

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

PREP Week

SCENARIO NUMBER: ESG-NRC-01

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM:

☐ L.O. REQUAL

☒ INITIAL LICENSE

☐ OTHER _____

REVISION SUMMARY:

PREPARED BY:

N/A
INSTRUCTOR

N/A
DATE

REVIEWED BY:

N/A
EP REPRESENTATIVE

N/A
DATE

APPROVED BY:

N/A
TRAINING SUPERVISOR

N/A
DATE

APPROVED BY:

N/A
OPS MANAGER OR DESIGNEE

N/A
DATE

I. OBJECTIVE(S):

- A. The Candidates must demonstrate the ability to operate effectively as a team while completing a series of **CRITICAL TASKS**, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an " *".)

II. MAJOR EVENTS:

- A. Raise reactor power with rods
- B. Stuck Control Rod, recoverable
- C. Place RFP in service
- D. APRM Failure
- E. Loss of **A Control Room Ventilation Supply Fan**
- F. Turbine Trip/ATWS/Failure of Turbine Bypass Valves to Open
- G. RCIC steam line break on initiation, manual isolation required

III. SCENARIO SUMMARY:

The scenario begins with the plant at 35% power. Reactor power is raised to approximately 40%. During the power ascension, a control rod will become stuck. Actions are taken in accordance with the Abnormal Procedures, and the rod is unstuck. The standby Reactor Feed Pump is placed in service. An APRM failure occurs requiring bypassing the affected APRM and resetting RPS. **The A Control Room Supply Fan trips on over current, causing a loss of the A Control Area Ventilation System (CAVS).** The standby **CAVS** auto starts. **After Technical Specifications are addressed, a Main Turbine trip/Reactor Scram/ATWS occurs.** Due to an EHC logic malfunction, **most of the BPVs** will fail to open. The operators will be required to control pressure using Safety Relief Valves. When RCIC starts, a steam leak develops in the RCIC room. The RCIC system isolation will fail to occur automatically, requiring the operator to isolate RCIC to stop the steam leak to the secondary containment.

The scenario may be terminated when all rods are "Full In", secondary containment parameters are improving, and RPV water level is stable between +12.5" and +54".

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-05; 35% power, pull sequence step #485.

Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT:

Description

1. NONE

OTHER CONDITIONS

Description

1. Markup IOP-0003 through step 5.4.18.E.
2. Start the 3rd PCP and SCP.
3. **Place E Condensate Filter Demineralizer**
4. Raise MSL radiation monitor setpoints.
- 5.

MALFUNCTIONS

	Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1.	CD18	20	Pre-insert			HIGH ROD WORTH
2.	CD031835		Pre-insert			STUCK CONTROL ROD
3.	RC10		Pre-insert			RCIC STM ISOLATION VLVS FAILURE TO AUTO CLOSE
4.	RP06		None/3	1		HALF CORE ATWS (LEFT SIDE)
5.	RP07		None/3	2		HALF CORE ATWS (RIGHT SIDE)
6.	NM11C		1/None			APRM CHANNELC INOPERABLE
7.	HV02A		2/None			CONTROL ROOM SUPPLY FAN A TRIP
8.	TC03		3/None			MAIN TURBINE TRIP
9.	TC01-9		3/None			TURBINE BYPASS VALVE – 9 FAILS CLOSED
10.	TC01-8		3/None			TURBINE BYPASS VALVE – 8 FAILS CLOSED
11.	TC01-7		3/None			TURBINE BYPASS VALVE – 7 FAILS CLOSED
12.	TC01-6		3/None			TURBINE BYPASS VALVE – 6 FAILS CLOSED
13.	TC01-5		3/None			TURBINE BYPASS VALVE – 5 FAILS CLOSED
14.	TC01-4		3/None			TURBINE BYPASS VALVE – 4 FAILS CLOSED
15.	RC09	50	None/2			RCIC STEAM LINE BREAK INSIDE RCIC RM 4110

I/O OVERRIDES:

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
___ 1.	NONE					

REMOTES:

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
___ 1.	NONE					

EVENT TRIGGERS

- ___ 1. LCPNEP01 >= 290 // CRD Drive Water pressure at 290 psid.
Command: DMF CD031835 // Removes stuck rod when drive pressure is 290 psid.
- ___ 2. RCNP > 0.5 // RCIC speed
- ___ 3. RP:K14A <1 && RP:K14B <1 // RPS scrammed
- ___ 4.

V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event / Instructor Activity	Expected Plant/Student Response	Comments
1. Raise reactor power with control rods.	<ul style="list-style-type: none"> • CRS orders power ascension with control rods in accordance with RE's guidance. • RO withdraws control rods in accordance with RE's guidance and Section 5.3 of HC.OP-SO.SF-0002. 	
<p>Note: If asked if the reactivity worth for the rods being withdrawn is expected, respond yes as the RE, as mentioned on the Turnover Sheet.</p>		
2. Stuck control rod.	<ul style="list-style-type: none"> • RO notices rod stuck and informs CRS. • CRS orders the RO to attempt to free the stuck control rod in accordance with HC.OP-AB.ZZ-0104. • RO: <ul style="list-style-type: none"> - attempts to operate the drive in both directions, - ensures drive water flow fluctuates normally, - ensures proper operation of the SETTLE, INSERT, and WITHDRAW lights, - and reports failure of rod to move. • RO raises drive water pressure in 50 psig increments, and attempts to move the control rod. RO reports that the rod has moved. • RO returns drive water pressure to normal operating range (260-270 psid). 	
<p>Note: If asked, respond as the RE that a 1 notch insert attempt may be made and the rod recovered if it does move in.</p>		
<p>Ensure CD031835 is removed when drive pressure exceeds 290 psid.</p>		
<p>Note: If the RE is asked for rod history, inform the crew that this rod has a history of sticking.</p>		
3. Placing RFP in service.	<ul style="list-style-type: none"> • CRS orders PO to place B RFP in service. • PO places B RFP in service in accordance with Section 5.6 of HC.OP-SO.AE-0001. 	
<p><i>Provide more detail</i></p>		

Event / Instructor Activity	Expected Plant/Student Response	Comments
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4. APRM failure.

Insert RT-1 when actions for the stuck control rod are complete, the RFP is in service, or at the discretion of the lead examiner.

- Crew notices APRM failure, Rod out motion blocks, and RPS half scram signal.
- CRS orders actions to be taken in accordance with HC.OP-AB.ZZ-0108 and HC.OP-AR.ZZ-0009.
 - Enters HC.OP-AB.ZZ-0300 and executes it concurrently. Orders crew to monitor for core instabilities.
 - Ensures all appropriate Immediate Operator Actions are complete.
- CRS orders the RO to bypass the C APRM and reset RPS.
- RO bypasses APRM in accordance with Section 5.3.4 of HC.OP-SO.SE-0001.
- RO resets RPS in accordance with Section 5.3 of HC.OP-SO.SB-0001
- CRS evaluated Technical Specifications 3.3.1 and 3.3.6 for applicability.

Tracking LCO.

5. Loss of A Control Room Ventilation Supply Fan.

Insert RT-2 when RPS is reset or at the discretion of the lead examiner.

- RO/PO recognizes trip of "A" Control Room Ventilation via annunciators E5-D2, E6-B1, and 10C651E bezel indications and informs CRS.
- CRS enters and implements HC.OP-AB.ZZ-0154.
- RO/PO dispatches ABEO to investigate trip of "A" train of control room ventilation.

Note: As ABEO report, the only alarm is "Evaporator Low Water Flow" on 1AK400. If asked, as the Shift Electrician report, thermal overload trip of the A CRS fan breaker 52-471062.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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NOTE:

Seven day LCO.

- CRS directs maintenance to investigate trip of "A" train of control room ventilation.
- RO/PO places/verifies "B" train of control room ventilation in service IAW HC.OP-SO.GK-0001 and CRS direction.
- OS/CRS evaluates Tech Spec 3.7.2 and determines applicability of action 3.7.2.a.

6. Turbine Trip/ATWS/Failure of Turbine Bypass Valves to Open.

Insert RT-3 when SCW is restored, or at the discretion of the lead examiner.

SCA

- Crew recognizes Main Turbine Trip and informs CRS.
- CRS directs actions in accordance with HC.OP-EO.ZZ-0101.
- RO places and locks the Rx mode switch to shutdown.
- CREW determines all control rods are NOT inserted to or beyond position 02 via CRIDS, SPDS and/or NSSS computer, and informs CRS.
- CRS directs actions in accordance with HC.OP-EO.ZZ-0101A.
- RO/PO verifies RRCS has initiated if an initiation signal is reached and informs CRS.
- RO/PO manually initiates RRCS (ARI) if not already initiated.
- RO/PO notices failure of most BPVs to open and informs CRS.
- CRS orders PO to control pressure using SRVs.
- PO inhibits ADS IAW CRS direction.
- CRS orders SLC initiated.
- RO/PO initiates SLC IAW CRS direction.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p><u>NOTE:</u> CRS may direct a more restrictive level control band.</p> <p>SCPs and RFPs may trip due to low suction pressures. The crew make take actions to restore a RFP to service.</p> <p><u>NOTE:</u> Support EO-322 bypass.</p> <p>Note: These actions are only if water level cannot be maintained above –190 inches, then RPV Emergency Depressurization is required in accordance with HC.OP-EO.ZZ-0202.</p>	<ul style="list-style-type: none"> • * Crew manually starts "A" and "B" SLC pump before suppression pool temperature reaches 110F. (K/A 295037 EA1.04 4.5/4.5) • CRS implements HC.OP-EO.ZZ-0101A, ATWS-RPV Control, to control Rx power and directs: <ul style="list-style-type: none"> - control of RPV water level between -50" and -190" - scram actions • CRS orders HC.OP-EO.ZZ-0322 implemented and HPCI injection secured until HC.OP-EO.ZZ-0322 is implemented or –129" is reached. • PO operates HPCI in accordance with CRS direction. • If Suppression Pool Temperature reaches 110°F., and reactor power is > 4%, the crew intentionally lowers RPV water level until: <ul style="list-style-type: none"> - Rx power drops below 4% OR - RPV water level reaches –129 inches OR - All SRVs remain closed and DRWL press remains below 1.68#. • RO/PO terminate injection as directed by the CRS. • RO/PO commence feeding the RPV and maintains RPV level as directed by the CRS. • CRS determines that water level cannot be maintained above –190 inches and directs: <ul style="list-style-type: none"> - Terminating injection except from SLC, CRD, and RCIC. - Emergency Depressurization in accordance with HC.OP-EO.ZZ-0202. (Open 5 ADS valves.) 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
	<ul style="list-style-type: none"> • RO/PO terminate injection as directed. • PO opens 5 ADS valves. • CRS directs raising injection to raise RPV level when RPV pressure drops to 200 psig. • RO/PO commence injecting into the RPV as directed. • Crew restores level to above –190 inches, and maintains level above –190 inches but less than –129 inches until the Reactor is shutdown. 	
<p>7. RCIC steam leak, failure to auto isolate.</p> <p>Ensure RC09(ET-2) becomes active when RCIC starts.</p>	<ul style="list-style-type: none"> • Crew notices RCIC steam leak/isolation signal following RCIC system initiation, and informs the CRS. • CRS orders RCIC system isolated manually. • PO isolates RCIC system manually in accordance with section 5.2.1 of HC.OP-SO.SM-0001. • * Crew initiates actions to terminate source of leakage and shuts HV-F008 and/or F007 before RCIC room 4110 temperature exceeds 250°F (K/A 217000 A2.15 3.8/3.8) • CRS directs actions in accordance with HC.OP-EO.ZZ-0103 to monitor Secondary Containment parameters to ensure RCIC is isolated. • RO/PO trips "A" and "B" RR pumps IAW CRS direction. • Crew directs bypassing the RWM to enable the insertion of control rods using RMCS. • RO/PO restores 1E breakers if directed. • CRS directs restoration of CRD if lost on 1E breaker trip. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>Support crew requests for implementation of HC.OP-EO.ZZ-0322, and HC.OP-EO.ZZ-320.</p> <p>Inform crew that HC.OP-EO.ZZ-0320 is completed. When SDV is drained, clear Malfunction RP06 and RP07 to allow full Rx scram.</p>	<ul style="list-style-type: none"> • RO restores CRD as directed. • Crew directs implementation of HC.OP-EO.ZZ-0322, Core Spray Injection Valve Override. • Crew directs implementation of HC.OP-EO.ZZ-0320 and resets RPS. • CRS directs RO/PO to place RHR 'A' 'B' in suppression pool cooling IAW HC.OP-EO.ZZ-0102, when available. • CRS directs RO to arm and depress RPS scram pushbuttons when overhead alarm C6-E4, CRD Scram Discharge Volume Not Drained, is extinguished. • RO initiates a manual scram by arming and depressing RPS scram pushbuttons. • CREW observes control rod movement via full core display, CRIDS, 4-rod display, and/or NSSS computer. • * CRS directs implementation of HC.OP-EO.ZZ-0320, resets RPS, and initiates manual Rx scrams until all control rods are fully inserted. <p>(K/A 295037EA1.01 4.6/4.6)</p> <ul style="list-style-type: none"> • CRS directs SLC be secured, exits HC.OP-EO.ZZ-0101A, ATWS-RPV Control, enters HC.OP-EO.ZZ-0101 and directs R01/PO to maintain RPV level between +12.5" to +54". • RO removes "A" and "B" SLC pumps from service. • CRS directs RO/PO to commence an RPV depressurization and cool down and to maintain cool down rate below 90° F/hr. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when all rods are "Full In", secondary containment parameters are improving, and RPV water level is being restore to between +12.5" and +54"

VI. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
- B. ES-604 Dynamic Simulator Requalification Examination Standard
- C. K/A Catalog
- D. JTA Listing
- E. Hope Creek Generating Station Probabilistic Risk Assessment
- F. Technical Specifications
- G. Emergency Plan (ECG)
- H. Alarm Response Procedures (Various)
 - I. NC.TQ-TC.ZZ-0028 Conduct of Simulator Training
 - J. HC.OP-SO.SF-0001 Reactor Manual Control System Operation
 - K. HC.OP-SO.AE-0001 Feedwater System Operation
 - L. HC.OP-SO.SE-0001 Nuclear Instrumentation System Operation
 - M. HC.OP-SO.SB-0001 Reactor Protection System Operation
 - N. HC.OP-AB.ZZ-0104 Stuck Control Rod
 - O. HC.OP-AB.ZZ-0108 LPRM/APRM Malfunction
 - P. HC.OP-AB.ZZ-0154 **Loss of HVAC**
 - Q. HC.OP-AB.ZZ-0300 Reactor Power Oscillations
 - R. HC.OP-EO.ZZ-0101 RPV Control
 - S. HC.OP-EO.ZZ-0101A ATWS-RPV Control
 - T. HC.OP-EO.ZZ-0102 Primary Containment Control
 - U. HC.OP-EO.ZZ-0103/4 Reactor Building and Rad Release Control
 - V. HC.OP-EO.ZZ-0202 Emergency RPV Depressurization
 - W. HC.OP-EO.ZZ-0320 Performing ARI and RPS Interlocks
 - X. HC.OP-EO.ZZ-0322 HPCI Core Spray Injection Valve Override
 - Y. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards
 - Z. SH.OP-DD.ZZ-0004 Operations Standards

ESG CRITICAL TASK RATIONAL

ESG-NRC-01 / 00

1.

- * **Crew manually starts "A" and "B" SLC pump before suppression pool temperature reaches 110F.**
(K/A 295037 EA1.04 4.5/4.5)

If the SLC pumps are not started, reactor power will not be reduced sufficiently to prevent significant heat addition to the suppression pool. Once suppression pool temperature reaches 110 F with the reactor not shutdown and SLC not injecting, the capability to inject the hot shutdown boron weight before reaching the heat capacity temperature limit is jeopardized. If suppression pool temperature cannot be maintained below the heat capacity temperature limit, emergency depressurization will be required. Given the ATWS conditions, executing emergency depressurization is a degraded control strategy.

2.

- * **Crew directs implementation of HC.OP-EO.ZZ-0320, resets RPS, and initiates manual Rx scrams until all control rods are fully inserted.**
(K/A 295037EA1.01 4.6/4.6)

Implementation of HC.OP-EO.ZZ-0320 provides the only method for control rod insertion and substantial negative reactivity addition. It is critical for the crew to implement this procedure and to initiate actions to allow the scram discharge volume to drain. Failure to initiate this action would result in significant heat addition to the suppression pool and possible complications with the heat capacity temperature limit. Insertion of additional manual scrams will fully insert control rods and terminate the ATWS event.

3.

- * **Crew initiates actions to terminate source of leakage and shuts HV-F008 and/or F007 before RCIC room 4110 temperature exceeds 250°F**
(K/A 217000 A2.15 3.8/3.8)

The crew will have indication of a valid isolation signal to the RCIC system with a failure to isolate condition. Initiating actions to isolate the system before exceeding the 250-degree limit allows adequate time for the crew to respond to the failure and manually isolate RCIC. 250F was chosen to ensure that adequate core cooling, containment integrity, safety of personnel, and continued operability of equipment required to perform EOP actions were available.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 1, 35% RTP, MAIN GEN. OUTPUT: 334 MWe

RISK MATRIX COLOR: Green

RIVER TEMPERATURE: 65°F

'D' CHANNEL WORK WEEK – BLUE Folders

Major activities accomplished last shift:

- Commenced Reactor startup IAW HC.OP-IO.ZZ-0003, complete through step 5.4.18.E. The startup follows Hot Standby operation in accordance with HC.OP-IO.ZZ-0007.
- Currently at step 485 of the Rod Pull List. RE guidance is to expect slightly higher than normal rod worth for these rods.
- I&C is investigating problems with a C RFP Vibration Probe. Do not start up C RFP until troubleshooting is complete.

Major activities scheduled for this shift:

- Continue with Reactor startup. Withdraw control rods to end of RWM Group 49(step 500). Place B RFP in service.

	OPERATIONS SUPERINTENDENT ISSUES:
Sys/Equip Problems	▪
Protected Equipment	▪
Update Status	▪
Action Plans	▪

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

•

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-01

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM: ☐ L.O. REQUAL

☒ INITIAL LICENSE

☐ OTHER _____

REVISION SUMMARY:

PREPARED BY: _____
INSTRUCTOR

N/A
DATE

REVIEWED BY: _____
EP REPRESENTATIVE

N/A
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APPROVED BY: _____
TRAINING SUPERVISOR

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The scenario begins with the plant at 35% power. Reactor power is raised to approximately 40%. During the power ascension, a control rod will become stuck. Actions are taken in accordance with the Abnormal Procedures, and the rod is unstuck. The standby Reactor Feed Pump is placed in service. An APRM failure occurs requiring bypassing the affected APRM and resetting RPS. **The A Control Room Supply Fan trips on over current, causing a loss of the A Control Area Ventilation System (CAVS).** The standby CAVS auto starts. **After Technical Specifications are addressed, a Main Turbine trip/Reactor Scram/ATWS occurs.** Due to an EHC logic malfunction, **most of the BPVs will fail to open.** The operators will be required to control pressure using Safety Relief Valves. When RCIC starts, a steam leak develops in the RCIC room. The RCIC system isolation will fail to occur automatically, requiring the operator to isolate RCIC to stop the steam leak to the secondary containment.

The scenario may be terminated when all rods are "Full In", secondary containment parameters are improving, and RPV water level is stable between +12.5" and +54".

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TAGGED EQUIPMENT:

Description

1. NONE

OTHER CONDITIONS:

Description

1. Markup IOP-0003 through step 5.4.18.E.
2. Start the 3rd PCP and SCP.
3. **Place E Condensate Filter Demineralizer**
4. Raise MSL radiation monitor setpoints.
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8.	TC03		3/None			MAIN TURBINE TRIP
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I/O OVERRIDES:

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
1.	NONE					

REMOTES:

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EVENT TRIGGERS

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3. RP:K14A <1 && RP:K14B <1 // RPS scrambled
- 4.

V. SEQUENCE OF EVENTS:

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Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

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<p>Note: If asked if the reactivity worth for the rods being withdrawn is expected, respond yes as the RE, as mentioned on the Turnover Sheet.</p>		
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<p>Note: If asked, respond as the RE that a 1 notch insert attempt may be made and the rod recovered if it does move in.</p>		
<p>Ensure CD031835 is removed when drive pressure exceeds 290 psid.</p> <p>Note: If the RE is asked for rod history, inform the crew that this rod has a history of sticking.</p>		
3. Placing RFP in service.	<ul style="list-style-type: none"> • CRS orders PO to place B RFP in service. • PO places B RFP in service in accordance with Section 5.6 of HC.OP-SO.AE-0001. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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4. APRM failure.

Insert RT-1 when actions for the stuck control rod are complete, the RFP is in service, or at the discretion of the lead examiner.

- Crew notices APRM failure, Rod out motion blocks, and RPS half scram signal.
- CRS orders actions to be taken in accordance with HC.OP-AB.ZZ-0108 and HC.OP-AR.ZZ-0009.
 - Enters HC.OP-AB.ZZ-0300 and executes it concurrently. Orders crew to monitor for core instabilities.
 - Ensures all appropriate Immediate Operator Actions are complete.
- CRS orders the RO to bypass the C APRM and reset RPS.
- RO bypasses APRM in accordance with Section 5.3.4 of HC.OP-SO.SE-0001.
- RO resets RPS in accordance with Section 5.3 of HC.OP-SO.SB-0001
- CRS evaluated Technical Specifications 3.3.1 and 3.3.6 for applicability.

Tracking LCO.

5. Loss of A Control Room Ventilation Supply Fan.

Insert RT-2 when RPS is reset or at the discretion of the lead examiner.

- RO/PO recognizes trip of "A" Control Room Ventilation via annunciators E5-D2, E6-B1, and 10C651E bezel indications and informs CRS.
- CRS enters and implements HC.OP-AB.ZZ-0154.
- RO/PO dispatches ABEO to investigate trip of "A" train of control room ventilation.

Note: As ABEO report, the only alarm is "Evaporator Low Water Flow" on 1AK400. If asked, as the Shift Electrician report, thermal overload trip of the A CRS fan breaker 52-471062.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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NOTE:

Seven day LCO.

- CRS directs maintenance to investigate trip of "A" train of control room ventilation.
- RO/PO places/verifies "B" train of control room ventilation in service IAW HC.OP-SO.GK-0001 and CRS direction.
- OS/CRS evaluates Tech Spec 3.7.2 and determines applicability of action 3.7.2.a.

6. Turbine Trip/ATWS/Failure of Turbine Bypass Valves to Open.

Insert RT-3 when SSW is restored, or at the discretion of the lead examiner.

- Crew recognizes Main Turbine Trip and informs CRS.
- CRS directs actions in accordance with HC.OP-EO.ZZ-0101.
- RO places and locks the Rx mode switch to shutdown.
- CREW determines all control rods are NOT inserted to or beyond position 02 via CRIDS, SPDS and/or NSSS computer, and informs CRS.
- CRS directs actions in accordance with HC.OP-EO.ZZ-0101A.
- RO/PO verifies RRCS has initiated if an initiation signal is reached and informs CRS.
- RO/PO manually initiates RRCS (ARI) if not already initiated.
- RO/PO notices failure of most BPVs to open and informs CRS.
- CRS orders PO to control pressure using SRVs.
- PO inhibits ADS IAW CRS direction.
- CRS orders SLC initiated.
- RO/PO initiates SLC IAW CRS direction.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p><u>NOTE:</u> CRS may direct a more restrictive level control band.</p> <p>SCPs and RFPs may trip due to low suction pressures. The crew make take actions to restore a RFP to service.</p> <p><u>NOTE:</u> Support EO-322 bypass.</p> <p>Note: These actions are only if water level cannot be maintained above –190 inches, then RPV Emergency Depressurization is required in accordance with HC.OP-EO.ZZ-0202.</p>	<ul style="list-style-type: none"> • * Crew manually starts "A" and "B" SLC pump before suppression pool temperature reaches 110F. (K/A 295037 EA1.04 4.5/4.5) • CRS implements HC.OP-EO.ZZ-0101A, ATWS-RPV Control, to control Rx power and directs: <ul style="list-style-type: none"> - control of RPV water level between -50" and -190" - scram actions • CRS orders HC.OP-EO.ZZ-0322 implemented and HPCI injection secured until HC.OP-EO.ZZ-0322 is implemented or –129" is reached. • PO operates HPCI in accordance with CRS direction. • If Suppression Pool Temperature reaches 110°F., and reactor power is > 4%, the crew intentionally lowers RPV water level until: <ul style="list-style-type: none"> - Rx power drops below 4% OR - RPV water level reaches –129 inches OR - All SRVs remain closed and DRWL press remains below 1.68#. • RO/PO terminate injection as directed by the CRS. • RO/PO commence feeding the RPV and maintains RPV level as directed by the CRS. • CRS determines that water level cannot be maintained above –190 inches and directs: <ul style="list-style-type: none"> - Terminating injection except from SLC, CRD, and RCIC. - Emergency Depressurization in accordance with HC.OP-EO.ZZ-0202. (Open 5 ADS valves.) 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
	<ul style="list-style-type: none"> • RO/PO terminate injection as directed. • PO opens 5 ADS valves. • CRS directs raising injection to raise RPV level when RPV pressure drops to 200 psig. • RO/PO commence injecting into the RPV as directed. • Crew restores level to above –190 inches, and maintains level above –190 inches but less than –129 inches until the Reactor is shutdown. 	
<p>7. RCIC steam leak, failure to auto isolate.</p> <p>Ensure RC09(ET-2) becomes active when RCIC starts.</p>	<ul style="list-style-type: none"> • Crew notices RCIC steam leak/isolation signal following RCIC system initiation, and informs the CRS. • CRS orders RCIC system isolated manually. • PO isolates RCIC system manually in accordance with section 5.2.1 of HC.OP-SO.SM-0001. • * Crew initiates actions to terminate source of leakage and shuts HV-F008 and/or F007 before RCIC room 4110 temperature exceeds 250°F (K/A 217000 A2.15 3.8/3.8) • CRS directs actions in accordance with HC.OP-EO.ZZ-0103 to monitor Secondary Containment parameters to ensure RCIC is isolated. • RO/PO trips "A" and "B" RR pumps IAW CRS direction. • Crew directs bypassing the RWM to enable the insertion of control rods using RMCS. • RO/PO restores 1E breakers if directed. • CRS directs restoration of CRD if lost on 1E breaker trip. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>Support crew requests for implementation of HC.OP-EO.ZZ-0322, and HC.OP-EO.ZZ-320.</p>	<ul style="list-style-type: none"> • RO restores CRD as directed. • Crew directs implementation of HC.OP-EO.ZZ-0322, Core Spray Injection Valve Override. • Crew directs implementation of HC.OP-EO.ZZ-0320 and resets RPS. 	
<p>Inform crew that HC.OP-EO.ZZ-0320 is completed. When SDV is drained, clear Malfunction RP06 and RP07 to allow full Rx scram.</p>	<ul style="list-style-type: none"> • CRS directs RO/PO to place RHR 'A'/'B' in suppression pool cooling IAW HC.OP-EO.ZZ-0102, when available. • CRS directs RO to arm and depress RPS scram pushbuttons when overhead alarm C6-E4, CRD Scram Discharge Volume Not Drained, is extinguished. • RO initiates a manual scram by arming and depressing RPS scram pushbuttons. • CREW observes control rod movement via full core display, CRIDS, 4-rod display, and/or NSSS computer. • * CRS directs implementation of HC.OP-EO.ZZ-0320, resets RPS, and initiates manual Rx scrams until all control rods are fully inserted. <p>(K/A 295037EA1.01 4.6/4.6)</p> <ul style="list-style-type: none"> • CRS directs SLC be secured, exits HC.OP-EO.ZZ-0101A, ATWS-RPV Control, enters HC.OP-EO.ZZ-0101 and directs R01/PO to maintain RPV level between +12.5" to +54". • RO removes "A" and "B" SLC pumps from service. • CRS directs RO/PO to commence an RPV depressurization and cool down and to maintain cool down rate below 90° F/hr. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when all rods are "Full In", secondary containment parameters are improving, and RPV water level is being restore to between +12.5" and +54"

VI. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
- B. ES-604 Dynamic Simulator Requalification Examination Standard
- C. K/A Catalog
- D. JTA Listing
- E. Hope Creek Generating Station Probabilistic Risk Assessment
- F. Technical Specifications
- G. Emergency Plan (ECG)
- H. Alarm Response Procedures (Various)
- I. NC.TQ-TC.ZZ-0028 Conduct of Simulator Training
- J. HC.OP-SO.SF-0001 Reactor Manual Control System Operation
- K. HC.OP-SO.AE-0001 Feedwater System Operation
- L. HC.OP-SO.SE-0001 Nuclear Instrumentation System Operation
- M. HC.OP-SO.SB-0001 Reactor Protection System Operation
- N. HC.OP-AB.ZZ-0104 Stuck Control Rod
- O. HC.OP-AB.ZZ-0108 LPRM/APRM Malfunction
- P. HC.OP-AB.ZZ-0154 **Loss of HVAC**
- Q. HC.OP-AB.ZZ-0300 Reactor Power Oscillations
- R. HC.OP-EO.ZZ-0101 RPV Control
- S. HC.OP-EO.ZZ-0101A ATWS-RPV Control
- T. HC.OP-EO.ZZ-0102 Primary Containment Control
- U. HC.OP-EO.ZZ-0103/4 Reactor Building and Rad Release Control
- V. HC.OP-EO.ZZ-0202 Emergency RPV Depressurization
- W. HC.OP-EO.ZZ-0320 Performing ARI and RPS Interlocks
- X. HC.OP-EO.ZZ-0322 HPCI Core Spray Injection Valve Override
- Y. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards
- Z. SH.OP-DD.ZZ-0004 Operations Standards

ESG CRITICAL TASK RATIONAL

ESG-NRC-01 / 00

1.

- * **Crew manually starts "A" and "B" SLC pump before suppression pool temperature reaches 110F.**
(K/A 295037 EA1.04 4.5/4.5)

If the SLC pumps are not started, reactor power will not be reduced sufficiently to prevent significant heat addition to the suppression pool. Once suppression pool temperature reaches 110 F with the reactor not shutdown and SLC not injecting, the capability to inject the hot shutdown boron weight before reaching the heat capacity temperature limit is jeopardized. If suppression pool temperature cannot be maintained below the heat capacity temperature limit, emergency depressurization will be required. Given the ATWS conditions, executing emergency depressurization is a degraded control strategy.

2.

- * **Crew directs implementation of HC.OP-EO.ZZ-0320, resets RPS, and initiates manual Rx scrams until all control rods are fully inserted.**
(K/A 295037EA1.01 4.6/4.6)

Implementation of HC.OP-EO.ZZ-0320 provides the only method for control rod insertion and substantial negative reactivity addition. It is critical for the crew to implement this procedure and to initiate actions to allow the scram discharge volume to drain. Failure to initiate this action would result in significant heat addition to the suppression pool and possible complications with the heat capacity temperature limit. Insertion of additional manual scrams will fully insert control rods and terminate the ATWS event.

