

**PSEG NUCLEAR L.L.C.
SALEM/OPERATIONS**

S2.OP-AB.RAD-0001(Q) REV. 28

ABNORMAL RADIATION

-
- ◆ Biennial Review Performed: Yes ___ No ___ NA
 - ◆ DCP Packages and Affected Document Numbers incorporated into this revision: None
 - ◆ The following OTSCs were incorporated into this revision: None
-

REVISION SUMMARY:

- ◆ Incorporated DCP 80057594, RMS Channels 2R5, 2R34, & 2R47 as follows: **[80057594]**
 - Attachment 5 , Updated the “Remote Display Location” for RMS Channels 2R5, 2R34, 2R45, & 2R47.

IMPLEMENTATION REQUIREMENTS

Effective Date: March 26, 2010

DCP 80057594, RMS Channels 2R5, 2R34, & 2R47

ABNORMAL RADIATION

1.0 **ENTRY CONDITIONS**

Date: _____ Time: _____

- 1.1 Any unexpected rise in activity on any Process, Filter, or Area Radiation Monitor.
- 1.2 Any unexpected warning or alarm on any Process, Filter, or Area Radiation Monitor.

2.0 **IMMEDIATE ACTIONS**

- 2.1 None

3.0 **SUBSEQUENT ACTIONS**

___ 3.1 **DETERMINE** affected Radiation monitor.

3.2 Is the alarm, warning, or rising indication valid? (**EVALUATE** the following):

- ◆ Chemistry Sampling
- ◆ Rising activity on related Radiation Monitors
- ◆ Maintenance activities in vicinity of radiation detector
- ◆ Transfer of radioactive resins or other materials in affected area
- ◆ No indication of failure or fault on affected Radiation Monitor
- ◆ Radioactive release from Salem or Hope Creek

___ NO ___ YES → **GO TO** Step 3.5

↓

_____ Time

___ 3.3 **NOTIFY** SM/CRS to Refer to Event Classification Guide
AND PERFORM ACTION REQUIRED in applicable Technical Specifications
 and ODCM for inoperable Radiation Monitor.

___ 3.4 **GO TO** Section 4.0

_____ Time

3.5 CONTINUE

NOTE

Attachment 5, RMS Channel Summary, provides information for monitor locations and functions.

- ___ 3.6 **ANNOUNCE** the following on Plant PA system:
- ◆ Affected Radiation Monitor number and name
 - ◆ Location of Radiation Monitor area with elevated indication
- ___ 3.7 IF a release to the environment is in progress,
THEN **DIRECT** Shift Radiation Protection Technician (SRPT) to complete and provide Page 2 of the Station Status Checklist (SSCL) for release rate determination.
- ___ 3.8 **NOTIFY** SM/CRS to REFER TO Event Classification Guide, ODCM and Technical Specifications.

___ 3.9 INITIATE the applicable attachment for affected Radiation Monitor:

ATTACHMENT 1					
Process Monitor	Description	Process Monitor	Description	Process Monitor	Description
2R1B-1	Control Room Air Intake Duct (Unit 2 side)	2R15	Condenser Air Ejector	2R37	Non-Rad Liquid Waste Basin
2R1B-2	Control Room Air Intake Duct (Unit 1 side)	2R17A-B	Component Cooling Header 21, 22	2R41D	Plant Vent Noble Gas Release Rate
2R11A	Containment Particulate	2R18	Liquid Waste Disposal	2R45A-D	Emergency Plant Vent Background, Medium Range, High Range, Particulate and Iodine
2R12A-B	Containment Gas Effluent/Iodine	2R19A-D	21-24 S/G Blowdown	2R46A-D	21-24 Common Discharge, S/G Steam Line Monitors
2R13A-B	21-25 CFCU SW	2R31	Letdown Line - Failed Fuel	2R53A-D	21-24 N ¹⁶ MS Line Rad. Monitors

ATTACHMENT 2	
Process Filter Monitor	Description
2R26	Reactor Coolant Filter
2R40	Condensate Filter

ATTACHMENT 3			
Area Monitor	Description	Area Monitor	Description
2R1A	Control Room	2R10A-B	Personnel Airlock
2R2	Containment - 130' Elevation	2R32A	Fuel Handling Crane (local)
2R4	Charging Pump Room	2R34	Mechanical Penetration Area - 100' Elevation
2R5	Fuel Handling Building	2R44A	Containment Equipment Hatch - 130' Elevation
2R7	Seal Table Area		
2R9	Fuel Storage Area	2R44B	Stairway to Reactor Sump - 96' Elevation

- ___ 3.10 When Radiation Monitor indication has returned to normal:
 - ___ 3.10.1 **ANNOUNCE** on Plant PA System that Radiological conditions have cleared.
 - ___ 3.10.2 **RESTORE** affected systems to service as available.
 - ___ 3.10.3 **RETURN** equipment actuated by automatic interlocks to normal operation.

