

## **Waterford 3 Job Performance Measure**

### **INITIAL CONDITIONS**

1. The plant is currently at 100% 400 EFPD
2. CEA 22 has been determined to be untrippable
3. No other CEA is inserted

### **INITIATING CUE**

You are required to perform a Shutdown Margin calculation with one untrippable CEA

### **TERMINATING CUE**

1. Shutdown Margin calculated successfully

### **STANDARD**

1. Emergency Boration determined to be required

### **TOOLS**

Calculator, plant data book, technical specifications, appropriate section of OP-903-090 and the appropriate attachment, straight edge ruler

### **SAFETY CONSIDERATIONS**

NONE

### **PERFORMANCE CONSEQUENCES**

1. TECH SPEC VIOLATION

### **HUMAN INTERFACES**

1. STA

### **SKILLS / KNOWLEDGES**

NONE

### **INSTRUCTOR NOTES**

## Waterford 3 Job Performance Measure

Perform the task in accordance with OP-903-090, Section 7.3.

Critical steps are denoted by **CRIT**.

**START TIME** \_\_\_\_\_

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1. Using current cycle burnup AND 545°F temperature, determine net worth worst pair stuck out (WPSO) from figure 1.5.6.

**CUES:**           ▪ None

**STANDARDS:**   ▪ Examinee determines net worst pair stuck out value to be 5.75-5.95 % delta rho and records on att. 10.3 step 7.3.1.1.

**SAT**\_\_ **UNSAT**\_\_\_\_\_

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2. Determine Shutdown Margin required by COLR

**CUES:**           ▪ None

**CRIT**

**STANDARDS:**   ▪ Examinee determines required Shutdown Margin required from COLR to be 5.15 %  $\Delta K/K$  and records on att. 10.3 step 7.3.1.2.

**SAT**\_\_ **UNSAT**\_\_\_\_\_

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3. Subtract step 7.3.1.2 from step 7.3.1.1 to determine Shutdown Margin allowed Power Defect % $\Delta K/K$

**CUES:**           ▪ None

**CRIT**

**STANDARDS:**   ▪ Examinee determines Shutdown Margin allowed Power Defect to be .8 - .6 %  $\Delta K/K$  and records on att. 10.3 step 7.3.1.3.

**SAT**\_\_ **UNSAT**\_\_\_\_\_

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4. Record current Reactor Power on attachment 10.3.

**CUES:**           ▪ **CUE: (If asked) plant is currently at 100 % power**

**STANDARDS:**   ▪ Examinee records 100% power on att. 10.3 step 7.3.1.4

**SAT**\_\_ **UNSAT**\_\_\_\_\_

## Waterford 3 Job Performance Measure

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5. Using result from step 7.3.1.3 AND Power Defect vs. Power Level, figure 1.2.1, determine Shutdown Margin allowed Power Level.

**CUES:**           ▪ None

**CRIT**

**STANDARDS:**   ▪ Examinee determines Shutdown Margin allowed Power Level to be 25-35 % power and records on att. 10.3 step 7.3.1.5.

**SAT\_\_ UNSAT\_\_\_\_\_**

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6. Verify Shutdown Margin GREATER THAN OR EQUAL TO that required by the COLR by verifying that current Power level is LESS THAN OR EQUAL TO the Shutdown Margin allowed Power level.

**CUES:**           ▪ None

**CRIT**

**STANDARDS:**   ▪ Examinee determines current Power level is greater than Shutdown Margin allowed power level and circles no on att. 10.3 step 7.3.1.6

**SAT\_\_ UNSAT\_\_\_\_\_**

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7. If Shutdown Margin does not meet the requirements of Technical Specifications, then commence Emergency Boration and go to OP-901-103, Emergency Boration.

**CUES:**           ▪ None

**CRIT**

**STANDARDS:**   ▪ Examinee recommends commencing Emergency Boration and entering OP-901-103

**SAT\_\_ UNSAT\_\_\_\_\_**

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8. End of task.

**STOP TIME\_\_\_\_\_**

## **Waterford 3 Job Performance Measure**

### **Examinee Copy**

#### **INITIAL CONDITION**

1. The plant is currently at 100% 400 EFPD
2. CEA 22 has been determined to be untrippable
3. No other CEA is inserted

#### **INITIATING CUE**

You are required to perform a Shutdown Margin calculation with one untrippable CEA

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Review and Approve an EOS



Site W3 Job RO System / Duty Area PPA Mode ADMIN Number 1

Revision 3 06/28/03

Approval

Estimated Time 15 Minutes

Time Critical No Critical Time Alternate Path Yes

References

NUMBER  
OP-100-010

NRC KA Number

NUMBER  
2-2-23

Evaluation Methods

METHOD  
PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

Unsatisfactory

## Waterford 3 Job Performance Measure

### INITIAL CONDITIONS

1. HPSI pump A tripped on overcurrent.
2. Reactor Power is 100 percent
3. Risk Assessment EOOS has been updated

### INITIATING CUE

You are directed by the Shift Manager to review an EOS for HPSI pump A for accuracy

### TERMINATING CUE

EOS checklist reviewed

### STANDARD

4 of 5 errors identified on EOS checklist

### TOOLS

NONE

### SAFETY CONSIDERATIONS

NONE

### PERFORMANCE CONSEQUENCES

1. TECH SPEC VIOLATION
2. PROCEDURE VIOLATION

### HUMAN INTERFACES

SM

### SKILLS / KNOWLEDGES

NONE

### INSTRUCTOR NOTES

PROVIDE COMPLETED COPY OF OP-100 -010 ATTACHMENT 7.2 CONTAINING FIVE ERRORS

## Waterford 3 Job Performance Measure

Perform the task in accordance with OP-100 -010, Section 5.3.

Critical steps are denoted by **CRIT**.

**START TIME**\_\_\_\_\_

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1. Review EOS Checklist for errors

**CUES:**           ▪ None

**STANDARDS:**   ▪ Examinee recognizes 4 of the following 5 errors

**CRIT**

- Examinee recognizes Mode in block 4 is incorrect, correct Mode is Mode 1.
- Examinee recognizes Mode changes allowed in block 5 is incorrect, T.S. 3.0.4 applies.
- Examinee recognizes justification in block 20 and TS/TRM entry guideline has incorrect action being entered, correct action is 3.5.2.b
- Examinee recognizes Attachment 7.1 TS/TRM entry guideline for TS 3.3.2, Engineering Safeguards is not applicable, TS 3.3.2 is instrumentation.
- Examinee recognizes T.S. 3.8.4.1 Overcurrent Protective Device checked incorrect, this is for containment penetrations

**SAT**\_\_\_**UNSAT**\_\_\_

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2. END OF TASK

**STOP TIME**\_\_\_\_\_

## **Waterford 3 Job Performance Measure**

### **Examinee Copy**

#### **INITIAL CONDITIONS**

1. HPSI pump A tripped on overcurrent.
2. Reactor Power is 100 percent
3. Risk Assessment EOOS has been updated

#### **INITIATING CUE**

You are directed by the Shift Manager to review an EOS for HPSI pump A for accuracy

Review and Approve a Gaseous Release Permit



Site W3 Job SRO System / Duty Area RMS Mode NORM Number 6

Revision 2 06/25/2003

Approval

Estimated Time 10 Minutes

Time Critical No Critical Time Alternate Path NO

References

NUMBER

OP-007-003

CE-003-515

NRC KA Number

NUMBER

2-3-6

Evaluation Methods

METHOD

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

Unsatisfactory

## Waterford 3 Job Performance Measure

### INITIAL CONDITIONS

1. Gas Decay Tank A is to be discharged via Batch Release
2. Noble Gas Monitor PRM -IRE-0648 is INOPERABLE, TS 3.3.3.11 entered
3. Meteorological conditions:
  - a. Primary Met Tower  $\Delta T$  @ 50m indicates -0.6
  - b. Ten Meter Wind Speed is 2 meters per second
  - c. Wind Direction 270°
4. RAB Exhaust Fan A is running
5. Waste Flow Rate Measurement Device GWM-IFT-0648 is INOPERABLE, TS 3.3.3.11 entered

### INITIATING CUE

The Shift Manager directs you to review the Batch Release Permit for GDT A and OP-007-003 to determine required actions for release and if Meteorological conditions allow the release.

### TERMINATING CUE

Required conditions for GDT release identified.

### STANDARD

Determine independent lineup verification required and proper meteorological conditions exist for release.

### TOOLS

NONE

### SAFETY CONSIDERATIONS

NONE

### PERFORMANCE CONSEQUENCES

1. EXCEEDING OFFSITE RELEASE LIMITS

### HUMAN INTERFACES

1. CHEMISTRY
2. SM

### SKILLS / KNOWLEDGES

NONE

### INSTRUCTOR NOTES

## Waterford 3 Job Performance Measure

Perform the task in accordance with OP-007-003, Section 6.4. Critical steps are denoted by **CRIT**.

**START TIME**\_\_\_\_\_

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1. Perform source check in accordance with OP-004-001

**CUES:**           ▪ **CUE: NAO assigned for lineup verification** **CRIT**

**STANDARDS:**   ▪ Examinee recognizes that with PRM IRE-0648 INOPERABLE, Independent Lineup Verification is required

**SAT**\_\_\_\_**UNSAT**\_\_\_\_

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2. Verify flow rate calculations required every four hours

**CUES:**           ▪ **CUE: Chemistry notified to calculate flowrate every 4 hours** **CRIT**

**STANDARDS:**   ▪ Examinee recognizes that with GWM-IFT-0648 inoperable, flow rate calculations are required every four hours

**SAT**\_\_\_\_**UNSAT**\_\_\_\_

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3. Verify proper meteorological conditions exist for release

**CUES:**           ▪ None **CRIT**

**STANDARDS:**   ▪ Examinee determines stability class is D and releases ARE permitted

**SAT**\_\_\_\_**UNSAT**\_\_\_\_

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4. END OF TASK.

**STOP TIME**\_\_\_\_\_

## **Waterford 3 Job Performance Measure**

### **Examinee Copy**

#### **INITIAL CONDITIONS**

1. Gas Decay Tank A is to be discharged via Batch Release
2. Noble Gas Monitor PRM -IRE-0648 is INOPERABLE, TS 3.3.3.11 entered
3. Meteorological conditions:
  - a. Primary Met Tower  $\Delta T$  @ 50m indicates -0.6
  - b. Ten Meter Wind Speed is 2 meters per second
  - c. Wind Direction 270°
4. RAB Exhaust Fan A is running
5. Waste Flow Rate Measurement Device GWM-IFT-0648 is INOPERABLE, TS 3.3.3.11 entered

#### **INITIATING CUE**

The Shift Manager directs you to review the Batch Release Permit for GDT A and OP-007-003 to determine required actions for release and if Meteorological conditions allow the release.

Determine Emergency Plan Classification



Site W3 Job SRO System / Duty Area PPE Mode EMERG Number 1

Revision 0 6/24/03

Approval

Estimated Time 10 Minutes

Time Critical No Critical Time Alternate Path NO

References

NUMBER  
EP-001-001

NRC KA Number

NUMBER  
2-4-29  
2-4-40

Evaluation Methods

METHOD  
PERFORM

Trainee	<input type="text"/>	Evaluator	<input type="text"/>
Observer	<input type="text"/>	Date	<input type="text"/>
Satisfactory	<input type="checkbox"/>	Unsatisfactory	<input type="checkbox"/>

## **Waterford 3 Job Performance Measure**

### **INITIAL CONDITIONS**

1. The Plant was at 58 percent Power
2. RCP 2B lower seal failed 48 hours ago.
3. Charging pump A/B is OOS
4. CS pump A is OOS

The following events occurred:

- The Reactor was manually tripped due to RCP 2B middle seal failure
- A Small Break LOCA occurs due to the RCP 2B pump seal failure
- HPSI pump A tripped on overcurrent when SIAS actuated
- A fault on A2 bus occurred causing a loss of power to Train A safety Buses
- EDG A failed to auto start requiring Manual Start
- EDG A Manual Start and loading was successful

### **INITIATING CUE**

Classify the event and determine the correct Emergency Plan Implementing Procedure to be entered

### **TERMINATING CUE**

The correct level of emergency has been declared

### **STANDARD**

Event classified as SITE AREA EMERGENCY B/SAE/II

### **TOOLS**

NONE

### **SAFETY CONSIDERATIONS**

NONE

### **PERFORMANCE CONSEQUENCES**

Incorrect Emergency Classification

### **HUMAN INTERFACES**

NONE

### **SKILLS / KNOWLEDGES**

NONE

### **INSTRUCTOR NOTES**

Use this JPM with Scenario E-NRC03 - 2

## Waterford 3 Job Performance Measure

Perform the task in accordance with EP-001-001, Section 5.2.

Critical steps are denoted by **CRIT**.

**START TIME**\_\_\_\_\_

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1. Classify the Event

**CUES:**           ▪ None

**CRIT**

**STANDARDS:**   ▪ Examinee classifies event as SITE AREA EMERGENCY B/SAE/II due to RCS leakage in excess of Charging pump capacity.

**SAT**\_\_\_\_**UNSAT**\_\_\_\_

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2. Perform emergency actions of appropriate emergency plan implementing instruction

**CUES:**           ▪ **EP-001-030 in progress**

**STANDARDS:**   ▪ Examinee states EP-001-030 to be entered

**SAT**\_\_\_\_**UNSAT**\_\_\_\_

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3. END OF TASK.

**STOP TIME**\_\_\_\_\_

## Waterford 3 Job Performance Measure

### Examinee Copy

#### INITIAL CONDITIONS

5. The Plant was at 58 percent Power
6. RCP 2B lower seal failed 48 hours ago.
7. Charging pump A/B is OOS
8. CS pump A is OOS

The following events occurred:

- The Reactor was manually tripped due to RCP 2B middle seal failure
- A Small Break LOCA occurs due to the RCP 2B pump seal failure
- HPSI pump A tripped on overcurrent when SIAS actuated
- A fault on A2 bus occurred causing a loss of power to Train A safety Buses
- EDG A failed to auto start requiring Manual Start
- EDG A Manual Start and loading was successful

#### INITIATING CUE

Classify the event and determine the correct Emergency Plan Implementing Procedure to be entered

MAKEUP TO THE VCT USING THE AUTO MAKEUP MODE



Site W3 Job RO System / Duty Area CVC Mode NORM Number 9

Revision 4 04/03/2000

Approval rfletch 04/05/2000

Estimated Time 20 Min

Time Critical No Critical Time Alternate Path Yes

**References**

**NUMBER**

OP-002-005

**NRC KA Number**

**NUMBER**

3.2-004-A3.01  
3.2-004-A4.04  
3.2-004-A4.07

**Evaluation Methods**

**METHOD**

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

Unsatisfactory

## Waterford 3 Job Performance Measure

### INITIAL CONDITIONS

1. The plant is Shutdown
2. RCS boron concentration is 1346 ppm
3. BAMT A concentration is 5000 ppm
4. BAMT Pump A is selected

### INITIATING CUE

You are directed by the CRS to perform an automatic makeup to the VCT using BAM Tank A

### TERMINATING CUE

1. VCT makeup has been restored to manual

### STANDARD

1. Automatic makeup to VCT performed and system restored to manual makeup mode

### TOOLS

NONE

### SAFETY CONSIDERATIONS

NONE

### PERFORMANCE CONSEQUENCES

1. ABNORMAL VCT LEVEL
2. INADVERTENT BORATION OR DILUTION OF RCS

### HUMAN INTERFACES

1. SM/CRS

### SKILLS / KNOWLEDGES

NONE

### INSTRUCTOR NOTES

### Waterford 3 Job Performance Measure

Perform the task in accordance with OP-002-005, Section 8.8 and Attachment 11.5. All components operated during the performance of this JPM are located on CP-4. Critical steps are denoted by **CRIT**.

START TIME \_\_\_\_\_

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1. Inform SM/CRS prior to performing this section.

**CUES:**           ▪ When operator notifies SM/CRS, perform paraphrased repeatback

**STANDARDS:**   ▪ The operator informs the CRS that he is commencing alignment for automatic makeup to the VCT.

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

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2. At SM/CRS discretion, calculate the boric acid flow rate to be used on att. 11.5, calculation of boric acid flow rate for VCT blended makeup.

**CUES:**           ▪ **Cue the operator that blend rate has been calculated to be 50 gpm PMU to 18.5 gpm Boric Acid.**

**STANDARDS:**   ▪ Operator acknowledges given flowrates

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

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3. Verify direct boration valve, BAM-143, control switch in CLOSE.

**CUES:**           ▪ Simulator provides cues

**STANDARDS:**   ▪ The operator locates the control switch for BAM-143 on CP-4 and verifies it is positioned to CLOSE

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

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4. Verify Boric Acid Makeup Pump Selector Switch aligned to desired Boric Acid Makeup Pump.

**CUES:**           ▪ Simulator provides cues

**STANDARDS:**   ▪ The operator verifies that the BAM Pump Selector Switch is selected to BAMT A

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

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5. Place Boric Acid Flow Controller, BAM-IFIC-210Y, in AUTO.

**CRIT**

**CUES:**           ▪ Simulator provides cues

**STANDARDS:**   ▪ The Operator depresses the auto pushbutton on controller BAM-IFIC-210Y  
▪ Operator verifies that BAM-IFIC-210Y red auto light illuminates.

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

## Waterford 3 Job Performance Measure

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6. Set boric acid flow controller, BAM-IFIC-210Y, setpoint potentiometer to > 3 gpm flow rate.

**CUES:**           ▪ Simulator provides cues

**CRIT**

**STANDARDS:**   ▪ The operator rotates the setpoint potentiometer on BAM-IFIC-210Y to raise the Boric Acid flow setpoint to the value calculated in att.11.5 of OP-002-005.

                      ▪ The operator ensures that setpoint is > 3 gpm.

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

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7. Place Primary Makeup Flow Controller PMU-IFIC-0210X in AUTO.

**CUES:**           ▪ Simulator provides cues

**CRIT**

**STANDARDS:**   ▪ The Operator depresses the AUTO pushbutton on controller PMU-IFIC-210X

                      ▪ Operator verifies that red AUTO light illuminates.

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

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8. Set primary makeup flow controller PMU-IFIC-210X setpoint potentiometer to > 5 gpm flow rate.

**CUES:**           ▪ Simulator provides cues

**CRIT**

**STANDARDS:**   ▪ The Operator rotates the setpoint potentiometer on PMU-IFIC-210X to raise the PMU flow setpoint to the value used in att.11.5 of OP-002-005.

                      ▪ The operator ensures that setpoint is > 10 gpm.

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

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9. Place makeup MODE SELECTOR SWITCH to AUTO.

**CUES:**           ▪ Simulator provides cues

**CRIT**

**STANDARDS:**   ▪ The operator rotates the makeup MODE SELECTOR SWITCH to the AUTO position.

                      ▪ Operator verifies MODE SELECTOR SWITCH red AUTO light illuminated

                      ▪ **If makeup is initiated the Operator verifies the selected BAM A Pump starts, CVC-510 opens, and controllers are controlling flows at respective setpoints or takes manual control and adjusts flow to setpoint value.**

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

## Waterford 3 Job Performance Measure

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10. While VCT makeup is in the automatic mode, monitor the following for proper indications:

- count rate,
- Reactor Power,
- VCT level and pressure,
- primary makeup water flow rate,
- and boric acid flow rate.

**CUES:**           ▪ Simulator provides cues

**STANDARDS:**   ▪ The operator informs the CRS that automatic makeup to the VCT is aligned.  
                      ▪ If VCT Makeup is in progress the Operator monitors listed parameters on CP-4 and CP-2

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

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11.           **(ALT)** Check VCT level periodically to verify makeup system is maintaining proper VCT level. **CRIT**

**CUES:**           ▪ Simulator provides cues; **(ALT)** BAM pump A trips

**STANDARDS:**   ▪ The operator verifies that the auto makeup system controls VCT level between 37% and 51%.  
                      ▪ **(ALT)** Examinee determines need to secure auto makeup to prevent dilution.

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

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12.           **(ALT)** When the Auto Makeup Mode to the VCT is no longer desired, then perform the following:  
Place MAKEUP MODE SELECTOR SWITCH in MANUAL.

**CUES:**           ▪ Simulator provides cues

**STANDARDS:**   ▪ The operator rotates the MAKEUP MODE SELECTOR SWITCH to the MANUAL **CRIT**  
                      position.  
                      ▪ **This step is NOT critical if Examinee places PMU-IFIC-0210X in manual and lowers output to zero. Either action prevents dilution**

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

### Waterford 3 Job Performance Measure

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13. (ALT) Verify CVC-510 CLOSED.

**CUES:**                   ▪ Simulator provides cues

**CRIT**

**STANDARDS:**       ▪ Examinee rotates switch for CVC-510 to CLOSED position  
                          ▪ Examinee verifies CVC-510 green CLOSED light illuminated.  
                          ▪ **This step is NOT critical if Examinee places PMU-IFIC-0210X in manual and lowers output to zero. Either action prevents dilution**

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

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14. (ALT) Places PMU-IFIC-0210X in MANUAL

**CRIT**

**CUES:**                   ▪ Simulator provides cues

**STANDARDS:**       ▪ Examinee depresses manual pushbutton PMU-IFIC-0210X  
                          ▪ Examinee verifies white MAN light illuminated,  
                          ▪ Examinee verifies red AUTO light extinguished  
                          ▪ **This step is NOT critical if Examinee places Makeup Mode Selector Switch in MANUAL and closes CVC-510. Either action prevents dilution**

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

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15. (ALT) Adjust PMU-IFIC-0210X setpoint to zero.

**CUES:**                   ▪ Simulator provides cues

**STANDARDS:**       ▪ Examinee rotates PMU-IFIC-0210X potentiometer to zero  
                          ▪ Examinee verifies PMU-IFIC-0210X setpoint indicates zero.

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

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16. (ALT) Verify PMU- 144 closed.

**CRIT**

**CUES:**                   ▪ Simulator provides cues

**STANDARDS:**       ▪ Examinee lowers output of PMU-IFIC-0210X to zero.  
                          ▪ Examinee verifies PMU-144 green CLOSED light illuminated,  
                          ▪ Examinee verifies PMU-144 red OPEN light extinguished.  
                          ▪ **This step is NOT critical if Examinee places Makeup Mode Selector Switch in MANUAL and closes CVC-510. Either action prevents dilution**

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

### Waterford 3 Job Performance Measure

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17. (ALT) Place boric acid flow controller BAM-IFIC-0210Y in manual.

**CUES:**                   ▪ Simulator provides cues

**STANDARDS:**       ▪ Examinee depresses BAM-IFIC-0210Y MANUAL pushbutton  
                          ▪ Examinee verifies white MAN light illuminated,  
                          ▪ Examinee verifies red AUTO light extinguished.

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

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18. (ALT) Adjust BAM-IFIC-0210Y setpoint output to zero.

**CUES:**                   ▪ Simulator provides cues

**STANDARDS:**       ▪ Examinee rotates BAM-IFIC-0210Y potentiometer to zero  
                          ▪ Examinee verifies BAM-IFIC-0210Y setpoint indicates zero.

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

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19. (ALT) Verify boric acid makeup control valve BAM-141 CLOSED.

**CUES:**                   ▪ Simulator provides cues  
                          ▪ **(NOTE; Notify Operator that another Operator will align to flush MU line)**

**STANDARDS:**       ▪ Examinee lowers output of BAM-IFIC-0210Y to zero.  
                          ▪ Examinee verifies PMU-144 green CLOSED light illuminated,  
                          ▪ Examinee verifies PMU-144 red OPEN light extinguished.

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

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20. End of task.

**STOP TIME** \_\_\_\_\_

## Waterford 3 Job Performance Measure

### Examinee copy

#### INITIAL CONDITIONS

1. The plant is Shutdown
2. RCS boron concentration is 1346 ppm
3. BAMT A concentration is 5000 ppm
4. BAMT Pump A is selected

#### INITIATING CUE

You are directed by the CRS to perform an automatic makeup to the VCT using BAM Tank A

Perform a Mode 5 entering Mode 6 checklist



Site W3 Job SRO System / Duty Area ADMIN Mode ADMIN Number 1

Revision 0 6/19/2003

Approval

Estimated Time 10 Minutes

Time Critical No Critical Time Alternate Path NO

References

NUMBER  
RF-004-001

NRC KA Number

NUMBER  
2-1-20  
2-2-26

Evaluation Methods

METHOD  
PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

Unsatisfactory

## Waterford 3 Job Performance Measure

### INITIAL CONDITIONS

1. The Reactor was shutdown on 4/1/2003 at 0033.
2. Reactor Vessel Head removal was scheduled for 4/6/2003 at 1800 when available Head Bolt Tensioner pumping units were determined to be INOPERABLE.
3. The current date and time is 4/8/03 at 1100 and the Tensioner pumping units have been repaired.
4. A Mode 5 to 6 Checklist was completed for the previously scheduled work. Since that time the following status is applicable.
  - Charging pump A and AB breakers are racked in and ready to run.
  - LPSI pump B is tripped on overcurrent and repairs are in progress.
  - LPSI pump A is running at 4100 gpm.
  - PMU flowpaths to the RCS have been isolated.
  - Keff has been verified to be .93.
  - All support groups report ready to enter mode 6.

### INITIATING CUE

The Shift Manager directs you to use the previously completed Mode 5 entering Mode 6 checklist to determine surveillances that need to be performed prior to entering Mode 6.

### TERMINATING CUE

1. Examinee has determined the surveillances that are required to be performed prior to entering Mode 6.

### STANDARD

Examinee determines that the following surveillances are required:

- a) OP-903-001 att. 11.2 Tech Spec logs need to be verified for Source Range channel checks
- b) OP-903-001 Att. 11.2 return LPSI pump to service verify two SDC trains OPERABLE.
- c) OP-903-001 att. 11.14 needs to be verified for performance of acceptable Boron concentration of the RCS and Refueling Canal.

### TOOLS

1. Copy of RF-004-001 Attachment 9.2

### SAFETY CONSIDERATIONS

NONE

### PERFORMANCE CONSEQUENCES

1. TECH SPEC VIOLATION

### HUMAN INTERFACES

1. SHIFT MANAGER

### SKILLS / KNOWLEDGES

NONE

### INSTRUCTOR NOTES

## Waterford 3 Job Performance Measure

Perform the task in accordance with RF-004-001 Section 9.2. Critical steps are denoted by **CRIT**.

**START TIME** \_\_\_\_\_

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1. Review all of the completion dates for the surveillances listed in Attachment 9.2 Mode 5 Entering Mode 6 Checklist

**CUES:**           ▪ Supply examinee with copies of attachment 9.2

**STANDARDS:**   ▪ Examinee determines that the following surveillances and checks are required.           **CRIT**

- OP-903-001, Att. 11.2 Tech Spec logs need to be verified for Source Range channel checks
- OP-903-001, Att. 11.2 return LPSI pump to service, verify two SDC trains OPERABLE.
- OP-903-001, Att. 11.14 needs to be verified for performance of acceptable Boron concentration of the RCS and Refueling Canal.

**SAT**\_\_\_**UNSAT**\_\_\_

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2. END OF TASK.

**STOP TIME**\_\_\_\_\_

## Waterford 3 Job Performance Measure

### Examinee Copy

#### INITIAL CONDITIONS

1. The Reactor was shutdown on 4/1/2003 at 0033.
2. Reactor Vessel Head removal was scheduled for 4/6/2003 at 1800 when available Head Bolt Tensioner pumping units were determined to be INOPERABLE.
3. The current date and time is 4/8/03 at 1100 and the Tensioner pumping units have been repaired.
4. A Mode 5 to 6 Checklist was completed for the previously scheduled work. Since that time the following status is applicable.
  - Charging pump A and AB breakers are racked in and ready to run.
  - LPSI pump B is tripped on overcurrent and repairs are in progress.
  - LPSI pump A is running at 4100 gpm.
  - PMU flowpaths to the RCS have been isolated.
  - Keff has been verified to be .93.
  - All support groups report ready to enter mode 6.

#### INITIATING CUE

The Shift Manager directs you to use the previously completed Mode 5 entering Mode 6 checklist to determine surveillances that need to be performed prior to entering Mode 6.

Perform Anticipated Transient System Check



Site W3 Job RO System / Duty Area PPS Mode SURV Number 1

Revision 0 06/17/2003

Approval

Estimated Time 15 Minutes

Time Critical No Critical Time Alternate Path NO

References

NUMBER  
OP-904-017

NRC KA Number

NUMBER  
3.7-012-A4.04  
3.7 012-A2.03

Evaluation Methods

METHOD  
PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

Unsatisfactory

## **Waterford 3 Job Performance Measure**

### **INITIAL CONDITIONS**

1. The plant is in mode 3 Shutdown for refueling
2. Both CEA MG SETS are operating

### **INITIATING CUE**

You are directed by the CRS to perform a DIVERSE REACTOR TRIP ACTUATION TEST per OP-904-017, Section 7.3

### **TERMINATING CUE**

1. Proper indication documented on OP-904-017, Attachment 10.3

### **STANDARD**

1. DIVERSE REACTOR TRIP ACTUATION successfully completed

### **TOOLS**

NONE

### **SAFETY CONSIDERATIONS**

NONE

### **PERFORMANCE CONSEQUENCES**

1. DIVERSE REACTOR TRIP ACTUATION SYTEM INOPERABILITY

### **HUMAN INTERFACES**

1. CRS

### **SKILLS / KNOWLEDGES**

NONE

### **INSTRUCTOR NOTES**

Copy of OP-904-017, Attachment 10.3 with SM/CRS signoff completed given to examinee.

## Waterford 3 Job Performance Measure

Perform the task in accordance with OP-904-017, Section 7.3. ALL Critical steps are denoted by **CRIT**.

**START TIME** \_\_\_\_\_

---

1. Verify MG SET LOAD CONTACTOR indications

**CUES:**           ▪ Simulator will provide the required cues

**STANDARDS:**   ▪ Examinee verifies MG SET A LOAD CONTACTOR computer point D55842 indicates closed  
                      ▪ Examinee verifies MG SET B LOAD CONTACTOR computer point D55843 indicates closed

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

---

2. Verify DIVERSE REACTOR TRIP SYSTEM SELECT SWITCH in ENABLE on CP-2

**CUES:**           ▪ Simulator will provide the required cues

**STANDARDS:**   ▪ Examinee verifies DIVERSE REACTOR TRIP SYSTEM SELECT SWITCH in ENABLE  
                      ▪ Examinee verifies DIVERSE REACTOR TRIP red ENABLE light illuminated on CP-2  
                      ▪ Candidate may verify annunciator DIVERSE REACTOR TRIP ACTIVE/ TROUBLE K-4, cabinet M clear  
                      ▪ Candidate may verify annunciator DIVERSE REACTOR TRIP L-4, cabinet M clear

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

---

3. Depress and release DRT 1 of 2 pushbutton

**CUES:**           ▪ Simulator will provide the required cues

**CRIT**

**STANDARDS:**   ▪ Examinee depresses and releases DRT 1 of 2 pushbutton on CP-2

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

## Waterford 3 Job Performance Measure

---

4. Verify :

- DIVERSE REACTOR TRIP ACTIVE/ TROUBLE (K-4, cabinet M) in alarm
- DRT white ACTIVE lights illuminated
- AUX PANEL 4 terminal DH99 to DH108 voltage indicate approximately 120VAC
- MG SET A and B load contactors closed

**CUES:**           ▪ **PMI informs examinee that voltage between Aux Panel 4 terminals DH99 and DH108 indicates 120VAC**

**STANDARDS:**   ▪ Examinee verifies DIVERSE REACTOR TRIP ACTIVE/ TROUBLE (K-4, cabinet M) in alarm

                      ▪ Examinee verifies DRT white ACTIVE lights illuminated

                      ▪ Examinee calls PMI for AUX PANEL 4 terminal DH99-DH108 voltage readings

                      ▪ Examinee verifies MG SET A LOAD CONTACTOR computer point D55842 indicates closed

                      ▪ Examinee verifies MG SET B LOAD CONTACTOR computer point D55843 indicates closed

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

---

5. Document proper indications on attachment 10.3

**CUES:**           ▪ None

**STANDARDS:**   ▪ Examinee initials steps for attachment 10.3 step 7.3.4.2

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

---

6. Place DRT switch to DISABLE

**CUES:**           ▪ Simulator will provide the required cues

**CRIT**

**STANDARDS:**   ▪ Examinee places DRTS switch on CP-2 to DISABLE

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

## Waterford 3 Job Performance Measure

---

7. Verify:

- DIVERSE REACTOR TRIP ACTIVE/ TROUBLE annunciator (K-4, cabinet M) clear
- DIVERSE REACTOR TRIP (L-4, cabinet M) annunciator clear
- DRT ACTIVE white lights extinguished
- DRT DISABLE green light illuminated

**CUES:**           ▪ Simulator will provide the required cues

**STANDARDS:**   ▪ Examinee verifies DIVERSE REACTOR TRIP ACTIVE/ TROUBLE annunciator K-4, cabinet M on CP-8 clear

                      ▪ Examinee verifies DIVERSE REACTOR TRIP annunciator L-4, cabinet M on CP-8 clear

                      ▪ Examinee verifies DRT ACTIVE white lights on CP-2 extinguished

                      ▪ Examinee verifies DRT DISABLE green light on CP-2 illuminated

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

---

8. Document proper indications on attachment 10.3

**CUES:**           ▪ None

**STANDARDS:**   ▪ Examinee initials steps for attachment 10.3 step 7.3.5.2

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

---

9. Place DIVERSE REACTOR TRIP SYSTEM SELECT SWITCH in ENABLE on CP-2

**CUES:**           ▪ Simulator will provide the required cues

**CRIT**

**STANDARDS:**   ▪ Examinee places DIVERSE REACTOR TRIP SYSTEM SELECT SWITCH in ENABLE

                      ▪ Examinee verifies red ENABLE light illuminated on CP-2

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

## Waterford 3 Job Performance Measure

---

10. Depress and release DRT 2 of 2 pushbutton

CRIT

**CUES:**           ▪ Simulator will provide the required cues

**STANDARDS:**   ▪ Examinee depresses and releases DRT 2 of 2 pushbutton

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

---

11. Verify:

- DIVERSE REACTOR TRIP ACTIVE/ TROUBLE (K-4, CABINET M) in alarm,
- DRT white active lights illuminated,
- Aux panel 4 terminal DH101 to DH108 voltage indicate approximately 120VAC,
- MG SET A and B load contactors closed

**CUES:**           ▪ **PMI informs examinee that voltages between Aux Panel 4 terminals DH101 and DH108 indicates 120VAC**

**STANDARDS:**   ▪ Examinee verifies DIVERSE REACTOR TRIP ACTIVE/ TROUBLE (K-4, cabinet M) on CP-8 in alarm

                      ▪ Examinee verifies DRT white ACTIVE lights on CP-2 illuminated

                      ▪ Examinee calls PMI for AUX PANEL 4 terminal DH101-DH108 voltage readings

                      ▪ Examinee verifies MG SET A LOAD CONTACTOR computer point D55842 indicates closed

                      ▪ Examinee verifies MG SET B LOAD CONTACTOR computer point D55843 indicates closed

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

---

12. Document proper indications on attachment 10.3

**CUES:**           ▪ None

**STANDARDS:**   ▪ Examinee initials steps for attachment 10.3 step 7.3.7.2

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

## Waterford 3 Job Performance Measure

---

13. Place DRT SWITCH to DISABLE

**CUES:**           ▪ Simulator will provide the required cues

**CRIT**

**STANDARDS:**   ▪ Examinee places DRTS SWITCH to DISABLE on CP-2

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

---

14. Verify:

- (K-4, cabinet M) DIVERSE REACTOR TRIP ACTIVE/ TROUBLE annunciator clear
- (L-4, cabinet M) DIVERSE REACTOR TRIP annunciator clear
- DRT active white lights extinguished

**CUES:**           ▪ Simulator will provide the required cues

**STANDARDS:**   ▪ Examinee verifies DIVERSE REACTOR TRIP ACTIVE/ TROUBLE annunciator (K-4, cabinet M on CP-8 clear

▪ Examinee verifies DIVERSE REACTOR TRIP annunciator (L-4, cabinet M) on CP-8 clear

▪ Examinee verifies DRT ACTIVE white lights on CP-2 extinguished

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

---

15. Document proper indications on attachment 10.3

**CUES:**           ▪ None

**STANDARDS:**   ▪ Examinee initials steps for attachment 10.3 step 7.3.8.2

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

---

16. Place DIVERSE REACTOR TRIP SYSTEM SELECT SWITCH in ENABLE on CP-2

**CUES:**           ▪ Simulator will provide the required cues

**CRIT**

**STANDARDS:**   ▪ Examinee places DIVERSE REACTOR TRIP SYSTEM SELECT SWITCH to enable

▪ Examinee verifies red ENABLE light illuminated on CP-2

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

## Waterford 3 Job Performance Measure

---

17. Simultaneously depress BOTH DRT pushbuttons THEN release BOTH pushbuttons

**CUES:**           ▪ Simulator will provide the required cues

**CRIT**

**STANDARDS:**   ▪ Examinee depresses both DRT pushbuttons on CP-2  
                      ▪ Examinee releases both DRT pushbuttons.  
                      ▪ Examinee verifies MG SET A LOAD CONTACTOR computer point D55842 indicates NOT CLOSED  
                      ▪ Examinee verifies MG SET B LOAD CONTACTOR computer point D55843 indicates NOT CLOSED

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

---

18. Document proper indications on attachment 10.3

**CUES:**           ▪ None

**STANDARDS:**   ▪ Examinee initials steps for attachment 10.3 step 7.3.10.2

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

---

19. Document final status of DRTS on attachment 10.3

**CUES:**           ▪ **CRS informs examinee to place DRTS switch to DISABLE**

**STANDARDS:**   ▪ Examinee places DRTS switch to DISABLE on CP-2  
                      ▪ Examinee circles disabled status,  
                      ▪ Examinee checks sat  
                      ▪ Examinee signs performed by on step 7.3.12

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

---

20. END OF TASK.

**STOP TIME** \_\_\_\_\_

## **Waterford 3 Job Performance Measure**

### **Examinee Copy**

#### **INITIAL CONDITIONS**

1. The plant is in mode 3 Shutdown for refueling
2. Both CEA MG SETS are operating

#### **INITIATING CUE**

You are directed by the CRS to perform a DIVERSE REACTOR TRIP ACTUATION TEST per OP-904-017, Section 7.3

RESET MSIS ACTUATION



Site W3 Job RO System / Duty Area PPS Mode Emerg Number 1

Revision 08/04/2003

Approval

Estimated Time 15Minutes

Time Critical No Critical Time Alternate Path Yes

References

**NUMBER**  
OP-901-009 APP. 5B Emergency Operating Procedures Standard Appendices 1.1

NRC KA Number

**NUMBER**  
2-1-20 4.3 4.2  
4.2-A40-AA2.05 4.1 4.5  
4.2-A40-AK3.04 4.5 4.7

Evaluation Methods

**METHOD**  
Simulate  
Simulator

Trainee	<input type="text"/>	Evaluator	<input type="text"/>
Observer	<input type="text"/>	Date	<input type="text"/>
Satisfactory	<input type="checkbox"/>	Unsatisfactory	<input type="checkbox"/>

## Waterford 3 Job Performance Measure

### INITIAL CONDITIONS

1. A Main Steam Line Break occurred outside Containment
2. A MAIN STEAM ISOLATION SIGNAL ACTUATION has occurred
3. Containment pressure is less than 17.1 psia
4. OP-902-009, appendix 5B is complete through step 4

### INITIATING CUE

The CRS orders you to reset the MSIS actuation in accordance with OP-902-009, Appendix 5B.

