	Sample Tank Area - 947	3	1000										
C-3	Conveyor Operating Aisle	0.2	1000										
D-1	Machine Shop (Hot)	0.2	1000										
E-1	Recombiner Instrument Room	1	1000										
E-2	Recombiner Pump Room	3	1000										
F-1	Off-Gas Foyer	.2	1000										
F-2	Off-Gas Foyer	< 100	1000 R										

WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q. A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes ___ No X

RESPONSIBILITIES OF RADIOLOGICAL EMERGENCY COORDINATOR

A.2-209

REVIEW AND APPROVAL

Prepared by: C.D. Mathews ALARA Review C.D. Mathews Date 2/15/83
Reviewed by: A. Winkelhill Q. A. Review R.L. Schenck Date 2/16/83
Operations Committee Final Review: Meeting Number 1186 Date 2/17/83
Approved by: J.L. Fey Date 2-18-83
Op. Com. Results Review: not required Mtg.# 1186 Date 2/17/83

PURPOSE

The purpose of this procedure is to provide a guide for the Radiological Emergency Coordinator (REC), the use of which will ensure that the duties assigned to the Health Physics Group are not overlooked.

CONDITIONS & PREREQUISITES

An emergency condition has been declared which requires the TSC to be activated.

ORGANIZATION AND RESPONSIBILITIES

A. In Charge - Radiological Emergency Coordinator

B. Assistance - Monitoring Section Leader
Chemistry and Dose Assessment Section Leader

PROCEDURE

PART I - Initial Actions

STEP 1 Report to TSC and assume control of Health Physics Group.

STEP 2 Determine current plant status.

STEP 3 Ensure that the emergency access control is activated (Reference A.2-108). Local evacuation and followup personnel accounting should be considered in order to increase effectiveness of access control function (Reference A.2-301).

STEP 4 Ensure that appropriate onsite monitoring is initiated (Reference A.2-201).

WP/kk

STEP 5 Dispatch a qualified technician (RPS) to activate and operate the backup countroom at the EOF. The technician should be instructed to report to the RPSS (or Emergency Manager, if RPSS not present) upon arrival at the EOF.

STEP 6 If significant radioactive releases are occurring or if a Site Area Emergency has been declared, ensure that off-site monitoring is initiated (Reference: A.2-202).

STEP 7 Evaluate the Health Physics Group staffing. If the situation dictates, call in off-duty personnel, request assistance from Prairie Island, and/or arrange for contract personnel to augment the staff.

PART II - Continuing Actions

NOTE: The REC CHECKLIST (see example in Attachment 1) should be used to coordinate these actions.

STEP 1 Continuously evaluate habitability.

a. Direct surveys in manned centers - TSC, OSC, Control Room, Access Control, Assembly Point, CAS and SAS. (Don't forget Security Person on plant access road.)

b. Post conditions on status board.

c. Make evacuation recommendations as necessary (Reference: A.2-201, Attachment 2).

NOTE: Surveys and posting may be assigned to Monitoring Section Leader.

STEP 2 Continuously assess radiological aspects of situation.

a. If an airborne release is occurring:

- Direct site and off-site surveys (Reference: A.2-202).
- Approximate plume location (notify EOF if plume is located in EOF Sector).
- Verify dose projection numbers.
- Chart and record survey results.

NOTE: Surveys, plume tracking, verification and results charting/recording may be assigned to Monitoring Section Leader.

b. If an airborne release is occurring:

- Project off-site doses and dose rates (Reference: A.2-406).

- Provide copies of dose projection reports to Monitoring Section Leader and Radiological Emergency Coordinator.

- Post dose projection results on status board.

NOTE: Dose projection activities may be assigned to Chemistry Section Leader.

c. If a liquid release is occurring, direct surveys of river as appropriate (Reference: A.2-202).

NOTE: Survey may be assigned to Monitoring Section Leader.

d. Direct appropriate process samples be obtained and analyzed (Reference: A.2-207).

- Sample each release point. Ensure that radioiodine component of any release be sampled and analyzed as soon as possible.

- Assess core damage, as applicable (Reference: A.2-208).

e. Formulate off-site protective action recommendations and forward to Emergency Director (Reference: A.2-204).

f. Determine appropriate on-site protective action (Reference: A.2-201, Attachment 2).

g. Review emergency classification (Reference: A.2-101), especially Guidelines 1, 2, 6 and 28.

STEP 3 Ensure that concerned personnel are kept informed of radiological status:

a. Periodically update Emergency Director.

b. Ensure that radiological status board in TSC is maintained.

c. Ensure that Access Control is updated.

d. Ensure that off-site survey teams are kept informed.

e. Update Radiation Protection Support Supervisor in EOF.

f. Until RPSS post is activated, ensure that FOLLOWUP MESSAGE is initiated and forwarded to Minnesota Health Department periodically (at least every 30 minutes).

STEP 4 Acknowledge the HPN phone if it rings. Provide information as requested. Responsibility for manning HPN line may be transferred to RPSS when EOF is fully activated.

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Revision 0, 02/15/83
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ATTACHMENT 1

Example of
REC CHECKLIST

Habitability:

- TSC
- OSC
- Access Control
- Control Room
- CAS
- SAS
- Assembly Point

Assessment:

- Dose Projection
- I:NG Ratio
- Process Sampler
- Plume Location
- Dose Projection Verification
- Protective Action Recommendations
- Emergency Classification

Updates:

- Emergency Director
- Status Board
- Access Control
- Off-Site Survey Teams
- RPSS
- Minnesota Health Department

WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes X No ___

SMALL VOLUME LIQUID SAMPLE OBTAINED AT THE POST ACCIDENT SAMPLING SYSTEM

Procedure A.2-413

Prepared by: [signature] ALARA Review: [signature] Date 2/3/83
Reviewed by: [signature] Q.A. Review: Revision 0 Date 8/16/82
Operations Committee Final Review: Meeting Number: 1183 Date 2/10/83
Approved by: [signature] Date 2-11-83
Op. Com. Results Review: Not Required Mtg. # 1100 Date 7/29/82

PURPOSE

The purpose of this procedure is to provide special instructions and precautions for collection and handling of small volume liquid samples obtained from the Post Accident Sampling System during and following an emergency at Monticello Nuclear Generating Plant.

