

ROCHESTER GAS & ELECTRIC CORPORATION R. E. GINNA NUCLEAR POWER PLANT EXAMINATION SCENARIO	NO.: 2004 NRC Initial Exam Scenario 04-1	REV: 0
	TITLE: Ejected RCCA	
	DATE: 1/18/04	PAGE: 1 of 22

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Date: 1/18/04

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Date: 1/26/04


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Evaluators

Final review 
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Date: 3/29/04

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1. SCENARIO OVERVIEW

- 1.1 The plant is initially at 2-3% power during a startup following a mid cycle maintenance shutdown. Procedure O-1.2 is complete up to starting the first MFW pump and placing MFW in service. The TDAFW Governor has failed but this has not yet been detected.
- 1.2 The operators will place MFW system in service and secure AFW as per procedure O-1.2.
- 1.3 Przr Level Transmitter LT-427 fails low causing letdown isolation. The operators will defeat the channel per ER-INST.1 and restore Letdown Operation per S-3.2E.
- 1.4 The "A" S/G ARV controller fails causing the valve to open fully. The operators should take manual control of the ARV and close the valve.
- 1.5 A leak develops on a CRDM housing ramping up to 25 gpm. Shortly after the leak develops, the MRPI coil stack on the associate CRDM fails (shorts) due to the coolant leak. The operator should enter AP-RCS.1. After performing action to stabilize the RCS inventory, the operator should determine that a plant shutdown is required and transition to O-2.1 or AP-TURB.5.
- 1.6 The leaking CRDM housing fails causing an 800 gpm LOCA and an ejected RCC. SI will auto actuate (possibly manual actuation). "A" SI Train Sequencer fails to actuate and "B" SI pump fails to auto start resulting in inadequate SI pump running. Both MDAFW pumps fail to auto start resulting in no AFW available. The operators should trip the Rx per AP-RCS.1. step 1 and enter E-0. They should start the failed ECCS equipment and verify other action per E-0. They should then transition to E-1 and then ES-1.2. The scenario is terminated when a cooldown is started as per ES-1.2.

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2. SCENARIO OBJECTIVES

2.1 RO(s) - Demonstrate the ability to monitor and operate the MCB, diagnose events and implement step of Normal, Abnormal and Emergency Procedures, interact with other members of the crew in a manner which facilitates the crews response to events which occur. Respond to the following events:

1) Normal Operations

- Start MFW pump and transition to MFW

2) Instrument Component Malfunctions

- Przr Level LT-427 fails low/letdown isolation
- S/G ARV controller fails causing the ARV to fail open
- RCS leak requiring shutdown

3) Emergency Events

- Ejected Rod/SB LOCA
- ECCS equipment failures

SRO - Demonstrate the ability to supervise the Control Board operators, diagnose event and choose and implement response procedures, interact with other members of the crew in a manner which facilitate the crews response to events which occur, determine Tech Spec required actions.

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3. CRITICAL TASKS (CTs)

CT #1 E-O-I

Task: Establish flow from at least two SI pumps before transition out of E-0.

Cues: • SI actuated
• RCS pressure less than SI pump shutoff head
• Less than two SI pumps indicating running

Indication: Manipulation of controls to establish flow from at least two SI pumps

Feedback: Indications that two SI pumps are running

CT #2 E-I-C

Task: Trip all RCP within five minutes of reaching the Trip Criteria

Cues: Indications that RCP Trip Criteria are met

Indication: Manipulation of controls as required to trip both RCPs

Feedback: Indications all RCPs are tripped

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4. INSTRUCTOR ACTIONS

<u>Problem Time</u>	<u>Actions</u>	<u>Notes</u>
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4.1 Set up the simulator per OTG-3.2

For 2004 License Exam saved as IC-171

- 4.1.1 Reset simulator to IC-21 MOL
10⁻⁸ Amp Xe-Free
- 4.1.2 Increase power to 2-3% and
complete O-1.2 up to step
5.4.3.18 and attachment MFW
Pump A up to step 9.0
- 4.1.3 Insert MAEF FDW12 ORPM

4.2 Initial Conditions

- 4.2.1 LT-427 Fails Low
MALF PZR03B, 0%, 0 ramp
Trigger 1
- 4.2.2 S/G A ARV Fails Open
MALF STM04A 100%, 10 sec ramp
Trigger 2
- 4.2.3 CRDM Leak/Coil Stack Failure
MALF RCS02A, 25 gpm, 300 sec
ramp
Trigger 3
MALF ROD13C-G11, 300 sec TD
Trigger 3
- 4.2.4 Ejected Rod/SI and AFW Pump
Fail to Start
MALF SIS02A, 1 no manual
Trigger 4
MALF RPS07B
Trigger 4
MALF RPS07K
Trigger 4
MALF RPS07L
Trigger 4
MALF ROD05-G11 800 gpm, 0 sec
ramp, 10 sec TD
Trigger 4

10 min

- 4.3 LT-427 Failure
Trigger 1

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- 20 min 4.4 S/G ARV Fails Open
 Trigger 2
 If called to, manual isolate valve
 LOCA STM02, 0%, 120 sec Ramp, 120 sec
 TD
- 25 min 4.5 RCS Leak/MRPI Coil Stack Failure
 Trigger 3
 When called to investigate AB System
 No leak found
- 30 min 4.6 Ejected Rod/Safeguard Equipment fails
 to Auto Start
 Trigger 4
- 4.7 Termination Criteria
 Terminate scenario when a cooldown is
 established in ES-1.2, unless directed
 otherwise by the Lead Examiner.

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5. TURNOVER INFORMATION

5.1 The plant is at ~2% power during a startup following a week long maintenance shutdown. C₈ - 1336 ppm Xenon Free. O-1.2 Complete up to step 5.4.3.18 and MFW A Attachment up to step 9.0.

5.2 Equipment Out of Service

None

5.3 Work in Progress

Startup of A MFW Pump transfer to MFW securing AFW

5.4 Planned Work

Turbine Roll up and Synchronization

5.5 Significant Events

None

5.6 Remarks

Continue actions in O-1.2 to place plant on line.