### TERMINATING CUE

1. MSIS ACTUATION IS RESET

### STANDARD

THE MAIN STEAM ISOLATION SIGNAL HAS BEEN RESET.

### TOOLS

NONE

### SAFETY CONSIDERATIONS

NONE

### PERFORMANCE CONSEQUENCES

1. MSIS NOT RESET
2. REACTUATION OF CHANNELS PREVIOUSLY RESET

### HUMAN INTERFACES

1. SM/CRS
2. NPO

### SKILLS / KNOWLEDGES

1. Ability to reset variable setpoints for Steam Generator pressure low trips
2. Ability to reset ESFAS actuations

### INSTRUCTOR NOTES

## Waterford 3 Job Performance Measure

Perform the task in accordance with OP-902-009, Appendix 5B, Critical steps are denoted by **CRIT**.

**START TIME** \_\_\_\_\_

---

1. Place Channel Test Switch to 'B' and verify Test Power Supply is illuminated.

**CRIT**

**CUES:**           ▪ The simulator provides the cues

- STANDARDS:**   ▪ The examinee locates the Channel Test Switch in CP-10 Channel A and positions the switch to "B".
- The Examinee verifies the Test Power Supply Pushbutton located in CP-10 Channel A is illuminated.

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

---

2. Place Bistable Select Switch to Bistable '12'

**CUES:**           ▪ The simulator provides the cues

**CRIT**

- STANDARDS:**   ▪ The examinee locates the B channel bistable select switch on PPS Cabinet B Bistable Control Panel and positions the switch to the '12' position

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

---

3. Place Meter Input Select Switch to 'Input'

**CUES:**           ▪ The simulator provides the cues

**CRIT**

- STANDARDS:**   ▪ The examinee locates the B channel Meter Input select switch on PPS Cabinet B Bistable Control Panel and positions the switch to the 'Input' position

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

---

4. Record DVM reading

**CUES:**           ▪ The simulator provides the cues

- STANDARDS:**   ▪ The examinee locates the Digital Voltmeter on PPS Cabinet B Bistable Control Panel and records the reading on Att. 5B

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

## Waterford 3 Job Performance Measure

---

5. Press and Hold the red Test pushbutton on Bistable Control Panel

**CUES:**           ▪ The simulator provides the cues

**CRIT**

**STANDARDS:**   ▪ The Examinee locates the B channel Test pushbutton on PPS Cabinet B Bistable Control Panel and depresses the pushbutton until directed by procedure to release the pushbutton. (Element 12)

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

---

6. Raise Test Pot output until DVM reads 3.9 vdc

**CUES:**           The simulator provides the cues

**CRIT**

**STANDARDS:**   ▪ The examinee locates the B channel Test Potentiometers on PPS Cabinet B Bistable Control Panel and rotates the pot until the voltage on the Digital Voltmeter reads at least 3.9 vdc

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

---

7. Press Lamp Reset pushbutton as necessary to clear Trip and Pretrip lights

**CUES:**           ▪ The simulator provides the cues

**STANDARDS:**   ▪ The Examinee locates the B channel Lamp Reset pushbutton on PPS Cabinet B Bistable Control Panel, depresses the pushbutton.  
▪ The Examinee verifies the trip and pretrip lights on S/G 2 Pressure Lo bistable indicator are extinguished

**CRIT**

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

---

8. Lower Test Pot output until LO SG-2 PRESS Pretrip occurs

**CUES:**           ▪ The simulator provides the cues

**CRIT**

**STANDARDS:**   ▪ The examinee locates the B channel Test potentiometer on PPS Cabinet B Bistable Control Panel and rotates pot counter-clockwise  
▪ The Examinee verifies the LO SG-2 Press Pretrip light illuminates.

**SAT**\_\_\_\_\_ **UNSAT**\_\_\_\_\_

## Waterford 3 Job Performance Measure

---

9. Press LOW SG PRESS SETPOINT RESET pushbutton

**CUES:**           ▪ The simulator provides the cues

**CRIT**

**STANDARDS:**   ▪ The examinee locates the B channel LOW SG PRESS SETPOINT RESET pushbutton on PPS Cabinet B Bistable Control Panel and presses the pushbutton

**SAT**\_\_\_\_ **UNSAT**\_\_\_\_\_

---

10. Press Lamp Reset pushbutton and verify Pretrip clears

**CUES:**           ▪ The simulator provides the cues

**STANDARDS:**   ▪ The Examinee locates the B channel Lamp Reset pushbutton on PPS Cabinet B Bistable Control Panel, depresses the pushbutton.

**CRIT**

▪ The Examinee verifies the trip and pretrip lights on S/G 2 Pressure Lo bistable indicator are extinguished.

**SAT**\_\_\_\_ **UNSAT**\_\_\_\_\_

---

11. When 10 seconds have elapsed, then repeat previous steps until EITHER DVM reads less than the reading recorded on Attachment 5-B, step 2c, with Low SG Pressure Trip and Pretrip clear OR DVM reads 0.0 vdc, corresponding to 0.0 psia

**CUES:**           ▪ The simulator provides the cue

**CRIT**

**STANDARDS:**   ▪ The examinee repeats elements 7-10 until the DVM reads less than reading recorded earlier on Att. 5B or 0.0 vdc and pretrip and trip lights are extinguished on LO SG-2 PRESS bistable indicator

**SAT**\_\_\_\_ **UNSAT**\_\_\_\_\_

---

12. Release the Test pushbutton

**CUES:**           ▪ The simulator provides the cues

## Waterford 3 Job Performance Measure

**STANDARDS:**   ▪ The examinee releases the Channel B Test pushbutton

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

---

13.           Press Lamp Reset pushbuttons to clear Trip and Pretrip lights

**CUES:**                   ▪ The simulator provides the cues

**STANDARDS:**           ▪ The Examinee locates the B channel Lamp Reset pushbutton on PPS Cabinet B Bistable Control Panel, depresses the pushbutton.  
                              ▪ The Examinee verifies the trip and pretrip lights on S/G 2 Pressure Lo bistable indicator are extinguished.

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

---

14.           Place Bistable Select switch to 'Off'

**CUES:**                   ▪ The simulator provides the cues

**STANDARDS:**           ▪ The examinee locates the B channel bistable select switch on PPS Cabinet B Bistable Control Panel and positions the switch to the 'OFF' position

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

---

15.           Place Channel Test switch to 'Off'

**CUES:**                   ▪ The simulator provides the cues

**STANDARDS:**           ▪ The examinee locates the Channel Test switch in CP-10 Channel A and positions the switch to 'OFF'

SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

---

16.           Bypass channel C LO SG-1 PRESS (Bistable 11) and verify BYPASS light is lit

**CUES:**                   ▪ The simulator provides the cues

**CRIT**

**STANDARDS:**           ▪ The examinee locates, unlocks, and opens the access door for the Bistable Bypass pushbuttons on PPS Channel C Bistable Control Panel and depresses

### Waterford 3 Job Performance Measure

the pushbutton for LO SG-1 Press (Bistable 11).

- The examinee verifies the Bistable Bypass pushbutton locks in and the amber bypass light is illuminated for LO SG-1 Press bistable on PPS Channel C Bistable Control Panel

SAT \_\_\_\_ UNSAT \_\_\_\_

---

17. Bypass Channel C Lo SG-2 PRESS (Bistable 12) and verify BYPASS light is lit.

**CUES:**                      ▪ The simulator provides the cues

**CRIT**

**STANDARDS:**

- The examinee locates, unlocks, and opens the access door for the Bistable Bypass pushbuttons on PPS Channel C Bistable Control Panel and depresses the pushbutton for LO SG-2 Press (Bistable 12).
- The examinee verifies the Bistable Bypass pushbutton locks in and the amber bypass light is illuminated for LO SG-2 Press bistable on PPS Channel C Bistable Control Panel

SAT \_\_\_\_ UNSAT \_\_\_\_

---

18. Reset MSIS Initiation relays on ALL four channels as follows:

- Place the Reset Permissive switch to 'UNLK' position. (CP-10)
- Press MSIS Reset pushbutton.
- Verify the initiation relay indicator lit on the ENGINEERED SAFETY FEATURES SYSTEM mimic.
- Place the Reset permissive switch to 'LK' position

**CUES:**                      ▪ The simulator provides the cues

**CRIT**

**STANDARDS:**

- The Examinee locates the Reset Permissive Switch on PPS Channel A.
- The Examinee places the switch in the UNLOCK position.
- The Examinee depresses the MSIS Reset pushbutton.
- The Examinee verifies the red initiation relay light for MSIS illuminates on CP-10 ENGINEERED SAFETY FEATURES SYSTEM mimic.
- The Examinee places the Reset Permissive switch to the LOCK position.
- **NOTE; The Examine will repeat the previous steps for Channels B,C and D, the Initiation relay light colors are as follows;**
  - Channel B.....Yellow
  - Channel C.....Green
  - Channel D.....Blue

## Waterford 3 Job Performance Measure

SAT \_\_\_\_ UNSAT \_\_\_\_

---

19. Reset MSIS actuation logic on BOTH trains as follows: Press the MSIS Reset pushbuttons (CP-33). Verify the actuation relay indicator lit on the ENGINEERED SAFETY FEATURES SYSTEM mimic (CP-10).

**CUES:**                      ▪ The simulator provides the cues

**CRIT**

- STANDARDS:**
- The examinee locates and depresses both MSIS Reset pushbuttons on CP-33
  - The examinee verifies that all four white action relay lights for MSIS on the ENGINEERED SAFETY FEATURES SYSTEM mimic on CP-10 are illuminated
  - **Cue the Operator at this point that another Operator will complete Appendix 5B fromn this point.**

SAT \_\_\_\_ UNSAT \_\_\_\_

---

20. End of Task

SAT \_\_\_\_ UNSAT \_\_\_\_

## **Waterford 3 Job Performance Measure**

### **Examinee Copy**

#### **INITIAL CONDITIONS**

1. A Main Steam Line Break occurred outside Containment
2. A MAIN STEAM ISOLATION SIGNAL ACTUATION has occurred
3. Containment pressure is less than 17.1 psia
4. OP-902-009, appendix 5B is complete through step 4

#### **INITIATING CUE**

The CRS orders you to reset the MSIS actuation in accordance with OP-902-009, Appendix 5B.

Synchronize and Load the EDG



Site W3 Job RO System / Duty Area EDG Mode NORM Number 3

Revision 6 6/26/2003

Approval

Estimated Time 15 Minutes

Time Critical No Critical Time Alternate Path Yes

References

NUMBER  
OP-009-002

NRC KA Number

NUMBER  
3.6-064-A4.01  
3.6-064-A4.07  
2-1-20

Evaluation Methods

METHOD  
PERFORM

Trainee	<input type="text"/>	Evaluator	<input type="text"/>
Observer	<input type="text"/>	Date	<input type="text"/>
Satisfactory	<input type="checkbox"/>	Unsatisfactory	<input type="checkbox"/>

## Waterford 3 Job Performance Measure

### INITIAL CONDITIONS

1. Emergency Diesel Generator A was started by MANUAL REMOTE start to troubleshoot the Governor Circuitry
2. Emergency Diesel Generator A has been running at 600 rpm for 5 minutes
3. Emergency Diesel Generator A CONTROL MODE selected to "RTGB" position.

### INITIATING CUE

You are directed by the CRS to parallel Emergency Diesel Generator A to the A3 bus and load the Diesel to 4.4 MW and 1 MVAR from the Control Room in accordance with OP-009-002 Section 6.4

### TERMINATING CUE

1. Emergency Diesel Generator loaded to the specified MW and MVAR values
2. (ALT) The Emergency Diesel Generator is shutdown

### STANDARD

1. Desired EDG synchronized and loaded
2. (ALT) The Diesel is tripped with no cooldown

### TOOLS

Key for synchronizer

### SAFETY CONSIDERATIONS

NONE

### PERFORMANCE CONSEQUENCES

1. EQUIPMENT DAMAGE

### HUMAN INTERFACES

1. SM/CRS
2. NAO

### SKILLS / KNOWLEDGES

NONE

### INSTRUCTOR NOTES

## Waterford 3 Job Performance Measure

Perform the task in accordance with OP-009-002, Section 6.4.

Critical steps are denoted by **CRIT**.

**START TIME**\_\_\_\_\_

---

1. Verify Emergency Diesel Generator operating with voltage between 3920 and 4580 volts

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee checks EDG A voltmeter on CP-1

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

---

2. Verify Emergency Diesel Generator operating with frequency between 58.8 – 61.2 Hz

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee checks EDG A frequency meter on CP-1

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

---

3. Verify VOLT REGULATOR MODE SELECT switch in AUTO

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee verifies EDG A VOLT REGULATOR MODE SELECT switch in AUTO

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

---

4. Position the EDG A SYNCHRONIZER SWITCH to "GEN MAN"

**CUES:**           ▪ Simulator will provide required cues

**CRIT**

**STANDARDS:**   ▪ Examinee obtains key (208) for EDG A synchronizer switch from locker and inserts into EDG A SYNCHRONIZER SWITCH

                      ▪ Examinee positions SYNCHRONIZER SWITCH to GEN MAN

                      ▪ Examinee verifies Running and Incoming voltmeters on CP-1 energize and EDG A Synchroscope on CP-1 energizes.

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

## Waterford 3 Job Performance Measure

---

5. Verify proper voltage response

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee rotates EDG A VOLTAGE ADJUST switch on CP-1 to raise  
                      ▪ Examinee rotates EDG A VOLTAGE ADJUST switch on CP-1 to lower  
                      ▪ Examinee verifies proper EDG A voltage response on Incoming or Running Voltmeters on CP-1.

**SAT**\_\_\_\_**UNSAT**\_\_\_\_

---

6. Adjust EDG A voltage slightly higher than system voltage

**CUES:**            Simulator will provide required cues

**STANDARDS:**   ▪ Examinee rotates EDG A VOLTAGE ADJUST SWITCH to obtain desired voltage.  
                      ▪ Examinee adjusts Incoming voltage slightly higher than Running voltage on CP-1

**SAT**\_\_\_\_**UNSAT**\_\_\_\_

---

7. Verify proper frequency response

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee adjusts EDG A SPEED ADJUST SWITCH on CP-1 raise  
                      ▪ Examinee adjusts EDG A SPEED ADJUST SWITCH on CP-1 to lower  
                      ▪ Examinee verifies proper response by checking EDG A Frequency meters and Synchroscope response on CP-1

**SAT**\_\_\_\_**UNSAT**\_\_\_\_

## Waterford 3 Job Performance Measure

---

8. Adjust engine speed until Synchroscope rotating slowly in the clockwise direction

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee rotates speed adjust switch on CP-1 to raise or lower to obtain desired rotation

                      ▪ Examinee verifies EDG A on Synchroscope on CP-1 is rotating slowly in the clockwise direction

                      ▪ **THIS STEP IS CRITICAL IF THE SYNCHROSCOPE IS ROTATING IN THE COUNTER-CLOCKWISE DIRECTION.**

SAT\_\_\_\_UNSAT\_\_\_\_

---

9. Verify EDG A red START light is illuminated

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee verifies EDG A red START light on CP-1 illuminated

SAT\_\_\_\_UNSAT\_\_\_\_

---

10. Close EDG A breaker

**CUES:**           ▪ Simulator will provide required cues

**CRIT**

**STANDARDS:**   ▪ Examinee rotates EDG A output breaker c/s on CP-1 to CLOSE at approx. the 12:00 position on EDG A Synchroscope (CP-1)

                      ▪ Examinee verifies EDG A output breaker red CLOSED light illuminates on CP-1

SAT\_\_\_\_UNSAT\_\_\_\_

---

11. Apply approximately 0.1 MW load on EDG A

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee verifies a minimum of .1 MW load on EDG A MW meter on CP-1

                      ▪ **THIS STEP IS CRITICAL IF EDG LOAD IS LESS THAN 0.1 MW AFTER CLOSING THE EDG OUTPUT BREAKER.**

## Waterford 3 Job Performance Measure

SAT \_\_\_ UNSAT \_\_\_

---

12. Position EDG A SNCHRONIZER SWITCH to OFF

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**  ▪ Examinee rotates EDG A synchronizer switch to OFF on CP-1

SAT \_\_\_ UNSAT \_\_\_

---

13. Adjust volt adjust c/s to obtain 1 MVAR

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**  ▪ Examinee rotates volt adjust switch to obtain 1 MVAR on EDG A MVAR meter

SAT \_\_\_ UNSAT \_\_\_

---

14. Adjust real load to 1-1.2 MW

**CUES:**           ▪ **If required, as CRS direct examinee to adjust real load to 4 MW in accordance with OP-009-002, Section 6.4**

**STANDARDS:**  ▪ Examinee rotates SPEED ADJUST switch to raise  
                      ▪ Examinee verifies EDG A MW meter reads 1-1.2 MW at .5 MW / minute

SAT \_\_\_ UNSAT \_\_\_

---

15. Hold at 1 MW for 5 minutes

**CUES:**           ▪ **Cue examinee that 5 minutes have elapsed**

**STANDARDS:**  ▪ Examinee states that EDG A real load would be held for 5 minutes

SAT \_\_\_ UNSAT \_\_\_

## Waterford 3 Job Performance Measure

---

16. (ALT) Perform EMERGENCY SHUTDOWN of EDG A in TEST mode

**CUES:**

- Provide the following cue to the Examinee:

**CRIT**

**The NAO at EDG A reports major leak on EDG A lube oil line. The CRS instructs you to perform an EMERGENCY SHUTDOWN of EDG A with no cooldown from CP-1.**

**STANDARDS:**

- Examinee depresses DIESEL A TRIP pushbutton on CP-1
- Examinee verifies EDG A shutdown by verifying EDG A frequency meter on CP-1 pegged low and the green light on EDG A START switch on CP-1 is illuminated
- Examinee may contact NAO to verify EDG A at 0 rpm

SAT\_\_\_\_ UNSAT\_\_\_\_

---

17. END OF TASK.

STOP TIME\_\_\_\_\_

## **Waterford 3 Job Performance Measure**

### **Examinee Copy**

#### **INITIAL CONDITIONS**

1. Emergency Diesel Generator A was started by MANUAL REMOTE start to troubleshoot the Governor Circuitry
2. Emergency Diesel Generator A has been running at 600 rpm for 5 minutes
3. Emergency Diesel Generator A CONTROL MODE selected to "RTGB" position.

#### **INITIATING CUE**

You are directed by the CRS to parallel Emergency Diesel Generator A to the A3 bus and load the Diesel to 4.4 MW and 1 MVAR from the Control Room in accordance with OP-009-002 Section 6.4

Synchronize and Load the EDG



Site W3 Job RO System / Duty Area EDG Mode NORM Number 3

Revision 6 6/26/2003

Approval

Estimated Time 15 Minutes

Time Critical No Critical Time Alternate Path Yes

References

NUMBER  
OP-009-002

NRC KA Number

NUMBER  
3.6-064-A4.01  
3.6-064-A4.07  
2-1-20

Evaluation Methods

METHOD  
PERFORM

Trainee	<input type="text"/>	Evaluator	<input type="text"/>
Observer	<input type="text"/>	Date	<input type="text"/>
Satisfactory	<input type="checkbox"/>	Unsatisfactory	<input type="checkbox"/>

## Waterford 3 Job Performance Measure

### INITIAL CONDITIONS

1. Emergency Diesel Generator A was started by MANUAL REMOTE start to troubleshoot the Governor Circuitry
2. Emergency Diesel Generator A has been running at 600 rpm for 5 minutes
3. Emergency Diesel Generator A CONTROL MODE selected to "RTGB" position.

### INITIATING CUE

You are directed by the CRS to parallel Emergency Diesel Generator A to the A3 bus and load the Diesel to 4.4 MW and 1 MVAR from the Control Room in accordance with OP-009-002 Section 6.4

### TERMINATING CUE

1. Emergency Diesel Generator loaded to the specified MW and MVAR values
2. (ALT) The Emergency Diesel Generator is shutdown

### STANDARD

1. Desired EDG synchronized and loaded
2. (ALT) The Diesel is tripped with no cooldown

### TOOLS

Key for synchronizer

### SAFETY CONSIDERATIONS

NONE

### PERFORMANCE CONSEQUENCES

1. EQUIPMENT DAMAGE

### HUMAN INTERFACES

1. SM/CRS
2. NAO

### SKILLS / KNOWLEDGES

NONE

### INSTRUCTOR NOTES

## Waterford 3 Job Performance Measure

Perform the task in accordance with OP-009-002, Section 6.4.

Critical steps are denoted by **CRIT**.

**START TIME**\_\_\_\_\_

---

1. Verify Emergency Diesel Generator operating with voltage between 3920 and 4580 volts

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee checks EDG A voltmeter on CP-1

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

---

2. Verify Emergency Diesel Generator operating with frequency between 58.8 – 61.2 Hz

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee checks EDG A frequency meter on CP-1

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

---

3. Verify VOLT REGULATOR MODE SELECT switch in AUTO

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee verifies EDG A VOLT REGULATOR MODE SELECT switch in AUTO

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

---

4. Position the EDG A SYNCHRONIZER SWITCH to "GEN MAN"

**CUES:**           ▪ Simulator will provide required cues

**CRIT**

**STANDARDS:**   ▪ Examinee obtains key (208) for EDG A synchronizer switch from locker and inserts into EDG A SYNCHRONIZER SWITCH

                      ▪ Examinee positions SYNCHRONIZER SWITCH to GEN MAN

                      ▪ Examinee verifies Running and Incoming voltmeters on CP-1 energize and EDG A Synchroscope on CP-1 energizes.

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

## Waterford 3 Job Performance Measure

---

5. Verify proper voltage response

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee rotates EDG A VOLTAGE ADJUST switch on CP-1 to raise  
                      ▪ Examinee rotates EDG A VOLTAGE ADJUST switch on CP-1 to lower  
                      ▪ Examinee verifies proper EDG A voltage response on Incoming or Running Voltmeters on CP-1.

**SAT**\_\_\_\_**UNSAT**\_\_\_\_

---

6. Adjust EDG A voltage slightly higher than system voltage

**CUES:**           Simulator will provide required cues

**STANDARDS:**   ▪ Examinee rotates EDG A VOLTAGE ADJUST SWITCH to obtain desired voltage.  
                      ▪ Examinee adjusts Incoming voltage slightly higher than Running voltage on CP-1

**SAT**\_\_\_\_**UNSAT**\_\_\_\_

---

7. Verify proper frequency response

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee adjusts EDG A SPEED ADJUST SWITCH on CP-1 raise  
                      ▪ Examinee adjusts EDG A SPEED ADJUST SWITCH on CP-1 to lower  
                      ▪ Examinee verifies proper response by checking EDG A Frequency meters and Synchroscope response on CP-1

**SAT**\_\_\_\_**UNSAT**\_\_\_\_

## Waterford 3 Job Performance Measure

---

8. Adjust engine speed until Synchroscope rotating slowly in the clockwise direction

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee rotates speed adjust switch on CP-1 to raise or lower to obtain desired rotation

                      ▪ Examinee verifies EDG A on Synchroscope on CP-1 is rotating slowly in the clockwise direction

                      ▪ **THIS STEP IS CRITICAL IF THE SYNCHROSCOPE IS ROTATING IN THE COUNTER-CLOCKWISE DIRECTION.**

SAT \_\_\_\_ UNSAT \_\_\_\_

---

9. Verify EDG A red START light is illuminated

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee verifies EDG A red START light on CP-1 illuminated

SAT \_\_\_\_ UNSAT \_\_\_\_

---

10. Close EDG A breaker

**CUES:**           ▪ Simulator will provide required cues

**CRIT**

**STANDARDS:**   ▪ Examinee rotates EDG A output breaker c/s on CP-1 to CLOSE at approx. the 12:00 position on EDG A Synchroscope (CP-1)

                      ▪ Examinee verifies EDG A output breaker red CLOSED light illuminates on CP-1

SAT \_\_\_\_ UNSAT \_\_\_\_

---

11. Apply approximately 0.1 MW load on EDG A

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**   ▪ Examinee verifies a minimum of .1 MW load on EDG A MW meter on CP-1

                      ▪ **THIS STEP IS CRITICAL IF EDG LOAD IS LESS THAN 0.1 MW AFTER CLOSING THE EDG OUTPUT BREAKER.**

## Waterford 3 Job Performance Measure

SAT \_\_\_ UNSAT \_\_\_

---

12. Position EDG A SNCHRONIZER SWITCH to OFF

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**  ▪ Examinee rotates EDG A synchronizer switch to OFF on CP-1

SAT \_\_\_ UNSAT \_\_\_

---

13. Adjust volt adjust c/s to obtain 1 MVAR

**CUES:**           ▪ Simulator will provide required cues

**STANDARDS:**  ▪ Examinee rotates volt adjust switch to obtain 1 MVAR on EDG A MVAR meter

SAT \_\_\_ UNSAT \_\_\_

---

14. Adjust real load to 1-1.2 MW

**CUES:**           ▪ **If required, as CRS direct examinee to adjust real load to 4 MW in accordance with OP-009-002, Section 6.4**

**STANDARDS:**  ▪ Examinee rotates SPEED ADJUST switch to raise  
                      ▪ Examinee verifies EDG A MW meter reads 1-1.2 MW at .5 MW / minute

SAT \_\_\_ UNSAT \_\_\_

---

15. Hold at 1 MW for 5 minutes

**CUES:**           ▪ **Cue examinee that 5 minutes have elapsed**

**STANDARDS:**  ▪ Examinee states that EDG A real load would be held for 5 minutes

SAT \_\_\_ UNSAT \_\_\_

## Waterford 3 Job Performance Measure

---

16. (ALT) Perform EMERGENCY SHUTDOWN of EDG A in TEST mode

**CUES:**

- Provide the following cue to the Examinee:

**CRIT**

**The NAO at EDG A reports major leak on EDG A lube oil line. The CRS instructs you to perform an EMERGENCY SHUTDOWN of EDG A with no cooldown from CP-1.**

**STANDARDS:**

- Examinee depresses DIESEL A TRIP pushbutton on CP-1
- Examinee verifies EDG A shutdown by verifying EDG A frequency meter on CP-1 pegged low and the green light on EDG A START switch on CP-1 is illuminated
- Examinee may contact NAO to verify EDG A at 0 rpm

SAT \_\_\_ UNSAT \_\_\_

---

17. END OF TASK.

STOP TIME \_\_\_\_\_

## **Waterford 3 Job Performance Measure**

### **Examinee Copy**

#### **INITIAL CONDITIONS**

1. Emergency Diesel Generator A was started by MANUAL REMOTE start to troubleshoot the Governor Circuitry
2. Emergency Diesel Generator A has been running at 600 rpm for 5 minutes
3. Emergency Diesel Generator A CONTROL MODE selected to "RTGB" position.

#### **INITIATING CUE**

You are directed by the CRS to parallel Emergency Diesel Generator A to the A3 bus and load the Diesel to 4.4 MW and 1 MVAR from the Control Room in accordance with OP-009-002 Section 6.4

Placing CCW Pump A/B In Service To Replace CCW Pump A(B)



Site W3 Job RO System / Duty Area CC Mode NORM Number 6

Revision 3 8/2/00

**Approval**

Estimated Time 10 Minutes

Time Critical No Critical Time Alternate Path Yes

**References**

**NUMBER**

OP-002-003 6.4 COMPONENT COOLING WATER SYSTEM 13 5

**NRC KA Number**

**NUMBER**

2-1-20 4.3 4.2  
3.8-008-A3.04 2.9 3.2  
3.8-008-A4.01 3.3 3.1

**Evaluation Methods**

**METHOD**

PERFORM  
SIMULATE  
SIMULATOR

Trainee	<input type="text"/>	Evaluator	<input type="text"/>
Observer	<input type="text"/>	Date	<input type="text"/>
Satisfactory	<input type="checkbox"/>	Unsatisfactory	<input type="checkbox"/>

## **Waterford 3 Job Performance Measure**

### **INITIAL CONDITIONS**

1. Maintenance is to be performed on CCW pump B
2. Plant is in Mode 3
3. TRM 3.7.3 for CCW pump B being inoperable has been entered

### **INITIATING CUE**

You are directed by the CRS to replace CCW pump B with CCW pump "AB"

### **TERMINATING CUE**

1. Pump AB has been secured, the AB assignment switch has been returned To NORMAL, and SM or CRS notified of oil leak

### **STANDARD**

1. AB CCW PUMP stopped after oil leak reported

### **TOOLS**

NONE

### **SAFETY CONSIDERATIONS**

NONE

### **PERFORMANCE CONSEQUENCES**

1. EQUIPMENT DAMAGE

### **HUMAN INTERFACES**

1. NAO
2. SM/CRS

### **SKILLS / KNOWLEDGES**

NONE

### **INSTRUCTOR NOTES**

## Waterford 3 Job Performance Measure

Perform the task in accordance with OP-002-003, Section 6.4.

Critical steps are denoted by **CRIT**.

**START TIME** \_\_\_\_\_

---

1. Verify the 3AB Bus is aligned to the 3B Bus.

**CUES:**

- The simulator provides the cues.

**STANDARDS:**

- The examinee locates the BUS AB STATUS lights on CP-8 and verifies the B light is illuminated.

**SAT** \_\_\_ **UNSAT** \_\_\_

---

2. Verify the CCW Pump A/B assignment switch is in the Normal position.

**CUES:**

- The simulator provides the cues.

**STANDARDS:**

- The examinee locates the CCW Pump A/B assignment switch on CP-8 and verifies the switch is in the NORM (middle) position.

**SAT** \_\_\_ **UNSAT** \_\_\_

---

3. Close the following valves:
- CC-114B, CCW Pump B To AB Suction Cross connect,
  - CC-115B, CCW Pump AB To B Suction Cross connect
  - CC-126B, CCW Pump B To AB Discharge Cross connect
  - CC-127B, CCW Pump AB To B Discharge Cross connect

**CUES:**

- The simulator provides the cues.

**STANDARDS:**

- The Examinee locates the common switch for CC-126B/114B (**NOTE; ONE SWITCH CONTROLS BOTH VALVES**), places and holds the control switch in the CLOSE position
- The Examinee verifies the upper and lower red lights are extinguished and the upper and lower green lights are illuminated.
- The examinee locates the common switch for CC-127B/115B, places and holds the control switch in the CLOSE position
- The Examinee verifies the upper and lower red lights are extinguished and the upper and lower green lights are illuminated.

**Waterford 3 Job Performance Measure**

SAT \_\_\_ UNSAT \_\_\_

## Waterford 3 Job Performance Measure

- 
4. Place the CCW Pump A/B assignment switch in Position B.

**CUES:**

- The simulator provides the cues.

**CRIT**

**STANDARDS:**

- The examinee locates the CCW Pump A/B assignment switch on CP-8 and positions the switch to the B position.

**SAT\_\_UNSAT\_\_**

---

5. Verify the following valves Open:
- CC-114B, CCW Pump B To AB Suction Cross connect
  - CC-115B, CCW Pump AB To B Suction Cross connect
  - CC-126B, CCW Pump B To AB Discharge Cross connect
  - CC-127B, CCW Pump AB To B Discharge Cross connect

**CUES:**

- The simulator provides the cues.

**STANDARDS:**

- The examinee locates the common switch for CC-126B/114B and verifies that the upper and lower red lights are illuminated and the upper and lower green lights are extinguished.
- The examinee locates the common switch for CC-127B/115B and verifies that the upper and lower red lights are illuminated and the upper and lower green lights are extinguished.

**SAT\_\_UNSAT\_\_**

---

6. If the CCW Pump suction and discharge cross-connect valves, CC-126B/114B and CC- 127B/115B, did not open, then contact maintenance to trouble shoot and repair the valves.

**CUES:**

- The simulator provides the cues.

**STANDARDS:**

- The examinee notifies maintenance if the appropriate valves did not open
- The examinee skips the step if all valves operate as required.

**SAT\_\_UNSAT\_\_**

## Waterford 3 Job Performance Measure

---

7. Verify CCW Pump A/B bearing oil level is between the Off level marks.

**CUES:**

- After the examinee requests the NAO to check bearing oil levels, **cue the examinee that bearing oil level is between the Off level marks.**

**STANDARDS:**

- The examinee requests the NAO to verify bearing oil levels at CCW Pump A/B.

SAT\_\_\_ UNSAT\_\_\_

---

8. Start CCW Pump A/B.

**CUES:**

- The simulator provides the cues.

**CRIT**

**STANDARDS:**

- The examinee locates the CCW Pump A/B control switch on CP-8 and momentarily places the switch in the START position.
- The examinee verifies the red light illuminates and the green light extinguishes on the CCW pump A/B control switch.
- The examinee may check CCW Header flows and CCW Header pressures on CP-8 rise slightly when pump is started.