CONDITIONS AND PREREQUISITES

The Emergency Director/REC/CSL has requested analysis of RHR or Jet Pump liquid samples.

Actual or potential radiological conditions are such that special methods and/or precautions are necessary in order to collect and analyze samples under conditions which may present a much greater than normal radiation hazard to individuals performing the sampling and analyses. Unless directed otherwise, this procedure should be used in lieu of routine sampling and analysis procedures whenever an Alert or higher emergency classification is declared.

ORGANIZATION AND RESPONSIBILITIES

Emergency Director - Overall responsibility

REC/CSL - Responsible for assigning sample priority and frequency and results review.

Chemistry Technicians - Responsible for sample collection, analysis and results reporting.

PRECAUTIONS

A. Exposures of sampling and analysis personnel shall be in accordance with A.2-401, "Emergency Exposure Control".

B. Exposures to all personnel due to sampling and analysis operations should be maintained as low as is reasonably achieveable. Techniques such as

temporary shielding, remote handling and sample dilution prior to analysis should be considered to reduce exposure to personnel.

C. When actual or potential radiation levels so warrant, high range portable survey instruments, and self-reading dosimeters shall be provided to sampling and analysis personnel to permit rapid assessment of high exposure rates and accumulated personnel exposure. Alarming dosimeters should also be considered.

D. Appropriate extremity dosimeters should be provided and worn when handling samples which themselves represent high level radiation sources.

E. Calculations for exposure rates resulting from radiation within a few hours after a Loss of Coolant Accident point out the desirability of spending minimum amount of time that is necessary near the surface of the sample enclosure. Most of the operation of the Post Accident Sampling System located at 951' of Turbine Building can be performed from the control panel. With the control panel located ten or more feet away from the sample enclosure the dose rates at the control panel due to radiation from the sample enclosure will be below 100 MR/HR. The indicator for the area radiation detector RE-507 is on the PASS control panel and its reading should be noted whenever the presence of radiation is suspected.

REMARKS

1. The Post Accident Sampling Station is located on the south side of the 951' level of the turbine building. The most efficient route to the PASS is through access control and into the turbine building. Move to the 951' level via the east stairway.

2. Two RPS should be used to obtain a post-accident sample when applicable and possible.

3. Obtain controlled access key 33A from R.P. Coordinator and key #153 from Shift Supervisor.

EQUIPMENT REQUIRED

1. 20 ml. sample vial
2. Small volume cask
3. pH paper
4. Flashlight
5. 1 liter demin water
6. Syringe
7. Neoprene caps
8. Aluminum retainer rings
9. Needles
10. Vial retainer ring crimper
11. Needle changing tool
12. Radector III or equivalent

WP/kk

PROCEDURE

STEP 1 Before traveling to the sampling station advise Shift Supervisor and call control room, to determine whether A or B RHR is operating. Determine from Control Room if RBCCW pumps are operating. Also advise Control Room that jet pump A flow transmitter, FT 2-3-64W or jet pump B flow transmitter FT 2-3-64M may be affected during primary coolant sampling.

NOTE 1 If neither RHR loop is operating, the position of the Liquid Return Selection Switch is immaterial.

STEP 2 Confirm that the demineralized water tank level is above the minimum mark on the sight glass level indicator (if not, perform Procedure A.2-418).

STEP 3 Open the nitrogen supply and regulate the supply pressure to 100 psi.

STEP 4 Turn on ventilation unit by depressing "START" button. Verify vacuum by feeling suction at one of the gas ports.

STEP 5 Set switch HC-600 to position A.

STEP 6 If determination of pH is desired place a pH indicator strip in a 20 ml sample bottle.

STEP 7 Check the condition of the needles on the right to verify that they are not bent. (They should be slightly angled inward toward one another.) Replace bent or damaged needles using needle changing tool.

STEP 8 Move the small volume cask positioner into place below the sample station.

STEP 9 Put the small volume cask into the cask positioner.

STEP 10 Remove the stopper and carrying handle from the small volume cask by unscrewing it.

STEP 11 Slide the lead shielding drawer out so that the needles under the sample station enclosure are exposed.

STEP 12 Swing the cask into position under the sample station and attach the chain to the cask holder.

STEP 13 Put the 20 ml sample bottle with an outer aluminum retainer ring and neoprene cap into the small volume cask. Check that the bottle lifting lever is free to move up and down.

STEP 14 Turn HC-700 to "liquid" mode.

PROCEDURE (Cont'd.)

STEP 15 Turn HC-626, LIQUID SAMPLE SOURCE SELECTOR, switch to position 2 (Jet Pump) or position 4 (RHR) as determined by the Emergency Director or his designee.

STEP 16 Raise the sample bottle into position on the needles by lifting the lever on the side of the cask. The bottle position status light on the control panel will change from red to green when the bottle is in position. (If the bottle position status light does not change to green do not continue to the next step until the problem is corrected.)

STEP 17 Turn the liquid sample source selector switch HC-626 to position 1 for Jet Pump Bypass Line or to position 5 for Residual Heat Removal (RHR) Bypass Line.

STEP 18 Set switch HC-500 to the position corresponding to the sample desired. Set the Liquid Return Selection Switch to A or B corresponding to the operating RHR loop (see NOTE 1).

NOTE 2 PCV-627 should be adjusted slowly in the following steps to avoid closing system excess flow check valves.

STEP 19 Adjust PCV-627 slowly so that the flow through FCV-627 is about 1 gpm as verified on FI-664. Continue this flow for a minimum time of 5 minutes. Record the flow and flush time on the Small Volume Liquid Sampling and Analysis Checklist.

STEP 20 After the flush is completed, turn switch HC-626 to position 2 if the sampling valves were set in STEP 18 above for Jet Pump sample or to position 4 if the sampling valves were set for an RHR sample.

STEP 21 Note that the flow per indicator FI-664 is reduced. With PCV-627 adjust valve FCV-627 for a flow of about 0.3 gpm.

STEP 22 Record the following on the Small Volume Liquid Sampling and Analysis Checklist: Flow per FI-664, pressure per PI-661, Temperature per TI-660, Conductivity per GI-663 and Radiation per RI-665.