4.0 **COMPLETION AND REVIEW**

- ___ 4.1 **CIRCLE** Entry Condition number in Section 1.0,
OR EXPLAIN Entry Condition in COMMENTS Section of Attachment 6.
- ___ 4.2 **COMPLETE** Attachment 6, Sections 1.0 and 2.0,
AND FORWARD this procedure to SM/CRS for review and approval.
- 4.3 SM/CRS **PERFORM** the following:
 - ___ 4.3.1 **REVIEW** this procedure with Attachments 1 - 4 (as applicable) and Attachment 6 for completeness and accuracy.
 - ___ 4.3.2 **COMPLETE** Attachment 6, Section 3.0.
 - ___ 4.3.3 **FORWARD** completed procedure to Operations Staff.

END OF PROCEDURE

ATTACHMENT 1
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PROCESS RADIATION MONITORS

- ___ 1.0 IF 2R1B-1 or 2R1B-2, Control Room Intake Duct, is the affected monitor,
THEN:
- ___ 1.1 **COORDINATE** with Unit 1 NCO to ensure Control Room Ventilation is aligned to ACCIDENT PRESSURIZED mode IAW the following procedures:
- ◆ S2.OP-SO.CAV-0001(Q), Control Room Ventilation Operation
 - ◆ S1.OP-SO.CAV-0001(Q), Control Room Ventilation Operation
- ___ 1.2 **COORDINATE** with Radiation Protection to:
- ◆ **SAMPLE** intake air to determine the source of elevated activity.
 - ◆ **LOCATE AND ISOLATE** the source of activity.
- ___ 2.0 IF any of the following is the affected monitor:
- ◆ 2R11A, Containment Particulate
 - ◆ 2R12A, Containment Gas Effluent
 - ◆ 2R12B, Containment Gas Effluent-Iodine
- THEN:
- ___ 2.1 IF fuel movement is in progress,
THEN STOP the fuel movement.
- ___ 2.2 IF the source of high radiation is due to a fuel handling incident,
THEN GO TO S2.OP-AB.FUEL-0001(Q), Fuel Handling Incident. Time
- ___ 2.3 IF the Containment Equipment Hatch is open,
THEN INITIATE S2.OP-AB.CONT-0001(Q), Containment Closure. Time
- ___ 2.4 IF the Containment Equipment Hatch is closed,
THEN:
- ___ A. **TERMINATE** any in-progress Containment Purge IAW S2.OP-SO.WG-0006(Q), Containment Purge to the Plant Vent.
 - ___ B. **ENSURE** 2VC1, 2VC4, 2VC5 AND 2VC6 are CLOSED.
- ___ 2.5 **COORDINATE** with Chemistry and Radiation Protection to:
- ◆ **SAMPLE** determine the source of elevated activity
 - ◆ **LOCATE AND ISOLATE** source of activity.

ATTACHMENT 1
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PROCESS RADIATION MONITORS

- ___ 3.0 IF 2R13A or 2R13B, CFCU Service Water Monitor(s), is the affected monitor,
THEN:
- ___ 3.1 **CLOSE** associated SW72 valve for the affected CFCU to determine the source of activity (Isolate one at a time).
- ◆ 2R13A - 21, 22, 23 CFCU
 - ◆ 2R13B - 23, 24, 25 CFCU
- ___ 3.2 **STOP** affected CFCU(s).
- ___ 3.3 Send an Operator to **DE-ENERGIZE** 125VDC Control Power to affected CFCU(s).
- ___ 3.4 **NOTIFY** SM/CRS to review applicable Technical Specifications and ODCM.
- ___ 3.5 **NOTIFY** Chemistry to sample to determine the source of elevated activity.
- ___ 4.0 IF 2R17A OR 2R17B is the affected monitor,
THEN:
- ___ 4.1 **ENSURE** 2CC149, Surge Tank Vent Valve is CLOSED.
- ___ 4.2 **NOTIFY** Chemistry to sample Component Cooling, to verify rise in activity.
- ___ 4.3 IF rise in activity is verified in Component Cooling,
THEN GO TO S2.OP-AB.RC-0001(Q), Reactor Coolant System Leak, Attachment 1, to identify the source of inleakage.
- _____ Time
- ___ 5.0 IF 2R18, Liquid Waste Disposal, is the affected monitor,
THEN:
- ___ 5.1 **ENSURE** 2WL51, TO CIRC WTR DISCHARGE, is CLOSED to stop all Liquid Waste releases.
- ___ 5.2 **TERMINATE** Liquid Waste Release procedure in effect.