SAT\_\_\_ UNSAT\_\_\_

---

9. Verify CCW Pump A/B bearing oil level is between the Run marks.

**CUES:**

- **(ALT): NAO reports oil level dropping rapidly on pump outboard bearing due to a split in the oil line to the flow sightglass, the leak is not isolable.**

**STANDARDS:**

- NAO directed to check oil level.
- **(ALT): RO recommends to the CRS securing pump and realigning CCW Pump A/B assignment switch.**

SAT\_\_\_ UNSAT\_\_\_

## Waterford 3 Job Performance Measure

---

10. (ALT): Secure CCW Pump A/B.

**CUES:**

- The simulator provides the cues.

**CRIT**

**STANDARDS:**

- The examinee momentarily places the CCW Pump A/B control switch on CP-8 in the OFF position.
- The examinee verifies that the green light illuminates and the red light extinguishes on the CCW Pump A/B control switch.

SAT \_\_\_ UNSAT \_\_\_

---

11. (ALT): Realign CCW Pump A/B assignment switch to NORM.

**CUES:**

- The simulator provides the cues.

**STANDARDS:**

- The examinee positions the CCW Pump A/B assignment switch to the NORM position. (Mid Position)

SAT \_\_\_ UNSAT \_\_\_

---

12. END OF TASK.

STOP TIME \_\_\_\_\_

## **Waterford 3 Job Performance Measure**

### **Examinee Copy**

#### **INITIAL CONDITIONS**

1. Maintenance is to be performed on CCW pump B
2. Plant is in Mode 3
3. TRM 3.7.3 for CCW pump B being inoperable has been entered

#### **INITIATING CUE**

You are directed by the CRS to replace CCW pump B with CCW pump "AB"

ALIGN A LPSI PUMP TO REPLACE A CS PUMP



Site W3 Job RO System / Duty Area SI Mode EMERG Number 1

Revision 2 8/03/2000

Approval

Estimated Time 10 Minutes

Time Critical No Critical Time Alternate Path NO

References

NUMBER

OP-902-008 CTPC-CA SAFETY FUNCTION RECOVERY 12 00
OP-902-009 APP 29 Emergency Operating Procedure Standard Appendices 1.1 00

NRC KA Number

NUMBER

4.4-E9-EA1.1 4.2 4

Evaluation Methods

METHOD

- DISCUSS
SIMULATE
SIMULATOR

Trainee [ ]

Evaluator [ ]

Observer [ ]

Date [ ]

Satisfactory [ ]

Unsatisfactory [ ]

## **Waterford 3 Job Performance Measure**

### **INITIAL CONDITIONS**

1. An ESD and a SGTR have occurred on SG 1.
2. Containment pressure is 40 psia and rising rapidly.
3. Neither CS pump is available.
4. All ESFAS actuations have occurred as required. Assume all components actuated per design unless otherwise stated.
5. OP-902-008, SAFETY FUNCTION RECOVERY PROCEDURE has been implemented.
6. The CRS has implemented Containment Temperature and Pressure Control Continuing Actions and has decided to align LPSI pump A to replace CS pump A.
7. The TSC concurs with the decision.

### **INITIATING CUE**

The CRS directs you, the SNPO to align LPSI pump A to replace CS pump A in accordance with OP-902-009 Standard Appendices 29.

### **TERMINATING CUE**

1. Spray flow is established to containment using the selected LPSI pump.

### **STANDARD**

1. One LPSI pump is aligned to CS with acceptable flow to containment.

### **TOOLS**

Locked valve keys

### **SAFETY CONSIDERATIONS**

NONE

### **PERFORMANCE CONSEQUENCES**

1. Loss of containment integrity
2. Possible offsite dose
3. Damage to equipment

### **HUMAN INTERFACES**

1. CRS

### **SKILLS / KNOWLEDGES**

NONE

### **INSTRUCTOR NOTES**

## **Waterford 3 Job Performance Measure**

## Waterford 3 Job Performance Measure

Perform the task in accordance with referenced procedure, OP-902-009, Appendix 29. All components operated are located on CP-8.

Critical steps are denoted by **CRIT**.

START TIME \_\_\_\_\_

---

1. Verify LPSI PUMP A control switch in OFF.

**CUES:**

- When the operator locates the C/S for LPSI pump A on CP-8 and demonstrates the intended action, **cue the operator that the switch is in OFF.**

**STANDARDS:**

- The operator locates the LPSI pump A C/S on CP-8.
- The operator ensures that the C/S is in the OFF position.

SAT \_\_\_ UNSAT \_\_\_

---

2. Verify CONTAINMENT SPRAY PUMP A control switch in OFF.

**CUES:**

- When the operator locates the C/S for CS PUMP A on CP-8 and demonstrates the intended action, **cue the operator that the c/s is in OFF.**

**STANDARDS:**

- The operator locates CS PUMP A C/S on CP-8.
- The operator ensures that the C/S is in the OFF position.

SAT \_\_\_ UNSAT \_\_\_

---

3. Place SI-129A, LPSI FLOW CONTROL VALVE to AUTO. [KEY 137]

**CUES:**

- When the operator locates the C/S for SI 129A and demonstrates the intended action, **cue the operator that the C/S was placed in the AUTO position and spring returned to the MID position.**

**STANDARDS:**

- The operator obtains KEY FOR SI-129A from key locker on side of NPO desk. **CRIT**
- The operator locates the C/S for SI-129A on CP-8.
- The operator inserts the key, momentarily places the C/S in the AUTO position, then releases the C/S to the MID position.

SAT \_\_\_ UNSAT \_\_\_

## Waterford 3 Job Performance Measure

---

4. Place SI-IFIC-0307 LPSI FLOW CONTROLLER HEADER 2A/2B in MANUAL.

**CUES:**

- When the operator locates the flow controller on CP-8 and demonstrates process for placing the controller in MANUAL, **cue the operator that the controller is in MANUAL and process output meter reads 100%.**

**CRIT**

**STANDARDS:**

- The operator locates SI-IFIC-0307 on CP-8.
- The operator depresses the MANUAL pushbutton on the controller and verifies the white light illuminates.

SAT\_\_ UNSAT\_\_

---

5. Adjust SI-IFIC-0307 LPSI FLOW CONTROLLER HEADER 2A/2B to 0% output.

**CUES:**

- When the operator locates the MANUAL OUTPUT DECREASE pushbutton on the controller and demonstrates action to lower output, **cue the operator that process output meter reads 0%.**

**STANDARDS:**

- The operator locates SI-IFIC-0307 on CP-8.
- The operator depresses the MANUAL OUTPUT DECREASE pushbutton on the controller until output reads 0%.
- The operator verifies SI-129A closed on CP-8 by verifying green light illuminated and red light extinguished

**CRIT**

SAT\_\_ UNSAT\_\_

## Waterford 3 Job Performance Measure

---

6. Verify the following valves closed:
- SI-415A, SHUTDOWN TEMP CONTROL VALVE [KEY 138],
  - SI-138A, COLD LEG 2B,
  - SI-139A, COLD LEG 2A

- CUES:**
- When the operator locates each valve C/S on CP-8 and demonstrates the action to place each valve in the required position, **cue the operator that the valve is closed.**
  - **(at the examiner's discretion he may cue the operator that SI-138A OR SI-139A is not moving if the operator does not demonstrate overriding the SIAS signal to the valve)**

**CRIT**

- STANDARDS:**
- The operator locates the C/S for SI-415A on CP-8 and verifies the C/S is locked in the LESS position.
  - The operator verifies the analog valve position indicator reads 0% or that the green light is lit and red light is extinguished above the C/S.
  - The operator locates the C/S for SI-138A on CP-8 and places the C/S to the MORE position to override the SIAS signal and then back to LESS.
  - The operator verifies the digital indicator above the C/S reads 0% or the green light is lit and red light is extinguished on the C/S.
  - The operator locates the c/s for SI-139A on CP-8 and places the C/S to the MORE position to override the SIAS signal and then back to LESS.
  - The operator verifies the digital indicator above the C/S reads 0% or the green light is lit and red light is extinguished on the C/S.

SAT\_\_\_ UNSAT\_\_\_

---

7. Open SI-125A/SI-412A, SHDN HX A ISOL VALVES. [KEY 136]

- CUES:**
- When the operator locates the switch for SI-125A/SI-412A on CP-8 and demonstrates action to open the valves, **cue the operator that SI-125A and SI-412A are OPEN.**

**CRIT**

- STANDARDS:**
- The operator obtains the key for SI-125A/SI-412A from the key locker on the side of the NPO desk.
  - The operator locates the switch for SI-125A/SI-412A on CP-8, inserts the key, momentarily places the C/S to OPEN, and releases the switch.
  - The operator verifies the valves OPEN by observing both red lights are lit and both green lights are extinguished above C/S.

SAT\_\_\_ UNSAT\_\_\_

## Waterford 3 Job Performance Measure

---

8. Verify CS-125A, CNTMT SPRAY HEADER A VALVE open.

**CUES:**

- When the operator locates the C/S for CS-125A on CP-8 and demonstrates method for verifying valve position, **cue the operator that CS-125A is OPEN.**

**STANDARDS:**

- The operator locates the C/S for CS-125A on CP-8.
- The operator verifies that the red light is lit and the green Light is extinguished on the C/S.

SAT \_\_\_ UNSAT \_\_\_

---

9. Start LPSI pump A.

**CUES:**

- When the operator locates LPSI pump A C/S on CP-8 and demonstrates action to start the pump, **cue the operator that the pump is running.**

**CRIT**

**STANDARDS:**

- The operator locates LPSI pump A C/S on CP-8, momentarily places the C/S to the start position, and verifies the red light is lit and the green light is extinguished on the C/S.
- The operator verifies discharge pressure indicator on CP-8 increases.
- The operator verifies current indication on CP-8 is steady and not pegged (20-60 amps) after starting current drops off.

SAT \_\_\_ UNSAT \_\_\_

---

10. Verify CONTAINMENT SPRAY HEADER A flow.

**CUES:**

- When the operator locates CONTAINMENT SPRAY HEADER A flow indicator on CP-8, **cue the operator that flow is 2000 gpm.**

**STANDARDS:**

- The Operator locates CONTAINMENT SPRAY HEADER A flow indicator on CP-8 and verifies flow indication meets acceptance criteria for safety function (**1750 gpm**).

SAT \_\_\_ UNSAT \_\_\_

---

11. END OF TASK

## Waterford 3 Job Performance Measure

STOP TIME \_\_\_\_\_

## **Waterford 3 Job Performance Measure**

### **Examinee Copy**

#### **INITIAL CONDITIONS**

1. An ESD and a SGTR have occurred on SG 1.
2. Containment pressure is 40 psia and rising rapidly.
3. Neither CS pump is available.
4. All ESFAS actuations have occurred as required. Assume all components actuated per design unless otherwise stated.
5. OP-902-008, SAFETY FUNCTION RECOVERY PROCEDURE has been implemented.
6. The CRS has implemented Containment Temperature and Pressure Control Continuing Actions and has decided to align LPSI pump A to replace CS pump A.
7. The TSC concurs with the decision.

#### **INITIATING CUE**

The CRS directs you, the SNPO to align LPSI pump A to replace CS pump A in accordance with OP-902-009 Standard Appendices 29.

RECOVER DROPPED CEA (CONTINUOUS CEA MOTION)



Site W3 Job RO System / Duty Area CED Mode OFFNORM Number 1

Revision 2 06/26/2003

Approval

Estimated Time 5 Minutes

Time Critical No Critical Time Alternate Path Yes

References

NUMBER  
OP-901-102

NRC KA Number

NUMBER  
3.1-001-A2.03  
3.1-014-A2.03  
4.2-A01-AA1.05

Evaluation Methods

METHOD  
PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

Unsatisfactory

## Waterford 3 Job Performance Measure

### INITIAL CONDITIONS

1. Reactor Power is at 58 percent
2. CEA 27 has dropped
3. Repairs to CEA 27 have been completed
4. OP-901-102 Subsection E1, is in progress, steps 1-14 have been completed

### INITIATING CUE

You are directed by the CRS to withdraw CEA 27 per step 15 of OP-901-102 using CEAs in MANUAL INDIVIDUAL mode

### TERMINATING CUE

1. CEA 27 is aligned with other CEAs in Group P
2. (ALT) Reactor is tripped

### STANDARD

1. CEA 27 is aligned within 4 inches of other CEAs in Group P
2. (ALT) Reactor manually tripped

### TOOLS

NONE

### SAFETY CONSIDERATIONS

NONE

### PERFORMANCE CONSEQUENCES

1. REACTIVITY EVENT

### HUMAN INTERFACES

1. CRS

### SKILLS / KNOWLEDGES

Consequences of uncontrolled reactivity additions

### INSTRUCTOR NOTES

1. Reset to IC 28 or special snap
2. insert RD02A27 to drop rod, then delete malfunction
3. Adjust RCS temperature

## Waterford 3 Job Performance Measure

Perform the task in accordance with OP-901-102, Section E.1. STEP 15. All components to be operated are located on CP-2.

Critical steps are denoted by **CRIT**.

**Note: Examinee may initiate Boration at beginning of Task**

**START TIME** \_\_\_\_\_

---

1. Position INDIVIDUAL CEA selection switches to CEA 27

**CRIT**

**CUES:**           ▪ The simulator will provide the required cues

**STANDARDS:**   ▪ Examinee positions individual CEA selection switch tens to 2  
                      ▪ Examinee positions individual CEA selection switch units to 7

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

---

2. Position GROUP SELECT switch to group P

**CUES:**           ▪ The simulator will provide the required cues

**CRIT**

**STANDARDS:**   ▪ Examinee positions GROUP SELECT switch to group P

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

---

3. Place mode select switch to MI

**CUES:**           ▪ The simulator will provide the required cues

**CRIT**

**STANDARDS:**   ▪ Examinee positions MODE SELECT switch to MI

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

## Waterford 3 Job Performance Measure

---

4. Verify:

- MI light illuminates
- white lights on GROUP SELECTION MATRIX for group 27 illuminates
- white selection light for CEA 227 illuminates

**CUES:**           ▪ The simulator will provide the required cues

**STANDARDS:**   ▪ Examinee verifies MI light illuminates ,  
▪ Examinee verifies white lights on GROUP SELECTION MATRIX for Group P illuminates  
▪ Examinee verifies white selection light for CEA 27 illuminates

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

---

5. Place CEA MANUAL SHIM switch to WITHDRAW

**CUES:**           ▪ The simulator will provide the required cues

**CRIT**

**STANDARDS:**   ▪ Examinee places CEA MANUAL SHIM switch to WITHDRAW

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

---

6. Monitor CEA 27 position indicator moving outward

**CUES:**           ▪ The simulator will provide the required cues

**STANDARDS:**   ▪ Examinee moves CEA 27 at less than 15 in/min

**SAT**\_\_\_\_**UNSAT**\_\_\_\_\_

## Waterford 3 Job Performance Measure

---

7. Monitor:

- Reactor Power
- RCS temperature
- Axial Shape Index

**CUES:**           ▪ The simulator will provide the required cues

**STANDARDS:**   ▪ Examinee monitors to meters on CP-2 or PMC indications for:  
▪ Power  
▪ Temperature  
▪ ASI

**SAT**\_\_\_\_ **UNSAT**\_\_\_\_\_

---

**(ALT) NOTE:** Continuous outward CEA motion will begin when OUT SHIM switch released

8. Attempt to stop outward CEA rod motion

**CUES:**           ▪ The simulator will provide the required cues

**STANDARDS:**   ▪ Examinee recognizes continuous CEA withdrawal  
▪ Examinee places MODE SELECTOR switch to OFF

**SAT**\_\_\_\_ **UNSAT**\_\_\_\_\_

---

9. **(ALT)** manually trip Reactor

**CUES:**           ▪ The simulator will provide the required cues

**CRIT**

**STANDARDS:**   ▪ Examinee recognizes continuous CEA withdrawal and recommends tripping the Reactor to CRS  
▪ Examinee Depresses both REACTOR TRIP pushbuttons on CP-1  
▪ Examinee Verifies all ROD BOTTOM lights illuminated

**SAT**\_\_\_\_ **UNSAT**\_\_\_\_\_

---

10. END OF TASK.

**Waterford 3 Job Performance Measure**

STOP TIME \_\_\_\_\_

## **Waterford 3 Job Performance Measure**

### **Examinee Copy**

#### **INITIAL CONDITIONS**

1. Reactor Power is at 58 percent
2. CEA 27 has dropped
3. Repairs to CEA 27 have been completed
4. OP-901-102 Subsection E1, is in progress, steps 1-14 have been completed

#### **INITIATING CUE**

You are directed by the CRS to withdraw CEA 27 per step 15 of OP-901-102 using CEAs in MANUAL INDIVIDUAL

RESET EFW PUMP AB MECHANICAL OVERSPEED DURING CR EVACUATION WITH FIRE



Site W3 Job NAO System / Duty Area EFW Mode EMERG Number 1

Revision 0 06/18/2003

Approval

Estimated Time 5 Minutes

Time Critical No Critical Time Alternate Path NO

References

NUMBER  
OP-901-502

NRC KA Number

NUMBER  
3.4-061-A2.04  
3.4-061-K4.07  
4.2-68-AA1.02

Evaluation Methods

METHOD  
SIMULATE

Trainee

Evaluator

Observer

Date

Satisfactory

Unsatisfactory

## **Waterford 3 Job Performance Measure**

### **INITIAL CONDITIONS**

1. The Control Room has been evacuated due to a fire in CP-2
2. A mechanical overspeed trip of Emergency Feedwater Pump AB has occurred
3. The Reactor has been shutdown for 1 hour
4. The AB AC busses have been deenergized per Subsection E2 of OP-901-502, Control Room Evacuation
5. Power is deenergized to 3A Safety Bus and MS-407, EFW Pump AB Drip Pot to Normal Drain Bypass is failed open

### **INITIATING CUE**

The Primary NPO directs you to reset the EFW Pump AB Mechanical Overspeed Trip and reopen the Stop Valve, MS-416 in accordance with OP-901-502, Subsection E2, Step 16.2

### **TERMINATING CUE**

1. The MECHANICAL OVERSPEED TRIP DEVICE is reset and the stop valve is reopened.

### **STANDARD**

1. The EFW Pump AB Mechanical Overspeed Trip Mechanism has been successfully reset

### **TOOLS**

NONE

### **SAFETY CONSIDERATIONS**

NONE

### **PERFORMANCE CONSEQUENCES**

1. LOSS OF EFW PUMP CAPABILITY

### **HUMAN INTERFACES**

1. PNPO

### **SKILLS / KNOWLEDGES**

NONE

### **INSTRUCTOR NOTES**

## Waterford 3 Job Performance Measure

Perform the task in accordance with OP-901-502, Subsection E.2 STEP 16.2. Components to be operated during this JPM are located on the – 35' elevation near EFW pump AB.

Critical steps are denoted by **CRIT**.

**START TIME** \_\_\_\_\_

---

1. Close both Pump AB TURB STM SUPPLY VALVES - MS 401A & B.

**CUES:**           ▪ **CUE: Primary NPO reports MS-401A & B are CLOSED**

**STANDARDS:**   ▪ Examinee requests that Primary NPO close MS-401A & B at Remote Shutdown Panel (LCP-43).

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

---

2. Verify:

- MS-407 EFW PUMP AB DRIP POT TO NORMAL DRAIN BYPASS is OPEN
- Steam supply header is depressurized by cycling MS-409, EFWPT MS SUPPLY DRIP POT NORMAL DRAIN BYPASS.

**CUES:**           ▪ **CUE: MS -407 is failed open and steam header is depressurized, MS-409 is closed**

**STANDARDS:**   ▪ Examinee verifies MS-407 is open by visual indication of limit switches on the valve  
▪ Examinee simulates cycling MS-409 by using local C/S  
▪ Examinee verifies steam header depressurized by no steam issuing to floor drain

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

---

3. Verify MS-407, EFW PUMP AB DRIP POT TO NORMAL DRAIN BYPASS is closed

**CUES:**           ▪ **CUE: MS-407 is closed**

**STANDARDS:**   ▪ Examinee simulates closing MS-407 by using manual handwheel on valve actuator. Direction to close or open valve is indicated on handwheel.  
▪ Examinee may isolate air to valve actuator.

**SAT** \_\_\_\_\_ **UNSAT** \_\_\_\_\_

## Waterford 3 Job Performance Measure

---

4. Locally close MS-416 EFW PUMP AB TURBINE STOP VALVE

**CUES:**           ▪ **CUE: MS-416 is closed**

**CRIT**

- STANDARDS:**
- Examinee simulates closing MS-416 EFW Pump AB Turbine Stop Valve by depressing the motor declutch lever and turning the handwheel clockwise until handwheel travel stops.
  - Examinee verifies latch arm on valve is positioned to accept latch

SAT\_\_\_ UNSAT\_\_\_\_\_

---

5. Verify EFW PUMP AB MECHANICAL OVERSPEED TRIP ASSEMBLY reset.

**CUES:**           ▪ **CUE: Mechanical overspeed linkage is reset**

**CRIT**

- STANDARDS:**
- Examinee simulates pushing connecting rod lever towards stop valve.
  - Examinee verifies tappet nut fully recessed in Overspeed Trip Mechanism.
  - Examinee verifies latch fully engaged with latch arm.
  - Examinee simulates releasing the connecting rod.
  - Examinee verifies latch remains engaged with latch arm.

SAT\_\_\_ UNSAT\_\_\_\_\_

---

6. Locally open MS-416, "EFW Pump AB TURBINE STOP VALVE".

**CUES:**           **CUE: MS-416 is open**

**CRIT**

- STANDARDS:**
- Examinee simulates opening MS-416 EFW Pump AB Turbine Stop Valve by depressing the motor declutch lever and turning the handwheel counterclockwise until handwheel travel stops
  - Examinee may verify external OPEN Limit switch on valve made up

SAT\_\_\_ UNSAT\_\_\_\_\_

## Waterford 3 Job Performance Measure

---

7. Open both Pump AB TURB STM SUPPLY VALVES - MS 401A & B.

**CUES:**

- **CUE: Primary NPO reports MS- 401A & B are open, EFW PUMP AB is running at normal speed**

**STANDARDS:**

- Examinee requests Primary NPO open MS-401A & B.
- Examinee Requests NPO open MS-401A & B.

**SAT**\_\_\_\_ **UNSAT**\_\_\_\_\_

---

8. END OF TASK.

**STOP TIME**\_\_\_\_\_

## **Waterford 3 Job Performance Measure**

### **Examinee Copy**

#### **INITIAL CONDITIONS**

1. The Control Room has been evacuated due to a fire in CP-2
2. A mechanical overspeed trip of Emergency Feedwater Pump AB has occurred
3. The Reactor has been shutdown for 1 hour
4. The AB AC busses have been deenergized per Subsection E2 of OP-901-502, Control Room Evacuation
5. Power is deenergized to 3A Safety Bus and MS-407, EFW Pump AB Drip Pot to Normal Drain Bypass is failed open

#### **INITIATING CUE**

The Primary NPO directs you to reset the EFW Pump AB Mechanical Overspeed Trip and reopen the Stop Valve, MS-416 in accordance with OP-901-502, Subsection E2, Step 16.2

Restore Power to Dry Cooling Tower Sump Pumps During a Control Room Evacuation and Loss of Offsite power



Site W3 Job NAO System / Duty Area SP Mode OFFNORM Number 1

Revision 1 11/19/2001

**Approval**

Estimated Time 15 Minutes

Time Critical No Critical Time Alternate Path NO

**References**

**NUMBER**

OP-901-502 Evacuation Of Control Room And Subsequent Plant Shutdown 08 00

**NRC KA Number**

**NUMBER**

2-4-11 3.4 3.6  
2-4-34 3.8 3.6  
4.2-A68-AK3.18 4.2 4.5

**Evaluation Methods**

**METHOD**

PERFORM  
SIMULATE

Trainee

Evaluator

Observer

Date

Satisfactory

Unsatisfactory

## Waterford 3 Job Performance Measure

### INITIAL CONDITIONS

1. A loss of offsite power concurrent with Control Room Evacuation.
2. Emergency Diesel Generator B is supplying power to the B Safety busses.
3. Emergency Diesel Generator A failed to start.

### INITIATING CUE

The NPO orders you to restore power to the B train powered Dry Cooling Tower Sump Pumps in accordance with OP-901-502, Subsection E1, Step 16.

### TERMINATING CUE

1. Power has been restored to the B train powered Dry Cooling Power Sump Pumps.

### STANDARD

1. Power restored to B train powered Dry Cooling Tower Sump Pumps.

### TOOLS

NONE

### SAFETY CONSIDERATIONS

NONE

### PERFORMANCE CONSEQUENCES

1. Possible flooding of DCT area

### HUMAN INTERFACES

1. NPO
2. NAO

### SKILLS / KNOWLEDGES

NONE

### INSTRUCTOR NOTES

## Waterford 3 Job Performance Measure

Perform the task in accordance with OP-901-502, Subsection E2, Step 16. All steps performed in the +1 FHB SWGR room.

Critical steps are denoted by **CRIT**.

**START TIME** \_\_\_\_\_

---

1. IF Emergency Diesel Generator B is supplying power to Train B Safety busses, THEN perform the following:

**(NOTE; Emergency Diesel Generator B is supplying power to the B Safety busses).**

Place the following switches to bypass:

(Switches located on respective pump breaker cubicles at MCC 314B in the +1 FHB SWGR room. )

- (West) DCT #1 Sump Pump B Radiation Monitor bypass switch SP-EBKR-314B-4F
- (East) DCT #2 Sump Pump B Radiation Monitor bypass switch SP-EBKR-314B-5F

**CUES:**

- When examinee locates and simulates placing the radiation monitor bypass switches to Bypass **cue examinee the switches are in Bypass**

**CRIT**

**STANDARDS:**

- DCT 1 and 2 sump pump B radiation monitor bypass switches placed to the Bypass position

**SAT** \_\_\_ **UNSAT** \_\_\_

---

2. Locally Open ALL non-safety bus load breakers on MCC-314B.

**CUES:**

- When examinee locates and simulates opening all non-safety-related bus load breakers on MCC-314B, **cue examinee the breakers are open**
- (all breakers are to the LEFT side of the Safety to Non-Safety Tie Bkr)

**STANDARDS:**

- All non-safety-related bus load breakers on MCC-314B are open

**SAT** \_\_\_ **UNSAT** \_\_\_

---

3. Locally Close SSDEBKR314B-2M, MCC 314B Safety to Non-Safety Tie.

**CUES:**

- If Examinee asks condition of Closing Spring Indicator, **Cue the Examinee Indicator shows CHARGED**
- When Examinee locates and simulates closing the safety to non-safety tie breaker by depressing CLOSE pushbutton or operating MANUAL Closing Spring Latch Lever, **cue the examinee the breaker is closed**

**CRIT**

**STANDARDS:**

- Safety to non-safety tie breaker is closed

## Waterford 3 Job Performance Measure

SAT \_\_\_ UNSAT \_\_\_

## Waterford 3 Job Performance Measure

---

4. Locally close SP EBKR 314B-4F, West Dry Cooling Tower Sump Pump B.

**CUES:**

- When examinee locates and simulates closing the West DCT sump pump breaker, **cue examinee the breaker is closed**

**CRIT**

**STANDARDS:**

- West DCT sump pump breaker is closed

**SAT**\_\_**UNSAT**\_\_

---

5. Locally close SP EBKR 314B-5F, East Dry Cooling Tower Sump Pump B.

**CUES:**

- When examinee locates and simulates closing East DCT sump pump breaker, **cue examinee breaker is closed**

**CRIT**

**STANDARDS:**

- East DCT sump pump breaker is closed

**SAT**\_\_**UNSAT**\_\_

---

6. End of task

**STOP TIME**\_\_\_\_\_

## **Waterford 3 Job Performance Measure**

### **Examinee Copy**

#### **INITIAL CONDITIONS**

1. A loss of offsite power concurrent with Control Room Evacuation.
2. Emergency Diesel Generator B is supplying power to the B Safety busses.
3. Emergency Diesel Generator A failed to start.

#### **INITIATING CUE**

The NPO orders you to restore power to the B train powered Dry Cooling Tower Sump Pumps in accordance with OP-901-502, Subsection E1, Step 16.

.

RETURNING A, B, OR AB BATTERY CHARGERS TO SERVICE



Site W3 Job NAO System / Duty Area DC Mode NORM Number 7

Revision 6 8/3/00

Approval

Estimated Time 15 Minutes

Time Critical No Critical Time Alternate Path Yes

References

NUMBER

OP-006-003 8.1 125 DC ELECTRICAL DISTRIBUTION SYSTEM OPERATION 09 02

NRC KA Number

NUMBER

2-1-20 4.3 4.2  
3.6-063-A4.02 2.8\* 2.9  
3.6-063-K1.03 2.9 3.5

Evaluation Methods

METHOD

PERFORM  
SIMULATE

Trainee

Evaluator

Observer

Date

Satisfactory

Unsatisfactory

## Waterford 3 Job Performance Measure

### INITIAL CONDITIONS

1. Maintenance has been completed on BATTERY CHARGER DC-EBC-1A
2. The remote power supply breakers for BATTERY CHARGER DC-EBC-1A were left open after maintenance.

### INITIATING CUE

The NPO directs you to place BATTERY CHARGER DC-EBC-1A in service.

### TERMINATING CUE

- 1 The battery charger is in service and operating normally.
2. **Faulted:** the battery charger is deenergized and the SM/CRS is Informed.

### STANDARD

1. Battery charger DC-EBC-1A has been returned to service.
2. **Faulted:** the operator re-opens the AC and DC isolation breakers and Informs the SM/CRS.

### TOOLS

NONE

### SAFETY CONSIDERATIONS

Energized Electrical Equipment

### PERFORMANCE CONSEQUENCES

- 1 Equipment damage
2. Personnel injury
3. Loss of vital instrumentation

### HUMAN INTERFACES

- 1 NPO
2. SM/CRS

### SKILLS / KNOWLEDGES

NONE

### INSTRUCTOR NOTES

## Waterford 3 Job Performance Measure

Perform the task in accordance with referenced procedure OP-006-003, section 8.1. All components are located in the RAB + 21' MSL, A Switchgear Room along the North wall.

**NOTE: This JPM requires opening battery charger doors. Permission is required from the On-shift Shift Manager to open these doors (Ext. 3104).**

**START TIME** \_\_\_\_\_

Critical steps are denoted by **CRIT**.

- 
1. Verify Battery Charger AC isolation and Battery Charger DC Isolation Breakers for applicable Battery Charger OPEN.

**CUES:**

- When the operator locates the applicable breaker at the selected Battery Charger **cue the operator that the breaker is OPEN.** (breakers are located inside front panel of the selected Battery Charger)

**STANDARDS:**

- The Operator locates the selected Battery Charger.
- The Operator checks that the AC Isolation Breaker of the selected Battery Charger is OPEN. (DC-EBKR-1161-A1)
- The Operator checks that the DC Isolation Breaker of the Selected Battery Charger is Open (DC-EBKR-1A2)

**SAT**\_\_\_\_ **UNSAT**\_\_\_\_\_

- 
2. Verify remote power supply breakers for applicable battery charger are closed.

**CUES:**

- When the operator locates the applicable breaker and demonstrates action to close the breaker, then **cue the operator that the applicable breaker is closed.**

**CRIT**

**STANDARDS:**

- The Operator locates the applicable 480vac Motor Control Center and (**simulates**) closes the correct breaker. (DC-EBKR-311A-14D) (EAST END OF MCC 311A, second row in, second breaker from top)
- The Operator locates the applicable DC distribution panel and (**simulates**) closes the correct breaker. (DC-EBKR-A-34) (PDP A-DC, right hand section, third breaker from bottom on right facing panel)

**SAT**\_\_\_\_ **UNSAT**\_\_\_\_\_

- 
3. Set EQUALIZE/FLOAT switch (inside cabinet) to float position.

**CUES:**

- When the operator locates the EQUALIZE/FLOAT switch inside The Battery Charger cabinet, **cue the operator that the Switch is in FLOAT.**

**CRIT**

**STANDARDS:**

- The Operator locates the EQUALIZE/FLOAT switch.
- The Operator verifies the switch is in the FLOAT position.

**SAT**\_\_\_\_ **UNSAT**\_\_\_\_\_

## Waterford 3 Job Performance Measure

---

4. Place load sharing switch to off.

**CUES:**

- When the Operator locates the LOAD SHARING switch on the front panel of the Battery Charger, then **cue the operator That the switch is in OFF.**

**CRIT**

**STANDARDS:**

- The Operator locates the LOAD SHARING switch.
- The Operator verifies the switch is in the OFF position.

SAT\_\_\_\_ UNSAT\_\_\_\_

---

5. Close Battery Charger Isolation (DC) Breaker and check the following:

- DC voltmeter equals battery potential
- NO CHARGE lamp Illuminates
- PHASE FAIL lamp illuminates

**CUES:**

- When the Operator demonstrates the action to close the DC breaker, then **cue the Operator that the Battery Charger Isolation (DC) breaker is CLOSED.**
- When the Operator locates the DC voltmeter, then **cue the Operator that the voltmeter indication equals battery Potential (~135 vdc).**
- When the Operator locates the NO CHARGE lamp on the Front panel of the Battery Charger, then **cue the Operator That the NO CHARGE lamp is illuminated.**
- When the Operator locates the PHASE FAIL lamp, then **cue The Operator that the PHASE FAIL lamp is ON.**

**CRIT**

**STANDARDS:**

- The Operator locates and (**simulates**) closes the Battery Charger Isolation (DC) breaker.
- The Operator verifies indication of DC voltage and lamp status.

SAT\_\_\_\_ UNSAT\_\_\_\_

## Waterford 3 Job Performance Measure

- 
6. When 25 seconds have elapsed, then close Battery Charger AC isolation Breaker and check the following:
- DC voltmeter remains at battery potential
  - NO CHARGE lamp extinguishes
  - PHASE FAIL lamp extinguishes

- CUES:**
- When the Operator locates the Battery charger AC isolation Breaker and demonstrates the action to close it, then **cue the operator that the Battery Charger AC isolation breaker is CLOSED.** CRIT
  - **(Alternate path):** when the operator locates the DC voltmeter, then **cue the operator that the voltmeter read 148 vdc for a short period and then dropped down to battery potential (~135 vdc).**
  - **(Alternate path):** when the operator locates the NO CHARGE lamp, then **cue the operator that the NO CHARGE lamp extinguished for a short period and then illuminated.**
  - **(Alternate path):** when the operator locates the PHASE FAIL lamp, then **cue the operator that the PHASE FAIL lamp is extinguished.**
  - **(Alternate path):** when the operator locates the HI-V SHUTDOWN lamp, **cue the operator that the HI-V SHUTDOWN lamp is illuminated.**

- STANDARDS:**
- The operator locates and **(simulates)** closes the battery charger ac Isolation breaker after waiting at least 25 seconds since closing the DC isolation breaker.
  - The operator verifies DC voltmeter indication and indicator Status.

SAT \_\_\_\_ UNSAT \_\_\_\_

- 
7. **(ALTERNATE PATH):** IF HI-V SHUTDOWN lamp is illuminated and output voltage is < 144 vdc, then depress the HIGH VOLTAGE RESET pushbutton located on HV SHUTDOWN CARD inside cabinet.

- CUES:**
- When the operator locates and resets the HIGH VOLTAGE RESET pushbutton, then **cue the operator that the HI-V SHUTDOWN lamp extinguished for a short period and then reilluminated.**

- STANDARDS:**
- The operator **(simulates)** opens the BATTERY CHARGER AC ISOLATION BREAKER. CRIT
  - The operator **(simulates)** opens BATTERY CHARGER ISOLATION (DC) BREAKER.
  - The operator notifies SM/CRS of condition.

SAT \_\_\_\_ UNSAT \_\_\_\_

---

8.

STOP TIME \_\_\_\_\_

## **Waterford 3 Job Performance Measure**

### **Examinee Copy**

#### **INITIAL CONDITIONS**

1. Maintenance has been completed on BATTERY CHARGER DC-EBC-1A
2. The remote power supply breakers for BATTERY CHARGER DC-EBC-1A were left open after maintenance.

#### **INITIATING CUE**

The NPO directs you to place BATTERY CHARGER DC-EBC-1A in service.