STEP 23 Turn the small volume liquid sample selector switch HC-616-1 to the "take sample" position. Valve CV-616 will rotate and carry the sample into alignment with the line to the sample bottle. The valve is energized in 10 seconds as indicated on mimic board.

STEP 24 Verify that the flow per FI-664 is zero.

NOTE 3 If pH is being determined the syringe in STEP 25 shall be filled with air rather than water.

STEP 25 Load a syringe with 10 cc of demin water.

WP/kk

PROCEDURE (Cont'd.)

STEP 26 Connect the syringe onto the line provided for it on the top-right side of the sample station. Open the two manual valves and press on the syringe and inject all of the 10 cc of water (air) into the line.

STEP 27 Close the manual valves.

STEP 28 Remove the syringe and fill it with air.

STEP 29 Re-attach the syringe and open the two manual valves and inject the air.

STEP 30 Turn the switch HC-616-1 back to the OFF position.

STEP 31 If pH is being determined repeat STEP 23 through 30 three times to assure that enough sample has been blown into the sample bottle to moisten the pH paper.

STEP 32 Close the two manual valves and remove the syringe.

STEP 33 Turn HC-500 SAMPLE SOURCE SELECTION SWITCH to position 9 if a jet pump sample was taken or position 6 if a RHR sample was taken.

STEP 34 Turn the switch HC-616-1 to the FLUSH position. Flush for 2 minutes or until RI-665 reaches a minimum.

STEP 35 When the flush is finished turn switch HC-626 to OFF, then HC-616-1 to OFF.

STEP 36 Turn PCV-627 fully counterclockwise.

STEP 37 Perform the Drain of Trap, Sump and Collector procedure (Procedure A.2-417).

STEP 38 Turn ventilation off by depressing "STOP" button.

STEP 39 If pH is being determined remove the sample bottle and compare the color of the pH indicator strip to that of the comparator strips and record results on the Small Volume Liquid Sampling and Analysis Checklist.

STEP 40 Transport sample to hot lab using the small volume liquid cask for analysis per Procedure A.2-419.

WP/kk

Form 5790-413-1
Revision 0, 05/26/82
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Example of

SMALL VOLUME LIQUID SAMPLING AND ANALYSIS CHECKLIST

Sampling

1. Sample Source _____ Date _____ Time _____ _____ RPS
2. Sample Identification No. _____
3. Bypass Flow _____ FI-664 (gpm)
4. Flush Time _____ Minutes
5. Sample Flow _____ FI-664 (gpm)
6. Pressure _____ PI-661 (psia)
7. Temperature _____ TI-660 (°F)
8. Conductivity Meter _____ µmhos/cm Scale _____ CI-663
9. Radiation _____ RI-665

Analysis

		Initial
1.	Spectrum collected (dilution factors _____ x _____)	_____
2.	Analyze spectrum	_____
3.	Activity calculated (µCi/cc)	_____
4.	pH _____	_____
5.	_____ ppb Chloride (From Chemistry Procedure I.1.3)	_____
6.	_____ ppm Boron (From Chemistry Procedure I.1.40)	_____
7.	Other analyses results as requested and comments:	

_____

_____

_____

_____

Performed by: _____ Date _____

Reviewed by: CSL or REC _____ Date _____

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes X No ___

LARGE VOLUME LIQUID SAMPLE AND/OR DISSOLVED GAS SAMPLE OBTAINED AT POST ACCIDENT SAMPLING SYSTEM

Procedure A.2-414

Prepared by: [signature] ALARA Review: [signature] Date 2/3/83
Reviewed by: [signature] Q.A. Review: Revision 0 Date 8/16/82
Operations Committee Final Review: Meeting Number: 1183 Date 2/10/83
Approved by: [signature] Date 2-11-83
Op. Com. Results Review: Not Required Mtg. # 1100 Date 7/24/82

PURPOSE

The purpose of this procedure is to provide special instructions and precautions for collection and handling of large volume liquid and dissolved gas samples during and following an emergency at Monticello Nuclear Generating Plant.

CONDITIONS AND PREREQUISITES

The Emergency Director/REC/CSL has requested a dissolved gas analysis of RHR or Jet Pump liquid samples. A large volume liquid sample may be obtained if requested for offsite analysis and for onsite analysis if coolant activity is low enough that a large volume sample (10 mls.) can be handled in the hot lab without undue exposure to technicians.

Actual or potential radiological conditions are such that special methods and/or precautions are necessary in order to collect and analyze samples under conditions which may present a much greater than normal radiation hazard to individuals performing the sampling and analyses. Unless directed otherwise, this procedure should be used in lieu of routine sampling and analysis procedures whenever an Alert or higher emergency classification is declared.

ORGANIZATION AND RESPONSIBILITIES

Emergency Director - Overall responsibility

REC/CSL - Responsible for assigning sample priority and frequency and results review.

Chemistry Technicians - Responsible for sample collection, analysis and results reporting.

PRECAUTIONS

A. Exposures of sampling and analysis personnel shall be in accordance with A.2-401, "Emergency Exposure Control".

B. Exposures to all personnel due to sampling and analysis operations should be maintained as low as is reasonably achieveable. Techniques such as temporary shielding, remote handling and sample dilution prior to analysis should be considered to reduce exposure to personnel.

WP/kk

PRECAUTIONS (Cont'd.)

C. When actual or potential radiation levels so warrant, high range portable survey instruments, and self-reading dosimeters shall be provided to sampling and analysis personnel to permit rapid assessment of high exposure rates and accumulated personnel exposure. Alarming dosimeters should also be considered.

D. Appropriate extremity dosimeters should be provided and worn when handling samples which themselves represent high level radiation sources.

E. Calculations for exposure rates resulting from radiation within a few hours after a Loss of Coolant Accident point out the desirability of spending the minimum amount of time that is necessary near the surface of the sample enclosure. Most of the operation of the Post Accident Sampling System located at 951' of Turbine Building can be performed from the control panel. With the control panel located ten or more feet away from the sample enclosure the dose rates at the control panel due to radiation from the sample enclosure will be below 100 MR/HR. The indicator for the area radiation detector RE-507 is on the PASS control panel and its reading should be noted whenever the presence of radiation is suspected.

