

Facility: <u>Hope Creek</u> Examination Level: <u>SRO(L)</u>		Date of Examination: <u>9/17/01</u> Operating Test Number: <u>1</u>
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Conduct of Operations Questions	2.1.12 (4.0) – Ability to apply Technical Specifications for a system. Question: Tech Spec requirements for Control Rod Mechanism Removal.
		2.1.10(3.9) – Knowledge of the conditions and limitations in the facility license. Question: Documenting Tech Spec requirements for Control Rod Mechanism removal.
	Conduct of Operations JPM	2.1.24 (3.1) – Ability to obtain and interpret station electrical and mechanical drawings. JPM: Demonstrate Emergency Makeup flowpath to the Fuel Pool with Service Water using P+ID's.
A.2	Equipment Control JPM	2.2.11 (3.4) – Knowledge of the process for controlling temporary changes. JPM: Initiate administrative requirements for installing a floor drain plug
A.3	Radiation Control Questions	2.3.1 (3.0) – Knowledge of 10 CFR 20 and related facility radiation control requirements. QUESTION: Drywell access restrictions during fuel transfer.
		2.3.4 (3.1) – Knowledge of radiation exposure limits and contamination control / including permissible levels in excess of those authorized. QUESTION: Emergency dose authorization.
A.4	Emergency Plan Questions	2.4.40 (4.0) – Knowledge of SRO's responsibilities during emergency plan implementation. QUESTION: Responsibilities during emergency conditions.
		2.4.29 (4.0) – Knowledge of the emergency plan. QUESTION: Control of contract personnel during emergency conditions.

Changes to Administrative Topics Outline

1. Admin A.2 Changed from "Annunciator Bypass of CRDM High Temp Overhead annunciator" to "Initiate administrative requirements for installing a floor drain plug." due to shift in procedure responsibilities to Engineering.

SRO QUESTION # Admin A.1-1

QUESTION

The plant conditions are as following:

- The plant is in Operational Condition 5
- Reactor mode switch is in REFUEL
- Core reload is in progress approximately 80 percent complete
- Control rod blade 22-23 is removed for guide tube vacuuming. This is an empty cell.
- Control rod drive 30-31 must be replaced to rebuild the seals. This is a fueled cell.

What actions are required to perform both jobs together and preclude criticality in accordance with Technical Specifications?

Matrix# 1
SRO QUESTION # Admin A.1-1
KACatalogID G2.1.12
KA Statement

SRORating Ability to apply Technical Specifications for a system.
4.0
Question level S
COGNITIVE LEVEL H
Question Topic Tech Spec requirements for Control Rod Mechanism Removal.
REFERENCE Tech Spec 3.9.10.2 and Bases 3.9.10.2

Material Provided
LEARNING
OBJECTIVE
QSOURCE
QUESTION

New Question based on Peach Bottom LSRO exam 6/99
The plant conditions are as following:

- The plant is in Operational Condition 5
- Reactor mode switch is in REFUEL
- Core reload is in progress approximately 80 percent complete
- Control rod blade 22-23 is removed for guide tube vacuuming. This is an empty cell.
- Control rod drive 30-31 must be replaced to rebuild the seals. This is a fueled cell.

What actions are required to perform both jobs together and preclude criticality in accordance with Technical Specifications?

CORRECT ANSWER

The 4 fuel bundles surrounding control rod 30-31 must be removed IAW TS 3.9.10.2 because more than one rod will be removed from the core. 3.9.10.1 will no longer be applicable because 30-31 is within the 5 by 5 array.

REFUELING OPERATIONS

MULTIPLE CONTROL ROD REMOVAL

LIMITING CONDITION FOR OPERATION

3.9.10.2 Any number of control rods and/or control rod drive mechanisms may be removed from the core and/or reactor pressure vessel provided that at least the following requirements are satisfied until all control rods and control rod drive mechanisms are reinstalled and all control rods are inserted in the core.

- a. The reactor mode switch is OPERABLE and locked in the Shutdown position or in the Refuel position per Specification 3.9.1, except that the Refuel position "one-rod-out" interlock may be bypassed, as required, for those control rods and/or control rod drive mechanisms to be removed, after the fuel assemblies have been removed as specified below.
- b. The source range monitors SRM are OPERABLE per Specification 3.9.2.
- c. The SHUTDOWN MARGIN requirements of Specification 3.1.1 are satisfied.
- d. All other control rods are either inserted or have the surrounding four fuel assemblies removed from the core cell.
- e. The four fuel assemblies surrounding each control rod or control rod drive mechanism to be removed from the core and/or reactor vessel are removed from the core cell.
- f. All fuel loading operations shall be suspended.

APPLICABILITY: OPERATIONAL CONDITION 5.

ACTION:

With the requirements of the above specification not satisfied, suspend removal of control rods and/or control rod drive mechanisms from the core and/or reactor pressure vessel and initiate action to satisfy the above requirements.

REFUELING OPERATIONS

SURVEILLANCE REQUIREMENTS

4.9.10.2.1 Within 4 hours prior to the start of removal of control rods and/or control rod drive mechanisms from the core and/or reactor pressure vessel and at least once per 24 hours thereafter until all control rods and control rod drive mechanisms are reinstalled and all control rods are inserted in the core, verify that:

- a. The reactor mode switch is OPERABLE per Surveillance Requirement 4.3.1.1 or 4.9.1.2, as applicable, and locked in the Shutdown position or in the Refuel position per Specification 3.9.1.
- b. The SRM channels are OPERABLE per Specification 3.9.2.
- c. The SHUTDOWN MARGIN requirements of Specification 3.1.1 are satisfied.
- d. All other control rods are either inserted or have the surrounding four fuel assemblies removed from the core cell.
- e. The four fuel assemblies surrounding each control rod and/or control rod drive mechanism to be removed from the core and/or reactor vessel are removed from the core cell.
- f. All fuel loading operations are suspended.