Facility: Waterford III		Scenario No.: 1	Op-Test No.: 1
Examiners: _____		Operators: _____	
_____		_____	
_____		_____	
Initial Conditions: IC-30, 100%, EOC			
Turnover: RCP 2B Lower Seal failed two days ago (RC08D). Charging pump AB has been OOS for 24 hours to replace a cracked pump block. CS Pump A has been OOS for 74 hours to replace the pump impeller.			
Event No.	Malf. No.	Event Type*	Event Description
1	ED02C	C-SRO	After the crew takes the shift, SUT A fails requiring evaluation of operability of AC offsite circuits, Technical Specification 3.8.1.1. OP-903-066 must be performed within 1 hour.
2	CC03A	C-BOP/SRO	After the crew evaluates Tech Specs for the SUT failure, CC Pump A bearing seizes. This causes CC Pump A to trip on overcurrent. The crew should implement OP-901-510, CCW Malfunction, Subsection E0 and E2 and evaluate actions for TS 3.7.3, TRM 3.7.3 and OP-100-014 (cascading Tech Specs).
3	RC21A	I-BOP/RO/SRO	After the crew starts CC Pump AB and evaluates Tech Specs, Reactor Regulating System Hot Leg 1 temperature input fails low affecting the PZR Level Control Setpoint. The crew should implement OP-901-110, PZR Level Control Malfunction, Subsection E0 and E2.
4	CV05B2	C-RO/SRO	While the crew is implementing OP-901-110, the in-service letdown back-pressure control valve fails closed. The crew should implement OP-901-112, Charging or Letdown Malfunction, Subsection E0 and E2.
5	RC03D RD11A73 RD11A58	C-RO/SRO M-All	After the crew places the alternate letdown back-pressure control valve in service, RCP 2B shaft seizure occurs, resulting in a reactor trip and loss of the offsite power source to Train A safety buses. Three CEAs fail to insert on the reactor trip. This requires the RO to initiate emergency boration. The crew should implement OP-902-000, Standard Post Trip Actions.
6	OVR45- OVR MS13A	I-BOP or RO M (All)	After emergency boration is initiated and the crew has transitioned to OP-902-001, Reactor Trip Recovery, a Main Steam Line Break on S/G 1 outside Containment occurs. MSIS fails to actuate automatically. This requires manual initiation of MSIS. The crew should re-diagnose to OP-902-004, Excess Steam Demand Recovery.

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

# Simulator Scenario

## Waterford 3 Nuclear Plant

### Simulator Scenario Number: E-NRC03-1

**Author:** avest

**Scenario Status:** APPROVED

**Approval:** rfletch

**Revision Number:** 1 6/11/2003

**Estimated Time:** 60 Minutes

**References Verified:** avest 6/11/2003

**Initial Conditions:** 100%, EOC (IC-66)

**Applications:** Initial Exam

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#### Scenario Description:

The plant is at 100% reactor power. RCP 2B lower seal failed 48 hours ago and required steps of OP-901-130 have been taken. After the crew takes the shift, SUT A fails requiring operability evaluation of AC offsite circuits. The crew should enter 3.8.1.1.a and 3.8.1.1.d, perform OP-903-066 within one hour and verify all required Train B components and EFW Pump AB operable. After the crew evaluates Tech Specs for the SUT failure, CC Pump A bearing seizes and the pump trips on overcurrent. After the crew starts CC Pump AB and evaluates Tech Specs (or at examiner discretion), RRS Hot Leg 1 temperature input fails low affecting PLCS setpoint. While the crew is implementing OP-901-110, the in-service letdown back-pressure control valve fails closed. After the crew places the alternate back-pressure control valve in service RCP 2B shaft seizure occurs, resulting in a reactor trip and loss of the Offsite power source to Train A busses. Two CEAs fail to insert on the reactor trip. After emergency boration is in progress and the crew has transitioned to OP-902-001, an unisolable Main Steam Line Break occurs on S/G 1 outside containment. SG 1 Pressure Lo bistables fail to actuate. The scenario may be terminated after the crew takes action to secure feeding SG 1 with EFW and take action to stabilize RCS temperature and pressure.

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#### Scenario Notes:

1. Reset Simulator to IC-66.
2. Verify Scenario Malfunctions, Remotes, and Overrides are loaded
  - a. Remotes and Overrides are as follows:
    1. CS Pump A Bkr - Rackout
    2. Charging Pump A/B Breaker - Rackout
    3. Shutdown HX A Outlet Valve - Closed
    4. DT07 ,Annun Cab. D\_T07 Switching Station trouble- FAIL ON - Event Trigger 1
  - b. Malfunctions
    1. OVR45, RPS CH A LO SG-1 PRESS TRIP OVRD - LOAD - TRUE
    2. OVR46, RPS CH B LO SG-1 PRESS TRIP OVRD - LOAD - TRUE
    3. OVR47, RPS CH C LO SG-1 PRESS TRIP OVRD - LOAD - TRUE
    4. OVR46, RPS CH D LO SG-1 PRESS TRIP OVRD - LOAD - TRUE
    5. RC08D, RCP 2B LOWER SEAL FAILURE - LOAD - 25%
    6. RD11A73, CEA 73 MECHANICALLY STUCK - LOAD - TRUE
    7. RD11A58, CEA 58 MECHANICALLY STUCK - LOAD - TRUE
    8. Malfunctions per Scenario Time Line
3. Danger Tag and place to OFF:
  - a. CS Pump A C/S on CP-8
  - b. Chg Pump A/B C/S on CP-4
4. Ensure Protected Train B sign is placed in SM office window.
5. Ensure CW pumps B and D are running.
6. Place B/U Charging Pump Selector Switch in AB
7. Ensure CCW temperature is lowered to 80-85 degrees F.

8. Complete the simulator setup checklist.

#### **EVENT 1 - Startup Transformer A Failure**

1. On Lead Examiner's cue initiate Event Trigger 1.
2. If TB watch sent to investigate SUT A alarms report flags on SUT A Differential Current, Transformer Ground, and SUT Sudden Pressure relays.
3. If TB watch sent to the Transformer report that there is evidence that the transformer relief lifted, but is not lifting at this time.
4. If Work Week Manager or Electrical Maintenance is contacted, inform the caller that a team will be sent to the SUT.

#### **EVENT 2 - CC Pump A Bearing Seizure**

1. On Lead Examiner's cue initiate Event Trigger 2.
2. If an NAO is sent to the CC Pump Breaker, report Overcurrent Relay flags on all 3 phases.
3. If and NAO is sent to the pump room report that there is no oil in the bubbler oil is on the floor, and the bearing housing is discolored.
4. If Work Week Manager or Mechanical Maintenance is contacted, inform the caller that a team will be sent to the CC pump.

#### **EVENT 3 - PZR Level Setpoint Malfunction/Hot Leg 1 Temperature Instrument Fails Low**

1. On Lead Examiner's cue initiate Event Trigger 3.
2. If Work Week Manager or I&C Maintenance is contacted, inform the caller that a team will be sent to the Control Room.

#### **EVENT 4 - In-service Letdown Backpressure Control Valve Fails Closed**

1. On Lead Examiner's cue initiate Event Trigger 4.
2. When called as RAB Place the Alternate Backpressure Control Valve in service using the following remotes:
  - a. CVR03, CVC-121A LTDN BPCV INLET ISOL - 100% @ 1 minute ramp
  - b. CVR04, CVC-121B LTDN BPCV INLET ISOL - 0% @ 1 minute ramp

#### **EVENT 5 - RCP 2B Shaft Seizure/Reactor Trip/Loss of Power to Train A Buses/Emergency Boration**

1. On Lead Examiner's cue initiate Event Trigger 5.
2. If the TB watch is sent to verify MSR TCVs, report that all MSR TCVs are closed.

#### **EVENT 6 - Unisolable MSLB Outside Containment S/G 1/Failure of S/G 1 Low Pressure Trips**

1. On Lead Examiner's cue initiate Event Trigger 6.
2. If an NAO is sent to verify secondary safeties status, report that no safeties are lifting.

**Scenario Timeline:**

Item	Malfunction	Time	Severity	Ramp	TUA	TRA	Trigger	Event
1	ED02C SUT A TRANSFORMER FAILURE	1 MIN	TRUE				1	T3811
2	CC03A CCW PUMP A BEARING SEIZURE	10 MIN	TRUE				2	A510, e2
3	RC21A RCS HOT LEG 1 CONTROL TT FAILS LOW (0-100%)	15 MIN	0%				3	A110, e2
4	CV05B2 LETDOWN BACK-PRESSURE REGULATOR VALVE B FAILS CLOSED	25 MIN	TRUE				4	A112,e2
5	RC03D RCP 2B SHAFT SEIZURE	35 MIN	TRUE				5	E000
6	MS13A MS LINE 1 BREAK OUTSIDE CONTAINMENT BEFORE MSIV (0-100%)	45 MIN	10%				6	E004

Manip #	Manipulation Description
14	Loss of CC Trains or CC to an Individual Component
20	Conditions Requiring Emergency Boration
24	Malfunction of RCS Pressure or Level Control (includes loss of letdown/charging)
25	Reactor Trip
26B	Main Steam Line Break, Outside Containment
9	Loss of Electrical Power or Degraded Power Source

## OP Test 1, Scenario 1, Event 1 - Startup Transformer A Failure

### Event Description:

After the crew takes the shift, SUT A fails requiring operability evaluation of AC offsite circuits. The crew should enter 3.8.1.1.a and 3.8.1.1.d, perform OP-903-066 within one hour and verify all required Train B components and EFW Pump AB operable.

### Event Objectives:

1. Evaluate the effects of the transformer failure on plant operations.
2. Evaluate Technical Specifications to determine and implement required actions.

### Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	SNPO	Identify Startup Transformer A failure by verifying annunciator response procedures and breaker indications on CP-1. <ul style="list-style-type: none"> <li>- SUT A to Bus A2 Feeder Breaker Open</li> <li>- SUT A to Bus A1 Feeder Breaker Open</li> <li>- SUT A Motor Operated Disconnect Open</li> <li>- Generator Output Breaker A Open</li> <li>- PMC alarms for SUT A Differential Current, Sudden Pressure, and Ground</li> <li>- Switching Station Trouble Annunciator</li> <li>- S/U XFMR A 86 Trip/Trouble</li> </ul>
	CRS	Review Technical Specification 3.8.1.1 and determine the following: <ul style="list-style-type: none"> <li>- 3.8.1.1.a applies</li> <li>- 3.8.1.1.d requirements are met</li> <li>- OP-903-066 must be performed within one hour</li> </ul>
	SNPO	Perform OP-903-066, Electrical Breaker Alignment Check.
	CRS	Notify Electrical Maintenance or Work Week Manager of failure.
	Termination	Termination point for event

## OP Test 1, Scenario 1, Event 2 - CC PUMP A Bearing Seizure

### Event Description:

After the crew evaluates Tech Specs for the SUT failure, CC Pump A bearing seizes and the pump trips on overcurrent. The crew starts CC Pump AB and evaluates Tech Spec implications.

### Event Objectives:

1. Restore and properly align CCW in accordance with off-normal operating procedure OP-901-510, Component Cooling Water System Malfunction.

### Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	SNPO	Recognize and report CC Pump A trip. <ul style="list-style-type: none"> <li>- CCW Pump A Trip/Trouble (CP-8)</li> <li>- Amber light on CC Pump A C/S (CP-8)</li> <li>- Lower CCW Flow and Pressure Indications on CP-8</li> <li>- PMC alarm for CC Pump A Overload</li> </ul>
	CRS	Enter OP-901-510, CCW Malfunction and implement Subsection E2, CCW Pumps.
	SNPO/CRS	Align CCW Pump AB Assignment Switch on CP-8 to position A.
	SNPO/CRS	Verify Suction and Discharge Cross Connect Valves from Train A are open on CP-8. <ul style="list-style-type: none"> <li>- CC-126A/CC-114A, CCW Suct &amp; Disch Header Tie Valves AB to A</li> <li>- CC-127A/CC-115A, CCW Suct &amp; Disch Header Tie Valves AB to A</li> </ul>
	SNPO/CRS	Start CCW Pump AB using C/S on CP-8.
	SNPO/CRS	Evaluate AB electrical bus alignment for Technical Specification impact. Enters: <ul style="list-style-type: none"> <li>- T. S. 3.7.3</li> <li>- Cascading Tech Specs per OP-100-014</li> <li>- TRM 3.7.3</li> </ul>
	Termination	Termination point for event

**OP Test 1, Scenario 1, Event 3 - PZR Level Setpoint Malfunction/Hot Leg 1 Temperature Instrument Fails Low**

**Event Description:**

After the crew starts CC Pump AB and evaluates Tech Specs (or at examiner discretion), RRS Hot Leg 1 temperature input fails low affecting PLCS setpoint. The crew should implement OP-901-110, Pressurizer Level Control Malfunction.

**Event Objectives:**

1. Determine faulty temperature channel(s) and take corrective actions to restore pressurizer level control back to normal.
2. Properly perform general subsequent operator actions in accordance with OP-901-110, Pressurizer Level Control Malfunction.

**Event Action Steps:**

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	PNPO	Report indications and alarms to CRS. <ul style="list-style-type: none"> <li>- Pressurizer Level Hi/Lo annunciator on CP-2</li> <li>- Pressurizer Level Hi-Hi annunciator on CP-2</li> <li>- All Backup heaters ON at CP-2</li> <li>- Setpoint Dropped suddenly on RC-ILR-0110 on CP-2</li> <li>- Letdown Flow rising on CP-4</li> <li>- Th Loop 1, RC-ITI-0110, instrument reading low on CP-2</li> </ul>
	CRS	Determines need to enter and implement OP-901-110, Pressurizer Level Control Malfunction.
	PNPO/CRS	Place PZR Level Controller on CP-2 to MANUAL and adjust output slowly to restore Pressurizer Level (CP-2). <ul style="list-style-type: none"> <li>- Takes manual control of RC-ILIC-0110 by momentarily depressing the MANUAL pushbutton</li> <li>- Lowers output of RC-ILIC-0110 to obtain a letdown flow that results in stable or rising PZR Level on CP-2 indicators and recorders.</li> </ul>
	CRS	Diagnose into Subsection, E2, Pressurizer Level Setpoint Malfunction
	PNPO/CRS	Verify normal indications on all Safety Measurement Channel Hot Leg And Cold Leg Temperature Indicators on CP-7. <ul style="list-style-type: none"> <li>- Determines that all Hot and Cold Leg Temperature Indicators on CP-7 are reading normally</li> </ul>
	PNPO/CRS	Determine affected channel(s) by checking RRS TAVG Recorders (RC-ITR-0111 AND RC-ITR-0121 ON CP-2). <ul style="list-style-type: none"> <li>- Determines that both RRS Channels are affected.</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/CRS	<p>Cycle Charging Pumps (CP-4) as necessary to maintain Pressurizer Level above minimum level for operation per Attachment 1, PZR Level vs. Tave curve.</p> <ul style="list-style-type: none"> <li>- Using pre-failure Tave indication and Attachment 1, determines minimum level for operation is 40-45%</li> <li>- CRS gives instructions to PNPO to maintain PZR level above minimum level or gives a band to maintain that ensures that minimum level is always met</li> </ul>
	PNPO/CRS	<p>If PZR Backup Heaters have energized, then place unnecessary Backup Heater banks to OFF on CP-2. (One bank may be left in ON)</p>
	PNPO/CRS	<p>Check RRS Hot and Cold Leg Temperature meters on CP-2 for abnormal readings.</p> <ul style="list-style-type: none"> <li>- Determines that Hot Leg instrument RC-ITI-0110 is failed low</li> </ul>
	SNPO/CRS	<p>If Hot Leg 1 indicates abnormally high or low, select Loop 2 for Tave Loop Selector in both RRS local cabinets (inside cabinet drawer on side of drawer).</p> <ul style="list-style-type: none"> <li>- CRS directs performance of this step</li> <li>- Locates RRS system cabinets behind main panels and places both Tave Loop Selector Switches to Loop 2.</li> </ul>
	PNPO/CRS	<p>Verify setpoint of Pressurizer Level Controller (RC-ILIC-0110 on CP-2) returns to program setpoint per Attachment 1, PZR Level vs. Tave curve and perform the following:</p> <ul style="list-style-type: none"> <li>- Place PZR Level Controller in AUTO by momentarily depressing AUTO pushbutton and verify PZR level is controlling at setpoint</li> <li>- Place backup Charging Pumps in AUTO as necessary (CP-4)</li> <li>- Place desired Pressurizer Backup Heaters in AUTO; one bank may be left in ON</li> <li>- Reset both Proportional Heater banks by momentarily placing each C/S on CP-2 to ON</li> </ul>
	Termination	Termination point for event

**OP Test 1, Scenario 1, Event 4 - In-service Letdown Backpressure Control Valve Fails Closed**

**Event Description:**

While the crew is implementing OP-901-110, the in-service Letdown Backpressure Control Valve fails closed. The crew should implement OP-901-112, Charging or Letdown Malfunction and place the Alternate Letdown Backpressure Control Valve in service and restore Letdown to automatic operation.

**Event Objectives**

1. Adjust letdown flow in manual, in the event of a letdown malfunction.
2. Locate and isolate leaks and/or faulted letdown system components in accordance with OP-901-112, Charging or Letdown Malfunction.
3. Place available standby components in service.

**Event Action Steps:**

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	PNPO	Reports alarms and indications to CRS. <ul style="list-style-type: none"> <li>- Letdown HX Outlet Pressure Hi annunciator on CP-4</li> <li>- Letdown Flow Hi/Lo Annunciator on CP-4</li> <li>- Pressure cycling on Letdown Back Pressure Controller CVC-IPIC-0201 on CP-4</li> <li>- Letdown Flow indicator on CP-4 indicates 0 gpm</li> <li>- In-Service Letdown Back Pressure Control Valve CVC-123B shows closed (green) on CP-4 with output of the Letdown Back Pressure controller at 100%</li> </ul>
	CRS	Determines need to implement OP-901-112, Charging Or Letdown Malfunction
	CRS	Determine need to implement Subsection E2, Letdown Malfunction.
	PNPO/CRS	If necessary, maintain Pressurizer level by adjusting Letdown Flow Controller (RC-IHIC-0110 on CP-4) in manual.
	PNPO/CRS	Operate Charging Pumps (CP-4) as necessary to maintain Pressurizer Level iaw Attachment 1. <ul style="list-style-type: none"> <li>- Determines minimum level for operation is between 40-45%</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/CRS	<p>If Backpressure Regulating Valve is not operating properly, place the Backup Backpressure Regulating Valve in service by:</p> <ul style="list-style-type: none"> <li>- Place Letdown Backpressure Controller (CVC-IPIC-0201 on CP-4) in manual and make adjusts to maintain pressure during transfer.</li> <li>- Place Letdown Backpressure Control Valve Selector Switch on CP-4 to both</li> <li>- Direct an NAO to locally unisolate the Backup Letdown Backpressure Control Valve and isolate the Normal Letdown Backpressure Control Valve.</li> <li>- Place Letdown Backpressure Control Valve Selector Switch on CP-4 to alternate.</li> <li>- If letdown is still in service, place letdown backpressure controller (CVC-IPIC-0201 on CP-4) in AUTO</li> </ul>
	PNPO/CRS	<p>If Letdown has been secured and all malfunctions found and corrected, restore Charging and Letdown in accordance with OP-002-005, Chemical and Volume Control.</p>
	Termination	<p>This event may be terminated after The Alternate Letdown Backpressure Control Valve is placed in service or at the Lead Examiner's discretion.</p>

**OP Test 1, Scenario 1, Event 5 - RCP 2B Shaft Seizure/Reactor Trip/Loss of Power to Train A Buses/Emergency Boration**

**Event Description:**

After the crew places the alternate letdown backpressure control valve in service, RCP 2B shaft seizure occurs, resulting in a reactor trip and loss of the Offsite power source to Train A buses. Two CEAs fail to insert on the reactor trip. After emergency boration is in progress and the crew has transitioned to OP-902-001, an unisolable Main Steam Line Break occurs on S/G 1 outside containment. SG 1 Pressure Lo bistables fail to actuate. The scenario may be terminated after the crew takes action to secure feeding SG 1 with EFW and take action to stabilize RCS temperature and pressure.

**Event Objectives:**

1. Carry out all operator actions, including necessary contingency actions in accordance with OP-902-000, Standard Post Trip Actions, in the event of a reactor trip.
2. Properly diagnose event in progress and transition to appropriate EOP recovery procedure.

**Event Critical Tasks:**

- |   |                              |   |
|---|------------------------------|---|
| 1 | Establish Reactivity Control | The task is identified by at least one member of the crew. The PNPO initiates Emergency Boration using BAM Pumps and Emergency Boration Valve or Gravity Feed Valves prior to entry into the diagnostics section of OP-902-000. |
|---|------------------------------|---|

**Event Action Steps:**

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/CRS	<p>VERIFY REACTIVITY CONTROL</p> <ul style="list-style-type: none"> <li>- Check Reactor Power dropping on Log Channel indicators and/or recorders on CP -2 and/CP -7</li> <li>- Check Startup Rate on CP -2 and/or CP-7 Is negative</li> <li>- Emergency Borate from CP -4 by performing the following. <b><u>CRITICAL</u></b> <ul style="list-style-type: none"> <li>o <b>Place Makeup Mode Selector Switch in MANUAL</b></li> <li>o <b>Align borated water source by performing one of the following:</b> <ul style="list-style-type: none"> <li>▪ <b>Initiate Emergency Boration using Boric Acid Pump as follows:</b> <ul style="list-style-type: none"> <li>• <b>Open Emergency Boration Valve, BAM-133.</b></li> <li>• <b>Start <u>one</u> Boric Acid Pump.</b></li> <li>• <b>Close recirc valve for Boric Acid Pump started:</b> <ul style="list-style-type: none"> <li>o <b>Boric Acid Makeup Pump Recirc Valve A, BAM-126A</b></li> </ul> </li> </ul> </li> <li>• <b><u>OR</u></b></li> <li>o <b>Boric Acid Makeup Pump Recirc Valve B, BAM-126B.</b></li> </ul> </li> </ul> </li> <li>o <b><u>OR</u></b></li> <li>▪ <b>Initiate Emergency Boration using Gravity Feed as follows:</b> <ul style="list-style-type: none"> <li>• <b>Open Boric Acid Makeup Gravity Feed Valve A, BAM-113A</b></li> </ul> </li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
		<p style="text-align: center;"><b>And</b></p> <ul style="list-style-type: none"> <li>• <b>Open Boric Acid Makeup Gravity Feed Valve B, BAM-113B.</b></li> <li>○ <b>Close VCT Disch Valve, CVC-183.</b></li> <li>○ <b>Verify at least <u>one</u> Charging Pump operating <u>and</u> Charging Header flow <math>\geq</math> 40 GPM.</b></li> </ul> <p><b>Note: Critical Task</b></p>
	SNPO/CRS	<p>Verify Maintenance Of Vital Auxiliaries by:</p> <ul style="list-style-type: none"> <li>▪ Checking the main turbine tripped by verifying all valves indicate green at Turbine Mimic on CP-1</li> <li>▪ Check the generator tripped by verifying green indication on both Generator Output Breakers and Exciter Field Breaker on CP-1</li> <li>▪ Check train A and B station loads are energized from offsite power by: <ul style="list-style-type: none"> <li>▪ Voltage available to A1, A2, A3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1</li> <li>▪ Voltage available to B1, B2, B3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1</li> <li>▪ A and B DC bus indicators on CP-1 read &gt; 105 volts</li> <li>▪ Vital AC Instrument Bus Indicators on CP-7 read ~ 120 volts</li> </ul> </li> </ul>
	PNPO/CRS	<p>Verify RCS Inventory Control by:</p> <ul style="list-style-type: none"> <li>▪ Checking PZR level 7% to 60% and trending to 33% to 60% on CP-2</li> <li>▪ Checks Subcooling Margin greater than or equal to 28 deg. on CP-2</li> </ul>
	PNPO/CRS	<p>Verify RCS Pressure Control by:</p> <ul style="list-style-type: none"> <li>▪ Checks PZR pressure between 1750 psia and 2300 psia (CP-2, CP-7, PMC or QSPDS) and trending to between 2025 and 2275 psia</li> </ul>
	PNPO/CRS	<p>Verify Core Heat Removal by:</p> <ul style="list-style-type: none"> <li>▪ Checking at least one RCP operating on CP-2,</li> <li>▪ Operating loop delta-T less than 13 deg. F (CP-2, CP-7, QSPDS) and</li> <li>▪ RCS Subcooling (CP-2) greater than or equal to 28 deg. F.</li> </ul>

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	SNPO/CRS	<p>Check RCS Heat Removal by:</p> <ul style="list-style-type: none"> <li>▪ Checking at least one S/G is both 15-80% NR (CP-1 or CP-8) and Main Feedwater is available to restore level or</li> <li>▪ Verify EFW is available to restore level in at least one S/G. <ul style="list-style-type: none"> <li>○ EFAS-1 or EFAS-2 actuation occurred if &lt; 27.4% NR (PPS ROM lights extinguished CP-7)</li> <li>○ EFW pumps operating (CP-8) if EFAS-1 or 2 actuated</li> </ul> </li> </ul>
	PNPO/CRS	Check RCS Tc (CP-2 or CP-7) is 535-555 deg. F
	SNPO/CRS	Check S/G pressure 925-1050 psia (CP-1 or CP-7)
	SNPO/CRS	<p>Check FWCS in Reactor Trip Override (CP-1) by</p> <ul style="list-style-type: none"> <li>▪ Checking Main Feed Reg Valves are closed,</li> <li>▪ Startup Feed Reg Valves are 13-21% open, and</li> <li>▪ Operating Feed Pumps are 3800 to 4000 rpm</li> </ul>
	SNPO/CRS	<p>Reset Moisture Separator Reheaters and</p> <ul style="list-style-type: none"> <li>▪ Check the Temp Control Valves closed (Reheat Control Panel CP-1)</li> </ul>
	PNPO/CRS	<p>Verify Containment Isolation by</p> <ul style="list-style-type: none"> <li>▪ Checking Containment pressure (CP-7 or CP-8) &lt; 16.4 psia,</li> <li>▪ Check that no Containment. Area rad monitors are in alarm or show an unexplained rise in activity, and</li> <li>▪ Check that no steam plant rad monitors alarm or show an unexplained rise in activity.</li> </ul>
	SNPO/PNPO/CRS	<p>Verify Containment Temperature And Pressure Control And Containment Combustible Gas Control by</p> <ul style="list-style-type: none"> <li>▪ Verifying Containment Temperature (CP-18 or QSPDS) less than or equal to 120 deg. F</li> <li>▪ Verify Containment pressure is &lt; 16.4 psia (CP-7 or CP-8)</li> </ul>
	CRS	<p>Determines whether all Safety Function Acceptance Criteria were met and no contingencies were taken:</p> <ul style="list-style-type: none"> <li>▪ If answer is Yes CRS goes to OP-902-001, Reactor Trip Recovery</li> <li>▪ If answer is NO then CRS performs diagnostics flowchart OP-902-009, Appendix 1</li> </ul>
	Termination	Crew diagnoses a Reactor Trip Event and transitions to OP-902-001

## Event Number 6 – Unisolable MSLB Outside Containment S/G 1/Failure of S/G 1 Low Pressure Trips

### Event Description:

After emergency boration is in progress and the crew has transitioned to OP-902-001, an unisolable Main Steam Line Break occurs on S/G 1 outside containment. SG 1 Pressure Lo bistables fail to actuate. The scenario may be terminated after the crew takes action to secure feeding SG 1 with EFW and take action to stabilize RCS temperature and pressure.

### Event Objectives:

- 1 Verify the existence/location of an excess steam demand.
- 2 Ensure the reactor is maintained in a shutdown condition.
- 3 Ensure the conditions for pressurized thermal shock are minimized.
- 4 Mitigate the consequences of an excess steam demand by properly utilizing OP-902-004, Excess Steam Demand Recovery Procedure.

### Event Critical Tasks

- |   |                                   |  |
|---|-----------------------------------|--|
| 1 | Establish Reactivity Control      | The task is identified by at least one member of the crew. The SNPO manually isolates EFW flow to SG 1 by placing both EFW flow controllers in manual on CP-8 prior to RCS Temperature lowering to 400 degrees F.                                      |
| 2 | Establish RCS Temperature Control | The task is identified by at least one member of the crew. The SNPO takes action to stabilize RCS temperature within the limits of the PT curve following blowdown of the affected SG.   |
| 3 | Establish RCS Pressure Control    | The task is identified by at least one member of the crew. The PNPO takes action to stabilize RCS pressure within the limits of the PT curve following blowdown of the affected SG. The pressure differential across the SG tubes will be < 1600 psid. |

### Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	CRS	Confirm diagnosis <ul style="list-style-type: none"> <li>▪ CRS directs STA to perform safety function status check list</li> <li>▪ CRS notifies Chemistry to sample both S/Gs for activity</li> </ul>
	CREW	Announce the event using plant page
	CRS	Directs SM to Refer to Emergency Plan
	CRS	Implements Placekeeper and records time of Reactor Trip

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	PNPO/CRS	If PZR pressure < 1684 psia verify SIAS initiated, <ul style="list-style-type: none"> <li>▪ SIAS lights off on PPS ROM on CP-7</li> <li>▪ SIAS Initiation Alarms on CP-2</li> </ul>
	PNPO/SNPO/CRS	If SIAS initiated, <ul style="list-style-type: none"> <li>▪ LPSI and HPSI pumps started,</li> <li>▪ Injection flow is acceptable per OP-902-009, Appendix 2</li> <li>▪ available charging pumps (1) are running</li> </ul>
	PNPO/SNPO/CRS	Verify MSIS actuation <ul style="list-style-type: none"> <li>▪ MSIS lights off on PPS ROM on CP-7</li> <li>▪ MSIS Initiation Alarms on CP-2</li> <li>▪ Both Main Steam Isolation Valves indicate closed on CP-8</li> <li>▪ Both Main Feed Isolation Valves indicate closed on CP-8</li> </ul>
	PNPO/CRS	If PZR press < 1621 psia and SIAS is actuated verify no more than 2 RCPs (CP-2) operating. If PZR PRESS does not meet Appendix 2A secure all RCPs.
	PNPO/SNPO/CRS	Verify RCP operating limits <ul style="list-style-type: none"> <li>▪ Verify CCW available to RCPs (CP-2/CP-8) or secure affected RCPs if not restored within 3 minutes.</li> <li>▪ if Tc &gt;500 deg. F, verify no more than 2 RCPs operating.</li> </ul>
	SNPO/CRS	Verify proper CCW operation <ul style="list-style-type: none"> <li>▪ Verify a CCW Pump (CP-8) is running for Train A and B</li> </ul>
	PNPO/SNPO/CRS	Determine most affected SG <ul style="list-style-type: none"> <li>▪ Determines SG 1 is most affected SG <ul style="list-style-type: none"> <li>▪ SG with lowest pressure (CP-8)</li> <li>▪ SG with Lowering or 0% WR level (CP-8)</li> <li>▪ SG with lowest RCS temperatures (CP-2/CP-7)</li> </ul> </li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	SNPO/CRS	Isolate SG 1: <ul style="list-style-type: none"> <li>▪ Verify MSIV 1 Closed on CP-8</li> <li>▪ Verify MFIV 1 Closed on CP-8</li> <li>▪ Verify ADV 1 is Closed by taking controller on CP-8 to MANUAL and verifying 0% output</li> <li>▪ Verify EFW-228A SG 1 Primary isolation valve closed on CP-8</li> <li>▪ Verify EFW-229A SG 1 Backup isolation valve closed on CP-8</li> <li>▪ <b>Places SG 1 EFW Primary and Backup flow controllers in MANUAL and verify 0% output on CP-8</b></li> <li>▪ Close MS-401A on CP-8</li> <li>▪ Verify MS-120A and MS-119A Main Steam Line 1 Drains are closed on CP-8</li> <li>▪ Verify SG 1 Blowdown Isolation Valves BD-102A and BD-103A are closed on CP-8</li> <li>▪ Notifies NAO to verify locally safeties not lifting on SG 1</li> </ul> <b>NOTE: Critical Task</b>
	PNPO/SNPO/CRS	Verify correct SG isolated <ul style="list-style-type: none"> <li>▪ Isolated SG with lowest pressure (CP-8)</li> <li>▪ Isolated SG with Lowering or 0% WR level (CP-8)</li> <li>▪ Isolated SG with lowest RCS temperatures (CP-2/CP-7)</li> </ul>
	PNPO/SNPO/CRS	Stabilize RCS temperature and pressure using SG 2 when RCS Pressure (CP-2/CP-7/QSPDS/PMC) starts to rise or CET Temperatures (CP-7/QSPDS/PMC) start to rise <ul style="list-style-type: none"> <li>▪ <b>SNPO depresses MANUAL pushbutton on ADV 2 controller on CP-8 and raises output to 100%</b></li> <li>▪ <b>SNPO manually initiates EFAS 2 by all EFAS 2 actuation switches on CP-7 and CP-8 to ACTUATE</b></li> <li>▪ <b>SNPO depresses MANUAL pushbutton on Primary or Backup EFW Flow Controller for SG 2 on CP-8 and raise output to initiate EFW Flow to SG-2</b></li> <li>▪ <b>PNPO uses Normal (CP-2) and/or Auxiliary Spray (CP-4) to stabilize RCS pressure (CP-2/CP-7/QSPDS/PMC) between 1500 and 1600 psia</b></li> <li>▪ SNPO throttles or stops HPSI flow if throttle criteria of Appendix 13 are met and CRS concurs</li> </ul> <b>NOTE: These Steps are Critical</b>
	TERMINATION	The scenario may be terminated when actions to stabilize RCS temperature and pressure have been addressed.

Facility: Waterford III		Scenario No.: 2	Op-Test No.: 1
Examiners: _____		Operators: _____	
_____		_____	
_____		_____	
Initial Conditions: IC-27, 65%, EOC			
Turnover: RCP 2B Lower Seal failed two days ago (RC08D). Charging pump AB has been OOS for 24 hours to replace a cracked pump block. CS Pump A has been OOS for 74 hours to replace the pump impeller.			
Event No.	Malf. No.	Event Type*	Event Description
1	NI01E	I-BOP/SRO	After the crew takes the shift, ENI Channel A Middle Detector fails low, energizing Startup (SU) Channel 2. The crew should de-energize SU Channel 2. The crew should evaluate TS 3.3.1 and bypass affected trip bistables.
2	CC12E2	I-BOP/SRO	After the crew bypasses the trip bistables, a Component Cooling Water Surge Tank Level switch fails which causes realignment of the CC system. The crew should enter OP-901-510, CCW Malfunction, Attachment 1 and evaluate TS 3.7.3, cascading Tech Specs and OP-100-014.
3	RC09D	C-BOP/RO/SRO	After the crew evaluates Tech Specs, RCP 2B middle seal fails, as a result of the CC malfunction. The crew should implement OP-901-130, RCP Malfunction, Subsection E0 and E1.
4	N/A	R-RO N-BOP/SRO	The RCP seal failure requires the crew to perform a plant shutdown in accordance with OP-010-005.
5	RX14A	I-RO/SRO	After the crew satisfies the reactivity manipulation, the in-service PZR pressure control channel fails high. The crew should implement OP-901-120, PZR Pressure Control Malfunction, Subsection E0 and E1.
6	RC14B1	C-All	After transferring to the non-faulted PPCS Channel. PZR Spray Valve B fails partially open requiring implementation of OP-901-120, Subsection E3. This requires a manual reactor trip and securing at least RCP 1B. Tripping the reactor requires implementation of OP-902-000, Standard Post Trip Actions. The crew should diagnose to OP-902-001, Reactor Trip Recovery.
7	SI01B RC23D	M-ALL	After the crew commences implementation of OP-902-001, a Small Break LOCA occurs due to RCP 2B seal failure. The crew should transition to OP-902-002. HPSI pump B trips on overcurrent.
	EG08A		After the crew starts to implement OP-902-002 a fault on A2 bus causes a loss of power to the Train A safety busses. EDG A fails to

**Simulator Scenario**  
**Waterford 3 Nuclear Plant**  
**Simulator Scenario Number: E-NRC03-2**

**Author:** evines  
**Scenario Status:** APPROVED  
**Approval:** rfletch  
**Revision Number:** 1 6/13/2003  
**Estimated Time:** 60 Minutes  
**References Verified:** 6/13/2003  
**Initial Conditions:** 58%, EOC (IC-96)  
**Applications:** Initial Exam

**Scenario Description:**

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The plant is at 58% Reactor power. RCP 2B lower seal failed 48 hours ago and the required steps of OP-901-130 have been taken. Charging Pump A/B is OOS for pump block replacement. CS Pump A is OOS for pump impeller replacement. After the crew takes the shift, ENI Channel A Middle Detector fails low energizing Startup Channel 2 requiring the crew to de-energize SU channel 2. The crew should enter TS 3.3.1 and bypass affected trip bistables. After the crew bypasses trip bistables a Component Cooling Water Surge Tank Level Switch fails. The crew should enter OP-901-510 CCW Malfunction and refer to Attachment 1. The crew should enter TS 3.7.4, and Cascading Tech Specs per OP-100-014. After the crew evaluates Tech Specs RCP 2B middle seal fails. The crew should implement OP-901-130, RCP Malfunction, Subsection E1 and commence a plant shutdown in accordance with OP-010-005, Plant Shutdown. After the crew satisfies the Reactivity Manipulation, the middle seal fails completely requiring a manual Reactor trip. The crew should perform OP-902-000, Standard Post Trip Actions and diagnose to OP-902-001, Reactor Trip Recovery. After OP-902-001, Reactor Trip Recovery is entered, the in-service PZR pressure control channel fails high and Spray Valve B fails open. The crew should refer to OP-901-120, Pressurizer Pressure Control Malfunction and implement Subsections E0, E1 and E3. After the crew secures RCP 1B at which point the Spray Valve will reclose. After the crew addresses the failed Spray Valve a small break LOCA occurs due to the RCP 2B seal failure. The crew should transition to OP-902-002, Loss of Coolant Accident Recovery. HPSI pump B will trip on overcurrent when SIAS actuates. After the crew enters OP-902-002, a fault on A2 Bus occurs, causing a loss of power to Train A safety Busses. EDG A fails to auto start requiring the crew to manually start EDG A. The scenario may be terminated after the crew takes action to commence an RCS cooldown.