3.

- * **Crew initiates actions to terminate source of leakage and shuts HV-F008 and/or F007 before RCIC room 4110 temperature exceeds 250°F**
(K/A 217000 A2.15 3.8/3.8)

The crew will have indication of a valid isolation signal to the RCIC system with a failure to isolate condition. Initiating actions to isolate the system before exceeding the 250-degree limit allows adequate time for the crew to respond to the failure and manually isolate RCIC. 250F was chosen to ensure that adequate core cooling, containment integrity, safety of personnel, and continued operability of equipment required to perform EOP actions were available.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 1, 35% RTP, MAIN GEN. OUTPUT: 334 MWe

RISK MATRIX COLOR: Green

RIVER TEMPERATURE: 65°F

'D' CHANNEL WORK WEEK – BLUE Folders

Major activities accomplished last shift:

- Commenced Reactor startup IAW HC.OP-IO.ZZ-0003, complete through step 5.4.18.E. The startup follows Hot Standby operation in accordance with HC.OP-IO.ZZ-0007.
- Currently at step 485 of the Rod Pull List. RE guidance is to expect slightly higher than normal rod worth for these rods.
- I&C is investigating problems with a C RFP Vibration Probe. Do not start up C RFP until troubleshooting is complete.

Major activities scheduled for this shift:

- Continue with Reactor startup. Withdraw control rods to end of RWM Group 49(step 500). Place B RFP in service.

	OPERATIONS SUPERINTENDENT ISSUES:
Sys/Equip Problems	▪
Protected Equipment	▪
Update Status	▪
Action Plans	▪

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

•

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-01

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM:

☐ L.O. REQUAL

☒ INITIAL LICENSE

☐ OTHER _____

REVISION SUMMARY:

PREPARED BY:

N/A
INSTRUCTOR

N/A
DATE

REVIEWED BY:

N/A
EP REPRESENTATIVE

N/A
DATE

APPROVED BY:

N/A
TRAINING SUPERVISOR

N/A
DATE

APPROVED BY:

N/A
OPS MANAGER OR DESIGNEE

N/A
DATE

I. OBJECTIVE(S):

- A. The Candidates must demonstrate the ability to operate effectively as a team while completing a series of CRITICAL TASKS, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an " *".)

II. MAJOR EVENTS:

- A. Raise reactor power with rods
- B. Stuck Control Rod, recoverable
- C. Place RFP in service
- D. APRM Failure
- E. Loss of **A Control Room Ventilation Supply Fan**
- F. Turbine Trip/ATWS/Failure of Turbine Bypass Valves to Open
- G. RCIC steam line break on initiation, manual isolation required

III. SCENARIO SUMMARY:

The scenario begins with the plant at 35% power. Reactor power is raised to approximately 40%. During the power ascension, a control rod will become stuck. Actions are taken in accordance with the Abnormal Procedures, and the rod is unstuck. The standby Reactor Feed Pump is placed in service. An APRM failure occurs requiring bypassing the affected APRM and resetting RPS. **The A Control Room Supply Fan trips on over current, causing a loss of the A Control Area Ventilation System (CAVS).** The standby CAVS auto starts. **After Technical Specifications are addressed, a Main Turbine trip/Reactor Scram/ATWS occurs.** Due to an EHC logic malfunction, **most of the BPVs will fail to open.** The operators will be required to control pressure using Safety Relief Valves. When RCIC starts, a steam leak develops in the RCIC room. The RCIC system isolation will fail to occur automatically, requiring the operator to isolate RCIC to stop the steam leak to the secondary containment.

The scenario may be terminated when all rods are "Full In", secondary containment parameters are improving, and RPV water level is stable between +12.5" and +54".

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-05; 35% power, pull sequence step #485.

Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT:

Description
1. NONE

OTHER CONDITIONS:

Description
1. Markup IOP-0003 through step 5.4.18.E.
2. Start the 3 rd PCP and SCP.
3. Place E Condensate Filter Demineralizer
4. Raise MSL radiation monitor setpoints.
5.

MALFUNCTIONS:

Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1. CD18	20	Pre-insert			HIGH ROD WORTH
2. CD031835		Pre-insert			STUCK CONTROL ROD
3. RC10		Pre-insert			RCIC STM ISOLATION VLVS FAILURE TO AUTO CLOSE
4. RP06		None/3	1		HALF CORE ATWS (LEFT SIDE)
5. RP07		None/3	2		HALF CORE ATWS (RIGHT SIDE)
6. NM11C		1/None			APRM CHANNELC INOPERABLE
7. HV02A		2/None			CONTROL ROOM SUPPLY FAN A TRIP
8. TC03		3/None			MAIN TURBINE TRIP
9. TC01-9		3/None			TURBINE BYPASS VALVE - 9 FAILS CLOSED
10. TC01-8		3/None			TURBINE BYPASS VALVE - 8 FAILS CLOSED
11. TC01-7		3/None			TURBINE BYPASS VALVE - 7 FAILS CLOSED
12. TC01-6		3/None			TURBINE BYPASS VALVE - 6 FAILS CLOSED
13. TC01-5		3/None			TURBINE BYPASS VALVE - 5 FAILS CLOSED
14. TC01-4		3/None			TURBINE BYPASS VALVE - 4 FAILS CLOSED
15. RC09	50	None/2			RCIC STEAM LINE BREAK INSIDE RCIC RM 4110

I/O OVERRIDES:

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
1.	NONE					

REMOTES:

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
1.	NONE					

EVENT TRIGGERS

1. LCPNEP01 >= 290 // CRD Drive Water pressure at 290 psid.
Command: DMF CD031835 // Removes stuck rod when drive pressure is 290 psid.
2. RCNP > 0.5 // RCIC speed
3. RP:K14A <1 && RP:K14B <1 // RPS scrambled
- 4.

V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event / Instructor Activity	Expected Plant/Student Response	Comments
1. Raise reactor power with control rods.	<ul style="list-style-type: none"> • CRS orders power ascension with control rods in accordance with RE's guidance. • RO withdraws control rods in accordance with RE's guidance and Section 5.3 of HC.OP-SO.SF-0002. 	
<p>Note: If asked if the reactivity worth for the rods being withdrawn is expected, respond yes as the RE, as mentioned on the Turnover Sheet.</p>		
2. Stuck control rod.	<ul style="list-style-type: none"> • RO notices rod stuck and informs CRS. • CRS orders the RO to attempt to free the stuck control rod in accordance with HC.OP-AB.ZZ-0104. • RO: <ul style="list-style-type: none"> - attempts to operate the drive in both directions, - ensures drive water flow fluctuates normally, - ensures proper operation of the SETTLE, INSERT, and WITHDRAW lights, - and reports failure of rod to move. • RO raises drive water pressure in 50 psig increments, and attempts to move the control rod. RO reports that the rod has moved. • RO returns drive water pressure to normal operating range (260-270 psid). 	
<p>Note: If asked, respond as the RE that a 1 notch insert attempt may be made and the rod recovered if it does move in.</p>		
<p>Ensure CD031835 is removed when drive pressure exceeds 290 psid.</p>		
<p>Note: If the RE is asked for rod history, inform the crew that this rod has a history of sticking.</p>		
3. Placing RFP in service.	<ul style="list-style-type: none"> • CRS orders PO to place B RFP in service. • PO places B RFP in service in accordance with Section 5.6 of HC.OP-SO.AE-0001. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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4. APRM failure.

Insert RT-1 when actions for the stuck control rod are complete, the RFP is in service, or at the discretion of the lead examiner.

Tracking LCO.

- Crew notices APRM failure, Rod out motion blocks, and RPS half scram signal.
- CRS orders actions to be taken in accordance with HC.OP-AB.ZZ-0108 and HC.OP-AR.ZZ-0009.
 - Enters HC.OP-AB.ZZ-0300 and executes it concurrently. Orders crew to monitor for core instabilities.
 - Ensures all appropriate Immediate Operator Actions are complete.
- CRS orders the RO to bypass the C APRM and reset RPS.
- RO bypasses APRM in accordance with Section 5.3.4 of HC.OP-SO.SE-0001.
- RO resets RPS in accordance with Section 5.3 of HC.OP-SO.SB-0001
- CRS evaluated Technical Specifications 3.3.1 and 3.3.6 for applicability.

5. Loss of A Control Room Ventilation Supply Fan.

Insert RT-2 when RPS is reset or at the discretion of the lead examiner.

Note: As ABEO report, the only alarm is "Evaporator Low Water Flow" on 1AK400. If asked, as the Shift Electrician report, thermal overload trip of the A CRS fan breaker 52-471062.

- RO/PO recognizes trip of "A" Control Room Ventilation via annunciators E5-D2, E6-B1, and 10C651E bezel indications and informs CRS.
- CRS enters and implements HC.OP-AB.ZZ-0154.
- RO/PO dispatches ABEO to investigate trip of "A" train of control room ventilation.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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NOTE:

Seven day LCO.

- CRS directs maintenance to investigate trip of "A" train of control room ventilation.
- RO/PO places/verifies "B" train of control room ventilation in service IAW HC.OP-SO.GK-0001 and CRS direction.
- OS/CRS evaluates Tech Spec 3.7.2 and determines applicability of action 3.7.2.a.

6. Turbine Trip/ATWS/Failure of Turbine Bypass Valves to Open.

Insert RT-3 when SSW is restored, or at the discretion of the lead examiner.

- Crew recognizes Main Turbine Trip and informs CRS.
- CRS directs actions in accordance with HC.OP-EO.ZZ-0101.
- RO places and locks the Rx mode switch to shutdown.
- CREW determines all control rods are NOT inserted to or beyond position 02 via CRIDS, SPDS and/or NSSS computer, and informs CRS.
- CRS directs actions in accordance with HC.OP-EO.ZZ-0101A.
- RO/PO verifies RRCS has initiated if an initiation signal is reached and informs CRS.
- RO/PO manually initiates RRCS (ARI) if not already initiated.
- RO/PO notices failure of most BPVs to open and informs CRS.
- CRS orders PO to control pressure using SRVs.
- PO inhibits ADS IAW CRS direction.
- CRS orders SLC initiated.
- RO/PO initiates SLC IAW CRS direction.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p><u>NOTE:</u> CRS may direct a more restrictive level control band.</p> <p>SCPs and RFPs may trip due to low suction pressures. The crew make take actions to restore a RFP to service.</p> <p><u>NOTE:</u> Support EO-322 bypass.</p> <p>Note: These actions are only if water level cannot be maintained above –190 inches, then RPV Emergency Depressurization is required in accordance with HC.OP-EO.ZZ-0202.</p>	<ul style="list-style-type: none"> • * Crew manually starts "A" and "B" SLC pump before suppression pool temperature reaches 110F. (K/A 295037 EA1.04 4.5/4.5) • CRS implements HC.OP-EO.ZZ-0101A, ATWS-RPV Control, to control Rx power and directs: <ul style="list-style-type: none"> - control of RPV water level between -50" and -190" - scram actions • CRS orders HC.OP-EO.ZZ-0322 implemented and HPCI injection secured until HC.OP-EO.ZZ-0322 is implemented or –129" is reached. • PO operates HPCI in accordance with CRS direction. • If Suppression Pool Temperature reaches 110°F., and reactor power is > 4%, the crew intentionally lowers RPV water level until: <ul style="list-style-type: none"> - Rx power drops below 4% OR - RPV water level reaches –129 inches OR - All SRVs remain closed and DRWL press remains below 1.68#. • RO/PO terminate injection as directed by the CRS. • RO/PO commence feeding the RPV and maintains RPV level as directed by the CRS. • CRS determines that water level cannot be maintained above –190 inches and directs: <ul style="list-style-type: none"> - Terminating injection except from SLC, CRD, and RCIC. - Emergency Depressurization in accordance with HC.OP-EO.ZZ-0202. (Open 5 ADS valves.) 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>7. RCIC steam leak, failure to auto isolate.</p> <p>Ensure RC09(ET-2) becomes active when RCIC starts.</p>	<ul style="list-style-type: none"> • RO/PO terminate injection as directed. • PO opens 5 ADS valves. • CRS directs raising injection to raise RPV level when RPV pressure drops to 200 psig. • RO/PO commence injecting into the RPV as directed. • Crew restores level to above –190 inches, and maintains level above –190 inches but less than –129 inches until the Reactor is shutdown. <ul style="list-style-type: none"> • Crew notices RCIC steam leak/isolation signal following RCIC system initiation, and informs the CRS. • CRS orders RCIC system isolated manually. • PO isolates RCIC system manually in accordance with section 5.2.1 of HC.OP-SO.SM-0001. • * Crew initiates actions to terminate source of leakage and shuts HV-F008 and/or F007 before RCIC room 4110 temperature exceeds 250°F (K/A 217000 A2.15 3.8/3.8) • CRS directs actions in accordance with HC.OP-EO.ZZ-0103 to monitor Secondary Containment parameters to ensure RCIC is isolated. • RO/PO trips "A" and "B" RR pumps IAW CRS direction. • Crew directs bypassing the RWM to enable the insertion of control rods using RMCS. • RO/PO restores 1E breakers if directed. • CRS directs restoration of CRD if lost on 1E breaker trip. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>Support crew requests for implementation of HC.OP-EO.ZZ-0322, and HC.OP-EO.ZZ-320.</p>	<ul style="list-style-type: none"> • RO restores CRD as directed. • Crew directs implementation of HC.OP-EO.ZZ-0322, Core Spray Injection Valve Override. • Crew directs implementation of HC.OP-EO.ZZ-0320 and resets RPS. 	
<p>Inform crew that HC.OP-EO.ZZ-0320 is completed. When SDV is drained, clear Malfunction RP06 and RP07 to allow full Rx scram.</p>	<ul style="list-style-type: none"> • CRS directs RO/PO to place RHR 'A' 'B' in suppression pool cooling IAW HC.OP-EO.ZZ-0102, when available. • CRS directs RO to arm and depress RPS scram pushbuttons when overhead alarm C6-E4, CRD Scram Discharge Volume Not Drained, is extinguished. • RO initiates a manual scram by arming and depressing RPS scram pushbuttons. • CREW observes control rod movement via full core display, CRIDS, 4-rod display, and/or NSSS computer. • * CRS directs implementation of HC.OP-EO.ZZ-0320, resets RPS, and initiates manual Rx scrams until all control rods are fully inserted. <p>(K/A 295037EA1.01 4.6/4.6)</p> <ul style="list-style-type: none"> • CRS directs SLC be secured, exits HC.OP-EO.ZZ-0101A, ATWS-RPV Control, enters HC.OP-EO.ZZ-0101 and directs R01/PO to maintain RPV level between +12.5" to +54". • RO removes "A" and "B" SLC pumps from service. • CRS directs RO/PO to commence an RPV depressurization and cool down and to maintain cool down rate below 90° F/hr. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when all rods are "Full In", secondary containment parameters are improving, and RPV water level is being restore to between +12.5" and +54".

VI. SCENARIO REFERENCES:

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- G. Emergency Plan (ECG)
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- J. HC.OP-SO.SF-0001 Reactor Manual Control System Operation
- K. HC.OP-SO.AE-0001 Feedwater System Operation
- L. HC.OP-SO.SE-0001 Nuclear Instrumentation System Operation
- M. HC.OP-SO.SB-0001 Reactor Protection System Operation
- N. HC.OP-AB.ZZ-0104 Stuck Control Rod
- O. HC.OP-AB.ZZ-0108 LPRM/APRM Malfunction
- P. HC.OP-AB.ZZ-0154 **Loss of HVAC**
- Q. HC.OP-AB.ZZ-0300 Reactor Power Oscillations
- R. HC.OP-EO.ZZ-0101 RPV Control
- S. HC.OP-EO.ZZ-0101A ATWS-RPV Control
- T. HC.OP-EO.ZZ-0102 Primary Containment Control
- U. HC.OP-EO.ZZ-0103/4 Reactor Building and Rad Release Control
- V. HC.OP-EO.ZZ-0202 Emergency RPV Depressurization
- W. HC.OP-EO.ZZ-0320 Performing ARI and RPS Interlocks
- X. HC.OP-EO.ZZ-0322 HPCI Core Spray Injection Valve Override
- Y. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards
- Z. SH.OP-DD.ZZ-0004 Operations Standards

ESG CRITICAL TASK RATIONAL

ESG-NRC-01 / 00

1.

- * Crew manually starts "A" and "B" SLC pump before suppression pool temperature reaches 110F.
(K/A 295037 EA1.04 4.5/4.5)

If the SLC pumps are not started, reactor power will not be reduced sufficiently to prevent significant heat addition to the suppression pool. Once suppression pool temperature reaches 110 F with the reactor not shutdown and SLC not injecting, the capability to inject the hot shutdown boron weight before reaching the heat capacity temperature limit is jeopardized. If suppression pool temperature cannot be maintained below the heat capacity temperature limit, emergency depressurization will be required. Given the ATWS conditions, executing emergency depressurization is a degraded control strategy.

2.

- * Crew directs implementation of HC.OP-EO.ZZ-0320, resets RPS, and initiates manual Rx scrams until all control rods are fully inserted.
(K/A 295037EA1.01 4.6/4.6)

Implementation of HC.OP-EO.ZZ-0320 provides the only method for control rod insertion and substantial negative reactivity addition. It is critical for the crew to implement this procedure and to initiate actions to allow the scram discharge volume to drain. Failure to initiate this action would result in significant heat addition to the suppression pool and possible complications with the heat capacity temperature limit. Insertion of additional manual scrams will fully insert control rods and terminate the ATWS event.

3.

- * Crew initiates actions to terminate source of leakage and shuts HV-F008 and/or F007 before RCIC room 4110 temperature exceeds 250°F
(K/A 217000 A2.15 3.8/3.8)

The crew will have indication of a valid isolation signal to the RCIC system with a failure to isolate condition. Initiating actions to isolate the system before exceeding the 250-degree limit allows adequate time for the crew to respond to the failure and manually isolate RCIC. 250F was chosen to ensure that adequate core cooling, containment integrity, safety of personnel, and continued operability of equipment required to perform EOP actions were available.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 1, 35% RTP, MAIN GEN. OUTPUT: 334 MWe

RISK MATRIX COLOR: Green

RIVER TEMPERATURE: 65°F

'D' CHANNEL WORK WEEK – BLUE Folders

Major activities accomplished last shift:

- Commenced Reactor startup IAW HC.OP-IO.ZZ-0003, complete through step 5.4.18.E. The startup follows Hot Standby operation in accordance with HC.OP-IO.ZZ-0007.
- Currently at step 485 of the Rod Pull List. RE guidance is to expect slightly higher than normal rod worth for these rods.
- I&C is investigating problems with a C RFP Vibration Probe. Do not start up C RFP until troubleshooting is complete.

Major activities scheduled for this shift:

- Continue with Reactor startup. Withdraw control rods to end of RWM Group 49(step 500). Place B RFP in service.

OPERATIONS SUPERINTENDENT ISSUES:	
Sys/Equip Problems	▪
Protected Equipment	▪
Update Status	▪
Action Plans	▪

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

•

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-02

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM:

☐ L.O. REQUAL

☒ INITIAL LICENSE

☐ OTHER _____

REVISION SUMMARY:

PREPARED BY:

N/A
INSTRUCTOR

N/A
DATE

REVIEWED BY:

N/A
EP REPRESENTATIVE

N/A
DATE

APPROVED BY:

N/A
TRAINING SUPERVISOR

N/A
DATE

APPROVED BY:

N/A
OPS MANAGER OR DESIGNEE

N/A
DATE

I. OBJECTIVE(S):

- A. The Candidates must demonstrate the ability to operate effectively as a team while completing a series of CRITICAL TASKS, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an “*”).

II. MAJOR EVENTS:

- A. Raise Reactor power with Recirculation flow
- B. Perform Core Spray Surveillance/Trip of Core Spray Pump
- C. Recirculation Pump Runaway
- D. Condenser level transmitter failure
- E. Recirculation Pump Trip
- F. Recirculation loop leak/Loss of power to A and B vital busses
- G. C RHR Pump suction strainer clogging/Failure of D RHR pump to auto start

III. SCENARIO SUMMARY:

The scenario begins with the plant at 93% power. The operators will raise Reactor power to 100% with Recirculation Pumps. Core Spray surveillance is required for the shift. The Core Spray Pump will trip during the test. **B Recirculation Pump Speed control fails and the B Recirculation Pump speed rises to its maximum setting.** The Reactor Operator will have to take control of the **A Recirculation Pump speed to lower power below 100%.** The selected Main Condenser level transmitter fails high. The operator must recognize the failure and select a good level transmitter or Main Condenser Hotwell level will lower and a loss of all feedwater will eventually occur. A Recirculation Pump trip requires action to be taken for single loop operations. A leak will develop from the Recirculation System requiring plant shutdown. When the Main Generator trips, off-site power is lost, and the A and B EDG fail resulting in a loss of the 10A401 and 10A402 buses. The D EDG output breaker fails to automatically close in on the 10A403 bus. C RHR pump suction strainer becomes clogged reducing the C RHR Pump's output. This requires that the operator close the D EDG output breaker and inject with D RHR Pump in order to maintain RPV water level.

The scenario may be terminated when RPV water level is being controlled above 12.5 inches, and primary containment parameters are improving.

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-01; 100% power, MOL, Xe equilibrium, pull sequence step #727.

Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT:

Description

1. NONE

OTHER CONDITIONS:

Description

1. Reduce Reactor power to 93% with Recirc.
2. Complete HC.OP-IS.BE-0001 through step 5.1.10 for a regular surveillance.
3. Ensure Condenser Level Transmitter B is selected.

MALFUNCTIONS:

	Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1.	DG01A		Pre-insert			DIESEL GENERATOR A FAILURE TO START
2.	DG02B		Pre-insert			DIESEL GENERATOR B FAILURE
3.	RH05C		Pre-insert			RHR LOOP C LOW FLOW
4.	DG08D		Pre-insert			DIESEL GENERATOR D BREAKER FAILURE TO AUTO CLOSE
5.	RH08D		Pre-insert			RHR SYSTEM D AUTO INJECTION FAILED TO ENERGIZE
6.	CS01A		1/None			CORE SPRAY PUMP A TRIP
7.	RRO8B		2/None			REACTOR RECIRC PUMP SPEED CONTROLLER B FAILS HIGH
8.	MC13B	100	3/None			CONDENSER LVL TRANSMITTER LT-1657B FAILURE
9.	RR11B		4/None			RECIRC PUMP B TRIP
10.	RR31B2	0-75	5/None	600		VARIABLE LOCA
11.	EG12		None/1			LOSS OF ALL OFF-SITE POWER
12.	RR31A2	50	None/2			VARIABLE LOCA

I/O OVERRIDES:

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
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1. NONE

2.

3.

REMOTES:

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
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1. NONE

EVENT TRIGGERS

1. TC:TRIP //Main Turbine Trip

2. RRLWR <= -129 // RPV water level -129 inches

V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

1. Raise Reactor power with Recirc.

- CRS orders the RO to raise Reactor power using Recirc flow in accordance with Section 5.2 of HC.OP-SO.BB-0002.
- RO raises Reactor power with Recirc by using the Master Speed Controller
- RO contacts Turbine Bldg EO to monitor Recirc MG Lube Oil temperatures.

2. Perform Core Spray Surveillance/Trip of Core Spray Pump

Insert RT-1 when Core Spray system is at test flow rate, or at the discretion of the Lead Examiner

Note: Report from field that all personnel are ready for pump start.

Use CRIDS page 95 for CS flow.

Note: Support crew requests for placing the breaker in PTL and restoring keep-fill.

7 day LCO (Loop considered inop until keep-fill restored.) Support crew efforts to fill and vent the A CS loop.

- CRS directs PO to complete the Core Spray surveillance HC.OP-IS.BE-0001.
- PO performs "A" Core Spray Pump surveillance IAW HC.OP-IS.BE-0001:
 - Starts A Core Spray pump
 - Throttles F015A to establish 3200 gpm
- PO recognizes trip of A Core Spray pump on motor overcurrent and informs the CRS.
- CRS directs PO to secure from the test.
- PO secures from the test in accordance with HC.OP-IS.BE-0001.
- CRS refers to T/S 3.5.1.a.1 for failed Core Spray surveillance.

3. Recirculation Pump Runaway.

Insert RT-2, when actions for the failed surveillance are complete or at the discretion of the lead examiner.

- Crew recognizes B RR Pump runaway by flow and power indications, and informs the CRS.
- CRS implements HC.OP-AB.ZZ-0204 and directs actions to stabilize Rx power by running back the non-effected Recirculation pump.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

Note: Respond as I&C to troubleshoot RR Pump problem.

When requested to investigate, as I&C report after a short time delay that it appears the speed control signal has failed upscale.

Support shift requests for RR pump speed adjustment.
Increase/decrease "A" RR speed using Remote RR09.

24 Hour Report

- RO reduces the speed of the non-effected Recirculation pump to stabilize power below 100%.
- CRS directs action to ensure RR loop flow mismatch is within 5% of rated core flow IAW tech spec 3.4.1.3.
- RO/PO notifies TBEO and I&C of scoop tube problem and directs investigation.
- IF local adjustment of the scoop tube is desired, CRS directs actions IAW HC.OP-SO.BB-0002
- RO/PO maintains constant communication with field at all times during scoop tube local adjustment.
- CRS evaluates Licensing Basis for exceeding 102% power.
- CRS may review or request the OS to review ECG Section 11.1.3.a.

4. **Condenser level transmitter failure.**

Insert RT-3 when CRD System flow is restored, or at the discretion of the lead examiner.

Per HC.OP-AR.ZZ-0004, actions for alarms A6-F1(2,3) is to ensure proper controller operation.

Note: If the level transmitter is not noticed, eventually CONDENSATE TRAIN TROUBLE alarms will be received. If no action is taken, a low level trip of the PCPs, SCPs, RFPs, and a reactor scram will eventually occur.

- Crew recognizes failure of condenser level transmitter from CRIDS alarm point, 10C651A indications, and informs CRS.
- CRS directs the PO to select another condenser level transmitter.
- PO selects the directed condenser level transmitter.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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5. Recirculation pump trip

Insert RT-4 when actions for the failed Main Condenser level transmitter are completed, or at the discretion of the lead examiner.

- Crew recognizes trip of the B Recirculation Pump and informs CRS.
- CRS orders the immediate operator actions in accordance with HC.OP-AB.ZZ-0112.
 - Enter HC.OP-AB.ZZ-0300, monitor for thermal hydraulic instabilities
- CRS orders the subsequent operator actions in accordance with HC.OP-AB.ZZ-0112.
 - Close the discharge valve on the tripped pump for 5 minutes then reopen.
 - Send operator to MG Set Panel
 - Notify RE and I&C.
 - Insert control rods if necessary
- RO closes the discharge valve for the B Recirculation Pump for 5 minutes, and then reopens the valve.
- RO/PO contacts Bldg. EO to check the MG Set Panel.
- RO/PO contacts RE and I&C.
- RO inserts control rods as necessary in accordance with the Interim Core Operating Instruction to suppress APRM Upscale alarms.
- CRS evaluates Technical Specifications 3.4.1.

Single loop requirements.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

6. Recirculation loop leak/Loss of power to A and B vital busses.

Insert RT-5 when actions for the tripped Recirculation Pump are complete, a reactor scram is in progress, or, at the discretion of the lead examiner.

Note: The operators may not have time to take these actions due to the rapidly rising Drywell pressure.

Verify ET-2 active(LOP, failure of A EDG to start, B EDGs starts and trips, and D EDG to fail to load) when Main Turbine trips.

NOTE:

Primary Containment parameters cannot be controlled because the "A" and/or "B" EDGs are inoperable.

- Crew recognizes LOCA via annunciator C6-B1, rising drywell pressure, and informs CRS.
- CRS orders actions to be taken in accordance with HC.OP-AB.ZZ-0201.
 - Increase Drywell cooling
 - Monitor RR pump seals, SRV position, Drywell sumps, Drywell conditions
- PO increases Drywell cooling by starting all available cooling fans.
- CRS orders RR to minimum and Reactor scram.
- RO reduces RR pump speed to minimum and scrams the Reactor.
- CRS enters and directs HC.OP-EO.ZZ-0101, RPV Control, and directs actions to:
 - Verify scram actions
 - Control RPV water level above +12.5"
 - Stabilize Rx pressure below 1037#
- Crew determines RPV level, pressure, and containment parameters and informs CRS.
- Crew recognizes LOP, failure of A and B EDGs, and the failure of D EDG to load, and notifies the CRS.
- R0/PO verifies start of ECCS and EDGs.
- CRS enters and directs HC.OP-EO.ZZ-0102, Primary Containment Control, to control primary containment parameters.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

Ensure ET-2 active when level reaches -129 inches.

- CRS orders restoration of A, B EDGs, and closure of D EDG output breaker in accordance with HC.OP-AB.ZZ-0135.
- PO attempts to restore A and B EDGs and closes D EDG output breaker.
- * RO/PO closes "D" EDG output breaker 52-40407 and reenergizes 10A404 vital bus.
(K/A 262001 A2.03 3.9/4.3)

7. C RHR pump suction filter clogging/D RHR pump failure to auto start

Pre-inserted

- PO observes indications of suction strainer clogging for the D RHR pump and informs CRS.
- PO recognizes failure of the D RHR pump to auto start and recommends the starting of D RHR pump to maintain RPV level.
- CRS orders D RHR pump started to maintain RPV level.
- * CREW starts the "D" RHR pump and opens HV-F017D to maintain RPV water level above -190".
(K/A 295031 EA1.01 4.4/4.4)
- PO starts D RHR pump and opens F017D to inject into the RPV.

7. Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when RPV water level is being controlled above 12.5 inches and primary containment parameters are improving.

1. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
- B. ES-604 Dynamic Simulator Requalification Examination Standard
- C. K/A Catalog
- D. JTA Listing
- E. Hope Creek Generating Station Probabilistic Risk Assessment
- F. Technical Specifications
- G. Emergency Plan (ECG)
- H. Alarm Response Procedures (Various)
- I. NC.TQ-TC.ZZ-0028 Conduct of Simulator Training
- J. HC.OP-AB.ZZ-0112 Recirculation Pump Trip
- K. HC.OP-AB.ZZ-0135 Loss of Offsite Power
- L. HC.OP-AB.ZZ-0201 Drywell High Pressure/Loss of Drywell Cooling
- M. HC.OP-AB.ZZ-0204 Positive Reactivity Addition
- N. HC.OP-AB.ZZ-0300 Reactor Power Oscillations
- O. HC.OP-EO.ZZ-0101 RPV Control
- P. HC.OP-EO.ZZ-0102 Primary Containment Control
- Q. HC.OP-IS.BE-0001 A&C Core Spray Pumps-AP206&CP206-Inservice Test
- R. HC.OP-SO.BB-0002 Reactor Recirculation System Operation
- S. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards
- T. SH.OP-DD.ZZ-0004 Operations Standards

ESG CRITICAL TASK RATIONAL

ESG-NRC-02 / 00

1.