4.9.10.2.2 Following replacement of all control rods and/or control rod drive mechanisms removed in accordance with this specification, perform a functional test of the "one-rod-out" Refuel position interlock, if this function had been bypassed.

REFUELING OPERATIONS

BASES

3/4.9.6 REFUELING PLATFORM

The OPERABILITY requirements ensure that (1) the refueling platform will be used for handling fuel assemblies and control rods, with limits placed upon auxiliary hoists' usage, within the reactor pressure vessel, (2) each crane and hoist has sufficient load capacity for handling the loads within its permitted usage, (3) the core internals are protected from excessive lifting force in the event that they are inadvertently engaged during lifting operations, (4) the core internals are protected from a fuel bundle or control rod drop with more impact energy than that assumed in the accident analyses, (5) refueling interlocks and rod blocks are initiated to prevent conditions that could result in criticality during refueling operations.

3/4.9.7 CRANE TRAVEL - SPENT FUEL STORAGE POOL

The restriction on movement of loads in excess of the nominal weight of a fuel assembly over other fuel assemblies in the storage pool ensures that in the event this load is dropped (1) the activity release will be limited to that contained in a single fuel assembly, and (2) any possible distortion of fuel in the storage racks will not result in a critical array. This assumption is consistent with the activity release assumed in the safety analyses.

3/4.9.8 and 3/4.9.9 WATER LEVEL - REACTOR VESSEL and WATER LEVEL - SPENT FUEL STORAGE POOL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gas activity released from the rupture of an irradiated fuel assembly. This minimum water depth is consistent with the assumptions of the accident analysis.

3/4.9.10 CONTROL ROD REMOVAL

These specifications ensure that maintenance or repair of control rods or control rod drives will be performed under conditions that limit the probability of inadvertent criticality. The requirements for simultaneous removal of more than one control rod are more stringent since the SHUTDOWN MARGIN specification provides for the core to remain subcritical with only one control rod fully withdrawn.

3/4.9.11 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

The requirement that at least one residual heat removal loop be OPERABLE or that an alternate method capable of decay heat removal be demonstrated and that an alternate method of coolant mixing be in operation ensures that (1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140°F as required during REFUELING, and (2) sufficient coolant circulation would be available through the reactor core to assure accurate temperature indication and to distribute and prevent stratification of the poison in the event it becomes necessary to actuate the standby liquid control system.

SRO QUESTION # Admin A.1-2

QUESTION

Given the following conditions:

- Control rod blade 06-27 has been removed from the core for replacement
- All fuel is removed from the cell IAW Technical Specifications for "Single Control Rod Removal"
- The Refueling Bridge is NOT in service due to problems with the Main Hoist Load Cell
- Core Alterations are suspended

Which ITEMS from HC.OP-DL.ZZ-0026 Attachment 2 are required to be completed?

Matrix# 2
SRO QUESTION # Admin A.1-2
KACatalogID G2.1.10
KA Statement

SRORating Knowledge of the conditions and limitations in the facility license.
3.9
Question level S
COGNITIVE LEVEL H
Question Topic Documenting Tech Spec requirements for Control Rod Mechanism removal.
REFERENCE HC.OP-DL.ZZ-0026 Attachment 2

Material Provided

LEARNING
OBJECTIVE
QSOURCE
QUESTION

New

Given the following conditions:

- Control rod blade 06-27 has been removed from the core for replacement
- All fuel is removed from the cell IAW Technical Specifications for "Single Control Rod Removal"
- The Refueling Bridge is NOT in service due to problems with the Main Hoist Load Cell
- Core Alterations are suspended

Which ITEMS from HC.OP-DL.ZZ-0026 Attachment 2 are required to be completed?

CORRECT ANSWER

DL-26-Attachment 2 ITEMS ---

ITEMS- 1, 2, 3, 4, 6, 10, 11, 12, 13, & 14 are required.

ITEMS- 5, 15, & 16 are NOT required because the rod is removed IAW TS 3.9.10.1

ITEMS- 7, 8, & 9 are NOT required because core alterations are NOT in progress

ITEMS- 17 through 24 are NOT required because the Refueling Bridge is NOT in service

REFUELING OPERATIONS

3/4.9.10 CONTROL ROD REMOVAL

SINGLE CONTROL ROD REMOVAL

LIMITING CONDITION FOR OPERATION

3.9.10.1 One control rod and/or the associated control rod drive mechanism may be removed from the core and/or reactor pressure vessel provided that at least the following requirements are satisfied until a control rod and associated control rod drive mechanism are reinstalled and the control rod is fully inserted in the core.

- a. The reactor mode switch is OPERABLE and locked in the Shutdown position or in the Refuel position per Table 1.2 and Specification 3.9.1.
- b. The source range monitors (SRM) are OPERABLE per Specification 3.9.2.
- c. The SHUTDOWN MARGIN requirements of Specification 3.1.1 are satisfied, except that the control rod selected to be removed;
 1. May be assumed to be the highest worth control rod required to be assumed to be fully withdrawn by the SHUTDOWN MARGIN test, and
 2. Need not be assumed to be immovable or untrippable.
- d. All other control rods in a five-by-five array centered on the control rod being removed are inserted and electrically or hydraulically disarmed or the four fuel assemblies surrounding the control rod or control rod drive mechanism to be removed from the core and/or reactor vessel are removed from the core cell.
- e. All other control rods are inserted.
- f. All fuel loading operations shall be suspended.