ATTACHMENT 1
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PROCESS RADIATION MONITORS

- | | | | |
|-----|-----|--|---------------|
| ___ | 6.0 | <u>IF</u> 2R19A, 2R19B, 2R19C, or 2R19D (21 - 24 Steam Generator Blowdown Monitors) is the affected monitor,
<u>THEN</u> : | |
| ___ | 6.1 | CLOSE the following valves: <ul style="list-style-type: none"> ◆ 2GB50, VALVE FROM 21 SGBT ◆ 21-24GB10, FROM 21 THROUGH 24 SG ◆ 21-24GB185, FROM 21 THROUGH 24 SG ◆ Associated GB4, SG OUTLET | |
| ___ | 6.2 | GO TO S2.OP-AB.SG-0001(Q), Steam Generator Tube Leak. | _____ |
| ___ | 7.0 | <u>IF</u> 2R53A, B, C, or D, ¹⁶ N MS Line Radiation Monitor, is in alarm,
<u>THEN GO TO</u> S2.OP-AB.SG-0001(Q), Steam Generator Tube Leak. | Time
_____ |
| ___ | 8.0 | <u>IF</u> 2R31, Letdown Line-Failed Fuel, is the affected monitor,
<u>THEN GO TO</u> S2.OP-AB.RC-0002(Q), High Activity in the Reactor Coolant. | Time
_____ |
| ___ | 9.0 | <u>IF</u> R37, Non-Rad Liquid Waste Basin, is the affected monitor,
<u>THEN</u> : | Time
_____ |
| ___ | 9.1 | NOTIFY Chemistry of 2R37 alarm, and the trip of Ground Water Remediation Pumps. | |
| ___ | 9.2 | Direct Chemistry to TERMINATE Non-Rad Liquid Waste discharge. | |
| ___ | 9.3 | <u>IF</u> a release is in progress using Waste Monitor Tank Pumps,
<u>THEN TERMINATE</u> release. | |

**ATTACHMENT 1
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PROCESS RADIATION MONITORS

- ___ 10.0 IF 2R41D, Plant Vent Release Rate is the affected monitor,
THEN:
- ___ 10.1 **ENSURE** 2VC1, 2VC4, 2VC5 AND 2VC6 are CLOSED.
- ___ 10.2 **ENSURE** 2WG41, GAS DECAY TK TO PLANT VENT DISCHARGE VALVE,
is CLOSED.
- ___ 10.3 **TERMINATE** gaseous release IAW appropriate Discharge of Gaseous Waste
procedure in effect.
- 10.4 Is at least one R1B Control Room Intake Duct Radiation Monitor channel
(in each Unit intake duct) OPERABLE?
- ___ NO ___ YES ———> **GO TO** Step 10.6 Time
- |
- V
- ___ 10.5 Coordinate with Unit 1 NCO to **ALIGN** Control Room Ventilation for
ACCIDENT PRESSURIZED IAW the following procedures:
- ◆ S2.OP-SO.CAV-0001(Q), Control Room Ventilation Operation
 - ◆ S1.OP-SO.CAV-0001(Q), Control Room Ventilation Operation
- ___ 10.6 **DIRECT** the Shift Radiation Protection Technician (SRPT) to
COMPLETE dose assessment, every 30 minutes, IAW NC.EP-EP.ZZ-0309(Q),
Dose Assessment, AND **PROVIDE** Page 2 of the Station Status Checklist (SSCL)
for release rate determination.
- ___ 10.7 **OBTAIN** release rates every 30 minutes using one of the following:
- ◆ Release Rates from SSCL, page 2 (ECG Att. 8) (preferred)
- OR
- ◆ Attachment 4, Total Release Rate Calculation

