

Facility: Hope Creek

Scenario No.:1

Op Test No.: 1

Examiners: _____

Candidates: _____ LSRO

_____ LSRO

_____ LSRO

Objectives: Evaluate applicants' response to an SRM failure. Applicant determines requirements for CRB removal are not met. 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. The Reactor Mode Switch is Operable and locked in Refuel position. All Control Rods are inserted except rod 30-31 for friction testing. The CRDM for 14-23 has been replaced after rebuild. All SRMs are operable. Shutdown Margin requirements are met. The Dominion Engineering Inc. (DEI) FSP tool with grid guide is attached to the Frame Mounted Aux Hoist. The Control Rod Grapple is on the Monorail Hoist.

Turnover: You are the Refueling SRO. All fuel is in the vessel except the 4 bundles of the 14-23 cell. Control Rod Blade 14-23 needs to be removed and replaced. The Control Rod Blade 14-23 is fully withdrawn with the CRDM uncoupled from under-vessel. The double blade guide was just removed from cell 14-23 and is on the Main Hoist. You are at Step 5.3 of HC.RE-FR.ZZ-0002.

Event No.	Malf. 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.	Determines rod does not meet Tech Spec 3.9.10.1 requirements for a single control rod removal. Rod 30-30 must be fully inserted. Discusses Restricted Core Operations Form (RCOF) to continue. Remove fuel support piece. Uses CRB Grapple on Monorail 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> <ul style="list-style-type: none"> -Evacuates the Refuel Floor - Notifies Control Room. - Notifies Reactor Engineer. - Notifies Radiation Protection. <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

Op-Test No. HC LSRO Scenario No. 1 Event No.: 1

Initial Conditions: Operational Condition 5, core alterations in progress.

- The Reactor Mode Switch is Operable and locked in Refuel position.
- All Control Rods are inserted except rod 30-31, which is full out for friction testing.
- The CRDM for 14-23 has been replaced after rebuild.
- All SRMs are operable.
- Shutdown Margin requirements are met.
- The Dominion Engineering Inc. (DEI) FSP tool with grid guide is attached to the Frame Mounted Aux Hoist.
- The Control Rod Grapple is on the Monorail Hoist.

Turnover: You are the Refueling SRO.

- All fuel is in the vessel except the 4 bundles of the 14-23 cell.
- Control Rod Blade 14-23 needs to be removed and replaced.
- The Control Rod Blade 14-23 is fully withdrawn with the CRDM uncoupled from under-vessel.
- The double blade guide was just removed from cell 14-23 and is on the Main Hoist.
- You are at Step 5.3 of HC.RE-FR.ZZ-0002.

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

Examiner Cue: SRM "A" DOWNSCALE alarm in the Control Room. The ROD OUT MOTION BLOCK annunciator is also in alarm. Analyze the effects of these alarms to continuing Core Alterations. When requested, CUE: SRM "A" is reading 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.

Op-Test No. LSRO Scenario No. 1 Event No.: 2

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
		Cue: When asked, provide Restricted Core Operations Form (RCOF).
	LSRO	Reviews Restricted Core Operations Form (RCOF).
	LSRO	* Determines Tech Spec 3.9.10.1 for a single control rod removal are not met. Rod 30-31 must be inserted. Ref: Tech Spec 3.9.10.1.e Cue: Control Rod 30-31 is now re-inserted. The Control Room tells you to continue with 14-23.
		Fuel Support Piece Removal using the Fuel Support Grapple. Ref: HC.RE-FR.ZZ-0002 5.3
		Cue: <i>Step 5.3.1.A is already completed.</i>
	LSRO	* 5.3.1.B. Ensure the ENGAGE push-button on the hoist pendant is DEPRESSED and the RED light is NOT illuminated.
	LSRO	5.3.1.C Using the Frame Mounted Aux 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	5.3.1.D Lower the grapple through the grid.
	LSRO	5.3.1.E & F Lower the grapple into position above the FSP.
	LSRO	5.3.1.G 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	* 5.3.1.H Verify the AMBER Light is on.
		Cue: <i>Amber light is illuminated on the fuel support piece grapple tool.</i>
	LSRO	5.3.1.I Raise hoist and Verify engagement of FSP by observing weight increases to approximately 130 pounds.
		Cue: <i>Hoist reads 130 pounds.</i>
	LSRO	* 5.3.1.J Slowly raise hoist until Amber signal is extinguished

