

VERMONT YANKEE NUCLEAR POWER CORPORATION  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009

**Task Identification:**

Title: Perform the RHR System Valve Lineup  
Failure Mode: Two mispositioned valves.  
References: OP 2124, Residual Heat Removal System, (Rev. 113)  
AP 0155, Current System Valve And Breaker Lineup and Identification, (Rev. 75)  
Task Number:     /    

**Task Performance:** AO/RO/SRO  RO/SRO  SRO Only

Sequence Critical: Yes  No

Time Critical: Yes  No

Operator Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation  Performance  Discuss

Setting: Classroom  Simulator  Plant

Performance Expected Completion Time: 13 minutes

Evaluation Results:

Performance: PASS  FAIL

Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_  
Operations Training Instructor

\_\_\_\_\_  
Date

Reviewed by: \_\_\_\_\_  
SRO Licensed/Certified Reviewer

\_\_\_\_\_  
Date

Approved by: \_\_\_\_\_  
Operations Training Manager

\_\_\_\_\_  
Date

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- The plant is preparing for startup following a Refueling Outage.
- Shutdown Cooling has been secured.
- Appendix B, Containment Remote Operated Valve Checklist, of OP 2115, Primary Containment, is completed.

**Initiating Cues:**

The CRS directs you to perform pages 1 and 2 of Appendix A, RHR System Valve Lineup, of OP 2124, Residual Heat Removal System using the guidance found in AP 0155, Current System Valve and Breaker Lineup and Identification.

**Task Standards:**

The operator performs the Valve Lineup in accordance with OP 2124, using the guidance provided within AP 0155, Current System Valve and Breaker Lineup and Identification, recording all tracking information on the appropriate documentation, discovering and notifying supervision of the two mispositioned valves, and re-positioning the valves as needed.

**Required Materials:**

**Handout 1** – OP2124, Appendix A (Rev. 113)

**Handout 2** - AP 0155, Current System Valve And Breaker Lineup and Identification, (Rev. 75)

A Danger Tag with a Tag Number on it.

**Simulator Set-Up:**

Reset to IC-106.

Remove SDC from service in accordance with OP 2124.

Open RHR-57.

Throttle RHR-65B so that it is NOT fully OPEN.

Start Recirc Pump A in accordance with OP2110.

Lined up SBGT on Containment Air Purge in accordance with OP 2115

**OR**

Reset to IC-824

Place a Danger Tag with a Tag Number on it on RHR-57.

**Examiner Notes:**

**Since the JPM task is focused on the RHR System Valve/Switch positions ONLY, the Simulator does not reflect the initial conditions specified in the JPM. If the operator questions the Simulator alignment, the Examiner should inform the operator that the Simulator alignment is acceptable for the task to be evaluated.**

**This JPM should be conducted simultaneously with A4 SRO.**

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.

**Evaluation**

**Performance Steps**

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

**SAT/UNSAT**

**\*Step 1: Perform Valve Lineup**

Standard: The operator completes the valve lineup and places their initials in the appropriate space on OP 2124 Appendix A.

The operator discovers RHR-57 OPEN, when it should be CLOSED, with a Danger Tag requiring it to be OPEN.

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Interim Cues: If asked, as the Shift Manager, Examiner direct the operator to leave the valve in its present position and annotate this as required by the procedure.

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The operator addresses AP 0155, Current System Valve And Breaker Lineup and Identification, (Rev. 75).

---

Interim Cue: When it is apparent that the operator is seeking to find AP 0155, Examiner provides copy (**Handout 2**).

---

The operator indicates the tag number (i.e., 1RFO-24-xxxx) on the lineup form next to its required position, and leaves the "Initials" column blank at this time.

The operator discovers RHR-65B NOT fully OPEN, when it should be fully OPEN, and reports this to the CRS.

---

Interim Cues: If asked, as the Shift Manager, Examiner direct the operator to place the valve in the position required by the Valve Lineup.

---

The operator places the RHR-65B control switch to OPEN, and observes Red light ON, Green light OFF.

The operator initials the appropriate space on OP 2124, Appendix A, and places a note at the bottom of the page indicating that RHR-65B was found out of position.