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6. EVALUATION

Event: 1

Event Title: Start MFW Pump

Expected Response/Behavior

CUES:

Response:

		<u>RATING</u>	<u>N/A</u>
BOP/SRO	Take MFW out of Pull Stop	_____	_____
BOP/SRO	Ensure Recirc Valves open • AOV 4147 • AOV 4262 (Local call AO)	_____	_____
BOP/SRO	Start A MFW Pump	_____	_____
BOP/SRO	Open MFW Discharge Valve MOV 3977	_____	_____
SRO	Notify AO to close 3977A (LOA FDW52)	_____	_____

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BOP/SRO	Verify MFW Regulating Valve and Bypass Valve Operation • HCV-466 • HCV-476 • HCV-480 • HCV-481	_____
BOP/SRO	Place MFRV/Bypass Valves in Automatic as desired	_____
BOP/SRO	Stop Both AFW Pumps	_____
BOP/SRO	Realign AFW for Normal Operations	_____

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6. EVALUATION

Event: 2

Event Title: LT-427 Przr Level Fails Low

Expected Response/Behavior

CUES: Przr Low Level Alarm
Letdown Isolation
Przr Heaters Trip
Charging Pump Speed Alarm
VCT Level Decreases

Response:

		<u>RATING</u>	<u>N/A</u>
RO/CRF	Recognize LT-427 has failed Letdown is isolated/Przr Heaters tripped	_____	_____
CRF	Enter ER-INST.1	_____	_____
RO/CRF	Monitor Przr Pressure	_____	_____
RO/CRF	Place Charging to manual/minimize speed	_____	_____
RO/CRF	Stop one charging pump	_____	_____
RO/CRF	Adjust HCV-142 to Control Lab Seal ΔP	_____	_____
RO/CRF	Close AOV-427, 200A, B, 202	_____	_____

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CRF	Determine if excess L/D should be placed in service	_____	_____
BOP/SRO	Defeat Channel per Attachment	_____	_____
RO/SRO	Restore Przr Heaters	_____	_____
RO/SRO	Restore Normal Letdown per S-3.2E <ul style="list-style-type: none"> • PCV-135 TCV-130 Manual @ 40% • Open 427/371 • Open 200A or B • Return Controllers to Auto 	_____	_____
RO	Restore Charging to normal	_____	_____
SRO	Evaluate Tech Specs <ul style="list-style-type: none"> • 3.3.1-1 Function 8 • 3.3.3-1 Function 2 • Section 3.4.9 	_____	_____

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6. EVALUATION

Event: 3

Event Title: "A" S/G ARV Fails Open

Expected Response/Behavior

CUES: Tavg - Decreasing
 A S/G Pressure Decreasing
 ARV indicates full open

Response:

		<u>RATING</u>	<u>N/A</u>
BOP/SRO	Recognize ARV full open	_____	_____
SRO	Direct RO to close ARV manually	_____	_____
BOP	Take ARV to manual close	_____	_____
BOP/RO/SRO	Stabilize plant following transient	_____	_____

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7 EVALUATION

Event: 4

Event Title: CRDM Leak

Expected Response/Behavior

CUES: CNMT Radiation Increasing
RCS leakage increasing (charging pump speed increasing)
MRPI Failure Alarm on MRPI CRT

Response:

		<u>RATING</u>	<u>N/A</u>
RO/SRO	Recognize indications of increased leakage	_____	_____
SRO	Enter AP-RCS.1 RCS Leak	_____	_____
RO/SRO	Monitor Przr Level • Increase Charging Flow • Isolate L/D if necessary	_____	_____
RO/SRO	Verify VCT Makeup System Alignment	_____	_____
RO/SRO	Verify RCS Leakage in CNMT • Rod Monitors • A Sump	_____	_____
SRO	Send AO to check Aux. Building	_____	_____

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RO/SRO	Check CCW for Leak	_____	_____
RO/SRO	Check CVCS for Leak <ul style="list-style-type: none"> • L/D Flow, Press • Charging/Seal Injection Flow • Aux. Building Radiation 	_____	_____
RO/SRO	Check PRT for Leak <ul style="list-style-type: none"> • Level • Pressure 	_____	_____
BOP/SRO	Check S/G for Leakage <ul style="list-style-type: none"> • S/G Radiation 	_____	_____
RO/SRO	Check Accumulator Levels	_____	_____
RO/SRO	Check RCP Seal Leakoff	_____	_____
RO/SRO	Check RCDT Leak Rate	_____	_____
SRO	Call AO to check Valve Leakoff Temperature	_____	_____
RO/SRO	Stabilize Plant Conditions	_____	_____
SRO/RO/BOP	Check MCB Annunciators	_____	_____

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SRO Determine a Tech Spec Shutdown Required

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6. EVALUATION

Event: 5

Event Title: MRPI Coil Stack Fails

Expected Response/Behavior

CUES: MRPI CRT Alarm and Loss of Indication for Rod G-11

Response:

		<u>RATING</u>	<u>N/A</u>
RO/SRO	Recognize Condition	_____	_____
SRO	Enter AP-RCC.2 RCC/RPI Malfunction	_____	_____
RO/CRF	Check the following: • Dropped Rod Alarms C-14, C-29 • Tavg Trend	_____	_____
BOP/CRF	Check for • G-15 Steam Dump Armed • Generator Load > 15 MW	_____	_____
CRF	Determine that AP-TURB.1 should not be entered	_____	_____
BOP/RO/SRO	Stabilize Plant	_____	_____

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RO/SRO Verify Control Rod Alignment and QPTR

RO/SRO Determine that an MRPI has failed

SRO Review Tech Spec 3.1.7

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7. EVALUATION

Event: 6, 7, 8

Event Title: Ejected Rod, SBLOCA

Expected Response/Behavior

CUES: Rx Power Increases
Przr Press and Level Decrease rapidly
CNMT Radiation Increases

Response:

		<u>RATING</u>	<u>N/A</u>
RO/SRO	Determine Leakage Exceed Charging Capacity	_____	_____
RO	Trip Rx	_____	_____
RO/BOP	Perform E-0 Immediate Actions <ul style="list-style-type: none"> • Trip Rx • Turbine Stop Valve • Vital Busses Energized • SI 	_____	_____
RO/SRO	Determine SI needed Manually Actuate	_____	_____

		<u>SAT</u>	<u>UNSAT</u>
CT #1	Establish flow from at least two SI pumps before transition out of E-0	_____	_____

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RO/SRO	Manually Start	_____	_____
	<ul style="list-style-type: none"> • CNMT Recirc Fans • Both AFW Pumps 		

RO/CRF	Verify CNMT Isolation	_____	_____
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		<u>SAT</u>	UNSAT
CT #2	Trip all RCP with five minutes of reaching the trip criteria <ul style="list-style-type: none"> • Two SI pumps running • RCS press - Highest S/G press < 175 psid (400 adverse) 	_____	_____

RO/CRF	Verify CCW pump running	_____	_____
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RO/CRF	Verify SI Flow	_____	_____
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BOP/SRO	Verify AFW Valve Alignment	_____	_____
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BOP/SRO	Control S/G Levels (Continuous Action)	_____	_____
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RO/SRO	Check SI/RHR Alignment	_____	_____
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RO/SRO	Check Thermal Barrier Cooling	_____	_____
BOP/SRO	Monitor Control Tavg <ul style="list-style-type: none"> • Stop dump steam • Control AFW • Shut MSIV's 	_____	_____
RO/SRO	Check PORVs and Block Valves	_____	_____
SRO	Determine LOCA in progress Transition to E-1 <ul style="list-style-type: none"> • CNMT Radiation • CNMT Sump Level • CNMT Press 	_____	_____
BOP/SRO	Check Secondary Intact (Pressure Stable)	_____	_____
BOP/SRO	Control S/G levels (17-50%, 25-50 adverse)	_____	_____
BOP/SRO	Check Secondary Radiation Normal	_____	_____
RO/BOP	Check PORVs	_____	_____
RO/SRO	Reset SI and CI signals	_____	_____

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BOP/SRO	Check SW System Direct AO to do SD-1	_____	_____
BOP/SRO	Restore IA to CNMT	_____	_____
BOP/SRO	Check Power Supplies for Charging	_____	_____
RO/SRO	Establish Charging Flow	_____	_____
SRO	Check SI Termination Criteria (not met)	_____	_____
RO/SRO	Stop RHR pumps	_____	_____
RO/BOP/ SRO	Check RCS and S/G Pressure (determine if LOCA or steamline break) Continue to step 16	_____	_____
BOP/SRO	Stop Diesel Generators	_____	_____
RO/SRO	Verify CNMT Sump Recirc Capability	_____	_____
BOP/RO/ SRO	Evaluate Status	_____	_____

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SRO Determine Post LOCA Cooldown Required
Transition to ES-1.2
(Steps 1-2 are repeat of E-0 Actions)

RO/SRO Increase charging to 75 gpm

BOP/SRO Setup ARV for Pressure Control and Control
intact S/G levels

RO/SRO Deenergize Przr Heater

BOP/SRO Initiate 100°F/hr Cooldown to CSD
If < 100°F/hr cooldown not already present
from the break

End Scenario

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Date: 1/18/04

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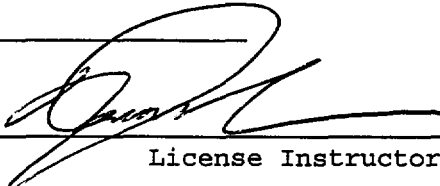
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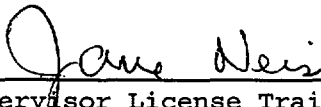
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Examinees

Evaluators

Final review 
License Instructor

Date: 3/29/04

Approved for use 
Supervisor License Training
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1. SCENARIO OVERVIEW

- 1.1 The plant is at 100% power MOL condition Xenon Equilibrium, C_B 845 ppm. The D CNMT Recirculation Fan is OOS. B and C charging pumps are running. A charging pump is OOS.
- 1.2 Turbine First Stage Pressure Transmitter PT-485 fails low, this results in rod stepping in at high speed. The operators should enter AP-RCC.1 Uncontrolled Rod Motion and place rods to manual. They should then defeat PT-485 per ER-INST.1.
- 1.3 A loss of off-site circuit results in loss of buses 16 and 17 until the diesel generator starts and restores the buses. The C Charging Pump is lost resulting in a partial loss of charging flow. The operators should respond using AP-ELEC.1.
- 1.4 A 10 gpm tube leak develops on the "B" S/G. The operator should recognize this condition from the increase in Air Ejector Radiation and increased RCS Makeup. They should respond per AP-SG.1 and initiate a plant shutdown.
- 1.5 Hotwell Level Controller LT-2001 Fails high causing hotwell rejection to the CSTs. The operators should recognize the failure and manual control hot well level utilizing LT-2002.
- 1.6 PCV-431C (Przr PORV) fails 50% open. The operator should recognize the rapidly decreasing pressurizer level and the valve mid position and enter AP-PRZR.1 Abnormal Przr Pressure. They should isolate the valve by closing its MOV block valve.
- 1.7 The SG Tube Leakage increases to 500 gpm (a SG Tube Rupture). The operator should trip the Rx and go to E-0 per the guidance of AP-SG.1. They should diagnose a SGTR and transition to E-3. When attempting to isolate the "B" MSIV, it fails to close requiring using the alternate isolation boundary in E-3.

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2. SCENARIO OBJECTIVES

RO(s) - Demonstrate the ability to monitor and operate the MCB, diagnose events and implement step of Normal, Abnormal and Emergency Procedures. Interact with other members of the crew in a manner which facilitates the crews response to the events listed below.

SRO - Demonstrate the ability to supervise the Control Board operators, diagnose events and choose and implement response procedures, implement Tech Spec requirements to ensure the plant is operated within its licensed basis, interact with other members of the crew in a manner which facilitates the crews response to the events listed below.