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**Scenario Notes:**

1. Reset Simulator to IC-96.
2. Verify Scenario Malfunctions, Remotes, and Overrides are loaded
  - a. Remotes and Overrides are as follows:
    1. CS Pump A Bkr - Rackout
    2. Charging Pump A/B Breaker - Rackout
    3. Shutdown HX A Outlet Valve - Closed
  - b. Malfunctions
    1. RC08D, RCP 2B LOWER SEAL FAILURE - LOAD - 25%
    2. SI01B, HPSI PUMP B TRIPPED - LOAD - TRUE
    3. EG08A, FAILURE OF DG A TO AUTOSTART - LOAD - TRUE
    4. Malfunctions per Scenario Time Line
3. Danger Tag and place to OFF:
  - a. CS Pump A C/S on CP-8
  - b. Chg Pump A/B C/S on CP-4
4. Ensure Protected Train B sign is placed in SM office window.
5. Ensure CW pumps B and D are running.
6. Place B/U Charging Pump Selector Switch in AB
7. Ensure CCW temperature is lowered to 80-85 degrees F.

8. Complete the simulator setup checklist.

### **Procedures Used**

OP-010-005  
OP-100-014  
OP-901-120  
OP-901-130  
OP-901-510  
OP-902-000  
OP-902-001  
OP-902-002  
OP-903-013  
OP-903-066

#### **EVENT 1- ENI Safety Channel A Middle Detector Failure**

1. On Lead Examiner's cue initiate Event Trigger 1.
2. If WWM called inform the caller work package will be assembled and team sent to Control Room.

#### **EVENT 2- CCW Surge Tank Level Switch CC-ILS-7013A failure**

1. On Lead Examiner's cue initiate Event Trigger 2.
2. If called as RAB to investigate for leaks wait 3 minutes and inform no evidence of leakage.
3. If WWM called inform the caller work package will be assembled and team sent to Control Room.

#### **EVENT 3- RCP 2B Middle Seal Degradation/Plant Shutdown**

1. On Lead Examiner's cue initiate Event Trigger 3.
2. If WWM called inform the caller work package will be assembled and team sent to Control Room.

#### **EVENT 4- Manual Reactor Trip Due to RCP 2B Middle Seal Total Failure**

1. When cued by Lead Examiner that Reactivity Manipulation completed, modify RC09D to 100 percent to require crew to initiate manual trip due to controlled bleedoff temperature exceeding trigger point in procedure.
2. If WWM called inform the caller work package will be assembled and team sent to Control Room.

#### **EVENT 5- Pressurizer Pressure Control Channel X Fails High/Pressurizer Spray Valve RC-301B Fails Open**

1. On Lead Examiner's cue initiate Event Trigger 4.
2. On Lead Examiner's cue or after RCP tripped delete RC14B1 to close Spray valve.
3. If WWM called inform the caller work package will be assembled and team sent to Control Room.

#### **EVENT 6- Small Break LOCA**

1. On Lead Examiner's cue initiate Event Trigger 5.
2. If WWM called inform the caller work package will be assembled and team sent to Control Room.

#### **EVENT 7- Loss of 4.16 KV Bus A/Emergency Diesel Generator A Fails to Auto Start**

1. On Lead Examiner's cue initiate Event Trigger 6.
2. If WWM called inform the caller work package will be assembled and team sent to Control Room.

**Scenario Timeline:**

Item	Malfunction	Time	Severity	Ramp	TUA	TRA	Trigger	Event
1	NI01E	1 min	0%				1	T331
	SAFETY CHANNEL ENI DETECTOR FAILS							
2	CC12E2	10 min	TRUE				2	A510
	CCW SURGE TANK LEVEL SWITCH FAILS							
3	RC09D	20 min	25%	00:01:00			3	A130,e1a
	RCP MIDDLE SEAL FAILURE (0-100%)							
4								N10005c
	PLANT SHUTDOWN							
5	RC09D	NOTE	100%					E000
	RCP MIDDLE SEAL FAILURE (0-100%)							
6	RX14A	30 min	100%				4	A120,e1
	PRESSURIZER PRESSURE CONTROL INSTRUMENT FAILURE HIGH							
7	RC14B1	30 min	TRUE				4	A120,e3
	PZR SPRAY VALVE FAILS OPEN/CLOSED							
8	RC23D	45 min	.5%	00:05:00			5	E002
	RCS COLD LEG RUPTURE (DBL-END 30" BREAK @100%)							
9	ED05A	50 min	TRUE				6	
	LOSS OF 4.16 KV BUS							

Manip #	Manipulation Description
14	Loss of CC Trains or CC to an Individual Component
2	Plant Shutdown
24	Malfunction of RCS Pressure or Level control (includes loss of letdown/charging)
25	Reactor Trip
27	Nuclear Instrumentation Malfunction
7B	LOCA, Inside Containment

**OP Test 1, Scenario 2, Event 1 - ENI Safety Channel A Middle Detector Failure**

**Event Description:**

After the crew takes the shift, ENI Channel A Middle Detector fails low energizing Startup Channel 2 requiring the crew to de-energize SU Channel 2. The crew should enter TS 3.3.1 and bypass affected trip bistables.

**Event Objectives:**

1. Recognize failed instrument and verify RPS/CPC bistable functions as expected.
2. Bypass affected bistable channel.

**Event Critical Tasks:**

- 1 None

**Event Action Steps:**

Time:	Position:	Applicant's Actions or Behavior:
	PNPO	Recognize and report indications of failed channel <ul style="list-style-type: none"> <li>- ENI Channel A Log Channel indicator failed low on CP-7</li> <li>- ENI Channel A Linear Power Recorder on CP-7 reads low on CP-7</li> <li>- CPC PIDs 011 and 171 read low on CPC Channel A on CP-7</li> <li>- Startup Channel 2 is energized and indication on CP-2 and CP-4 are reading high</li> <li>- Alarms associated with CPCs, Startup Channel 2 and PPS on CP-2</li> </ul>
	PNPO/CRS	Verify RPS/CPC bistables respond as expected <ul style="list-style-type: none"> <li>- Reports trips/pretrips associated with bistables for Low DNBR and High LPD if present</li> </ul>
	CRS	Review and/or implement actions required by Technical Specification section 3.3.1 (RPS), 3.3.3.5 (Remote Shutdown), and 3.3.3.6 (Accident Monitoring) <ul style="list-style-type: none"> <li>- Enters TS 3.3.1 Action 2</li> <li>- Determines that following trip bistables in PPS Channel must be bypassed within 1 hour of time of failure:                             <ul style="list-style-type: none"> <li>o Linear Power Hi,</li> <li>o DNBR Lo,</li> <li>o LPD Hi</li> <li>o The CRS may decide to bypass PPS Channel A Log Pwr Hi to ensure that on plant shutdown it is not missed, but it is not required in Mode 1</li> </ul> </li> <li>- CRS reviews OP-903-013 and TS 3.3.3.5 and determines that minimum requirements are met</li> <li>- CRS reviews OP-903-013 and TS 3.3.3.6 and determines that minimum requirements are met</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	CRS	Directs SNPO to bypass the following PPS Channel A trip bistables within 1 hour of failure: <ul style="list-style-type: none"> <li>- Linear Power Hi,</li> <li>- DNBR Lo,</li> <li>- LPD Hi</li> <li>- The CRS may decide to bypass PPS Channel A Log Pwr Hi to ensure that on plant shutdown it is not missed, but it is not required in Mode 1</li> </ul>
	SNPO	Bypasses affected bistable in PPS Channel A as follows: <ul style="list-style-type: none"> <li>- Obtains Key 220 from Key locker on side of SNPO Desk</li> <li>- Unlocks and opens front access door at CP-10 Channel A</li> <li>- Unlocks and opens the Bistable Control Panel door in PPS Channel A</li> <li>- Depresses the bistable bypass pushbuttons for the following trip bistables in PPS Channel A and verifies associated bypass lights illuminate on CP-10:               <ul style="list-style-type: none"> <li>o Linear Power Hi,</li> <li>o DNBR Lo,</li> <li>o LPD Hi</li> <li>o The SNPO bypass PPS Channel A Log Pwr Hi per CRS instructions, but it is not required in Mode 1</li> </ul> </li> </ul>
	Termination	BYPASS lights illuminated on BCP and ROM for the desired bistable channels

**OP Test 1, Scenario 2, Event 2 - CCW Surge Tank Level Switch CC-ILS-7013A failure**

**Event Description:**

After the crew bypasses trip bistables a Component Cooling Water Surge Tank Level Switch fails. The crew should enter OP-901-510 CCW Malfunction and refer to Attachment 1. The crew should enter TS 3.7.4, and Cascading Tech Specs per OP-100-014.

**Event Objectives:**

1. Identify failed level switch and determine the effects on CCW components.
2. Determine operability of the system.

**Event Critical Tasks:**

- 1 None

**Event Action Steps:**

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	SNPO	Reports annunciators and indications to CRS: <ul style="list-style-type: none"> <li>- CCW Surge Tank level on CP-8 is stable</li> <li>- CCW Makeup Pump A running on CP-8</li> <li>- CCW Make Pump A Running/Power Lost annunciator on CP-8</li> <li>- CCW Surge Tank Makeup Valves are closed on CP-8</li> <li>- CCW A and B Safety Headers Cross-Connect Valves are closed on CP-8</li> <li>- A to AB Header Isolation Valves are closed on CP-8</li> <li>- Dry Cooling Tower A is bypassed and isolated on CP-33</li> <li>- Dry Tower A Isolated annunciator on CP-33</li> <li>- CCW Surge Tank A Level Lost annunciator on CP-18</li> </ul>
	SNPO/PNPO	Reviews annunciator response procedures and determines that OP-901-510, Component Cooling Water System Malfunction should be entered.
	CRS	Enters OP-901-510, Component Cooling Water System Malfunction <ul style="list-style-type: none"> <li>- Determines need to refer to Attachment 1: CCW Surge Tank Level Switch Failures</li> </ul>
	CRS/SNPO	Determine correct level switch failure and effects of failure on the CCW system components <ul style="list-style-type: none"> <li>- Compares indications received at onset of event with Attachment 1 indications and determines that CC-ILS-7013A is the failed level switch</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	CRS	Determine system operability requirements: <ul style="list-style-type: none"> <li>- Reviews and enters TS 3.7.4 (may enter 3.7.3)</li> <li>- Reviews OP-100-014, Technical Specification and Technical Requirements Compliance and enters cascading Tech Specs (appropriate Tech Specs are listed in Attachment 6.6 of OP-100-014)</li> <li>- Determines need to perform OP-903-066, Electrical Breaker Alignment Check within one hour of failure and every 8 hours thereafter</li> <li>- Determines need to verify required Train B components and EFW Pump AB operable w/in 2 hours per TS 3.8.1.1.d.</li> </ul>
	SNPO	Performs OP-903-066, Electrical Breaker Alignment Check within one hour of failure
	Termination	Event may be terminated after CRS determines operability requirements or at Lead Examiners discretion.

## OP Test 1, Scenario 2, Event 3 - RCP 2B Middle Seal Degradation/Plant Shutdown

### Event Description:

After the crew evaluates CCW Tech Specs, RCP 2B middle seal fails. The crew should implement OP-901-130, RCP Malfunction, Subsection E1 and commence a plant shutdown in accordance with OP-010-005, Plant Shutdown

### Event Objectives:

1. Monitor parameters for Reactor Coolant Pumps and take appropriate action when limits are approached.
2. Determine which Reactor Coolant Pump seal(s) have failed and take appropriate actions in accordance with OP-901-130, Reactor Coolant Pump Malfunction.
3. Reduce Reactor power and/or remove the unit from service by operating, securing, or realigning plant equipment as directed by precautions, limitations, and procedural guidance of OP-010-005, Plant Shutdown.

### Event Critical Tasks:

- 1 None

### Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	PNPO	Identifies second Seal Failure using Plant Computer alarms for Bleedoff flow and Seal pressures and/or CP-2 Seal pressure gauges.  <b>SNPO may lower ACCW temp Setpoint to lower CCW temp and Controlled Bleedoff temp.</b>
	CRS	Determines need to perform a Controlled Shutdown in accordance with OP-010-005
	PNPO	Maintain Tcold 541-558°F during downpower estimate boron addition using Thumbrule or OP-002-005 (~1200 gals) borate to reduce power at rate specified by CRS  - Performs Direct Boration lineup in accordance with OP-002-005
	PNPO/CRS	Maintains ASI using group 5, 6 or Group P control rods  - CRS provides direction on ASI Control - Preferred groups and CEA insertion limits per TS 3.1.3.6  - PNPO uses CEAs in Manual Group in accordance with CRS direction and OP-004-004, Control Element Drive
	SNPO	Reduces Generator load as required once Tave starts to drop to match reference temperature and Tave  - SNPO lowers load reference and sets load rate per CRS or PNPO instructions and depresses GO pushbutton on DEH Control Panel on CP-1
	CRS	Direct Turbine Building Operator to monitor Condenser Polisher Differential Pressure and remove Polishers as necessary to maintain system pressure

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	SNPO/PNPO	When < 50% power and B24006, UFM overall quality (QLEFM) indicates BAD remove UFM alarms from the COLSS master annunciator
	SNPO	When power is 40%, remove one of the three Condensate Pumps from service in accordance with OP-003-003, Condensate <ul style="list-style-type: none"> <li>- Directs Turbine Building Operator to close selected CD Pump Discharge Valve locally</li> <li>- Momentarily places selected CD Pump C/S on CP-1 to STOP</li> </ul>
	<b>Lead Examiner</b>	<b>Note: When Reactivity Manipulation is satisfied modify RCP 2B Middle Seal Failure to 100%</b>
	CRS/PNPO	If during the Shutdown Control Bleedoff temperature reaches 200 degrees F, perform the following: <ul style="list-style-type: none"> <li>▪ Trip the Reactor</li> <li>▪ Secure Reactor coolant pump 2B</li> <li>▪ Go to OP-902-000, Standard Post Trip Actions</li> </ul>
	Termination	Terminate after Reactor is tripped and RCP 2B is secured.

## OP Test 1, Scenario 2, Event 4 - Manual Reactor Trip Due to RCP 2B Middle Seal Total Failure

### Event Description:

After the crew satisfies the Reactivity Manipulation, the middle seal fails completely requiring a manual Reactor trip. The crew should perform OP-902-000, Standard Post Trip Actions and diagnose to OP-902-001, Reactor Trip Recovery.

### Event Objectives

1. Carry out all operator actions, including necessary contingency actions in accordance with OP-902-000, Standard Post Trip Actions, in the event of a Reactor trip.
2. Properly diagnose event in progress and transition to appropriate EOP recovery procedure.

### Event Critical Tasks:

- 1 None

### Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/CRS	Verify Reactivity Control. <ul style="list-style-type: none"> <li>- Check Reactor power dropping (CP-2 or CP-7)</li> <li>- Check startup rate is negative (CP-2 or CP-7).</li> <li>- Check less than 2 CEAs not fully inserted (CP-2)</li> </ul>
	SNPO/CRS	Verify Maintenance Of Vital Auxiliaries by: <ul style="list-style-type: none"> <li>▪ Checking the main turbine tripped by verifying all valves indicate green at Turbine Mimic on CP-1</li> <li>▪ Check the generator tripped by verifying green indication on both Generator Output Breakers and Exciter Field Breaker on CP-1</li> <li>▪ Check train A and B station loads are energized from offsite power by:               <ul style="list-style-type: none"> <li>▪ Voltage available to A1, A2, A3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1</li> <li>▪ Voltage available to B1, B2, B3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1</li> <li>▪ A and B DC bus indicators on CP-1 read &gt; 105 volts</li> <li>▪ Vital AC Instrument Bus Indicators on CP-7 read ~ 120 volts</li> </ul> </li> </ul>
	PNPO/CRS	Verify RCS Inventory Control by: <ul style="list-style-type: none"> <li>▪ Checking PZR level 7% to 60% and trending to 33% to 60% on CP-2</li> <li>▪ Checks Subcooling Margin greater than or equal to 28 deg. on CP-2</li> </ul>
	PNPO/CRS	Verify RCS Pressure Control by: <ul style="list-style-type: none"> <li>▪ Checks PZR pressure between 1750 psia and 2300 psia (CP-2, CP-7, PMC or QSPDS) and trending to between 2025 and 2275 psia</li> </ul>

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	PNPO/CRS	Verify Core Heat Removal by: <ul style="list-style-type: none"> <li>▪ Checking at least one RCP operating on CP-2,</li> <li>▪ Operating loop delta-T less than 13 deg. F (CP-2, CP-7, QSPDS) and</li> <li>▪ RCS Subcooling (CP-2) greater than or equal to 28 deg. F.</li> </ul>
	SNPO/CRS	Check RCS Heat Removal by: <ul style="list-style-type: none"> <li>▪ Checking at least one S/G is both 15-80% NR (CP-1 or CP-8) and Main Feedwater is available to restore level or</li> <li>▪ Verify EFW is available to restore level in at least one S/G. <ul style="list-style-type: none"> <li>○ EFAS-1 or EFAS-2 actuation occurred if &lt; 27.4% NR (PPS ROM lights extinguished CP-7)</li> <li>○ EFW pumps operating (CP-8) if EFAS-1 or 2 actuated</li> </ul> </li> </ul>
	PNPO/CRS	Check RCS Tc (CP-2 or CP-7) is 535-555 deg. F
	SNPO/CRS	Check S/G pressure 925-1050 psia (CP-1 or CP-7)
	SNPO/CRS	Check FWCS in Reactor Trip Override (CP-1) by <ul style="list-style-type: none"> <li>▪ Checking Main Feed Reg Valves are closed,</li> <li>▪ Startup Feed Reg Valves are 13-21% open, and</li> <li>▪ Operating Feed Pumps are 3800 to 4000 rpm</li> </ul>
	SNPO/CRS	Reset Moisture Separator Reheaters and <ul style="list-style-type: none"> <li>▪ Check the Temp Control Valves closed (Reheat Control Panel CP-1)</li> </ul>
	PNPO/CRS	Verify Containment Isolation by <ul style="list-style-type: none"> <li>▪ Checking Containment pressure (CP-7 or CP-8) &lt; 16.4 psia,</li> <li>▪ Check that no Containment. Area rad monitors are in alarm or show an unexplained rise in activity, and</li> <li>▪ Check that no steam plant rad monitors alarm or show an unexplained rise in activity.</li> </ul>
	SNPO/PNPO/CRS	Verify Containment Temperature And Pressure Control And Containment Combustible Gas Control by <ul style="list-style-type: none"> <li>▪ Verifying Containment Temperature (CP-18 or QSPDS) less than or equal to 120 deg. F</li> <li>▪ Verify Containment pressure is &lt; 16.4 psia (CP-7 or CP-8)</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	CRS	Determines whether all Safety Function Acceptance Criteria were met and no contingencies were taken: <ul style="list-style-type: none"> <li>▪ If answer is Yes CRS goes to OP-902-001, Reactor Trip Recovery</li> <li>▪ If answer is NO then CRS performs diagnostics flowchart OP-902-009, Appendix 1</li> </ul>
	Termination	Crew diagnoses a Reactor Trip Event and transitions to OP-902-001

**OP Test 1, Scenario 2, Event 5 - Pressurizer Pressure Control Channel X Fails High/Pressurizer Spray Valve RC-301B Fails Open**

**Event Description:**

After OP-902-001, Reactor Trip Recovery is entered, the in-service PZR pressure control channel fails high and Spray Valve B fails open. The crew should refer to OP-901-120, Pressurizer Pressure Control Malfunction and implement Subsections E0, E1 and E3 or perform actions per Standard Post Trip Actions. After the crew secures RCP 1B the Spray Valve will re-close.

**Event Objectives:**

1. Stabilize pressurizer pressure on alternate control channel according to off-normal operator procedure OP-901-120, Pressurizer Pressure Control Malfunction.
2. Perform actions of OP-901-120, section E3 as necessary for a spray valve failed open.
3. Realign pressurizer spray components for failed closed spray valve(s).

**Event Critical Tasks:**

- |   |                                |   |
|---|--------------------------------|---|
| 1 | Establish RCS Pressure Control | The task is identified by at least one member of the crew. The PNPO takes action to secure Reactor Coolant Pump for affected Pressurizer Spray valve prior to subcooled margin dropping below 28 degrees F. |
|---|--------------------------------|---|

**Event Action Steps:**

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/CRS	Verifies Pressurizer Pressure Instrument failure by checking X/Y recorder (CP-2)  - Determines Channel X is failed high
	PNPO/CRS	Places Pressurizer Spray Controller to MANUAL and adjusts output to 0%
	PNPO/CRS	Transfer Pressurizer Pressure Control Channel Selector C/S Switch to Y on CP-2
	PNPO/CRS	If Pressurizer Pressure Control Channel is failed high, then perform the following:  - Transfer Pressurizer Lo Level Cutout Selector Switch to Y (CP-2)  - Verify all available Backup Heater Banks energize if RCS Pressure < 2200 psia (CP-2)  - Reset Proportional Heater Banks #1 and #2 (CP-2)
	PNPO/CRS	If Spray Valve fails open, Selects Spray Valve A using Spray Valve Selector Switch on CP-2

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/CRS	If Pressurizer Pressure still dropping: <ul style="list-style-type: none"> <li>- Verify Reactor tripped</li> <li>- Stop Reactor Coolant Pump 1B               <ul style="list-style-type: none"> <li>o Start at least 1 Lift Oil Pump for RCP 1B (CP-2)</li> <li>o Momentarily place RCP 1B C/S to OFF (CP-2)</li> </ul> </li> </ul>
	Termination	Initiate Event 6 at this point.

**OP Test 1, Scenario 2, Event Number 6 – Small Break LOCA**

**Event Description:**

After the crew addresses the failed Spray Valve a small break LOCA occurs due to the RCP 2B seal failure. The crew should transition to OP-902-002, Loss of Coolant Accident Recovery. HPSI pump B will trip on overcurrent when SIAS actuates. After the crew enters OP-902-002, a fault on A2 Bus occurs, causing a loss of power to Train A safety Busses. EDG A fails to auto start requiring the crew to manually start EDG A. The scenario may be terminated after the crew takes action to commence an RCS cooldown.

**Event Objectives:**

1. Take appropriate actions to mitigate the consequences of a large break loss of coolant accident in accordance with OP-902-002, Loss of Coolant Accident Recovery Procedure.
2. Monitor RCS/Core conditions and verify all critical safety functions are being addressed.
3. Ensure Reactor coolant pumps are secured as required, and the automatic & manual actions required for recirc actuation take place with two minutes of signal.

**Event Critical Tasks**

- |                 |   |
|-----------------|---|
| 1 Stop All RCPs | The task is identified by at least one member of the crew. The PNPO takes action to stop all RCPs within 3 minutes of a loss of CCW flow or loss of subcooled margin. |
|-----------------|---|

**Event Action Steps:**

Time:	Position:	Applicant's Actions or Behavior:
	STA/CRS	Confirm diagnosis <ul style="list-style-type: none"> <li>▪ CRS directs STA to perform safety function status check list</li> <li>▪ CRS notifies Chemistry to sample both S/Gs for activity</li> </ul>
	CREW	Announce the event using plant page
	CRS	Directs SM to refer to Emergency Plan
	CRS	Implements Placekeeper and records time of Reactor Trip
	PNPO/SNPO/CRS	If PZR pressure < 1684 psia verify SIAS initiated, <ul style="list-style-type: none"> <li>▪ LPSI and HPSI pumps started,</li> <li>▪ Injection flow is acceptable per OP-902-009, Appendix 2</li> <li>▪ available charging pumps (2) are running</li> </ul> OR <ul style="list-style-type: none"> <li>▪ perform any of the following:                             <ul style="list-style-type: none"> <li>▪ Verify power to SI pumps.</li> <li>▪ Verify Cold Leg injection valves open.</li> <li>▪ Start additional SI pumps until flow is acceptable per app. 2.</li> <li>▪ Align HPSI AB to replace A or B</li> </ul> </li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/CRS	<p>If Pzr press &lt; 1621 psia and SIAS is actuated verify no more than 2 RCPs operating.</p> <p><b>If PZR PRESS does not meet Appendix 2A (Curve located on CP-6) secure all RCPs.</b></p> <p><b>NOTE: CRITICAL TASK IF CONDITIONS REACHED BEFORE CSAS INITIATES</b></p>
	PNPO/CRS	<p>Verify RCP operating limits</p> <ul style="list-style-type: none"> <li>▪ Verify CCW available to RCPs (CP-8 and CP-2) or secure affected RCPs if not restored within 3 minutes.</li> <li>▪ <b>Secure all RCPs if CSAS is initiated.</b></li> <li>▪ if Tc &gt; 500 deg. F, verify no more than 2 RCPs operating.</li> </ul> <p><b>NOTE: CRITICAL TASK IF NOT PERFORMED IN PREVIOUS STEP</b></p>
	SNPO/CRS	<p>Verify CCW operation by checking a CCW pump (CP-8) is operating for each energized 4 KV safety bus (CP-1) or</p> <ul style="list-style-type: none"> <li>▪ If AB bus aligned to same side as faulted CCW pump start the AB CCW pump</li> <li>▪ If AB bus aligned to opposite Side from faulted CCW pump start the AB CCW pump after the sequencer has timed out.</li> <li>▪ If CCW flow can not be restored, notify an NAO to pull the overspeed trip device on the affected EDG.</li> </ul>
	PNPO/SNPO/CRS	<p>Isolate the LOCA by:</p> <ul style="list-style-type: none"> <li>▪ Verifying letdown Containment isolations (CP-4) are closed.</li> <li>▪ Verifying RCS sampling isolations (CP-8) are closed.</li> <li>▪ Checking CCW AB rad monitor not in alarm (RMS CRT on CP-6) and no Abnormal rise in reading or stop all RCPs and close CCW Containment isolations.</li> </ul>
	PNPO/SNPO/CRS	<p>Verify LOCA not outside Containment by checking</p> <ul style="list-style-type: none"> <li>▪ RAB rad monitors,</li> <li>▪ sump levels (CP-8 and PMC) , and waste tank levels (PMC).</li> <li>▪ If a leak is indicated, locate and isolate the leak and verify CIAS actuated per Appendix 4D.</li> </ul>
	SNPO/CRS	<p>Place Hydrogen Analyzers A and B in service (CP-33)</p> <ul style="list-style-type: none"> <li>▪ Open Hydrogen Analyzer Containment Isolation Valves</li> <li>▪ Start Hydrogen Analyzer sample Pumps</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/SNPO/CRS	<p>IF Containment Pressure is &gt; 17.1 psia (CP-7 or CP-8) or Containment area rad monitors are in hi alarm (RMS CRT CP-6 or CP-14),</p> <ul style="list-style-type: none"> <li>▪ Verify CIAS is initiated (CP-7 or CP-8)</li> <li>▪ Verify all available CFCs are in the EMERGENCY MODE (CP-18)</li> <li>▪ If any CFC is not operating and Containment pressure is &gt; 17.1 psia notify a NAO to perform OP-902-009, Appendix 22B and close the associated CFC CCW isolation valves.</li> </ul>
	SNPO/PNPO/CRS	<p>If Containment pressure is &gt; 17.7 psia:</p> <ul style="list-style-type: none"> <li>▪ Verify CSAS is initiated (CP-7 or CP-8)</li> <li>▪ Verify all operating CS pumps are delivering &gt; 1750 gpm (CP-8).</li> <li>▪ If any CS pump is not operating and its associated CS-125 valve is open, perform OP-902-009, Appendix 22A and close the associated valve. (not required – CS-111A and 118A tagged closed per initial conditions)</li> </ul>
	SNPO/CRS	<p>IF offsite power has been lost verify MSIVs and Blowdown Containment isolations are closed.</p>
	SNPO/CRS	<p>Restore IA</p> <ul style="list-style-type: none"> <li>▪ If a TCW pump and CW pump are not running notify NAO to align IA compressors to potable water</li> <li>▪ If IA pressure &lt; 95 psig dispatch an operator to start all available air compressors</li> <li>▪ If IA press &gt; 95 psig ensure IA Containment isolation valve ia-909 is open.</li> </ul>
	PNPO/SNPO/CRS	<p>Commence RCS Cooldown to less than 350 degrees F (after cooldown has been started the exam lead may terminate the scenario)</p>

**OP Test 1, Scenario 2, Event Number 7 – Loss of 4.16 KV Bus A/Emergency Diesel Generator A Fails to Auto Start**

**Event Description:**

After the crew enters OP-902-002, a fault on A2 Bus occurs, causing a loss of power to Train A safety Busses. EDG A fails to auto start requiring the crew to manually start EDG A.

**Event Objectives:**

**Event Critical Tasks**

1 Establish RCS Inventory Control

The task is identified by at least one member of the crew. The SNPO starts Emergency Diesel Generator A prior to Reactor Vessel Plenum level dropping below 20%.

**Event Action Steps:**

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	SNPO	Determines 3A bus deenergized by <ul style="list-style-type: none"> <li>- 2A to 3A Tie Bkr open (CP-1)</li> <li>- 3A to 2A Tie Bkr open (CP-1)</li> </ul>
	SNPO	Verifies Emergency Diesel Generator A Auto Starts <ul style="list-style-type: none"> <li>- SNPO determines that Emergency Diesel Generator A did not Start by               <ul style="list-style-type: none"> <li>o Green Light on EDG A Start Switch (CP-1)</li> <li>o Voltage indication for 3A bus (CP-1) pegged lo</li> <li>o EDG A frequency meter (CP-1) pegged lo</li> <li>o EDG A Output Breaker (CP-1) indicates green</li> </ul> </li> </ul>
	SNPO	Manually Starts Emergency Diesel A by momentarily placing EDG A Start Switch (CP-1) to START <ul style="list-style-type: none"> <li>- Verifies EDG A Frequency stabilizes at ~ 60 HZ (CP-1)</li> <li>- Verifies EDG A Output Breaker closes (Red Light CP-1)</li> <li>- Verifies 3A bus Voltage ~ 4100 V (CP-1)</li> <li>- EDG A Sequencer starts (White Lights illuminating for Sequencer CP-1)</li> </ul> <p><b>NOTE: CRITICAL TASK</b></p>
	Termination	Continue in OP-902-002, Loss of Coolant Accident Recovery.

8	ED05A	C-BOP/SRO	auto start. The crew should manually start EDG A.
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\* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: Waterford III		Scenario No.: 3	Op-Test No.: 1
Examiners: _____		Operators: _____	
_____		_____	
_____		_____	
Initial Conditions: IC-20, 100%, MOC			
Turnover: RCP 2B Lower Seal failed two days ago (RC08D). Charging pump AB has been OOS for 24 hours to replace a cracked pump block. CS Pump A has been OOS for 74 hours to replace the pump impeller.			
Event No.	Malf. No.	Event Type*	Event Description
1	SG10B	I-BOP/SRO	After the crew takes the shift, the PPS Channel B S/G 1 narrow range level instrument fails high. The crew should evaluate TS 3.3.1 and 3.3.2 and take required actions to bypass the S/G Level High, S/G Level Low and S/G Delta-P trips for S/G 1 in PPS Channel B within 1 hour.
2	CV02A RC23A	C-RO/SRO	After the crew bypasses the trip bistables in PPS Channel B, an RCS leak in excess of Tech Spec limits occurs. The crew should implement OP-901-111, RCS Leak, and evaluate T.S. 3.4.5.2. The backup charging pump fails to start on lowering level. The crew should evaluate TS 3.1.2.4 and TRM 3.1.2.4.
3	RD02A20	C-BOP/RO/SRO	After the crew addresses the RCS leak, CEA 20 drops into the core. The crew should implement OP-901-102, CEDMCS or CEA Malfunction, Subsection E0 and E1.
4	N/A	R-RO N-BOP/SRO	Within 15 minutes of the dropped CEA the crew must start a power reduction in accordance with OP-901-212, Rapid Plant Power Reduction.
5	RD02A02	C-RO/SRO	After the crew reduces power to less than 70%, or at the lead examiner's discretion, CEA 2 drops which requires a manual reactor trip. The crew should implement OP-902-000, Standard Post Trip Actions.
6	OVR25-28 OVR53-56 RC23A	I-RO M-ALL	While the crew is implementing OP-902-000, a large break LOCA occurs. SIAS/CIAS/MSIS fail to automatically actuate, requiring manual actuation. The crew should complete the Standard Post Trip Actions and diagnose to OP-902-002.

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

# Simulator Scenario

## Waterford 3 Nuclear Plant

### Simulator Scenario Number: E-NRC03-3

**Author:** evines

**Scenario Status:** APPROVED

**Approval:** rfletch

**Revision Number :** 1 6/13/2003

**Estimated Time :** 60 Minutes

**References Verified:** evines

**Initial Conditions:** 100%, MOC (IC-94)

**Applications:** Initial Exam

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#### Scenario Description:

The plant is at 100% reactor power. RCP 2B Lower seal failed 48 hours ago and required steps of OP-901-130 have been taken. Charging Pump A/B is OOS for pump block replacement. CS Pump A is OOS for pump impeller replacement. After the crew takes the shift, PPS channel B S/G 1 narrow range level instrument fails high. The crew should evaluate TS 3.3.1, 3.3.2, 3.3.3.5, and 3.3.3.6 and bypass S/G level high, low, and DP Bistables for S/G 1 in PPS channel B within 1 hour. After the crew bypasses trip Bistables a leak in excess of Tech Spec limits occurs. The crew should implement OP- 901-111, RCS Leak and evaluate T.S. 3.4.5.2. After the crew addresses the leak, CEA 20 drops into the core. The crew should implement OP-901-102 CEDMCS or CEA Malfunction, Subsection E0 and E1 and OP-901-501, PMC or COLSS Inoperable. Within 15 minutes of the dropped CEA, the crew must begin a power reduction to less than 70% IAW OP-901-212, Rapid Plant Power Reduction. After the crew satisfies the reactivity manipulation, or at the Lead Examiner's discretion, CEA 2 drops into the core. Two CEAs misaligned by > 19 inches requires a manual reactor trip. The crew should implement OP-902-000, Standard Post Trip Actions. Charging Pump A fails to auto start on level deviation or SIAS requiring a manual start. While the crew is implementing OP-902-000, a large break LOCA occurs. SIAS/CIAS/MSIS/CSAS fail to automatically actuate requiring manual actuation. The crew should complete Standard Post Trip Actions and diagnose to OP-902-002. The scenario may be terminated after the crew takes action to commence an RCS cooldown.