APPLICABILITY: OPERATIONAL CONDITIONS 4 and 5.

ACTION:

With the requirements of the above specification not satisfied, suspend removal of the control rod and/or associated control rod drive mechanism from the core and/or reactor pressure vessel and initiate action to satisfy the above requirements.

REFUELING OPERATIONS

SURVEILLANCE REQUIREMENTS

4.9.10.1 Within 4 hours prior to the start of removal of a control rod and/or the associated control rod drive mechanism from the core and/or reactor pressure vessel and at least once per 24 hours thereafter until a control rod and associated control rod drive mechanism are reinstalled and the control rod is inserted in the core, verify that:

- a. The reactor mode switch is OPERABLE per Surveillance Requirement 4.3.1. or 4.9.1.2, as applicable, and locked in the Shutdown position or in the Refuel position with the "one rod out" Refuel position interlock OPERABLE per Specification 3.9.1.
- b. The SRM channels are OPERABLE per Specification 3.9.2.
- c. The SHUTDOWN MARGIN requirements of Specification 3.1.1 are satisfied per Specification 3.9.10.1.c.
- d. All other control rods in a five-by-five array centered on the control rod being removed are inserted and electrically or hydraulically disarmed or the four fuel assemblies surrounding the control rod or control rod drive mechanism to be removed from the core and/or reactor vessel are removed from the core cell.
- e. All other control rods are inserted.
- f. All fuel loading operations are suspended.

ATTACHMENT 2 Refuel/Core Alterations

HCGS

Date _____

ITEM	SURVEILLANCE	OPER COND	ACCEPTABLE LIMITS			INSTRUMENT (PANEL)	DAY	EVE	MID	COMMENTS
			MIN	NORM	MAX					
1.	REACTOR MODE SWITCH POSITION	5	---	LOCKED IN S/D OR REFUEL	---	(10C651)				(NOTE 1)
2.	DATE THE REACTOR MODE SWITCH REFUEL POSITION ONE-ROD-OUT INTERLOCK WAS VERIFIED OPERABLE IAW HC.OP-ST.KE-0001	5	---	---	WITHIN LAST 7 DAYS	N/A		N/A	N/A	
3.	ALL SRM'S FULLY INSERTED	4, 5	---	YES	---	(10C651)				
4.	RX WATER LEVEL >22" 2"	5	---	YES	---	(DI-A5 OR LOCAL)				
5.	ALL CONTROL RODS INSERTED AND ALL CONTROL ROD DRIVE MECHANISMS INSTALLED	4, 5				(10C651)				(NOTE 2)
6.	ADEQUATE SHUTDOWN MARGIN	5	---	YES	---	HC.RE-ST.ZZ-0007(Q)				
IF CORE ALTERATIONS ARE IN PROGRESS THEN COMPLETE ITEMS 7 THRU 9, OTHERWISE MARK ITEMS - N/A										
7.	OPERABLE SRM IN SAME AND ADJACENT QUADRANT AS CORE ALTERATIONS	4, 5	---	YES	---	(10C651)				
8.	DIRECT COMMUNICATION BETWEEN CONTROL ROOM AND REFUEL FLOOR EXISTS.	5	---	YES	---	(10C651)				
9.	DATE THE NEEDED REFUEL POSITION INTERLOCKS WERE DEMONSTRATED OPERABLE IAW HC.OP-ST.KE-0001 (Q).	5	---	---	7 DAY	N/A				

NOTES: 1. ENSURE KEY IS REMOVED WHILE SWITCH IS BEING MAINTAINED "LOCKED".

2. EXCEPT CONTROL RODS AND CONTROL ROD DRIVE MECHANISMS REMOVED PER T/S 3.9.10.1 OR 3.9.10.2 (SHORTING LINKS MAY HAVE TO BE PULLED FOR OTHER CONTROL ROD WITHDRAWAL)

ATTACHMENT 2 **Refuel/Core Alterations**

Page 2 of 5

HCGS

Date _____

ITEM	SURVEILLANCE	OPER COND	ACCEPTABLE LIMITS			INSTRUMENT (PANEL)	DAY	EVE	MID	COMMENTS
			MIN	NORM	MAX					
IF CONTROL RODS OR CONTROL ROD MECHANISMS HAVE BEEN REMOVED UNDER T/S 3.9.10.1 OR 3.9.10.2, <u>THEN COMPLETE ITEMS 10 AND 11, OTHERWISE MARK ITEMS - N/A</u>										
10	REACTOR MODE SWITCH POSITION	4, 5	---	LOCKED IN S/D OR REFUEL	---	(10C651)				(NOTE 1)
11	FUEL LOADING OPERATIONS SUSPENDED	4, 5	---	YES	---	N/A				
IF CONTROL RODS OR CONTROL ROD MECHANISMS HAVE BEEN REMOVED UNDER T/S 3.9.10.1, <u>THEN COMPLETE ITEMS 12 THRU 14, OTHERWISE MARK ITEMS - N/A</u>										
12	4 FUEL ASSEMBLIES SURROUNDING EACH REMOVED CONTROL ROD OR MECHANISM HAVE BEEN REMOVED FROM THE CORE CELL OR ALL OTHER CONTROL RODS IN A 5X5 ARRAY HAVE BEEN INSERTED AND DISARMED.	4, 5	---	YES	---	N/A				
13	VERIFY HC.OP-ST.SF-0001(Q) IS CURRENT.	4, 5	---	---	18 MO	N/A	N/A	N/A		
14	ALL OTHER CONTROL RODS ARE INSERTED	4, 5		YES						
IF CONTROL RODS OR CONTROL ROD MECHANISMS HAVE BEEN REMOVED UNDER T/S 3.9.10.2, <u>THEN COMPLETE ITEMS 15 AND 16, OTHERWISE MARK ITEMS - N/A</u>										
15	THE 4 FUEL ASSEMBLIES SURROUNDING EACH REMOVED CONTROL ROD OR MECHANISM HAVE BEEN REMOVED FROM THE CORE CELL.	5	---	YES	---	N/A				(NOTE 3)
16	ALL OTHER CONTROL RODS ARE INSERTED	4, 5		YES						