REMARKS

1. The Post Accident Sampling Station is located on the south side of the 951' level of the Turbine Building. The most efficient route to the PASS is through access control and into the Turbine Building. Move to the 951' level via the east stairway.

2. Two-man teams should be used to obtain a post-accident sample when possible.

3. Obtain controlled access key 33A from R.P. Coordinator and key #153 from Shift Supervisor.

EQUIPMENT REQUIRED

1. 15 ml. sample vial
2. Large volume cask
3. Rubber septums
4. Flashlight
5. Gas vial cask
6. Gas vial positioner
7. Neoprene cap
8. Aluminum retainer ring
9. Vial retainer ring crimper
10. Needles
11. Needle changing tool
12. Rubber stopper
13. Gas vial carrying cask
14. 20 ml gas vial
15. Large volume liquid cask
16. Jumper cable

PROCEDURE

NOTE 1 Use Form #5790-414-1 when obtaining a large volume liquid sample and Form #5790-414-2 when sampling dissolved gas.

STEP 1 Before traveling to the PASS Station call control room to advise the Shift Supervisor of your intentions and determine whether A or B RHR is operating. Determine if RBCCW pumps are operating. Also advise contr room that Jet Pump A flow transmitter, FT 2-3-64W or Jet Pump B flow transmitter, FT 2-3-64M may be affected during sampling.

PROCEDURE (Cont'd.)

NOTE 2 If neither RHR loop is operating, the position of the Liquid Return Selection Switch is immaterial.

STEP 2 Confirm that the demineralized water tank level is above the minimum mark on the sight glass level indicator (if not, perform Procedure A.2-418).

STEP 3 Open the nitrogen supply and regulate the supply pressure to 100 psi.

STEP 4 Set switch HC-600 to position A.

STEP 5 Check that Krypton Tracer gas at approximately 5 psig is available and that valve PAS-57-10 is open.

STEP 6 Turn on ventilation unit by depressing START button. Verify vacuum by feeling suction at one of the two gas ports.

STEP 7 Slide the lead shield drawer out so that the needles under the sample station enclosure are exposed. Inspect the needles. Replace bent or damaged needles using needle changing tool. (The needles should be slightly angled inward toward one another.)

STEP 8 Remove the lead stopper from the large volume cask and put a 20 ml. sample bottle with an outer aluminum retainer ring and a neoprene cap into the large cask. With the cask in the fully lowered position, roll the cask into the position under the sample station.

STEP 9 Turn HC-700 switch to "liquid" mode.

STEP 10 With the handle on the hydraulic pump of the large volume cask start raising the cask. Look for possible misalignment (by removing the lead shield drawer and looking into the drawer slot the needle area can be seen). If the cask is positioned correctly underneath the sample enclosure the top part of the cask will fit into the bottom opening in the sample station. Stop pumping when the top cask ring is inside and the large volume cask is just touching the bottom of the sample station.

STEP 11 Turn HC-626, LIQUID SAMPLE SOURCE SELECTOR, switch to position 2 (Jet Pump) or position 4 (RHR) as determined by the Emergency Director or his designee.

STEP 12 Push the cask plunger down that causes the sample bottle to be raised out of the cask and up and onto the two needles. When the bottle is up and correctly onto the needles the "Bottle In" lights on the control panel will change from red to green. (If the bottle position status light does not change to green, do not continue to the next step until the problem is corrected.)

PROCEDURE (Con't'd.)

STEP 13 If a dissolved gas sample is to be obtained place a 15 ml gas vial with a septum and cap into the gas vial positioner and slide the positioner into the dissolved gas port (lower of two ports) and turn it to lock it into place. Observe that the bottle status light changes from red to green.

STEP 14 Turn the liquid sample source selector switch HC-626 to position 1 for Jet Pump Bypass Line or to position 5 for Residual Heat Removal Bypass (RHR) line corresponding to the sample source.

STEP 15 Verify HC-616-1, SMALL VOLUME SAMPLE, switch is off.

STEP 16 Set switch HC-500 to the position corresponding to the sample desired. Set Liquid Return Selection Switch to A or B corresponding to the operating RHR Loop (see STEP 1 and NOTE 2).

NOTE 3 PCV-627 should be adjusted slowly in the following steps to avoid closing system excess flow check valves.

STEP 17 Adjust PCV-627 so that the flow through FCV-627 is about 1 gpm as verified on FI-664. Continue this flow for a minimum time of 5 minutes. Record the flow from FI-664 and the flush time on the appropriate checklist.

STEP 18 After the flush is completed, turn the Liquid Sample Source selector switch HC-626 to position 2 if switch HC-500 was previously positioned for a Jet Pump sample or to position 4 if switch HC-500 was positioned for an RHR sample. Note that the flow per indicator FI-664 is reduced. With PCV-627 adjust valve FCV-627 for a flow of about 0.3 gpm.

STEP 19 Open secondary containment return line valve by jumpering TB5-1 to TB5-27 (you should obtain a red status light for position 5 of HC-500).

NOTE 4 The sample system lines and valves are probably filled with quite a bit of air and by going through the complete cycle (HC-601 positions 1 through 11) about 3 times without taking a sample, the air is effectively purged from the system. During the first three cycles turn through positions 5 and 10 quickly. Observe the pressure on PI-662 when in position 9. The readings will be highest on the first cycle and should be repeatable on the last two cycles.

STEP 20 Turn HC-601 through positions 1 through 11 three times allowing 2 or 3 seconds per position except positions 5 and 10 (see NOTE 4).

STEP 21 Turn the Dissolved Gas and Liquid Sample System switch HC-601 to position 1 and observe that P-701 starts and valve CV-622 rotates.

PROCEDURE (Cont'd.)

STEP 22 Turn switch HC-601 to position 2 and observe that P-601 starts.

STEP 23 Record the following on the appropriate checklist. Flow per FI-664, Pressure per PI-662, Temperature per TI-660, Conductivity per CI-663 and Radiation per RI-665.

STEP 24 Turn switch HC-601 to position 3 to isolate the sample and start the dissolved gas separation. Leave in this position for approximately 10 seconds.

STEP 25 Turn to position 4 to inject tracer gas into valve CV-615. Leave in this position for approximately 10 seconds. Read and record the tracer gas supply system pressure.