- * Crew closes "D" EDG output breaker 52-40407 and reenergizes 10A404 vital bus.
(K/A 262001 A2.03 3.9/4.3)

The "D" EDG output breaker fails to auto-close following the LOP. With the failure of the "A" and "B" EDGs, the Crew must establish injection to the RPV to maintain adequate core cooling. This will require injection with the "D" RHR Pump. To use the "D" RHR Pump, power must be restore to the 10A403 vital bus.

2.

- * CREW starts the "D" RHR pump and opens HV-F017D to maintain RPV water level above -190".
(K/A 295031 EA1.01 4.4/4.4)

The Crew must manually start and align injection to restore adequate core cooling by core submergence.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 1, 93% RTP, MAIN GEN. OUTPUT: 1090 MWe

RISK MATRIX COLOR: Green

RIVER TEMPERATURE: 65°F

'A' CHANNEL WORK WEEK – BLUE Folders

Major activities accomplished last shift:

- Reduced Reactor power due to a Minimum Generation Alert
- Completed preparations for HC.OP-IS.BE-0001 through step 5.1.10.

Major activities scheduled for this shift:

- Raise reactor power to 100% with recirc.
- Complete HC.OP-IS.BE-0001.

	OPERATIONS SUPERINTENDENT ISSUES:
Sys/Equip Problems	▪
Protected Equipment	▪
Update Status	▪
Action Plans	▪

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

•

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-02

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM: ☐ L.O. REQUAL

☒ INITIAL LICENSE

☐ OTHER _____

REVISION SUMMARY:

PREPARED BY:	N/A INSTRUCTOR	N/A DATE
REVIEWED BY:	N/A EP REPRESENTATIVE	N/A DATE
APPROVED BY:	N/A TRAINING SUPERVISOR	N/A DATE
APPROVED BY:	N/A OPS MANAGER OR DESIGNEE	N/A DATE

I. OBJECTIVE(S):

- A. The Candidates must demonstrate the ability to operate effectively as a team while completing a series of CRITICAL TASKS, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an “*”).

II. MAJOR EVENTS:

- A. Raise Reactor power with Recirculation flow
- B. Perform Core Spray Surveillance/Trip of Core Spray Pump
- C. Recirculation Pump Runaway
- D. Condenser level transmitter failure
- E. Recirculation Pump Trip
- F. Recirculation loop leak/Loss of power to A and B vital busses
- G. C RHR Pump suction strainer clogging/Failure of D RHR pump to auto start

III. SCENARIO SUMMARY:

The scenario begins with the plant at 93% power. The operators will raise Reactor power to 100% with Recirculation Pumps. Core Spray surveillance is required for the shift. The Core Spray Pump will trip during the test. **B Recirculation Pump Speed control fails and the B Recirculation Pump speed rises to its maximum setting.** The Reactor Operator will have to take control of the **A Recirculation Pump speed to lower power below 100%.** The selected Main Condenser level transmitter fails high. The operator must recognize the failure and select a good level transmitter or Main Condenser Hotwell level will lower and a loss of all feedwater will eventually occur. A Recirculation Pump trip requires action to be taken for single loop operations. A leak will develop from the Recirculation System requiring plant shutdown. When the Main Generator trips, off-site power is lost, and the A and B EDG fail resulting in a loss of the 10A401 and 10A402 buses. The D EDG output breaker fails to automatically close in on the 10A403 bus. C RHR pump suction strainer becomes clogged reducing the C RHR Pump's output. This requires that the operator close the D EDG output breaker and inject with D RHR Pump in order to maintain RPV water level.

The scenario may be terminated when RPV water level is being controlled above 12.5 inches, and primary containment parameters are improving.

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-01; 100% power, MOL, Xe equilibrium, pull sequence step #727.

Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT:

Description

1. NONE

OTHER CONDITIONS:

Description

1. Reduce Reactor power to 93% with Recirc.
2. Complete HC.OP-IS.BE-0001 through step 5.1.10 for a regular surveillance.
3. Ensure Condenser Level Transmitter B is selected.

MALFUNCTIONS:

	Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1.	DG01A		Pre-insert			DIESEL GENERATOR A FAILURE TO START
2.	DG02B		Pre-insert			DIESEL GENERATOR B FAILURE
3.	RH05C		Pre-insert			RHR LOOP C LOW FLOW
4.	DG08D		Pre-insert			DIESEL GENERATOR D BREAKER FAILURE TO AUTO CLOSE
5.	RH08D		Pre-insert			RHR SYSTEM D AUTO INJECTION FAILED TO ENERGIZE
6.	CS01A		1/None			CORE SPRAY PUMP A TRIP
7.	RRO8B		2/None			REACTOR RECIRC PUMP SPEED CONTROLLER B FAILS HIGH
8.	MC13B	100	3/None			CONDENSER LVL TRANSMITTER LT-1657B FAILURE
9.	RR11B		4/None			RECIRC PUMP B TRIP
10.	RR31B2	0-75	5/None	600		VARIABLE LOCA
11.	EG12		None/1			LOSS OF ALL OFF-SITE POWER
12.	RR31A2	50	None/2			VARIABLE LOCA

I/O OVERRIDES

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
--	------------	-------	-------	-------	------	-------------

1. NONE

2.

3.

REMOTES

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
--	---------	-------	---------	-------	------	-------------

1. NONE

EVENT TRIGGERS

1. TC:TRIP //Main Turbine Trip

2. RRLWR <= -129 // RPV water level -129 inches

V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

1. Raise Reactor power with Recirc.

- CRS orders the RO to raise Reactor power using Recirc flow in accordance with Section 5.2 of HC.OP-SO.BB-0002.
- RO raises Reactor power with Recirc by using the Master Speed Controller
- RO contacts Turbine Bldg EO to monitor Recirc MG Lube Oil temperatures.

2. Perform Core Spray Surveillance/Trip of Core Spray Pump

Insert RT-1 when Core Spray system is at test flow rate, or at the discretion of the Lead Examiner

Note: Report from field that all personnel are ready for pump start.

Use CRIDS page 95 for CS flow.

Note: Support crew requests for placing the breaker in PTL and restoring keep-fill.

7 day LCO (Loop considered inop until keep-fill restored.)
Support crew efforts to fill and vent the A CS loop.

- CRS directs PO to complete the Core Spray surveillance HC.OP-IS.BE-0001.
- PO performs "A" Core Spray Pump surveillance IAW HC.OP-IS.BE-0001:
 - Starts A Core Spray pump
 - Throttles F015A to establish 3200 gpm
- PO recognizes trip of A Core Spray pump on motor overcurrent and informs the CRS.
- CRS directs PO to secure from the test.
- PO secures from the test in accordance with HC.OP-IS.BE-0001.
- CRS refers to T/S 3.5.1.a.1 for failed Core Spray surveillance.

3. Recirculation Pump Runaway:

Insert RT-2, when actions for the failed surveillance are complete or at the discretion of the lead examiner

- Crew recognizes B RR Pump runaway by flow and power indications, and informs the CRS.
- CRS implements HC.OP-AB.ZZ-0204 and directs actions to stabilize Rx power by running back the non-effected Recirculation pump.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

Note: Respond as I&C to troubleshoot RR Pump problem.

When requested to investigate, **as I&C report** after a short time delay that it appears the speed control signal has failed upscale.

Support shift requests for RR pump speed adjustment.
Increase/decrease "A" RR speed using Remote RR09.

24 Hour Report

- RO reduces the speed of the non-effected Recirculation pump to stabilize power below 100%.
- CRS directs action to ensure RR loop flow mismatch is within 5% of rated core flow IAW tech spec 3.4.1.3.
- RO/PO notifies TBEO and I&C of scoop tube problem and directs investigation.
- IF local adjustment of the scoop tube is desired, CRS directs actions IAW HC.OP-SO.BB-0002
- RO/PO maintains constant communication with field at all times during scoop tube local adjustment.
- CRS evaluates Licensing Basis for exceeding 102% power.
- CRS may review or request the OS to review ECG Section 11.1.3.a.

4. Condenser level transmitter failure.

Insert RT-3 when CRD System flow is restored, or at the discretion of the lead examiner.

Per HC.OP-AR.ZZ-0004, actions for alarms A6-F1(2,3) is to ensure proper controller operation.

Note: If the level transmitter is not noticed, eventually CONDENSATE TRAIN TROUBLE alarms will be received. If no action is taken, a low level trip of the PCPs, SCPs, RFPs, and a reactor scram will eventually occur.

- Crew recognizes failure of condenser level transmitter from CRIDS alarm point, 10C651A indications, and informs CRS.
- CRS directs the PO to select another condenser level transmitter.
- PO selects the directed condenser level transmitter.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

5. Recirculation pump trip

Insert RT-4 when actions for the failed Main Condenser level transmitter are completed, or at the discretion of the lead examiner.

- Crew recognizes trip of the B Recirculation Pump and informs CRS.
- CRS orders the immediate operator actions in accordance with HC.OP-AB.ZZ-0112.
 - Enter HC.OP-AB.ZZ-0300, monitor for thermal hydraulic instabilities
- CRS orders the subsequent operator actions in accordance with HC.OP-AB.ZZ-0112.
 - Close the discharge valve on the tripped pump for 5 minutes then reopen.
 - Send operator to MG Set Panel
 - Notify RE and I&C.
 - Insert control rods if necessary
- RO closes the discharge valve for the B Recirculation Pump for 5 minutes, and then reopens the valve.
- RO/PO contacts Bldg. EO to check the MG Set Panel.
- RO/PO contacts RE and I&C.
- RO inserts control rods as necessary in accordance with the Interim Core Operating Instruction to suppress APRM Upscale alarms.
- CRS evaluates Technical Specifications 3.4.1.

Single loop requirements.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

6. Recirculation loop leak/Loss of power to A and B vital busses.

Insert RT-5 when actions for the tripped Recirculation Pump are complete, a reactor scram is in progress, or at the discretion of the lead examiner.

Note: The operators may not have time to take these actions due to the rapidly rising Drywell pressure.

Verify ET-2 active(LOP, failure of A EDG to start, B EDGs starts and trips, and D EDG to fail to load) when Main Turbine trips.

NOTE:

Primary Containment parameters cannot be controlled because the "A" and/or "B" EDGs are inoperable.

- Crew recognizes LOCA via annunciator C6-B1, rising drywell pressure, and informs CRS.
- CRS orders actions to be taken in accordance with HC.OP-AB.ZZ-0201.
 - Increase Drywell cooling
 - Monitor RR pump seals, SRV position, Drywell sumps, Drywell conditions
- PO increases Drywell cooling by starting all available cooling fans.
- CRS orders RR to minimum and Reactor scram.
- RO reduces RR pump speed to minimum and scrams the Reactor.
- CRS enters and directs HC.OP-EO.ZZ-0101, RPV Control, and directs actions to:
 - Verify scram actions
 - Control RPV water level above +12.5"
 - Stabilize Rx pressure below 1037#
- Crew determines RPV level, pressure, and containment parameters and informs CRS.
- Crew recognizes LOP, failure of A and B EDGs, and the failure of D EDG to load, and notifies the CRS.
- R0/PO verifies start of ECCS and EDGs.
- CRS enters and directs HC.OP-EO.ZZ-0102, Primary Containment Control, to control primary containment parameters.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

Ensure ET-2 active when level reaches -129 inches.

- CRS orders restoration of A, B EDGs, and closure of D EDG output breaker in accordance with HC.OP-AB.ZZ-0135.
- PO attempts to restore A and B EDGs and closes D EDG output breaker.
- * RO/PO closes "D" EDG output breaker 52-40407 and reenergizes 10A404 vital bus.
(K/A 262001 A2.03 3.9/4.3)

7. C RHR pump suction filter clogging/D RHR pump failure to auto start.

Pre-inserted

- PO observes indications of suction strainer clogging for the D RHR pump and informs CRS.
- PO recognizes failure of the D RHR pump to auto start and recommends the starting of D RHR pump to maintain RPV level.
- CRS orders D RHR pump started to maintain RPV level.
- * CREW starts the "D" RHR pump and opens HV-F017D to maintain RPV water level above -190".
(K/A 295031 EA1.01 4.4/4.4)
- PO starts D RHR pump and opens F017D to inject into the RPV.

7. Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when RPV water level is being controlled above 12.5 inches, and primary containment parameters are improving.

1. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
- B. ES-604 Dynamic Simulator Requalification Examination Standard
- C. K/A Catalog
- D. JTA Listing
- E. Hope Creek Generating Station Probabilistic Risk Assessment
- F. Technical Specifications
- G. Emergency Plan (ECG)
- H. Alarm Response Procedures (Various)
- I. NC.TQ-TC.ZZ-0028 Conduct of Simulator Training
- J. HC.OP-AB.ZZ-0112 Recirculation Pump Trip
- K. HC.OP-AB.ZZ-0135 Loss of Offsite Power
- L. HC.OP-AB.ZZ-0201 Drywell High Pressure/Loss of Drywell Cooling
- M. HC.OP-AB.ZZ-0204 Positive Reactivity Addition
- N. HC.OP-AB.ZZ-0300 Reactor Power Oscillations
- O. HC.OP-EO.ZZ-0101 RPV Control
- P. HC.OP-EO.ZZ-0102 Primary Containment Control
- Q. HC.OP-IS.BE-0001 A&C Core Spray Pumps-AP206&CP206-Inservice Test
- R. HC.OP-SO.BB-0002 Reactor Recirculation System Operation
- S. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards
- T. SH.OP-DD.ZZ-0004 Operations Standards

ESG CRITICAL TASK RATIONAL

ESG-NRC-02 / 00

1.

- * Crew closes "D" EDG output breaker 52-40407 and reenergizes 10A404 vital bus.
(K/A 262001 A2.03 3.9/4.3)

The "D" EDG output breaker fails to auto-close following the LOP. With the failure of the "A" and "B" EDGs, the Crew must establish injection to the RPV to maintain adequate core cooling. This will require injection with the "D" RHR Pump. To use the "D" RHR Pump, power must be restore to the 10A403 vital bus.

2.

- * CREW starts the "D" RHR pump and opens HV-F017D to maintain RPV water level above -190".
(K/A 295031 EA1.01 4.4/4.4)

The Crew must manually start and align injection to restore adequate core cooling by core submergence.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 1, 93% RTP, MAIN GEN. OUTPUT: 1090 MWe

RISK MATRIX COLOR: Green

RIVER TEMPERATURE: 65°F

'A' CHANNEL WORK WEEK – BLUE Folders

Major activities accomplished last shift:

- Reduced Reactor power due to a Minimum Generation Alert
- Completed preparations for HC.OP-IS.BE-0001 through step 5.1.10.

Major activities scheduled for this shift:

- Raise reactor power to 100% with recirc.
- Complete HC.OP-IS.BE-0001.

OPERATIONS SUPERINTENDENT ISSUES:	
Sys/Equip Problems	▪
Protected Equipment	▪
Update Status	▪
Action Plans	▪

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

•

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-02

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM:

☐

L.O. REQUAL

☒

INITIAL LICENSE

☐

OTHER

REVISION SUMMARY:

PREPARED BY:

N/A

INSTRUCTOR

N/A

DATE

REVIEWED BY:

N/A

EP REPRESENTATIVE

N/A

DATE

APPROVED BY:

N/A

TRAINING SUPERVISOR

N/A

DATE

APPROVED BY:

N/A

OPS MANAGER OR DESIGNEE

N/A

DATE

I. OBJECTIVE(S):

- A. The Candidates must demonstrate the ability to operate effectively as a team while completing a series of CRITICAL TASKS, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an “*”.)

II. MAJOR EVENTS:

- A. Raise Reactor power with Recirculation flow
- B. Perform Core Spray Surveillance/Trip of Core Spray Pump
- C. Recirculation Pump Runaway
- D. Condenser level transmitter failure
- E. Recirculation Pump Trip
- F. Recirculation loop leak/Loss of power to A and B vital busses
- G. C RHR Pump suction strainer clogging/Failure of D RHR pump to auto start

III. SCENARIO SUMMARY:

The scenario begins with the plant at 93% power. The operators will raise Reactor power to 100% with Recirculation Pumps. Core Spray surveillance is required for the shift. The Core Spray Pump will trip during the test. **B Recirculation Pump Speed control fails and the B Recirculation Pump speed rises to its maximum setting.** The Reactor Operator will have to take control of the **A Recirculation Pump speed to lower power below 100%.** The selected Main Condenser level transmitter fails high. The operator must recognize the failure and select a good level transmitter or Main Condenser Hotwell level will lower and a loss of all feedwater will eventually occur. A Recirculation Pump trip requires action to be taken for single loop operations. A leak will develop from the Recirculation System requiring plant shutdown. When the Main Generator trips, off-site power is lost, and the A and B EDG fail resulting in a loss of the 10A401 and 10A402 buses. The D EDG output breaker fails to automatically close in on the 10A403 bus. C RHR pump suction strainer becomes clogged reducing the C RHR Pump's output. This requires that the operator close the D EDG output breaker and inject with D RHR Pump in order to maintain RPV water level.

The scenario may be terminated when RPV water level is being controlled above 12.5 inches, and primary containment parameters are improving.

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-01; 100% power, MOL, Xe equilibrium, pull sequence step #727.

Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT:

Description

1. NONE

OTHER CONDITIONS:

Description

1. Reduce Reactor power to 93% with Recirc.
2. Complete HC.OP-IS.BE-0001 through step 5.1.10 for a regular surveillance.
3. Ensure Condenser Level Transmitter B is selected.

MALFUNCTIONS:

	Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1.	DG01A		Pre-insert			DIESEL GENERATOR A FAILURE TO START
2.	DG02B		Pre-insert			DIESEL GENERATOR B FAILURE
3.	RH05C		Pre-insert			RHR LOOP C LOW FLOW
4.	DG08D		Pre-insert			DIESEL GENERATOR D BREAKER FAILURE TO AUTO CLOSE
5.	RH08D		Pre-insert			RHR SYSTEM D AUTO INJECTION FAILED TO ENERGIZE
6.	CS01A		1/None			CORE SPRAY PUMP A TRIP
7.	RRO8B		2/None			REACTOR RECIRC PUMP SPEED CONTROLLER B FAILS HIGH
8.	MC13B	100	3/None			CONDENSER LVL TRANSMITTER LT-1657B FAILURE
9.	RR11B		4/None			RECIRC PUMP B TRIP
10.	RR31B2	0-75	5/None	600		VARIABLE LOCA
11.	EG12		None/1			LOSS OF ALL OFF-SITE POWER
12.	RR31A2	50	None/2			VARIABLE LOCA

I/O OVERRIDES

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
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1. NONE

2.

3.

REMOTES

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
--	---------	-------	---------	-------	------	-------------

1. NONE

EVENT TRIGGERS

1. TC:TRIP //Main Turbine Trip

2. RRLWR <= -129 // RPV water level -129 inches

V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event / Instructor Activity	Expected Plant/Student Response	Comments
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1. Raise Reactor power with Recirc.

- CRS orders the RO to raise Reactor power using Recirc flow in accordance with Section 5.2 of HC.OP-SO.BB-0002.
- RO raises Reactor power with Recirc by using the Master Speed Controller
- RO contacts Turbine Bldg EO to monitor Recirc MG Lube Oil temperatures.

2. Perform Core Spray Surveillance/Trip of Core Spray Pump

Insert RT-1 when Core Spray system is at test flow rate, or at the discretion of the Lead Examiner

Note: Report from field that all personnel are ready for pump start.

Use CRIDS page 95 for CS flow.

Note: Support crew requests for placing the breaker in PTL and restoring keep-fill.

7 day LCO (Loop considered inop until keep-fill restored.) Support crew efforts to fill and vent the A CS loop.

- CRS directs PO to complete the Core Spray surveillance HC.OP-IS.BE-0001.
- PO performs "A" Core Spray Pump surveillance IAW HC.OP-IS.BE-0001:
 - Starts A Core Spray pump
 - Throttles F015A to establish 3200 gpm
- PO recognizes trip of A Core Spray pump on motor overcurrent and informs the CRS.
- CRS directs PO to secure from the test.
- PO secures from the test in accordance with HC.OP-IS.BE-0001.
- CRS refers to T/S 3.5.1.a.1 for failed Core Spray surveillance.

3. Recirculation Pump Runaway

Insert RT-2, when actions for the failed surveillance are complete or at the discretion of the lead examiner.

- Crew recognizes B RR Pump runaway by flow and power indications, and informs the CRS.
- CRS implements HC.OP-AB.ZZ-0204 and directs actions to stabilize Rx power by running back the non-effected Recirculation pump.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

Note: Respond as I&C to troubleshoot RR Pump problem.

When requested to investigate, **as I&C report** after a short time delay that it appears the speed control signal has failed upscale.

Support shift requests for RR pump speed adjustment.
Increase/decrease "A" RR speed using Remote RR09.

24 Hour Report

- RO reduces the speed of the non-effected Recirculation pump to stabilize power below 100%.
- CRS directs action to ensure RR loop flow mismatch is within 5% of rated core flow IAW tech spec 3.4.1.3.
- RO/PO notifies TBEO and I&C of scoop tube problem and directs investigation.
- IF local adjustment of the scoop tube is desired, CRS directs actions IAW HC.OP-SO.BB-0002
- RO/PO maintains constant communication with field at all times during scoop tube local adjustment.
- CRS evaluates Licensing Basis for exceeding 102% power.
- CRS may review or request the OS to review ECG Section 11.1.3.a.

4. Condenser level transmitter failure.

Insert RT-3 when CRD System flow is restored, or at the discretion of the lead examiner.

Per HC.OP-AR.ZZ-0004, actions for alarms A6-F1(2,3) is to ensure proper controller operation.

Note: If the level transmitter is not noticed, eventually CONDENSATE TRAIN TROUBLE alarms will be received. If no action is taken, a low level trip of the PCPs, SCPs, RFPs, and a reactor scram will eventually occur.

- Crew recognizes failure of condenser level transmitter from CRIDS alarm point, 10C651A indications, and informs CRS.
- CRS directs the PO to select another condenser level transmitter.
- PO selects the directed condenser level transmitter.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

5. Recirculation pump trip Insert RT-4 when actions for the failed Main Condenser level transmitter are completed, or at the discretion of the lead examiner.

- Crew recognizes trip of the B Recirculation Pump and informs CRS.
- CRS orders the immediate operator actions in accordance with HC.OP-AB.ZZ-0112.
 - Enter HC.OP-AB.ZZ-0300, monitor for thermal hydraulic instabilities
- CRS orders the subsequent operator actions in accordance with HC.OP-AB.ZZ-0112.
 - Close the discharge valve on the tripped pump for 5 minutes then reopen.
 - Send operator to MG Set Panel
 - Notify RE and I&C.
 - Insert control rods if necessary
- RO closes the discharge valve for the B Recirculation Pump for 5 minutes, and then reopens the valve.
- RO/PO contacts Bldg. EO to check the MG Set Panel.
- RO/PO contacts RE and I&C.
- RO inserts control rods as necessary in accordance with the Interim Core Operating Instruction to suppress APRM Upscale alarms.
- CRS evaluates Technical Specifications 3.4.1.

Single loop requirements.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

6. Recirculation loop leak/Loss of power to A and B vital busses.

Insert RT-5 when actions for the tripped Recirculation Pump are complete, a reactor scram is in progress, or at the discretion of the lead examiner.

Note: The operators may not have time to take these actions due to the rapidly rising Drywell pressure.

Verify ET-2 active(LOP, failure of A EDG to start, B EDGs starts and trips, and D EDG to fail to load) when Main Turbine trips.

NOTE:

Primary Containment parameters cannot be controlled because the "A" and/or "B" EDGs are inoperable.

- Crew recognizes LOCA via annunciator C6-B1, rising drywell pressure, and informs CRS.
- CRS orders actions to be taken in accordance with HC.OP-AB.ZZ-0201.
 - Increase Drywell cooling
 - Monitor RR pump seals, SRV position, Drywell sumps, Drywell conditions
- PO increases Drywell cooling by starting all available cooling fans.
- CRS orders RR to minimum and Reactor scram.
- RO reduces RR pump speed to minimum and scrams the Reactor.
- CRS enters and directs HC.OP-EO.ZZ-0101, RPV Control, and directs actions to:
 - Verify scram actions
 - Control RPV water level above +12.5"
 - Stabilize Rx pressure below 1037#
- Crew determines RPV level, pressure, and containment parameters and informs CRS.
- Crew recognizes LOP, failure of A and B EDGs, and the failure of D EDG to load, and notifies the CRS.
- RO/PO verifies start of ECCS and EDGs.
- CRS enters and directs HC.OP-EO.ZZ-0102, Primary Containment Control, to control primary containment parameters.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

Ensure ET-2 active when level reaches -129 inches.

- CRS orders restoration of A, B EDGs, and closure of D EDG output breaker in accordance with HC.OP-AB.ZZ-0135.
 - PO attempts to restore A and B EDGs and closes D EDG output breaker.
 - * RO/PO closes "D" EDG output breaker 52-40407 and reenergizes 10A404 vital bus.
- (K/A 262001 A2.03 3.9/4.3)

7. C RHR pump suction filter clogging/D RHR pump failure to auto start.

Pre-inserted.

- PO observes indications of suction strainer clogging for the D RHR pump and informs CRS.
 - PO recognizes failure of the D RHR pump to auto start and recommends the starting of D RHR pump to maintain RPV level.
 - CRS orders D RHR pump started to maintain RPV level.
 - * CREW starts the "D" RHR pump and opens HV-F017D to maintain RPV water level above -190".
- (K/A 295031 EA1.01 4.4/4.4)
- PO starts D RHR pump and opens F017D to inject into the RPV.

7. Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when RPV water level is being controlled above 12.5 inches, and primary containment parameters are improving.

1. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
- B. ES-604 Dynamic Simulator Requalification Examination Standard
- C. K/A Catalog
- D. JTA Listing
- E. Hope Creek Generating Station Probabilistic Risk Assessment
- F. Technical Specifications
- G. Emergency Plan (ECG)
- H. Alarm Response Procedures (Various)
- I. NC.TQ-TC.ZZ-0028 Conduct of Simulator Training
- J. HC.OP-AB.ZZ-0112 Recirculation Pump Trip
- K. HC.OP-AB.ZZ-0135 Loss of Offsite Power
- L. HC.OP-AB.ZZ-0201 Drywell High Pressure/Loss of Drywell Cooling
- M. HC.OP-AB.ZZ-0204 Positive Reactivity Addition
- N. HC.OP-AB.ZZ-0300 Reactor Power Oscillations
- O. HC.OP-EO.ZZ-0101 RPV Control
- P. HC.OP-EO.ZZ-0102 Primary Containment Control
- Q. HC.OP-IS.BE-0001 A&C Core Spray Pumps-AP206&CP206-Inservice Test
- R. HC.OP-SO.BB-0002 Reactor Recirculation System Operation
- S. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards
- T. SH.OP-DD.ZZ-0004 Operations Standards

ESG-NRC-02 / 00

1.

- * **Crew closes "D" EDG output breaker 52-40407 and reenergizes 10A404 vital bus.**
(K/A 262001 A2.03 3.9/4.3)

The "D" EDG output breaker fails to auto-close following the LOP. With the failure of the "A" and "B" EDGs, the Crew must establish injection to the RPV to maintain adequate core cooling. This will require injection with the "D" RHR Pump. To use the "D" RHR Pump, power must be restore to the 10A403 vital bus.

2.

- * **CREW starts the "D" RHR pump and opens HV-F017D to maintain RPV water level above -190".**
(K/A 295031 EA1.01 4.4/4.4)

The Crew must manually start and align injection to restore adequate core cooling by core submergence.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 1, 93% RTP, MAIN GEN. OUTPUT: 1090 MWe

RISK MATRIX COLOR: Green

RIVER TEMPERATURE: 65°F

'A' CHANNEL WORK WEEK – BLUE Folders

Major activities accomplished last shift:

- Reduced Reactor power due to a Minimum Generation Alert
- Completed preparations for HC.OP-IS.BE-0001 through step 5.1.10.

Major activities scheduled for this shift:

- Raise reactor power to 100% with recirc.
- Complete HC.OP-IS.BE-0001.

	OPERATIONS SUPERINTENDENT ISSUES
Sys/Equip Problems	▪
Protected Equipment	▪
Update Status	▪
Action Plans	▪

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

•

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-03

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM:

☐ L.O. REQUAL

☒ INITIAL LICENSE

☐ OTHER _____

REVISION SUMMARY:

PREPARED BY:

N/A
INSTRUCTOR

N/A
DATE

REVIEWED BY:

N/A
EP REPRESENTATIVE

N/A
DATE

APPROVED BY:

N/A
TRAINING SUPERVISOR

N/A
DATE

APPROVED BY:

N/A
OPS MANAGER OR DESIGNEE

N/A
DATE

I. OBJECTIVE(S):

The Candidates must demonstrate the ability to operate effectively as a team while completing a series of CRITICAL TASKS, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an " *".)

II. MAJOR EVENTS:

- A. HPCI In-service Test
- B. HPCI oil leak
- C. CRD pump trip
- D. Recirculation Flow unit failure
- E. Recirculation System Speed Control Fails Low
- F. Loss of 1CD482/TACS recovery
- G. MSIV Closure/Reactor scram/stuck control rods
- H. RCIC flow controller failure in Auto

III. SCENARIO SUMMARY:

The scenario begins with the plant at 100% power. HPCI In-service test in progress. HPCI develops an oil leak during operation, requiring the system shutdown and declared inoperable. The CRD Pump trips on overcurrent. The standby CRD Pump is placed in service and the system returned to normal. Then a Recirculation Flow Unit fails. After actions to bypass the Flow Unit and resetting RPS are complete, the A Recirculation Pump speed control signal fails. When power is stabilized, the crew will be directed to reduce the speed of the operating pump to meet Technical Specification requirements. An inverter failure occurs that requires the operators to transfer TACS to the standby SACS loop. The operator will have to re-open the TACS common supply valves in order to continue plant operation.

An inadvertent MSIV closure causes the Reactor to scram. 4 control rods do not insert on the scram. ATWS control strategies are used to insert these control rods. The MSIV closure and inoperable HPCI make RCIC operation required to maintain RPV water level above -190 inches. A RCIC flow controller failure requires the operator to take manual control of RCIC to control level.

The scenario may be terminated when all control rods are fully inserted, RPV water level is being controlled above 12.5 inches, and primary containment parameters are under control.

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-01; 100% power, MOL, Xe equilibrium, pull sequence step #727.

Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT:

Description

1. NONE

2.

3.

OTHER CONDITIONS:

Description

1. Set up HPCI surveillance test HC.OP-IS.BJ-0001 through step 5.1.16. Lower power by 10 Mwe.

2. Place B RHR in Suppression Pool cooling.

3. Lower Suppression Pool level to 75 inches.

4. Obtain DL-26 Attachment 3m.

MALFUNCTIONS:

Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1. CD032203		Pre-insert			STUCK CONTROL ROD 22-03
2. CD034259		Pre-insert			STUCK CONTROL ROD 42-59
3. CD031835		Pre-insert			STUCK CONTROL ROD 18-35
4. CD031823		Pre-insert			STUCK CONTROL ROD 18-23
5. HP06M		1/None			HPCI AUX OIL PUMP OIL LINE BREAK
6. CD10A		2/None			CRD PUMP A FAILURE
7. RR19B1	0	3/None			RECIRC FLOW TRANSMITTER B FAILURE
8. RR01A		4/None			RECIRC SYSTEM A SPEED CONTROL FAILS LOW
9. ED09C2		5/None			LOSS OF 120 VAC CLASS 1E INVERTER CD482
10. MS15		None/2			SPURIOUS GROUP 1 ISOLATION (MSIV CLOSURE)
11. RC03		None/1			RCIC TURBINE SPEED CONTROL FAILURE
12.					
13.					