NOTES:

1. ENSURE KEY IS REMOVED WHILE SWITCH IS BEING MAINTAINED "LOCKED".

3. THE ONE-ROD-OUT INTERLOCK MAY BE BYPASSED FOR THE AFFECTED CONTROL CELLS AFTER THE FUEL IS REMOVED FROM THE CELLS (T/S 3.9.10.2.A)

ATTACHMENT 2
Refuel/Core Alterations

Page 3 of 5

HCGS

Date _____

ITEM	SURVEILLANCE	OPER COND	ACCEPTABLE LIMITS			INSTRUMENT (PANEL)	DAY	EVE	MID	COMMENTS
			MIN	NORM	MAX					
IF THE FUEL BRIDGE IS IN SERVICE <u>THEN</u> COMPLETE ITEMS 17 THRU 24 (NOTE 4) IF THE FUEL BRIDGE IS <u>NOT</u> IN SERVICE <u>OR</u> IF ITEMS HAVE ALREADY BEEN COMPLETED ONCE ON THIS DAILY LOG THEN MARK ITEMS 17 THRU 24 AS N/A										
17.	VISUALLY INSPECT THE FUEL GRAPPLE HOIST CABLE BY OBSERVING THE CABLE IS PROPERLY WOUND ON THE HOIST DRUM, NOT KINKED <u>OR</u> CREASED AND INDIVIDUAL WIRE THREADS ARE NOT BROKEN	5	---	SAT	---	(LOCAL)				
18.	VISUALLY INSPECT THE FUEL GRAPPLE PNEUMATIC HOSES BY OBSERVING THE HOSES ARE NOT RIPPED, TORN <u>OR</u> KINKED	5	---	SAT	---	(LOCAL)				
19.	VISUALLY INSPECT THE FUEL GRAPPLE LIGHT ELEC. CABLE BY OBSERVING THE CABLE IS NOT BROKEN <u>OR</u> STRIPPED	5	---	SAT	---	(LOCAL)				
20.	VERIFY THE NORMAL GRAPPLE UP LIMIT SWITCH IS OPERABLE BY OBSERVING THAT THE FUEL GRAPPLE HOIST AUTOMATICALLY STOPS APPROX. 8 FEET BELOW WATER LEVEL AND "NORMAL GRAPPLE UP" LIGHT ILLUMINATES	5	---	SAT	---	(LOCAL)				

NOTES: 4. ITEMS 17 THRU 24 ARE ONLY REQUIRED TO BE COMPLETED ONE TIME DAILY WHEN EQUIPMENT IS IN USE.

ATTACHMENT 2
Refuel/Core Alterations

Page 4 of 5

HCGS

Date _____

ITEM	SURVEILLANCE	OPER COND	ACCEPTABLE LIMITS			INSTRUMENT (PANEL)	DAY	EVE	MID	COMMENTS
			MIN	NORM	MAX					
21.	VISUALLY INSPECT THE FUEL GRAPPLE HOOKS BY OBSERVING: A. WHEN THE FUEL GRAPPLE 'ENGAGE' PB IS DEPRESSED, THE FUEL GRAPPLE HOOKS MOVE TO THE ENGAGED POSITION, THE 'ENGAGE' LIGHT IS ON, AND NO AIR BUBBLES ESCAPE FROM THE AIR HOSES OR HOOK OPERATING CYLINDER. AND B. WHEN THE FUEL GRAPPLE 'RELEASE' PB IS DEPRESSED, THE FUEL GRAPPLE HOOKS MOVE TO THE RELEASED POSITION, THE 'ENGAGE' LIGHT IS OFF, AND NO AIR BUBBLES ESCAPE FROM THE AIR HOSES OR HOOK OPERATING CYLINDER.	5	---	SAT	---	(LOCAL)				
22.	VERIFY THE SLACK CABLE LIMIT SWITCH IS OPERABLE BY OBSERVING THAT WHEN THE GRAPPLE IS LOWERED ONTO A FUEL BUNDLE OR DUMMY FUEL BUNDLE, DOWNWARD MOTION AUTOMATICALLY STOPS AND THE "SLACK CABLE" LIGHT ILLUMINATES.	5	---	SAT	---	(LOCAL)				
23.	VERIFY THE HOIST LOADED SWITCH IS OPERABLE BY OBSERVING: A. WHEN A FUEL BUNDLE OR DUMMY FUEL BUNDLE IS LIFTED THE "HOIST LOADED" LIGHT ILLUMINATES, AND B. WHEN THE BUNDLE IS SET DOWN THE "HOIST LOADED" LIGHT EXTINGUISHES.	5	---	SAT	---	(LOCAL)				

ATTACHMENT 2
Refuel/Core Alterations

Page 5 of 5

HCGS

Date _____

ITEM	SURVEILLANCE	OPER COND	ACCEPTABLE LIMITS			INSTRUMENT (PANEL)	DAY	EVE	MID	COMMENTS
			MIN	NORM	MAX					
24.	VERIFY THE FUEL GRAPPLE BRAKE IS OPERABLE BY OBSERVING NO DOWNWARD MOTION OF THE FUEL GRAPPLE WHEN A FUEL BUNDLE OR DUMMY FUEL BUNDLE IS SUSPENDED ON THE FUEL GRAPPLE.	5	--	SAT	---	(LOCAL)				

SRO QUESTION # Admin A.3-1

QUESTION

Given the following conditions:

- The plant is in a refueling outage
- Core offload is in progress

How can the refueling bridge crew reduce the radiation dose received by workers in the Drywell?