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#### Scenario Notes:

1. Reset Simulator to IC-94
2. Verify Scenario Malfunctions, Remotes, and Overrides are loaded
  - a. Remotes and Overrides are as follows:
    1. CSR11, CS Pump A Bkr - Rack out
    2. CVR22, Charging Pump A/B Breaker - Rack out
    3. CSR04, Shutdown HX A Outlet Valve – Closed
    4. H\_K08 – CEA Disabled – FAIL\_ON – Event Trigger 3
  - b. Malfunctions
    1. RC08D, RCP 2B LOWER SEAL FAILURE - LOAD - 25%
    2. OVR25, RPS CH A LO PZR PRESS TRIP OVRD - LOAD - TRUE
    3. OVR26, RPS CH B LO PZR PRESS TRIP OVRD - LOAD - TRUE
    4. OVR27, RPS CH C LO PZR PRESS TRIP OVRD - LOAD - TRUE
    5. OVR28, RPS CH D LO PZR PRESS TRIP OVRD - LOAD - TRUE
    6. OVR53, RPS CH A HI CTMT PRESS TRIP OVRD - LOAD - TRUE
    7. OVR54, RPS CH B HI CTMT PRESS TRIP OVRD - LOAD - TRUE
    8. OVR55, RPS CH C HI CTMT PRESS TRIP OVRD - LOAD - TRUE
    9. OVR56, RPS CH D HI CTMT PRESS TRIP OVRD - LOAD - TRUE
    10. OVR65, ESF CH A HI CTMT PRESS TRIP OVRD - LOAD - TRUE
    11. OVR66, ESF CH B HI CTMT PRESS TRIP OVRD - LOAD - TRUE
    12. OVR67, ESF CH C HI CTMT PRESS TRIP OVRD - LOAD - TRUE
    13. OVR68, ESF CH D HI CTMT PRESS TRIP OVRD - LOAD - TRUE
    14. CV02A, CHARGING PUMP FAILS TO START - LOAD - TRUE

15. Malfunctions per Scenario Time Line

3. Danger Tag and place to OFF:
  - a. CS Pump A C/S on CP-8
  - b. Chg Pump A/B C/S on CP-4
4. Ensure Protected Train B Sign is placed in SM office window.
5. Ensure CW pumps B and D are running.
6. Place B/U Charging Pump Selector Switch in AB
7. Ensure CCW temperature is lowered to 80-85 degrees F.
8. Complete the Simulator setup checklist.

**Procedures Used**

OP-901-111  
OP-901-403  
OP-901-102  
OP-901-501  
OP-901-212  
OP-902-000  
OP-902-002  
OP-903-013  
OP-903-066

**EVENT 1 - SG 1 NR Level Transmitter SG-ILT-1113B Fails High**

1. On Lead Examiner's cue initiate Event Trigger 1.
2. If WWM called inform the caller work package will be assembled and team sent to Control room

**EVENT 2 - RCS Leak Cold Leg 1A**

1. On Lead Examiner's cue initiate Event Trigger 2.

**EVENT 3 - CEA 20 Drops**

1. On Lead Examiner's cue initiate Event Trigger 3.
2. If RAB sent to CEDMCS Alley, report the CEA disconnect for CEA 20 is open, no other indications of problem are readily apparent.
3. If WWM or I&C called inform the caller, a team will be sent to CEDMCS Alley.

**EVENT 4 Rapid Power Reduction**

None

**EVENT 5 - CEA 2 Drops/Manual Reactor Trip**

1. On Lead Examiner's cue initiate Event Trigger 4.

**EVENT 6 - Large Break LOCA in Cold Leg 1A**

1. On Lead Examiner's cue initiate Event Trigger 5.

**Scenario Timeline:**

Item	Malfunction	Time	Severity	Ramp	TUA	TRA	Trigger	Event
1	SG10B	1 min	100 %				1	T331 FAIL SG1 NR LVL XMTR SG-ILT-1113B - SG 1 NR LEVEL TRANSMITTER SG-ILT-1113B FAILS HIGH
2	RC23A	10 min	.002%				2	A111 RCS COLD LEG RUPTURE (DBL-END 30" BREAK @100%) – RCS LEAK IN COLD LEG 1A
3	RD02A20	20 MIN	TRUE				3	A102,e DROPPED CEA – CEA 20 DROPS
4		30 MIN						A212 RAPID POWER REDUCTION
5	RD02A02	40 MIN	TRUE				4	E000 DROPPED CEA – CEA 2 DROPS/MANUAL REACTOR TRIP
6	RC23A	45 MIN	2 %	00:03:00			5	E002 RCS COLD LEG RUPTURE (DBL-END 30" BREAK @100%) – LARGE BREAK LOCA IN COLD LEG 1A

Manip #	Manipulation Description
17	Loss of Protective System Channel
18	Mispositioned or Dropped CEAs
5	Power Change (>10%) Due to Changes in CEA Position
25	Reactor Trip
7D	LOCA, Large Leak

**OP Test 1, Scenario 3, Event 1 - SG 1 NR Level Transmitter SG-ILT-1113B Fails High**

**Event Description:**

After the crew takes the shift, PPS channel B S/G 1 narrow range level instrument fails high. The crew should evaluate TS 3.3.1, 3.3.2, 3.3.3.5, and 3.3.3.6 and bypass S/G level high, low, and DP Bistables for S/G 1 in PPS channel B within 1 hour.

**Event Objectives:**

1. Recognize failed instrument and verify RPS/CPC bistable functions as expected.
2. Bypass affected bistable channel.

**Event Critical Tasks:**

None

**Event Action Steps:**

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	PNPO/SNPO	Recognize and report indications of failed channel <ul style="list-style-type: none"> <li>▪ Channel B SG 1 NR Level Indication pegged high on CP-8</li> <li>▪ RPS Channel B Trouble Annunciator on CP-2</li> <li>▪ RPS Channel Trip SG 1 Level Hi annunciator on CP-2</li> <li>▪ SG 1 Level Hi Pretrip B/D annunciator on CP-2</li> <li>▪ Pretrip and Trip Lights illuminated for SG 1 Level Hi on Channel B PPS ROM on CP-7</li> </ul>
	PNPO/CRS	Verify RPS/CPC function bistable respond as expected <ul style="list-style-type: none"> <li>▪ Pretrip and Trip Lights illuminated for SG 1 Level Hi on Channel B PPS ROM on CP-7</li> <li>▪ No trips or pretrips on SG 1 Level Hi on other 3 channels of PPS ROMs on CP-7</li> </ul>
	CRS	Review and/or implement actions required by technical specification section 3.3.1 (RPS), 3.3.3.5 (Remote Shutdown), and 3.3.3.6 (Accident Monitoring) <ul style="list-style-type: none"> <li>- Enters TS 3.3.1 Action 2</li> <li>- Enters TS 3.3.2 Action 13</li> <li>- Determines that following trip bistables in PPS Channel B must be bypassed within 1 hour of time of failure:                             <ul style="list-style-type: none"> <li>o SG 1 Level Hi,</li> <li>o SG 1 Level Lo,</li> <li>o SG 1 Delta P Hi</li> </ul> </li> <li>- CRS reviews OP-903-013 and TS 3.3.3.5 and determines that minimum requirements are met</li> <li>- CRS reviews OP-903-013 and TS 3.3.3.6 and determines that minimum requirements are met</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	CRS	Directs SNPO to bypass the following PPS Channel B trip bistables within 1 hour of failure: <ul style="list-style-type: none"> <li>- SG 1 Level Hi,</li> <li>- SG 1 Level Lo,</li> <li>- SG 1 Delta P Hi</li> </ul>
	SNPO	Bypasses affected bistable in PPS Channel B as follows: <ul style="list-style-type: none"> <li>- Obtains Key 222 from Key locker on side of SNPO Desk</li> <li>- Unlocks and opens front access door at CP-10 Channel B</li> <li>- Unlocks and opens the Bistable Control Panel door in PPS Channel B</li> <li>- Depresses the bistable bypass pushbuttons for the following trip bistables in PPS Channel B and verifies associated bypass lights illuminate on CP-10:               <ul style="list-style-type: none"> <li>o SG 1 Level Hi,</li> <li>o SG 1 Level Lo,</li> <li>o SG 1 Delta P Hi</li> </ul> </li> </ul>
	TERM	Bypass lights illuminated on BCP and ROM for the desired bistable channels

## OP Test 1, Scenario 3, Event 2 - RCS Leak Cold Leg 1A

### Event Description:

After the crew bypasses trip Bistables a leak in excess of Tech Spec limits occurs. The crew should implement OP- 901-111, RCS Leak and evaluate T.S. 3.4.5.2.

### Event Objectives:

1. Determine that an RCS leak exists and quantify leak according to OP-903-024 RCS Water Inventory Balance.
2. Take Tech Spec action and make notifications according to Off-Normal Operating Procedure OP-901-111, Reactor Coolant System Leak.

### Event Critical Tasks:

None

### Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/SNPO	Recognizes a RCS leak exists and checks that automatic actions occur as required <ul style="list-style-type: none"> <li>▪ Letdown flow on CP-4 lowers to maintain Pressurizer at setpoint</li> <li>▪ Containment Water Leakage annunciator on CP-8</li> <li>▪ Containment PIG alarms and rising trend indication on RMS CRT at CP-6</li> <li>▪ Containment Pressure on CP-8 shows a slow rise over time</li> <li>▪ Containment Leakage recorder on CP-1 shows rising trend</li> </ul>
	CRS	Discusses contingency with crew for inability to maintain Pressurizer Level with available Charging Pumps <ul style="list-style-type: none"> <li>▪ Trip Reactor</li> <li>▪ Manually initiate SIAS/CIAS,</li> <li>▪ Go to OP-902-000, Standard Post Trip Actions</li> </ul>
	PNPO	Determines amount of RCS leakage by the difference between Charging flow (CP-4) and Letdown flow (CP-4) plus RCP Controlled Bleed Off flows (PMC)
	CRS	Refers to Tech Spec 3.4.5.2 and determines required actions <ul style="list-style-type: none"> <li>▪ Enters TS 3.4.5.2</li> </ul>
	CRS	Implements OP-901-403, High Airborne Activity in Containment in parallel with OP-901-111.
	CRS	Directs STA to commence OP-903-024, RCS Water Inventory Balance <b>(Note: Event may be terminated any time after this step)</b>

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	CRS	Directs SM to refer to Emergency Plan (EP-001-001)
	PNPO/SNPO	Checks for SG activity <ul style="list-style-type: none"> <li>▪ Condenser AE PIG Gas Channel (RMS CRT on CP-6)</li> <li>▪ Condenser Offgas WRGM (RMS CRT on CP-6)</li> <li>▪ SG Blowdown Rad Monitor (RMS CRT on CP-6)</li> <li>▪ Main Steam Line 1 Rad Monitor (RMS CRT on CP-6)</li> <li>▪ Main Steam Line 2 Rad Monitor (RMS CRT on CP-6)</li> <li>▪ PSLR Group on PMC</li> </ul>
	PNPO/SNPO	Checks for CCW activity (RMS CRT on CP-6) <ul style="list-style-type: none"> <li>▪ CCW A Rad Monitor</li> <li>▪ CCW B Rad Monitor</li> <li>▪ CCW AB Rad Monitor</li> </ul>
	CRS	Determines Containment Walkdown is necessary from initial indications. <ul style="list-style-type: none"> <li>▪ Starts preparations for Containment entry at power if conditions in Containment allow</li> </ul>
	CRS/PNPO	At CRS discretion, secure Charging/Letdown and walkdown system to determine source of leakage <ul style="list-style-type: none"> <li>▪ Directs PNPO to secure charging and letdown per OP-002-005</li> <li>▪ Directs Auxiliary Operators to walkdown the system locally</li> </ul>
	CRS/PNPO	At CRS discretion, restore Charging/Letdown if determined not to be source of leakage <ul style="list-style-type: none"> <li>▪ Directs PNPO to restore charging and letdown per OP-002-005</li> </ul>
	PNPO	Take necessary actions to locate leaks to Quench Tank (CP-2, PMC) and/or Reactor Drain Tank (CP-4, PMC) if levels are rising: <ul style="list-style-type: none"> <li>▪ Monitor Relief line Temperatures on CP-2</li> <li>▪ Monitor Vent Header Pressures on CP-8</li> <li>▪ Monitor Control Bleedoff Pressure on CP-4</li> <li>▪ Reduce temperature as necessary in applicable tank per OP-007-001</li> </ul>
	CRS	Notify Radiation Protection for radiological support <ul style="list-style-type: none"> <li>▪ Support needed if CRS plans containment entry at power or if leak indicated outside containment</li> </ul>
	TERM	Lead Examiner may terminate at any time after crew evaluates Tech Spec 3.4.5.2.

**OP Test 1, Scenario 3, Event 3 - CEA 20 Drops**

**Event Description:**

After the Crew addresses the leak, CEA 20 drops into the core. The crew should implement OP-901-102 CEDMCS or CEA Malfunction, Subsection E0 and E1 and OP-901-501, PMC or COLSS Inoperable. Within 15 minutes of the dropped CEA, the crew must begin a power reduction to < 70% IAW OP-901-212, Rapid Plant Power Reduction.

**Event Objectives:**

1. Stabilize plant conditions following a dropped CEA.
2. Determine the cause and results of a dropped CEA.
3. Reduce reactor power and withdraw dropped CEA in accordance with Off-Normal Operating Procedure OP-901-102, CEA or CEDMCS Malfunction.

**Event Critical Tasks:**

None

**Event Action Steps:**

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	PNPO/SNPO	Recognize and report indications of Dropped CEA <ul style="list-style-type: none"> <li>▪ CEA 20 Amber Rod Bottom Light on CEA Rod Bottom Light Mimic on CP-2</li> <li>▪ CEA 20 Green Lower Electrical Limit Light illuminated on CEDMCS Control Panel on CP-2</li> <li>▪ CEAC CRT on CP-2 indicates CEA 20 inserted in core</li> <li>▪ RCS Tc, Th, and Tave lowering on indicators and recorders on CP -2, CP-7 and PMC</li> <li>▪ RCS Pressure slowly lowering on CP-2 and CP-7 indicators and recorders</li> <li>▪ CEA Disabled, CEA Group Minor Deviation, CEA Group Major Deviation annunciators on CP-2</li> <li>▪ COLSS Master annunciator on CP-36 (SNPO)</li> <li>▪ SG pressure lowering on CP-1 and CP-8 (SNPO)</li> </ul>
	CRS	Determines need to enter OP-901-102, CEA or CEDMCS Malfunction.
	PNPO	Place CEDMCS Mode Select Switch to OFF on CEDMCS Control Panel on CP-2.
	CRS	CRS transitions to Section E1, CEA Misalignment Greater Than 7 Inches

Time:	Position:	Applicant's Actions or Behavior:
	Crew	Match TREF with TAVE <ul style="list-style-type: none"> <li>▪ CRS directs the SNPO and PNPO to coordinate to match Tave and Tref</li> <li>▪ SNPO lowers load reference and sets load rate per CRS or PNPO instructions and depresses GO pushbutton on DEH Control Panel on CP-1</li> <li>▪ PNPO instructs SNPO to place turbine in Hold when Tave and Tref are matched</li> <li>▪ Action is taken prior to reactor tripping on SG Pressure Lo</li> </ul>
	CRS	Notifies or directs notification of the Duty Plant Manager and Duty Engineer.
	CRS/PNPO	Record time of CEA misalignment.
	PNPO	Verify Pulse Counter indication for CEA 20 is correct or enter correct position in the PMC Database.
	CREW	If > 19 inches then: <ul style="list-style-type: none"> <li>▪ CRS determines need to commence power reduction by boration of 30% and implement OP-901-212, Rapid Plant Power Reduction</li> <li>▪ CRS determines need to start downpower within 15 minutes of CEA deviation</li> <li>▪ CRS declares COLSS inoperable and enters OP-901-501, PMC or COLSS Inoperable</li> <li>▪ CRS directs STA or board operators to start COLSS offnormal 15 minute logs</li> </ul>
	TERM	Termination Point is entry into OP-901-212 to perform downpower

## OP Test 1, Scenario 3, Event 4 - Rapid Power Reduction

### Event Description:

Within 15 minutes of the dropped CEA, the crew must begin a power reduction IAW OP-901-212, Rapid Plant Power Reduction.

### Event Objectives

1. When plant conditions exist requiring a Rapid Plant Shutdown, implement the steps of OP-901-212 to establish the desired final plant conditions.
2. During a Rapid Plant Downpower, coordinate boration and Main Turbine load reduction to control RCS Tcold B between 541 and 558.

### Event Critical Tasks:

None

### Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	PNPO	Initiate RCS boration <ul style="list-style-type: none"> <li>▪ Performs Direct Boration lineup in accordance with OP-002-005 or aligns for emergency boration at CP-4 per CRS direction.</li> <li>▪ Estimates ~ 600 gallons of boric acid to reduce power to 70% and sets up Boric Acid Batch Counter at CP-4 for desired amount of Boric Acid</li> </ul>
	PNPO	Calculate Spray Nozzle Delta T using: <ul style="list-style-type: none"> <li>▪ Pressurizer Water Temperature on CP-2 or PMC</li> <li>▪ Spray Line Temperatures on CP-2 or PMC</li> </ul>
	PNPO	Establish Boron Equalization. <ul style="list-style-type: none"> <li>▪ Place all available Pressurizer Backup Heater C/Ss to ON on CP-2.</li> <li>▪ Lower Potentiometer on Spray Valve Controller on CP-2 until Spray Valves indicate intermediate</li> </ul>
	PNPO/CRS	Maintain ASI <ul style="list-style-type: none"> <li>▪ CRS provides direction on ASI Control - Preferred groups and CEA insertion limits per TS 3.1.3.6</li> <li>▪ PNPO uses CEAs in Manual Group in accordance with CRS direction and OP-004-004, Control Element Drive</li> </ul>
	CRS	Notify Dispatcher of load reduction
	SNPO	Initiate MT load reduction to maintain RCS Tcold 541 to 558. <ul style="list-style-type: none"> <li>▪ SNPO lowers load reference and sets load rate per CRS or PNPO instructions and depresses GO pushbutton on DEH Control Panel on CP-1</li> </ul>
	Termination	Terminate after reactivity manipulation is satisfied.

**OP Test 1, Scenario 3, Event 5 - CEA 2 Drops/Manual Reactor Trip**

**Event Description:**

After the Crew reduces power to less than 70%, or at Lead Examiners discretion, CEA 2 drops into the core which will require a manual reactor trip. Charging Pump A fails to auto start on level deviation or SIAS requiring a manual start. The Crew should implement OP-902-000, Standard Post Trip Actions.

**Event Objectives:**

1. Carry out all operator actions, including necessary contingency actions in accordance with OP-902-000, Standard Post Trip Actions, in the event of a reactor trip.
2. Properly diagnose event in progress and transition to appropriate EOP recovery procedure.

**Event Critical Tasks:**

Establish Reactivity Control

The task is identified by at least one member of the crew. The PNPO manually trips the Reactor within one minute of recognizing two CEAs dropped.

**Event Action Steps:**

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	PNPO/SNPO	Recognize and report indications of Dropped CEA <ul style="list-style-type: none"> <li>▪ CEA 2 Amber Rod Bottom Light on CEA Rod Bottom Light Mimic on CP -2</li> <li>▪ CEA 2 Green Lower Electrical Limit Light illuminated on CEDMCS Control Panel on CP-2</li> <li>▪ CEAC CRT on CP-2 indicates CEA 2 inserted in core</li> </ul>
	PNPO	Manually Trip the Reactor using Manual Trip Pushbuttons on CP -2 <b>NOTE: CRITICAL TASK</b>
	PNPO/CRS	Verify Reactivity Control <ul style="list-style-type: none"> <li>▪ Check reactor power dropping on CP-2 or CP -7</li> <li>▪ Check startup rate is negative on CP-2 or CP-7</li> <li>▪ Check less than 2 CEAS not fully inserted using                             <ul style="list-style-type: none"> <li>▪ CEAC CRT on CP-2</li> <li>▪ CEDMCS LEL Lights illuminated on CP-2</li> <li>▪ CEA Rod Bottom Lights illuminated on CP -2</li> </ul> </li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	SNPO/CRS	Verify Maintenance Of Vital Auxiliaries by: <ul style="list-style-type: none"> <li>▪ Checking the main turbine tripped by verifying all valves indicate green at Turbine Mimic on CP-1</li> <li>▪ Check the generator tripped by verifying green indication on both Generator Output Breakers and Exciter Field Breaker on CP-1</li> <li>▪ Check train A and B station loads are energized from offsite power by:               <ul style="list-style-type: none"> <li>▪ Voltage available to A1, A2, A3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1</li> <li>▪ Voltage available to B1, B2, B3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1</li> <li>▪ A and B DC bus indicators on CP-1 read &gt; 105 volts</li> <li>▪ Vital AC Instrument Bus Indicators on CP-7 read ~ 120 volts</li> </ul> </li> </ul>
	PNPO/CRS	Verify RCS Inventory Control by: <ul style="list-style-type: none"> <li>▪ Checking PZR level 7% to 60% and trending to 33% to 60% on CP-2</li> <li>▪ Checks Subcooling Margin greater than or equal to 28 deg. on CP-2</li> <li>▪ PNPO notes Charging Pump A (CP-4) did not start on level deviation and performs manual starts and stops as necessary to control PZR Level</li> </ul>
	PNPO/CRS	Verify RCS Pressure Control by: <ul style="list-style-type: none"> <li>▪ Checks PZR pressure between 1750 psia and 2300 psia (CP-2, CP-7, PMC or QSPDS) and trending to between 2025 and 2275 psia or</li> <li>▪ <b>If PZR pressure is less than 1684 psia, the operator verifies that SIAS and CIAS (CP-7) initiate or performs manual initiation (CP-7 or CP-8)</b></li> <li>▪ If PZR pressure is less than 1621 psia, the operator verifies no more than two RCPs are operating               <ul style="list-style-type: none"> <li>▪ Starts a lift oil pump for RCPs to be secured at CP-2</li> <li>▪ Secures a RCP in Loop 1 and Loop 2 at CP-2</li> </ul> </li> <li>▪ If PZR pressure is less than minimum RCP NPSH of App. 2A (curve located on CP-6) the operator secures all RCPS.               <ul style="list-style-type: none"> <li>▪ Starts a lift oil pump for RCPs to be secured on CP-2</li> <li>▪ Secures all RCPs at CP-2</li> </ul> </li> </ul>
	PNPO/CRS	Verify Core Heat Removal by: <ul style="list-style-type: none"> <li>▪ Checking at least one RCP operating on CP-2,</li> <li>▪ Operating loop delta-T less than 13 deg. F, and</li> <li>▪ RCS Subcooling (CP-2) greater than or equal to 28 deg. F. (may be N/A for LOCA event)</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	SNPO/CRS	Check RCS Heat Removal by: <ul style="list-style-type: none"> <li>▪ Checking at least one S/G is both 15-80% NR (CP-1 or CP-8) and Main Feedwater is available to restore level or</li> <li>▪ Verify EFW is available to restore level in at least one S/G.               <ul style="list-style-type: none"> <li>○ EFAS-1 or EFAS-2 actuation occurred if &lt; 27.4% NR (PPS ROM lights extinguished CP-7)</li> <li>○ EFW pumps operating (CP-8) if EFAS-1 or 2 actuated</li> </ul> </li> </ul>
	PNPO/SNPO/C	Check RCS Tc (CP-2 or CP-7) is 535-555 deg. F or <ul style="list-style-type: none"> <li>▪ If Tc is &gt; 555 deg. F verify level is being restored to at least one S/G (CP-1 or CP-8) and verify SBCS (CP-1) or ADVS (CP-8) are maintaining RCS temp 535-555 deg. F.</li> <li>▪ If Tc is &lt; 535 deg. F then verify feed flow (MFW-CP-1 or EFW-CP-8) is not excessive and verify SBCS or ADVs are restoring RCS Tc 535-555 deg. F</li> <li>▪ If Tc is &lt; 500 deg. F verify no more than 2 RCPs operating on CP-2</li> </ul>
	SNPO/CRS	Check S/G pressure 925-1050 psia (CP-1 or CP-7) or <ul style="list-style-type: none"> <li>▪ If S/G press &lt; 925 psia verify steam bypass valves and ADVs are closed.</li> <li>▪ If S/G press less than or equal to 764 psia verify MSIS is initiated.</li> <li>▪ if S/G press &gt; 1050 psia verify SBCs or ADVs are restoring S/G press to &lt; 1050 psia</li> </ul>
	SNPO/CRS	Check FWCS in Reactor Trip Override (CP-1)by <ul style="list-style-type: none"> <li>▪ Checking Main Feed Reg Valves are closed,</li> <li>▪ Startup Feed Reg Valves are 13-21% open, and</li> <li>▪ Operating Feed Pumps are 3800 to 4000 rpm or</li> <li>▪ Manually operate feedwater system to restore level in at least one S/G to 50-70% NR.(N/A if MSIS is initiated)</li> </ul>
	SNPO/CRS	Reset Moisture Separator Reheaters and <ul style="list-style-type: none"> <li>▪ Check the Temp Control Valves closed (Reheat Control Panel CP-1) (N/A if MSIS is initiated)</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/CRS	Verify Containment Isolation by <ul style="list-style-type: none"> <li>▪ Checking Containment pressure (CP-7 or CP-8) &lt; 16.4 psia,</li> <li>▪ Check that no Containment Area rad monitors (RMS CRT/CP-14/PMC) are in alarm or show an unexplained rise in activity, and</li> <li>▪ Check that no steam plant rad monitors (RMS CRT/CP-14/PMC) alarm or show an unexplained rise in activity.</li> <li>▪ <b>If Containment pressure is greater than or equal to 17.1 psia verify CIAS, SIAS, and MSIS (CP-7) initiate or manually initiate each actuation (CP-7 or CP-8).</b></li> </ul>
	SNPO/PNPO/C	Verify Containment Temperature And Pressure Control And Containment Combustible Gas Control by <ul style="list-style-type: none"> <li>▪ Verifying Containment Temperature (CP-18 or QSPDS) less than or equal to 120 deg. F and Containment pressure is &lt; 16.4 psia or</li> <li>▪ Verify at least 3 Containment Fan Coolers (CP-18) operating.</li> <li>▪ If Containment press is greater or equal to 17.1 psia verify all CFCs are operating in emergency mode.               <ul style="list-style-type: none"> <li>○ Verifies 4 CFCs operating in slow speed</li> </ul> </li> <li>▪ <b>If Containment pressure is greater than or equal to 17.7 verify CSAS is initiated, all available CS pumps are delivering &gt; 1750 gpm, and secure all RCPs.</b></li> </ul>
	CRS	Determines whether all Safety Function Acceptance Criteria were met and no contingencies were taken: <ul style="list-style-type: none"> <li>▪ If answer is Yes CRS goes to OP-902-001, Reactor Trip Recovery</li> <li>▪ <b>If answer is NO then CRS performs diagnostics flowchart OP-902-009, Appendix 1</b></li> </ul>
	TERM	Crew diagnoses a LOCA event and exits to OP-902-002

**OP Test 1, Scenario 3, Event Number 6 – Large Break LOCA in Cold Leg 1A**

**Event Description:**

While the Crew is implementing OP-902-000 a large break LOCA occurs. SIAS/CIAS/MSIS/CSAS fail to automatically actuate requiring manual actuation. The crew should complete the Standard Post Trip Actions and diagnose to OP-902-002. The scenario may be terminated after the crew takes action to commence an RCS cooldown.

**Event Objectives:**

1. Take appropriate actions to mitigate the consequences of a Large Break Loss of Coolant Accident in accordance with OP-902-002, Loss of Coolant Accident Recovery Procedure.
2. Monitor RCS/Core conditions and verify all Critical Safety Functions are being addressed.
3. Ensure Reactor Coolant Pumps are secured as required, and the automatic & manual actions required for recirc actuation take place with two minutes of Signal.

**Event Critical Tasks**

- |   |  |   |
|---|--|---|
| 1 | Establish RCS Inventory Control, Containment Isolation, and Containment Pressure Control | The task is identified by at least one member of the crew. The PNPO manually initiates SIAS/CIAS/MSIS/CSAS prior to Reactor Vessel plenum level going empty.          |
| 2 | Stop All RCPs  | The task is identified by at least one member of the crew. The PNPO takes action to stop all RCPs within 3 minutes of a loss of CCW flow or loss of subcooled margin. |

**Event Action Steps:**

Time:	Position:	Applicant's Actions or Behavior:
	STA/CRS	Confirm diagnosis <ul style="list-style-type: none"> <li>▪ CRS directs STA to perform safety function status check list</li> <li>▪ CRS notifies Chemistry to sample both S/Gs for activity</li> </ul>
	CREW	Announce the event using plant page
	CRS	Directs SM to Refer to Emergency Plan
	CRS	Implements Placekeeper and records time of Reactor Trip

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/SNPO/CRS	<p><b>If PZR pressure &lt; 1684 psia verify SIAS initiated,</b></p> <ul style="list-style-type: none"> <li>▪ LPSI and HPSI pumps started,</li> <li>▪ Injection flow is acceptable per OP-902-009, Appendix 2</li> <li>▪ available charging pumps (2) are running</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>▪ perform any of the following: <ul style="list-style-type: none"> <li>▪ Verify power to SI pumps.</li> <li>▪ Verify Cold Leg injection valves open.</li> <li>▪ Start additional SI pumps until flow is acceptable per app. 2.</li> <li>▪ Align HPSI AB to replace A or B</li> </ul> </li> </ul> <p><b>NOTE: CRITICAL TASK IF NOT PERFORMED IN SPTAs</b></p>
	PNPO/CRS	<p>If PZR press &lt; 1621 psia and SIAS is actuated verify no more than 2 RCPs operating.</p> <p>If PZR PRESS does not meet Appendix 2A secure all RCPs.</p>
	PNPO/CRS	<p>Verify RCP operating limits</p> <ul style="list-style-type: none"> <li>▪ verify CCW available to RCPs or secure affected RCPs if not restored within 3 minutes.</li> <li>▪ <b>Secure all RCPs if CSAS is initiated.</b></li> <li>▪ if Tc &gt;500 deg. F, verify no more than 2 RCPs operating.</li> </ul> <p><b>NOTE: CRITICAL TASK IF NOT PERFORMED IN SPTAs</b></p>
	SNPO/CRS	<p>Verify CCW operation by checking a CCW pump (CP-8) is operating for each energized 4 KV safety bus (CP-1) or</p> <ul style="list-style-type: none"> <li>▪ If AB bus aligned to same side as faulted CCW pump start the AB CCW pump</li> <li>▪ If AB bus aligned to opposite Side from faulted CCW pump start the AB CCW pump after the sequencer has timed out.</li> <li>▪ If CCW flow can not be restored, notify an NAO to pull the overspeed trip device on the affected EDG.</li> </ul>
	PNPO/SNPO/C	<p>Isolate the LOCA by:</p> <ul style="list-style-type: none"> <li>▪ Verifying letdown Containment isolations are closed.</li> <li>▪ Verifying RCS sampling isolations are closed.</li> <li>▪ Checking CCW AB rad monitor not in alarm and no Abnormal rise in reading or stop all RCPs and close CCW Containment isolations.</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/SNPO/CRS	Verify LOCA not outside Containment by checking <ul style="list-style-type: none"> <li>▪ RAB rad monitors,</li> <li>▪ sump levels (CP-8 and PMC) , and waste tank levels (PMC).</li> <li>▪ If a leak is indicated, locate and isolate the leak and verify CIAS actuated per Appendix 4D.</li> </ul>
	SNPO/CRS	Place Hydrogen Analyzers A and B in service (CP-33) <ul style="list-style-type: none"> <li>▪ Open Hydrogen Analyzer Containment Isolation Valves</li> <li>▪ Start Hydrogen Analyzer sample Pumps</li> </ul>
	PNPO/SNPO/CRS	IF Containment Pressure is > 17.1 psia (CP-7 or CP-8)or Containment area rad monitors are in hi alarm (RMS CRT CP-6 or CP-14), <ul style="list-style-type: none"> <li>▪ <b>Verify CIAS is initiated (CP-7 or CP-8)</b></li> <li>▪ Verify all available CFCs are in the EMERGENCY MODE (CP-18)</li> <li>▪ If any CFC is not operating and Containment pressure is &gt; 17.1 psia notify a NAO to perform OP-902-009, Appendix 22B and close the associated CFC CCW isolation valves.</li> </ul> <p><b>NOTE: CRITICAL TASK IF NOT PERFORMED IN SPTAs</b></p>
	SNPO/PNPO/CRS	If Containment pressure is > 17.7 psia: <ul style="list-style-type: none"> <li>▪ <b>Verify CSAS is initiated (CP-7 or CP-8)</b></li> <li>▪ Verify all operating CS pumps are delivering &gt; 1750 gpm (CP-8).</li> <li>▪ If any CS pump is not operating and its associated CS-125 valve is open, perform OP-902-009, Appendix 22A and close the associated valve. (not required – CS-111A and 118A tagged closed per initial conditions)</li> </ul> <p><b>NOTE: CRITICAL TASK IF NOT PERFORMED IN SPTAs</b></p>
	SNPO/CRS	IF offsite power has been lost verify MSIVs and Blowdown Containment isolations are closed.
	SNPO/CRS	Restore IA <ul style="list-style-type: none"> <li>▪ If a TCW pump and CW pump are not running notify NAO to align IA compressors to potable water</li> <li>▪ If IA pressure &lt; 95 psig dispatch an operator to start all available air compressors</li> <li>▪ If IA press &gt; 95 psig ensure IA Containment isolation valve ia-909 is open.</li> </ul>
	PNPO/SNPO/CRS	Commence RCS Cooldown to less than 350 degrees F (after cooldown has been started the exam lead may terminate the scenario)

Facility: Waterford III		Scenario No.: 4	Op-Test No.: 1
Examiners: _____		Operators: _____	
_____		_____	
_____		_____	
Initial Conditions: IC-30, 100%, EOC			
Turnover: RCP 2B Lower Seal failed two days ago (RC08D). Charging pump AB has been OOS for 24 hours to replace a cracked pump block. CS Pump A has been OOS for 74 hours to replace the pump impeller.			
Event No.	Malf. No.	Event Type*	Event Description
1	RC15A2	I-RO/SRO	After the crew takes the shift, in-service pressurizer level channel fails low requiring the crew to implement OP-901-110, PZR Level Control Malfunction, Subsection E0 and E1. The crew should evaluate Tech Spec 3.3.3.6.
2	CH01A	C-BOP/SRO	After the crew implements OP-901-110, Containment Fan Cooler A trips. The crew should start the idle Containment Fan Cooler in accordance with OP-008-003, Containment Cooling System, Subsection 6.1 and evaluate Tech Spec 3.6.2.2 and 3.4.5.1.
3	CV01B	C-RO/SRO	Charging Pump B trips on Overcurrent. The crew should implement OP-901-112, Charging or Letdown Malfunction, Subsection E0 and E1 and evaluate Tech Spec 3.1.2.4 and TRM 3.1.2.4.
4	SG04E	I-BOP/SRO	Sometime after the crew has commenced restoration of charging and letdown, S/G 1 pressure input to PPS channel A fails low. The crew should evaluate Tech Specs 3.3.1, 3.3.2, 3.3.3.5, and 3.3.3.6. PPS Channel A trip bistables for S/G 2 pressure low and both S/G delta-pressures must be bypassed within one hour.
5	RP01A-D RP02A-D MS-13B	I-RO/SRO M-All	After the PPS Channel A bistables are bypassed a Main Steam Line Break outside containment occurs on S/G 2. The reactor fails to trip automatically or by manual pushbuttons, however, Diverse Reactor Trip pushbuttons do work. The crew should implement OP-902-000, Standard Post Trip Actions and diagnose to OP-902-004, ESD Recovery.
6	SG01B	M-ALL	After the crew diagnoses to OP-902-004 and S/G dryout occurs, a Steam Generator Tube Rupture occurs in S/G 2. The crew should implement OP-902-008.