Instrument/Component Malfunction

- Loss of Circuit 751
- PT-485 Failure
- LT-2001 Failure
- PCV-431C Failure
- S/G Tube Leak

Major Malfunction

- SGTR

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3. CRITICAL TASKS (CTs)

CT #1 E-3--A

Task: Isolate feedwater flow into and steam flow from the ruptured steam generator before a transition to ECA-3.1 occurs.

Cues:

- Indication of SGTR
 - Increasing SG water level
 - Steam Generator radiation
 and
- SI actuated
 - and
- Rx trip actuated

Indication: Manipulation of controls to isolate the rupture SG

- MSIV closed
- Local isolation by attachment Ruptured SG initiated
- ARV setpoint adjusted to 1050 in Auto
- SG blowdown and sample valve closed (verify)
- TDAFW steam supply valve from ruptured SG closed
- MDAFW and TDAFW discharge valve to ruptured SG closed
- Main feed reg and bypass valve to ruptured SG closed, main feedwater pumps tripped (verify)

Feedback: Ruptured SG pressure stable or increasing. No indication of feed flow to ruptured SG.

CT #2 E-3--B

Task: Establish/maintain RCS temperature so that a transition out of E-3 does not occur because the RCS temperature is in either of the following conditions:

- Too high to maintain minimum subcooling
- or
- Below the orange path PTS transition temperature (285°F)

Cues: Indication of SGTR

- Increasing SG water level
- SG radiation

and

Rx trip actuated

and

SI actuated

and

Ruptured SG pressure greater than 300 psig

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3. CRITICAL TASKS (CTs) (continued)

Indications: Manipulation of intact SG ARV or condenser steam dump to establish the required RCS temperature.

Feedback: Indication of steam dump/ARV position
Indication of RCS temperature decreasing
Indications of RCS temperature less than target value

CT #3 E-3--C

Task: Depressurize RCS to SI termination criteria within one hour of SGTR initiation.

Cue: Indication of SGTR

- Ruptured SG level
- Ruptured SG radiation

and
Rx trip and SI actuated
and
RCS cooled down to less than or equal to the target temperature

Indications: Manipulations of control to depressurize the RCS; PRZR spray, PORV or auxiliary spray.

Feedback: Indication of PRZR pressure decreasing
Indication of PRZR level increasing

CT #4 CT E-3--D

Task: Terminate SI within one hour of SGTR initiation and control RCS pressure and makeup so that primary and secondary inventory are stable before the end of the scenario.

Cue: Indication of increasing SG level and high radiation RCS temperature at or below target cooldown value
SI termination criteria met

Indications: SI pumps are stopped

Feedback: SI flow indicates zero

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4. INSTRUCTOR ACTIONS

<u>Problem Time</u>	<u>Actions</u>	<u>Notes</u>
	4.1 Setup simulator per OTG-3.2	
	4.2 Initial Conditions (Note: Saved as IC-172)	
	4.2.1 Initialize the simulator to IC-19 100% MOL Xenon Eq.	
	4.2.2 Pull stop and hold the D CNMT Recirc Fan Out 2 hours for breaker replacement	A-52.4 TS
	4.2.3 Insert Malfunctions	
	4.2.3.1 "B" MSIV Fails Open MALF STM05B 100%	
	4.2.3.2 Turbine 1 st Stage Press PT-485 Fails low MALF TUR 16A, 0 Trigger 1	
	4.2.3.3 LT 2006 Fails High MALF CND03A, 48, 0 Trigger 4	
	4.2.3.4 Loss of 751 MALF EDS01A Trigger 2	
	4.2.3.5 SG Tube Leak MALF SGN04B 10 gpm, Trigger 3	
	4.2.3.6 PCV431C Przr PORV MALF PZR05B, 50% Trigger 5	
3 min.	4.3 Turbine 1 st Stage Press Fail Low Trigger 1	
10 min.	4.4 Loss Circuit 751 Trigger 2	

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20 min. 4.5 SG Tube Leak
 Trigger 3

20 min. 4.6 Hotwell Level Fails High
 Trigger 4

40 min. 4.7 Przr PORV 431C Fails Open
 Trigger 5

 4.8 SGTR
 Increase SGN04B to 500 gpm

Terminate when directed by the Lead Examiner.

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5. TURNOVER INFORMATION

5.1 The plant is at 100% MOL Xenon Eq. C_B 845 ppm. The "D" CNMT Recirc Fan is OOS. See the A-52.4. "A" Charging Pump is OOS. See A-52.12

5.2 Equipment Out of Service

D CNMT Recirc. Fan out for two hours
A Charging Pump Belt replacement

5.3 Work in Progress

D CNMT Recirc Fan Breaker
A Charging Pump Belt replacement

5.4 Planned Work

None

5.5 Significant Events

CNMT Recirc Fan expected to be restored within 4 hours.
A Charging Pump will be out at least 24 more hours.

5.6 Remarks

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6. EVALUATION

Event: 1

Event Title: Turbine 1st Stage Pressure Fails Low (PT-485)

Expected Response/Behavior

CUES: Tref Fails Low
Control Rods step in at high speed

Response:

		<u>RATING</u>	<u>N/A</u>
SRO	Recognize rod motion, enter AP-RCC.1	_____	_____
RO/SRO	Verify Turbine Power Stable, place rods in manual	_____	_____
RO/SRO	Check Tavg. Manually operate rods to restore Tavg.	_____	_____
RO/SRO/BOP	Check for Instrument Failure • Tavg • Turbine 1 st Stage Press	_____	_____
SRO	Refer to ER-INST.1 for Channel Defeat	_____	_____
SRO	Determine if Steam Dump should be placed in manual.	_____	_____

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BOP/SRO Monitor S/G Levels

- BOP Defeat PT-485 per attachment First Stage
 Pressure PT-485
- Trip 485 Channel 2 in the white protection rack
 - Verify AMSAC trip status light is extinguished
 - Verify TL 400 Status Light extinguished (call AO to check)
 - Call I&C to place TPS/485 to trip
 - Verify AMSAC Auto Block life extinguished
 - Delete point P0485 on PPCA