**ATTACHMENT 1
(Page 5 of 5)**

PROCESS RADIATION MONITORS

- ___ 10.8 **PLACE** Auxiliary Building HEPA Plus Charcoal in service
IAW S2.OP-SO.ABV-0001(Q), Auxiliary Building Ventilation Operation.
- ___ 10.9 **PLACE** Fuel Handling Building HEPA Plus Charcoal in service
IAW S2.OP-SO.FHV-0001(Q), Fuel Handling Building Ventilation Operation.
- ___ 10.10 **COORDINATE** with Chemistry and Radiation Protection to:
- ◆ **SAMPLE** to determine the source of elevated activity.
 - ◆ **LOCATE AND ISOLATE** the source of activity.
- ___ 10.11 **RECORD** sample results in Control Room Log.
- ___ 11.0 **IF** 2R45A, B, C or D is the affected monitor,
THEN:
- ___ 11.1 **COORDINATE** with Chemistry and Radiation Protection
(TSC and OSC if activated) to perform the following as appropriate:
- ◆ **SAMPLE** to determine the source of elevated activity
 - ◆ **LOCATE AND ISOLATE** the source of activity
 - ◆ **OBTAIN** R45 skid grab sample
- ___ 12.0 **IF** any of the following monitors are affected:
- ◆ 2R15, Condenser Air Ejector Monitor
 - ◆ 2R46A, 22 Steam Generator Main Steam Line Monitors
 - ◆ 2R46B, 24 Steam Generator Main Steam Line Monitors
 - ◆ 2R46C, 21 Steam Generator Main Steam Line Monitors
 - ◆ 2R46D, 23 Steam Generator Main Steam Line Monitors
- THEN GO TO** S2.OP-AB.SG-0001(Q), Steam Generator Tube Leak.
- ___ 13.0 **IF** any other Process Radiation Monitor
(not specifically identified in this Attachment) is affected,
THEN COORDINATE with Chemistry and Radiation Protection to:
- ◆ **SAMPLE** to determine the source of elevated activity
 - ◆ **LOCATE AND ISOLATE** the source of activity

Time

ATTACHMENT 2
(Page 1 of 1)

PROCESS FILTER RADIATION MONITORS

- ___ 1.0 **NOTIFY** Chemistry Department to sample affected filter influent and effluent to determine if filter breakthrough has occurred.
- ___ 2.0 **EVALUATE** filter differential pressure to determine if filter overload has occurred.
- ___ 3.0 Notify Radiation Protection to **SURVEY** filter.
- ___ 4.0 **INITIATE** actions to isolate, flush, or replace filter as necessary.

ATTACHMENT 3
(Page 1 of 2)

AREA RADIATION MONITORS

- ___ 1.0 IF 2R1A, Control Room Area, is the affected monitor,
THEN:
- ___ 1.1 Coordinate with Unit 1 NCO to **ALIGN** Control Room Ventilation for ACCIDENT PRESSURIZED IAW the following procedures:
- ◆ S2.OP-SO.CAV-0001(Q), Control Room Ventilation Operation
 - ◆ S1.OP-SO.CAV-0001(Q), Control Room Ventilation Operation
- ___ 1.2 Notify Radiation Protection to **SURVEY** area to determine source of elevated activity.
- ___ 2.0 IF 2R5, Fuel Handling Building Area Monitor,
OR 2R9, Fuel Storage Area Monitor, is the affected monitor,
THEN:
- ___ 2.1 **PRESS** FHB Ventilation Exhaust Filter HEPA 22 PLUS CHAR pushbutton.
- ___ 2.2 **ENSURE** all available Fuel Handling Building Exhaust Fans are running.
- ___ 2.3 **VERIFY** HEPA 22 PLUS CHAR and SEQUENCE COMPLETE lights illuminate.
- ___ 2.4 **VERIFY** HEPA 21 ONLY and SEQUENCE COMPLETE lights extinguish.
- ___ 2.5 **NOTIFY** Radiation Protection to survey the area to determine the source of elevated activity.
- ___ 2.6 **ENSURE** a negative pressure is maintained in the Fuel Handling Building IAW S2.OP-SO.FHV-0001(Q), Fuel Handling Building Ventilation Operation.
- ___ 2.7 IF fuel handling is in progress,
THEN GO TO S2.OP-AB.FUEL-0001(Q), Fuel Handling Incident.

Time

ATTACHMENT 3
(Page 2 of 2)

AREA RADIATION MONITORS

NOTE

High radiation indicated on 2R32A, Fuel Handling Crane Monitor, will prevent crane hoist UP operation.

Containment radiation levels of $\geq 1.0E+5$ R/HR indicated on 2R44A or 2R44B inserts ADVERSE CONTAINMENT correction factors into the Subcooling Monitor.