I/O OVERRIDES:

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
--	------------	-------	-------	-------	------	-------------

___ 1.	NONE					
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___ 2.						
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REMOTES:

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
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___ 1.	RR07A	OFF	None/4			POSITIONER A POWER SWITCH
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___ 2.						
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___ 3.						
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___ 4.						
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___ 5.						
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EVENT TRIGGERS

___ 1.	RCNP >= 0.5 //RCIC pump speed
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___ 2.	ISTRIGGER_ACT(7) > 0 ET_ARRAY(3) > 0 // RT-6 activated or RPS scram
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___ 3.	RP:K14A <1 && RP:K14B <1 // RPS scrammed
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___ 4.	ZARRS621(5) <= 0.65 // RECIRC PUMP SPEED APPROXIMATELY 65%
--------	--

___ 5.	
--------	--

V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event / Instructor Activity	Expected Plant/Student Response	Comments
1. HPCI In-service Test	<ul style="list-style-type: none"> • PO continues HPCI surveillance test in accordance with HC.OP-IS.BJ-0001. • PO Starts the HPCI turbine and establishes proper system flow. 	
2. HPCI oil leak Insert RT-1 when HPCI turbine is in operation or at the discretion of the lead examiner		
<p>Respond as EO to HPCI when directed and report an oil leak. Oil is still spraying into the room (if the oil pump is still in operation).</p> <p>Support opening of oil pump breaker if requested.</p> <p>14 day LCO</p>	<ul style="list-style-type: none"> • PO notices indications of an HPCI oil leak and informs the CRS. • CRS orders the PO to secure from the HPCI surveillance. • PO secures HPCI and restores the system to normal operations with the exception(s) given by the CRS. • CRS declares HPCI inoperable and evaluates Technical Specifications 3.5.1.c to determine required actions. 	<p><i>detected</i></p>
3. CRD pump trip. Insert RT-2 when Technical Specification actions are taken or at the discretion of the lead examiner.		<p><i>detected</i></p>
	<ul style="list-style-type: none"> • Crew recognizes the trip of the A CRD pump and informs the CRS. • CRS directs action in accordance with HC.OP-AB.ZZ-0105. <ul style="list-style-type: none"> - Start the standby CRD pump • RO starts the B CRD pump and restores the CRD system in accordance with Section 5.2.6 HC.OP-SO.BF-0001, or Annunciator C6-F2 response given in HC.OP-AR.ZZ-0011. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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4. Recirculation Flow unit failure.

Insert RT-3 when CRD is restored or at the discretion of the lead examiner.

Note: When crew requests I&C to adjust B RR Flow Unit output, **raise severity of RR19B1 to 100%**, and report as I&C that the signal has been adjusted.

Tracking LCO

- Crew recognizes failure of the B RR Flow Unit and reports this to the CRS.

- CRS directs actions in accordance with HC.OP-AB.ZZ-0108, and C6-D1 of HC.OP-AR.ZZ-0011.

- Monitor for thermal hydraulic instabilities in accordance with HC.OP-AB.ZZ-0300.
- Bypass the B RR flow unit
- When I&C has adjusted Flow Unit output, reset RPS

- RO resets RPS in accordance with HC.OP-SO.SB-0001.

- CRS refers to Technical Specification 3.3.6.

5. Recirculation System Speed Control Failure.

Insert RT-4 when RPS has been reset or at the discretion of the lead examiner.

2 hour LCO to restore speed differential to less than 5%.

Note: Respond as I&C; take approximately 6 hours to troubleshoot the problem.

- Crew recognizes failure of the A RR Pump Runback Circuit and informs the CRS.

- CRS directs monitoring of Reactor power, level and pressure
- RO reports status of Reactor power, level, and pressure.
- CRS refers to Technical Specification 3.4.1.3.
- CRS contacts I&C for assistance.

(LOCAL)

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>Note: May be required to prompt the power reduction. Call as Operations Manager and direct power reduction.</p>	<ul style="list-style-type: none"> CRS may direct actions to locally operate the A RR Pump Scoop Tube. 	
<p>Respond, if required, that brake cannot be disengaged.</p> <p>Note: Respond as RE, reduction of B RR Pump speed to approximately 65%. No control rod motion should be required and 15% power change should not be exceeded.</p> <p>TS 4.4.5</p>	<ul style="list-style-type: none"> CRS contacts RE for guidance. 	
<p>Note: May be required to prompt the power reduction. Call as Operations Manager and direct power reduction.</p>	<ul style="list-style-type: none"> CRS may direct Chemistry and Rad Pro to take Tech Spec samples due to the rapid power change. (Conservative) CRS directs power reduction in accordance with RE's guidance and Section 5.2 of HC.OP-IO.ZZ-0006. RO reduces ^BA RR Pump speed in accordance with RE's guidance and Section 5.2 of HC.OP-SO.BB-0002. 	
<p>6. Loss of 1CD482/TACS recovery.</p> <p>Insert RT-5 when power has been reduced with RR by approximately 5% or at the discretion of the lead examiner.</p>	<ul style="list-style-type: none"> Crew recognizes loss of an inverter and the loss of TACS and reports this to the CRS. CRS directs actions to be taken in accordance with HC.OP-AB.ZZ-0136. <ul style="list-style-type: none"> Monitor Reactor power, level, pressure, and Main Generator output. Determine which inverter is failed. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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- RO reports power, level, pressure, and Main Generator output steady.
- CRS directs actions to be taken in accordance with HC.OP-AB.ZZ-0148.
 - Verifies no break in the TACS
 - Complete TACS transfer to the B STACS loop
 - Open TACS isolation valves HV-2522E AND F.
 - Open HV-2512B and close HV-2512A.
- PO opens HV-2522E, HV-2522F and HV-2512B, and closes HV-2512A and HV-2522A/2496A.
- Verifies transfer IAW Section 5.7 of HC.OP-SO.EG-0001.
- Crew recognizes loss of RBVS by observing Reactor Bldg dp at 0", RBVS & Wing Area HVAC panel trouble alarm(E6-C5), and informs the CRS
- CRS directs actions to restore Reactor Bldg dp in accordance with HC.OP-AB.ZZ-0115:
 - Place FRVS in service

Note: If excessive sluicing occurs between the SACS loops, a total loss of TACS may occur. The crew will then be required to scram the reactor in accordance with AB-148. If the plant is scrammed, **ensure** ET-2 is active.

none detected

- PO places FRVS in service in accordance with CRS directions and Section 5.3 of HC.OP-SO.GU-0001.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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8 hour LCO for 1CD482 restoration, EDG inoperable requires ST.ZZ-0001 and evaluation of other Tech Specs. CRS reviews HC.OP-AP.ZZ-0108 for applicability of supporting systems and declares those pumps supplied from the EDG as inoperable. CS and RHR. 3.0.3 entry is required due to HPCI inop, a CS, and a RHR system inoperable.

Note:

Support SACS and SSW pump realignments as required. **B SSW pump start required to maintain TACS Temperatures.**

- CRS declares 1CD482, and C EDG, C RHR, C CS inoperable and refers to Technical Specification 3.8.3.1, 3.8.1.1, and 3.5.1.

7. MSIV closure/Reactor scram/stuck control rods.

Insert ET-2 when actions are complete for the loss of 1CD482, at the discretion of the lead examiner, or ensure ET-2 is active if the plant is scrammed during the loss of the inverter.

- Crew determines the closure of the MSIVs and the Reactor scram, and reports this to the CRS.
- CRS directs scram actions be taken.
- RO places and locks the Mode Switch in Shutdown and performs scram actions.
- CREW determines all control rods are NOT inserted to or beyond position 02 via CRIDS, SPDS and/or NSSS computer, and informs CRS.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>NOTE: CRS may direct a more restrictive level control band.</p>	<ul style="list-style-type: none"> CRS implements HC.OP-EO.ZZ-0101A, ATWS-RPV Control, to control Rx power and directs: <ul style="list-style-type: none"> control of RPV water level between +54" and -190" scram actions 	
<p>8. RCIC flow controller failure in Auto. Ensure RC03 active on RCIC initiation.</p>	<ul style="list-style-type: none"> PO recognizes failure of RCIC flow controller in Automatic and informs the CRS. CRS directs PO to take manual control of RCIC to maintain RPV level and SRVs to control Reactor pressure. * CREW takes manual control of RCIC flow controller to control RPV water level IAW HC.OP-EO.ZZ-0101A, and maintain RPV water level greater than -190" when the Rx is not shut down. <p>(K/A 295037 EA2.02 4.1/4.2)</p> <ul style="list-style-type: none"> PO takes manual control of RCIC and maintains RPV water level as directed. PO takes control of the SRVs and maintains RPV pressure as directed. RO/PO verifies RRCS has initiated if an initiation signal is reached and informs CRS. CRS enters HC.OP-EO.ZZ-0102 if Suppression Pool temperature exceeds 95F, and directs PO to place RHR in Suppression Pool Cooling PO places RHR in Suppression Pool Cooling as directed in accordance with Section 5.5 of HC.OP-SO.BC-0001. CREW manually initiates RRCS (ARI) if not already initiated. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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Clear CD032203, CD034259, CD031835, and CD031823 when the SDV is full. (Use SDV monitor to determine when the SDV is full.) This will allow rod movement by RMCS or EOP-320.

Note: Support completion of HC.OP-EO.ZZ-0320 and **inform** the crew when completed in the field.

- PO inhibits ADS IAW CRS direction.
- CRS directs SLC initiation before suppression pool temperature reaches 150°F
- RO/PO initiates SLC pumps when directed.
- CRS directs bypassing the RWM to enable the insertion of control rods using RMCS. *default*

- RO bypasses RWM and inserts control rods.
- CRS may direct implementation of HC.OP-EO.ZZ-0320 and resets RPS.
- CRS directs RO to arm and depress RPS scram pushbuttons when overhead alarm C6-E4, CRD Scram Discharge Volume Not Drained, is extinguished.
- RO initiates a manual scram by arming and depressing RPS scram pushbuttons. (If Control Rods are were not inserted previously.)
- CREW observes control rod movement via full core display, CRIDS, 4-rod display, and/or NSSS computer.
- * Crew inserts control rods via RMCS and/or, when the SDV is drained (annunciator C6-E4 clear), Crew implements a manual scram IAW HC.OP-EO.ZZ-0320 to initiate rod insertion.

(K/A 295037 EA1.01 4.6/4.6)
(K/A 295037 EA1.07 3.9/4.0)

Event / Instructor Activity	Expected Plant/Student Response	Comments
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- CRS directs RO to remove "A" and "B" SLC pumps from service(if in operation).
- CRS secures SLC (if initiated) and exits HC.OP-EO.ZZ-0101A, ATWS-RPV Control, enters HC.OP-EO.ZZ-0101 and directs RO/PO to maintain RPV level between +12.5" to +54".
- CRS directs RO/PO to commence an RPV depressurization and cooldown and to maintain cooldown rate below 90° F/hr.

Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when all rods are "Full In", and RPV water level is being restored to between +12.5" and +54".

VI. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
- B. ES-604 Dynamic Simulator Requalification Examination Standard
- C. K/A Catalog
- D. JTA Listing
- E. Hope Creek Generating Station Probabilistic Risk Assessment
- F. Technical Specifications
- G. Emergency Plan (ECG)
- H. Alarm Response Procedures (Various)
- I. NC.TQ-TC.ZZ-0028 Conduct of Simulator Training
- J. HC.OP-AB.ZZ-0105 Loss of CRD Regulating Function
- K. HC.OP-AB.ZZ-0108 LPRM/APRM Malfunction
- L. HC.OP-AB.ZZ-0115 Loss of Reactor Building Integrity
- M. HC.OP-AB.ZZ-0136 Loss of 120 VAC Inverter
- N. HC.OP-AB.ZZ-0148 Turbine Auxiliaries Cooling System Malfunction
- O. HC.OP-AP.ZZ-0108 Operability Assessment and Equipment Control Program
- P. HC.OP-EO.ZZ-0101 RPV Control
- Q. HC.OP-EO.ZZ-0101A ATWS-RPV Control
- R. HC.OP-EO.ZZ-0102 Primary Containment Control
- S. HC.OP-EO.ZZ-0320 Performing ARI and RPS Interlocks
- T. HC.OP-EO.ZZ-0322 HPCI Core Spray Injection Valve Override
- U. HC.OP-IS.BJ-0001 HPCI Main and Booster Pump Set-OP204&OP217-In-Service Test
- V. HC.OP-SO.GU-0001 Filtration, Recirculation and Ventilation System Operation
- W. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards
- X. SH.OP-DD.ZZ-0004 Operations Standards

ESG CRITICAL TASK RATIONAL**ESG-NRC-03 / 00**

1.

- * **CREW takes manual control of RCIC flow controller to control RPV water level IAW HC.OP-EO.ZZ-0101A, and maintain RPV water level greater than -190" when the Rx is not shut down. (K/A 295037 EA2.02 4.1/4.2)**

Sufficient injection capability remains to maintain reactor water level above -190 IN. If the crew cannot maintain reactor water level above this level, emergency depressurization is required. Under ATWS conditions, this is a degraded control strategy.

2.

- * **Crew inserts control rods via RMCS and/or, when the SDV is drained (annunciator C6-E4 clear), Crew implements a manual scram IAW HC.OP-EO.ZZ-0320 to initiate rod insertion. (K/A 295037 EA1.01 4.6/4.6)
(K/A 295037 EA1.07 3.9/4.0)**

Implementation of HC.OP-EO.ZZ-0320 and/or manual insertion of control rods via the reactor manual control system will insert control rods (at least partial insertion for manual scram) to terminate the ATWS event and prevent fuel damage caused by a local criticality.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 1, 100% RTP, MAIN GEN. OUTPUT: 1092 MWe

RISK MATRIX COLOR: Green

RIVER TEMPERATURE: 65°F

'B' CHANNEL WORK WEEK – BLUE Folders

Major activities accomplished last shift:

- Complete HPCI IST HC.OP-IS.BJ-0001; procedure is complete through step 5.1.16, with system fill and vent complete. All support personnel/test equipment are ready for test completion. Suppression pool level is at 75" to support the test.

Major activities scheduled for this shift:

- Complete IST HC.OP-IS.BJ-0001.

OPERATIONS SUPERINTENDENT ISSUES	
Sys/Equip Problems	
Protected Equipment	
Update Status	
Action Plans	

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action
00-150	Planned	"B" RHR in SP Cooling (3.5.1.b.1)	+30 d.	None

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

- B RHR in suppression pool cooling to support HPCI test.

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-03

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM:

☐ L.O. REQUAL

☒ INITIAL LICENSE

☐ OTHER _____

REVISION SUMMARY:

PREPARED BY:

N/A
INSTRUCTOR

N/A
DATE

REVIEWED BY:

N/A
EP REPRESENTATIVE

N/A
DATE

APPROVED BY:

N/A
TRAINING SUPERVISOR

N/A
DATE

APPROVED BY:

N/A
OPS MANAGER OR DESIGNEE

N/A
DATE

I. OBJECTIVE(S):

The Candidates must demonstrate the ability to operate effectively as a team while completing a series of CRITICAL TASKS, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an “*”).

II. MAJOR EVENTS:

- A. HPCI In-service Test
- B. HPCI oil leak
- C. CRD pump trip
- D. Recirculation Flow unit failure
- E. Recirculation System Speed Control Fails Low
- F. Loss of 1CD482/TACS recovery
- G. MSIV Closure/Reactor scram/stuck control rods
- H. RCIC flow controller failure in Auto

III. SCENARIO SUMMARY:

The scenario begins with the plant at 100% power. HPCI In-service test in progress. HPCI develops an oil leak during operation, requiring the system shutdown and declared inoperable. The CRD Pump trips on overcurrent. The standby CRD Pump is placed in service and the system returned to normal. Then a Recirculation Flow Unit fails. After actions to bypass the Flow Unit and resetting RPS are complete, the A Recirculation Pump speed control signal fails. When power is stabilized, the crew will be directed to reduce the speed of the operating pump to meet Technical Specification requirements. An inverter failure occurs that requires the operators to transfer TACS to the standby SACS loop. The operator will have to re-open the TACS common supply valves in order to continue plant operation.

An inadvertent MSIV closure causes the Reactor to scram. 4 control rods do not insert on the scram. ATWS control strategies are used to insert these control rods. The MSIV closure and inoperable HPCI make RCIC operation required to maintain RPV water level above -190 inches. A RCIC flow controller failure requires the operator to take manual control of RCIC to control level.

The scenario may be terminated when all control rods are fully inserted, RPV water level is being controlled above 12.5 inches, and primary containment parameters are under control.

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-01; 100% power, MOL, Xe equilibrium, pull sequence step #727.

Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT:

Description
1. NONE
2.
3.

OTHER CONDITIONS:

Description
1. Set up HPCI surveillance test HC.OP-IS.BJ-0001 through step 5.1.16. Lower power by 10 Mwe.
2. Place B RHR in Suppression Pool cooling.
3. Lower Suppression Pool level to 75 inches.
4. Obtain DL-26 Attachment 3m.

MALFUNCTIONS:

Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1. CD032203		Pre-insert			STUCK CONTROL ROD 22-03
2. CD034259		Pre-insert			STUCK CONTROL ROD 42-59
3. CD031835		Pre-insert			STUCK CONTROL ROD 18-35
4. CD031823		Pre-insert			STUCK CONTROL ROD 18-23
5. HP06M		1/None			HPCI AUX OIL PUMP OIL LINE BREAK
6. CD10A		2/None			CRD PUMP A FAILURE
7. RR19B1	0	3/None			RECIRC FLOW TRANSMITTER B FAILURE
8. RR01A		4/None			RECIRC SYSTEM A SPEED CONTROL FAILS LOW
9. ED09C2		5/None			LOSS OF 120 VAC CLASS 1E INVERTER CD482
10. MS15		None/2			SPURIOUS GROUP 1 ISOLATION (MSIV CLOSURE)
11. RC03		None/1			RCIC TURBINE SPEED CONTROL FAILURE
12.					
13.					

I/O OVERRIDES

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
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1.	NONE					
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2.						
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REMOTES:

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
--	---------	-------	---------	-------	------	-------------

1.	RR07A	OFF	None/4			POSITIONER A POWER SWITCH
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2.						
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3.						
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4.						
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5.						
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EVENT TRIGGERS

1.	RCNP >= 0.5 //RCIC pump speed
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2.	ISTRIGGER_ACT(7) > 0 ET_ARRAY(3) > 0 // RT-6 activated or RPS scram
----	--

3.	RP:K14A <1 && RP:K14B <1 // RPS scrammed
----	--

4.	ZARRS621(5) <= 0.65 // RECIRC PUMP SPEED APPROXIMATELY 65%
----	--

5.	
----	--

V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event/ Instructor Activity	Expected Plant/Student Response	Comments
1. HPCI In-service Test	<ul style="list-style-type: none"> • PO continues HPCI surveillance test in accordance with HC.OP-IS.BJ-0001. • PO Starts the HPCI turbine and establishes proper system flow. 	
2. HPCI oil leak Insert RT-1 when HPCI turbine is in operation or at the discretion of the lead examiner		
<p>Respond as EO to HPCI when directed and report an oil leak. Oil is still spraying into the room(if the oil pump is still in operation).</p> <p>Support opening of oil pump breaker if requested.</p> <p>14 day LCO</p>	<ul style="list-style-type: none"> • CRS orders the PO to secure from the HPCI surveillance. • PO secures HPCI and restores the system to normal operations with the exception(s) given by the CRS. • CRS declares HPCI inoperable and evaluates Technical Specifications 3.5.1.c to determine required actions. 	
3. CRD pump trip. Insert RT-2 when Technical Specification actions are taken or at the discretion of the lead examiner.		
	<ul style="list-style-type: none"> • Crew recognizes the trip of the A CRD pump and informs the CRS. • CRS directs action in accordance with HC.OP-AB.ZZ-0105. <ul style="list-style-type: none"> - Start the standby CRD pump • RO starts the B CRD pump and restores the CRD system in accordance with Section 5.2.6 HC.OP-SO.BF-0001, or Annunciator C6-F2 response given in HC.OP-AR.ZZ-0011. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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4. Recirculation Flow unit failure.

Insert RT-3 when CRD is restored or at the discretion of the lead examiner

Note: When crew requests I&C to adjust B RR Flow Unit output, **raise severity of RR19B1 to 100%**, and report as I&C that the signal has been adjusted.

Tracking LCO

- Crew recognizes failure of the B RR Flow Unit and reports this to the CRS.

- CRS directs actions in accordance with HC.OP-AB.ZZ-0108, and C6-D1 of HC.OP-AR.ZZ-0011.
 - Monitor for thermal hydraulic instabilities in accordance with HC.OP-AB.ZZ-0300.
 - Bypass the B RR flow unit
 - When I&C has adjusted Flow Unit output, reset RPS
- RO resets RPS in accordance with HC.OP-SO.SB-0001.
- CRS refers to Technical Specification 3.3.6.

5. Recirculation System Speed Control Failure.

Insert RT-4 when RPS has been reset or at the discretion of the lead examiner

2 hour LCO to restore speed differential to less than 5%.

Note: Respond as I&C; take approximately 6 hours to troubleshoot the problem.

- Crew recognizes failure of the A RR Pump Runback Circuit and informs the CRS.
- CRS directs monitoring of Reactor power, level and pressure
- RO reports status of Reactor power, level, and pressure.
- CRS refers to Technical Specification 3.4.1.3.
- CRS contacts I&C for assistance.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>Note: May be required to prompt the power reduction. Call as Operations Manager and direct power reduction.</p> <p>Respond, if required, that brake cannot be disengaged.</p> <p>Note: Respond as RE, reduction of B RR Pump speed to approximately 65%. No control rod motion should be required and 15% power change should not be exceeded.</p> <p>TS 4.4.5</p> <p>Note: May be required to prompt the power reduction. Call as Operations Manager and direct power reduction.</p>	<ul style="list-style-type: none"> • CRS may direct actions to locally operate the A RR Pump Scoop Tube. • CRS contacts RE for guidance. • CRS may direct Chemistry and Rad Pro to take Tech Spec samples due to the rapid power change. (Conservative) • CRS directs power reduction in accordance with RE's guidance and Section 5.2 of HC.OP-IO.ZZ-0006. • RO reduces A RR Pump speed in accordance with RE's guidance and Section 5.2 of HC.OP-SO.BB-0002. 	
<p>6. Loss of 1CD482/TACS recovery.</p> <p>Insert RT-5 when power has been reduced with RR by approximately 5%, or at the discretion of the lead examiner.</p>	<ul style="list-style-type: none"> • Crew recognizes loss of an inverter and the loss of TACS and reports this to the CRS. • CRS directs actions to be taken in accordance with HC.OP-AB.ZZ-0136. <ul style="list-style-type: none"> - Monitor Reactor power, level, pressure, and Main Generator output. - Determine which inverter is failed. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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- RO reports power, level, pressure, and Main Generator output steady.
- CRS directs actions to be taken in accordance with HC.OP-AB.ZZ-0148.
 - Verifies no break in the TACS
 - Complete TACS transfer to the B STACS loop
 - Open TACS isolation valves HV-2522E AND F.
 - Open HV-2512B and close HV-2512A.
- PO opens HV-2522E, HV-2522F and HV-2512B, and closes HV-2512A and HV-2522A/2496A.
- Verifies transfer IAW Section 5.7 of HC.OP-SO.EG-0001.
- Crew recognizes loss of RBVS by observing Reactor Bldg dp at 0", RBVS & Wing Area HVAC panel trouble alarm(E6-C5), and informs the CRS
- CRS directs actions to restore Reactor Bldg dp in accordance with HC.OP-AB.ZZ-0115:
 - Place FRVS in service
- PO places FRVS in service in accordance with CRS directions and Section 5.3 of HC.OP-SO.GU-0001.

Note: If excessive sluicing occurs between the SACS loops, a total loss of TACS may occur. The crew will then be required to scram the reactor in accordance with AB-148. If the plant is scrammed, **ensure** ET-2 is active.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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8 hour LCO for 1CD482 restoration, EDG inoperable requires ST.ZZ-0001 and evaluation of other Tech Specs. CRS reviews HC.OP-AP.ZZ-0108 for applicability of supporting systems and declares those pumps supplied from the EDG as inoperable. CS and RHR. 3.0.3 entry is required due to HPCI inop, a CS, and a RHR system inoperable.

Note:

Support SACS and SSW pump realignments as required. **B SSW pump start required to maintain TACS Temperatures.**

- CRS declares 1CD482, and C EDG, C RHR, C CS inoperable and refers to Technical Specification 3.8.3.1, 3.8.1.1, and 3.5.1.

7. MSIV closure/Reactor scram/stuck control rods.

Insert ET-2 when actions are complete for the loss of 1CD482, at the discretion of the lead examiner, or ensure ET-2 is active if the plant is scrammed during the loss of the inverter.

- Crew determines the closure of the MSIVs and the Reactor scram, and reports this to the CRS.
- CRS directs scram actions be taken.
- RO places and locks the Mode Switch in Shutdown and performs scram actions.
- CREW determines all control rods are NOT inserted to or beyond position 02 via CRIDS, SPDS and/or NSSS computer, and informs CRS.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>NOTE: CRS may direct a more restrictive level control band.</p>	<ul style="list-style-type: none"> CRS implements HC.OP-EO.ZZ-0101A, ATWS-RPV Control, to control Rx power and directs: <ul style="list-style-type: none"> control of RPV water level between +54" and -190" scram actions 	
<p>8. RCIC flow controller failure in Auto.</p> <p>Ensure RG03 active on RCIC initiation.</p>	<ul style="list-style-type: none"> PO recognizes failure of RCIC flow controller in Automatic and informs the CRS. CRS directs PO to take manual control of RCIC to maintain RPV level and SRVs to control Reactor pressure. * CREW takes manual control of RCIC flow controller to control RPV water level IAW HC.OP-EO.ZZ-0101A, and maintain RPV water level greater than -190" when the Rx is not shut down. <p>(K/A 295037 EA2.02 4.1/4.2)</p> <ul style="list-style-type: none"> PO takes manual control of RCIC and maintains RPV water level as directed. PO takes control of the SRVs and maintains RPV pressure as directed. RO/PO verifies RRCS has initiated if an initiation signal is reached and informs CRS. CRS enters HC.OP-EO.ZZ-0102 if Suppression Pool temperature exceeds 95F, and directs PO to place RHR in Suppression Pool Cooling PO places RHR in Suppression Pool Cooling as directed in accordance with Section 5.5 of HC.OP-SO.BC-0001. CREW manually initiates RRCS (ARI) if not already initiated. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>Clear CD032203, CD034259, CD031835, and CD031823 when the SDV is full. (Use SDV monitor to determine when the SDV is full.) This will allow rod movement by RMCS or EOP-320.</p> <p>Note: Support completion of HC.OP-EO.ZZ-0320 and inform the crew when completed in the field.</p>	<ul style="list-style-type: none"> • PO inhibits ADS IAW CRS direction. • CRS directs SLC initiation before suppression pool temperature reaches 150°F • RO/PO initiates SLC pumps when directed. • CRS directs bypassing the RWM to enable the insertion of control rods using RMCS. • RO bypasses RWM and inserts control rods. • CRS may direct implementation of HC.OP-EO.ZZ-0320 and resets RPS. • CRS directs RO to arm and depress RPS scram pushbuttons when overhead alarm C6-E4, CRD Scram Discharge Volume Not Drained, is extinguished. • RO initiates a manual scram by arming and depressing RPS scram pushbuttons. (If Control Rods are were not inserted previously.) • CREW observes control rod movement via full core display, CRIDS, 4-rod display, and/or NSSS computer. • * Crew inserts control rods via RMCS and/or, when the SDV is drained (annunciator C6-E4 clear), Crew implements a manual scram IAW HC.OP-EO.ZZ-0320 to initiate rod insertion. <p>(K/A 295037 EA1.01 4.6/4.6) (K/A 295037 EA1.07 3.9/4.0)</p>	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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- CRS directs RO to remove "A" and "B" SLC pumps from service(if in operation).
- CRS secures SLC (if initiated) and exits HC.OP-EO.ZZ-0101A, ATWS-RPV Control, enters HC.OP-EO.ZZ-0101 and directs RO/PO to maintain RPV level between +12.5" to +54".
- CRS directs RO/PO to commence an RPV depressurization and cooldown and to maintain cooldown rate below 90° F/hr.

Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when all rods are "Full In", and RPV water level is being restored to between +12.5" and +54".

VI. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
- B. ES-604 Dynamic Simulator Requalification Examination Standard
- C. K/A Catalog
- D. JTA Listing
- E. Hope Creek Generating Station Probabilistic Risk Assessment
- F. Technical Specifications
- G. Emergency Plan (ECG)
- H. Alarm Response Procedures (Various)
 - I. NC.TQ-TC.ZZ-0028 Conduct of Simulator Training
 - J. HC.OP-AB.ZZ-0105 Loss of CRD Regulating Function
 - K. HC.OP-AB.ZZ-0108 LPRM/APRM Malfunction
 - L. HC.OP-AB.ZZ-0115 Loss of Reactor Building Integrity
 - M. HC.OP-AB.ZZ-0136 Loss of 120 VAC Inverter
 - N. HC.OP-AB.ZZ-0148 Turbine Auxiliaries Cooling System Malfunction
 - O. HC.OP-AP.ZZ-0108 Operability Assessment and Equipment Control Program
 - P. HC.OP-EO.ZZ-0101 RPV Control
 - Q. HC.OP-EO.ZZ-0101A ATWS-RPV Control
 - R. HC.OP-EO.ZZ-0102 Primary Containment Control
 - S. HC.OP-EO.ZZ-0320 Performing ARI and RPS Interlocks
 - T. HC.OP-EO.ZZ-0322 HPCI Core Spray Injection Valve Override
 - U. HC.OP-IS.BJ-0001 HPCI Main and Booster Pump Set-OP204&OP217-In-Service Test
 - V. HC.OP-SO.GU-0001 Filtration, Recirculation and Ventilation System Operation
 - W. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards
 - X. SH.OP-DD.ZZ-0004 Operations Standards

ESG CRITICAL TASK RATIONAL**ESG-NRC-03 / 00**

1.

- * **CREW takes manual control of RCIC flow controller to control RPV water level IAW HC.OP-EO.ZZ-0101A, and maintain RPV water level greater than -190" when the Rx is not shut down. (K/A 295037 EA2.02 4.1/4.2)**

Sufficient injection capability remains to maintain reactor water level above -190 IN. If the crew cannot maintain reactor water level above this level, emergency depressurization is required. Under ATWS conditions, this is a degraded control strategy.