BOP/RO/SRO Check Systems in Auto

SRO Notify Plant Supervision

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6 EVALUATION

Event: 2

Event Title: Loss of Circuit 751

Expected Response/Behavior

CUES: Circuit 751 Deenergized
Buses 16, 17 lose power
B D/G starts

Response:

		<u>RATING</u>	<u>N/A</u>
BOP/SRO	Recognize loss of 751	_____	_____
SRO	Enter AP-ELEC.1	_____	_____
RO/SRO	Verify Tavg > 350°F and both RCP running	_____	_____
BOP/SRO	Verify B D/G running and both trains AC emergency buses energized	_____	_____
BOP/SRO	Verify SW pump running Manually start "C" or "D"	_____	_____
RO/SRO	Verify CCW pump running	_____	_____
RO/SRO	Verify Charging Pump running Determine none running secure letdown	_____	_____

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BOP/SRO	Verify Instrument Air available	_____	_____
BOP/SRO	Verify 11A/11B energized and MFW Regulating Valve Controlling	_____	_____
RO/SRO	Check VCT Makeup System Charging Aligned to VCT	_____	_____
RO/SRO	Check VCT Makeup System Charging Aligned to VCT	_____	_____
RO/SRO	Start a Charging Pump	_____	_____
RO/SRO	Restore Letdown	_____	_____
RO/SRO	Restore Przr Heaters	_____	_____
RO/SRO	Restore Rod to Auto	_____	_____
RO/SRO	Stabilize Plant	_____	_____
BOP/SRO	Restore Power Alignment using ER-ELEC.1 • Restore power to Bus 12B (step 4.1.6) • Restore power to buses 16/17 by holding normal feeder closed while tripping D/G feeder	_____	_____

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BOP	Secure the B D/G per T-27.4	_____	_____
RO/SRO	Verify at least two CNMT Recirc Fans running	_____	_____
RO/BOP/SRO	Check Control System in Auto <ul style="list-style-type: none"> • 431K Przr Press • Heaters/Sprays • Charging Pumps • MFW Reg Valves • Turbine EH Control • Rods 	_____	_____
SRO	Check Battery Chargers Dispatch AO	_____	_____
RO/SRO	Secure one of two CCW pumps	_____	_____
RO/SRO	Check/Start Radiation Monitor Sample Pump	_____	_____
SRO	Send AO to check Seal Oil System	_____	_____
BOP/SRO	Close Fire Pump Breaker	_____	_____
BOP/SRO	Check Aux. Building Ventilation	_____	_____
SRO	Dispatch AO to check Waste Gas Compressors/SFP Cooling/Reset UV Relay Targets	_____	_____

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6 EVALUATION

Event: 3

Event Title: S/G Tube Leak

Expected Response/Behavior

CUES: R-15/15A increasing
Computer alarms on S/G leakage (from R-15A)
Charging Pump speed increases
VCT level decreases

Response:

		<u>RATING</u>	<u>N/A</u>
RO/SRO	Determine S/G Tube Leak has occurred from indications. Enter AP-SG.1 Steam Generator Tube Leak	_____	_____
RO/SRO	Monitor Przr Level adjust charging to stabilize pressurizer level	_____	_____
RO/BOP/SRO	Monitor Tube Leak Rate Determine that it is > 1 gpm Go to Step 8 (Rapid Plant Shutdown)	_____	_____
RO/BOP/SRO	Initiate Load Reduction <ul style="list-style-type: none"> • Verify Rod in Auto • Setup Turbine for 3% min load reduction • Verify Steam Dump operation • Przr Backup Heater on 	_____	_____

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6. EVALUATION

Event: 4

Event Title: Hotwell Level Channel LT-2001 Fails High

Expected Response/Behavior

CUES: LT-2001 Offscale High
LT-2002 Decreasing
Hotwell Level Controller Rejecting
Increasing Condensate Storage Tank Levels

Response:

		<u>RATING</u>	<u>N/A</u>
BOP	Recognize symptom of LT-2001 failure	_____	_____
SRO/BOP	Place Hotwell Level control to manual Restore Hotwell Level	_____	_____
BOP	Monitor Control Hotwell Level manually	_____	_____
SRO	Notify Scheduling	_____	_____
BOP	Secure third Condensate Pump per T-5F	_____	_____
BOP	Close Condensate Bypass Valve	_____	_____

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6. EVALUATION

Event: 5

Event Title: Przr PORV-431C Fails Open

Expected Response/Behavior

CUES: Przr Pressure Decreasing
PORV Tail Pipe Temp Alarm
PORV-431C Indicates mid position

Response:

		<u>RATING</u>	<u>N/A</u>
RO	Recognize PORV-431C partly open Attempt to close/close block valve	_____	_____
SRO	Enter AP-PRZR.1 Abnormal Przr Press	_____	_____
RO/CRF	Check Przr Press Channels	_____	_____
RO/CRF	Check RCS Parameters • Power • Przr Pressure	_____	_____
RO/SRO	Check Przr Press Control • Przr Heaters • Normal Spray • Press Controller 431K	_____	_____
RO/SRO	Check PORVs. Determine 431C was open and the block valve is now closed.	_____	_____

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RO/SRO Check Przr Safety Valves and Auxiliary Spray _____

RO/SRO Verify Przr Press returning to normal (go to
step 16) _____

RO/SRO Check PRT _____

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6. EVALUATION

Event: 6,7

Event Title: SGTR

Expected Response/Behavior

CUES: Rapid Decreasing Przr Level
SF/FF Mismatch
Air Ejector R-15/15A Radiation increasing rapidly

Response:

		<u>RATING</u>	<u>N/A</u>
RO/SRO	Recognize Przr level decreasing Start additional Charging Pump Isolate Letdown Recognize that Przr level can't be maintained Trip Rx and go to E-0	_____	_____
RO/BOP	Check Immediate Actions (May manually initiate SI)	_____	_____
RO/BOP/SRO	Check Status of Emergency Equipment <ul style="list-style-type: none"> • SI/RHR • CNMT Recirc Fans • CNMT Spray (not required) • Steamline Isolation • MFW Isolation • MDAFW Pumps • Service Water Pumps • CI/CVI • CCW • SI Flow • AFW Alignment 	_____	_____

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BOP/SRO	Check S/G levels (should secure feeding "B" S/G when level is > 50%) Control intact S/G 17-50%	_____	_____
RO/SRO	Verify SI/RHR Alignment	_____	_____
RO/SRO	Check CCW Cooling to RCPs	_____	_____
RO/SRO	Secure TDAFW Pump	_____	_____
BOP/SRO	Control RCS Tavg to 547°F (may need to limit AFW to A S/G)	_____	_____
RO/SRO	Check PORVs and Sprays Closed.	_____	_____
BOP/RO/ SRO	Monitor RCP Trip Criteria (should not be met)	_____	_____
BOP/SRO	Check Secondary Side Intact	_____	_____

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BOP/SRO Check for SGTR
Transition to E-3 SGTR

BOP/SRO Identify "B" S/G as ruptured
• Level Response
• R-32 Alarm

	<u>SAT</u>	<u>UNSAT</u>
<u>CT #1 E-3--A</u> Isolate feedwater flow into and steam flow from the ruptured steam generator before a transition to ECA-3.1 occurs.		
Isolate Rupture S/G		
• ARV 1050 psi in Auto		
• TDAFW Steam Valve		
MOV 3504A closed		
• S/G Blowdown and Sample Valves Closed		
• Try to close "B" MSIV. When it will not Close, perform the following:		
- Close "A" MSIV		
- Set "A" ARV to 1005 psig in AUTO		
- Adjust Condenser Steam Dump to 1050 psi in AUTO		
- Place Steam Dump mode switch to Manual (Pressure Control Mode)		
- Adjust reheat steam supply. ? to close Reheat steam supply valves (will already be closed)		
- Dispatch AO to complete Rupture S/G Isolation (Parts A and B for the B S/G)		
• Check Rupture S/G Level > 5%		
- Close MOV 4008		
- Pull Stop MDAFW Pump "B"		
- Close TDAFW Flow Control Valve AOV 4298		
- Verify MDAFW Cross-tie Valves Closed MOV 4000 A/B		

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BOP/SRO	Check S/G Isolation - MSIV Closed (instruct AO working on Attachment Rupture S/G to close Air Ejector and Flange Heat Steam Valves) - Verify TDAFW Steam Supply Isolate - Verify Rupture S/G Press > 300 psi	
BOP/SRO	Adjust Intact S/G ARV to maintain S/G pressure	
RO/SRO	Reset SI	

		<u>SAT</u>	<u>UNSAT</u>
<u>CT #2 E-3--B</u>	Establish/maintain RCS temperature so that a transition out of E-3 does not occur because the RCS temperature is in either of the following conditions: • Too high to maintain minimum subcooling or • Below the orange path PTS transition temperature (285°F)		
SRO	Determine required Core Exit Temp from Table		
BOP/SRO	Dump steam from the intact S/G ARV to cooldown To less than the required temperature		
BOP	Stabilize Core Exit Temperature		

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SRO Check for > 20°F core exit subcooling _____

		<u>SAT</u>	<u>UNSAT</u>
<u>CT #3 E-3--C</u>	Depressurize RCS to SI termination criteria within one hour of SGTR initiation.		
RO/SRO	Depressurize using normal spray until termination criteria met.	_____	_____

RO/SRO Check RCS Press Increasing _____

RO/BOP/
SRO Check SI Termination Criteria _____

		<u>SAT</u>	<u>UNSAT</u>
<u>CT #4 CT E-3--D</u>	Terminate SI within one hour of SGTR initiation and control RCS pressure and makeup so that primary and secondary inventory are stable before the end of the scenario.	_____	_____

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Written by: Kenneth Masker
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Date: 1/21/04

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Date: 1/30/04

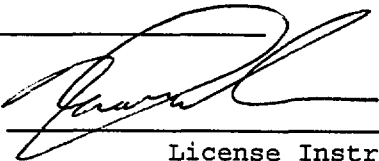
Time validated 90 minutes By: K. Masker
License Instructor

Date: 2/7/04

Date of exam: _____

Examinees

Evaluators

Final review 
License Instructor

Date: 3/29/04

Approved for use Jane Weis
Supervisor License Training
or Designee

Date: 3/29/04

ROCHESTER GAS & ELECTRIC CORPORATION R. E. GINNA NUCLEAR POWER PLANT EXAMINATION SCENARIO	NO.: 2004 NRC Initial Exam Scenario 04-3	REV: 0
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1. SCENARIO OVERVIEW

- 1.1 The plant is initially at 100% Power Xenon Equilibrium. Auto Rod Control is OOS due to Tavq input problems, I&C is investigating. The "C" Condensate Booster Pump is OOS due to a motor bearing failure. PT-429 failed low and has been defeated.
- 1.2 The running CCW pump trips. The standby pump fails to auto start. The operator needs to recognize the trip and take action per AP-CCW.1, Loss of CCW During Power Operations, prior to exceeding the operating limits for the RCPs.
- 1.3 The "A" Feed Regulating Valve fails closed in Auto. The operator needs to take manual control per AP-FW.1 and control S/G levels manually.
- 1.4 The "A" Charging Pump speed controller fails causing the pump to slow to minimum speed. The operator should start the standby pump and secure the "A" pump, then place the system back in auto control.
- 1.5 "B" Condensate Booster Pump Trips leaving only the "A" Pump Running. The operator should decrease load to prevent runout of the "A" pump per AP-TURB.5, Rapid Power Reduction.
- 1.6 A station blackout occurs causing a Turbine and Reactor Trip. Because of the PT-429 failure, an inadvertent SI occurs. The Diesel Generator fails to auto start requiring a manual start. When power is restored, MOV-852B opens on the SI signal and CV-853B fails allowing full RCS pressure to enter the RHR system. This results in an inter-system LOCA. The operators respond by implementing E-0, Reactor Trip or SI and transitioning to ECA-1.2, LOCA outside CNMT. The scenario is terminated when SI is terminated per procedure ES-1.1, SI Termination.

