

Facility: Hope Creek

Scenario No.: 1

Op Test No.: 1

Examiners: _____
_____Candidates: _____ LSRO
_____ LSRO
_____ LSRO
_____ LSRO

Objectives: Evaluate applicants' response to a CRD Mechanism leak. Discuss the effects of lowering fuel pool level. Demonstrate knowledge of method to stop CRDM leak from above with CRB

Initial Conditions: Operational Condition 5, core alterations in progress. All Control Rods are inserted except rod 30-31. The CRDM for 14-23 has been replaced after rebuild. The Reactor Mode Switch is Operable and locked in Refuel position. All SRMs are operable. Shutdown Margin requirements are met.

Turnover: You are the Refueling SRO. Control Rod Blade 14-23 needs to be removed and replaced from the reactor core using the Frame Mounted Aux Hoist. All fuel has been removed from the cell. A double blade guide is installed. The Control Rod Blade 14-23 is full out with the CRDM uncoupled from under-vessel.

Event No.	Mal. No.	Event Type*	Event Description	Evaluator Guide
1	1	I	SRM A fails to zero (0) cps	Reviews Tech Spec 3.9.2 for SRM Operability. Determines core alterations may continue for 14-23.
2	N/A	N	Removal of the Control Rod Blade.	Meets Tech Spec 3.9.10.1 requirements for a single control rod removal. Discusses Restricted Core Operations Form (RCOF) to continue. - Remove double blade guide. - Remove fuel support piece. - Uses CRB Grapple on Frame Mounted Aux Hoist to remove CRB.

3	NA	M	Under vessel crew reports water pouring out 14-23 CRDM flange. They are unable to stop the leak.	<p>Recognizes cavity level would be lowering and takes actions of HC.OP-AB.COOL-0004 Fuel Pool Cooling.</p> <p>-Evacuates the Refuel Floor</p> <p>- Notifies Control Room.</p> <p>- Notifies Reactor Engineer.</p> <p>- Notifies Radiation Protection.</p> <p>Recognizes that the CRB needs to be placed back into the guide tube to bottom in order to stop leak. (Not required for full credit)</p>
4	N/A	M	Reactor Engineer and OS concurs with placing CRB back into guide tube.	Puts CRB back into guide tube and lowers to the bottom to stop the leak.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

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Initial Conditions: Operational Condition 5, core alterations in progress. All Control Rods are inserted except rod 30-31. The CRDM for 14-23 has been replaced after rebuild. The Reactor Mode Switch is Operable and locked in Refuel position. All SRMs are operable. Shutdown Margin requirements are met.

Turnover: You are the Refueling SRO. Control Rod Blade 14-23 needs to be removed and replaced from the reactor core using the Frame Mounted Aux Hoist. All fuel has been removed from the cell. A double blade guide was just removed. The Control Rod Blade 14-23 is full out with the CRDM uncoupled from under-vessel. You are at Step 5.3 of HC.RE-FR.ZZ-0002. The Dominion engineering Inc. (DEI) tool with grid guide is attached to the Monorail Hoist.

Event Description: SRM A fails to zero (0) cps.

Examiner Cue: *SRM A fails to zero (0) cps.*

Time	Position	Applicant's Actions or Behavior
	LSRO	Reviews Tech Spec 3.9.2 for SRM Operability.
	LSRO	*Determines core alterations may continue for 14-23.
	LSRO	Determines core alterations may continue for quadrants B, C, and D.
	LSRO	Requests RE to revise move sheets accordingly.

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Event Description:

Removal of the Control Rod Blade.

Examiner Cue:

Continue with Removal of Control Rod Blade 14-23

Time	Position	Applicant's Actions or Behavior
	LSRO	Determines Tech Spec 3.9.10.1 for a single control rod removal are met.
	LSRO	Reviews Restricted Core Operations Form (RCOF)
		Fuel Support Piece Removal using the Fuel Support Grapple Ref: HC.RE-FR.ZZ-0002 5.3
		Step 5.3.1.A is already completed
	LSRO	*Ensure the ENGAGE push-button on the hoist pendant is DEPRESSED and the RED light is NOT illuminated.
	LSRO	Using the Monorail hoist controls, position the fuel support grapple above the upper grid. Align the grapple with the grid diagonal.
		Cue: <i>Grapple is aligned.</i>
	LSRO	Lower the grapple through the grid.
	LSRO	Lower the grapple into position above the FSP
	LSRO	Lower the grapple through the coolant holes of the FSP. Continue lowering until the cable goes slack. Verify the engage air supply is on.
		Cue: <i>Cable is slack; Engage air supply is on.</i>
	LSRO	*Verify the AMBER Light is on.
		Cue: <i>Amber light is on.</i>
	LSRO	Raise hoist and Verify engagement of FSP by observing weight increases to approximately 130 pounds.
		Cue: <i>Hoist reads 130 pounds.</i>
	LSRO	*Slowly raise hoist until Amber signal is extinguished
		Cue: <i>The Amber light is extinguished.</i>
	LSRO	Continue raising the hoist.