2.

- * **Crew inserts control rods via RMCS and/or, when the SDV is drained (annunciator C6-E4 clear), Crew implements a manual scram IAW HC.OP-EO.ZZ-0320 to initiate rod insertion. (K/A 295037 EA1.01 4.6/4.6)
(K/A 295037 EA1.07 3.9/4.0)**

Implementation of HC.OP-EO.ZZ-0320 and/or manual insertion of control rods via the reactor manual control system will insert control rods (at least partial insertion for manual scram) to terminate the ATWS event and prevent fuel damage caused by a local criticality.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 1, 100% RTP, MAIN GEN. OUTPUT: 1092 MWe

RISK MATRIX COLOR: Green

RIVER TEMPERATURE: 65°F

'B' CHANNEL WORK WEEK – BLUE Folders

Major activities accomplished last shift:

- Complete HPCI IST HC.OP-IS.BJ-0001; procedure is complete through step 5.1.16, with system fill and vent complete. All support personnel/test equipment are ready for test completion. Suppression pool level is at 75" to support the test.

Major activities scheduled for this shift:

- Complete IST HC.OP-IS.BJ-0001.

OPERATIONS SUPERINTENDENT ISSUES	
Sys/Equip Problems	
Protected Equipment	
Update Status	
Action Plans	

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action
00-150	Planned	"B" RHR in SP Cooling (3.5.1.b.1)	+30 d.	None

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

- B RHR in suppression pool cooling to support HPCI test.

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-03

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM:

☐ L.O. REQUAL

☒ INITIAL LICENSE

☐ OTHER _____

REVISION SUMMARY:

PREPARED BY:

N/A
INSTRUCTOR

N/A
DATE

REVIEWED BY:

N/A
EP REPRESENTATIVE

N/A
DATE

APPROVED BY:

N/A
TRAINING SUPERVISOR

N/A
DATE

APPROVED BY:

N/A
OPS MANAGER OR DESIGNEE

N/A
DATE

I. OBJECTIVE(S):

The Candidates must demonstrate the ability to operate effectively as a team while completing a series of CRITICAL TASKS, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an “*”).

II. MAJOR EVENTS:

- A. HPCI In-service Test
- B. HPCI oil leak
- C. CRD pump trip
- D. Recirculation Flow unit failure
- E. Recirculation System Speed Control Fails Low
- F. Loss of 1CD482/TACS recovery
- G. MSIV Closure/Reactor scram/stuck control rods
- H. RCIC flow controller failure in Auto

III. SCENARIO SUMMARY:

The scenario begins with the plant at 100% power. HPCI In-service test in progress. HPCI develops an oil leak during operation, requiring the system shutdown and declared inoperable. The CRD Pump trips on overcurrent. The standby CRD Pump is placed in service and the system returned to normal. Then a Recirculation Flow Unit fails. After actions to bypass the Flow Unit and resetting RPS are complete, the A Recirculation Pump speed control signal fails. When power is stabilized, the crew will be directed to reduce the speed of the operating pump to meet Technical Specification requirements. An inverter failure occurs that requires the operators to transfer TACS to the standby SACS loop. The operator will have to re-open the TACS common supply valves in order to continue plant operation.

An inadvertent MSIV closure causes the Reactor to scram. 4 control rods do not insert on the scram. ATWS control strategies are used to insert these control rods. The MSIV closure and inoperable HPCI make RCIC operation required to maintain RPV water level above -190 inches. A RCIC flow controller failure requires the operator to take manual control of RCIC to control level.

The scenario may be terminated when all control rods are fully inserted, RPV water level is being controlled above 12.5 inches, and primary containment parameters are under control.

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-01; 100% power, MOL, Xe equilibrium, pull sequence step #727.

Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT:

Description
1. NONE
2.
3.

OTHER CONDITIONS:

Description
1. Set up HPCI surveillance test HC.OP-IS.BJ-0001 through step 5.1.16. Lower power by 10 Mwe.
2. Place B RHR in Suppression Pool cooling.
3. Lower Suppression Pool level to 75 inches.
4. Obtain DL-26 Attachment 3m.

MALFUNCTIONS:

Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1. CD032203		Pre-insert			STUCK CONTROL ROD 22-03
2. CD034259		Pre-insert			STUCK CONTROL ROD 42-59
3. CD031835		Pre-insert			STUCK CONTROL ROD 18-35
4. CD031823		Pre-insert			STUCK CONTROL ROD 18-23
5. HP06M		1/None			HPCI AUX OIL PUMP OIL LINE BREAK
6. CD10A		2/None			CRD PUMP A FAILURE
7. RR19B1	0	3/None			RECIRC FLOW TRANSMITTER B FAILURE
8. RR01A		4/None			RECIRC SYSTEM A SPEED CONTROL FAILS LOW
9. ED09C2		5/None			LOSS OF 120 VAC CLASS 1E INVERTER CD482
10. MS15		None/2			SPURIOUS GROUP 1 ISOLATION (MSIV CLOSURE)
11. RC03		None/1			RCIC TURBINE SPEED CONTROL FAILURE
12.					
13.					

I/O OVERRIDES:

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
--	------------	-------	-------	-------	------	-------------

1.	NONE					
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2.						
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REMOTES:

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
--	---------	-------	---------	-------	------	-------------

1.	RR07A	OFF	None/4			POSITIONER A POWER SWITCH
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2.						
----	--	--	--	--	--	--

3.						
----	--	--	--	--	--	--

4.						
----	--	--	--	--	--	--

5.						
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EVENT TRIGGERS

1.	RCNP >= 0.5 //RCIC pump speed
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2.	ISTRIGGER_ACT(7) > 0 ET_ARRAY(3) > 0 // RT-6 activated or RPS scram
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3.	RP:K14A <1 && RP:K14B <1 // RPS scrammed
----	--

4.	ZARRS621(5) <= 0.65 // RECIRC PUMP SPEED APPROXIMATELY 65%
----	--

5.	
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V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event / Instructor Activity	Expected Plant/Student Response	Comments
<div>1. <u>HPCI In-service Test</u></div>	<ul style="list-style-type: none">• PO continues HPCI surveillance test in accordance with HC.OP-IS.BJ-0001.• PO Starts the HPCI turbine and establishes proper system flow.	
<div>2. <u>HPCI oil leak</u></div> <div>Insert RT-1 when HPCI turbine is in operation or at the discretion of the lead examiner.</div> <div>Respond as EO to HPCI when directed and report an oil leak. Oil is still spraying into the room(if the oil pump is still in operation).</div> <div>Support opening of oil pump breaker if requested.</div> <div>14 day LCO</div>	<ul style="list-style-type: none">• PO notices indications of an HPCI oil leak and informs the CRS.• CRS orders the PO to secure from the HPCI surveillance.• PO secures HPCI and restores the system to normal operations with the exception(s) given by the CRS.• CRS declares HPCI inoperable and evaluates Technical Specifications 3.5.1.c to determine required actions.	
<div>3. <u>CRD pump trip.</u></div> <div>Insert RT-2 when Technical Specification actions are taken or at the discretion of the lead examiner.</div>	<ul style="list-style-type: none">• Crew recognizes the trip of the A CRD pump and informs the CRS.• CRS directs action in accordance with HC.OP-AB.ZZ-0105.<ul style="list-style-type: none">- Start the standby CRD pump• RO starts the B CRD pump and restores the CRD system in accordance with Section 5.2.6 HC.OP-SO.BF-0001, or Annunciator C6-F2 response given in HC.OP-AR.ZZ-0011.	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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4. **Recirculation Flow unit failure.**

Insert RT-3 when CRD is restored or at the discretion of the lead examiner.

Note: When crew requests I&C to adjust B RR Flow Unit output, **raise severity of RR19B1 to 100%**, and report as I&C that the signal has been adjusted.

Tracking LCO

- Crew recognizes failure of the B RR Flow Unit and reports this to the CRS.
- CRS directs actions in accordance with HC.OP-AB.ZZ-0108, and C6-D1 of HC.OP-AR.ZZ-0011.
 - Monitor for thermal hydraulic instabilities in accordance with HC.OP-AB.ZZ-0300.
 - Bypass the B RR flow unit
 - When I&C has adjusted Flow Unit output, reset RPS
- RO resets RPS in accordance with HC.OP-SO.SB-0001.
- CRS refers to Technical Specification 3.3.6.

5. **Recirculation System Speed Control Failure.**

Insert RT-4 when RPS has been reset or at the discretion of the lead examiner.

2 hour LCO to restore speed differential to less than 5%.

Note: Respond as I&C; take approximately 6 hours to troubleshoot the problem.

- Crew recognizes failure of the A RR Pump Runback Circuit and informs the CRS.
- CRS directs monitoring of Reactor power, level and pressure
- RO reports status of Reactor power, level, and pressure.
- CRS refers to Technical Specification 3.4.1.3.
- CRS contacts I&C for assistance.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>Note: May be required to prompt the power reduction. Call as Operations Manager and direct power reduction.</p> <p>Respond, if required, that brake cannot be disengaged.</p> <p>Note: Respond as RE, reduction of B RR Pump speed to approximately 65%. No control rod motion should be required and 15% power change should not be exceeded.</p> <p>TS 4.4.5</p> <p>Note: May be required to prompt the power reduction. Call as Operations Manager and direct power reduction.</p>	<ul style="list-style-type: none"> • CRS may direct actions to locally operate the A RR Pump Scoop Tube. • CRS contacts RE for guidance. • CRS may direct Chemistry and Rad Pro to take Tech Spec samples due to the rapid power change. (Conservative) • CRS directs power reduction in accordance with RE's guidance and Section 5.2 of HC.OP-IO.ZZ-0006. • RO reduces A RR Pump speed in accordance with RE's guidance and Section 5.2 of HC.OP-SO.BB-0002. 	
<p>6. Loss of 1CD482/TACS recovery.</p> <p>Insert RT-5 when power has been reduced with RR by approximately 5%, or at the discretion of the lead examiner.</p>	<ul style="list-style-type: none"> • Crew recognizes loss of an inverter and the loss of TACS and reports this to the CRS. • CRS directs actions to be taken in accordance with HC.OP-AB.ZZ-0136. <ul style="list-style-type: none"> - Monitor Reactor power, level, pressure, and Main Generator output. - Determine which inverter is failed. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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- RO reports power, level, pressure, and Main Generator output steady.
- CRS directs actions to be taken in accordance with HC.OP-AB.ZZ-0148.
 - Verifies no break in the TACS
 - Complete TACS transfer to the B STACS loop
 - Open TACS isolation valves HV-2522E AND F.
 - Open HV-2512B and close HV-2512A.
- PO opens HV-2522E, HV-2522F and HV-2512B, and closes HV-2512A and HV-2522A/2496A.
- Verifies transfer IAW Section 5.7 of HC.OP-SO.EG-0001.
- Crew recognizes loss of RBVS by observing Reactor Bldg dp at 0", RBVS & Wing Area HVAC panel trouble alarm(E6-C5), and informs the CRS
- CRS directs actions to restore Reactor Bldg dp in accordance with HC.OP-AB.ZZ-0115:
 - Place FRVS in service
- PO places FRVS in service in accordance with CRS directions and Section 5.3 of HC.OP-SO.GU-0001.

Note: If excessive sluicing occurs between the SACS loops, a total loss of TACS may occur. The crew will then be required to scram the reactor in accordance with AB-148. If the plant is scrammed, **ensure** ET-2 is active.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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8 hour LCO for 1CD482 restoration, EDG inoperable requires ST.ZZ-0001 and evaluation of other Tech Specs. CRS reviews HC.OP-AP.ZZ-0108 for applicability of supporting systems and declares those pumps supplied from the EDG as inoperable. CS and RHR. 3.0.3 entry is required due to HPCI inop, a CS, and a RHR system inoperable.

Note:

Support SACS and SSW pump realignments as required. **B SSW pump start required to maintain TACS Temperatures.**

- CRS declares 1CD482, and C EDG, C RHR, C CS inoperable and refers to Technical Specification 3.8.3.1, 3.8.1.1, and 3.5.1.

7. MSIV closure/Reactor scram/stuck control rods.

Insert ET-2 when actions are complete for the loss of 1CD482, at the discretion of the lead examiner, or ensure ET-2 is active if the plant is scrammed during the loss of the inverter.

- Crew determines the closure of the MSIVs and the Reactor scram, and reports this to the CRS.
- CRS directs scram actions be taken.
- RO places and locks the Mode Switch in Shutdown and performs scram actions.
- CREW determines all control rods are NOT inserted to or beyond position 02 via CRIDS, SPDS and/or NSSS computer, and informs CRS.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>NOTE: CRS may direct a more restrictive level control band.</p>	<ul style="list-style-type: none"> CRS implements HC.OP-EO.ZZ-0101A, ATWS-RPV Control, to control Rx power and directs: <ul style="list-style-type: none"> - control of RPV water level between +54" and -190" - scram actions 	
<p>8. RCIC flow controller failure in Auto.</p> <p>Ensure RC03 active on RCIC initiation.</p>	<ul style="list-style-type: none"> PO recognizes failure of RCIC flow controller in Automatic and informs the CRS. CRS directs PO to take manual control of RCIC to maintain RPV level and SRVs to control Reactor pressure. * CREW takes manual control of RCIC flow controller to control RPV water level IAW HC.OP-EO.ZZ-0101A, and maintain RPV water level greater than -190" when the Rx is not shut down. <p>(K/A 295037 EA2.02 4.1/4.2)</p> <ul style="list-style-type: none"> PO takes manual control of RCIC and maintains RPV water level as directed. PO takes control of the SRVs and maintains RPV pressure as directed. RO/PO verifies RRCS has initiated if an initiation signal is reached and informs CRS. CRS enters HC.OP-EO.ZZ-0102 if Suppression Pool temperature exceeds 95F, and directs PO to place RHR in Suppression Pool Cooling PO places RHR in Suppression Pool Cooling as directed in accordance with Section 5.5 of HC.OP-SO.BC-0001. CREW manually initiates RRCS (ARI) if not already initiated. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>Clear CD032203, CD034259, CD031835, and CD031823 when the SDV is full. (Use SDV monitor to determine when the SDV is full.) This will allow rod movement by RMCS or EOP-320.</p> <p>Note: Support completion of HC.OP-EO.ZZ-0320 and inform the crew when completed in the field.</p>	<ul style="list-style-type: none"> • PO inhibits ADS IAW CRS direction. • CRS directs SLC initiation before suppression pool temperature reaches 150°F • RO/PO initiates SLC pumps when directed. • CRS directs bypassing the RWM to enable the insertion of control rods using RMCS. • RO bypasses RWM and inserts control rods. • CRS may direct implementation of HC.OP-EO.ZZ-0320 and resets RPS. • CRS directs RO to arm and depress RPS scram pushbuttons when overhead alarm C6-E4, CRD Scram Discharge Volume Not Drained, is extinguished. • RO initiates a manual scram by arming and depressing RPS scram pushbuttons. (If Control Rods are were not inserted previously.) • CREW observes control rod movement via full core display, CRIDS, 4-rod display, and/or NSSS computer. • * Crew inserts control rods via RMCS and/or, when the SDV is drained (annunciator C6-E4 clear), Crew implements a manual scram IAW HC.OP-EO.ZZ-0320 to initiate rod insertion. <p>(K/A 295037 EA1.01 4.6/4.6) (K/A 295037 EA1.07 3.9/4.0)</p>	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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- CRS directs RO to remove "A" and "B" SLC pumps from service(if in operation).
- CRS secures SLC (if initiated) and exits HC.OP-EO.ZZ-0101A, ATWS-RPV Control, enters HC.OP-EO.ZZ-0101 and directs RO/PO to maintain RPV level between +12.5" to +54".
- CRS directs RO/PO to commence an RPV depressurization and cooldown and to maintain cooldown rate below 90° F/hr.

Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when all rods are "Full In" and RPV water level is being restored to between +12.5" and +54".

VI. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
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 - M. HC.OP-AB.ZZ-0136 Loss of 120 VAC Inverter
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 - S. HC.OP-EO.ZZ-0320 Performing ARI and RPS Interlocks
 - T. HC.OP-EO.ZZ-0322 HPCI Core Spray Injection Valve Override
 - U. HC.OP-IS.BJ-0001 HPCI Main and Booster Pump Set-OP204&OP217-In-Service Test
 - V. HC.OP-SO.GU-0001 Filtration, Recirculation and Ventilation System Operation
 - W. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards
 - X. SH.OP-DD.ZZ-0004 Operations Standards

ESG CRITICAL TASK RATIONAL**ESG-NRC-03 / 00**

1.

- * **CREW takes manual control of RCIC flow controller to control RPV water level IAW HC.OP-EO.ZZ-0101A, and maintain RPV water level greater than -190" when the Rx is not shut down. (K/A 295037 EA2.02 4.1/4.2)**

Sufficient injection capability remains to maintain reactor water level above -190 IN. If the crew cannot maintain reactor water level above this level, emergency depressurization is required. Under ATWS conditions, this is a degraded control strategy.

2.

- * **Crew inserts control rods via RMCS and/or, when the SDV is drained (annunciator C6-E4 clear), Crew implements a manual scram IAW HC.OP-EO.ZZ-0320 to initiate rod insertion. (K/A 295037 EA1.01 4.6/4.6)
(K/A 295037 EA1.07 3.9/4.0)**

Implementation of HC.OP-EO.ZZ-0320 and/or manual insertion of control rods via the reactor manual control system will insert control rods (at least partial insertion for manual scram) to terminate the ATWS event and prevent fuel damage caused by a local criticality.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 1, 100% RTP, MAIN GEN. OUTPUT: 1092 MWe

RISK MATRIX COLOR: Green

RIVER TEMPERATURE: 65°F

'B' CHANNEL WORK WEEK – BLUE Folders

Major activities accomplished last shift:

- Complete HPCI IST HC.OP-IS.BJ-0001; procedure is complete through step 5.1.16, with system fill and vent complete. All support personnel/test equipment are ready for test completion. Suppression pool level is at 75" to support the test.

Major activities scheduled for this shift:

- Complete IST HC.OP-IS.BJ-0001.

OPERATIONS SUPERINTENDENT ISSUES:	
Sys/Equip Problems	
Protected Equipment	
Update Status	
Action Plans	

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action
00-150	Planned	"B" RHR in SP Cooling (3.5.1.b.1)	+30 d.	None

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

- B RHR in suppression pool cooling to support HPCI test.

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-04

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM:

☐ L.O. REQUAL

☒ INITIAL LICENSE

☐ OTHER _____

REVISION SUMMARY:

PREPARED BY:

N/A
INSTRUCTOR

N/A
DATE

REVIEWED BY:

N/A
EP REPRESENTATIVE

N/A
DATE

APPROVED BY:

N/A
TRAINING SUPERVISOR

N/A
DATE

APPROVED BY:

N/A
OPS MANAGER OR DESIGNEE

N/A
DATE

I. OBJECTIVE(S):

- A. The Candidates must demonstrate the ability to operate effectively as a team while completing a series of CRITICAL TASKS, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an " *".)

II. MAJOR EVENTS:

- A. Synchronize Main Generator
- B. Raise Reactor power with control rods
- C. RWM Failure
- D. Control Rod Drift
- E. False Main Generator Core Monitor alarm
- F. **Loss of Reactor Building Ventilation**
- G. RWCU System leak/Failure to isolate
- H. Steam leak inside the drywell/Downcomer failure/ Emergency Depressurization
- I. 2 ADS SRVs fail to open

III. SCENARIO SUMMARY:

The scenario begins with the plant at 22% power. A Reactor Startup is in progress in accordance with HC.OP-IO.ZZ-0003. The crew will synchronize the Main Generator to the grid and raise power with control rods. During control rod withdrawal, the Rod Worth Minimizer will fail. The crew will bypass the RWM and take actions to allow the startup to continue in accordance with Technical Specifications. After actions for the control rod drift are complete, a Main Generator Core Monitor alarm is received. The crew will have to determine that the alarm is false. **A damper in the Reactor Building Ventilation System (RBVS) fails closed causing a loss of RBVS. FRVS will be required to be placed in service.** A leak develops from the RWCU system. The isolation valves will fail to automatically close. The crew will take actions to isolate the leak. A major steam leak occurs inside the drywell. Due to a Downcomer failure the Drywell pressure will raise to the action required region of the Pressure Suppression Pressure curve. This requires an Emergency Depressurization of the RPV in accordance with the Emergency Operating Procedures. 2 ADS valves will fail to open. The crew will open two additional SRVs.

The scenario may be terminated when all control rods are fully inserted, RPV water level is being controlled above 12.5 inches, and primary containment parameters are under control.

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-07; 22% power, MOL, Xe equilibrium, pull sequence step #377.

Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT:

	Description
1.	NONE
2.	

OTHER CONDITIONS:

	Description
1.	Make the Main Generator ready IAW HC.OP-SO.MA-0001, step 5.2.1.
2.	Pull rods through step 388
3.	Close HV-1459A, B, AND C, HTRS 1&2/DC, S/U AND OPR VENTS

MALFUNCTIONS:

	Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1.	CU11A		Pre-insert			RWCU VLV F001 FAILURE TO AUTO CLOSE
2.	CU11B		Pre-insert			RWCU VLV F004 FAILURE TO AUTO CLOSE
3.	AD02DC		Pre-insert			SAFETY RELIEF VALVE D FAILURE
4.	AD02BC		Pre-insert			SAFETY RELIEF VALVE B FAILURE
5.	CD19A		Pre-insert			CONTROL RODS BOUNCING ON SCRAM (2-4)
6.	CD18	10	Pre-insert			HIGH ROD WORTH
7.	CD025027		Pre-insert			CONTROL ROD DRIFTS OUT
8.	RS01		1/None			RWM WITHDRAW BLOCK
9.	EG02		2/None			MAIN GENERATOR CORE MONITOR ALARM
10.	CU03	100	4/None		120	RWCU SYSTEM LEAK
11.	MS01	30	5/None		720	STEAM LINE BREAK IN THE DRYWELL
12.	PC04		5/None			PRIMARY CONTAINMENT DOWNCOMER FAILURE
13.						

I/O OVERRIDES

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
___ 1.	1A159 E	OFF	3/None			DI HD-9414A OPEN-INBD EXH-REACTOR BUILDING
___ 2.	1A159 F	ON	3/None			DI HD-9414A CLOSE-INBD EXH-REACTOR BUILDING

REMOTES

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
___ 1.	NONE					
___ 2.						

EVENT TRIGGERS

- ___ 1. **ZCLCINSE > 0 && ZLLCWHIT(083) > 0 // Insert push button depressed and rod 50-27 selected**
Command: DMF CD025027
- ___ 2. **ZCLCCINS > 0 && ZLLCWHIT(083) > 0 // Cont. Insert push button depressed and rod 50-27 selected**
Command: DMF CD025027

V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event / Instructor Activity	Expected Plant/Student Response	Comments
1. Synchronize Main Generator	<ul style="list-style-type: none"> • CRS directs synchronizing the main generator in accordance with HC.OP-SO.MA-0001. • PO synchronizes the main generator in accordance with HC.OP-SO.MA-0001. 	
2. Raise Reactor power with control rods	<ul style="list-style-type: none"> • CRS directs continuation of power ascension in accordance with HC.OP-IO.ZZ-0003 and RE guidance. • RO withdraws control rods in accordance with Section 5.2, or 5.3, of HC.OP-SO.SF-0001 and RE guidance. 	
3. RWM Failure Insert RT-1 at the discretion of the lead examiner.	<ul style="list-style-type: none"> • RO observes failure of the RWM and informs the CRS. • CRS directs actions in accordance with Section 4.3 of HC.OP-AB.ZZ-0106: <ul style="list-style-type: none"> - Check operation of RWM - Notify I&C - Bypass RWM • CRS reviews Technical Specification 3.1.4.1 and directs bypassing the RWM in accordance with Section 5.2 of HC.OP-SO.SF-0003. • RO places the bypass switch for the RWM in BYPASS. • CRS directs continuation of startup. 	

Note: Respond as Reactor Engineer or additional qualified member of the plant staff if required.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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4. Control Rod Drift

Pre-inserted

Ensure CD025027 clears when the insert push button is depressed.

Note:
As the RE inform the CRS that you are evaluating rod recovery and that you will provide guidance soon.

- RO notices rod continuing to move outward by observing RPI and overhead alarm C6-E3, and informs the CRS.
- RO informs CRS of actions to be taken in accordance with HC.OP-AR.ZZ-0011.
- CRS directs actions in accordance with HC.OP-AB.ZZ-0102, and HC.OP-AB.ZZ-0204:
 - Insert control rods, in sequence, as necessary to reduce Reactor power
- CRS directs actions in accordance with HC.OP-AR.ZZ-0011:
 - Apply a continuous insert signal
- RO applies an insert signal; rod inserts; and informs the CRS.
- CRS directs removal of insert signal.
- RO removes the insert signal, notices rod remains at its current position, and notifies the CRS.
- CRS confers with the RE to determine actions for continuing Reactor startup.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

- CRS refers to Technical Specification 3.1.3.1.b for applicability

<p>5. False Main Generator Core Monitor alarm.</p> <p>Insert RT-2 when actions for the rod drift are complete or at the discretion of the lead examiner.</p>

Respond as TB to requests of Core Monitor Status. Flow is normal.

- RO/PO reports Gen Core Particulate High alarm E1-D2 and indications on the Core monitor to the CRS.
- PO depresses the Core Monitor Filter push button for 15-20 seconds and observes Core Monitor indication and reports to the CRS indications of a false Core Monitor alarm.

<p>6. Loss of Reactor Building Ventilation.</p> <p>Insert RT-3 when actions for the Core Monitor alarm are complete, or at the discretion of the lead examiner.</p>
--

- RO/PO reports alarm E6-C5, closure of HD-9414A, and indications of the loss of the RBVS to the CRS.
- CRS directs placing FRVS in service in accordance with HC.OP-AB.ZZ-0115 and HC.OP-AR.ZZ-0019.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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Note:
Support removal of RBVS.

- PO places FRVS in service in accordance with section 5.3 of HC.OP-SO.GU-0001.

**7. RWCU System
- leak/Failure to Isolate.**

Insert RT-4 when FRVS is in service, or at the discretion of the lead examiner.

Note:
The RWCU system may be manually isolated before the leak detection system timers time out.

- RO/PO reports RWCU alarms D3-B3, C1-A2, D3-B3, C1-C2, and indications of the RWCU system to the CRS.
- RO reports failure of F001 and F004 to automatically isolate to the CRS.
- CRS directs manual isolation of the RWCU system in accordance with HC.OP-AB.ZZ-0116, and HC.OP-AB.ZZ-0114:
 - Close F001 and F004
 - Close SV-4310 and 4311
- RO closes F001, F004, SV-4310 and 4311.
- * CREW isolates the RWCU system by shutting HV-F001 and/or HV-F004 within two minutes of confirming the automatic isolation failure.
(K/A 223002 A4.06 3.6/3.7)
(K/A 223002 A4.01 3.6/3.5)
- CRS directs actions for RWCU system isolation in accordance with HC.OP-AR.ZZ-0008.
- CRS refers to Technical Specification 3.4.4, 3.6.3, and 3.3.2

Conductivity sampling requirements. Containment isolation valves (if failure to auto isolate is noticed). Isolation instrumentation.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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<p>7. Steam leak inside the drywell/Downcomer failure/ Emergency Depressurization:</p> <p>Insert RT-5 when actions for the RWCU isolation are complete or at the discretion of the lead examiner.</p>
--

- Crew recognizes DRWL pressure at 1.68# via annunciators A7-D4, C5-B5, & LOCA initiation signals and informs CRS.
- CREW determines RPV water level, pressure, and containment parameters and informs CRS.
- CRS enters HC.OP-EO.ZZ-0101, RPV Control and directs actions to:
 - Control RPV water level above 12.5".
 - Verify ECCS actuates
 - Verify PCIS/NSSSS isolations
- RO places and locks the Rx mode switch in SHUTDOWN.
- RO inserts SRMs and IRMs and informs CRS.
- RO/PO verifies initiation of HPCI and RCIC and informs CRS.
- Crew determines that all control rods are not fully inserted via SPDS, CRIDS, and/or NSSS computer, and reports the positions of those rods to the CRS.
- Crew determines that the Reactor is shutdown under all conditions without boron.
- CRS directs closure of MSIVs to minimize the cool down rate.
- RO closes MSIVs as directed.
- RO/PO controls Reactor Pressure and level as directed

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p><u>NOTE:</u></p> <p>Level may not reach -129".</p>	<ul style="list-style-type: none"> • CRS enters and directs HC.OP-EO.ZZ-0102, Primary Containment Control, to control primary containment parameters. • CREW monitors RPV water level, pressure, and containment parameters and informs CRS. • CRS directs securing Reactor Recirculation Pumps if in operation. • RO secures Reactor Recirculation Pumps. • If reactor water level reaches -129", CRS directs action to inhibit ADS. 	
<p><u>NOTE:</u></p> <p>Crew should consider anticipating Emergency Depressurization using BPVs if the Main Condenser is available</p>	<ul style="list-style-type: none"> • PO inhibits ADS IAW CRS direction. • RO/PO verifies start of ECCS and EDGs and informs CRS. • CRS directs actions to spray the Drywell in accordance with HC.OP-EO.ZZ-0102. • PO places the RHR system in Drywell Sprays as directed in accordance with Section 5.6 of HC.OP-SO.BC-0001. • CRS recognizes suppression chamber pressure is in, or cannot be maintained below, the required action zone on the Pressure Suppression Pressure Curve. • CRS implements HC.OP-EO.ZZ-0202, Emergency Depressurization, and directs action to open five ADS valves. • PO reports to the CRS that 2 ADS valves failed to open. • CRS directs the opening of 2 additional SRVs. • PO opens the SRVs directed. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

- * CREW opens at least four SRVs to emergency depressurize the Rx before suppression chamber pressure reaches 55 psig, or within 2 minutes of exceeding the PSP curve.
(K/A 295030 EK3.01 3.8/4.1)
- RO/PO restores level to 12.5-54 inches.

Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when containment parameters are improving, and RPV water level is under control.

VI. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
- B. ES-604 Dynamic Simulator Requalification Examination Standard
- C. K/A Catalog
- D. JTA Listing
- E. Hope Creek Generating Station Probabilistic Risk Assessment
- F. Technical Specifications
- G. Emergency Plan (ECG)
- H. Alarm Response Procedures (Various)
 - I. NC.TQ-TC.ZZ-0028 Conduct of Simulator Training
 - J. HC.OP-AB.ZZ-0106 Rod Control System Malfunction
 - K. HC.OP-AB.ZZ-0114 Loss of Primary Containment Integrity
 - L. HC.OP-AB.ZZ-0204 Positive Reactivity Addition
 - M. HC.OP-AB.ZZ-0116 Containment Isolations and Recovery for an Isolation
 - N. HC.OP-AB.ZZ-0126 Abnormal Releases of Gaseous Radioactivity
 - O. HC.OP-SO.BC-0001 Residual Heat Removal System Operation
 - P. HC.OP-SO.GU-0001 Filtration, Recirculation and Ventilation System Operation
 - Q. HC.OP-SO.MA-0001 Main Generator & Exciter Operation & Switching
 - R. HC.OP-SO.SF-0001 Reactor Manual Control System Operation
 - S. HC.OP-SO.SF-0003 Rod Worth Minimizer Operation
 - T. HC.OP-EO.ZZ-0101 RPV Control
 - U. HC.OP-EO.ZZ-0102 Primary Containment Control
 - V. HC.OP-EO.ZZ-0202 Emergency RPV Depressurization
 - W. SH.OP-DD.ZZ-0004 Operations Standards
 - X. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards

ESG CRITICAL TASK RATIONAL**ESG-NRC-04 / 00**

1.