Evaluation

Performance Steps

SAT/UNSAT

**\*Step 2: Track valve position on OP 2124, Appendix A:**

Standard: The operator completes the valve lineup and places their initials in the appropriate space on OP 2124 Appendix A for the following valves:  
RHR-20  
RHR-66  
RHR-57 (indicates the tag number on the lineup form next to its required position, and leaves the "Initials" column blank)  
RHR-89B  
RHR 89B Test Switch  
RHR-65B (with Note and bottom of Page indicating that Valve was found out of position)  
RHR-65A  
RHR-89A  
RHR 89A Test Switch  
RHR-184  
RHR-183

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NOTE: The Examiner should review the Valve Lineup paperwork when completed and check to see that the operator has placed their initials, and made one Note, as required on OP 2124, Appendix A.

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\*Critical Step

TIME FINISH: \_\_\_\_\_

**Terminating Cue:** The JPM is complete.

**Evaluator Comments:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**System Generic K/A:** 2.1.29 (4.1/4.0)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- The plant is preparing for startup following a Refueling Outage.
- Shutdown Cooling has been secured.
- Appendix B, Containment Remote Operated Valve Checklist, of OP 2115, Primary Containment, is completed.

### **Initiating Cues:**

The CRS directs you to perform pages 1 and 2 of Appendix A, RHR System Valve Lineup, of OP 2124, Residual Heat Removal System using the guidance found in AP 0155, Current System Valve and Breaker Lineup and Identification.

VERMONT YANKEE NUCLEAR POWER CORPORATION  
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WORKSHEET  
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**Task Identification:**

Title: Perform the CS/HPCI System Valve Lineup  
Failure Mode: Two mispositioned valves.  
References: OP 2115, Residual Heat Removal System, (Rev. 113)  
AP 0155, Current System Valve And Breaker Lineup and Identification, (Rev. 75)  
Task Number:     /    

**Task Performance:**

AO/RO/SRO  RO/SRO  SRO Only

Sequence Critical: Yes  No

Time Critical: Yes  No

Operator Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation  Performance  Discuss

Setting: Classroom  Simulator  Plant

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS \_\_\_\_\_ FAIL \_\_\_\_\_

Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_  
Operations Training Instructor

\_\_\_\_\_  
Date

Reviewed by: \_\_\_\_\_  
SRO Licensed/Certified Reviewer

\_\_\_\_\_  
Date

Approved by: \_\_\_\_\_  
Operations Training Manager

\_\_\_\_\_  
Date

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- The plant is preparing to enter the Startup mode.
- Appendix B, Containment Remote Operated Valve Checklist, of OP 2115, Primary Containment, is in progress.

**Initiating Cues:**

The CRS directs you to complete pages 3-5 of Appendix B, Containment Remote Operated Valve Checklist, of OP 2115, Primary Containment, using the guidance found in AP 0155, Current System Valve and Breaker Lineup and Identification.

**Task Standards:**

The operator performs the valve lineup in accordance with OP 2115, using the guidance provided within AP 0155, Current System Valve and Breaker Lineup and Identification, recording all tracking information on the appropriate documentation, discovering and determining the final disposition of the two mispositioned valves, and identifying Technical Specification limitations.

**Required Materials:**

**Handout 1** – OP2115, Appendix B (Rev. 75) Pages 3, 4 and 5 with all valves initialed except:

Page 3 – CS-7A, CS-5A, and CS-11A

Page 4 – CS-12A and CS-14A

Page 5 – CS-7B, CS-5B, CS-11B, CS-12B, CS-14B, HPCI-25, HPCI-16, HPCI-15, HPCI-58, and HPCI-57

**Handout 2** - AP 0155, Current System Valve And Breaker Lineup and Identification, (Rev. 75)

**Simulator Set-Up:**

Reset to IC-106.

Remove SDC from service in accordance with OP 2124.

CLOSE CS-11A (mispositioned).

CLOSE CS-11B (mispositioned) and use Soft Patch override CSdi0314AS2B to prevent valve from moving.

Start Recirc Pump A in accordance with OP2110.

Lined up SBGT on Containment Air Purge in accordance with OP 2115

**OR**

Reset to IC-820

**Examiner Notes:**

**Since the JPM task is focused on the CS/HPCI System Valve/Switch positions ONLY, the Simulator does not reflect the initial conditions specified in the JPM. If the operator questions the Simulator alignment, the Examiner should inform the operator that the Simulator alignment is acceptable for the task to be evaluated.**

**This JPM should be conducted simultaneously with A4 RO.**

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.