NOTE 5 If it is desirable not to introduce tracer gas into the loop, turn switch HC-601 through position 5 very quickly and valve CV-615 will not be rotated.

STEP 26 Turn to position 5 to put the tracer gas into the loop (see NOTE 5).

STEP 27 Read the initial pressure of the dissolved gas sample bottle at this time from PI-662 and record as P_o on the appropriate checklist.

NOTE 6 Water will evaporate until a saturated condition is reached. The slow increase in pressure due to this evaporation may be observed on PI-662. Reaching a saturated condition takes about 30 seconds. If you wait for this equilibrium, condensation will be present in the sampling vial. It is recommended that the switch HC-601 be left in position 6 for no more than 5 seconds.

STEP 28 Turn to position 6 for $\leq$ 5 seconds (see NOTE 6).

STEP 29 Turn to position 7 to again circulate the liquid in the P-601 loop. Leave in this position approximately 10 seconds.

STEP 30 Read PI-662 again and record its value as P_1 on the appropriate checklist.

STEP 31 Turn to position 8 for no more than 5 seconds.

STEP 32 Turn to position 9 to get ready to take the dissolved gas sample or to relieve the collection chamber pressure. Record PI-662 as P_2 on the appropriate checklist as this is the pressure of the liquid sample loop at the time the sample is taken.

PROCEDURE (Cont'd.)

CAUTION: There is a potential for having a higher gas pressure in the gas chamber than can be safely handled in the dissolved gas sample vial. If the pressure observed (PI-662) indicates an off-scale reading, relieve the pressure to near atmospheric pressure as described in STEP 35 prior to taking the sample as described in STEP 34.

STEP 33 If only a liquid sample is to be obtained skip STEP 34.

STEP 34 Turn switch HC-652 to "Gas Sample" and hold it there while watching PI-662. After at least 10 seconds and when PI-662 is very steady, release HC-652 and it will spring back to its center position. Turn HC-652 again to "Gas Sample" to verify the equalized pressure and read PI-662. Record the steady PI-662 pressure as P_3 reading on the appropriate checklist.

STEP 35 When a dissolved gas sample is not desired it is only necessary to relieve the gas pressure back to the suppression pool by rotating switch HC-652 counterclockwise to the lower position and hold it while watching PI-662. The pressures will equalize very rapidly.

STEP 36 If a large volume liquid sample is desired, turn HC-601 to position 10. Pushbutton HC-629-1 must be pushed and held for liquid to be drawn into the sample bottle that was earlier positioned under the sample station. Hold the pushbutton for at least 10 seconds. If a liquid sample is not desired, turn the switch HC-601 to the OFF position very quickly.

STEP 37 Turn HC-601 to OFF.

STEP 38 Lower the liquid sample bottle into the large cask by pulling up on the plunger handle. Do not turn plunger handle as twisting the bottle while it is on the needles will bend the needles.

STEP 39 Lower the cask on the cart by relieving the hydraulic oil pressure with the small petcock handle on the hydraulic cylinder.

STEP 40 Slide the lead shield drawer back into the enclosure to cover the opening for the needles.

STEP 41 Roll the cask out from under the sample station and quickly put the lead plug into the top of the cask. Be careful not to lean over the top of the cask where there will be a column of radiation before the plug is inserted.

STEP 42 Roll the cask away from the sample station and prepare for off-site shipment or on-site analysis as directed. If a dissolved gas sample was not obtained go to STEP 45.

PROCEDURE (Cont'd.)

STEP 43 Open and place the gas vial carrying cask near the sample station. Remove the gas vial positioner from the sample enclosure. Keep the vial at a maximum distance and quickly insert the sample bottle into the gas vial cask. Close and latch the gas vial cask.

STEP 44 Place a rubber stopper into the port in the sample station from which the gas vial positioner was withdrawn.

STEP 45 Turn HC-500 to position 9 if a jet pump sample was taken or position 6 if a RHR sample was taken.

STEP 46 Turn the flush system switch HC-628-1 to position 2. Adjust PCV-672 for maximum flow per FI-664.

STEP 47 After RI-665 shows radiation has decreased significantly, turn switch HC-628-1 to position 3. Observe RI-665.

STEP 48 When the radiation reaches a minimum turn switch HC-628-1 to position 4. Observe RI-665.

STEP 49 When the radiation reaches a minimum turn switch HC-628-1 to position 5. Observe RI-665. A change in RI-665 may not be observable.

STEP 50 When the radiation reaches a minimum turn switch HC-628-1 to position 6. The bypass will be open for this flush and the main flow will not be past RI-665 so run this flush for 2-3 minutes.

STEP 51 Turn switch HC-628-1 to position 7. Observe RI-665.

STEP 52 Repeat STEPS 47 through 51.

STEP 53 Turn HC-626 to off position. Then turn HC-628-1 to off position.

STEP 54 Turn PCV-627 fully counterclockwise.

STEP 55 Close PAS-57-10 and krypton gas cylinder valve.

STEP 56 Remove the jumper installed in STEP 19.

STEP 57 Perform the Drain of Trap, Sump and Collector per Procedure A.2-417.

STEP 58 Turn ventilation off by depressing STOP button.

STEP 59 Transport the gas sample to the hot lab for analysis using the gas vial carrying cask.

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Example of

LARGE VOLUME LIQUID SAMPLING AND ANALYSIS CHECKLIST

Sampling

1. Sample Source: _____ Date _____ Time _____ _____ RPS
2. Sample Identification No. _____
3. Bypass Flow _____ FI-664 (gpm)
4. Flush Time _____ Minutes
5. Sample Flow _____ FI-664 (gpm)
6. Pressure _____ PI-661 (psia)
7. Temperature _____ TI-660 (°F)
8. Conductivity Meter _____ Scale _____ CI-663
9. Radiation _____ RI-665 (mR/hr)
10. Initial Pressure P_o _____ PI-662 (psia)
11. Pressure P_1 _____ PI-662 (psia)
12. Stabilized Pressure P_2 _____ PI-662 (psia)
13. Stabilized Pressure P_3 _____ PI-662 (psia)