- * **CREW isolates the RWCU system by shutting HV-F001 and/or HV-F004 within two minutes of confirming the automatic isolation failure.**

(K/A 223002 A4.06 3.6/3.7)

(K/A 223002 A4.01 3.6/3.5)

The RWCU System has failed to isolate automatically. Failure of the Crew to manually isolate the system will result in a bypass of the Primary Containment boundary and release of radioactive materials to the Reactor Building. Two minutes is deemed adequate time to affect isolation from the time confirmation of failure of the automatic isolation function is received.

2.

- * **CREW opens at least four SRVs to emergency depressurize the Rx before suppression chamber pressure reaches 55 psig, or within 2 minutes of exceeding the PSP curve.**

(K/A 295030 EK3.01 3.8/4.1)

With suppression chamber pressure approaching the maximum EOP-102 limit of 65 psig, the reactor must be emergency depressurized to reduce the RPV stored energy with the ultimate goal of preserving primary containment integrity. 55 psig, and within 2 minutes of exceeding the PSP curve, was chosen as a reasonable performance value for a Crew. This value is reached under the conditions of this scenario approximately 10 min. after the LOCA, which is the time assumed for no operator action in the FSAR.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 22% RTP, MAIN GEN. OUTPUT: 0 MWe

RISK MATRIX COLOR: GREEN

RIVER TEMPERATURE: 65°F

'D' CHANNEL WORK WEEK - YELLOW

Major activities accomplished last shift:

- HC.OP-IO.ZZ-0003 complete up to step 5.4.7.
- HC.OP-SO.MA-0001 complete through step 5.2.12
- Unit synch in progress with turbine at 1800 rpm.

Major activities scheduled for this shift:

- Synch to grid and raise MVARs to 175 (per LD) IAW HC.OP-IO.ZZ-0003 (Salem units I & II are on-line).
- RE guidance is to W/D rods IAW the pull sheet from step #389 to 30% power; then contact RE for further guidance.

Continuous rod withdrawal has been authorized.

OPERATIONS SUPERINTENDENT ISSUES	
Sys/Equip Problems	▪
Protected Equipment	▪
Update Status	▪
Action Plans	▪

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

•

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-04

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM:

☐ L.O. REQUAL

☒ INITIAL LICENSE

☐ OTHER _____

REVISION SUMMARY:

PREPARED BY:

N/A
INSTRUCTOR

N/A
DATE

REVIEWED BY:

N/A
EP REPRESENTATIVE

N/A
DATE

APPROVED BY:

N/A
TRAINING SUPERVISOR

N/A
DATE

APPROVED BY:

N/A
OPS MANAGER OR DESIGNEE

N/A
DATE

I. OBJECTIVE(S):

- A. The Candidates must demonstrate the ability to operate effectively as a team while completing a series of CRITICAL TASKS, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an " *".)

II. MAJOR EVENTS:

- A. Synchronize Main Generator
- B. Raise Reactor power with control rods
- C. RWM Failure
- D. Control Rod Drift
- E. False Main Generator Core Monitor alarm
- F. **Loss of Reactor Building Ventilation**
- G. RWCU System leak/Failure to isolate
- H. Steam leak inside the drywell/Downcomer failure/ Emergency Depressurization
- I. 2 ADS SRVs fail to open

III. SCENARIO SUMMARY:

The scenario begins with the plant at 22% power. A Reactor Startup is in progress in accordance with HC.OP-IO.ZZ-0003. The crew will synchronize the Main Generator to the grid and raise power with control rods. During control rod withdrawal, the Rod Worth Minimizer will fail. The crew will bypass the RWM and take actions to allow the startup to continue in accordance with Technical Specifications. After actions for the control rod drift are complete, a Main Generator Core Monitor alarm is received. The crew will have to determine that the alarm is false. **A damper in the Reactor Building Ventilation System (RBVS) fails closed causing a loss of RBVS. FRVS will be required to be placed in service.** A leak develops from the RWCU system. The isolation valves will fail to automatically close. The crew will take actions to isolate the leak. A major steam leak occurs inside the drywell. Due to a Downcomer failure the Drywell pressure will raise to the action required region of the Pressure Suppression Pressure curve. This requires an Emergency Depressurization of the RPV in accordance with the Emergency Operating Procedures. 2 ADS valves will fail to open. The crew will open two additional SRVs.

The scenario may be terminated when all control rods are fully inserted, RPV water level is being controlled above 12.5 inches, and primary containment parameters are under control.

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-07; 22% power, MOL, Xe equilibrium, pull sequence step #377.

Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT:

	Description
1.	NONE
2.	

OTHER CONDITIONS:

	Description
1.	Make the Main Generator ready IAW HC.OP-SO.MA-0001, step 5.2.1.
2.	Pull rods through step 388
3.	Close HV-1459A, B, AND C, HTRS 1&2/DC, S/U AND OPR VENTS

MALFUNCTIONS:

	Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1.	CU11A		Pre-insert			RWCU VLV F001 FAILURE TO AUTO CLOSE
2.	CU11B		Pre-insert			RWCU VLV F004 FAILURE TO AUTO CLOSE
3.	AD02DC		Pre-insert			SAFETY RELIEF VALVE D FAILURE
4.	AD02BC		Pre-insert			SAFETY RELIEF VALVE B FAILURE
5.	CD19A		Pre-insert			CONTROL RODS BOUNCING ON SCRAM (2-4)
6.	CD18	10	Pre-insert			HIGH ROD WORTH
7.	CD025027		Pre-insert			CONTROL ROD DRIFTS OUT
8.	RS01		1/None			RWM WITHDRAW BLOCK
9.	EG02		2/None			MAIN GENERATOR CORE MONITOR ALARM
10.	CU03	100	4/None		120	RWCU SYSTEM LEAK
11.	MS01	30	5/None		720	STEAM LINE BREAK IN THE DRYWELL
12.	PC04		5/None			PRIMARY CONTAINMENT DOWNCOMER FAILURE
13.						

I/O OVERRIDES:

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
1.	1A159 E	OFF	3/None			DI HD-9414A OPEN-INBD EXH-REACTOR BUILDING
2.	1A159 F	ON	3/None			DI HD-9414A CLOSE-INBD EXH-REACTOR BUILDING

REMOTES:

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
1.	NONE					
2.						

EVENT TRIGGERS

1. **ZCLCINSE > 0 && ZLLCWHIT(083) > 0 // Insert push button depressed and rod 50-27 selected**
Command: DMF CD025027
2. **ZCLCCINS > 0 && ZLLCWHIT(083) > 0 // Cont. Insert push button depressed and rod 50-27 selected**
Command: DMF CD025027

V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event / Instructor Activity	Expected Plant/Student Response	Comments
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1. Synchronize Main Generator

- CRS directs synchronizing the main generator in accordance with HC.OP-SO.MA-0001.
- PO synchronizes the main generator in accordance with HC.OP-SO.MA-0001.

detail

2. Raise Reactor power with control rods

- CRS directs continuation of power ascension in accordance with HC.OP-IO.ZZ-0003 and RE guidance.
- RO withdraws control rods in accordance with Section 5.2, or 5.3, of HC.OP-SO.SF-0001 and RE guidance.

3. RWM Failure

Insert RT-1 at the discretion of the lead examiner.

- RO observes failure of the RWM and informs the CRS.
- CRS directs actions in accordance with Section 4.3 of HC.OP-AB.ZZ-0106:
 - Check operation of RWM
 - Notify I&C
 - Bypass RWM
- CRS reviews Technical Specification 3.1.4.1 and directs bypassing the RWM in accordance with Section 5.2 of HC.OP-SO.SF-0003.
- RO places the bypass switch for the RWM in BYPASS.
- CRS directs continuation of startup.

Note: Respond as Reactor Engineer or additional qualified member of the plant staff if required.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

4. Control Rod Drift

Pre-inserted

Ensure CD025027 clears when the insert push button is depressed.

Note:
As the RE inform the CRS that you are evaluating rod recovery and that you will provide guidance soon.

- RO notices rod continuing to move outward by observing RPI and overhead alarm C6-E3, and informs the CRS.
- RO informs CRS of actions to be taken in accordance with HC.OP-AR.ZZ-0011.
- CRS directs actions in accordance with HC.OP-AB.ZZ-0102, and HC.OP-AB.ZZ-0204:
 - Insert control rods, in sequence, as necessary to reduce Reactor power
- CRS directs actions in accordance with HC.OP-AR.ZZ-0011:
 - Apply a continuous insert signal
- RO applies an insert signal; rod inserts; and informs the CRS.
- CRS directs removal of insert signal.
- RO removes the insert signal, notices rod remains at its current position, and notifies the CRS.
- CRS confers with the RE to determine actions for continuing Reactor startup.

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

- CRS refers to Technical Specification 3.1.3.1.b for applicability

<p>5. False Main Generator Core Monitor alarm.</p> <p>Insert RT-2 when actions for the rod drift are complete or at the discretion of the lead examiner.</p>

Respond as TB to requests of Core Monitor Status. Flow is normal.

- RO/PO reports Gen Core Particulate High alarm E1-D2 and indications on the Core monitor to the CRS.
- PO depresses the Core Monitor Filter push button for 15-20 seconds and observes Core Monitor indication and reports to the CRS indications of a false Core Monitor alarm.

<p>6. Loss of Reactor Building Ventilation.</p> <p>Insert RT-3 when actions for the Core Monitor alarm are complete, or at the discretion of the lead examiner.</p>
--

- RO/PO reports alarm E6-C5, closure of HD-9414A, and indications of the loss of the RBVS to the CRS.
- CRS directs placing FRVS in service in accordance with HC.OP-AB.ZZ-0115 and HC.OP-AR.ZZ-0019.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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Note:
Support removal of RBVS.

- PO places FRVS in service in accordance with section 5.3 of HC.OP-SO.GU-0001.

**7. RWCU System
leak/Failure to isolate.**

Insert RT-4 when FRVS is in service, or at the discretion of the lead examiner.

Note:

The RWCU system may be manually isolated before the leak detection system timers time out.

- RO/PO reports RWCU alarms D3-B3, C1-A2, D3-B3, C1-C2, and indications of the RWCU system to the CRS.
- RO reports failure of F001 and F004 to automatically isolate to the CRS.
- CRS directs manual isolation of the RWCU system in accordance with HC.OP-AB.ZZ-0116, and HC.OP-AB.ZZ-0114:
 - Close F001 and F004
 - Close SV-4310 and 4311
- RO closes F001, F004, SV-4310 and 4311.
- * CREW isolates the RWCU system by shutting HV-F001 and/or HV-F004 within two minutes of confirming the automatic isolation failure.
(K/A 223002 A4.06 3.6/3.7)
(K/A 223002 A4.01 3.6/3.5)
- CRS directs actions for RWCU system isolation in accordance with HC.OP-AR.ZZ-0008.
- CRS refers to Technical Specification 3.4.4, 3.6.3, and 3.3.2

Conductivity sampling requirements. Containment isolation valves (if failure to auto isolate is noticed). Isolation instrumentation.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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7. Steam leak inside the drywell/Downcomer failure/ Emergency Depressurization:

Insert RT-5 when actions for the RWCU isolation are complete or at the discretion of the lead examiner.

- Crew recognizes DRWL pressure at 1.68# via annunciators A7-D4, C5-B5, & LOCA initiation signals and informs CRS.
- CREW determines RPV water level, pressure, and containment parameters and informs CRS.
- CRS enters HC.OP-EO.ZZ-0101, RPV Control and directs actions to:
 - Control RPV water level above 12.5".
 - Verify ECCS actuates
 - Verify PCIS/NSSSS isolations
- RO places and locks the Rx mode switch in SHUTDOWN.
- RO inserts SRMs and IRMs and informs CRS.
- RO/PO verifies initiation of HPCI and RCIC and informs CRS.
- Crew determines that all control rods are not fully inserted via SPDS, CRIDS, and/or NSSS computer, and reports the positions of those rods to the CRS.
- Crew determines that the Reactor is shutdown under all conditions without boron.
- CRS directs closure of MSIVs to minimize the cool down rate.
- RO closes MSIVs as directed.
- RO/PO controls Reactor Pressure and level as directed

Event / Instructor Activity	Expected Plant/Student Response	Comments
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NOTE:

Level may not reach -129".

- CRS enters and directs HC.OP-EO.ZZ-0102, Primary Containment Control, to control primary containment parameters.
- CREW monitors RPV water level, pressure, and containment parameters and informs CRS.
- CRS directs securing Reactor Recirculation Pumps if in operation.
- RO secures Reactor Recirculation Pumps.
- If reactor water level reaches -129", CRS directs action to inhibit ADS.

- PO inhibits ADS IAW CRS direction.
- RO/PO verifies start of ECCS and EDGs and informs CRS.
- CRS directs actions to spray the Drywell in accordance with HC.OP-EO.ZZ-0102.
- PO places the RHR system in Drywell Sprays as directed in accordance with Section 5.6 of HC.OP-SO.BC-0001.
- CRS recognizes suppression chamber pressure is in, or cannot be maintained below, the required action zone on the Pressure Suppression Pressure Curve.
- CRS implements HC.OP-EO.ZZ-0202, Emergency Depressurization, and directs action to open five ADS valves.
- **PO reports to the CRS that 2 ADS valves failed to open.**
- CRS directs the opening of 2 additional SRVs.
- PO opens the SRVs directed.

NOTE:

Crew should consider anticipating Emergency Depressurization using BPVs if the Main Condenser is available

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

- * CREW opens at least four SRVs to emergency depressurize the Rx before suppression chamber pressure reaches 55 psig, or within 2 minutes of exceeding the PSP curve.
(K/A 295030 EK3.01 3.8/4.1)
- RO/PO restores level to 12.5-54 inches.

Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when containment parameters are improving, and RPV water level is under control.

VI. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
- B. ES-604 Dynamic Simulator Requalification Examination Standard
- C. K/A Catalog
- D. JTA Listing
- E. Hope Creek Generating Station Probabilistic Risk Assessment
- F. Technical Specifications
- G. Emergency Plan (ECG)
- H. Alarm Response Procedures (Various)
 - I. NC.TQ-TC.ZZ-0028 Conduct of Simulator Training
 - J. HC.OP-AB.ZZ-0106 Rod Control System Malfunction
 - K. HC.OP-AB.ZZ-0114 Loss of Primary Containment Integrity
 - L. HC.OP-AB.ZZ-0204 Positive Reactivity Addition
 - M. HC.OP-AB.ZZ-0116 Containment Isolations and Recovery for an Isolation
 - N. HC.OP-AB.ZZ-0126 Abnormal Releases of Gaseous Radioactivity
 - O. HC.OP-SO.BC-0001 Residual Heat Removal System Operation
 - P. HC.OP-SO.GU-0001 Filtration, Recirculation and Ventilation System Operation
 - Q. HC.OP-SO.MA-0001 Main Generator & Exciter Operation & Switching
 - R. HC.OP-SO.SF-0001 Reactor Manual Control System Operation
 - S. HC.OP-SO.SF-0003 Rod Worth Minimizer Operation
 - T. HC.OP-EO.ZZ-0101 RPV Control
 - U. HC.OP-EO.ZZ-0102 Primary Containment Control
 - V. HC.OP-EO.ZZ-0202 Emergency RPV Depressurization
 - W. SH.OP-DD.ZZ-0004 Operations Standards
 - X. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards

ESG CRITICAL TASK RATIONAL**ESG-NRC-04 / 00**

1.

- * **CREW isolates the RWCU system by shutting HV-F001 and/or HV-F004 within two minutes of confirming the automatic isolation failure.**

(K/A 223002 A4.06 3.6/3.7)**(K/A 223002 A4.01 3.6/3.5)**

The RWCU System has failed to isolate automatically. Failure of the Crew to manually isolate the system will result in a bypass of the Primary Containment boundary and release of radioactive materials to the Reactor Building. Two minutes is deemed adequate time to affect isolation from the time confirmation of failure of the automatic isolation function is received.

2.

- * **CREW opens at least four SRVs to emergency depressurize the Rx before suppression chamber pressure reaches 55 psig, or within 2 minutes of exceeding the PSP curve.**

(K/A 295030 EK3.01 3.8/4.1)

With suppression chamber pressure approaching the maximum EOP-102 limit of 65 psig, the reactor must be emergency depressurized to reduce the RPV stored energy with the ultimate goal of preserving primary containment integrity. 55 psig, and within 2 minutes of exceeding the PSP curve, was chosen as a reasonable performance value for a Crew. This value is reached under the conditions of this scenario approximately 10 min. after the LOCA, which is the time assumed for no operator action in the FSAR.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 22% RTP, MAIN GEN. OUTPUT: 0 MWe

RISK MATRIX COLOR: GREEN

RIVER TEMPERATURE: 65°F

'D' CHANNEL WORK WEEK - YELLOW

Major activities accomplished last shift:

- HC.OP-IO.ZZ-0003 complete up to step 5.4.7.
- HC.OP-SO.MA-0001 complete through step 5.2.12
- Unit synch in progress with turbine at 1800 rpm.

Major activities scheduled for this shift:

- Synch to grid and raise MVARs to 175 (per LD) IAW HC.OP-IO.ZZ-0003 (Salem units I & II are on-line).
 - RE guidance is to W/D rods IAW the pull sheet from step #389 to 30% power; then contact RE for further guidance.
- Continuous rod withdrawal has been authorized.

OPERATIONS SUPERINTENDENT ISSUES	
Sys/Equip Problems	
Protected Equipment	
Update Status	
Action Plans	

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

•

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-04

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM:

☐ L.O. REQUAL

☒ INITIAL LICENSE

☐ OTHER _____

REVISION SUMMARY:

PREPARED BY:

N/A
INSTRUCTOR

N/A
DATE

REVIEWED BY:

N/A
EP REPRESENTATIVE

N/A
DATE

APPROVED BY:

N/A
TRAINING SUPERVISOR

N/A
DATE

APPROVED BY:

N/A
OPS MANAGER OR DESIGNEE

N/A
DATE

I. OBJECTIVE(S):

- A. The Candidates must demonstrate the ability to operate effectively as a team while completing a series of **CRITICAL TASKS**, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an “*”).

II. MAJOR EVENTS:

- A. Synchronize Main Generator
- B. Raise Reactor power with control rods
- C. RWM Failure
- D. Control Rod Drift
- E. False Main Generator Core Monitor alarm
- F. **Loss of Reactor Building Ventilation**
- G. RWCU System leak/Failure to isolate
- H. Steam leak inside the drywell/Downcomer failure/ Emergency Depressurization
- I. 2 ADS SRVs fail to open

III. SCENARIO SUMMARY:

The scenario begins with the plant at 22% power. A Reactor Startup is in progress in accordance with HC.OP-IO.ZZ-0003. The crew will synchronize the Main Generator to the grid and raise power with control rods. During control rod withdrawal, the Rod Worth Minimizer will fail. The crew will bypass the RWM and take actions to allow the startup to continue in accordance with Technical Specifications. After actions for the control rod drift are complete, a Main Generator Core Monitor alarm is received. The crew will have to determine that the alarm is false. **A damper in the Reactor Building Ventilation System (RBVS) fails closed causing a loss of RBVS. FRVS will be required to be placed in service.** A leak develops from the RWCU system. The isolation valves will fail to automatically close. The crew will take actions to isolate the leak. A major steam leak occurs inside the drywell. Due to a Downcomer failure the Drywell pressure will raise to the action required region of the Pressure Suppression Pressure curve. This requires an Emergency Depressurization of the RPV in accordance with the Emergency Operating Procedures. 2 ADS valves will fail to open. The crew will open two additional SRVs.

The scenario may be terminated when all control rods are fully inserted, RPV water level is being controlled above 12.5 inches, and primary containment parameters are under control.

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-07; 22% power, MOL, Xe equilibrium, pull sequence step #377.

Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT:

Description

1. NONE
- 2.

OTHER CONDITIONS:

Description

1. Make the Main Generator ready IAW HC.OP-SO.MA-0001, step 5.2.1.
2. Pull rods through step 388
3. Close HV-1459A, B, AND C, HTRS 1&2/DC, S/U AND OPR VENTS

MALFUNCTIONS:

Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1. CU11A		Pre-insert			RWCU VLV F001 FAILURE TO AUTO CLOSE
2. CU11B		Pre-insert			RWCU VLV F004 FAILURE TO AUTO CLOSE
3. AD02DC		Pre-insert			SAFETY RELIEF VALVE D FAILURE
4. AD02BC		Pre-insert			SAFETY RELIEF VALVE B FAILURE
5. CD19A		Pre-insert			CONTROL RODS BOUNCING ON SCRAM (2-4)
6. CD18	10	Pre-insert			HIGH ROD WORTH
7. CD025027		Pre-insert			CONTROL ROD DRIFTS OUT
8. RS01		1/None			RWM WITHDRAW BLOCK
9. EG02		2/None			MAIN GENERATOR CORE MONITOR ALARM
10. CU03	100	4/None		120	RWCU SYSTEM LEAK
11. MS01	30	5/None		720	STEAM LINE BREAK IN THE DRYWELL
12. PC04		5/None			PRIMARY CONTAINMENT DOWNCOMER FAILURE
13.					

I/O OVERRIDES

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
1.	1A159 E	OFF	3/None			DI HD-9414A OPEN-INBD EXH-REACTOR BUILDING
2.	1A159 F	ON	3/None			DI HD-9414A CLOSE-INBD EXH-REACTOR BUILDING

REMOTES

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
1.	NONE					
2.						

EVENT TRIGGERS

1. ZCLCINSE > 0 && ZLLCWHIT(083) > 0 // Insert push button depressed and rod 50-27 selected
Command: DMF CD025027
2. ZCLCCINS > 0 && ZLLCWHIT(083) > 0 // Cont. Insert push button depressed and rod 50-27 selected
Command: DMF CD025027

V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event / Instructor Activity	Expected Plant/Student Response	Comments
1. Synchronize Main Generator	<ul style="list-style-type: none"> • CRS directs synchronizing the main generator in accordance with HC.OP-SO.MA-0001. • PO synchronizes the main generator in accordance with HC.OP-SO.MA-0001. 	
2. Raise Reactor power with control rods		
3. RWM Failure Insert RT-1 at the discretion of the lead examiner.		
Note: Respond as Reactor Engineer or additional qualified member of the plant staff if required.	<ul style="list-style-type: none"> • RO observes failure of the RWM and informs the CRS. • CRS directs actions in accordance with Section 4.3 of HC.OP-AB.ZZ-0106: <ul style="list-style-type: none"> - Check operation of RWM - Notify I&C - Bypass RWM • CRS reviews Technical Specification 3.1.4.1 and directs bypassing the RWM in accordance with Section 5.2 of HC.OP-SO.SF-0003. • RO places the bypass switch for the RWM in BYPASS. • CRS directs continuation of startup. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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4. Control Rod Drift

Pre-inserted

Ensure CD025027 clears when the insert push button is depressed.

Note:

As the RE inform the CRS that you are evaluating rod recovery and that you will provide guidance soon.

- RO notices rod continuing to move outward by observing RPI and overhead alarm C6-E3, and informs the CRS.
- RO informs CRS of actions to be taken in accordance with HC.OP-AR.ZZ-0011.
- CRS directs actions in accordance with HC.OP-AB.ZZ-0102, and HC.OP-AB.ZZ-0204:
 - Insert control rods, in sequence, as necessary to reduce Reactor power
- CRS directs actions in accordance with HC.OP-AR.ZZ-0011:
 - Apply a continuous insert signal
- RO applies an insert signal; rod inserts; and informs the CRS.
- CRS directs removal of insert signal.
- RO removes the insert signal, notices rod remains at its current position, and notifies the CRS.
- CRS confers with the RE to determine actions for continuing Reactor startup.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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- CRS refers to Technical Specification 3.1.3.1.b for applicability

5. False Main Generator Core Monitor alarm.

Insert RT-2 when actions for the rod drift are complete or at the discretion of the lead examiner.

Respond as TB to requests of Core Monitor Status. Flow is normal.

- RO/PO reports Gen Core Particulate High alarm E1-D2 and indications on the Core monitor to the CRS.
- PO depresses the Core Monitor Filter push button for 15-20 seconds and observes Core Monitor indication and reports to the CRS indications of a false Core Monitor alarm.

6. Loss of Reactor Building Ventilation.

Insert RT-3 when actions for the Core Monitor alarm are complete, or at the discretion of the lead examiner.

- RO/PO reports alarm E6-C5, closure of HD-9414A, and indications of the loss of the RBVS to the CRS.
- CRS directs placing FRVS in service in accordance with HC.OP-AB.ZZ-0115 and HC.OP-AR.ZZ-0019.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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Note:
Support removal of RBVS.

- PO places FRVS in service in accordance with section 5.3 of HC.OP-SO.GU-0001.

**7. RWCU System
leak/Failure to isolate.**

Insert RT-4 when FRVS is in service, or at the discretion of the lead examiner.

Note:
The RWCU system may be manually isolated before the leak detection system timers time out.

- RO/PO reports RWCU alarms D3-B3, C1-A2, D3-B3, C1-C2, and indications of the RWCU system to the CRS.
- RO reports failure of F001 and F004 to automatically isolate to the CRS.
- CRS directs manual isolation of the RWCU system in accordance with HC.OP-AB.ZZ-0116, and HC.OP-AB.ZZ-0114:
 - Close F001 and F004
 - Close SV-4310 and 4311
- RO closes F001, F004, SV-4310 and 4311.
- * CREW isolates the RWCU system by shutting HV-F001 and/or HV-F004 within two minutes of confirming the automatic isolation failure.
(K/A 223002 A4.06 3.6/3.7)
(K/A 223002 A4.01 3.6/3.5)
- CRS directs actions for RWCU system isolation in accordance with HC.OP-AR.ZZ-0008.
- CRS refers to Technical Specification 3.4.4, 3.6.3, and 3.3.2

Conductivity sampling requirements. Containment isolation valves (if failure to auto isolate is noticed). Isolation instrumentation.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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<p>7. Steam leak inside the drywell/Downcomer failure/ Emergency Depressurization:</p> <p>Insert RT-5 when actions for the RWCU isolation are complete or at the discretion of the lead examiner.</p>
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- Crew recognizes DRWL pressure at 1.68# via annunciators A7-D4, C5-B5, & LOCA initiation signals and informs CRS.
- CREW determines RPV water level, pressure, and containment parameters and informs CRS.
- CRS enters HC.OP-EO.ZZ-0101, RPV Control and directs actions to:
 - Control RPV water level above 12.5".
 - Verify ECCS actuates
 - Verify PCIS/NSSSS isolations
- RO places and locks the Rx mode switch in SHUTDOWN.
- RO inserts SRMs and IRMs and informs CRS.
- RO/PO verifies initiation of HPCI and RCIC and informs CRS.
- Crew determines that all control rods are not fully inserted via SPDS, CRIDS, and/or NSSS computer, and reports the positions of those rods to the CRS.
- Crew determines that the Reactor is shutdown under all conditions without boron.
- CRS directs closure of MSIVs to minimize the cool down rate.
- RO closes MSIVs as directed.
- RO/PO controls Reactor Pressure and level as directed

Event / Instructor Activity	Expected Plant/Student Response	Comments
	<ul style="list-style-type: none"> • CRS enters and directs HC.OP-EO.ZZ-0102, Primary Containment Control, to control primary containment parameters. • CREW monitors RPV water level, pressure, and containment parameters and informs CRS. • CRS directs securing Reactor Recirculation Pumps if in operation. • RO secures Reactor Recirculation Pumps. 	
<p><u>NOTE:</u></p> <p>Level may not reach -129".</p>	<ul style="list-style-type: none"> • If reactor water level reaches -129", CRS directs action to inhibit ADS. 	
	<ul style="list-style-type: none"> • PO inhibits ADS IAW CRS direction. • RO/PO verifies start of ECCS and EDGs and informs CRS. • CRS directs actions to spray the Drywell in accordance with HC.OP-EO.ZZ-0102. • PO places the RHR system in Drywell Sprays as directed in accordance with Section 5.6 of HC.OP-SO.BC-0001. 	
<p><u>NOTE:</u></p> <p>Crew should consider anticipating Emergency Depressurization using BPVs if the Main Condenser is available</p>	<ul style="list-style-type: none"> • CRS recognizes suppression chamber pressure is in, or cannot be maintained below, the required action zone on the Pressure Suppression Pressure Curve. 	
	<ul style="list-style-type: none"> • CRS implements HC.OP-EO.ZZ-0202, Emergency Depressurization, and directs action to open five ADS valves. • PO reports to the CRS that 2 ADS valves failed to open. • CRS directs the opening of 2 additional SRVs. • PO opens the SRVs directed. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
-----------------------------	---------------------------------	----------

- * CREW opens at least four SRVs to emergency depressurize the Rx before suppression chamber pressure reaches 55 psig, or within 2 minutes of exceeding the PSP curve.
(K/A 295030 EK3.01 3.8/4.1)
- RO/PO restores level to 12.5-54 inches.

Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when containment parameters are improving, and RPV water level is under control.

VI. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
- B. ES-604 Dynamic Simulator Requalification Examination Standard
- C. K/A Catalog
- D. JTA Listing
- E. Hope Creek Generating Station Probabilistic Risk Assessment
- F. Technical Specifications
- G. Emergency Plan (ECG)
- H. Alarm Response Procedures (Various)
 - I. NC.TQ-TC.ZZ-0028 Conduct of Simulator Training
 - J. HC.OP-AB.ZZ-0106 Rod Control System Malfunction
 - K. HC.OP-AB.ZZ-0114 Loss of Primary Containment Integrity
 - L. HC.OP-AB.ZZ-0204 Positive Reactivity Addition
 - M. HC.OP-AB.ZZ-0116 Containment Isolations and Recovery for an Isolation
 - N. HC.OP-AB.ZZ-0126 Abnormal Releases of Gaseous Radioactivity
 - O. HC.OP-SO.BC-0001 Residual Heat Removal System Operation
 - P. HC.OP-SO.GU-0001 Filtration, Recirculation and Ventilation System Operation
 - Q. HC.OP-SO.MA-0001 Main Generator & Exciter Operation & Switching
 - R. HC.OP-SO.SF-0001 Reactor Manual Control System Operation
 - S. HC.OP-SO.SF-0003 Rod Worth Minimizer Operation
 - T. HC.OP-EO.ZZ-0101 RPV Control
 - U. HC.OP-EO.ZZ-0102 Primary Containment Control
 - V. HC.OP-EO.ZZ-0202 Emergency RPV Depressurization
 - W. SH.OP-DD.ZZ-0004 Operations Standards
 - X. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards

ESG CRITICAL TASK RATIONAL**ESG-NRC-04 / 00**

1.