**Evaluation**

**Performance Steps**

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

**SAT/UNSAT**

**\*Step 1: Perform Valve Lineup**

Standard: The operator completes the valve lineup and places their initials in the appropriate space on OP 2115 Appendix B.

The operator discovers CS-11A CLOSED, when it should be OPEN.

The operator addresses AP 0155, Current System Valve And Breaker Lineup and Identification, (Rev. 75).

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Interim Cue: When it is apparent that the operator is seeking to find AP 0155, Examiner provides copy (**Handout 2**).

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Interim Cues: If the operator asks for SM assistance, Examiner inform the operator to act as the Shift Manager.

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The operator places the CS-11A control switch to OPEN and observes the Red status light ON and the Green status light OFF.

The operator places their initials in the appropriate space on OP 2115 Appendix B for CS-11A, and places a Note at the bottom of page 3 identifying that CS-11A was discovered to be in the CLOSED position.

The operator discovers CS-11B CLOSED, when it should be OPEN.

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Interim Cues: If the operator asks for SM assistance, Examiner inform the operator to act as the Shift Manager.

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The operator places the CS-11B control switch to OPEN and observes the Green status light ON and the Red status light OFF, and identifies that CS-11B will NOT Open.

The operator DOES NOT place their initials in the appropriate space on

OP 2115 Appendix B for CS-11B, and places a Note at the bottom of page 5 identifying that CS-11B was discovered to be in the CLOSED position, and will NOT OPEN.

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Interim Cues:           Examiner ask "If you were the CRS, what are the operational implications of CS-11B failing closed?"

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**SAT/UNSAT           \*Step 2:        Evaluate Technical Specifications**

Standard:           The operator addresses LCO 3.5.A.1 and determines that the valve must be correctly positioned prior to entering the Startup mode.

**SAT/UNSAT           \*Step 3:        Track valve position on OP 2115, Appendix B:**

Standard:           The operator completes the valve lineup and places their initials in the appropriate space on OP 2115 Appendix B for the following valves:  
CS-7A  
CS-5A  
CS-11A (Found Closed, Note on bottom of page 3)  
CS-12A  
CS-14A  
CS-7B  
CS-5B  
CS-11B (Found Closed, Note on the bottom of page 5 to identify that the valve was found out of position, No initials)  
CS-12B  
CS-14B  
HPCI-25  
HPCI-16  
HPCI-15  
HPCI-58  
HPCI-57

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NOTE:                The Examiner should review the Valve Lineup paperwork when completed and check to see that the operator has placed their initials, and made one Note, as required on OP 2115, Appendix B.

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TIME FINISH: \_\_\_\_\_

**Terminating Cue:**           The JPM is complete.

**Evaluator Comments:**

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**System Generic K/A:** 2.1.29 (4.1/4.0)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- The plant is preparing to enter the Startup mode.
- Appendix B, Containment Remote Operated Valve Checklist, of OP 2115, Primary Containment, is in progress.

### **Initiating Cues:**

The CRS directs you to complete pages 3-5 of Appendix B, Containment Remote Operated Valve Checklist, of OP 2115, Primary Containment, using the guidance found in AP 0155, Current System Valve and Breaker Lineup and Identification.

VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009

**Task Identification:**

Title: Perform a Core Thermal Hydraulics Limits Evaluation  
Failure Mode: One of the Thermal Limits is Out of Spec  
Reference: OP 4401, Core Thermal Hydraulics Limits Evaluation, (Rev. 34)  
Task Number: \_\_\_\_\_

**Task Performance:** AO/RO/SRO \_\_\_ RO/SRO \_\_\_ SRO Only X

Sequence Critical: Yes X No

Time Critical: Yes \_\_\_ No X

Individual Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation \_\_\_ Performance X Discuss \_\_\_

Setting: Classroom X Simulator \_\_\_ Plant \_\_\_

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS \_\_\_ FAIL \_\_\_ Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Instructor

Reviewed by: \_\_\_\_\_ Date \_\_\_\_\_  
SRO Licensed/Certified Reviewer

Approved by: \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Supervisor

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the individual has failed the Job Performance Measure.

After providing the initiating cue, ask the individual "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Classroom** and you are to **perform** all actions.