Time	Position	Applicant's Actions or Behavior
	LSRO	*Raise the FSP to the level of the upper grid. When the FSP has cleared the grid then move to a storage location.
		<i>Cue: The Fuel Support Piece will remain on the hoist.</i>
	LSRO	Control rod Removal using Control Rod Grapple. Ref: HC.RE-FR.ZZ-0002 5.5
	LSRO	<i>Verify that prerequisite 2.16 was completed based on the control rod grapple.</i>
		<i>Cue: Prerequisite 2.16 was completed</i>
		Install grid guide NA (already installed on FSP tool) Step 5.5.3 is NA.
	LSRO	5.4.4 Verify Ops that Control Rod is uncoupled from its drive.
		<i>Cue: Control Rod 14-23 is uncoupled from its drive.</i>
	LSRO	Maneuver the refuel platform and aux hoist to obtain direct vertical alignment over the reactor core location where the control rod is to be removed.
	LSRO	Lower the grapple to a level just above the upper core grid.
	LSRO	*Depress the DISENGAGE pushbutton.
	LSRO	Rotate the hoist cable for alignment.
	LSRO	*Lower the control rod grapple through the upper core grid. Continue to lower the control rod grapple until the hoist cable is slack.
	LSRO	*Depress the engage pushbutton.
	LSRO	Request operations continuously observe the control rod position indication to ensure that the position does not change as the control rod is moved.
	LSRO	*Raise the grappled control rod to the hoist upper limit.

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Event Description: Under vessel crew reports water pouring out 14-23 CRDM flange. They are unable to stop the leak.

Examiner Cue: *The Under vessel crew reports water pouring out 14-23 CRDM flange. They are unable to stop the leak.*

Time	Position	Applicant's Actions or Behavior
	LSRO	Recognizes cavity level would be lowering and takes actions of HC.OP-AB.COOL-0004 Fuel Pool Cooling.
	LSRO	*Evacuates the Refuel Floor of non-essential personnel.
	LSRO	Notifies Control Room.
	LSRO	Notifies Reactor Engineer.
	LSRO	Notifies Radiation Protection.
	LSRO	Recognizes that the CRB needs to be placed back into the guide tube to bottom in order to stop leak. (Not required for full credit)
	LSRO	The operator requests to return the CRB to 14-23 cell.

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Event Description: Reactor Engineer and OS concurs with placing CRB back into guide tube.

Examiner Cue:

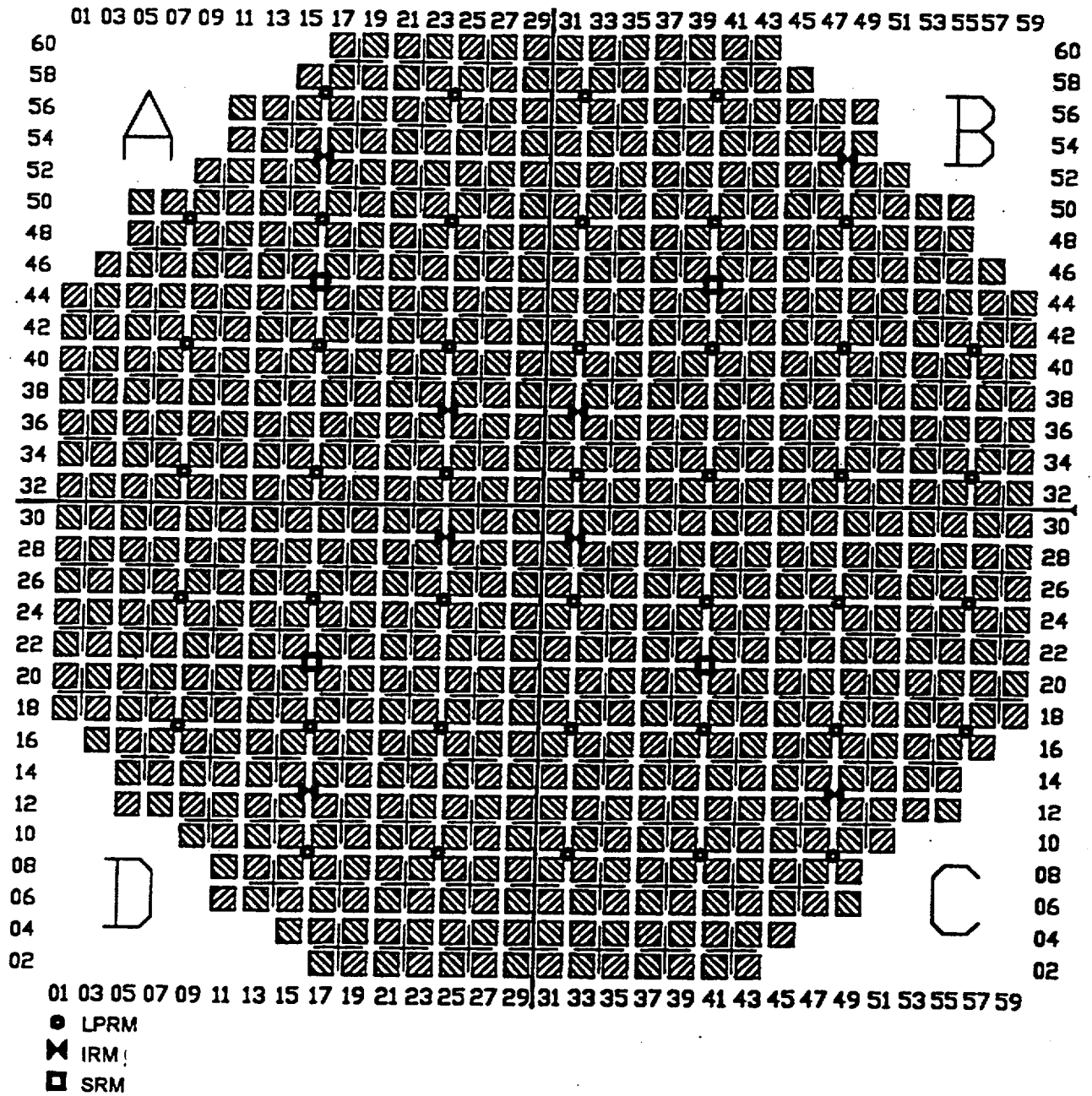
Time	Position	Applicant's Actions or Behavior
	LSRO	If operator does not recognize that the CRB needs to be placed back into the guide tube to bottom in order to stop leak, then Cue: <i>Return the CRB to cell 14-23 and lower it full down.</i>
		Cue: <i>The Reactor Engineer and operations Superintendent concurs.</i>
	LSRO	*Operator returns CRB to cell 14-23 and lowers until fully seated to stop leak.
		Cue: <i>You have reached the termination point for the scenario.</i>

ATTACHMENT 2

RESTRICTED CORE OPERATIONS FORM

Refueling Outage: 11 RCOF No. 1 / 1[illegible]

CORE MAP



Facility: Hope Creek**Scenario No.:** 2**Op Test No.:** 1**Examiners:** _____
_____**Candidates:** _____ LSRO
_____ LSRO
_____ LSRO
_____ LSRO**Objectives:** To evaluate the applicants' ability to recognize and address problems with refueling bridge interlocks. Recognize HC.OP-AB.CONT-0005 IRRADIATED FUEL DAMAGE entry and take required actions.**Initial Conditions:** Core Alterations are in progress. A fuel bundle is in the Fuel Prep Machine, being re-assembled.**Turnover:** You are the Refueling SRO. Double blade guide 31-28/29-26 is about to be removed from the core.

Event No.	Malf. No.	Event Type*	Event Description	Evaluator Guide
1	N/A	N	Double blade guide removed IAW HC.OP-SO.KE-0001	Grapple is open with proper bail alignment. Grapple is centered over bail handle. Grapple is lowered, Slack Cable light comes on. Hoist position indication is consistent with seated blade guide. Verifies proper location and orientation then engages grapple. Grapple Engaged light is lit. Raises double blade guide.
2	1	C	Hoist Jam light comes on. Hoist movement stops.	Lowers hoist until Hoist Jam light clears. Stops refueling operation until problem is resolved.
3	N/A	M	A fuel bundle in the fuel prep machine is being re-assembled. Several pins that were removed fall into the spent fuel storage rack and rupture.	Notify Control Room. Implement actions of HC.OP-AB.CONT-0005 IRRADIATED FUEL DAMAGE. Suspends all refueling operations.