- ___ 3.0 IF any other Area Radiation Monitor is affected,
THEN NOTIFY Radiation Protection to survey the area to determine the source of elevated activity.

ATTACHMENT 4
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TOTAL RELEASE RATE CALCULATIONS

1.0 CALCULATING TOTAL RELEASE RATE

NOTE

Additional copies of applicable section(s) may be made as necessary to support half-hour calculation requirements.

1.1 IF the following instrumentation is operable:

- ◆ Radiation Monitor 2R41D
- ◆ Radiation Monitor 1R41D

THEN PERFORM Total Release Rate Calculation IAW Section 2.0 of this Attachment.

1.2 IF 1R41D is unavailable,

THEN PERFORM Total Release Rate Calculation IAW Section 3.0 of this Attachment.

ATTACHMENT 4
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TOTAL RELEASE RATE CALCULATIONS

Page ___ of ___

2.0 TOTAL RELEASE RATE USING 2R41D AND 1R41D

TOTAL RELEASE RATE		INITIALS	TIME	DATE
	_____ $\mu\text{Ci/sec}$ (2R41D)			
+	_____ $\mu\text{Ci/sec}$ (1R41D)	_____	_____	_____
=	_____ $\mu\text{Ci/sec}$ (Total)			
	_____ $\mu\text{Ci/sec}$ (2R41D)			
+	_____ $\mu\text{Ci/sec}$ (1R41D)	_____	_____	_____
=	_____ $\mu\text{Ci/sec}$ (Total)			
	_____ $\mu\text{Ci/sec}$ (2R41D)			
+	_____ $\mu\text{Ci/sec}$ (1R41D)	_____	_____	_____
=	_____ $\mu\text{Ci/sec}$ (Total)			
	_____ $\mu\text{Ci/sec}$ (2R41D)			
+	_____ $\mu\text{Ci/sec}$ (1R41D)	_____	_____	_____
=	_____ $\mu\text{Ci/sec}$ (Total)			

**ATTACHMENT 4
(Page 3 of 3)**

TOTAL RELEASE RATE CALCULATIONS

Page ___ of ___

3.0 ALTERNATE METHOD - TOTAL RELEASE RATE USING 2R41D AND 1R45B/C

RELEASE PARAMETERS	TOTAL RELEASE RATE	<u>INITIALS</u> <u>TIME</u> <u>DATE</u>
(_____ μCi/sec 2R41D	_____ μCi/sec (2R41D)	
	+	
(_____ μCi/cc X 472 X _____ cfm) = 1R45B/C Unit 1 Plant Vent Flow Rate	_____ μCi/sec (1R45B or C)	
	= _____ μCi/sec (Total)	
(_____ μCi/sec 2R41D	_____ μCi/sec (2R41D)	
	+	
(_____ μCi/cc X 472 X _____ cfm) = 1R45B/C Unit 1 Plant Vent Flow Rate	_____ μCi/sec (1R45B or C)	
	= _____ μCi/sec (Total)	
(_____ μCi/sec 2R41D	_____ μCi/sec (2R41D)	
	+	
(_____ μCi/cc X 472 X _____ cfm) = 1R45B/C Unit 1 Plant Vent Flow Rate	_____ μCi/sec (1R45B or C)	
	= _____ μCi/sec (Total)	
(_____ μCi/sec 2R41D	_____ μCi/sec (2R41D)	
	+	
(_____ μCi/cc X 472 X _____ cfm) = 1R45B/C Unit 1 Plant Vent Flow Rate	_____ μCi/sec (1R45B or C)	
	= _____ μCi/sec (Total)	