You are requested to **"talk-through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- The plant is at 100% power.
- A power change from 90% to 100% occurred one hour ago.
- The 3D Monicore case is available.

**Initiating Cues:**

You are required to perform the Daily Core Thermal Hydraulics Limit Evaluation in accordance with OP 4401, Core Thermal Hydraulics Limit Evaluation.

**Task Standards:**

The Daily Core Thermal Hydraulics Limit Evaluation is performed in accordance with OP 4401, MFLCPR is identified as being out of spec, LCO 3.11.C and determines that MCPR must be returned to within the prescribed limits within 2 hours otherwise the reactor power shall be brought to less than 23% RTP within four (4) hours.

**Required Materials:**

**Handout 1** – 3D Monicore Case # FMLS 1810319125947 (Modified so that MFLCPR is OOS high).

**Handout 2** – Thermal Limit Status Board (Copy)

**Handout 3** – OP 4401, Core Thermal Hydraulics Limit Evaluation (Rev. 34)

**Handout 4** – Printout of the computer screen showing control rod oppositions and APRM GAFs.

**Simulator Setup:**

NA

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout #1.**

**Evaluation**

**Performance Steps**

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

**SAT/UNSAT**

**Step 1: Obtains and reviews procedure OP 4401**

Standard: Procedure obtained and reviewed.

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Interim Cue:

When it is apparent that the operator is seeking to find OP 4401, Examiner provides copy (**Handout 3**).

---

**SAT/UNSAT**

**Step 2: (NOTE prior to Step 1) The time and date that a thermal limits evaluation is completed to meet a surveillance requirement is the time and date the 3D Monicore case was calculated (i.e., From case ID).**

Standard: The operator reads the Note and proceeds to Step 1.

**SAT/UNSAT**

**Step 3: (Step 1) If performing daily surveillance, data from an automatic case may be used.**

Standard: The operator recognizes that the daily surveillance is being performed and that the automatic case has been provided.

Evaluation

Performance Steps

SAT/UNSAT

\*Step 4: (Step 2) Complete VYOPF 4401.01

Standard: The operator evaluates 3D Monicore Case # FMLS 1810319125947 and completes steps 1-6 of VYOPF 4401.01 as follows:

The operator records 3D Monicore Official Monitoring Case ID **FMLS 1810319125947** in Step 1.

The operator compares the control rod positions of the Official Monitoring case to the full core display/RWM.

---

Interim Cues:

When it is apparent that the operator is seeking to locate the full core display or the RWM, provide the operator with the printout of the control rod positions and APRM GAFs (**Handout 4**).

---

After cue, the operator determines that the rod positions are correct and enters **their name** and **date** in Step 2.

The operator records the core thermal power (in MWth) as **1910.6** in Step 3.

The operator records the highest MFLCPR as **1.022**, and its core location as **25-26** in Step 4.

The operator records the highest MFLPD as **.796**, and its core location as **21-36-4** in Step 5.

The operator records the highest MAPRAT as **.712**, and its core location as **21-36-4** in Step 6.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 5:** (NOTE prior to VYOPF 4401.01 Step 7) Any APRM found to be non-conservative shall be corrected as soon as possible. An APRM is considered inoperable if the AGAF is not restored within 6 hours of the time of discovery.

Standard: The operator reads the Note and proceeds to Step 7.

SAT/UNSAT

**Step 6:** (Step 7) Check the APRM system gains using the REO display on ERFIS.

Standard: The operator calls up the REO display on ERFIS and observes APRM System gains.

After cue, the operator proceeds to Step 8.

---

Interim Cue:

When asked, Examiner inform operator Item #7, APRM gains, has been verified SAT.

---

SAT/UNSAT

**\*Step 7:** (Step 8) Verify MFLCPR, MFLPD and MAPRAT from Steps 4 - 6 are less than or equal to Administrative Limits posted on Thermal Limit Status Board. If not, contact Reactor Engineering.

Standard: The operator compares the values recorded on VYOPF 4401.01 Steps 4-6 to the associated Administrative Limits listed on the Thermal Limit Status Board, and identifies that the MFLCPR is out of specification.

The operator notifies RE of the out of spec situation.

---

Interim Cues:

When it is apparent that the operator is seeking the Thermal Limit Status Board, Examiner provide a copy of the Thermal Limit Status Board (**Handout**).