Matrix# 3
SRO QUESTION # Admin A.3-1
KACatalogID G2.3.1
KA Statement

SRORating Knowledge of 10 CFR 20 and related facility radiation control requirements.
3.0
Question level S
COGNITIVE LEVEL F
Question Topic Drywell access restrictions during fuel transfer.
REFERENCE NC.NA-AP.ZZ-0049(Q) 5.2.4.I

Material Provided
LEARNING
OBJECTIVE
QSOURCE
QUESTION

New
Given the following conditions:

- The plant is in a refueling outage
- Core offload is in progress

How can the refueling bridge crew reduce the radiation dose received by workers in the Drywell?

CORRECT ANSWER The time spent with irradiated fuel in transit between the Fuel Pool and the RPV shall be minimized to avoid the potential for high radiation doses in the upper regions of the Drywell.

5.2.4 (Continued)

- G. All material nonconformances identified during the performance of Fuel Handling shall be documented in accordance with NAP-0.
- H. (Hope Creek) All LPRM and Control Blade replacements shall be performed in accordance with procedures in the sequence prescribed by Reactor Engineering.
- I. (Hope Creek) During irradiated fuel movement, the time spent with fuel in transit between the spent fuel pool and reactor pressure vessel shall be minimized to avoid the potential for high radiation doses in the upper regions of the drywell. [CD-612X]
- J. (Salem) During irradiated fuel movement, the time spent with fuel in the transfer tube shall be minimized to avoid the potential for high radiation doses in the transfer tube area.
- K. When sufficient manpower exists, Fuel Handling should be conducted using more than one Fuel Handling crew per operating shift. This allows the periodic rotation of Fuel Handling crew personnel and decreases the individual radiation dose received.

5.2.5 The suspension of Fuel Handling may be directed by the OS/CRS or Refueling SRO as appropriate. Prior to the resumption of Fuel Handling, applicable Technical Specification Surveillances shall be verified current. The following conditions require the suspension of Fuel Handling activities:

- Refueling floor radiological conditions that require the termination of refuel work activities.
- Any non-compliance with the applicable unit Technical Specifications governing the performance of Fuel Handling involving Core Alterations.
- Any neutron monitoring channel indicates unexpected increasing count rate.
- Any fuel damage occurs including the dropping, bumping, scraping or general mishandling of fuel or other suspended loads during handling.
- (Hope Creek) For any reactor core fuel loading, if any control rod or associated control rod drive mechanism has been removed from the reactor core or pressure vessel.

SRO QUESTION # Admin A.3-2

QUESTION

Given the following:

- A Site Area Emergency has been declared due to radioactive release to the environment.
- All Emergency Response Facilities are activated.

WHICH ONE (1) of the following is the MAXIMUM dose limit that an operator can receive without a Planned Emergency Exposure Limit authorization?

Matrix# 4
SRO QUESTION # Admin A.3-2
KACatalogID G2.3.4
KA Statement Knowledge of radiation exposure limits and contamination control / including permissible levels in excess of those authorized.

SRORating 3.1
Question level S
COGNITIVE LEVEL F
Question Topic Dose limit extension during emergencies.
REFERENCE Emergency Plan Overview - NEPOVERVIEWC Rev 2
Material Provided

LEARNING
OBJECTIVE
QSOURCE New
QUESTION Given the following:

- A Site Area Emergency has been declared due to radioactive release to the environment.
- All Emergency Response Facilities are activated.

WHICH ONE (1) of the following is the MAXIMUM dose limit that an operator can receive without a Planned Emergency Exposure Limit authorization?

CORRECT ANSWER 4500 mRem automatically upon declaration of an emergency of Alert or higher.

PSEG Internal Use Only

PSEG NUCLEAR LLC

Page 1 of 1

NC.EP-EP.ZZ-0304 (Q) Rev. 03

OPERATIONAL SUPPORT CENTER (OSC) RADIATION PROTECTION RESPONSE

USE CATEGORY: II

REVISION SUMMARY:

1. This revision satisfies the requirement for a biennial review.
2. Added instructions in Attachment 1 (Steps 1.1 and 1.2) for the Radiation Protection Supervisor – Exposure Control to follow so the Emergency Response Organization's (ERO) dose limits are raised to 4500 mRem in PRORAD during an alert or higher event classification and return the ERO's dose limits to normal after the emergency is concluded. The means to perform this action on paper already existed in this procedure, but until recently, could not be performed on PRORAD.

IMPLEMENTATION REQUIREMENTS

This procedure is effective upon issue.