**ATTACHMENT 5
(Page 1 of 3)**

RMS CHANNEL SUMMARY

CHANNEL	DESCRIPTION	REMOTE DISPLAY LOCATION	LOCAL DISPLAY LOCATION	HIGH RAD ACTUATIONS
2R1A	Control Room (Area)	2RP1	2RP1	None
2R1B-1	Unit 2 Control Room Duct (Process)		None	Align suction to Unit 1 intake and sends start signal to 21 EACS Fan in ACCIDENT PRESSURIZED mode.
2R1B-2	Unit 1 Control Room Duct (Process)			1RP1
2R2	Containment (Area)	RMS CRT	Containment Elev 130'	None
2R4	Charging Pumps (Area)		Aux Bldg Elev 84'	
2R5	FHB - SFP (Area)	Rack 236C	FHB Elev 130', east wall center of SFP	Transfers FHB ventilation to HEPA and Charcoal Filters. Starts FHB Exhaust Fans.
2R7	In-Core Seal Table (Area)	RMS CRT	Containment Elev 100'	Energizes warning lights at 100' and 130' airlocks
2R9	FHB - New Fuel Storage (Area)		FHB Elev 130', east wall center of NFP	Transfers FHB ventilation to HEPA and Charcoal Filters. Starts FHB Exhaust Fans.
2R10A	Personnel Hatch - Cntmt Elev 100' (Area)		Containment Elev 100', by airlock	Energizes warning lights at 100' and 130' airlocks
2R10B	Personnel Hatch - Cntmt Elev 130' (Area)		Containment Elev 130', by airlock	
2R11A	Ctnmt Particulate (Process)	2RP1	Elev 78' Electrical Pen.	Closes 2VC1, 2VC4, 2VC5, <u>AND</u> 2VC6 on fail or Hi Rad
2R12A	Ctnmt Noble Gas (Process)			
2R12B	Ctnmt Iodine (Process)			
2R13A	21, 22, 23 CFCU Service Wtr (Process)	Rack 236B	Circulating Water Thermal Monitoring Enclosure	None
2R13B	23, 24, 25 CFCU Service Wtr (Process)			
2R15	Condenser Air Ejector (Process)	Panel 236A	Elev 100' TGA, near 23B waterbox	
2R17A	21 Component Cooling (Process)	RMS CRT	None	Closes 2CC149
2R17B	22 Component Cooling (Process)			
2R18	Liquid Waste Disposal (Process)	Rack 236B	Elev 84' Aux Bldg, near MWT	Closes WL51

**ATTACHMENT 5
(Page 2 of 3)**

RMS CHANNEL SUMMARY

CHANNEL	DESCRIPTION	REMOTE DISPLAY LOCATION	LOCAL DISPLAY LOCATION	HIGH RAD ACTUATIONS
2R19A	21 SG Blowdown (Process)	2RP1	Elev 122' Aux Bldg	Warning closes: 21-24GB10 21-24GB185 and 2GB50 Alarm closes: associated GB4
2R19B	22 SG Blowdown (Process)			
2R19C	23 SG Blowdown (Process)			
2R19D	24 SG Blowdown (Process)			
2R26	Reactor Coolant Filter (Process Filter)	Rack 236B	Elev 100' Aux Bldg, Demin area	None
2R31	Letdown Hx/Failed Fuel (Process)	RMS CRT	Elev 84' Aux Bldg, entrance to Letdown Hx room	
2R32A	Fuel Handling Crane (Area)	None	Elev 130' FHB, on Spent Fuel Handling Crane	Locks out all crane motion other than downward movement of suspended load
2R34	South Pipe Pen. (Area)	Rack 236C	Elev 100' Aux Bldg, near entrance to south Mech. Pen. area	None
R37	Non-Rad Liquid Waste Basin (Process)	RMS CRT	Yard, west end of Non-Radwaste Basin (in transfer house)	Trips Ground Water Remediation System well pumps
2R40	Condensate Filter (Process Filter)		Yard, CPS	None
2R41A	Plant Vent Noble Gas Low Range	2RP1	Elev 122' Aux Bldg	None
2R41B	Plant Vent Noble Gas Inter. Range			
2R41C	Plant Vent Noble Gas High Range			
2R41D	Plant Vent Release Rate		None	Alarm: Closes 2VC1, 2VC4, 2VC5, 2VC6 AND 2WG41, also bypasses chem sample flowpath (F-1 Filter)
2R44A	Cntmt High Range (Area)	Rack 236A		
2R44B				
2R45A	Plant Vent Noble Gas Background	Rack 236B	Elev 100' between Aux. Bldg and FHB	None
2R45B	Plant Vent Noble Gas Intermediate Range (Process)			
2R45C	Plant Vent Noble Gas High Range (Process)			
2R45D	Plant Vent Filter (Process)			

ATTACHMENT 5
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RMS CHANNEL SUMMARY

CHANNEL	DESCRIPTION	REMOTE DISPLAY LOCATION	LOCAL DISPLAY LOCATION	HIGH RAD ACTUATIONS
2R46A-D	Main Steam Line (Process)	Cabinet 158	Elev 100' Aux Bldg, Relay Room	None
2R47	Electrical Pen. (Area)	Rack 236C	Elev 78' Electrical Pen.	
2R52	Liquid PASS Room (Area)	None	Elev 100' Aux Bldg, PASS room	Energizes warning light outside PASS room
2R53A-D	21 - 24 ¹⁶ N MS Line Rad Monitors	2RP1	Elev 100' Aux Bldg, Relay Room	None