- * **CREW isolates the RWCU system by shutting HV-F001 and/or HV-F004 within two minutes of confirming the automatic isolation failure.**

(K/A 223002 A4.06 3.6/3.7)

(K/A 223002 A4.01 3.6/3.5)

The RWCU System has failed to isolate automatically. Failure of the Crew to manually isolate the system will result in a bypass of the Primary Containment boundary and release of radioactive materials to the Reactor Building. Two minutes is deemed adequate time to affect isolation from the time confirmation of failure of the automatic isolation function is received.

2.

- * **CREW opens at least four SRVs to emergency depressurize the Rx before suppression chamber pressure reaches 55 psig, or within 2 minutes of exceeding the PSP curve.**

(K/A 295030 EK3.01 3.8/4.1)

With suppression chamber pressure approaching the maximum EOP-102 limit of 65 psig, the reactor must be emergency depressurized to reduce the RPV stored energy with the ultimate goal of preserving primary containment integrity. 55 psig, and within 2 minutes of exceeding the PSP curve, was chosen as a reasonable performance value for a Crew. This value is reached under the conditions of this scenario approximately 10 min. after the LOCA, which is the time assumed for no operator action in the FSAR.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 22% RTP, MAIN GEN. OUTPUT: 0 MWe

RISK MATRIX COLOR: GREEN

RIVER TEMPERATURE: 65°F

'D' CHANNEL WORK WEEK - YELLOW

Major activities accomplished last shift:

- HC.OP-IO.ZZ-0003 complete up to step 5.4.7.
- HC.OP-SO.MA-0001 complete through step 5.2.12
- Unit synch in progress with turbine at 1800 rpm.

Major activities scheduled for this shift:

- Synch to grid and raise MVARs to 175 (per LD) IAW HC.OP-IO.ZZ-0003 (Salem units I & II are on-line).
- RE guidance is to W/D rods IAW the pull sheet from step #389 to 30% power; then contact RE for further guidance.

Continuous rod withdrawal has been authorized.

OPERATIONS SUPERINTENDENT ISSUES	
Sys/Equip Problems	▪
Protected Equipment	▪
Update Status	▪
Action Plans	▪

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

•

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-05

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM:

☐ L.O. REQUAL

☒ INITIAL LICENSE

☐ OTHER

REVISION SUMMARY:

PREPARED BY:

N/A
INSTRUCTOR

N/A
DATE

REVIEWED BY:

N/A
EP REPRESENTATIVE

N/A
DATE

APPROVED BY:

N/A
TRAINING SUPERVISOR

N/A
DATE

APPROVED BY:

N/A
OPS MANAGER OR DESIGNEE

N/A
DATE

I. OBJECTIVE(S):

- A. The Candidates must demonstrate the ability to operate effectively as a team while completing a series of **CRITICAL TASKS**, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an “*”).

II. MAJOR EVENTS:

- A. Reduce Reactor power with Recirculation System
- B. Remove Reactor Feed Pump from service
- C. Failure of RPS EPA Breaker Undervoltage Device
- D. **Recirculation Pump Dual Seal Failure**
- E. Failure of 3RD stage Air Ejector Flow, SJAE isolation.
- F. Seismic event, RHR rooms flood, unisolable Torus leak, Emergency Depressurization
- G. Mode Switch failure (RPS contacts) on Scram

III. SCENARIO SUMMARY:

The scenario begins with the plant at 100% power. The B RFP will be removed from service for maintenance. The A RPS MG set EPA Breaker undervoltage device fails causing a loss of the A RPS bus. This requires a transfer to the alternate power supply and an RPS reset. **Once RPS is reset, a Recirculation Pump dual seal failure occurs requiring isolation of the affected pump and preparations for Single Loop operations.** The 3RD stage Air Ejector Flow transmitter fails requiring the Standby Steam Jet Air Ejector to be placed in service. A Seismic Event causes a leak in the C RHR suction piping. The leak is unisolable. Due to a floor drain check valve problem, water will also fill up the A RHR pump room. This requires a plant shutdown. Due to the lowering Suppression Pool level, a scram and subsequent Emergency Depressurization is needed. The Mode Switch contacts fail on the scram.

The scenario may be terminated when all control rods are fully inserted, and RPV water level is being controlled above 12.5 inches.

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-01; 100% power, MOL, Xe equilibrium, pull sequence step #727.
 Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT:

Description

1. NONE

2.

OTHER CONDITIONS:

Description

1. NONE

2.

MALFUNCTIONS:

	Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1.	RP08A		1/None			RPS EPA BREAKER A TRIP
2.	RR05B	100	2/None			RECIRC PUMP B INBOARD SEAL FAILURE
3.	RR06B	100	2/None	255		RECIRC PUMP B OUTBOARD SEAL FAILURE
4.	MC06B		3/None			SJAE B STEAM SUPPLY FAILURE
5.	PC07A		4/None			SEISMIC EVENT
6.	PC06	5-20	4/None	300		SUPPRESSION POOL BREAK
7.	RH09C		4/None	420		RHR PUMP ROOM C FLOODED
8.	RH09A		4/None	600		RHR PUMP ROOM A FLOODED
9.						

I/O OVERRIDES

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
___ 1.	3S22 A	OFF	Pre-Insert			OVDI RPS MODE SWITCH-SHUTDOWN
___ 2.	3S22 B	OFF	Pre-Insert			OVDI RPS MODE SWITCH-REFUEL
___ 3.	3S22 C	OFF	Pre-Insert			OVDI RPS MODE SWITCH-STARTUP&HOT STDY
___ 4.	3S22 D	ON	Pre-Insert			OVDI RPS MODE SWITCH-RUN
___ 5.						

REMOTES

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
___ 1.	NONE					
___ 2.						

EVENT TRIGGERS

___ 1.	NONE
___ 2.	

V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the OS/CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event / Instructor Activity	Expected Plant/Student Response	Comments
1. Lower Reactor Power	<ul style="list-style-type: none"> • CRS directs actions to reduce Reactor power IAW HC.OP-IO.ZZ-0006. • RO reduces Recirculation Pump speed IAW HC.OP-SO.BB-0002 and CRS's direction. 	
2. Remove B RFP from service.	<ul style="list-style-type: none"> • CRS directs actions to remove the B RFP from service IAW HC.OP-SO.AE-0001. • PO removes the B RFP from service IAW Section 5.9 of HC.OP-SO.AE-0001. 	
3. Failure of RPS EPA Breaker Undervoltage Device. Insert RT-1 when the RFP is removed from service, or at the discretion of the lead examiner.	<ul style="list-style-type: none"> • CREW recognizes failure of the "A" RPS channel via alarms C3-A2, C3-A3, C8-A1, C8-A2, C5 (window) and indication at the RPS power source display on the H11-P610 panel. • RO monitors Rx power, pressure, water level and main generator output for any changes. • CRS implements and executes HC.OP-AB.ZZ-0110 and HC.OP-AB.ZZ-0116 directs actions to recover from loss of "A" RPS power and isolations • RO/PO notifies ABEO to investigate cause of "A" RPS channel failure. • CRS directs actions for RWCU system isolation in accordance with HC.OP-AR.ZZ-0008. • CRS refers to Technical Specification 3.4.4 for applicability. 	

As ABEO, report that the AN410 and BN410 EPA breakers RPS "A" MG set have tripped open on under voltage.

Conductivity sampling requirements.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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Respond as Shift Electrician, that it appears to be an AN410 EPA breaker under voltage device fault.

RPS EPA breakers.

- CRS directs the following when conditions permit in accordance with HC.OP-AB.ZZ-0110 and HC.OP-AB.ZZ-0116:
 - Re-energization of the tripped RPS bus
 - Resetting the half scram
 - Resetting NSSSS and restoration of RWCU system
- CRS refers to Technical Specification 3.8.4.4 for applicability.
- PO re-energizes the "A" RPS bus by repositioning the RPS MG SET TRANSFER SWITCH on panel H11-P610 to ALT "A" as directed by the CRS.
- RO/PO reset NSSSS and PCIS IAW CRS direction and Section 5.3 of HC.OP-SO.SB-0001 and Section 5.3 of HC.OP-SO.SM-0001.

4. "B" RR pump inboard & outboard seal failure:

Insert RT-2 when RPS is reset, or at the discretion of the Lead Examiner.

NOTE:

The inboard seal fails when RT-2 is inserted. The outboard seal fails 4.25 minutes later.

- CREW recognizes "B" RR pump inboard seal has failed via CRIDS and informs CRS.
- RO/PO monitors CRIDS pg. 85 and heightens awareness for potential second seal failure.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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NOTE:

If CREW calls Rad Pro and requests DWFDS and DWFDS readings on RM11, report actual readings from the RM11.

- CREW recognizes increased leakage into DRWL and takes appropriate actions for following alarms:
 - 1) CRIDs indication
 - 2) DRYWELL SUMP LEVEL
HI/LO - D3/C3
 - 3) DRYWELL PRESSURE
HI/LO - A7/E4
 - 4) RADIATION MONITORING
ALARM/TRBL - C6/A2
 - 5) DLD SYSTEM ALARM/TRBL
- C6/B1
 - CREW recognizes "B" RR pump multiple seal failure and informs CRS.
 - CRS implements HC.OP-AB.ZZ-0112 and directs actions to trip and isolate the "B" RR pump.
 - * CREW trips and isolates the "B" RR pump before DRWL pressure reaches 1.68 psig by:
 - shutting pump suction valve HV-F023B
 - shutting pump seal purge valve HV-F3800B
 - shutting RWCU suction valve BG-F106
 - shutting pump discharge valve HV-F031B
- (K/A 202001 A2.10 3.5/3.9)

NOTE:

If plant is scrammed due to DRWL pressure increase, the following expected actions for single loop operation are not applicable.

- OS/CRS ensures compliance with the operability requirements of Tech Spec 3.4.1.1 for single loop operations.
- CRS implement HC.OP-AB.ZZ-0300, and directs actions to monitor for power oscillations.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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If guidance from RE is requested, as the RE direct crew to monitor for power to flow oscillations and insert the stuff sheet as necessary to clear APRM Upscale alarms.

- CRS ensures that the CREW does not intentionally enter instability (exit) region.
- RO inserts control rods IAW the stuff sheet and CRS direction to clear APRM upscale alarms.
- If Exit region is entered, the CREW exits the area of instability IAW HC.OP-AB.ZZ-0300 by manually inserting rods or increasing RR flow.
- CRS implements HC.OP-IO.ZZ-0006 for single loop operations.
- CREW references HC.OP-SO.BB-0002 sections 5.3 and implements attachment 3V of HC.OP-DL.ZZ-0026 for single loop operations.
- RO/PO monitors APRMs and LPRMs for abnormal flux oscillations.
- CRS notifies RE / I&C of RR pump trip and requirements of Tech Spec 3.4.1.1.
- RO/PO dispatches TBEO to monitor MG Set lube oil temperatures and adjust TACS flow as necessary.
- CRS notifies Chemistry/Rad Pro of Rx power decrease of >15% in one hour.

Tech Spec 4.4.5

Event / Instructor Activity	Expected Plant/Student Response	Comments
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5. Failure of 3RD stage Air Ejector Flow, SJAE isolation.

Insert YP:MALF(294) in MONITOR. Set to 1(TRUE) when the Recirculation Pump is isolated and actions for Single Loop operations are in progress, or at the discretion of the lead examiner.

Note: 15 minute warm-up is not required for rapid response.

- PO notices failure of the SJAE via overhead annunciator A4-D1, CRIDS alarm, and informs the CRS.
- CRS directs actions in accordance with HC.OP-AB.ZZ-0128
 - Place the A SJAE in service.
- PO places the A SJAE in service in accordance with Section 5.4 of HC.OP-SO.CG-0001.
- PO monitors and reports Main Condenser Vacuum.
- CRS directs actions to lower Reactor Power to maintain Condenser vacuum less than 5.0" Hg ABS in accordance with HC.OP-AB.ZZ-0208.
- CRS directs a Reactor scram if Main Condenser vacuum cannot be maintained.
- RO places and locks the Mode Switch in Shutdown. Notices the failure to scram and informs the CRS.
- CRS enters and directs HC.OP-EO.ZZ-0101A, ATWS-RPV Control, and directs actions to:
 - Scram using RPS or ARI
- RO initiates an RPS scram using the Arm and Depress push buttons or by initiating ARI. Verifies rod movement and informs the CRS.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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- CRS exits HC.OP-EO.ZZ-0101A, ATWS-RPV Control, enters and directs HC.OP-EO.ZZ-0101, RPV Control, and directs actions to:
 - Verify scram actions
 - Control RPV water level above +12.5"
 - Stabilize Rx pressure below 1037#
- Crew determines RPV level, pressure, and containment parameters and informs CRS.
- PO controls Feedwater System to maintain water level as directed.
- RO performs scram actions in accordance with Section 5.2 of HC.OP-SO.SB-0001
- CRS directs pressure control with SRVs when the MSiVs close at 756 psig due to Mode Switch failure.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>6. Seismic event, RHR rooms flood, unisolable Torus leak, Emergency Depressurization.</p> <p>Insert RT-4 when the standby SJAE is placed in service, the Reactor is scrammed, or at the discretion of the lead examiner.</p> <p>Make announcement: "Motion can be felt and then stops," or use the Simulator Sound System to simulate the Seismic Event.</p>	<ul style="list-style-type: none"> • CREW recognizes Seismic Event via annunciator and Response Spectrum Analyzer panel display and informs CRS. 	
<p>Report as the ABEO if dispatched to the Upper Relay Room, that the seismic switch has tripped (Amber light on power supply drawer is on) and that the tape recorders are advanced but not running. The Event indicator is white. If requested to reset the Seismic Monitor, clear Malfunction PC07.</p>	<ul style="list-style-type: none"> • CRS implements HC.OP-AB.ZZ-0139 and directs actions to: <ul style="list-style-type: none"> - Monitor power, level, and pressure - Inspect the plant for damage - Verify the security system intact 	
<p>Note: Only if the plant was not previously shutdown.</p>	<ul style="list-style-type: none"> • CRS determines from reports that an immediate plant shutdown is required. • Crew recognizes lowering Suppression Pool water level, flooding in the C RHR Pump Room and flooding in the A RHR Pump Room. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>Respond as EO to enter various areas to report leak. Report Torus has a leak approximately two feet from the bottom and appears to be unisolable.</p> <p>Note: If directed, respond as EO on attempts to makeup to the Suppression Pool. Report makeup in progress, but do not simulate.</p>	<ul style="list-style-type: none"> • CRS implements HC.OP-AB.ZZ-0114, HC.OP-EO.ZZ-0102, and HC.OP-EO.ZZ-0103, and directs actions to: <ul style="list-style-type: none"> - Restore Suppression Pool level - Attempt to isolate the leaks by closing the suction valves for the C and A RHR Pumps. • PO closes the suction valves for the C and A RHR Pumps. 	
<p>Note: Only if the plant was not previously shutdown.</p>	<ul style="list-style-type: none"> • Crew observes Suppression Pool level continues to lower and reports this to the CRS. • CRS directs that Recirculation be runback and a manual scram inserted if Suppression Pool water level cannot be maintained above 55". 	
<p>Note: Raise severity of PC06 to 40% over 10 min ramp when the Reactor is scrammed.</p>	<ul style="list-style-type: none"> • RO runs back Recirculation Pumps to minimum, places the Mode Switch in shutdown, notices the failure to scram, and informs the CRS. • CRS enters and directs HC.OP-EO.ZZ-0101A, ATWS-RPV Control, and directs actions to: <ul style="list-style-type: none"> - Scram using RPS or ARI • RO initiates an RPS/ARI as directed, or on own initiative, to scram the Reactor. Verifies rod movement and informs the CRS. • CRS exits HC.OP-EO.ZZ-0101A, enters and directs HC.OP-EO.ZZ-0101, RPV Control, and directs actions to: <ul style="list-style-type: none"> - Verify scram actions - Control RPV water level above +12.5" - Stabilize Rx pressure below 1037# 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>NOTE: Crew should consider anticipating Emergency Depressurization by using BPVs if the Main Condenser is available. The Main Condenser will not be available when the MSIVs close at 756 psig due to the Mode Switch failure.</p>	<ul style="list-style-type: none"> • Crew determines RPV level, pressure, and containment parameters and informs CRS. • RO initiates an RPS scram using the Arm and Depress push buttons. Verifies rod movement and informs the CRS. • PO controls pressure as directed, SRVs or BPVs. • PO controls Feedwater System to maintain water level as directed. • RO performs scram actions in accordance with Section 5.2 of HC.OP-SO.SB-0001. • CREW monitors RPV water level, pressure, and containment parameters and informs CRS. • CRS recognizes Suppression Pool level is, or cannot be maintained above 38.5". 	
<p>NOTE: CRS may not direct opening of the BPVs for the reason stated above.</p> <p>Note: Crew may emergency depressurize before reaching 38.5 inches, satisfying this critical task.</p>	<ul style="list-style-type: none"> • CRS directs opening the BPVs in anticipation of emergency depressurizing the Reactor. • RO/PO opens all BPVs as directed. • CRS implements HC.OP-EO.ZZ-0202, Emergency RPV Depressurization, and directs action to open five ADS valves. • PO opens the ADS valves, and reports this to the CRS. • * CREW opens at least four SRVs to emergency depressurize the Rx within 1 minute of suppression pool level reaching 38.5". <p>(K/A 223001 A2.11 3.6/3.8)</p>	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when the RPV is depressurized and RPV water level is stable between +12.5" and +54".

VI. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
- B. ES-604 Dynamic Simulator Requalification Examination Standard
- C. K/A Catalog
- D. JTA Listing
- E. Hope Creek Generating Station Probabilistic Risk Assessment
- F. Technical Specifications
- G. Emergency Plan (ECG)
- H. Alarm Response Procedures (Various)
 - I. HC.OP-IO.ZZ-0006 Power Changes During Operation
 - J. HC.OP-SO.AE-0001 Feedwater System Operation
 - K. HC.OP-SO.BB-0002 Reactor Recirculation System Operation
 - L. HC.OP-SO.CG-0001 Condenser Air Removal System Operation
 - M. HC.OP-SO.SB-0001 Reactor Protection System
 - N. HC.OP-SO.SM-0001 Isolation Systems Operation
 - O. HC.OP-AB.ZZ-0110 Loss of an RPS Channel
 - P. HC.OP-AB.ZZ-0112 Recirculation Pump Trip
 - Q. HC.OP-AB.ZZ-0110 Loss of an RPS Channel
 - R. HC.OP-AB.ZZ-0300 Reactor Power Oscillations
 - S. HC.OP-AB.ZZ-0116 Containment Isolations and Recovery From an Isolation
 - T. HC.OP-AB.ZZ-0139 Acts of Nature
 - U. HC.OP-AB.ZZ-0208 Main Condenser Low Vacuum
 - V. HC.OP-DL.ZZ-0026 Surveillance Log
 - W. HC.OP-EO.ZZ-0101 RPV Control
 - X. HC.OP-EO.ZZ-0101A ATWS-RPV Control
 - Y. HC.OP-EO.ZZ-0102 Primary Containment Control
 - Z. HC.OP-EO.ZZ-0103 Reactor Building & Rad Release Control
 - AA. HC.OP-EO.ZZ-0202 Emergency RPV Depressurization
 - BB. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards
 - CC. SH.OP-DD.ZZ-0004 Operations Standards

ESG CRITICAL TASK RATIONAL**ESG-NRC-05 / 00**

1.

- * **CREW trips and isolates the "B" RR pump before DRWL pressure reaches 1.68 psig by:**
 - **shutting pump suction valve HV-F023B**
 - **shutting pump seal purge valve HV-F3800B**
 - **shutting RWCU suction valve BG-F106**
 - **shutting pump discharge valve HV-F031B**

(K/A 202001 A2.10 3.5/3.9)

Based upon the severity of the leak in the drywell, the operators will be able to identify and isolate the source of leakage before drywell pressure reaches 1.68 psig. Reaching 1.68 psig in the drywell initiates a reactor scram and starts ECCS and emergency systems. The scram and subsequent plant transient can be eliminated by proper operator actions.

2.

- * **CREW opens at least four SRVs to emergency depressurize the Rx within 1 minute of suppression pool level reaching 38.5".**

(K/A 223001 A2.11 3.6/3.8)

EOPs direct action to emergency depressurize the Reactor if Suppression Pool level cannot be maintained above 38.5". This level represents the Suppression Pool level that results in uncovering the Downcomer pipes and a loss of pressure suppression function of the Primary Containment.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 1, 100% RTP, MAIN GEN. OUTPUT: 1104 MWe

RISK MATRIX COLOR: Green

RIVER TEMPERATURE: 65°F

'D' CHANNEL WORK WEEK – BLUE Folders

Major activities accomplished last shift:

- Maintained 100% power.
-

Major activities scheduled for this shift:

- Reduce Reactor power to 95%.
- Remove B RFP from service for maintenance. Turbine inspection.

OPERATIONS SUPERINTENDENT ISSUES:	
Sys/Equip Problems	▪
Protected Equipment	▪
Update Status	▪
Action Plans	▪

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

•

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-05

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM:

☐

L.O. REQUAL

☒

INITIAL LICENSE

☐

OTHER _____

REVISION SUMMARY:

PREPARED BY:

N/A
INSTRUCTOR

N/A
DATE

REVIEWED BY:

N/A
EP REPRESENTATIVE

N/A
DATE

APPROVED BY:

N/A
TRAINING SUPERVISOR

N/A
DATE

APPROVED BY:

N/A
OPS MANAGER OR DESIGNEE

N/A
DATE

I. OBJECTIVE(S):

- A. The Candidates must demonstrate the ability to operate effectively as a team while completing a series of **CRITICAL TASKS**, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an “*”).

II. MAJOR EVENTS:

- A. Reduce Reactor power with Recirculation System
- B. Remove Reactor Feed Pump from service
- C. Failure of RPS EPA Breaker Undervoltage Device
- D. **Recirculation Pump Dual Seal Failure**
- E. Failure of 3RD stage Air Ejector Flow, SJAE isolation.
- F. Seismic event, RHR rooms flood, unisolable Torus leak, Emergency Depressurization
- G. Mode Switch failure (RPS contacts) on Scram

III. SCENARIO SUMMARY:

The scenario begins with the plant at 100% power. The B RFP will be removed from service for maintenance. The A RPS MG set EPA Breaker undervoltage device fails causing a loss of the A RPS bus. This requires a transfer to the alternate power supply and an RPS reset. **Once RPS is reset, a Recirculation Pump dual seal failure occurs requiring isolation of the affected pump and preparations for Single Loop operations.** The 3RD stage Air Ejector Flow transmitter fails requiring the Standby Steam Jet Air Ejector to be placed in service. A Seismic Event causes a leak in the C RHR suction piping. The leak is unisolable. Due to a floor drain check valve problem, water will also fill up the A RHR pump room. This requires a plant shutdown. Due to the lowering Suppression Pool level, a scram and subsequent Emergency Depressurization is needed. The Mode Switch contacts fail on the scram.

The scenario may be terminated when all control rods are fully inserted, and RPV water level is being controlled above 12.5 inches.

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-01; 100% power, MOL, Xe equilibrium, pull sequence step #727.

Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT:

Description

1. NONE

2.

OTHER CONDITIONS:

Description

1. NONE

2.

MALFUNCTIONS:

	Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1.	RP08A		1/None			RPS EPA BREAKER A TRIP
2.	RR05B	100	2/None			RECIRC PUMP B INBOARD SEAL FAILURE
3.	RR06B	100	2/None	255		RECIRC PUMP B OUTBOARD SEAL FAILURE
4.	MC06B		3/None			SJAE B STEAM SUPPLY FAILURE
5.	PC07A		4/None			SEISMIC EVENT
6.	PC06	5-20	4/None	300		SUPPRESSION POOL BREAK
7.	RH09C		4/None	420		RHR PUMP ROOM C FLOODED
8.	RH09A		4/None	600		RHR PUMP ROOM A FLOODED
9.						

I/O OVERRIDES:

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
___ 1.	3S22 A	OFF	Pre-Insert			OVDI RPS MODE SWITCH-SHUTDOWN
___ 2.	3S22 B	OFF	Pre-Insert			OVDI RPS MODE SWITCH-REFUEL
___ 3.	3S22 C	OFF	Pre-Insert			OVDI RPS MODE SWITCH-STARTUP&HOT STDY
___ 4.	3S22 D	ON	Pre-Insert			OVDI RPS MODE SWITCH-RUN
___ 5.						

REMOTES:

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
___ 1.	NONE					
___ 2.						

EVENT TRIGGERS

- ___ 1. NONE
- ___ 2.

V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the OS/CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event / Instructor Activity	Expected Plant/Student Response	Comments
1. Lower Reactor Power	<ul style="list-style-type: none"> • CRS directs actions to reduce Reactor power IAW HC.OP-IO.ZZ-0006. • RO reduces Recirculation Pump speed IAW HC.OP-SO.BB-0002 and CRS's direction. 	
2. Remove B RFP from service.	<ul style="list-style-type: none"> • CRS directs actions to remove the B RFP from service IAW HC.OP-SO.AE-0001. • PO removes the B RFP from service IAW Section 5.9 of HC.OP-SO.AE-0001. 	
3. Failure of RPS EPA Breaker Undervoltage Device. Insert RT-1 when the RFP is removed from service, or at the discretion of the lead examiner.	<ul style="list-style-type: none"> • CREW recognizes failure of the "A" RPS channel via alarms C3-A2, C3-A3, C8-A1, C8-A2, C5 (window) and indication at the RPS power source display on the H11-P610 panel. • RO monitors Rx power, pressure, water level and main generator output for any changes. • CRS implements and executes HC.OP-AB.ZZ-0110 and HC.OP-AB.ZZ-0116 directs actions to recover from loss of "A" RPS power and isolations • RO/PO notifies ABEO to investigate cause of "A" RPS channel failure. • CRS directs actions for RWCU system isolation in accordance with HC.OP-AR.ZZ-0008. • CRS refers to Technical Specification 3.4.4 for applicability. 	

As ABEO, report that the AN410 and BN410 EPA breakers RPS "A" MG set have tripped open on under voltage.

Conductivity sampling requirements.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>Respond as Shift Electrician, that it appears to be an AN410 EPA breaker under voltage device fault.</p> <p>RPS EPA breakers.</p>	<ul style="list-style-type: none"> • CRS directs the following when conditions permit in accordance with HC.OP-AB.ZZ-0110 and HC.OP-AB.ZZ-0116: <ul style="list-style-type: none"> - Re-energization of the tripped RPS bus - Resetting the half scram - Resetting NSSSS and restoration of RWCU system • CRS refers to Technical Specification 3.8.4.4 for applicability. • PO re-energizes the "A" RPS bus by repositioning the RPS MG SET TRANSFER SWITCH on panel H11-P610 to ALT "A" as directed by the CRS. • RO/PO reset NSSSS and PCIS IAW CRS direction and Section 5.3 of HC.OP-SO.SB-0001 and Section 5.3 of HC.OP-SO.SM-0001. 	
<p>4. "B" RR pump inboard & outboard seal failure:</p> <p>Insert RT-2 when RPS is reset, or at the discretion of the Lead Examiner.</p>	<ul style="list-style-type: none"> • CREW recognizes "B" RR pump inboard seal has failed via CRIDS and informs CRS. • RO/PO monitors CRIDS pg. 85 and heightens awareness for potential second seal failure. 	
<p>NOTE:</p> <p>The inboard seal fails when RT-2 is inserted. The outboard seal fails 4.25 minutes later.</p>		

Event / Instructor Activity	Expected Plant/Student Response	Comments
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NOTE:

If CREW calls Rad Pro and requests DWFDS and DWFDS readings on RM11, report actual readings from the RM11.

- CREW recognizes increased leakage into DRWL and takes appropriate actions for following alarms:
 - 1) CRIDs indication
 - 2) DRYWELL SUMP LEVEL
HI/LO - D3/C3
 - 3) DRYWELL PRESSURE
HI/LO - A7/E4
 - 4) RADIATION MONITORING
ALARM/TRBL - C6/A2
 - 5) DLD SYSTEM ALARM/TRBL
- C6/B1
 - CREW recognizes "B" RR pump multiple seal failure and informs CRS.
 - CRS implements HC.OP-AB.ZZ-0112 and directs actions to trip and isolate the "B" RR pump.
 - * CREW trips and isolates the "B" RR pump before DRWL pressure reaches 1.68 psig by:
 - shutting pump suction valve HV-F023B
 - shutting pump seal purge valve HV-F3800B
 - shutting RWCU suction valve BG-F106
 - shutting pump discharge valve HV-F031B
- (K/A 202001 A2.10 3.5/3.9)

NOTE:

If plant is scrammed due to DRWL pressure increase, the following expected actions for single loop operation are not applicable.

- OS/CRS ensures compliance with the operability requirements of Tech Spec 3.4.1.1 for single loop operations.
- CRS implement HC.OP-AB.ZZ-0300, and directs actions to monitor for power oscillations.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>If guidance from RE is requested, as the RE direct crew to monitor for power to flow oscillations and insert the stuff sheet as necessary to clear APRM Upscale alarms.</p> <p>Tech Spec 4.4.5</p>	<ul style="list-style-type: none"> • CRS ensures that the CREW does not <u>intentionally</u> enter instability (exit) region. • RO inserts control rods IAW the stuff sheet and CRS direction to clear APRM upscale alarms. • If Exit region is entered, the CREW exits the area of instability IAW HC.OP-AB.ZZ-0300 by manually inserting rods or increasing RR flow. • CRS implements HC.OP-IO.ZZ-0006 for single loop operations. • CREW references HC.OP-SO.BB-0002 sections 5.3 and implements attachment 3V of HC.OP-DL.ZZ-0026 for single loop operations. • RO/PO monitors APRMs and LPRMs for abnormal flux oscillations. • CRS notifies RE / I&C of RR pump trip and requirements of Tech Spec 3.4.1.1. • RO/PO dispatches TBEO to monitor MG Set lube oil temperatures and adjust TACS flow as necessary. • CRS notifies Chemistry/Rad Pro of Rx power decrease of >15% in one hour. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>5. Failure of 3RD stage Air Ejector Flow, SJAE Isolation.</p> <p>Insert YP:MALF(294) in MONITOR. Set to 1(TRUE) when the Recirculation Pump is isolated and actions for Single Loop operations are in progress, or at the discretion of the lead examiner.</p>	<ul style="list-style-type: none"> • PO notices failure of the SJAE via overhead annunciator A4-D1, CRIDS alarm, and informs the CRS. • CRS directs actions in accordance with HC.OP-AB.ZZ-0128 <ul style="list-style-type: none"> - Place the A SJAE in service. • PO places the A SJAE in service in accordance with Section 5.4 of HC.OP-SO.CG-0001. • PO monitors and reports Main Condenser Vacuum. • CRS directs actions to lower Reactor Power to maintain Condenser vacuum less than 5.0" Hg ABS in accordance with HC.OP-AB.ZZ-0208. • CRS directs a Reactor scram if Main Condenser vacuum cannot be maintained. • RO places and locks the Mode Switch in Shutdown. Notices the failure to scram and informs the CRS. • CRS enters and directs HC.OP-EO.ZZ-0101A, ATWS-RPV Control, and directs actions to: <ul style="list-style-type: none"> - Scram using RPS or ARI • RO initiates an RPS scram using the Arm and Depress push buttons or by initiating ARI. Verifies rod movement and informs the CRS. 	