5/24/01

APPROVED: _____

[Signature]

EP Manager

Thelmer 5/10/01

5/9/01
Date

APPROVED: _____

[Signature]

Vice President – Operations

5/15/01
Date

OPERATIONAL SUPPORT CENTER (OSC) RADIATION PROTECTION RESPONSE

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1.0	PURPOSE	2
2.0	PREREQUISITES	2
2.1	Prerequisites To Be Followed Prior To Implementing This Procedure...	2
3.0	PRECAUTIONS AND LIMITATIONS	2
3.1	Precaution and Limitations To Be Followed Prior To Implementing This Procedure.	2
4.0	EQUIPMENT REQUIRED	2
5.0	PROCEDURE.....	3
5.1	The Radiation Protection Supervisor - Exposure Control Should Perform the Following.....	3
5.2	Perform The Following Steps If Emergency Exposure is Required.....	6
6.0	RECORDS.....	6
7.0	REFERENCES	7
7.1	References	7
7.2	Cross References	7
7.3	Closing Documents.....	7
ATTACHMENTS		
ATTACHMENT 1 - Individual Radiation Exposure Record.....		8
ATTACHMENT 2 - ALARA Analysis Form		9
ATTACHMENT 3 - Selection And Authorization For Emergency Exposures		11
ATTACHMENT 4 - Onsite Protective Action Guidelines		15
ATTACHMENT 5 - Operation of The VAX LA120 Terminal		16
FORMS		
FORM 1	TLD Log.....	19
FORM 2	Habitability Log	20

1.0 **PURPOSE**

- To outline and describe the duties Radiological Protection Supervisor – Exposure Control (RPS-EXP).
- To provide guidance to emergency response personnel for administration of Radiation Protection Team Response for the Operational Support Center (OSC) during an emergency at Hope Creek or Salem Nuclear Generating Station.

2.0 **PREREQUISITES**

2.1 **Prerequisites To Be Followed Prior To Implementing This Procedure.**

Implement this procedure at:

- The OS' discretion.
- The manning of the OSC.
- The declaration of an Alert.

3.0 **PRECAUTIONS AND LIMITATIONS**

3.1 **Precautions and Limitations To Be Followed Prior To Implementing This Procedure.**

3.1.1 **SALEM ONLY**

Dose Rates in the 78' Electrical Penetration Area could be higher than what is indicated on the R47 ARM. The R47 ARM is located across the room from the PASS lines.
CAUTION should be exercised when entering this area.

3.1.2 It is recommended that initials be used in the place-keeping sign-off, instead of checkmarks, if more than one person may implement this procedure.

3.1.3 Personnel who implement this procedure shall be trained and qualified in accordance with (IAW) the Emergency Plan.

4.0 **EQUIPMENT REQUIRED**

As provided In the Emergency Response Facility.

5.0 **PROCEDURE**

5.1 **The Radiation Protection Supervisor – Exposure Control Should Perform The Following:**

5.1.1 DIRECT habitability to be performed every 30 minutes and the results logged on Form 2, Habitability Log. _____

5.1.2 COMPARE habitability results to Attachment 4, Onsite Protective Action Guidelines, and perform appropriate actions. _____

5.1.3 OBTAIN current status of the emergency from the OSCC. _____

NOTE

- An individual's yearly dose limit is to be automatically raised to 4500 mrem upon the declaration of an Alert or higher classification. The dose extension to 4500 mrem may be entered into the PRORAD system, but is not required.
- An authorization needs to be placed into the system before a person's dose can be raised to 4500 mrem in PRORAD. Refer to Attachment 1 for instructions on how to accomplish this task and return a person's dose limit to normal upon the termination of an Emergency.
- No dose extension shall be allowed, if a person does not have a completed NRC Form 4 on record. The person's dose limit will be 400 mrem.

5.1.4 IF persons in the OSC do not have a TLD,
THEN ensure one is issue and log it on Form 1, TLD Log. _____

NOTE

Dose Tracking may be performed using the PRORAD System instead of Attachment 1, Individual Radiation Exposure Record, if PRORAD is operational

5.1.5 ENSURE 1.0 of Attachment 1 is completed for the onsite emergency response personnel assigned to the OSC and Control Point. _____

5.1.6 ENSURE control of Attachment 1 is maintained in order to expedite and provide a tracking mechanism for OSC/CP personnel activities and exposures. _____

SRO QUESTION # Admin A.4-1

QUESTION

Given the following:

- A fuel handling accident with equipment failures has occurred
- The Reactor Engineer on the Refuel Floor reports reactor cavity water level dropping rapidly

What ECG Classification would apply?

Matrix# 5
SRO QUESTION # Admin A.4-1
KACatalogID G2.4.40
KA Statement

SRORating Knowledge of SRO's responsibilities during emergency plan implementation.
4.0

Question level S

COGNITIVE LEVEL F

Question Topic Responsibilities during emergency conditions.

REFERENCE Hope Creek Event Classification Guide 6.4 6.4.1.a

Material Provided

LEARNING

OBJECTIVE

QSOURCE

QUESTION

New

Given the following:

- A fuel handling accident with equipment failures has occurred
- The Reactor Engineer on the Refuel Floor reports reactor cavity water level dropping rapidly

What ECG Classification would apply?