Op-Test No. <u>LSRO</u> Scenario No. <u>1</u> Event No.: <u>2</u>		
Time	Position	Applicant's Actions or Behavior
		Cue: <i>The Amber light is extinguished.</i>
	LSRO	5.3.1.K Continue raising the hoist.
	LSRO	* 5.3.1.L Raise the FSP to the level of the upper grid. When the FSP has cleared the grid then move to a storage location.
		Cue: <i>The Fuel Support Piece is above the upper grid and will remain on the hoist.</i>
	LSRO	Control rod Removal using Control Rod Grapple. Ref: HC.RE-FR.ZZ-0002 5.5
	LSRO	5.5.1 Verify that prerequisite 2.16 was completed based on the control rod grapple.
		Cue: <i>Prerequisite 2.16 was completed</i>
		5.5.2 Install grid guide NA (already installed on FSP tool) Step 5.5.3 is NA.
	LSRO	5.5.4 Verify with Ops that Control Rod is uncoupled from its drive.
		Cue: <i>Control Rod 14-23 is uncoupled from its drive.</i>
	LSRO	5.5.5 Maneuver the refuel platform and Monorail Hoist to obtain direct vertical alignment over the reactor core location where the control rod is to be removed.
		Cue: <i>The Monorail Hoist is directly above the stated core location.</i>
	LSRO	5.5.6 Lower the grapple to a level just above the upper core grid.
		Cue: <i>The grapple has been lowered as stated.</i>
	LSRO	* 5.5.7 Depress the DISENGAGE pushbutton.
		Cue: <i>The controls stated have been operated as stated.</i>
	LSRO	5.5.8 Rotate the hoist cable for alignment.
		Cue: <i>The hoist cable is aligned as stated.</i>
	LSRO	* 5.5.9 Lower the control rod grapple through the upper core grid. Continue to lower the control rod grapple until the hoist cable is slack.
		Cue: <i>The grapple has been lowered until the cable is slack.</i>

	LSRO	* 5.5.10 Depress the ENGAGE pushbutton.
		Cue: <i>The controls stated have been operated as stated.</i>
	LSRO	5.5.11 Request operations continuously observe the control rod position indication to ensure that the position does not change as the control rod is moved.
		Cue: <i>Operations will observe as requested.</i>
	LSRO	* 5.5.12 Raise the grappled control rod to the hoist upper limit.
		Cue: <i>The controls respond as stated. The CRB is grappled and the load cell reads 325 lbs. The hoist reaches the hoist upper limit.</i>

Op-Test No. LSRO Scenario No. 1 Event No.: 3

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.
	LSRO	The operator requests permission to return the CRB to 14-23 cell.

Op-Test No. LSRO Scenario No. 1 Event No.: 4

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

Examiner Cue: *The Reactor Engineer and operations Superintendent concurs with placing CRB back into guide tube.*

Time	Position	Applicant's Actions or Behavior
	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>

RESTRICTED CORE OPERATIONS FORM

[illegible]

OPERATOR COPY

ATTACHMENT 5

CONTROL ROD MOVEMENT SHEET

REFUEL NO. 11SHEET NO. 1CONTINUED ON SHEET N/A

Step Number	I.D. Number	FROM Location	TO Location	Camera Verified	Time & Date	Initials Verified
01	DBG	CORE 13-22/15-24	MAIN HOIST	N/A	5 MINUTES AGO TODAYS DATE	<i>JB</i>
02	FSP 14-23	CORE 14-23	FRAME MOUNTED AUX HOIST	N/A		
03	CRB 14-23	CORE 14-23	MONORAIL HOIST	N/A		
VACUUM CONTROL ROD GUIDE TUBE						
04	CRB 14-23	MONORAIL HOIST	CORE 14-23	N/A		
05	FSP 14-23	FRAME MOUNTED AUX HOIST	CORE 14-23			
06	DBG	MAIN HOIST	CORE 13-22/15-24	N/A		

OPERATOR COPY

Russel P. Crowe
Prepared By

3/17/03
Date

Ship Morton
Verified By

3/17/03
Date

Tony R. Thompson
Supv. Reactor Eng.