**ABNORMAL RADIATION
TECHNICAL BASES DOCUMENT**

1.0 REFERENCES

1.1 Technical Documents

- A. Updated Final Safety Analysis Report:
Section 9.4, Heating, Ventilation, and Air Conditioning Systems
Section 11.4, Radiological Monitoring
- B. Technical Specifications - Unit 2:
3.3.3.1, Radiation Monitoring Instrumentation
6.8.4.g, Radioactive Effluent Control Program
- C. Salem Nuclear Generating Station Event Classification Guide
- D. Emergency Plan:
Section 10, Assessment
Section 11, Response
Section 12, Exposure
- E. Technical/Engineering Letters:
Salem 1 and 2 Core Exit Thermocouple Processing System Technical Manual,
5587-ICE-0527, Rev. 2
Letter from D.L. Branham, Lead Engineer, Radiation Protection/Chemistry Services,
16 October 1991
Letter RMS 92-0019 dated May 22, 1992 from T. Murphy, Project Engineer-RMS to
F. Wiltsee, PUP Group
Letter to L. Catalfomo, Operations Manager Salem
from Craig Bersak, Engineering Analysis Group dated 05/25/95;
"Review of operability determination for the single failure concern related to Salem
Unit 1 & 2 Control Area Ventilation System as a result of PR 950524316"

1.2 Procedures

- A. S1.OP-AB.RAD-0001(Q), Abnormal Radiation
- B. S2.OP-AR.ZZ-0001(Q), Overhead Annunciators Window A
- C. S2.OP-AR.ZZ-0015(Q), 2RP1 Radiation Alarm Annunciator
- D. S2.OP-AR.ZZ-0017(Q), 2RP1 Accident Range Annunciator
- E. S2.OP-SO.CAV-0001(Q), Control Area Ventilation System Operation
- F. S2.OP-SO.FHV-0001(Q), Fuel Handling Building Ventilation System Operation
- G. S2.OP-SO.RM-0001(Q), Radiation Monitoring Systems Operation
- H. S2.OP-SO.WG-0008(Q), Discharge of No. 21 Gas Decay Tank to the Plant Vent
- I. S2.OP-SO.WG-0009(Q), Discharge of No. 22 Gas Decay Tank to the Plant Vent
- J. S2.OP-SO.WG-0010(Q), Discharge of No. 23 Gas Decay Tank to the Plant Vent
- K. S2.OP-SO.WG-0011(Q), Discharge of No. 24 Gas Decay Tank to the Plant Vent
- L. S2.OP-SO.WL-0001(Q), Release of Radioactive Liquid Waste from 21 CVCS MT
- M. S2.OP-SO.WL-0002(Q), Release of Radioactive Liquid Waste from 22 CVCS MT
- N. S2.OP-SO.WL-0003(Q), Release of Radioactive Liquid Waste from 2 WMHUT

1.3 **Drawings**

- A. 203566, 1 & 2 Units Fuel Handling Area Vent. 11, 12, 21 & 22 Exhaust Filter Units
- B. 205315, 1 & 2 Units Heating Steam & Condensate Return
- C. 232310, 1 & 2 Units Heating Steam & Condensate Return
- D. 239077, 1 Unit Radiation Monitoring Gaseous Effluent Discharge
- E. 239078, 1 Unit Radiation Monitoring Liquid Effluent Discharge
- F. 239989, 1 & 2 Units Fuel Handling Area Vent. 1 & 2 Supply Units & 11, 21, 12 & 22 Exhaust Filter Units
- G. 242772, No. 2 Control Room Recorder Panel 2RP1