CORRECT ANSWER Unusual Event ECG Section 6.4.1.a

6.0 Radiological Releases/Occurrences

6.4 Irradiated Fuel Event

Initiating
Condition

OPCON

EAL #

E
M
E
R
G
E
N
C
Y

A
C
T
I
O
N

L
E
V
E
L
S

Action
Required

Major Damage to
Irradiated Fuel

All

6.4.2.a

IF

Major Damage to
Irradiated Fuel
has occurred

AND

Valid High Alarm
received from
ANY one of the
following
RMS channels:

- Refuel Floor Exhaust
Channel A (9RX627)
- Refuel Floor Exhaust
Channel B (9RX628)
- Refuel Floor Exhaust
Channel C (9RX629)

Events that have or may result in uncovering
Irradiated Fuel outside the Reactor Vessel

All

6.4.2.b

IF

Unplanned rise
on ANY one of the
following
Area Rad Monitors or
by general area rad survey
indicates
 ≥ 2000 mRem/hr:

- Spent Fuel Storage Pool
Area (9RX707)
- New Fuel Criticality
Storage Channel A
(9RX612)
- New Fuel Criticality
Storage Channel B
(9RX613)

All

6.4.2.c

IF

Visual observation of
Irradiated Fuel uncovered

THEN

Refer to Attachment 2
ALERT

SRO QUESTION # Admin A.4-2

QUESTION

Given the following:

- You are the Refueling SRO
- You have contract personnel working for you on the Refuel Floor
- A page announcement states there is an emergency at Salem Station

Where will your contract personnel report if Assembly is called?

Matrix# 6
SRO QUESTION # Admin A.4-2
KACatalogID G2.4.29
KA Statement

SRORating Knowledge of the emergency plan
4.0
Question level S
COGNITIVE LEVEL F
Question Topic Control of contract personnel during emergency conditions.
REFERENCE Emergency Plan Procedures NC.EP-EP.ZZ-0102 Attachment 6

Material Provided

LEARNING

OBJECTIVE

QSOURCE

QUESTION

New

Given the following:

- You are the Refueling SRO
- You have contract personnel working for you on the Refuel Floor
- A page announcement states there is an emergency at Salem Station

Where will your contract personnel report if Assembly is called?

CORRECT ANSWER They exit the site immediately through the normal exits.

NOTE

Should the EDO/ERM be unable to fulfill the duties of Emergency Coordinator (EC) for any reason (e.g., sudden illness, accident, etc.) the Technical Support Supervisor (TSS) or Site Support Manager (SSM) may assume the duties and responsibilities of EC until another qualified EDO/ERM arrives at the facility.

5.0 PROCEDURE:

5.1 Initial Actions:

EDO 5.1.1. ACTIVATE the TSC.

ERM 5.1.2. ACTIVATE the EOF.

Note: Initial each block as applicable.

IE	AT	SAE	GE
Optional Att 8	ATT 8	ATT 8	ATT 8
Optional Att 9	Optional Att 9	ATT 9	ATT 9

NOTE

Since the Rad Alert alarm is located in the Control Room, the OS directs all emergency status announcements. However, when the EDO or ERM has the Emergency Coordinator duties, he/she ensures that the OS is notified to direct the emergency announcements.

5.2 Emergency Conditions:

EC 5.2.1. DIRECT the OS to generate the announcement of the emergency status and Assembly IAW:

OS 5.2.2 IF not performed previously, **THEN DIRECT** the OSC Coordinator to Activate the OSC IAW EPEP 202, OSC Activation and Operations.

EC 5.2.3. IF desired or **WHEN** required, **DIRECT** implementation of Accountability IAW:

OS 5.2.4 IF not performed previously, **THEN DIRECT** the other station OS to Implement EPEP-101, Actions Required at Unaffected Station:

EC 5.2.5 ENSURE the NRC Data Sheet is completed and CM-1 notifies NRC as soon as possible, but not to exceed one hour from emergency classification IAW:

Note: Initial each block as applicable.

IE	AT	SAE	GE
ATT 7	ATT 6	ATT 5	ATT 4
Optional (Except bomb search)			
Optional Att 3	Optional Att 3	ATT 3	ATT 3
EPEP 101 Unusual Event Att 5	EPEP 101 ASSEMBLY Att 4	EPEP 101 ASSEMBLY Att 4	EPEP 101 ASSEMBLY Att 4
ECG ATT 5	ECG ATT 5	ECG ATT 5	ECG ATT 5

ATTACHMENT 6
Page 1 of 1
ALERT MESSAGE

Initials

SOUND

RAD ALERT ALARM

AND

ANNOUNCE TWICE

"ATTENTION ALL PERSONNEL. ATTENTION ALL PERSONNEL.
(HOPE CREEK – SALEM Unit 1/Unit 2) IS IN AN Alert

Circle one – cross out the others

DUE TO:

ALL PSEG PERSONNEL REPORT TO YOUR ASSIGNED ASSEMBLY
AREA. ALL CONTRACTORS LEAVE THE SITE IMMEDIATELY.

RADIO

Announcer

REPEAT EMERGENCY ANNOUCEMENT MESSAGE

Announcer

IF NOT PERFORMED PREVIOUSLY,
DIRECT Security (x2222)

- IMPLEMENT both EPEP 901, Onsite Security Response, and EPEP 903, Opening of Emergency Operations Facility (EOF).
- IMPLEMENT EPEP 0902, section 5.1 Assembly, DUE TO:
(read "DUE TO:" from above) _____

Announcer

NUCLEAR COMMON

OPERATOR TRAINING PROGRAM JOB PERFORMANCE MEASURE

STATION: HOPE CREEK

SYSTEM: Conduct of Operations -Ability to obtain and interpret station electrical and mechanical drawings.

TASK: Demonstrate Emergency Makeup flowpath to the Fuel Pool with Service Water using P+ID's.