When RE is notified, Examiner acknowledge as RE.

---

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 8: (Step 9) Verify the Acceptance Criteria below are satisfied. If A, B, C or D below are not satisfied, enter applicable Tech. Spec. LCO.**

Standard: The operator recognizes that Acceptance Criteria C is NOT satisfied.

The operator enters LCO 3.11.C and determines that MCPR must be returned to within the prescribed limits within 2 hours otherwise the reactor power shall be brought to less than 23% RTP within four (4) hours.

The operator does NOT sign Step 10 of VYOPF 4401.01 indicating that the surveillance has been performed and that the Acceptance Criteria are satisfied.

The operator notifies the SM of the results of the surveillance.

TIME FINISH: \_\_\_\_\_

**Terminating Cue:** This JPM is complete.

**Evaluator Comments:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

K/A: Generic 2.1.7 (4.4/4.7)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- The plant is at 100% power.
- A power change from 90% to 100% occurred one hour ago.
- The 3D Monicore case is available.

### **Initiating Cues:**

You are required to perform the Daily Core Thermal Hydraulics Limit Evaluation in accordance with OP 4401, Core Thermal Hydraulics Limit Evaluation.

**VERMONT YANKEE NUCLEAR POWER CORPORATION  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009**

**Task Identification:**

Title: Perform a Drywell Temperature Profile  
Failure Mode: High Temperature in the Drywell  
Reference: OP 4115, Primary Containment Surveillance, (Rev. 60)  
Task Number: 2997170301

**Task Performance:** AO/RO/SRO \_\_\_ RO/SRO X SRO Only \_\_\_

Sequence Critical: Yes \_\_\_ No X

Time Critical: Yes \_\_\_ No X

Operator Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation \_\_\_ Performance X Discuss \_\_\_

Setting: Classroom \_\_\_ Simulator X Plant \_\_\_

Performance Expected Completion Time: 15 minutes

Evaluation Results:

Performance: PASS \_\_\_\_\_ FAIL \_\_\_\_\_

Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_  
Operations Training Instructor

\_\_\_\_\_  
Date

Reviewed by: \_\_\_\_\_  
SRO Licensed/Certified Reviewer

\_\_\_\_\_  
Date

Approved by: \_\_\_\_\_  
Operations Training Manager

\_\_\_\_\_  
Date

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- The plant is operating at 100% power.
- MCB Annunciator 9-5/F-2, DRYWELL TROUBLE has alarmed.
- RBCCW HX A is in service.

**Initiating Cues:**

The CRS directs you to perform the Drywell Temperature Profile in accordance with Section F of OP 4115, Primary Containment Surveillance.

**Task Standards:**

The Drywell Temperature Check is completed in accordance with OP4115 (Rev 60), Section F, VYOPF 4115.05 is filled in, the operator identifies that the Drywell Temperature for Elevation 250' in vicinity of the Recirculation Pumps, and Drywell Temperature below Elevation 270' do NOT meet the identified acceptance criteria, and the operator identifies that (1) the Duty Officer/Operations manager must be notified, (2) a CR must be written to identify a possible EQ concern, (3) the Drywell Temperature Profile must be performed once per shift, and (4) the completed form VYOPF 4115.05 must be routed to the EQ Coordinator.

**Required Materials:**

**Handout 1** – OP 4115, Primary Containment Surveillance, (Rev. 60)

**Simulator Set-Up:**

Reset to any 100% power IC  
Insert mfMS\_06 at .07% and allow to run until the MCB Annunciator 9-5/F-2 alarms.  
Remove malfunction and allow plant to stabilize.  
Freeze the Simulator

**OR**

Reset to IC# 821  
Go to RUN  
Remove Malfunction MS\_06

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

**Evaluation**

**Performance Steps**

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

SAT/UNSAT

**Step 1: Obtain Procedure.**

Standard: OP 4115, Rev 60, obtained, prerequisites reviewed.

Place keeps on the procedure during performance of the task

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Interim Cue:

When it is apparent that the operator is seeking to find OP 4115, Examiner provide copy (Handout 1).

---

SAT/UNSAT

**Step 2: (CAUTION prior to Step 1) If temperatures below 320 foot elevation exceed 215°F, reactor water level instrumentation errors can occur.**

Standard: The operator reads the Caution, and proceeds to Step 1.