Analysis

		Initial
1.	Spectrum Ran (Dilution Factors _____ x _____)	_____
2.	Spectrum Analyzed	_____
3.	Activity Calculated _____ µCi/cc	_____
4.	pH _____	_____
5.	_____ ppb Chloride (From Attachment Chemistry Procedure I.1.3)	_____
6.	_____ ppm Boron (From Attachment Chemistry Procedure I.1.40)	_____

7. Other analyses results as requested and comments:

_____

_____

_____

Performed by: _____ Date _____

Reviewed by: CSL or REC _____ Date _____

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

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Example of

DISSOLVED GAS SAMPLING AND ANALYSIS CHECKLIST

Sampling

1. Sample Source _____ Date _____ Time _____ _____ RPS
2. Sample Identification No. _____
3. Bypass Flow _____ FI-664 (gpm)
4. Flush Time _____ Minutes
5. Sample Flow _____ FI-664 (gpm)
6. Pressure _____ PI-661 (psia)
7. Temperature _____ TI-660 (°F)
8. Conductivity Meter _____ Scale _____ CI-663
9. Radiation _____ RI-665 (mR/hr)
10. Tracer Gas Supply System Pressure _____ (psia)
11. Initial Pressure, P_0 _____ PI-662 (psia)
12. Pressure, P_1 _____ PI-662 (psia)
13. Stabilized Pressure, P_2 _____ PI-662 (psia)
14. Stabilized Pressure, P_3 _____ PI-662 (psia)

Analysis

		Initial
1.	Spectrum ran (Dilution Factors _____ x _____)	_____
2.	Spectrum Analyzed	_____
3.	Activity Calculated _____ µCi/cc	_____
4.	Dissolved Gas Analysis (complete pages 2 through 5)	_____

5. Other analysis results as requested or comments:

_____

_____

_____

Performed by: _____ Date: _____

Reviewed by: CSL or REC _____ Date: _____

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

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Example of
DISSOLVED GAS SAMPLING AND ANALYSIS CHECKLIST (Cont'd.)

DISSOLVED GAS CALCULATIONS FOR TOTAL INVENTORY OF H_2, O_2, AND N_2 AS SAMPLED IN THE POST ACCIDENT SAMPLE STATION

The volume of dissolved gas sample in sample vial is:
(Temperature and pressure must be in units of °Kelvin and atmospheres respectively.)

$V_{sx} = 0.05 \times T_s \times P_3 =$ _____ cc (See NOTE page 5)

The volume of O_2, H_2, N_2 and Kr in vial is:

$V_2{}^{O_2} = V_{GC}{}^{O_2} \times V_{sx} =$ _____ cc

$V_2{}^{H_2} = V_{GC}{}^{H_2} \times V_{sx} =$ _____ cc

$V_2{}^{N_2} = V_{GC}{}^{N_2} \times V_{sx} =$ _____ cc

$V_2{}^{Kr} = V_{GC}{}^{Kr} \times V_{sx} =$ _____ cc

The volume of O_2 and N_2 in vial prior to sampling is:
(Pressure must be units of atmospheres.)

$V_1{}^{O_2} = \frac{P_0}{14.7} \times 14.9 \times 0.21 =$ _____ cc

$V_1{}^{N_2} = \frac{P_0}{14.7} \times 14.9 \times 0.78 =$ _____ cc

The volume of oxygen, hydrogen, nitrogen and krypton collected from isolated sample system is:

$V_3{}^{O_2} = V_2{}^{O_2} - V_1{}^{O_2} =$ _____ cc

$V_3{}^{H_2} = V_2{}^{H_2} =$ _____ cc

$V_3{}^{N_2} = V_2{}^{N_2} - V_1{}^{N_2} =$ _____ cc

$V_3{}^{Kr} = V_2{}^{Kr} =$ _____ cc

WP/kk

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Example of
DISSOLVED GAS SAMPLING AND ANALYSIS CHECKLIST (Cont'd.)

The volume of injected tracer gas (Kr) is:

$V_1^{Kr} = 0.022 \times P_{Kr} =$ _____ cc

The concentration of O_2, H_2 and N_2 in isolated sample system is:

$C_1^{O}2 = (V_3^{O}2/117.8) \times (V_1^{Kr}/V_3^{Kr}) =$ _____ cc/ml H_2O

$C_1^{H}2 = (V_3^{H}2/117.8) \times (V_1^{Kr}/V_3^{Kr}) =$ _____ cc/ml H_2O

$C_1^{N}2 = (V_3^{N}2/117.8) \times (V_1^{Kr}/V_3^{Kr}) =$ _____ cc/ml H_2O

The volume of O_2, H_2 and N_2 in the system being sampled (see Sample Source on Page 1) is:

$C_2^{O}2 = C_1^{O}2 \times V^s =$ _____ cc

$C_2^{H}2 = C_1^{H}2 \times V^s =$ _____ cc

$C_2^{N}2 = C_1^{N}2 \times V^s =$ _____ cc

WP/kk

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Example of
DISSOLVED GAS SAMPLING AND ANALYSIS CHECKLIST (Cont'd.)

V_{sx} = volume of dissolved gas sample in sample vial (cc)

P_3 = pressure of sample (item #14 on page 1) - psia

T_s = temperature of sample (item #7 on page 1) - psia

$V_{GC}{}^{O_2}$= % O_2 determined by G.C. analysis in sample vial (Chemistry Procedure I.1.36)

$V_{GC}{}^{H_2}$= % H_2 determined by G.C. analysis in sample vial (Chemistry Procedure I.1.36)

$V_{GC}{}^{N_2}$= % N_2 determined by G.C. analysis in sample vial (Chemistry Procedure I.1.36)

$V_{GC}{}^{Kr}$= % Kr determined by G.C. analysis in sample vial (Chemistry Procedure I.1.36)

$V_2{}^{O_2}$ = volume of O_2 in sample vial (cc)

$V_2{}^{H_2}$ = volume of H_2 in sample vial (cc)

$V_2{}^{N_2}$ = volume of N_2 in sample vial (cc)

$V_2{}^{Kr}$ = volume of Kr in sample vial (cc)

P_0 = pressure of sample vial after evacuation (item #11 on page 1) - psia

$V_1{}^{O_2}$ = volume of O_2 in sample vial prior to sampling (cc)

$V_1{}^{N_2}$ = volume of N_2 in sample vial prior to sampling (cc)

WP/kk

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Example of

DISSOLVED GAS SAMPLING AND ANALYSIS CHECKLIST (Cont'd.)