Note: 15 minute warm-up is not required for rapid response.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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- CRS exits HC.OP-EO.ZZ-0101A, ATWS-RPV Control, enters and directs HC.OP-EO.ZZ-0101, RPV Control, and directs actions to:
 - Verify scram actions
 - Control RPV water level above +12.5"
 - Stabilize Rx pressure below 1037#
- Crew determines RPV level, pressure, and containment parameters and informs CRS.
- PO controls Feedwater System to maintain water level as directed.
- RO performs scram actions in accordance with Section 5.2 of HC.OP-SO.SB-0001
- CRS directs pressure control with SRVs when the MSiVs close at 756 psig due to Mode Switch failure.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>6. Seismic event, RHR rooms flood, unisolable Torus leak, Emergency Depressurization.</p> <p>Insert RT-4 when the standby SJAE is placed in service, the Reactor is scrammed, or at the discretion of the lead examiner.</p> <p>Make announcement "Motion can be felt and then stops," or use the Simulator Sound System to simulate the Seismic Event.</p> <p>Report as the ABEO if dispatched to the Upper Relay Room, that the seismic <u>switch</u> has tripped (Amber light on power supply drawer is on) and that the tape recorders are advanced but not running. The Event indicator is white. If requested to reset the Seismic Monitor, clear Malfunction PC07.</p> <p>Note: Only if the plant was not previously shutdown.</p>	<ul style="list-style-type: none"> • CREW recognizes Seismic Event via annunciator and Response Spectrum Analyzer panel display and informs CRS. • CRS implements HC.OP-AB.ZZ-0139 and directs actions to: <ul style="list-style-type: none"> - Monitor power, level, and pressure - Inspect the plant for damage - Verify the security system intact • CRS determines from reports that an immediate plant shutdown is required. • Crew recognizes lowering Suppression Pool water level, flooding in the C RHR Pump Room and flooding in the A RHR Pump Room. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>Respond as EO to enter various areas to report leak. Report Torus has a leak approximately two feet from the bottom and appears to be unisolable.</p> <p>Note: If directed, respond as EO on attempts to makeup to the Suppression Pool. Report makeup in progress, but do not simulate.</p> <p>Note: Only if the plant was not previously shutdown.</p> <p>Note: Raise severity of PC06 to 40% over 10 min ramp when the Reactor is scrammed.</p>	<ul style="list-style-type: none"> • CRS implements HC.OP-AB.ZZ-0114, HC.OP-EO.ZZ-0102, and HC.OP-EO.ZZ-0103, and directs actions to: <ul style="list-style-type: none"> - Restore Suppression Pool level - Attempt to isolate the leaks by closing the suction valves for the C and A RHR Pumps. • PO closes the suction valves for the C and A RHR Pumps. • Crew observes Suppression Pool level continues to lower and reports this to the CRS. • CRS directs that Recirculation be runback and a manual scram inserted if Suppression Pool water level cannot be maintained above 55". • RO runs back Recirculation Pumps to minimum, places the Mode Switch in shutdown, notices the failure to scram, and informs the CRS. • CRS enters and directs HC.OP-EO.ZZ-0101A, ATWS-RPV Control, and directs actions to: <ul style="list-style-type: none"> - Scram using RPS or ARI • RO initiates an RPS/ARI as directed, or on own initiative, to scram the Reactor. Verifies rod movement and informs the CRS. • CRS exits HC.OP-EO.ZZ-0101A, enters and directs HC.OP-EO.ZZ-0101, RPV Control, and directs actions to: <ul style="list-style-type: none"> - Verify scram actions - Control RPV water level above +12.5" - Stabilize Rx pressure below 1037# 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p><u>NOTE:</u> Crew should consider anticipating Emergency Depressurization by using BPVs if the Main Condenser is available. The Main Condenser will not be available when the MSIVs close at 756 psig due to the Mode Switch failure.</p>	<ul style="list-style-type: none"> • Crew determines RPV level, pressure, and containment parameters and informs CRS. • RO initiates an RPS scram using the Arm and Depress push buttons. Verifies rod movement and informs the CRS. • PO controls pressure as directed, SRVs or BPVs. • PO controls Feedwater System to maintain water level as directed. • RO performs scram actions in accordance with Section 5.2 of HC.OP-SO.SB-0001. • CREW monitors RPV water level, pressure, and containment parameters and informs CRS. • CRS recognizes Suppression Pool level is, or cannot be maintained above 38.5". 	
<p><u>NOTE:</u> CRS may not direct opening of the BPVs for the reason stated above.</p>	<ul style="list-style-type: none"> • CRS directs opening the BPVs in anticipation of emergency depressurizing the Reactor. • RO/PO opens all BPVs as directed. • CRS implements HC.OP-EO.ZZ-0202, Emergency RPV Depressurization, and directs action to open five ADS valves. • PO opens the ADS valves, and reports this to the CRS. • * CREW opens at least four SRVs to emergency depressurize the Rx within 1 minute of suppression pool level reaching 38.5". 	
<p>Note: Crew may emergency depressurize before reaching 38.5 inches, satisfying this critical task.</p>	<p>(K/A 223001 A2.11 3.6/3.8)</p>	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when the RPV is depressurized and RPV water level is stable between +12.5" and +54".

VI. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
- B. ES-604 Dynamic Simulator Requalification Examination Standard
- C. K/A Catalog
- D. JTA Listing
- E. Hope Creek Generating Station Probabilistic Risk Assessment
- F. Technical Specifications
- G. Emergency Plan (ECG)
- H. Alarm Response Procedures (Various)
 - I. HC.OP-IO.ZZ-0006 Power Changes During Operation
 - J. HC.OP-SO.AE-0001 Feedwater System Operation
 - K. HC.OP-SO.BB-0002 Reactor Recirculation System Operation
 - L. HC.OP-SO.CG-0001 Condenser Air Removal System Operation
 - M. HC.OP-SO.SB-0001 Reactor Protection System
 - N. HC.OP-SO.SM-0001 Isolation Systems Operation
 - O. HC.OP-AB.ZZ-0110 Loss of an RPS Channel
 - P. HC.OP-AB.ZZ-0112 Recirculation Pump Trip
 - Q. HC.OP-AB.ZZ-0110 Loss of an RPS Channel
 - R. HC.OP-AB.ZZ-0300 Reactor Power Oscillations
 - S. HC.OP-AB.ZZ-0116 Containment Isolations and Recovery From an Isolation
 - T. HC.OP-AB.ZZ-0139 Acts of Nature
 - U. HC.OP-AB.ZZ-0208 Main Condenser Low Vacuum
 - V. HC.OP-DL.ZZ-0026 Surveillance Log
 - W. HC.OP-EO.ZZ-0101 RPV Control
 - X. HC.OP-EO.ZZ-0101A ATWS-RPV Control
 - Y. HC.OP-EO.ZZ-0102 Primary Containment Control
 - Z. HC.OP-EO.ZZ-0103 Reactor Building & Rad Release Control
 - AA. HC.OP-EO.ZZ-0202 Emergency RPV Depressurization
 - BB. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards
 - CC. SH.OP-DD.ZZ-0004 Operations Standards

ESG CRITICAL TASK RATIONAL**ESG-NRC-05 / 00**

1.
 - * **CREW trips and isolates the "B" RR pump before DRWL pressure reaches 1.68 psig by:**
 - shutting pump suction valve HV-F023B
 - shutting pump seal purge valve HV-F3800B
 - shutting RWCU suction valve BG-F106
 - shutting pump discharge valve HV-F031B
- (K/A 202001 A2.10 3.5/3.9)

Based upon the severity of the leak in the drywell, the operators will be able to identify and isolate the source of leakage before drywell pressure reaches 1.68 psig. Reaching 1.68 psig in the drywell initiates a reactor scram and starts ECCS and emergency systems. The scram and subsequent plant transient can be eliminated by proper operator actions.

2.
 - * **CREW opens at least four SRVs to emergency depressurize the Rx within 1 minute of suppression pool level reaching 38.5".**
- (K/A 223001 A2.11 3.6/3.8)

EOPs direct action to emergency depressurize the Reactor if Suppression Pool level cannot be maintained above 38.5". This level represents the Suppression Pool level that results in uncovering the Downcomer pipes and a loss of pressure suppression function of the Primary Containment.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 1, 100% RTP, MAIN GEN. OUTPUT: 1104 MWe

RISK MATRIX COLOR: Green

RIVER TEMPERATURE: 65°F

'D' CHANNEL WORK WEEK – BLUE Folders

Major activities accomplished last shift:

- Maintained 100% power.

Major activities scheduled for this shift:

- Reduce Reactor power to 95%.
- Remove B RFP from service for maintenance. Turbine inspection.

OPERATIONS SUPERINTENDENT ISSUES:	
Sys/Equip Problems	▪
Protected Equipment	▪
Update Status	▪
Action Plans	▪

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

•

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•

HOPE CREEK SIMULATOR

EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:

SCENARIO NUMBER: ESG-NRC-05

EFFECTIVE DATE: 5/29/00

EXPECTED DURATION: 1.5 Hours

REVISION NUMBER: 01

PROGRAM:

☐ L.O. REQUAL

☒ INITIAL LICENSE

☐ OTHER _____

REVISION SUMMARY:

PREPARED BY:

N/A
INSTRUCTOR

N/A
DATE

REVIEWED BY:

N/A
EP REPRESENTATIVE

N/A
DATE

APPROVED BY:

N/A
TRAINING SUPERVISOR

N/A
DATE

APPROVED BY:

N/A
OPS MANAGER OR DESIGNEE

N/A
DATE

I. OBJECTIVE(S):

- A. The Candidates must demonstrate the ability to operate effectively as a team while completing a series of CRITICAL TASKS, which measure the Candidate's ability to safely operate the plant during normal, abnormal, and emergency plant conditions.

(Critical tasks within this examination scenario guide are identified with an " *".)

II. MAJOR EVENTS:

- A. Reduce Reactor power with Recirculation System
- B. Remove Reactor Feed Pump from service
- C. Failure of RPS EPA Breaker Undervoltage Device
- D. **Recirculation Pump Dual Seal Failure**
- E. Failure of 3RD stage Air Ejector Flow, SJAE isolation.
- F. Seismic event, RHR rooms flood, unisolable Torus leak, Emergency Depressurization
- G. Mode Switch failure (RPS contacts) on Scram

III. SCENARIO SUMMARY:

The scenario begins with the plant at 100% power. The B RFP will be removed from service for maintenance. The A RPS MG set EPA Breaker undervoltage device fails causing a loss of the A RPS bus. This requires a transfer to the alternate power supply and an RPS reset. **Once RPS is reset, a Recirculation Pump dual seal failure occurs requiring isolation of the affected pump and preparations for Single Loop operations.** The 3RD stage Air Ejector Flow transmitter fails requiring the Standby Steam Jet Air Ejector to be placed in service. A Seismic Event causes a leak in the C RHR suction piping. The leak is unisolable. Due to a floor drain check valve problem, water will also fill up the A RHR pump room. This requires a plant shutdown. Due to the lowering Suppression Pool level, a scram and subsequent Emergency Depressurization is needed. The Mode Switch contacts fail on the scram.

The scenario may be terminated when all control rods are fully inserted, and RPV water level is being controlled above 12.5 inches.

IV. INITIAL CONDITIONS:

Initialize the simulator to IC-01; 100% power, MOL, Xe equilibrium, pull sequence step #727.

Complete Attachment 1 "Simulator Ready-for-Training/Examination Checklist" of NC.TQ-WB.ZZ-0004(Z)

TAGGED EQUIPMENT

Description

1. NONE

2.

OTHER CONDITIONS

Description

1. NONE

2.

MALFUNCTIONS:

	Malfunction #	Severity	RT#/ET#	Delay	Ramp	Description
1.	RP08A		1/None			RPS EPA BREAKER A TRIP
2.	RR05B	100	2/None			RECIRC PUMP B INBOARD SEAL FAILURE
3.	RR06B	100	2/None	255		RECIRC PUMP B OUTBOARD SEAL FAILURE
4.	MC06B		3/None			SJAE B STEAM SUPPLY FAILURE
5.	PC07A		4/None			SEISMIC EVENT
6.	PC06	5-20	4/None	300		SUPPRESSION POOL BREAK
7.	RH09C		4/None	420		RHR PUMP ROOM C FLOODED
8.	RH09A		4/None	600		RHR PUMP ROOM A FLOODED
9.						

I/O OVERRIDES

	Singer ID#	Value	RT/ET	Delay	Ramp	Description
1.	3S22 A	OFF	Pre-Insert			OVDI RPS MODE SWITCH-SHUTDOWN
2.	3S22 B	OFF	Pre-Insert			OVDI RPS MODE SWITCH-REFUEL
3.	3S22 C	OFF	Pre-Insert			OVDI RPS MODE SWITCH-STARTUP&HOT STDY
4.	3S22 D	ON	Pre-Insert			OVDI RPS MODE SWITCH-RUN
5.						

REMOTES

	Remote#	Value	RT#/ET#	Delay	Ramp	Description
1.	NONE					
2.						

EVENT TRIGGERS

1.	NONE
2.	

V. SEQUENCE OF EVENTS:

State shift job assignments.

Hold a shift briefing, detailing instruction to the shift.

(Provide crewmembers a copy of the shift turnover sheet)

Unfreeze the simulator and inform the crew;

"The simulator is running. You may commence panel walk downs at this time. CRS please inform me when your crew is ready to assume the shift."

Allow sufficient time for panel walk-downs. When informed by the OS/CRS that the crew is ready to assume the shift, make the following announcement:

"The Hope Creek simulator examination is in progress. All personnel not directly associated with the examination process please exit the simulator. This exam scenario has commenced."

Incorporate/evaluate the following activities during the scenario exam:

Event / Instructor Activity	Expected Plant/Student Response	Comments
1. Lower Reactor Power	<ul style="list-style-type: none"> CRS directs actions to reduce Reactor power IAW HC.OP-IO.ZZ-0006. RO reduces Recirculation Pump speed IAW HC.OP-SO.BB-0002 and CRS's direction. 	
2. Remove B RFP from service.		<ul style="list-style-type: none"> CRS directs actions to remove the B RFP from service IAW HC.OP-SO.AE-0001. PO removes the B RFP from service IAW Section 5.9 of HC.OP-SO.AE-0001.
3. Failure of RPS EPA Breaker Undervoltage Device. Insert RT-1 when the RFP is removed from service, or at the discretion of the lead examiner.	<ul style="list-style-type: none"> CREW recognizes failure of the "A" RPS channel via alarms C3-A2, C3-A3, C8-A1, C8-A2, C5 (window) and indication at the RPS power source display on the H11-P610 panel. RO monitors Rx power, pressure, water level and main generator output for any changes. CRS implements and executes HC.OP-AB.ZZ-0110 and HC.OP-AB.ZZ-0116 directs actions to recover from loss of "A" RPS power and isolations RO/PO notifies ABEO to investigate cause of "A" RPS channel failure. CRS directs actions for RWCU system isolation in accordance with HC.OP-AR.ZZ-0008. CRS refers to Technical Specification 3.4.4 for applicability. 	
As ABEO, report that the AN410 and BN410 EPA breakers RPS "A" MG set have tripped open on under voltage.		
Conductivity sampling requirements.		

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>Respond as Shift Electrician, that it appears to be an AN410 EPA breaker under voltage device fault.</p> <p>RPS EPA breakers.</p>	<ul style="list-style-type: none"> • CRS directs the following when conditions permit in accordance with HC.OP-AB.ZZ-0110 and HC.OP-AB.ZZ-0116: <ul style="list-style-type: none"> - Re-energization of the tripped RPS bus - Resetting the half scram - Resetting NSSSS and restoration of RWCU system • CRS refers to Technical Specification 3.8.4.4 for applicability. • PO re-energizes the "A" RPS bus by repositioning the RPS MG SET TRANSFER SWITCH on panel H11-P610 to ALT "A" as directed by the CRS. • RO/PO reset NSSSS and PCIS IAW CRS direction and Section 5.3 of HC.OP-SO.SB-0001 and Section 5.3 of HC.OP-SO.SM-0001. 	
<p>4. "B" RR pump inboard & outboard seal failure:</p> <p>Insert RT-2 when RPS is reset, or at the discretion of the Lead Examiner.</p>	<ul style="list-style-type: none"> • CREW recognizes "B" RR pump inboard seal has failed via CRIDS and informs CRS. • RO/PO monitors CRIDS pg. 85 and heightens awareness for potential second seal failure. 	
<p>NOTE:</p> <p>The inboard seal fails when RT-2 is inserted. The outboard seal fails 4.25 minutes later.</p>		

Event / Instructor Activity	Expected Plant/Student Response	Comments
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NOTE:

If CREW calls Rad Pro and requests DWFDS and DWFDS readings on RM11, report actual readings from the RM11.

- CREW recognizes increased leakage into DRWL and takes appropriate actions for following alarms:
 - 1) CRIDs indication
 - 2) DRYWELL SUMP LEVEL
HI/LO - D3/C3
 - 3) DRYWELL PRESSURE
HI/LO - A7/E4
 - 4) RADIATION MONITORING ALARM/TRBL - C6/A2
 - 5) DLD SYSTEM ALARM/TRBL - C6/B1
- CREW recognizes "B" RR pump multiple seal failure and informs CRS.
- CRS implements HC.OP-AB.ZZ-0112 and directs actions to trip and isolate the "B" RR pump.
- * CREW trips and isolates the "B" RR pump before DRWL pressure reaches 1.68 psig by:
 - shutting pump suction valve HV-F023B
 - shutting pump seal purge valve HV-F3800B
 - shutting RWCU suction valve BG-F106
 - shutting pump discharge valve HV-F031B

(K/A 202001 A2.10 3.5/3.9)

NOTE:

If plant is scrammed due to DRWL pressure increase, the following expected actions for single loop operation are not applicable.

- OS/CRS ensures compliance with the operability requirements of Tech Spec 3.4.1.1 for single loop operations.
- CRS implement HC.OP-AB.ZZ-0300, and directs actions to monitor for power oscillations.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>If guidance from RE is requested, as the RE direct crew to monitor for power to flow oscillations and insert the stuff sheet as necessary to clear APRM Upscale alarms.</p>	<ul style="list-style-type: none"> • CRS ensures that the CREW does not <u>intentionally</u> enter instability (exit) region. • RO inserts control rods IAW the stuff sheet and CRS direction to clear APRM upscale alarms. • If Exit region is entered, the CREW exits the area of instability IAW HC.OP-AB.ZZ-0300 by manually inserting rods or increasing RR flow. • CRS implements HC.OP-IO.ZZ-0006 for single loop operations. • CREW references HC.OP-SO.BB-0002 sections 5.3 and implements attachment 3V of HC.OP-DL.ZZ-0026 for single loop operations. • RO/PO monitors APRMs and LPRMs for abnormal flux oscillations. • CRS notifies RE / I&C of RR pump trip and requirements of Tech Spec 3.4.1.1. • RO/PO dispatches TBEO to monitor MG Set lube oil temperatures and adjust TACS flow as necessary. • CRS notifies Chemistry/Rad Pro of Rx power decrease of >15% in one hour. 	

Tech Spec 4.4.5

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>5. Failure of 3RD stage Air Ejector Flow, SJAE isolation.</p> <p>Insert YP:MALF(294) in MONITOR. Set to 1(TRUE) when the Recirculation Pump is isolated and actions for Single Loop operations are in progress, or at the discretion of the lead examiner.</p>	<ul style="list-style-type: none"> • PO notices failure of the SJAE via overhead annunciator A4-D1, CRIDS alarm, and informs the CRS. • CRS directs actions in accordance with HC.OP-AB.ZZ-0128 <ul style="list-style-type: none"> - Place the A SJAE in service. • PO places the A SJAE in service in accordance with Section 5.4 of HC.OP-SO.CG-0001. • PO monitors and reports Main Condenser Vacuum. • CRS directs actions to lower Reactor Power to maintain Condenser vacuum less than 5.0" Hg ABS in accordance with HC.OP-AB.ZZ-0208. • CRS directs a Reactor scram if Main Condenser vacuum cannot be maintained. • RO places and locks the Mode Switch in Shutdown. Notices the failure to scram and informs the CRS. • CRS enters and directs HC.OP-EO.ZZ-0101A, ATWS-RPV Control, and directs actions to: <ul style="list-style-type: none"> - Scram using RPS or ARI • RO initiates an RPS scram using the Arm and Depress push buttons or by initiating ARI. Verifies rod movement and informs the CRS. 	

Note: 15 minute warm-up is not required for rapid response.

Event / Instructor Activity	Expected Plant/Student Response	Comments
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- CRS exits HC.OP-EO.ZZ-0101A, ATWS-RPV Control, enters and directs HC.OP-EO.ZZ-0101, RPV Control, and directs actions to:
 - Verify scram actions
 - Control RPV water level above +12.5"
 - Stabilize Rx pressure below 1037#
- Crew determines RPV level, pressure, and containment parameters and informs CRS.
- PO controls Feedwater System to maintain water level as directed.
- RO performs scram actions in accordance with Section 5.2 of HC.OP-SO.SB-0001
- CRS directs pressure control with SRVs when the MSiVs close at 756 psig due to Mode Switch failure.

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>6. Seismic event, RHR rooms flood, unisolable Torus leak, Emergency Depressurization:</p> <p>Insert RT-4 when the standby SJAE is placed in service, the Reactor is scrammed, or at the discretion of the lead examiner.</p> <p>Make announcement "Motion can be felt and then stops," or use the Simulator Sound System to simulate the Seismic Event.</p>	<ul style="list-style-type: none"> • CREW recognizes Seismic Event via annunciator and Response Spectrum Analyzer panel display and informs CRS. 	
<p>Report as the ABEO if dispatched to the Upper Relay Room, that the seismic switch has tripped (Amber light on power supply drawer is on) and that the tape recorders are advanced but not running. The Event indicator is white. If requested to reset the Seismic Monitor, clear Malfunction PC07.</p>	<ul style="list-style-type: none"> • CRS implements HC.OP-AB.ZZ-0139 and directs actions to: <ul style="list-style-type: none"> - Monitor power, level, and pressure - Inspect the plant for damage - Verify the security system intact 	
<p>Note: Only if the plant was not previously shutdown.</p>	<ul style="list-style-type: none"> • CRS determines from reports that an immediate plant shutdown is required. • Crew recognizes lowering Suppression Pool water level, flooding in the C RHR Pump Room and flooding in the A RHR Pump Room. 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p>Respond as EO to enter various areas to report leak. Report Torus has a leak approximately two feet from the bottom and appears to be unisolable.</p> <p>Note: If directed, respond as EO on attempts to makeup to the Suppression Pool. Report makeup in progress, but do not simulate.</p>	<ul style="list-style-type: none"> • CRS implements HC.OP-AB.ZZ-0114, HC.OP-EO.ZZ-0102, and HC.OP-EO.ZZ-0103, and directs actions to: <ul style="list-style-type: none"> - Restore Suppression Pool level - Attempt to isolate the leaks by closing the suction valves for the C and A RHR Pumps. • PO closes the suction valves for the C and A RHR Pumps. 	
<p>Note: Only if the plant was not previously shutdown.</p>	<ul style="list-style-type: none"> • Crew observes Suppression Pool level continues to lower and reports this to the CRS. • CRS directs that Recirculation be runback and a manual scram inserted if Suppression Pool water level cannot be maintained above 55". 	
<p>Note: Raise severity of PC06 to 40% over 10 min ramp when the Reactor is scrammed.</p>	<ul style="list-style-type: none"> • RO runs back Recirculation Pumps to minimum, places the Mode Switch in shutdown, notices the failure to scram, and informs the CRS. • CRS enters and directs HC.OP-EO.ZZ-0101A, ATWS-RPV Control, and directs actions to: <ul style="list-style-type: none"> - Scram using RPS or ARI • RO initiates an RPS/ARI as directed, or on own initiative, to scram the Reactor. Verifies rod movement and informs the CRS. • CRS exits HC.OP-EO.ZZ-0101A, enters and directs HC.OP-EO.ZZ-0101, RPV Control, and directs actions to: <ul style="list-style-type: none"> - Verify scram actions - Control RPV water level above +12.5" - Stabilize Rx pressure below 1037# 	

Event / Instructor Activity	Expected Plant/Student Response	Comments
<p><u>NOTE:</u> Crew should consider anticipating Emergency Depressurization by using BPVs if the Main Condenser is available. The Main Condenser will not be available when the MSIVs close at 756 psig due to the Mode Switch failure.</p>	<ul style="list-style-type: none"> • Crew determines RPV level, pressure, and containment parameters and informs CRS. • RO initiates an RPS scram using the Arm and Depress push buttons. Verifies rod movement and informs the CRS. • PO controls pressure as directed, SRVs or BPVs. • PO controls Feedwater System to maintain water level as directed. • RO performs scram actions in accordance with Section 5.2 of HC.OP-SO.SB-0001. • CREW monitors RPV water level, pressure, and containment parameters and informs CRS. • CRS recognizes Suppression Pool level is, or cannot be maintained above 38.5". 	
<p><u>NOTE:</u> CRS may not direct opening of the BPVs for the reason stated above.</p>	<ul style="list-style-type: none"> • CRS directs opening the BPVs in anticipation of emergency depressurizing the Reactor. • RO/PO opens all BPVs as directed. • CRS implements HC.OP-EO.ZZ-0202, Emergency RPV Depressurization, and directs action to open five ADS valves. • PO opens the ADS valves, and reports this to the CRS. • * CREW opens at least four SRVs to emergency depressurize the Rx within 1 minute of suppression pool level reaching 38.5". 	
<p>Note: Crew may emergency depressurize before reaching 38.5 inches, satisfying this critical task.</p>	<p>(K/A 223001 A2.11 3.6/3.8)</p>	

Event / Instructor Activity	Expected Plant/Student Response	Comments
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Scenario Termination:

With concurrence from the lead examiner, the scenario may be terminated when the RPV is depressurized and RPV water level is stable between +12.5" and +54".

VI. SCENARIO REFERENCES:

- A. ES-301 Preparation of Operating Tests
- B. ES-604 Dynamic Simulator Requalification Examination Standard
- C. K/A Catalog
- D. JTA Listing
- E. Hope Creek Generating Station Probabilistic Risk Assessment
- F. Technical Specifications
- G. Emergency Plan (ECG)
- H. Alarm Response Procedures (Various)
 - I. HC.OP-IO.ZZ-0006 Power Changes During Operation
 - J. HC.OP-SO.AE-0001 Feedwater System Operation
 - K. HC.OP-SO.BB-0002 Reactor Recirculation System Operation
 - L. HC.OP-SO.CG-0001 Condenser Air Removal System Operation
 - M. HC.OP-SO.SB-0001 Reactor Protection System
 - N. HC.OP-SO.SM-0001 Isolation Systems Operation
 - O. HC.OP-AB.ZZ-0110 Loss of an RPS Channel
 - P. HC.OP-AB.ZZ-0112 Recirculation Pump Trip
 - Q. HC.OP-AB.ZZ-0110 Loss of an RPS Channel
 - R. HC.OP-AB.ZZ-0300 Reactor Power Oscillations
 - S. HC.OP-AB.ZZ-0116 Containment Isolations and Recovery From an Isolation
 - T. HC.OP-AB.ZZ-0139 Acts of Nature
 - U. HC.OP-AB.ZZ-0208 Main Condenser Low Vacuum
 - V. HC.OP-DL.ZZ-0026 Surveillance Log
 - W. HC.OP-EO.ZZ-0101 RPV Control
 - X. HC.OP-EO.ZZ-0101A ATWS-RPV Control
 - Y. HC.OP-EO.ZZ-0102 Primary Containment Control
 - Z. HC.OP-EO.ZZ-0103 Reactor Building & Rad Release Control
 - AA. HC.OP-EO.ZZ-0202 Emergency RPV Depressurization
 - BB. HC.OP-AZ.ZZ-0002 Hope Creek Operations Standards
 - CC. SH.OP-DD.ZZ-0004 Operations Standards

ESG CRITICAL TASK RATIONAL**ESG-NRC-05 / 00**

1.

- * **CREW trips and isolates the "B" RR pump before DRWL pressure reaches 1.68 psig by:**
 - shutting pump suction valve HV-F023B
 - shutting pump seal purge valve HV-F3800B
 - shutting RWCU suction valve BG-F106
 - shutting pump discharge valve HV-F031B

(K/A 202001 A2.10 3.5/3.9)

Based upon the severity of the leak in the drywell, the operators will be able to identify and isolate the source of leakage before drywell pressure reaches 1.68 psig. Reaching 1.68 psig in the drywell initiates a reactor scram and starts ECCS and emergency systems. The scram and subsequent plant transient can be eliminated by proper operator actions.

2.

- * **CREW opens at least four SRVs to emergency depressurize the Rx within 1 minute of suppression pool level reaching 38.5".**

(K/A 223001 A2.11 3.6/3.8)

EOPs direct action to emergency depressurize the Reactor if Suppression Pool level cannot be maintained above 38.5". This level represents the Suppression Pool level that results in uncovering the Downcomer pipes and a loss of pressure suppression function of the Primary Containment.

Hope Creek Generating Station Turnover Sheet

Today's Date

Oncoming Shift: Days [X] Nights []

OPERATIONAL CONDITION: 1, 100% RTP, MAIN GEN. OUTPUT: 1104 MWe

RISK MATRIX COLOR: Green

RIVER TEMPERATURE: 65°F

'D' CHANNEL WORK WEEK – BLUE Folders

Major activities accomplished last shift:

- Maintained 100% power.
-

Major activities scheduled for this shift:

- Reduce Reactor power to 95%.
- Remove B RFP from service for maintenance. Turbine inspection.

OPERATIONS SUPERINTENDENT ISSUES:	
Sys/Equip Problems.	▪
Protected Equipment	▪
Update Status	▪
Action Plans	▪

Active LCO's

LCO	Planned or Unplanned	Deficiency	Expiration Date/Time	Additional Action

Follow-up Operability Assessments (CRFA) Assigned

AR	DEFICIENCY	Responsible Person	DUE DATE

Compensatory Actions in effect (Required by CROD/CRFA for Operability)

OD/FA Number	DEFICIENCY	COMPENSATORY ACTIONS	Resolution Due Date

Reactivity Controls:

•

Standby Safety Systems:

•

Balance of Plant:

•

Electrical:

- CRIDS "Excess MVARs" point is INOP; contact Load Dispatch for info regarding this point.

Cooling Water Systems:

•

Ventilation:

•

Administrative:

•