SAT/UNSAT

**Step 3: (Step 1) If necessary, refer to Figure 2 for temperature probe locations.**

Standard: The operator may or may not refer to Figure 2, and proceeds to Step 2.

SAT/UNSAT

**Step 4: (Steps 2/2.a) If a high Drywell temperature alarm is received: Calculate the average Drywell temperature for the various elevations using VYOPF 4115.05.**

Standard: The operator recognizes that MCB Annunciator 9-5/F-2, DRYWELL TROUBLE, is LIT, and proceeds to VYOPF.05.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 5: (VYOPF 4115.05/NOTE prior to CRP 9-25 data) Identify any out of service temperature probe with INOP and ensure a WR is submitted.**

Standard: The operator reads the Note and proceeds to record raw data.

SAT/UNSAT

**Step 6: (CRP 9-25 Data) CRP 9-25 TR 1-149, Place a √ Mark If RRU In Operation.**

Standard: The operator observes the RRU 1through 4 Return and RRU 1through 4 Disch Temperatures, and records on VYOPF 4115.05.

The operator places a √ Mark in space for RRU 1A, 1B, 2A, 2B, 3A and 4A on VYOPF 4115.05.

The operator records RBCCW HX in service as A on VYOPF 4115.05 (Initial Conditions).

The operator observes M008 and records RBCCW HX Outlet Temperature on VYOPF 4115.05.

SAT/UNSAT

**\*Step 7: (Step A.1) Calculate the average temperature for each Drywell elevation: Drywell Temperature for Elev. 250' in Vicinity of Recirculation Pumps(DBD-OIHVAC-041\_01).**

Standard: The operator calls up ERFIS computer points (or a User Defined Group) as required and records the data on VYOPF 4115.05.

The operator completes the calculation (2 total sensors/2) on VYOPF 4115.05 and determines that the calculated Drywell Temperature does NOT meet the Acceptance Criteria.

Evaluation

Performance Steps

SAT/UNSAT

**\*Step 8: (Step A.2) Calculate the average temperature for each Drywell elevation: Drywell Temperature for Elev. Below 270'.**

Standard: The operator calls up ERFIS computer points (or a User Defined Group) as required and records the data on VYOPF 4115.05.

The operator observes temperature points on the Steam Leak Detection Touchscreen Monitor and records the data on VYOPF 4115.05.

The operator observes TI-16-19-30B (DW) and records the data on VYOPF 4115.05.

The operator observes TR-16-19-45 (DW) and records the data on VYOPF 4115.05.

The operator completes the calculation (11 total sensors/11) on VYOPF 4115.05 and determines that the calculated Drywell Temperature does NOT meet the Acceptance Criteria.

---

NOTE: The operator may record data required in Steps A.3 and A.4 while performing this Step.

---

SAT/UNSAT

**Step 9: (Step A.3) Calculate the average temperature for each Drywell elevation: Drywell Temperature for Elev. 270' to 315'.**

Standard: The operator calls up ERFIS computer points (or a User Defined Group) as required and records the data on VYOPF 4115.05.

The operator observes temperature points on the Steam Leak Detection Touchscreen Monitor and records the data on VYOPF 4115.05.

The operator completes the calculation (7 total sensors/7) on VYOPF 4115.05 and determines that the calculated Drywell Temperature meets the Acceptance Criteria.

Evaluation

Performance Steps

SAT/UNSAT

**Step 10: (Step A.4) Calculate the average temperature for each Drywell elevation: Drywell Temperatures Above Elev. 315'.**

Standard: The operator calls up ERFIS computer points (or a User Defined Group) as required and records the data on VYOPF 4115.05.

The operator observes temperature points on the Steam leak Detection Touchscreen Monitor and records the data on VYOPF 4115.05.

The operator completes the calculation (5 total sensors/5) on VYOPF 4115.05 and determines that the calculated Drywell Temperature meets the Acceptance Criteria.

SAT/UNSAT

**\*Step 11: (Section F/Steps 2.b.1-4) If the average temperature of an area exceeds the recommended temperature. Notify the Duty on Call Officer and the Operations Manager. Generate a Condition Report for possible EQ concern due to exceeding the average recommended temperature. Calculate and document the average temperature once per shift while this condition exists or until an evaluation deems this action is not needed. Route a copy of the completed form to the EQ Coordinator.**

Standard: The operator notifies the Duty On call Officer.