$V_3^{O_2}$ = the volume of O_2 collected from the isolated sample system

$V_3^{N_2}$ = the volume of H_2 collected from the isolated sample system

$V_3^{N_2}$ = the volume of N_2 collected from the isolated sample system

V_3^{Kr} = the volume of Kr collected from the isolated sample system

P_{Kr} = pressure of tracer gas (Kr) (item #10 on page 1)

V_I^{Kr} = volume of injected tracer gas (Kr)

$C_1^{O_2}$ = concentration of O_2 in isolated sample system

$C_1^{H_2}$ = concentration of H_2 in isolated sample system

$C_1^{N_2}$ = concentration of N_2 in isolated sample system

V^s = volume of water in system being sampled
Use either 1.76E8 mls. for reactor coolant or
1.93E9 mls. for torus.

$C_2^{O_2}$ = the volume of O_2 in system being sampled

$C_2^{H_2}$ = the volume of H_2 in system being sampled

$C_2^{N_2}$ = the volume of N_2 in system being sampled

NOTE: The following conversion factors will be required:

$$\text{atmospheres} = \frac{\text{psia}}{14.7}$$

$$^{\circ}\text{Kelvin} = \frac{5}{9} \times (^{\circ}\text{F}-32) + 273.15$$

WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes X No ___

DRAINING THE TRAP, SUMP AND COLLECTOR OF POST ACCIDENT SAMPLING SYSTEM

Procedure A.2-417

Prepared by: [signature] ALARA Review: C.J. Mathew Date 2/3/83
Reviewed by: [signature] Q.A. Review: Revision 0 Date 7/28/82
Operations Committee Final Review: Meeting Number: 1153 Date 2/10/83
Approved by: [signature] Date 2-11-83
Op. Com. Results Review: Not Required Mtg. # 1100 Date 7/29/82

PURPOSE

The purpose of this procedure is to provide special instructions and precautions for draining the trap, sump and collector of the PASS.

CONDITIONS AND PREREQUISITES

A sample has been obtained at the PASS.

ORGANIZATION AND RESPONSIBILITIES

Emergency Director - Overall responsibility

REC/CSL - Responsible for requesting a sample be obtained at the PASS.

Chemistry Technician - Responsible for draining the trap, sump and collector.

PRECAUTIONS

A. Exposures of sampling personnel shall be in accordance with A.2-401, "Emergency Exposure Control".

B. Exposures to all personnel due to sampling operations should be maintained as low as is reasonably achieveable.

C. When actual or potential radiation levels so warrant, high range portable survey instruments, and self-reading dosimeters shall be provided to sampling personnel to permit rapid assessment of high exposure rates and accumulated personnel exposure. Alarming dosimeters should also be considered.

D. It is very important that the sump discharge to the suppression pool line be open before the drain and blow out operation is started, especially if valve FCV-627 is left open. If the discharge line is not open the 100 psi nitrogen used for discharging the collector tank V-715 will force the liquid into the liquid sample loop. Note that this may occur even if FCV-627 is closed since it is not a tight shut-off valve.

WP/kk

PRECAUTIONS (Cont'd.)

E. Calculations for exposure rates resulting from radiation within a few hours after a Loss of Coolant Accident point out the desirability of spending minimum amount of time that is necessary near the surface of the sample enclosure. Most of the operation of the Post Accident Sampling System located at 951' of Turbine Building can be performed from the control panel. With the control panel located ten or more feet away from the sample enclosure the dose rates at the control panel due to radiation from the sample enclosure will be below 100 MR/HR. The indicator for the area radiation detector RE-507 is on the PASS control panel and its reading should be noted whenever the presence of radiation is suspected.

REMARKS

1. There is no automatic drain or blow down but there is an alarm light to indicate that the level in the trap T-717 is high and that the trap needs to be drained right away. This trap removes water from the gas sample lines. If the liquid level becomes too high water will be sucked into an air pump and mechanical damage may result.

2. The drain and blow out sequence will take precedence over any other operation. Therefore the drain and blow out operation may be performed at any time by merely turning the Sump Drain System Switch HC-715-1 to any position other than off. Any other operation sequence that may be occurring will immediately be stopped and when the Sump Drain System Switch HC-715-1 is returned to the OFF position, the sample station operation will return to the step previously interrupted, unless other switches were changed in the meantime.

3. The Post Accident Sampling Station is located on the south side of the 951' level of the turbine building. The most efficient route to the PASS is through access control and into the turbine building. Move to the 951' level via the east stairway.

4. Obtain controlled access key 33A from R.P. Coordinator and key #153 from Shift Supervisor.

PROCEDURE

NOTE 1 If neither RHR loop is operating, the position of the Liquid Return Selection Switch in STEP 1 is immaterial.

STEP 1 Set switch HC-500 to position 9. Set the Liquid Return Selection Switch to A or B corresponding to the operating RHR Loop.

STEP 2 Check that the nitrogen tank supply valve and the corresponding valve PAS-57-11 or PAS-57-22 is open and that the pressure is set at 100 psig and verify that PASS Ventilation System is on.

PROCEDURE (Cont'd.)

STEP 3 Check that the demineralized flush water tank level is above the minimum level mark on the site glass and is pressurized at 100 psig (PI-4021) and that valves DM-136 and DM-137 are closed and DM-138 open and demin water supply valve PAS-57-1 on PASS demin water tank is open.

NOTE 2 If tank level is below minimum marking perform Procedure A.2-418 before proceeding.

STEP 4 Turn all control panel switches except HC-500 up and off and then turn the control panel power selector switch (HC-600) to "A".

STEP 5 Turn the Liquid or Gas selector switch (HC-700) to Liquid.

STEP 6 Turn HC-626 to position 2.

STEP 7 Turn Flush System Switch HC-628-1 counterclockwise to position 6.

STEP 8 Use the knob adjacent to CV-627 gauge on the control panel to obtain a flow per FI-664 of at least 0.4 gpm.

STEP 9 Rotate HC-715 through positions 2 through 7 pausing about 5 seconds at each position.

STEP 10 Turn HC-626 to OFF.

STEP 11 Turn HC-628 to OFF.