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2. SCENARIO OBJECTIVES

RO(s) - Demonstrate the ability to monitor and operate the MCB, diagnose events and implement step of Normal, Abnormal and Emergency Procedures. Interact with other members of the crew in a manner which facilitates the crews response to the events listed below.

SRO - Demonstrate the ability to supervise the Control Board operators, diagnose events and choose and implement response procedures, implement Tech Spec requirements to ensure the plant is operated within its licensed basis, interact with other members of the crew in a manner which facilitates the crews response to the events listed below.

Instrument/Component Malfunctions

- Running CCW Pump Trip/Without Auto Start
- "A" FRV Failure of Auto Control
- "A" Charging Pump Speed Controller Failure
- PT-429 Failure Low
- Station Blackout
- Diesel Generator Fails to Auto Start

Reactivity Manipulations

- Power Reduction for Loss of Condensate Booster Pump

Major Malfunctions

- CV-853B Fail during Inadvertent SI causing an inter-system LOCA

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3. CRITICAL TASKS (CTs)

CT #1 E-0--C

Task: Energize at least one AC emergency bus before transition out of E-0 unless the transition is to ECA-0.0, in which case the critical task must be performed before placing safeguards equipment handswitches in the pull-to-lock position.

Cues: Indication and/or annunciation that all AC emergency buses are de-energized

- Circuit breaker position
- Bus voltage
- EDG status

Indication: Manipulation of controls as required to energize at least one AC emergency bus

- Circuit breaker position lamps indicate closed
- Bus voltage indication shows nominal voltage present

Feedback: Indication that at least one AC emergency bus is energized

- Safeguards equipment sequences into the energized bus(es)
- EDG status

CT #2 ECA-1.2--A

Task: Isolate LOCA outside containment before transition out of ECA-1.2

Cues: Indication that SI is actuated and required

- RCS pressure < SI pump shutoff head
- SI pump running

and

Indication that Auxiliary Building radiation is abnormally high
R-10B, 13, 14 on Alarm
R-4, 9 on Alarm

Indication: MOV-852B is shut to isolate leak and is not reopened

Feedback: • RCS pressure increasing
• Auxiliary Building radiation level decreasing

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4. INSTRUCTOR ACTIONS

<u>Problem Time</u>	<u>Actions</u>	<u>Notes</u>
4.1	Initial Conditions	
4.2	Set up Simulator per OTG-3.2	
4.2.1	IC-19 MOL 100% Xenon Equilibrium	
4.2.2	Place "C" Condensate Booster Pump in off and place hold Tag Verify "A" and "B" Pump Running	
4.2.3	Place "B" CCW in service secure "A" CCW pump	
4.2.4	Enter Malfunctions	
4.2.4.1	MALF CLG10 MALF GEN08, 0 (both)	CCW Auto Start Failure Both DG fail to Autostart
4.2.4.2	MALF CLG2B Trigger 1	"B" CCW Pump Trip
4.2.4.3	MALF FDW07A, 0%, 60 sec ramp Trigger 2	"A" FRV Fails Closed
4.2.4.4	MALF CVC18A, 15 gpm, 0 ramp Trigger 2	"A" Charging Pump Speed Control Failure
4.2.4.5	MALF CND01B Trigger 3	"B" CNDST Booster Pump Trips
4.2.4.6	MALF EDS06, 0 Trigger 6 MALF RCS19D, 800 gpm, 30 sec TD Trigger 4	Station Blackout LOCA O/S CNM
4.2.5	Insert Malfunction PZR02A, 1600 Defeat PT-429 per ER-INST.1	Submit A-52.4 on PT-429 out 3 days

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2 min	4.3 CCW Pump Trip Trigger 1
7 min	4.4 "A" FRV Fails Closed Trigger 2
7 min	4.5 Charging Speed Failure Trigger 2
25 min	4.6 CNDST BSTR Pump Trip Trigger 4
45 min	4.8 LOCA O/S CNMT Trigger 5

Terminate Scenario when SI has to be terminated or when instructed by the Lead Examiner.

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7 min	4.4 "A" FRV Fails Closed Trigger 2
7 min	4.5 Charging Speed Failure Trigger 2
25 min	4.6 CNDST BSTR Pump Trip Trigger 4
45 min	4.8 LOCA O/S CNMT Trigger 5

Terminate Scenario when SI has to be terminated or when instructed by the Lead Examiner.

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5. TURNOVER INFORMATION

5.1 100% Power MOL C_B 845 ppm. Xenon Equilibrium.

5.2 Equipment Out of Service

- Auto Rod Control due to a problem with the Average Tav_g signal to rod control
- "C" Condensate Booster Pump due to a motor bearing problem
- PT-429 Failed Low A-52.4 submitted

5.3 Work in Progress

- Rod Control Trouble Shooting
- "C" Condensate Booster Pump Motor Replacement

5.4 Planned Work

No Additional

5.5 Significant Events

Six hours ago rod began stepping out in Auto without a valid signal. I&C is investigating. Manual Rod Control is operable.