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

# Simulator Scenario

## Waterford 3 Nuclear Plant

### Simulator Scenario Number: E-NRC03-4

**Author:** evines  
**Scenario Status:** Approved  
**Approval:** rfletch  
**Revision Number:** 1 6/16/2003  
**Estimated Time:** 75 Minutes  
**References Verified:** evines  
**Initial Conditions:** IC-30  
**Applications:** Initial Exam

#### **Scenario Description:**

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The plant is at 100% reactor power. RCP 2B Lower seal failed 48 hours ago and required steps of OP-901-130 have been taken. Charging Pump A/B is OOS for pump block replacement. CS Pump A is OOS for pump impeller replacement. After the crew takes the shift, the in service pressurizer level channel fails low. The crew should implement OP-901-110 Pressurizer Level Control Malfunction, Subsection E0 and E1. The crew should evaluate TS 3.3.3.5 and 3.3.3.6. After the crew implements OP-901-110 Containment Fan Cooler A trips. The crew should start the idle Containment Fan Cooler IAW OP-008-003, Containment Cooling System Subsection 6.1 and evaluate TS 3.6.2.2, 3.6.1.5, and 3.4.5.1. After the crew has evaluated Tech Specs, Charging Pump B trips on overcurrent. The crew should implement OP-901-112, Charging or Letdown Malfunction, Subsection E0 and E1 and evaluate TS 3.1.2.4 and TRM 3.1.2.4. After the crew has evaluated tech Specs and has commenced restoration of charging and letdown, S/G1 pressure input to PPS channel A fails low. The crew should evaluate TS 3.3.1, 3.3.2, 3.3.3.5 and 3.3.3.6. The crew must bypass PPS Channel A trip bistables for S/G 1 pressure low and both S/G D/P pressures within one hour. After PPS A bistables are bypassed, a Main Steam Line Break outside containment occurs on S/G 2. The Reactor fails to trip automatically or by manual pushbuttons. The crew should trip the Reactor using DRTS pushbuttons. The crew should implement OP-902-000 Standard Post Trip actions and diagnose to OP-902-004, ESD Recovery. After the crew diagnoses to OP-902-004 and S/G dryout occurs, a SGTR occurs in S/G 2, requiring the Crew to implement OP-902-008. The scenario may be terminated after the crew performs steps to isolate SG and commence depressurization.

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#### **Scenario Notes:**

1. Reset Simulator to IC-92
2. Verify Scenario Malfunctions, Remotes, and Overrides are loaded
  - a. Remotes and Overrides are as follows:
    1. CSR11, CS Pump A Bkr - Rack out
    2. CVR22, Charging Pump A/B Breaker - Rack out
    3. CSR04, Shutdown HX A Outlet Valve - Closed
  - b. Malfunctions
    1. RC08D, RCP2B LOWER SEAL FAILURE - LOAD - 25%
    2. RP01A, RPS MANUAL PUSH BUTTON CH A - LOAD - TRUE
    3. RP01B, RPS MANUAL PUSH BUTTON CH B - LOAD - TRUE
    4. RP01C, RPS MANUAL PUSH BUTTON CH C - LOAD - TRUE
    5. RP01D, RPS MANUAL PUSH BUTTON CH D - LOAD - TRUE
    6. RP02A, RPS CH A AUTO TRIP FAILURE - LOAD - TRUE
    7. RP02B, RPS CH B AUTO TRIP FAILURE - LOAD - TRUE
    8. RP02C, RPS CH C AUTO TRIP FAILURE - LOAD - TRUE
    9. RP02D, RPS CH D AUTO TRIP FAILURE - LOAD - TRUE
    10. Malfunctions per Scenario Time Line

3. Danger Tag and place to OFF:
  - a. CS Pump A C/S on CP-8
  - b. Chg Pump A/B C/S on CP-4
4. Ensure Protected Train B sign is placed in SM office window.
5. Ensure CW pumps B and D are running.
6. Place B/U Charging Pump Selector Switch in AB
7. Ensure CCW temperature is lowered to 80-85 degrees F.
8. Complete the simulator setup checklist.

#### **Procedures Used**

OP-008-003  
OP-901-110  
OP-901-112  
OP-902-000  
OP-902-004  
OP-902-008  
OP-903-013

#### **EVENT 1- Pressurizer Level Channel X Fails Low**

1. On Lead Examiner's cue initiate Event Trigger 1.
2. If WWM called inform the caller work package will be assembled and team sent to Control room

#### **EVENT 2- Containment Fan Cooler A Failure**

1. On Lead Examiner's cue initiate Event Trigger 2
2. If called as RAB to investigate Brkr 317A inform OC trip flags all 3 phases
3. If WWM called inform the caller work package will be assembled and team sent to Control room

#### **EVENT 3- Charging Pump B Trips**

1. On Lead Examiner's cue initiate Event Trigger 3
2. If called as RAB to investigate Charging pump B report OC flags on phase A.
3. If WWM called inform the caller work package will be assembled and team sent to Control room

#### **EVENT 4- SG 1 Pressure Safety Channel A Failure**

1. On Lead Examiner's cue initiate Event Trigger 4
2. If WWM called inform the caller work package will be assembled and team sent to Control room

#### **EVENT 5- Main Steam Line 2 Break Outside Containment/RPS Auto and Manual Trip Failure**

1. On Lead Examiner's cue initiate Event Trigger 5

#### **EVENT 6- Steam Generator Tube Rupture in SG 2 Concurrent with MSLB on SG 2 Outside Containment**

1. On Lead Examiner's cue initiate Event Trigger 6
2. If called as Chem to sample SG for activity and boron inform sample will be taken

**Scenario Timeline:**

Item	Malfunction	Time	Severity	Ramp	TUA	TRA	Trigger	Event
1	RC15A2	1 MIN	TRUE				1	A110,e1 PZR CONTROL CHANNEL LEVEL TRANSMITTER FAILS
2	CH01A	18 MIN	TRUE				2	AR002, CONTAINMENT FAN COOLER FAILS OFF
3	CV01B	25 MIN	TRUE				3	A112,e1 CHARGING PUMP TRIP
4	SG04E	32 MIN	0 %				4	T331 SG PRESSURE SAFETY CHANNEL FAILS
5	MS13B	45 MIN	8 %	00:05:00			5	E000,E004 MS LINE BREAK OUTSIDE CNTMT BEFORE MSIV (0-100%)(Dryout should occur 4-5 min before 004 transition)
6	SG01B	65 MIN	10 %	00:05:00			6	E008, E0, SGTR SG TUBE RUPTURE (Conditional on SG Dryout occurring and Transition to OP-902-004)

**Manip #**

**Manipulation Description**

17	Loss of Protective System Channel
24	Malfunction of RCS Pressure or Level Control (includes loss of letdown/charging)
25	Reactor Trip
26B	Main Steam Line Break, Outside Containment
7A	Steam Generator Tube Leak or Steam Generator Tube Rupture

**OP Test 1, Scenario 4, Event 1 - Pressurizer Level Channel X Fails Low**

**Event Description:**

After the Crew takes the shift, the in service Pressurizer level channel fails low. The crew should implement OP-901-110 Pressurizer Level Control Malfunction, Subsection E0 and E1. The crew should evaluate TS 3.3.3.5 and 3.3.3.6.

**Event Objectives:**

1. Establish manual control of Pressurizer level and reselect operable level channel for control.
2. Perform all recovery action steps according to OP-901-110, Pressurizer Level Control Malfunction.

**Event Critical Tasks:**

None

**Event Action Steps:**

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	PNPO	Notify CRS of annunciators and indications of instrument failure <ul style="list-style-type: none"> <li>▪ Letdown flow at minimum on CP-4</li> <li>▪ 3 Charging Pumps running on CP-4</li> <li>▪ Pressurizer Level Hi/Lo Annunciator on CP-2</li> <li>▪ Pressurizer Level Lo Lo Annunciator on CP-2</li> <li>▪ Pressurizer Level Channel X indicator and recorder on CP-2 pegged lo</li> <li>▪ All Pressurizer Heaters Off on CP-2</li> </ul>
	CRS	Determines need to enter OP-901-110, Pressurizer Level Control Malfunction and implements Subsection E0.
	PNPO/CRS	Place PZR Level Controller on CP-2 to MANUAL and adjust output slowly to restore Pressurizer Level on Channel Y (CP-2). <ul style="list-style-type: none"> <li>- Takes manual control of RC-ILIC-0110 by momentarily depressing the MANUAL pushbutton</li> <li>- Raises output of RC-ILIC-0110 to obtain a letdown flow that results in stable or rising PZR Level on CP-2 indicators and recorders.</li> </ul>
	CRS	Transitions to Subsection E1, Pressurizer Level Control Channel Malfunction
	PNPO	Transfer Pressurizer Level Control Channel Select switch to Y on CP-2.
	PNPO	Transfer Channel Select Lo Level Heater Cutout switch to Y on CP-2
	PNPO	Verify desired backup Charging Pump C/S in Auto on CP-4 <ul style="list-style-type: none"> <li>- Verifies Charging Pump A C/S in Auto on CP-4</li> </ul>

	PNPO	<p>Verify all Proportional Heater and Backup Heater Banks reset on CP-2</p> <ul style="list-style-type: none"> <li>- Reset both Proportional Heater banks by momentarily placing each C/S on CP-2 to ON</li> </ul>
	PNPO	Place Pressurizer Level Controller RC-ILIC-0110 on CP-2 in AUTO and verify level being restored to setpoint (~55.6%)
	CRS	<p>Refer to Tech Spec 3.3.3.5 and 3.3.3.6</p> <ul style="list-style-type: none"> <li>▪ Enters TS 3.3.3.5, Remote Shutdown Instrumentation</li> <li>▪ Determines that 3.3.3.6, Accident Monitoring Instrumentation requires are met if PZR Level indication on QSPDS Channel 1, Page 103 is Operable</li> <li>▪ Requests PNPO to cross-check QSPDS PZR Level indication with Channel Y indication on CP-2</li> </ul>
	Termination	

**OP Test 1, Scenario 4, Event 2 - Containment Fan Cooler A Failure**

**Event Description:**

After the crew implements OP-901-110 Containment Fan Cooler A trips. The crew should start the idle Containment Fan Cooler IAW OP-008-003, Containment Cooling System Subsection 6.1 and evaluate TS 3.6.2.2, 3.6.1.5, and 3.4.5.1.

**Event Objectives:**

1. Recognize failure of Containment Fan Cooler
2. Take action to start the standby Containment Fan Cooler.
3. Recognize and implement appropriate Technical Specification LCOs and action statements.

**Event Critical Tasks:**

None

**Event Action Steps:**

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	SNPO	Report annunciators and indications to CRS <ul style="list-style-type: none"> <li>▪ Trn A Cntmt Cooler Power Lost on CP -33</li> <li>▪ CFC/AC Power Lost alarm on PMC</li> <li>▪ No lights illuminated on Containment Fan Cooler A C/S on CP -18</li> </ul>
	CREW	Refer to the appropriate Annunciator Response Procedure <ul style="list-style-type: none"> <li>▪ OP-500-002, Control Room Cabinet B</li> </ul>
	SNPO	Start the Standby Containment Fan Cooler (CFC C) <ul style="list-style-type: none"> <li>▪ Refers to OP-008-003, Containment Cooling, Section 6.4</li> <li>▪ Momentarily place Containment Fan Cooler C/S on CP-18 to Start/Fast</li> <li>▪ Verify CC-807A and CC-823A indicate open (red) on CP-18</li> <li>▪ Check Containment Fan Cooler C differential pressure indicates between 5.0 and 8.0 INWC on CCS-IDPR-5154A on CP-18.</li> <li>▪ Check CCW flow is greater than or equal to 625 gpm on CC-IFI-7570A on CP-18.</li> </ul>
	CRS	Send an NAO to CFC A Breaker at MCC 317A to investigate fault
	CRS	Notify Maintenance of failure and request assistance
	CRS	Refer to TS. 3.4.5.1, 3.6.1.5, and 3.6.2.2. <ul style="list-style-type: none"> <li>▪ Determines requirements of 3.4.5.1, 3.6.1.5, and 3.6.2.2 are met</li> </ul>
	TERM	Event may be terminated after Tech Specs evaluated or at Lead Examiner's discretion

## OP Test 1, Scenario 4, Event 3 - Charging Pump B Trips

### Event Description:

After the crew has evaluated Tech Specs, Charging Pump B trips on overcurrent, the crew should implement OP-901-112, Charging or Letdown Malfunction, Subsection E0 and E1 and evaluate TS 3.1.2.4 and TRM 3.1.2.4.

### Event Objectives:

1. Determine the cause of charging malfunction and realign system as necessary to restore charging capability.
2. Properly perform subsequent operator actions in accordance with off normal operating procedure OP-901-112, Charging and Letdown Malfunctions.

### Event Critical Tasks:

None

### Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/CRS	Recognize and report Charging Pump trip (alarms and indication) <ul style="list-style-type: none"> <li>▪ Overload alarm on PMC</li> <li>▪ Charging Pump B Trip/Trouble on CP-4</li> <li>▪ Charging Pump Header Pressure Lo on CP-4</li> <li>▪ Charging Header Flow Lo on CP-4</li> <li>▪ Charging Header Flow = 0 gpm on CP-4</li> <li>▪ Regen HX Tube Outlet Temp rising on CP-4</li> <li>▪ Green light illuminated on Charging Pump B C/S on CP-4</li> <li>▪ Pressurizer Level slowly lowering on CP-2</li> </ul>
	SNPO/CRS	Stop Turbine load changes (if applicable)
	PNPO/CRS	If Charging pumps have tripped: verify Charging Pump suction path <ul style="list-style-type: none"> <li>▪ Verifies either CVC-183 or CVC-507 open (red) on CP-4</li> </ul>
	PNPO/CRS	If Letdown is not isolated attempt to restart Charging pumps <ul style="list-style-type: none"> <li>▪ Takes Charging Pump A C/S to ON on CP-4 if CVC-101 has not closed on High Regen HX Tube Outlet Temperature</li> </ul>
	PNPO/CRS	Close letdown stop valve (CVC-101) if charging pumps cannot be restarted <ul style="list-style-type: none"> <li>▪ Momentarily places CVC-101 C/S to Close on CP-4</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	CRS	Check Technical Specifications <ul style="list-style-type: none"> <li>▪ Enters TS 3.1.2.4</li> <li>▪ Enters TRM 3.1.2.4</li> </ul>
	PNPO/CRS	If the reason for the Charging Pump trip is corrected and pressurizer level is normal operating band, then place Charging and Letdown in Service <ul style="list-style-type: none"> <li>▪ CRS directs PNPO to restore Charging and Letdown to Service in accordance with OP-002-005</li> </ul>
	TERM	Event may be terminated when Tech Specs have been evaluated or if letdown has isolated the crew commences restoration of Charging and Letdown

**OP Test 1, Scenario 4, Event 4 - SG 1 Pressure Safety Channel A Failure**

**Event Description:**

After the Crew has commenced restoration of Charging and Letdown, S/G1 pressure input to PPS channel A fails low. The Crew should evaluate TS 3.3.1, 3.3.2, 3.3.3.5 and 3.3.3.6. The Crew must bypass PPS Channel A trip bistables for S/G 1 pressure low and both S/G D/P pressures within one hour.

**Event Objectives**

1. Recognize failed instrument and verify RPS/CPC bistable functions as expected.
2. Bypass affected bistable channel.

**Event Critical Tasks:**

None

**Event Action Steps:**

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	PNPO/SNPO	Recognize and report indications of failed channel <ul style="list-style-type: none"> <li>▪ Channel A SG 1 Pressure Indicator pegged low on CP-8</li> <li>▪ RPS Channel A Trouble Annunciator on CP-2</li> <li>▪ RPS Channel Trip SG 1 Pressure Lo annunciator on CP-2</li> <li>▪ SG 1 Pressure Lo Pretrip A/C annunciator on CP-2</li> <li>▪ Pretrip and Trip Lights illuminated for SG 1 Pressure Lo on Channel A PPS ROM on CP-7</li> <li>▪ Pretrip and Trip Lights illuminated for SG 2 Delta P Hi on Channel A PPS ROM on CP-7</li> </ul>
	PNPO/CRS	Verify RPS/CPC function bistable respond as expected <ul style="list-style-type: none"> <li>▪ Pretrip and Trip Lights illuminated for SG 1 Pressure Lo on Channel A PPS ROM on CP-7</li> <li>▪ Pretrip and Trip Lights illuminated for SG 2 Delta P Hi on Channel A PPS ROM on CP-7</li> <li>▪ No trips or pretrips on SG 1 Pressure Lo on other 3 channels of PPS ROMs on CP-7</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	CRS	<p>Review and/or implement actions required by technical specification section 3.3.1 (RPS), 3.3.3.5 (Remote Shutdown), and 3.3.3.6 (Accident Monitoring)</p> <ul style="list-style-type: none"> <li>- Enters TS 3.3.1 Action 2</li> <li>- Enters TS 3.3.2 Action 13</li> <li>- Determines that following trip bistables in PPS Channel A must be bypassed within 1 hour of time of failure: <ul style="list-style-type: none"> <li>o SG 1 Pressure Lo,</li> <li>o SG 1 Delta P Hi,</li> <li>o SG 2 Delta P Hi</li> </ul> </li> <li>- CRS reviews OP-903-013 and TS 3.3.3.5 and determines that minimum requirements are not met</li> <li>- CRS Enters 3.3.3.5, Remote Shutdown Instrumentation</li> <li>- CRS reviews OP-903-013 and TS 3.3.3.6 and determines that minimum requirements are met</li> </ul>
	CRS	<p>Directs SNPO to bypass the following PPS Channel A trip bistables within 1 hour of failure:</p> <ul style="list-style-type: none"> <li>- SG 1 Pressure Lo,</li> <li>- SG 1 Delta P Hi,</li> <li>- SG 2 Delta P Hi</li> </ul>
	SNPO	<p>Bypasses affected bistable in PPS Channel B as follows:</p> <ul style="list-style-type: none"> <li>- Obtains Key 221 from Key locker on side of SNPO Desk</li> <li>- Unlocks and opens front access door at CP-10 Channel A</li> <li>- Unlocks and opens the Bistable Control Panel door in PPS Channel A</li> <li>- Depresses the bistable bypass pushbuttons for the following trip bistables in PPS Channel A and verifies associated bypass lights illuminate on CP-10: <ul style="list-style-type: none"> <li>o SG 1 Pressure Lo,</li> <li>o SG 1 Delta P Hi,</li> <li>o SG 2 Delta P Hi</li> </ul> </li> </ul>
	TERM	Bypass lights illuminated on BCP and ROM for the desired bistable channels

**OP Test 1, Scenario 4, Event 5 - Main Steam Line 2 Break Outside Containment/RPS Auto and Manual Trip Failure**

**Event Description:**

After PPS A bistables are bypassed a Main Steam Line Break outside containment occurs on S/G 2. The Reactor fails to trip automatically or by manual pushbuttons. The Crew should trip the Reactor using DRTS pushbuttons. The Crew should implement OP-902-000 Standard Post Trip actions and diagnose to OP-902-004, ESD Recovery

**Event Objectives:**

1. Carry out all operator actions, including necessary contingency actions in accordance with OP-902-000, Standard Post Trip Actions, in the event of a Reactor Trip.
2. Properly diagnose event in progress and transition to appropriate EOP recovery procedure.

**Event Critical Tasks:**

Establish Reactivity Control

The task is identified by at least one member of the crew. The PNPO trips the reactor within one minute of receiving automatic trips on common Bistables in at least two of four PPS channels by depressing the DRTs pushbuttons.

**Event Action Steps:**

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/CRS	Verify Reactivity Control <ul style="list-style-type: none"> <li>▪ Check reactor power dropping on CP-2 or CP-7                             <ul style="list-style-type: none"> <li>○ <b>Trips reactor by depressing both DRTS Pushbuttons on CP-2</b></li> </ul> </li> <li>▪ Check startup rate is negative on CP-2 or CP-7</li> <li>▪ Check less than 2 CEAS not fully inserted using                             <ul style="list-style-type: none"> <li>▪ CEAC CRT on CP-2</li> <li>▪ CEDMCS LEL Lights illuminated on CP-2</li> <li>▪ CEA Rod Bottom Lights illuminated on CP-2</li> </ul> </li> </ul> <p><b>NOTE: CRITICAL TASK</b></p>

Time:	Position:	Applicant's Actions or Behavior:
	SNPO/CRS	Verify Maintenance Of Vital Auxiliaries by: <ul style="list-style-type: none"> <li>▪ Checking the main turbine tripped by verifying all valves indicate green at Turbine Mimic on CP-1</li> <li>▪ Check the generator tripped by verifying green indication on both Generator Output Breakers and Exciter Field Breaker on CP-1</li> <li>▪ Check Train A and B station loads are energized from offsite power by:               <ul style="list-style-type: none"> <li>▪ Voltage available to A1, A2, A3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1</li> <li>▪ Voltage available to B1, B2, B3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1</li> <li>▪ A and B DC bus indicators on CP-1 read &gt; 105 volts</li> <li>▪ Vital AC Instrument Bus Indicators on CP-7 read ~ 120 volts</li> </ul> </li> </ul>
	PNPO/CRS	Verify RCS Inventory Control by: <ul style="list-style-type: none"> <li>▪ Checking PZR level 7% to 60% and trending to 33% to 60% on CP-2</li> <li>▪ Checks Subcooling Margin greater than or equal to 28 deg. on CP-2</li> </ul>
	PNPO/CRS	Verify RCS Pressure Control by: <ul style="list-style-type: none"> <li>▪ Checks PZR pressure between 1750 psia and 2300 psia (CP-2, CP-7, PMC or QSPDS) and trending to between 2025 and 2275 psia or</li> <li>▪ If PZR pressure is less than 1684 psia, the operator verifies that SIAS and CIAS (CP-7) initiate or performs manual initiation (CP-7 or CP-8)</li> <li>▪ If PZR pressure is less than 1621 psia, the operator verifies no more than two RCPs are operating               <ul style="list-style-type: none"> <li>▪ Starts a lift oil pump for RCPs to be secured at CP-2</li> <li>▪ Secures a RCP in Loop 1 and Loop 2 at CP-2</li> </ul> </li> <li>▪ If PZR pressure is less than minimum RCP NPSH of App. 2A (curve located on CP-6) the operator secures all RCPS.               <ul style="list-style-type: none"> <li>▪ Starts a lift oil pump for RCPs to be secured on CP-2</li> <li>▪ Secures all RCPs at CP-2</li> </ul> </li> </ul>
	PNPO/CRS	Verify Core Heat Removal by: <ul style="list-style-type: none"> <li>▪ Checking at least one RCP operating on CP-2,</li> <li>▪ Operating loop delta-T less than 13 deg. F, and</li> <li>▪ RCS Subcooling (CP-2) greater than or equal to 28 deg. F.</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	SNPO/CRS	Check RCS Heat Removal by: <ul style="list-style-type: none"> <li>▪ Checking at least one S/G is both 15-80% NR (CP-1 or CP-8) and Main Feedwater is available to restore level or</li> <li>▪ Verify EFW is available to restore level in at least one S/G.               <ul style="list-style-type: none"> <li>○ EFAS-1 or EFAS-2 actuation occurred if &lt; 27.4% NR (PPS ROM lights extinguished CP-7)</li> <li>○ EFW pumps operating (CP-8) if EFAS-1 or 2 actuated</li> </ul> </li> </ul>
	PNPO/SNPO/CRS	Check RCS Tc (CP-2 or CP-7) is 535-555 deg. F or <ul style="list-style-type: none"> <li>▪ If Tc is &lt; 535 deg. F then verify feed flow (MFW-CP-1 or EFW-CP-8) is not excessive and verify SBCS or ADVs are restoring RCS Tc 535-555 deg. F</li> <li>▪ If Tc is &lt; 500 deg. F verify no more than 2 RCPs operating on CP-2</li> <li>▪ If RCS Tc is being controlled by an ESD Perform Appendix 13 Using SG 1 when RCS Pressure (CP-2/CP-7/QSPDS/PMC) starts to rise or CET Temperatures (CP-7/QSPDS/PMC) start to rise               <ul style="list-style-type: none"> <li>○ SNPO depresses MANUAL pushbutton on ADV 1 controller on CP-8 and raises output to 100%</li> <li>○ SNPO manually initiates EFAS 1 by all EFAS 1 actuation switches on CP-7 and CP-8 to ACTUATE</li> <li>○ SNPO depresses MANUAL pushbutton on Primary or Backup EFW Flow Controller for SG 1 on CP-8 and raise output to initiate EFW Flow to SG-1</li> <li>○ PNPO uses Normal (CP-2) and/or Auxiliary Spray (CP-4) to stabilize RCS pressure (CP-2/CP-7/QSPDS/PMC) between 1500 and 1600 psia</li> <li>○ SNPO throttles or stops HPSI flow if throttle criteria of Appendix 13 are met and CRS concurs</li> </ul> </li> </ul>
	SNPO/CRS	Check S/G pressure 925-1050 psia (CP-1 or CP-7) or <ul style="list-style-type: none"> <li>▪ If S/G press &lt; 925 psia verify steam bypass valves and ADVs are closed.</li> <li>▪ If S/G press less than or equal to 764 psia verify MSIS is initiated.</li> </ul>
	SNPO/CRS	Check FWCS in Reactor Trip Override (CP-1) by <ul style="list-style-type: none"> <li>▪ Checking Main Feed Reg Valves are closed,</li> <li>▪ Startup Feed Reg Valves are 13-21% open, and</li> <li>▪ Operating Feed Pumps are 3800 to 4000 rpm or</li> <li>▪ Manually operate feedwater system to restore level in at least one S/G to 50-70% NR.(N/A if MSIS is initiated)</li> </ul>
	SNPO/CRS	Reset Moisture Separator Reheaters and <ul style="list-style-type: none"> <li>▪ Check the Temp Control Valves closed (Reheat Control Panel CP-1)</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/CRS	Verify Containment Isolation by <ul style="list-style-type: none"> <li>▪ Checking Containment pressure (CP-7 or CP-8) &lt; 16.4 psia,</li> <li>▪ Check that no Containment Area rad monitors (RMS CRT/CP-14/PMC) are in alarm or show an unexplained rise in activity, and</li> <li>▪ Check that no steam plant rad monitors (RMS CRT/CP-14/PMC) alarm or show an unexplained rise in activity.</li> </ul>
	SNPO/PNPO/C	Verify Containment Temperature And Pressure Control And Containment Combustible Gas Control by <ul style="list-style-type: none"> <li>▪ Verifying Containment Temperature (CP-18 or QSPDS) less than or equal to 120 deg. F and Containment pressure is &lt; 16.4 psia or</li> <li>▪ Verify at least 3 Containment Fan Coolers (CP-18) operating.</li> </ul>
	CRS	Determines whether all Safety Function Acceptance Criteria were met and no contingencies were taken: <ul style="list-style-type: none"> <li>▪ If answer is Yes CRS goes to OP-902-001, Reactor Trip Recovery</li> <li>▪ <b>If answer is NO then CRS performs diagnostics flowchart OP-902-009, Appendix 1</b></li> </ul>
	CRS	Crew diagnoses an ESD event and exits to OP-902-004
	CRS	Confirm diagnosis <ul style="list-style-type: none"> <li>▪ CRS directs STA to perform safety function status check list</li> <li>▪ CRS notifies Chemistry to sample both S/Gs for activity</li> </ul>
	CREW	Announce the event using plant page
	CRS	Directs SM to Refer to Emergency Plan
	CRS	Implements Placekeeper and records time of Reactor Trip
	PNPO/CRS	If PZR pressure < 1684 psia verify SIAS initiated, <ul style="list-style-type: none"> <li>▪ SIAS lights off on PPS ROM on CP-7</li> <li>▪ SIAS Initiation Alarms on CP-2</li> </ul>
	PNPO/SNPO/CRS	If SIAS initiated, <ul style="list-style-type: none"> <li>▪ LPSI and HPSI pumps started,</li> <li>▪ Injection flow is acceptable per OP-902-009, Appendix 2</li> <li>▪ available charging pumps (1) are running</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/SNPO/CRS	Verify MSIS actuation <ul style="list-style-type: none"> <li>▪ MSIS lights off on PPS ROM on CP-7</li> <li>▪ MSIS Initiation Alarms on CP-2</li> <li>▪ Both Main Steam Isolation Valves indicate closed on CP-8</li> <li>▪ Both Main Feed Isolation Valves indicate closed on CP-8</li> </ul>
	PNPO/CRS	If Pzr press < 1621 psia and SIAS is actuated verify no more than 2 RCPs (CP-2) operating. If PZR PRESS does not meet Appendix 2A secure all RCPs.
	PNPO/SNPO/CRS	Verify RCP operating limits <ul style="list-style-type: none"> <li>▪ Verify CCW available to RCPs (CP-2/CP-8) or secure affected RCPs if not restored within 3 minutes.</li> <li>▪ if Tc &gt;500 deg. F, verify no more than 2 RCPs operating.</li> </ul>
	SNPO/CRS	Verify proper CCW operation <ul style="list-style-type: none"> <li>▪ Verify a CCW Pump (CP-8) is running for Train A and B</li> </ul>
	PNPO/SNPO/CRS	Determine most affected SG <ul style="list-style-type: none"> <li>▪ Determines SG 2 is most affected SG               <ul style="list-style-type: none"> <li>▪ SG with lowest pressure (CP-8)</li> <li>▪ SG with Lowering or 0% WR level (CP-8)</li> <li>▪ SG with lowest RCS temperatures (CP-2/CP-7)</li> </ul> </li> </ul>
	SNPO/CRS	Isolate SG 1: <ul style="list-style-type: none"> <li>▪ Verify MSIV 2 Closed on CP-8</li> <li>▪ Verify MFIV 2 Closed on CP-8</li> <li>▪ Verify ADV 1 is Closed by taking controller on CP-8 to MANUAL and verifying 0% output</li> <li>▪ Verify EFW-228B SG 2 Primary isolation valve closed on CP-8</li> <li>▪ Verify EFW-229B SG 2 Backup isolation valve closed on CP-8</li> <li>▪ Places SG 2 EFW Primary and Backup flow controllers in MANUAL and verify 0% output on CP-8</li> <li>▪ Close MS-401B on CP-8</li> <li>▪ Verify MS-120B and MS-119B Main Steam Line 2 Drains are closed on CP-8</li> <li>▪ Verify SG 2 Blowdown Isolation Valves BD-102B and BD-103B are closed on CP-8</li> <li>▪ Notifies NAO to verify locally safeties not lifting on SG 2</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/SNPO/CRS	Verify correct SG isolated <ul style="list-style-type: none"> <li>▪ Isolated SG with lowest pressure (CP-8)</li> <li>▪ Isolated SG with Lowering or 0% WR level (CP-8)</li> <li>▪ Isolated SG with lowest RCS temperatures (CP-2/CP-7)</li> </ul>
	PNPO/SNPO/CRS	If not performed in SPTAs, stabilize RCS temperature and pressure using SG 1 when RCS Pressure (CP-2/CP-7/QSPDS/PMC) starts to rise or CET Temperatures (CP-7/QSPDS/PMC) start to rise <ul style="list-style-type: none"> <li>▪ SNPO depresses MANUAL pushbutton on ADV 1 controller on CP-8 and raises output to 100%</li> <li>▪ SNPO manually initiates EFAS 1 by all EFAS 1 actuation switches on CP-7 and CP-8 to ACTUATE</li> <li>▪ SNPO depresses MANUAL pushbutton on Primary or Backup EFW Flow Controller for SG 1 on CP-8 and raise output to initiate EFW Flow to SG-1</li> <li>▪ PNPO uses Normal (CP-2) and/or Auxiliary Spray (CP-4) to stabilize RCS pressure (CP-2/CP-7/QSPDS/PMC) between 1500 and 1600 psia</li> <li>▪ SNPO throttles or stops HPSI flow if throttle criteria of Appendix 13 are met and CRS concurs</li> </ul>
	Terminate	This Event may be terminated and next event initiated when SG dryout occurs

**OP Test 1, Scenario 4, Event Number 6 – Steam Generator Tube Rupture in SG 2 Concurrent with MSLB on SG 2 Outside Containment**

**Event Description:**

After the Crew diagnoses to OP-902-004 an S/G Dryout occurs a SGTR occurs in S/G 2 requiring the Crew to implement OP-902-008. The scenario may be terminated after the crew performs steps to isolate SG and commence depressurization

**Event Objectives:**

1. Recognize entry criteria for the functional recovery procedure and take preliminary actions as required by OP-902-008.
2. Determine the safety function status and proceed to proper success path.
3. Respond to the identified safety functions in jeopardy by selecting the proper success paths and implementing them.
4. Demonstrate knowledge of OP-902-008 General Usage By recognizing when success path criteria are met or when transition to another success path is appropriate.
5. Respond to the containment isolation safety function not met by selecting the proper success path and implementing it.
6. Demonstrate knowledge of OP-902-008 General Usage by recognizing when success path criteria are met or when transition to another success path is appropriate.
7. Given a loss of the containment isolation safety function due to an identified steam generator tube rupture, perform the appropriate HR success path actions to restore the containment isolation safety function.

**Event Critical Tasks**

None

**Event Action Steps:**

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	CREW	Announce event using plant page
	CRS	Directs SM to Refer to Emergency Plan
	CRS	Implements Placekeeper and records time of Reactor Trip
	PNPO/CRS	If Pzr press < 1621 psia and SIAS is actuated verify no more than 2 RCPs (CP-2) operating. If PZR PRESS does not meet Appendix 2A secure all RCPs.
	PNPO/CRS	Verify RCP operating limits <ul style="list-style-type: none"> <li>▪ Stop all if CSAS/loss CCW</li> <li>▪ &lt; 500 degrees, stop 2 RCPs</li> </ul>
	CRS	Direct chemistry to sample both SGs for activity and boron

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	SNPO/CRS	Place Hydrogen Analyzers A and B in service (CP-33) <ul style="list-style-type: none"> <li>▪ Open Hydrogen Analyzer Containment Isolation Valves</li> <li>▪ Start Hydrogen Analyzer sample Pumps</li> </ul>
	CRS	Identify Success Paths Using Resource Assessment Trees and Safety Function Tracking Sheet
	CRS	Direct STA to perform Safety Function Status Checklist and independently prioritize safety functions
	CRS	Prioritize success paths <ul style="list-style-type: none"> <li>▪ Determines that CI-1 is first path to be implemented</li> </ul>
	SNPO/CRS	Determine most affected SG <ul style="list-style-type: none"> <li>▪ High Rad Monitor readings (RMS CRT on CP-6)</li> <li>▪ SG level (CP-8) rise in SG 2 when not feeding</li> <li>▪ Determine need to go to HR-2 step 16 per step 2 of CI-1</li> </ul>
	PNPO/CRS	Depressurize the RCS using Main or Aux. Spray to meet all of the following: <ul style="list-style-type: none"> <li>▪ RCS pressure less than 1000 psia</li> <li>▪ RCS pressure within Appendix 2-A, "</li> <li>▪ If HPSI Throttle Criteria are met control Charging and Letdown flow and throttle HPSI flow</li> </ul>
	SNPO/CRS	When RCS T-hot is less than 520 degrees F isolate the most affected SG 2 by: <ul style="list-style-type: none"> <li>▪ Place ADV 2 controller setpoint to 980 psig and verify the controller is in AUTO on CP-8</li> <li>▪ Verify MSIV 2 is CLOSED on CP-8</li> <li>▪ Verify MFIV 2 Closed on CP-8</li> <li>▪ If EFAS 2 is not initiated close EFW-228B and EFW-229B</li> <li>▪ place the EFW FCV controllers in manual and close EFW-224B and EFW-223B on CP-8 by verifying output of controller is )%</li> <li>▪ Close MS-401B on CP-8</li> <li>▪ Close the main steam line drains MS-120B and MS-119B</li> <li>▪ Direct an NAO to check Main Steam Safety Valves closed on SG 2</li> </ul>
	TERM	Termination point

Facility: Waterford III		Scenario No.: 5	Op-Test No.: 1
Examiners: _____		Operators: _____	
_____		_____	
_____		_____	
Initial Conditions: IC-29, 85%, EOC			
Turnover: RCP 2B Lower Seal failed two days ago (RC08D). Charging pump AB has been OOS for 24 hours to replace a cracked pump block. CS Pump A has been OOS for 74 hours to replace the pump impeller.			
Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R-RO N-BOP/SRO	After the crew takes the shift, a power reduction to 65% will be performed to remove FWPT A from service to repair an oil leak and replace oil soaked lagging.
2	PC01	I-All	After the crew satisfies the reactivity manipulation, the Plant Monitoring Computer fails. The crew should implement OP-901-501, PMC or COLSS Inoperable. The crew should evaluate Tech Specs 3.2.1, 3.2.4, and 3.2.7.
3	SG05A	I-BOP/SRO	After the crew evaluates Tech Specs, a S/G1 Narrow Range control channel instrument fails low causing the controllers for FWCS 1 to shift to manual. The crew should implement OP-901-201 and control S/G 1 level manually. Post trip, the Main and Startup Feed Reg Valve controllers must be placed in a RTO condition.
4	FW12A	C-All	After the crew addresses the FWCS malfunction, the oil leak worsens on FWPT A requiring a manual trip of FWPT A and a Reactor Power Cutback. The crew should implement OP-901-101, Reactor Power Cutback.
5	FW03B FW07A FW05	C-BOP M-All	After the crew stabilizes the plant, FWPT B trips on overspeed. The crew should manually trip the reactor in accordance with OP-901-101, Reactor Power Cutback. The crew should implement OP-902-000. When EFAS-1 or 2 is actuated, EFW Pump A fails to auto start and EFW Pump AB trips on overspeed. The crew should diagnose to OP-902-006, Loss of Main Feedwater.
6	SG01A	M-ALL	During implementation of OP-902-006, a Steam Generator Tube Rupture occurs in S/G 1. The crew should re-diagnose and implement OP-902-007 Tube Rupture.