STEP 12 Turn HC-715 to OFF position.

STEP 13 Turn HC-700 to OFF.

STEP 14 Turn PCV-627 fully counterclockwise.

STEP 15 If this is the end of an operation, turn all switches to UP and OFF position, turn Power Source Selector Switch (HC-600) to OFF and secure nitrogen cylinder and associated valve PAS-57-21 or PAS-57-11. If the sampling operation is not complete, make only those changes consistent with the appropriate sampling procedure.

WP/kk

Op. Com. Rev. Req'd. Yes X No ___
Q.A. Review Req'd. Yes ___ No X
ALARA Review Req'd. Yes ✓ No ___

POST ACCIDENT GAS SAMPLE LINE HEAT TRACE

Procedure A.2-425

Prepared by: K Pearson ALARA Review: Cobb Mathes Date 2/4/83
Reviewed by: K Jacobs Q.A. Review: D. Rancourt Date 2/7/83
Operations Committee Final Review: Meeting Number: 1183 Date 2/10/83
Approved by: T J Fay Date 2-14-83
Op. Com. Results Review: not required Mtg. # 1183 Date 2/10/83

PURPOSE

The purpose of this procedure is to provide special instructions and precautions for operating the post accident sampling system gas sample line heat tracing.

CONDITIONS AND PREREQUISITES

The Emergency Director/REC/CSL has requested that the gas sample line heat trace be turned on for possible sampling of torus or drywell atmosphere.

Actual or potential radiological conditions are such that special methods and/or precautions are necessary to minimize personnel exposure. Unless directed otherwise, this procedure should be used in lieu of routine testing procedures whenever an Alert or higher emergency classification is declared.

ORGANIZATION AND RESPONSIBILITIES

Emergency Director - Overall responsibility

REC/CSL - Responsible for requesting that heat trace be turned on and off.

Chemistry Technicians - Responsible for operating heat tracing for PAS gas lines.

PRECAUTIONS

A. Exposures of personnel shall be in accordance with A.2-401, "Emergency Exposure Control".

B. Exposures to all personnel operations should be maintained as low as is reasonably achieveable.

C. When actual or potential radiation levels so warrant, high range portable survey instruments, and self-reading dosimeters shall be provided to sampling and analysis personnel to permit rapid assessment of high exposure rates and accumulated personnel exposure. Alarming dosimeters should also be considered.

WP/kk

REMARKS

1. Once the heat tracing is turned on it will take about one hour for the temperature of the gas lines to reach the predetermined value. Therefore, the heat trace should be turned on as soon as it is anticipated that a drywell or torus atmosphere gas sample will be taken.

2. The heat trace controls are located in the MG Set Room in the Reactor Building. Proceed through the ventilation room on the third floor of the Administration Building to the MG Set Room.

3. Obtain CAP Key #1 from R.P. Coordinator and vital access key #211 from the Shift Supervisor.

4. Advise the Control Room, Security Shift Supervisor and the Radiation Protection Coordinator of your intentions.

EQUIPMENT REQUIRED

- Small standard screwdriver

PROCEDURE

PART I - Turn Heat Trace ON

STEP 1 Open cabinet C283A.

STEP 2 Turn Silent/Reset Normal switch to Silent/Reset.

STEP 3 Repeat STEPS 4 through 9 for each control module DW2, DW3, DW4, TR2, TR3, TR4 and TR5.

STEP 4 Turn Calibration control knob to 250°F.

STEP 5 Hold the CAL/READ switch on a control module in the CAL position. Using a screwdriver adjust the "SP" L.E.D. potentiometer until the green L.E.D. just lights.

STEP 6 Hold the CAL/READ switch on the same control module in the CAL position and verify that the "SP" L.E.D. comes on when the calibration control knob is rotated through 250°F ± 3°F.

STEP 7 Turn Calibration control knob to 235°F.

STEP 8 Hold the CAL/READ switch on the control module in the CAL position. Using a screwdriver adjust the "UT" potentiometer until the red L.E.D. just lights.

STEP 9 Hold the CAL/READ switch on the same control module in the CAL position and verify that the "UT" L.E.D. comes on when the calibration control knob is rotated through 235°F ± 3°F.

STEP 10 Open cabinet C283B.

WP/kk

PROCEDURE (Cont'd.)

STEP 11 Turn Silent/Reset Normal switch to Silent/Reset.

STEP 12 Repeat STEPS 4 through 9 for each control module DW1 and TR1.

STEP 13 When the temperature indication from each module is greater than 235°F the Silent/Reset Normal Switch shall be turned to the Normal position. (The current temperature for each module is determined by holding the CAL/READ switch for that module in the READ position.)

NOTE 1 It will require about one hour for the heat trace to reach 250°F. To minimize radiation exposure leave the MG Set Room and return to check the heat trace temperatures in about one hour.

PART II - Turn Heat Trace OFF

STEP 14 Open cabinet C283A

STEP 15 Turn Silent/Reset Normal switch to Silent/Reset.

STEP 16 Repeat STEPS 17 through 22 for each control module DW2, DW3, DW4, TR2, TR3, TR4 and TR5.

STEP 17 Turn calibration control knob to 50°F.

STEP 18 Hold the CAL/READ switch in the CAL position. Using a screwdriver adjust the "SP" L.E.D. potentiometer until the green L.E.D. just lights.

STEP 19 Hold the CAL/READ switch on the same control module in the CAL position and verify that the "SP" L.E.D. comes on when the calibration control knob is rotated through 50°F ± 3°F.

STEP 20 Turn calibration control knob to 40°F.

STEP 21 Hold the CAL/READ switch on the control module in the CAL position. Using a screwdriver adjust the "UT" potentiometer until the red L.E.D. just lights.

STEP 22 Hold the CAL/READ switch on the same control module in the CAL position and verify that the "UT" L.E.D. comes on when the calibration control knob is rotated through 40°F ± 3°F.

STEP 23 Turn the Silent/Reset Normal switch to Normal.

STEP 24 Open cabinet C283B.

STEP 25 Turn Silent/Reset Normal switch to Silent/Reset.

STEP 26 Repeat STEPS 17 through 22 for each control module DW1 and TR1.

STEP 27 Turn Silent/Reset Normal switch to Normal.

WP/kk