3/17/03
Date

Initial Conditions: Operational Condition 5, core alterations in progress.

- The Reactor Mode Switch is Operable and locked in Refuel position.
- All Control Rods are inserted except rod 30-31, which is full out for friction testing.
- The CRDM for 14-23 has been replaced after rebuild.
- All SRMs are operable.
- Shutdown Margin requirements are met.
- The Dominion Engineering Inc. (DEI) FSP tool with grid guide is attached to the Frame Mounted Aux Hoist.
- The Control Rod Grapple is on the Monorail Hoist.

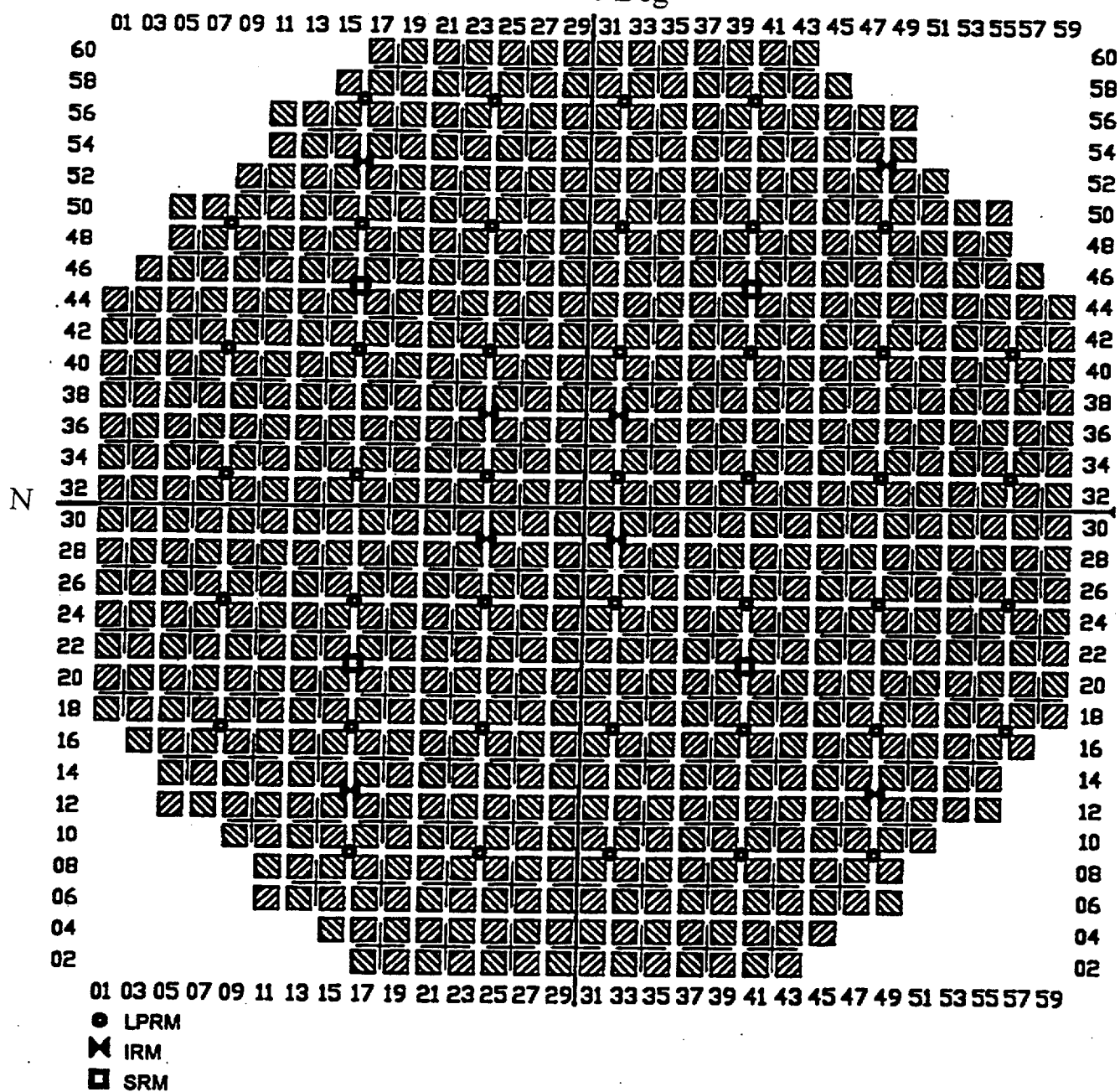
Turnover: You are the Refueling SRO.