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

**Simulator Scenario**  
**Waterford 3 Nuclear Plant**  
**Simulator Scenario Number: E-NRC03-5**

**Author:** evines  
**Scenario Status:** Approved  
**Approval:** rfletch  
**Revision Number:** 16/16/2003  
**Estimated Time:** 60 Minutes  
**References Verified:** evines  
**Initial Conditions:** IC-29  
**Applications:** Initial Exam

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**Scenario Description:**

The plant is at ~85% Reactor power. RCP 2B Lower seal failed 48 hours ago and required steps of OP-901-130 have been taken. Charging Pump A/B is OOS for pump block replacement. CS Pump A is OOS for pump impeller replacement. After the crew takes the shift a power reduction to 60% is performed to remove FWPT A from service to repair an oil leak and replace soaked lagging. The TB NAO is standing by at FWPT A. After the crew satisfies the reactivity manipulation, the Plant Monitoring Computer fails. The crew should implement OP-901-501, PMC or COLSS Inoperable and evaluate TS 3.2.1, 3.2.4, and 3.2.7. After the crew evaluates Tech Specs, a S/G 1 Narrow Range Control Channel Instrument fails low causing FWCS 1 controllers to shift to manual. The crew should implement OP-901-201 and control S/G 1 level manually. After the crew addresses the FWCS malfunction, the oil leak on FWPT A worsens requiring a manual trip of FWPT A and a Reactor Power Cutback. The crew should implement OP-901-101 Reactor Power Cutback. After the plant is stabilized FWPT B trips on overspeed. The crew should manually trip the Reactor IAW OP-901-101. The crew should implement OP-902-000. When EFAS-1 or 2 is actuated, EFW Pump A fails to auto start and EFW Pump AB trips on overspeed. The crew should diagnose to OP-902-006, Loss of Main Feedwater. During implementation of OP-902-006, a Steam Generator Tube Rupture occurs in S/G 1. The crew should diagnose to OP-902-007. The scenario may be terminated after the crew takes action to isolate S/G 1 and commence depressurization of the RCS.

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**Scenario Notes:**

1. Reset Simulator to IC-95.
2. Verify Scenario Malfunctions, Remotes, and Overrides are loaded
  - a. Remotes and Overrides are as follows:
    1. CSR11, CS Pump A Bkr - Rackout
    2. CVR22, Charging Pump A/B Breaker - Rackout
    3. CSR04, Shutdown HX A Outlet Valve - Closed
  - b. Malfunctions
    1. RC08D, RCP2B LOWER SEAL FAILURE - LOAD - 25%
    2. FW05, STEAM DRIVEN EFW AB MECHANICAL OVR SPEED - LOAD - TRUE
    3. FW07A, EFW PUMP A FAIL TO START - LOAD - TRUE
    4. Malfunctions per Scenario Time Line
3. Danger Tag and place to OFF:
  - a. CS Pump A C/S on CP-8
  - b. Chg Pump A/B C/S on CP-4
4. Ensure Protected Train B sign is placed in SM office window.
5. Ensure CW pumps B and D are running.
6. Place B/U Charging Pump Selector Switch in AB
7. Ensure CCW temperature is lowered to 80-85 degrees F.
8. Complete the simulator setup checklist.

**Procedures Used**

OP-901-101  
OP-901-201  
OP-901-501  
OP-902-000  
OP-902-007  
OP-010-005

**EVENT 1 - Power Reduction to 60%**

1. If called as TB to check oil leak inform caller oil leak unchanged.

**EVENT 2 – Plant Monitoring Computer Failure**

1. On Lead Examiner's cue initiate Event Trigger 1
2. If called as NAO to continuously monitor equipment locally, acknowledge
3. If called as Shift Computer Tech to failover PMC, acknowledge
4. If called as Woodlands that PMC lost, acknowledge

**EVENT 3 - SG NR Range Level Transmitter SG-ILT-1105 Fails Low**

1. On Lead Examiner's cue initiate Event Trigger 2
2. If WWM called inform the caller work package will be assembled and team sent to Control room

**EVENT 4 - Main Feedwater Pump A Oil Leak and High Vibration**

1. On Lead Examiner's cue initiate Event Trigger 3
2. Inform Control Room as TB NAO that oil leak worsening and pump is vibrating badly.
3. If called as TB NAO to secure FWPT A lube oil system when pump stops acknowledge

**EVENT 5 - Main Feedwater Pump B Trip on Overspeed/Manual Reactor Trip**

1. On Lead Examiner's cue initiate Event Trigger 4
2. If called as TB to check FWPT B inform tripped on overspeed.

**EVENT 6 – Steam Generator Tube Rupture in SG 1**

1. On Lead Examiner's cue initiate Event Trigger 5
2. If called as Shift Chemist to sample SG for boron and activity acknowledge
3. If called as RCA to reset EFW AB trip throttle valve inform linkage broken
4. If called as Outside to check for safeties lifting inform no safeties lifting

**Scenario Timeline:**

<b>Item</b>	<b>Malfunction</b>	<b>Time</b>	<b>Severity</b>	<b>Ramp</b>	<b>TUA</b>	<b>TRA</b>	<b>Trigger</b>	<b>Event</b>
1		START						N10005
		POWER REDUCTION TO 60%						
2	PC01	15 min	TRUE				1	A501
		PMC HOST A & B TOTAL FAILURE						
3	SG05A	25 min	0%				2	A201
		SG ILT NR LEVEL FAIL (1-100% )						
4	FW12A	35 min	100%				3	A101
		MAIN FEEDWATER PUMP TURBINE HIGH VIBRATION						
5	FW03B	45 min	TRUE				4	E000
		MAIN FEEDWATER PUMP OVERSPEED TRIP						
6	SG01A	55 min	10%	00:05:00			5	E007
		SG TUBE RUPTURE						

**Manip #**

**Manipulation Description**

15	Loss of Main Feedwater or Main Feedwater System Failure
16	Loss of All Feedwater (Main, Aux, and Emergency)
7A	Steam Generator Tube Leak or Steam Generator Tube Rupture

**OP Test 1, Scenario 5, Event 1 - Power Reduction to 60%**

**Event Description:**

After the Crew takes the shift a power reduction to 65% is performed to remove FWPT A from service to repair an oil leak and replace soaked lagging TB NAO is standing by FWPT A.

**Event Objectives:**

Reduce Reactor power and/or remove the unit from service by operating securing, or realigning plant equipment as directed by Precautions, Limitations, and procedural guidance of Plant Shutdown, OP-010-005.

**Event Critical Tasks:**

1 None

**Event Action Steps:**

<b>Time:</b>	<b>Position:</b>	<b>Applicant's Actions or Behavior:</b>
	PNPO	Maintain Tcold 541-558 (CP-2/CP-8/PMC) during downpower.
	PNPO	Initiate RCS boration <ul style="list-style-type: none"> <li>▪ Performs Direct Boration lineup in accordance with OP-002-005 at CP-4 per CRS direction.</li> <li>▪ Estimates ~ 500 gallons of boric acid to reduce power to 60% and sets up Boric Acid Batch Counter at CP-4 for desired amount of Boric Acid</li> </ul>
	PNPO/CRS	Maintain ASI <ul style="list-style-type: none"> <li>▪ CRS provides direction on ASI Control - Preferred groups and CEA insertion limits per TS 3.1.3.6</li> <li>▪ PNPO uses CEAs in Manual Group in accordance with CRS direction and OP-004-004, Control Element Drive</li> </ul>
	SNPO	Initiate MT load reduction to maintain RCS Tcold 541 to 558. <ul style="list-style-type: none"> <li>▪ SNPO lowers load reference and sets load rate per CRS or PNPO instructions and depresses GO pushbutton on DEH Control Panel on CP-1</li> </ul>
	CREW	Between 90% and 80% re-evaluate CEA subgroup selection for Reactor Power Cutback
	CRS	Following a Reactor power change of >15% within one hour notify Chemistry to sample the RCS for an Isotopic Iodine analysis 2 to 6 hours later
	CRS	Direct Turbine building operator monitor Condenser Polisher Differential pressure and remove Polishers as necessary to maintain system pressure
	TERM	This event may be terminated at any time at the Lead Examiner's discretion

## OP Test 1, Scenario 5, Event 2 – Plant Monitoring Computer Failure

### Event Description:

After the crew satisfies the reactivity manipulation, the Plant Monitoring Computer fails. The crew should implement OP-901-501, PMC or COLSS Inoperable and evaluate TS 3.2.1, 3.2.4, and 3.2.7.

### Event Objectives:

- 1) Respond to a loss of PMC/COLSS by notifying computer tech, and taking required Tech Spec actions, including calculations per (OP-901-501) PMC or COLSS System inoperable.
- 2) Restore COLSS to service following the restoration of the PMC.

### Event Critical Tasks:

1 None

### Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/SNPO	Report alarms and indications of PMC failure <ul style="list-style-type: none"> <li>▪ Time not updating on PMC CRTs</li> <li>▪ Host Link Down message on PMC CRTs</li> <li>▪ COLSS Master and Computer Trouble alarms on CP-36</li> </ul>
	CRS	Determine need to Implement OP-901-501, PMC or COLSS Inoperable
	CRS	Directs STA or Board operators to commence taking 15 minute log OP-901-501, Attachment 6.2
	PNPO/SNPO/CRS	Verify LPD, DNBR, and ASI within limits on operable CPC channels every 15 minutes by performing OP-901-501, Attachment 6.2 <ul style="list-style-type: none"> <li>▪ CRS determines that TS for DNBR, LPD, and ASI are met using CPC indications</li> </ul>
	CRS	Notify shift computer technician to reboot or failover PMC
	CRS	Direct NAOs to continuously monitor local indications and plant equipment
	CRS/SM	If PMC/SPDS is inoperable >12 hour, then an 8 hour notification to NRC required
	CRS	Inform Woodlands that PMC feed from Waterford 3 has been lost
	CRS	Enter TRM 3.3.3.11(4a) Action 3

	CRS	Refer to 3.4.5.1 and determine if meeting minimum leak detection requirements <ul style="list-style-type: none"> <li>▪ Determines requirements of TS 3.4.5.1 are met</li> </ul>
	CRS	Inform Chemistry that PSLR program is unavailable and alternate methods of measuring Primary to Secondary leakage is required.
	CRS/PNPO/SNPO	If COLSS LPD or DNBR are outside limits, reduce power to restore DNBR and LPD to limits of TS 3.2.4 and 3.2.1 or reduce power to $\leq 20\%$ rated thermal power
	CRS	Direct STA to perform Azimuthal Power Tilt Calculation every 12 hours, as well as RCS flow calculation
	PNPO/CRS	Verify at least 2 of 3 CEA position indicator channels required by TS 3.1.3.2 are operable.
	CRS	Direct chemistry to perform thermal discharge calculations every two hours
	PNPO/CRS	Verify each regulating CEA group individual CEA position within transient insertion limit every 4 hours
	TERM	This event may be terminated at any time at the Lead Examiner's discretion

## OP Test 1, Scenario 5, Event 3 - SG NR Range Level Transmitter SG-ILT-1105 Fails Low

### Event Description:

After the Crew evaluates Tech Specs a S/G 1 Narrow Range control channel instrument fails low causing FWCS 1 controllers to shift to manual. The Crew should implement OP-901-201 and control S/G 1 level manually. The Crew should place the Startup and Main Feed Reg valves in a RTO position after the Trip

### Event Objectives:

- 1) Verify feedwater control systems respond to level deviation.
- 2) Restore and maintain steam generator levels in accordance with OP-901-201, Steam Generator Level Control System Malfunction.

### Event Critical Tasks:

- 1 None

### Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	SNPO	<p>Reports alarms and indications</p> <ul style="list-style-type: none"> <li>▪ SG 1 FW Contl Lvl Dev/Pwr Lost on CP-1</li> <li>▪ SG 1 &amp; 2 NR levels are ~ 68% and steady (CP-1 CP-8)</li> <li>▪ SG-ILT-1105 has failed low on CP-1 recorder</li> <li>▪ FWCS 1 controllers in MANUAL for FWPT A, Main Feed Reg Valve 1, and Startup Feed Reg Valve 1 on CP-1</li> </ul>
	CRS	Determines need to enter OP-902-201, Feedwater Control System Malfunction
	CRS	If Reactor Trip occurs, go to OP-902-000, Standard Post Trip Actions.
	SNPO/CRS	<p>Determine and note any controllers for the FWCS that are behaving erratically. Place any erratic controllers in manual and control S/G level.</p> <ul style="list-style-type: none"> <li>▪ Determine that no FWCS controllers on CP-1 are operating erratically</li> </ul>
	SNPO/CRS	<p>Verify both SGFP discharge pressures are matched (CP-1) and greater than S/G pressure (CP-1).</p> <ul style="list-style-type: none"> <li>▪ Determines step is met</li> </ul>
	SNPO/CRS	<p>Stop Turbine load changes except to match Tave and Tref.</p> <ul style="list-style-type: none"> <li>▪ Determines no load changes in progress</li> </ul>
	SNPO/CRS	<p>Restore S/G level to 60 - 70% NR by:</p> <ul style="list-style-type: none"> <li>▪ Uses FWPT speed controller 1 (CP-1) in manual to adjust speed or Main Feed Reg Valve 1 controller (CP-1) in MANUAL</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	SNPO/CRS	Determine if control channel has failed by checking all of the control channel indications on CP-1. <ul style="list-style-type: none"> <li>▪ Determines SG-ILT-1105 has failed low</li> </ul>
	SNPO/CRS	If control channel has been determined to have deviated by >7%, verify applicable controllers have shifted to manual. <ul style="list-style-type: none"> <li>▪ Verifies FWPT A Speed Controller on CP-1 in MANUAL</li> <li>▪ Verifies Main Feed Reg Valve 1 Controller in MANUAL</li> <li>▪ Verifies Startup Feed Reg Valve 1 Controller in MANUAL</li> </ul>
	CRS	Notifies I&C or Work Week Manager of instrument failure
	TERM	Determine and correct the cause of the malfunction.

## OP Test 1, Scenario 5, Event 4 - Main Feedwater Pump A Oil Leak and High Vibration

### Event Description:

After the Crew addresses the FWCS malfunction, the oil leak on FWPT A worsens requiring a manual trip of FWPT A and a Reactor Power Cutback. The Crew should implement OP-901-101 Reactor Power Cutback.

### Event Objectives

1. Verify plant parameters are stabilizing in automatic or manual control as necessary, post Reactor Power Cutback.
2. Properly perform subsequent operator actions according to off-normal operating procedure OP-901-101, Reactor Power Cutback

### Event Critical Tasks:

- 1 None

### Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	SNPO	Reports FWPT A High Vibration alarm on CP-1
	CRS	Orders Manual Trip of FWPT A and Enters OP-901-101, Reactor Power Cutback.
	SNPO	Momentarily places FWPT A Trip/Reset switch on CP-1 to TRIP on CP-1 Verifies FWPT A Stop Valves close on CP-1 Verifies FWPT A speed lowering on CP-1.
	PNPO	Places CEDMCS Mode Select switch to AS and verifies selected Subgroups (5 and 11) (CEAC CRT and CEDMCS control panel on CP-2) drop <b>Note: Placing the CEDMCS Mode Selector Switch has no affect on the scenario because the PMC is failed</b>
	PNPO/SNPO/CRS	Trip Reactor if: <ul style="list-style-type: none"> <li>▪ Both main feedwater pumps tripped.</li> </ul>
	SNPO	If Feedwater Pump lost, verify Turbine setback to 50% (<550 MW) at DEH Control Panel on CP-1
	SNPO/PNPO/CRS	Verify all Control Systems restoring parameters <ul style="list-style-type: none"> <li>▪ Steam Generator levels (Manual control of FWCS 1) CP-1</li> <li>▪ Pressurizer level restoring to setpoint (CP-2)</li> <li>▪ Pressurizer pressure restoring to 2250 psia (CP-2)</li> <li>▪ Steam Bypass Control System maintaining SG pressure &lt; 1000 psia (CP-1)</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	SNPO/CRS	Announce Reactor Power Cutback on Plant Page
	SNPO/PNPO	When Steam Bypass AMI received, place CEDMCS Mode Select switch on CP-2 to OFF
	PNPO	Disable and reset RXC on CP-2 <ul style="list-style-type: none"> <li>▪ Depress Auto Actuation Out of Service Pushbutton on RXC module on CP-2 and Verify Auto Actuate Out of Service light illuminated on Pushbutton</li> <li>▪ Depress the Reset Pushbutton on the RXC module on CP-2.</li> </ul>
	TERM	Terminate event after RXC is taken out of service (Disable and reset RXC on CP-2)

## OP Test 1, Scenario 5, Event 5 - Main Feedwater Pump B Trip on Overspeed/Manual Reactor Trip

### Event Description:

After the plant is stabilized, FWPT B trips on overspeed. The Crew should manually trip the Reactor IAW OP-901-101. The Crew should implement OP-902-000. When EFAS-1 or 2 is actuated, EFW Pump A fails to auto start and EFW Pump AB trips on overspeed. The Crew should diagnose to OP-902-006, Loss of Main Feedwater.

### Event Objectives:

1. Carry out all operator actions, including necessary contingency actions in accordance with OP-902-000, Standard Post Trip Actions, in the event of a Reactor trip.
2. Properly diagnose event in progress and transition to appropriate EOP recovery procedure.

### Event Critical Tasks:

1 None

### Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	SNPO	Reports FWPT B Overspeed Trip Alarm on CP-1 and Verifies FWPT B is tripped
	CRS	Directs PNPO to manually trip the reactor
	PNPO	Depresses both Manual Reactor Trip Pushbuttons on CP-2.
	PNPO/CRS	Verify Reactivity Control. <ul style="list-style-type: none"> <li>- Check Reactor power dropping (CP-2 or CP-7)</li> <li>- Check startup rate is negative (CP-2 or CP-7).</li> <li>- Check less than 2 CEAs not fully inserted (CP-2)</li> </ul>
	SNPO/CRS	Verify Maintenance Of Vital Auxiliaries by: <ul style="list-style-type: none"> <li>▪ Checking the main turbine tripped by verifying all valves indicate green at Turbine Mimic on CP-1</li> <li>▪ Check the generator tripped by verifying green indication on both Generator Output Breakers and Exciter Field Breaker on CP-1</li> <li>▪ Check train A and B station loads are energized from offsite power by: <ul style="list-style-type: none"> <li>▪ Voltage available to A1, A2, A3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1</li> <li>▪ Voltage available to B1, B2, B3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1</li> <li>▪ A and B DC bus indicators on CP-1 read &gt; 105 volts</li> <li>▪ Vital AC Instrument Bus Indicators on CP-7 read ~ 120 volts</li> </ul> </li> </ul>
	PNPO/CRS	Verify RCS Inventory Control by: <ul style="list-style-type: none"> <li>▪ Checking PZR level 7% to 60% and trending to 33% to 60% on CP-2</li> <li>▪ Checks Subcooling Margin greater than or equal to 28 deg. on CP-2</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/CRS	Verify RCS Pressure Control by: <ul style="list-style-type: none"> <li>▪ Checks PZR pressure between 1750 psia and 2300 psia (CP-2, CP-7, PMC or QSPDS) and trending to between 2025 and 2275 psia</li> </ul>
	PNPO/CRS	Verify Core Heat Removal by: <ul style="list-style-type: none"> <li>▪ Checking at least one RCP operating on CP-2,</li> <li>▪ Operating loop delta-T less than 13 deg. F (CP-2, CP-7, QSPDS) and</li> <li>▪ RCS Subcooling (CP-2) greater than or equal to 28 deg. F.</li> </ul>
	SNPO/CRS	Check RCS Heat Removal by: <ul style="list-style-type: none"> <li>▪ Verify EFW is available to restore level in at least one S/G.               <ul style="list-style-type: none"> <li>○ EFAS-1 or EFAS-2 actuation occurred if &lt; 27.4% NR (PPS ROM lights extinguished CP-7)</li> <li>○ EFW pumps operating (CP-8) if EFAS-1 or 2 actuated                   <ul style="list-style-type: none"> <li>▪ Manually starts EFW Pump A using C/S on CP-8</li> <li>▪ Directs NAO to determine problem with EFW Pump AB locally</li> </ul> </li> </ul> </li> </ul>
	PNPO/CRS	Check RCS Tc (CP-2 or CP-7) is 535-555 deg. F
	SNPO/CRS	Check S/G pressure 925-1050 psia (CP-1 or CP-7)
	SNPO/CRS	Check FWCS in Reactor Trip Override (CP-1) by <ul style="list-style-type: none"> <li>▪ Checking Main Feed Reg Valves are closed,</li> <li>▪ Startup Feed Reg Valves are 13-21% open, and</li> </ul> Note: This step may not be performed due to no FWPTs running
	SNPO/CRS	Reset Moisture Separator Reheaters and <ul style="list-style-type: none"> <li>▪ Check the Temp Control Valves closed (Reheat Control Panel CP-1)</li> </ul>
	PNPO/CRS	Verify Containment Isolation by <ul style="list-style-type: none"> <li>▪ Checking Containment pressure (CP-7 or CP-8) &lt; 16.4 psia,</li> <li>▪ Check that no Containment. Area rad monitors are in alarm or show an unexplained rise in activity, and</li> <li>▪ Check that no steam plant rad monitors alarm or show an unexplained rise in activity.</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	SNPO/PNPO/CRS	Verify Containment Temperature And Pressure Control And Containment Combustible Gas Control by <ul style="list-style-type: none"> <li>▪ Verifying Containment Temperature (CP-18 or QSPDS) less than or equal to 120 deg. F</li> <li>▪ Verify Containment pressure is &lt; 16.4 psia (CP-7 or CP-8)</li> </ul>
	CRS	Determines whether all Safety Function Acceptance Criteria were met and no contingencies were taken: <ul style="list-style-type: none"> <li>▪ If answer is Yes CRS goes to OP-902-001, Reactor Trip Recovery</li> <li>▪ If answer is NO then CRS performs diagnostics flowchart OP-902-009, Appendix 1</li> </ul>
	Termination	Crew diagnoses a Loss of Main Feedwater event and transitions to OP-902-006

**OP Test 1, Scenario 5, Event Number 6 – Steam Generator Tube Rupture in SG 1**

**Event Description:**

During implementation of OP-902-006, a Steam Generator Tube Rupture occurs in S/G 1. The Crew should diagnose to OP-902-007. The scenario may be terminated after the crew takes action to isolate S/G 1 and commence depressurization of the RCS

**Event Objectives:**

1. Verify a steam generator tube rupture exists and identify the affected Steam Generator.
2. Ensure adequate Core Cooling and sufficient RCS inventory exist.
3. Minimize radioactive effluents by isolating the affected Steam Generator in accordance with OP-902-007, Steam Generator Tube Rupture Recovery Procedure.

**Event Critical Tasks**

- |   |   |  |
|---|---|--|
| 1 | Isolate the Most Affected SG            | The task is identified by at least one member of the crew. The SNPO takes action to isolate SG 1 prior to commencing a cooldown to 350 degrees F |
| 2 | Prevent Opening of the SG Safety Valves | The task is identified by at least one member of the crew. The PNPO takes action to reduce T-Hot to < 520 degrees F prior to isolating SG 1.     |

**Event Action Steps:**

Time:	Position:	Applicant's Actions or Behavior:
	CRS	Confirm diagnosis <ul style="list-style-type: none"> <li>▪ CRS directs STA to perform safety function status check list</li> <li>▪ CRS notifies Chemistry to sample both S/Gs for activity</li> </ul>
	CREW	Announce the event using plant page
	CRS	Directs SM to Refer to Emergency Plan
	CRS	Implements Placekeeper and records time of Reactor Trip
	PNPO/CRS	If PZR pressure < 1684 psia verify SIAS initiated, <ul style="list-style-type: none"> <li>▪ SIAS lights off on PPS ROM on CP-7</li> <li>▪ SIAS Initiation Alarms on CP-2</li> </ul>
	PNPO/SNPO/CRS	If SIAS initiated, <ul style="list-style-type: none"> <li>▪ LPSI and HPSI pumps started,</li> <li>▪ Injection flow is acceptable per OP-902-009, Appendix 2</li> <li>▪ available charging pumps (2) are running</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	PNPO/CRS	<p>If PZR press &lt; 1621 psia and SIAS is actuated verify no more than 2 RCPs (CP-2) operating.</p> <p>If PZR PRESS does not meet Appendix 2A secure all RCPs.</p>
	PNPO/SNPO/CRS	<p>Verify RCP operating limits</p> <ul style="list-style-type: none"> <li>▪ Verify CCW available to RCPs (CP-2/CP-8) or secure affected RCPs if not restored within 3 minutes.</li> <li>▪ if Tc &gt;500 deg. F, verify no more than 2 RCPs operating.</li> </ul>
	SNPO/CRS	<p>Verify proper CCW operation</p> <ul style="list-style-type: none"> <li>▪ Verify a CCW Pump (CP-8) is running for Train A and B</li> </ul>
	SNPO	<p>Perform Rapid Cooldown of RCS to less than 520°F Th</p> <ul style="list-style-type: none"> <li>▪ Places Permissive switch for one Steam Bypass Valve on CP-1 to MANUAL</li> <li>▪ Places Controller for respective Steam Bypass Valve to Manual on CP-1 and raises output to initiate an RCS cooldown</li> </ul> <p><b>NOTE: CRITICAL TASK</b></p>
	PNPO/CRS	<p>Depressurize the RCS using Main(CP-2) or Aux. Spray (CP-4) to meet all of the following:</p> <ul style="list-style-type: none"> <li>▪ RCS pressure less than 950 psia</li> <li>▪ RCS pressure within Appendix 2-A</li> <li>▪ If HPSI Throttle Criteria are met control Charging and Letdown flow and throttle HPSI flow</li> </ul>
	PNPO/SNPO	<p>Reset MSIS initiation setpoints</p> <ul style="list-style-type: none"> <li>▪ Depress all 4 SG Pressure setpoint Reset pushbutton on PPS ROMs on CP-7 when SG Pressure Lo Pretrip alarms actuate on CP-2</li> <li>▪ Verify SG Press Lo Trip Setpoints Lower on all 4 indicators on CP-8 and clear SG pressure Lo Pretrips annunciators by depressing CLEAR pushbutton at CP-2</li> </ul>
	SNPO/CRS	<p>Determine most affected SG</p> <ul style="list-style-type: none"> <li>▪ High Rad Monitor readings (RMS CRT on CP-6)</li> <li>▪ SG level (CP-8) rise in SG 1 when not feeding</li> <li>▪ SG Activity Samples</li> </ul>

Time:	Position:	Applicant's Actions or Behavior:
	SNPO/CRS	<p>When RCS T-hot is less than 520 degrees F isolate the most affected SG 1 by:</p> <ul style="list-style-type: none"> <li>▪ Place ADV 1 controller setpoint to 980 psig and verify the controller is in AUTO on CP-8</li> <li>▪ Verify MSIV 1 is CLOSED on CP -8</li> <li>▪ Verify MFIV 1 Closed on CP-8</li> <li>▪ If EFAS 1 is not initiated close EFW-228A and EFW-229A on CP-8</li> <li>▪ place the EFW FCV controllers in manual and close EFW-224A and EFW-223A on CP-8 by verifying output of controller is 0%</li> <li>▪ Close MS-401A on CP-8</li> <li>▪ Close the main steam line drains MS-120A and MS-119A on CP-8</li> <li>▪ Direct an NAO to check Main Steam Safety Valves closed on SG 1</li> </ul> <p><b>NOTE: CRITICAL TASK</b></p>
	Termination	

Perform SNPO Immediate Actions on CR Evacuation



Site W3 Job RO System / Duty Area PPO Mode OFFNORM Number 5

Revision 3 6/26/2003

Approval

Estimated Time 5 Minutes

Time Critical NO Critical Time N/A Alternate Path Yes

References

NUMBER  
OP-901-502

NRC KA Number

NUMBER  
4.2-A68-A1.15  
4.2-A68-A1.16  
4.2-A68-A3.12

Evaluation Methods

METHOD  
PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

Unsatisfactory

## Waterford 3 Job Performance Measure

### INITIAL CONDITIONS

1. REACTOR POWER WAS AT 100%.
2. A FIRE HAS OCCURRED IN CONTROL ROOM PANEL CP-7.
3. A CONTROL ROOM EVACUATION HAS BEEN ORDERED.
4. THE PRIMARY NPO HAS TRIPPED THE REACTOR.

### INITIATING CUE

PERFORM IMMEDIATE OPERATOR ACTIONS AS SECONDARY NPO FOR CONTROL ROOM EVACUATION PER OP-901-502

### TERMINATING CUE

1. IMMEDIATE OPERATOR ACTIONS ARE TAKEN
2. EXITING CONTROL ROOM FOR + 35 RAB

### STANDARD

1. ALL IMMEDIATE OPERATOR ACTIONS FOR SNPO ARE TAKEN

### TOOLS

NONE

### SAFETY CONSIDERATIONS

NONE

### PERFORMANCE CONSEQUENCES

1. TURBINE NOT TRIPPED - EXCESSIVE COOLDOWN
2. MOISTURE SEPARATOR REHEATERS NOT RESET - EXCESSIVE COOLDOWN
3. GENERATOR NOT TRIPPED - GENERATOR DAMAGE

### HUMAN INTERFACES

1. SM/CRS

### SKILLS / KNOWLEDGES

NONE

### INSTRUCTOR NOTES

SIMULATOR SETUP

1. REACTOR TRIPPED,
2. **(ALT)** TURB FAIL TO AUTO TRIP ACTIVE
3. **(ALT)** FAIL SETPOINT FOR ATMOSPHERIC DUMP VALVE 1 LOW

## Waterford 3 Job Performance Measure

Perform the task in accordance with OP-901-502, Section D. 2.1-2.5 Critical steps are denoted by **CRIT**.

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**1. VERIFY TURBINE TRIP (ALT)**

- CUES:**           ▪ ALL GOVERNOR AND THROTTLE VALVES ON CP-1 MIMIC INDICATE OPEN
- STANDARDS:**   ▪ THE EXAMINEE RECOGNIZES ALL GOVERNOR /THROTTLE VALVES INDICATE OPEN ON CP-1
- 

**2. VERIFY TURBINE TRIP**

**CRIT**

- CUES:**           ▪ ALL GOVERNOR AND THROTTLE VALVES ON CP-1 MIMIC INDICATE CLOSED
- STANDARDS:**   ▪ EXAMINEE DEPRESSES THINK AND TURBINE TRIP PUSHBUTTONS ON CP-1 AND VERIFIES ALL GOVERNOR /THROTTLE VALVES INDICATE CLOSED ON CP-1
- 

**3. VERIFY GENERATOR TRIP**

- CUES:**           ▪ MAIN GENERATOR EXCITER FIELD BREAKER, GENERATOR BREAKER A GENERATOR BREAKER B, ON CP-1 INDICATES OPEN
- STANDARDS:**   ▪ EXAMINEE VERIFIES EXCITER FIELD BREAKER , GENERATOR BREAKER A AND B INDICATE OPEN ON CP-1
- 

**4. RESET MOISTURE SEPARATOR REHEATER CONTROLS**

**CRIT**

- CUES:**           ▪ MSR TCVS ON CP-1 INDICATE CLOSED
- STANDARDS:**   ▪ EXAMINEE DEPRESSES MSR RESET PUSHBUTTON ON CP-1 VERIFIES RESET LIGHT ILLUMINATES AND ALL FOUR MSR VALVE CLOSED LIGHTS ILLUMINATE
- 

**5. VERIFY SG ATMOSPHERIC DUMP VALVE #1 IS CLOSED (ALT)**

- CUES:**           ▪ SG ATMOSPHERIC DUMP #1 CONTROLLER ON CP-8 INDICATES 20 %
- STANDARDS:**   ▪ EXAMINEE CHECKS SG ATMOSPHERIC DUMP #1 CONTROLLER OUTPUT ON CP-8
- 

**6. VERIFY SG ATMOSPHERIC DUMP VALVE #1 IS CLOSED**

**CRIT**

- CUES:**           ▪ SG ATMOSPHERIC DUMP #1 CONTROLLER INDICATES 0 %
- STANDARDS:**   ▪ EXAMINEE PLACES SG ATMOSPHERIC DUMP #1 CONTROLLER ON CP-8 IN MANUAL AND LOWERS SETPOINT TO 0%
- 

**7. EXAMINEE VERIFIES SG ATMOSPHERIC DUMP #2 IS CLOSED**

- CUES:**           ▪ SG ATMOSPHERIC DUMP #2 CONTROLLER INDICATES 0 %
- STANDARDS:**   ▪ EXAMINEE CHECKS SG ATMOSPHERIC DUMP #1 CONTROLLER OUTPUT ON CP-8
- SG ATMOSPHERIC DUMP #2 IS CLOSED

## Waterford 3 Job Performance Measure

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8. CLOSE MS-124A, MAIN STEAM ISO VALVE #1

**CRIT**

**CUES:**           ▪ MS-124A, MAIN STEAM ISO VALVE #1 INDICATES CLOSED

**STANDARDS:**   ▪ EXAMINEE ROTATES MS-124A MAIN STEAM ISO VALVE #1 SWITCH ON CP-8 TO CLOSE AND VERIFIES GREEN CLOSED LIGHT ILLUMINATES

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9. CLOSE MS124B MAIN STEAM ISO VALVE #2

**CRIT**

**CUES:**           ▪ MS-124B, MAIN STEAM ISO VALVE #2 IS CLOSED

**STANDARDS:**   ▪ EXAMINEE ROTATES MS-124B, MAIN STEAM ISO VALVE #2 SWITCH ON CP-8 TO CLOSE AND VERIFIES GREEN CLOSED LIGHT ILLUMINATES

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10. OBTAIN OPERATIONS SECURITY KEY RING AND PROCEED TO RAB +35 RELAY ROOM

**CUES:**           ▪ EXAMINEE HAS OBTAINED REQUIRED KEYS

**STANDARDS:**   ▪ EXAMINEE LOCATES SECURITY KEYS FROM SHIFT MANAGERS OFFICE AND STATES HE/SHE WILL ENTER THE +35 RELAY ROOM.

JPM MAY BE TERMINATED WHEN EXAMINEE HAS SIMULATED OBTAINING KEYS AND STATES HE/SHE WILL GO TO +35 RELAY ROOM

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11. END OF TASK.

## **Waterford 3 Job Performance Measure**

**Examinee Copy**

### **INITIAL CONDITION**

1. REACTOR POWER WAS AT 100%.
2. A FIRE HAS OCCURRED IN CONTROL ROOM PANEL CP-7.
3. A CONTROL ROOM EVACUATION HAS BEEN ORDERED.
4. THE PRIMARY NPO HAS TRIPPED THE REACTOR.

### **INITIATING CUE**

PERFORM IMMEDIATE OPERATOR ACTIONS AS SECONDARY NPO FOR CONTROL ROOM EVACUATION PER OP-901-502