1.4 **Other**

- A. Emergency Plan Implementing Procedures:
100 Series, SNSS/EDO Response
300 Series, Radiation Protection Response
- B. T/S Amendment 245, Refueling Operations - Relaxation of Requirements Applicable During Movement of Irradiated Fuel
- C. DCP 1EC-3505, Control Room Ventilation Modification
- D. DCP 1EC-3244, Plant Vent ADP Change Out
- E. DCP 2EC-3212, Radiation Monitor 2R41D skid
- F. DCP 2EC-3265, Removal of Radiation Monitors 2R35 and 2R38
- G. DCP 2EC-3449, Main Steam Line N16 Detectors
- H. DCP 2EC-3559, FHA Ventilation Exhaust Fans Interlock With Radiation Monitors
- I. DCP 80004831, 2R24A, 2R24B, 2R25, 2R28, 2R29, 2R30 and 2R33 Removal
- J. DCP 80005320, 2R42A-D and 2R27 Removal
- K. DCP 80030824, Deletion of RMS Channel 1R16
- L. DCP 80045432, Deletion of RMS Channel 2R16
- M. DCP 80045601 Rev. 0, AD P11 Rev. 0, RMS Channel 2R15 Replacement
- N. DCP 80057146, 2R36 Removal
- O. DCP 80057503, 2R1A & 2R11/12 Mod to P250 & Annunciator
- P. DCP 80057587 Rev. 0, AD P31 Rev. 0, RMS Channel 2R46 Upgrade
- Q. DCP 80057593, Relocate 2R44B to new Cab 236B
- R. DCP 80057594, Relocate 2R45 to new Cab 236C / 2R5, 2R34, 2R47 Upgrade
- S. DCP 80073267, Ground Water Remediation
- T. DCP 80059614, 2R13 Radiation Monitor Replacement / Relocation

1.5 **Conformance Documents**

None

2.0 DISCUSSION

- 2.1 This procedure provides the direction necessary for recognizing and mitigating abnormal radiological events. This discussion provides the reasoning behind procedure logic and flowpath. This discussion is not intended to provide additional direction.
- 2.2 Entry Conditions - Entry conditions are based on the Operator receiving one or more alarms associated with radiation monitoring, or detection of an abnormal rise in indication on a radiation monitor. The Radiation Monitoring System is divided into three main subsystems: Process Monitoring, Area Monitoring, and Process Filter Monitoring.

The Process Monitoring System continuously samples and analyzes systems which have potential to cause uncontrolled or unmonitored releases to the environment, or would indicate a failure of a major boundary between radioactive materials and non-radioactive systems. Included with Process Monitors are Attachments 4 and 5 for determining release rates to the environment to aid in event classification.

The Area Monitoring System continuously monitors radiation levels in numerous areas throughout the plant to rapidly detect any changes in local radiological conditions. These changes may be due to various events including local maintenance activities, or transfer of radioactive materials, such as resin flushes or movement of tools, waste, or equipment. Changes may also indicate fuel failure with the transport of highly activated material through piping systems.

The Process Filter Monitoring System continuously monitors the Condensate Polishing System Filter and Reactor Coolant Filter installed in plant systems to indicate system malfunctions or filter depletion.

The following alarms are installed to alert the Operator of Abnormal Radiological conditions:

- ◆ OHA-A6, RMS HI RAD OR TRBL
- ◆ 2RP1-A3, RADIATION ALARM AREA
- ◆ 2RP1-A4, RADIATION ALARM FILTER
- ◆ 2RP1-A5, RMS TEST/LOCAL
- ◆ 2RP1-A7, RADIATION ALARM PROCESS

In addition to alarms, the Operator may be alerted to abnormal Radiological conditions by any of the following:

- ◆ Radiation Monitor Recorder located on Control Room panel 2RP1
- ◆ Indications on Control Room Radiation Monitor Computer
- ◆ Reports or local observation by plant personnel
- ◆ Reports of survey or sample results by Chemistry or Radiation Protection personnel
- ◆ Process Computer RMS Readings

2.3 Immediate Actions

None

- 2.4 Subsequent Actions - The Operator initially determines the affected Radiation Monitor and verifies the validity of the alarm or rising indication. If the instrument proves to be inoperable, the Operator is directed to refer to appropriate Technical Specification and ODCM requiring operable Radiation Monitoring System.

If a valid warning, alarm, or rise in indication occurs, the Operator is directed to:

- ◆ Notify plant personnel of the affected area to minimize exposure
- ◆ Refer to Technical Specifications and Event Classification Guide
- ◆ Initiate applicable Attachment for affected monitor

Each Attachment contains actions and information pertinent to the affected radiation monitor, including verification of interlocks and required actions. Action is taken to notify Chemistry and Radiation Protection personnel to assist Operators in locating and correcting the source of the problem.

When required actions have been performed, and all abnormal Radiological conditions are cleared, the Operator completes administrative requirements for procedure use and resumes normal operation.

- 2.5 The methodology used in this procedure for calculation of noble gas release rates is the same used in the SPDS computer software. Digital Systems Group (DSG) controls SPDS software, therefore procedure methodology changes require coordination with DSG.

END OF DOCUMENT