- All fuel is in the vessel except the 4 bundles of the 14-23 cell.
- Control Rod Blade 14-23 needs to be removed and replaced.
- The Control Rod Blade 14-23 is fully withdrawn with the CRDM uncoupled from under-vessel.
- The double blade guide was just removed from cell 14-23 and is on the Main Hoist.
- You are at Step 5.3 of HC.RE-FR.ZZ-0002.

OPERATOR COPY

CORE MAP

0 Deg



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 control rod support. 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. A move sheet and core map is provided.

Turnover: You are the Refueling SRO. Double blade guide 29-26/31-28 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	Double Blade Guide is grappled to be removed from the core location according to procedure.
2	1	N	Provide adequate support for Control Rod 30-27.	Determines inadequate support and initiates corrective action.
3	N/A	C	A fuel bundle fails in a location causing high radiation conditions on the Refueling Floor and in the Drywell.	Notify Control Room. Implement actions of HC.OP-AB.CONT-0005 IRRADIATED FUEL DAMAGE. Suspends all refueling operations. Recognizes radiological effects on the Drywell.
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.
5	N/A	M	Classify the event.	Classifies the event as an ALERT IAW ECG 6.4.2.a

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

Op-Test No. HC LSRO Scenario No. 2 Event No.: 1

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 29-26/31-28 is about to be removed from the core. A move sheet and core map is provided.

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

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

Time	Position	Applicant's Actions or Behavior
		Ref: HC.OP-SO.KE-0001 5.5
	LSRO	5.5.1 Ensure that all prerequisites have been satisfied IAW Section 2.5 of this procedure.
		Cue: <i>All prerequisites have been satisfied.</i>
	LSRO	5.5.2 Use the Refuel Platform and Trolley Position Controls to maneuver the Fuel Grapple to the coordinates listed on the Fuel Movement Sheet(s). Digital position Indication System should be used for single blade guides.
		Cue: <i>The Fuel Grapple is positioned above Double Blade Guide (DBG) 29-26/31-28 in the Full Up position.</i>
	LSRO	5.5.3 Ensure the fuel grapple is at the correct Core or Fuel Pool Coordinates.
	LSRO	Operator checks map and move sheet. Confirms location is correct.
	LSRO	* 5.5.4 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
		Cue: <i>Fuel hoist has been lowered to approximately one foot above the blade guide.</i>
	LSRO	* 5.5.5 ROTATE the Fuel Grapple so that the grapple hooks are in line with the blade guide handle.
		Cue: <i>Grapple hooks are aligned.</i>