TASK NUMBER: 294000 G 2.1.24

JPM NUMBER: 2001-NRC-LSRO-Admin 1

ALTERNATE PATH: ☐

APPLICABILITY:

EO ☐ RO ☒ SRO ☒

K/A NUMBER:	294000	G2.1.24
IMPORTANCE FACTOR:	2.8	3.1
	RO	SRO

EVALUATION SETTING/METHOD: CONTROL ROOM/SIMULATOR – PERFORM / SIMULATE

REFERENCES: HC.OP-SO.EC-0001(Q) Rev 16

TOOLS AND EQUIPMENT: Hope Creek P&ID's

VALIDATED JPM COMPLETION TIME: 5 min.

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

APPROVED:

N/A

**BARGAINING UNIT
REPRESENTATIVE**



TRAINING SUPERVISOR



OPERATIONS MANAGER

CAUTION:	No plant equipment shall be operated during the performance of a JPM without the following: 1. Permission from the OS Or Unit CRS; 2. Direct oversight by a qualified individual (determined by the individual granting permission based on plant conditions). 3. Verification of the "as left" condition by a qualified individual.
-----------------	---

ACTUAL JPM COMPLETION TIME: _____

ACTUAL TIME CRITICAL COMPLETION TIME: N/A

JPM PERFORMED BY: _____

GRADE: ☐ SAT ☐ UNSAT

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: _____

DATE: _____

**OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE**

NAME: _____

DATE: _____

SYSTEM: Conduct of Operations -Ability to obtain and interpret station electrical and mechanical drawings.

TASK: Demonstrate Emergency Makeup flowpath to the Fuel Pool with Service Water using P+ID's

TASK NUMBER: 294000 G 2.1.24

INITIAL CONDITIONS:

- You are the Refueling SRO
- A loss of Off-site power occurred with multiple equipment failures.
- The Reactor is in Operational Condition 4 preparing for refueling
- Fuel Pool Level has been lowering
- "B" Station Service Water Pump becomes available for makeup
- The CRS orders Emergency Makeup to the Fuel Pool from Service Water IAW HC.OP-SO.EC-0001(Q)

INITIATING CUE:

Demonstrate Emergency Makeup flowpath from the Station Service Water Pump to the Fuel Pool using P+ID's

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

OPERATOR TRAINING PROGRAM

NAME: _____

JOB PERFORMANCE MEASURE

DATE: _____

SYSTEM: Conduct of Operations -Ability to obtain and interpret station electrical and mechanical drawings.

TASK: Demonstrate Emergency Makeup flowpath to the Fuel Pool with Service Water using P+ID's

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Operator obtains procedure HC.OP-SO.EC-0001.	Operator obtains the correct procedure.		
		Operator reviews precautions and limitations.	Operator reviews precautions and limitations. Examiner Cue: If excessive time is taken reviewing precautions and limitations, inform operator that all are satisfied.		
		Operator determines beginning step of the procedure	Operator determines correct beginning step to be 5.10.1		
	5.10 5.10.1	<u>Emergency Makeup to Fuel Pool from Service Water System</u> ENSURE all prerequisites of Section 2.10 are satisfied.	Examiner Note: All operations for this JPM are performed from the Control Room area or the Hope Creek Simulator. Initialing steps is not critical. Operator reviews prerequisites of Section 2.10		
	5.10.2	<u>IF</u> A Loop is to supply Service Water, <u>THEN</u> PERFORM the following:	Operator recognizes that this section is not applicable due to "A" SSW Loop is unavailable. Continues to step 5.10.3		

OPERATOR TRAINING PROGRAM

NAME: _____

JOB PERFORMANCE MEASURE

DATE: _____

SYSTEM: Conduct of Operations -Ability to obtain and interpret station electrical and mechanical drawings.**TASK:** Demonstrate Emergency Makeup flowpath to the Fuel Pool with Service Water using P+ID's

# *	STEP NO.	STEP (*Denotes a Critical Step) (#Denotes a Sequential Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.10.3	IF B Loop is to supply Service Water, <u>THEN</u> PERFORM the following: START TIME: _____	Operator obtains P&ID M-10-1 Sheet 1. Operator traces the path from "B" SSW Pump to sheet continuation arrow at H-3. Operator obtains P&ID M-10-1 Sheet 2. Operator traces the flow path from sheet continuation arrow at A-4 to MOV EA-HV- 2238.		
*	5.10.3.A	OPEN EA-HV-2238, HDR ISOL VLV.	Operator discusses opening MOV EA-HV-2238. Operator traces flow path to MOV-EA-HV-F073.		
*	5.10.3.B	OPEN EA-HV-F073, HDR ISOL VLV.	Operator discusses opening MOV EA-HV-F073. Operator traces flow path to MOV-EC-HV-4648.		
*	5.10.3.C	OPEN EC-HV-4648, FUEL POOL EMERG MAKEUP VLV. STOP TIME: _____	Operator discusses opening MOV EC-HV-4648. Operator traces flowpath to sheet continuation arrow at B-2. Operator obtains P&ID M-53-1 Sheet 1. Operator traces flowpath from sheet continuation arrow at H-5 to Fuel Storage Pool diffuser at F-4.		

Terminating Cue: This JPM is complete.

**JOB PERFORMANCE MEASURE
SIMULATOR INSTRUCTIONS**

INITIAL CONDITIONS:

- You are the Refueling SRO
- A loss of Off-site power occurred with multiple equipment failures.
- The Reactor is in Operational Condition 4 preparing for refueling
- Fuel Pool Level has been lowering
- "B" Station Service Water Pump becomes available for makeup
- The CRS orders Emergency Makeup to the Fuel Pool from Service Water IAW HC.OP-SO.EC-0001(Q)

INITIATING CUE:

Demonstrate Emergency Makeup flowpath from the Station Service Water Pump to the Fuel Pool using P+ID's