5.6 Remarks

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6. EVALUATION

Event: 1

Event Title: Running CCW Pump Trips/No Auto Start

Expected Response/Behavior

CUES: CCW Pump "A" Tripped
CCW Temp and Flow Alarms
RCP Temp Alarms

Response:

		<u>RATING</u>	<u>N/A</u>
RO/SRO	Recognize Loss of CCW Pump Enter AP-CCW.2, Loss of CCW during Power Operations	_____	_____
RO/SRO	Start the Standby CCW Pump	_____	_____
RO/SRO	Check Monitor Plant Conditions <ul style="list-style-type: none"> • CCW Surge Tank Level • CCW to RCPs • Letdown 	_____	_____
RO/SRO	Check CCW Valve Alignment	_____	_____
RO/SRO	Check for CCW Leaks <ul style="list-style-type: none"> • Seal Water • CNMT • Aux Building 	_____	_____

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SRO Determine that no CCW Leak exists

RO/SRO Verify Letdown in service

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6. EVALUATION

Event: 2

Event Title: "A" FRV Fails Closed

Expected Response/Behavior

CUES: Feedwater Flow decreases
 S/G "A" level decreases
 S/G level deviation alarms

Response:

		<u>RATING</u>	<u>N/A</u>
BOP/SRO	Recognize feed flow decreasing Enter AP-FW.1 Abnormal Feedwater Flow	_____	_____
BOP/SRO	Check MFW Flow < Steam Flow	_____	_____
BOP/SRO	Check both MFW Pumps Running	_____	_____
BOP/SRO	Check MFW Pump Suction Press	_____	_____
BOP/SRO	Check MFW Regulating Valve Determine "A" not controlling in Auto swap to manual control	_____	_____
BOP	Restore "A" S/G Level in manual	_____	_____

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RO/BOP/ Stabilize Plant Conditions _____

- SRO
- Tavg
 - Przr Press
 - Przr Level
 - S/G Level
 - RIL Alarms

BOP/SRO Check MFW System _____

- Pump Suction Press
- Auto Control (not available)

BOP/SRO Check Condensate System _____

- CNDST Bypass Valve
- Hotwell Level
- Only two Condensate Pumps Running
- Trim Valves in Auto

RO/BOP/ Establish Control System in Auto _____

- SRO
- Przr Press/Level
 - EHC
 - Steam Dump

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6 EVALUATION

Event: 3

Event Title: Charging Pump Speed Controller Failure

Expected Response/Behavior

CUES: Charging Pump Speed Alarm (F-14)
Charging flow decreases
Przr Level decreases

Response:

		<u>RATING</u>	<u>N/A</u>
RO/SRO	Recognize abnormal indication in CVCS Determine "A" Charging pump speed has failed to minimum	_____	_____
RO/SRO	Control Charging pump speed manually to control Przr Level (cannot control in manual)	_____	_____
RO/SRO	Swap Charging Pump Auto Speed control to the "B" or "C" pump	_____	_____
SRO	Notify plant management of problem	_____	_____

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6. EVALUATION

Event: 4

Event Title: "B" CNDST Booster Pump Trip

Expected Response/Behavior

CUES: Low Feedwater Suction Pressure
4KV Motor Overload Alarm (6-8)
Feedwater Pump NPSH Alarm
Condensate Bypass Valve Opens

Response:

		<u>RATING</u>	<u>N/A</u>
BOP/SRO	Recognize Booster Pump Trip Verify MFW Suction Press > 185 psi	_____	_____
SRO	Determine power must be reduced to < 90% in 30 minutes. (AR-AA-10)	_____	_____
SRO	Enter O-5.1 for power reduction	_____	_____
SRO	Verify O-5.1 Initial Conditions	_____	_____
RO/BOP/SRO	Make preparation for decreasing load • Notify Energy Operations • Przr Back Heaters on • Select rate on EHC • Notify plant personnel	_____	_____

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RO/BOP/SRO

Perform Load Reduction

- Rods in manual
- Add Boric Acid as necessary
- Lower Tube Load using EHC

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6. EVALUATION

Event: 6, 7, 8

Event Title: Station Black out Rx Trip, SI, LOCA O/S CNMT

Expected Response/Behavior

CUES: Rx Trip
SI Signal Present

Response:

		<u>RATING</u>	<u>N/A</u>
SRO	Recognize Rx Trip, direct Board Operators to perform immediate actions	_____	_____
RO/BOP	Perform immediate actions of E-0	_____	_____

		<u>SAT</u>	<u>UNSAT</u>
<u>CT #1 E-0--M</u>	Manually start at least one Emergency Diesel Generator (see Section 3.0)	_____	_____

SRO	Determine SI Actuated, continue in E-0	_____	_____
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SRO/RO/BOP

Verify Auto Actions

- SI/RHR Pump Running
- CNMT Recirc Fans Running
- CNMT Spray not required
- Main Steamline Isolation not required
- MFW Isolation
- MDAFW Pump Running
- SW Pump Running
- CI and CVI
- One CCW Pump Running
- SI Flow
- AFW Alignment

BOP/SRO

Monitor S/G Levels
Control at 17-50%

RO/SRO

Check SI/RHR Alignment

RO/SRO

Check RCP Cooling

BOP/SRO

Stop TDAFW Pump

BOP/SRO

Control Tavg at 547°F
• AFW
• Steaming (may need to shut MSIVs)

RO/SRO

Check Przr PORVs and Spray

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SRO/BOP/ RO	Perform diagnostic step • S/G Intact • S/G Tubes Intact • No LOCA in CNMT Continue in E-0	_____	_____
SRO	Determine SI cannot be Terminated	_____	_____
BOP/SRO	Control S/G Levels 17-50%	_____	_____
BOP/SRO	Check Secondary Radiation Levels	_____	_____
RO/SRO	Reset SI and CI	_____	_____
BOP/SRO	Verify adequate SW • Three pumps running - Start third pump • Send AO to do SD-1 Attachment	_____	_____
BOP/SRO	Establish IA to CNMT • Close 13-14 and 15-16 cross tie breakers • Open Turbine Building SW Isolation Valves • Start Adequate IA Compressors "A" and "B" <u>Or</u> "C" <u>Or</u> Service Air • Open AOV-5392	_____	_____

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RO/SRO Establish Charging to Restore Przr Level

- HCV-142 open
- Align Charging Suction to the RWST
 - 112B open
 - 112C closed
- Start Charging Pumps

SRO Check SI Termination Criteria
Determine it is met go to ES-1.1 SI
Termination

(Only step not done in E-0 and E-1 appear here)

RO/SRO Maintain Przr Press 1800-2235 psig

- Reset Przr Heater

RO/SRO Stop SI and RHR pumps

End Scenario