	LSRO	* 5.5.6 PLACE the GRAPPLE ENGAGE/RELEASE Switch to the RELEASE to ensure the Fuel Grapple hooks are open, OBSERVE the grapple ENGAGE light off.
		Cue: <i>The controls stated are in the positions stated. The Grapple ENGAGE light is off.</i>
	LSRO	* 5.5.7 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
		Cue: <i>The grapple lowers until seated.</i>
		5.5.7.A OBSERVE the Fuel Grapple Hoist downward motion automatically stops.
		Cue: <i>The Fuel Grapple Hoist downward motion automatically stops.</i>
	LSRO	5.5.7.B OBSERVE the SLACK CABLE light on.
		Cue: <i>The SLACK CABLE light is on.</i>
	LSRO	ENSURE Fuel Grapple is at required depth by observing HOIST GRAPPLE ELEVATION Digital Readout.
		Cue: <i>The digital readout reads approximately 548". (NOTE: This is the value of the top of a fully seated fuel bundle plus 6 inches. These numbers are NOT required from memory and are not written in any procedure.)</i>
	LSRO	* 5.5.8 PLACE the GRAPPLE ENGAGE/RELEASE Switch in the ENGAGE position to grapple the blade guide <u>AND</u> OBSERVE the GRAPPLE ENGAGE light on.
		Cue: <i>The grapple ENGAGE Light is on.</i>
	LSRO	CAUTION 5.5.9 DO NOT remove a blade guide from its Reactor Core location <u>if</u> the respective control rod will be left unsupported.
		When asked, Cue: <i>Fuel Bundle 29-28 is in the core.</i> When asked, Cue: <i>Fuel Bundle location 31-26 is empty.</i>
	LSRO	* The operator determines Control Rod Blade 30-27 does NOT have adequate support to remove the double blade guide, therefore the double blade guide cannot be removed.

Op-Test No. LSRO Scenario No. 2 Event No.: 2

Event Description:

Provide adequate support for Control Rod 30-27.

Examiner Cue:

You have returned to the fuel pool. The fuel bundle for location 31-26 is now grappled

Time	Position	Applicant's Actions or Behavior
	LSRO	Operator discusses options of putting either a fuel bundle or single blade guide in location 31-26 and * requests a revised Move Sheet.
		<i>Cue: The fuel movement sheet for fuel assembly 31-26 was inadvertently signed off.</i> Provide new move sheet #2 for bundle location 31-26.
		<i>Cue: You have returned to the fuel pool. The fuel bundle for location 31-26 is now grappled and full up on the Fuel Hoist in the Fuel Pool.</i>
	LSRO	Operator determines beginning step to be 5.3.13 of HC.OP-SO.KE-0001.
	LSRO	* 5.3.13 USE the Trolley position control to position the Fuel Grapple in direct alignment with the center of the fuel transfer path to the Reactor Well.
		<i>Cue: The fuel grapple is aligned as stated.</i>
	LSRO	* 5.3.14 USE the Refuel Platform Position Control in the REVERSE position to maneuver the Refuel Platform to the Reactor Cavity area.
		<i>Cue: The Refuel Platform is moving towards the Reactor Cavity.</i>

Op-Test No. LSRO Scenario No. 2 Event No.: 3

Event Description: A fuel bundle fails in a location causing high radiation conditions on the Refueling Floor and in the Drywell.

Examiner Cue: *The once burned fuel bundle on the fuel grapple free falls and lands horizontally on the end of the Cattle Chute above the RPV flange. The bundle is broken into several pieces.*

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	Notify Radiation Protection of the condition.
		<i>Cue: What areas of the plant will be directly affected by the radiation from the bundle?</i>
	LSRO	Operator discusses increased radiation concerns inside the Drywell area.

Op-Test No. LSRO Scenario No. 2 Event No.: 4

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.

Op-Test No. LSRO Scenario No. 2 Event No.: 5

Event Description:

Classify the event.

Examiner Cue:

Classify the event including E.A.L number based on the information given.

Time	Position	Applicant's Actions or Behavior
	LSRO	Reviews Event Classification Guide (ECG) and Technical Basis.
	LSRO	* Classifies the event as an ALERT IAW EAL # 6.4.2.a
		<i>CUE: You have reached the termination point for the scenario.</i>

ATTACHMENT 1 FUEL MOVEMENT SHEET

REFUEL NO. N/A

SHEET NO. 1

CONTINUED ON SHEET N/A

Step Number	I.D. Number	FROM Location	Orien- tation	Time	TO Location	Orien- tation	Time	Operator Initials	Verified By Initials
				Date			Date		
01	DBG	CORE 29-26/31-28			SFP RACK #21, or 22				