4	N/A	M	Refuel Floor Exhaust Hi-Hi Radiation alarms	Evacuate the refuel floor. Recognizes FRVS auto start and Reactor Building Ventilation isolation setpoints.
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* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Initial Conditions: Core Alterations are in progress. A fuel bundle is in the Fuel Prep Machine, being re-assembled.

Turnover: You are the Refueling SRO. Double blade guide 31-28/26-29 is about to be removed from the core.

Event Description: Double Blade Guide (DBG) 31-28/26-29 removed IAW HC.OP-SO.KE-0001.

Examiner Cue: The Main Fuel Grapple is unloaded and positioned above Double Blade Guide (DBG) 31-28/26-29 in the Full Up position.

Time	Position	Applicant's Actions or Behavior
	LSRO	*Direct the RPO to LOWER the Fuel Grapple to approximately one foot above the blade guide to be removed by using the Fuel Grapple Hoist control in the LOWER position Ref: HC.OP-SO.KE-0001 5.5
	LSRO	Direct the RPO to ROTATE the Fuel Grapple so that the grapple hooks are in line with the blade guide handle.
	LSRO	*Direct the RPO to PLACE the GRAPPLE ENGAGE/RELEASE Switch to the RELEASE to ensure the Fuel Grapple hooks are open, OBSERVE the grapple ENGAGE light off.
	LSRO	Direct the RPO to Slowly LOWER the Fuel Grapple UNTIL the Fuel Grapple is resting on the blade guide handle. Grapple may be gently twisted to seat on handle
	LSRO	OBSERVE the SLACK CABLE light on.
	LSRO	ENSURE Fuel Grapple is at required depth by observing HOIST GRAPPLE ELEVATION Digital Readout.
	LSRO	* PLACE the GRAPPLE ENGAGE/RELEASE Switch in the ENGAGE position to grapple the blade guide <u>AND</u> OBSERVE the GRAPPLE ENGAGE light on.
	LSRO	CAUTION 5.5.9 DO NOT remove a blade guide from its Reactor Core location if the respective control rod will be left unsupported.
	LSRO	*Slowly RAISE the grapple blade guide using the Fuel Grapple Hoist Control in the RAISE position.
	LSRO	OBSERVE the SLACK CABLE light off.

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Time	Position	Applicant's Actions or Behavior
	LSRO	OBSERVE the load cell indicator to ensure the blade guide has been grappled.
	LSRO	Visually VERIFY blade guide is being lifted.

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Event Description:

Hoist Jam light comes on. Hoist Movement stops

Examiner Cue:

The Double Blade Guide moved upward about one inch when the Hoist Jam light comes on.

Time	Position	Applicant's Actions or Behavior
	LSRO	Direct the RPO to lower the hoist until the Hoist Jam light goes out.
	LSRO	*Direct the RPO to stop bridge operation until problem can be resolved.
	LSRO	*Notifies the Control Room of the condition.
	LSRO	Notifies Maintenance to initiate corrective action.

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Event Description: A fuel bundle in the fuel prep machine is being re-assembled. Several pins that were removed fall into the spent fuel storage rack and rupture.

Examiner Cue: *A fuel bundle in the fuel prep machine is being re-assembled. Several pins that were removed fall into the spent fuel storage rack and rupture.*

Time	Position	Applicant's Actions or Behavior
	LSRO	*Notifies the Control Room.
	LSRO	Implement actions of HC.OP-AB.CONT-0005 IRRADIATED FUEL DAMAGE.
	LSRO	*Suspends all refueling operations.
		<i>CUE: the Spent Fuel Pool Area Radiation Monitor alarms.</i>
	LSRO	Inform Radiation Protection of the condition.

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Event Description:
Refuel Floor Exhaust Hi-Hi Radiation alarms.

Examiner Cue:
The Control Room informs you that Refuel Floor Exhaust Hi-Hi Radiation alarms.

Time	Position	Applicant's Actions or Behavior
	LSRO	*Direct the crew to evacuate the refuel floor.
	LSRO	Recognizes FRVS auto start and Reactor Building Ventilation isolation setpoints.
		<i>CUE: You have reached the termination point for the scenario.</i>

CORE MAP