Russel P. Crowe

Prepared By

Today's Date

Date

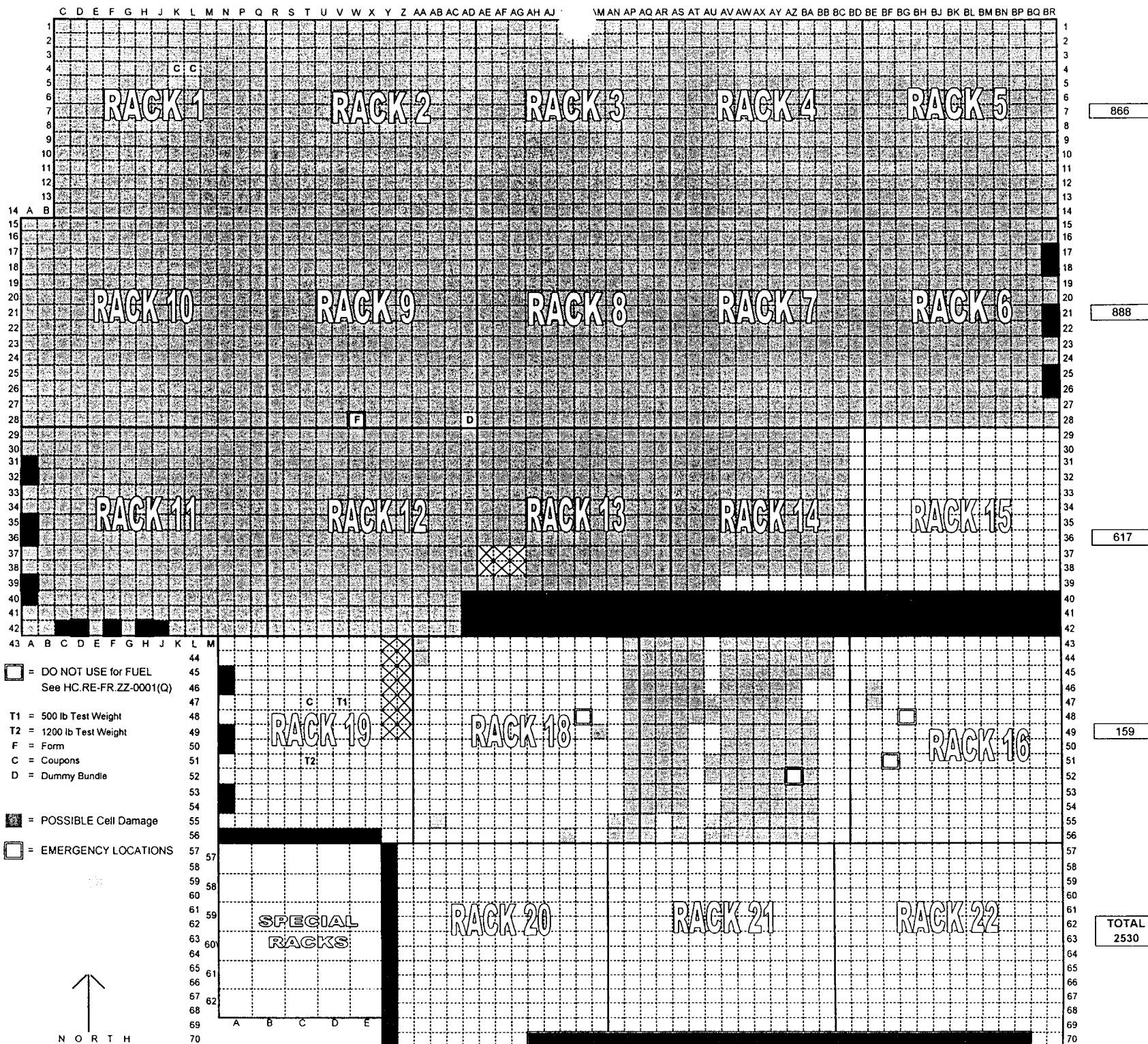
Richard T. Basehart

Independently Verified By

Today's Date

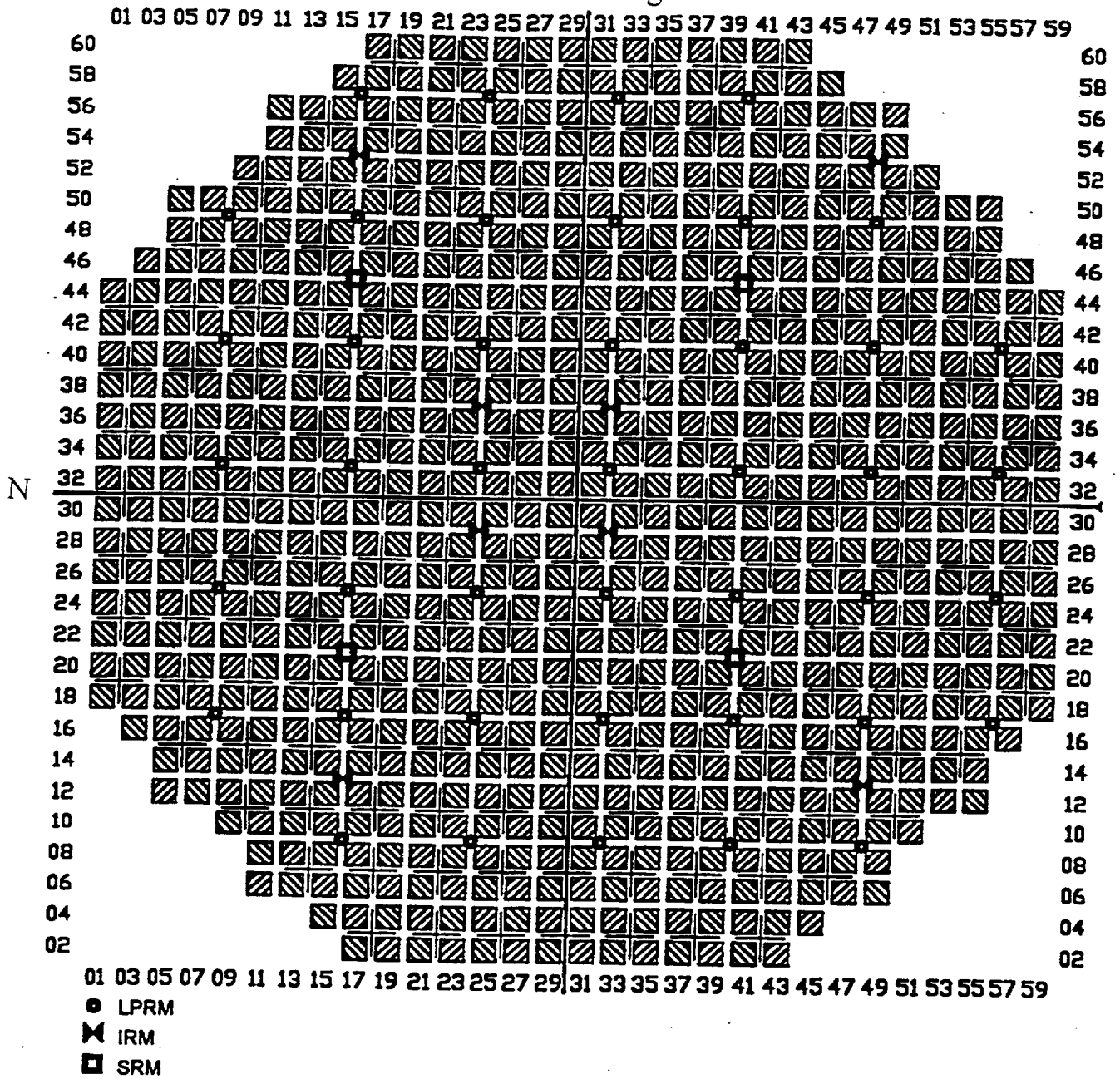
Date

OPERATOR COPY #1



CORE MAP

0 Deg



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 29-26/31-28 is about to be removed from the core. A move sheet and core map is provided.