The operator notifies the Operations Manager.

The operator identifies that a CR must be written to identify a possible EQ concern.

The operator notifies the CRS that this surveillance must be performed once per shift.

The operator forwards a copy of the completed VYOPF 4115.05 to the EQ Coordinator.

\*Critical Step

TIME FINISH: \_\_\_\_\_

Terminating Cue:

The JPM is complete.

**Evaluator Comments:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**System Generic K/A's:** 2.2.12 (3.7/4.1)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- The plant is operating at 100% power.
- MCB Annunciator 9-5/F-2, DRYWELL TROUBLE has alarmed.
- RBCCW HX A is in service.

### **Initiating Cues:**

The CRS directs you to perform the Drywell Temperature Profile in accordance with Section F of OP 4115, Primary Containment Surveillance.

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JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009

**Task Identification:**

Title: Review a Surveillance  
Failure Mode: Error carried forward interpreting Steam Tables.  
References: OP 4110, Reactor Recirculation System Surveillance, (Rev. 41)  
Steam Tables  
Task Number:     /    

**Task Performance:** AO/RO/SRO  RO/SRO  SRO Only

Sequence Critical: Yes  No

Time Critical: Yes  No

Operator Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation  Performance  Discuss

Setting: Classroom  Simulator  Plant

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS  FAIL

Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_  
Operations Training Instructor

\_\_\_\_\_  
Date

Reviewed by: \_\_\_\_\_  
SRO Licensed/Certified Reviewer

\_\_\_\_\_  
Date

Approved by: \_\_\_\_\_  
Operations Training Manager

\_\_\_\_\_  
Date

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Classroom** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- The plant is 50% power with Recirc Pump B shutdown for corrective maintenance on its associated MG Set.
- ERFIS is NOT available, and attempts to restore it have been unsuccessful for the last hour.
- The MG Set maintenance has been completed, and Recirc Pump restart is in progress in accordance with OP 2110, Reactor Recirculation System.
- The Reactor Operator has just indicated that while performing the Reactor Coolant Temperature Check Data Sheet of OP 4110, Reactor Recirculation System Surveillance, he has determined that the criteria necessary to start Recirc Pump B is NOT met.

**Initiating Cues:**

As the CRS, evaluate the surveillance and determine if the RO is correct.

**Task Standards:**

The operator evaluates the Reactor Coolant Temperature Check Data Sheet and determines that a mistake has been made in evaluating the Steam Tables. The operator will correct the mistake, and then direct that the RO continue the process of starting Recirc Pump B in accordance with OP 2110.

**Required Materials:**

**Handout 1** – VYOPF 4110.05, Reactor Coolant Temperature Check Data Sheet, (Rev. 41), filled in as follows:

Startup of Recirc Pump in Loop	B	
	Before Pump S/U	After Pump S/U
Recirc Loop A Temperature (°F)	510	Blank
Recirc Loop B Temperature (°F)	468	Blank
Reactor Pressure (psig)	942	Blank
Bottom Head Drain Temp (°F) (PLC-2-166, RPV/SV/RV Screen, Ch. 4 (ERFIS Pt S026)	445.9	Blank
Saturation temperature corresponding to above reactor pressure from saturated steam tables		604 °F (In Error, Should be 539.3)
Difference between saturation temperature and bottom head drain temperature		148.1 °F

**Handout 2** – Steam Tables

Calculator

**Simulator Set-Up:**

NA

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.

**Evaluation**

**Performance Steps**

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

SAT/UNSAT

**\*Step 1: Review Reactor Coolant Temperature Check Data Sheet already in progress.**

Standard: The operator observes the partially completed VYOPF 4110.05.

The operator calculates the differential temperature between Loop A and B to be 42°F, and determines that this differential temperature will support Recirc Pump B start.

The operator observes that the  $\Delta T$  between the saturation temperature and the bottom head drain temperature will NOT support Recirc Pump B start.

SAT/UNSAT

**\*Step 2: Evaluate Steam Tables for saturation temperature.**

Standard: The operator obtains the Steam Tables.

Interim Cue:

When it is apparent that the operator is seeking the Steam Tables, provide the operator with the Steam Tables (**Handout 2**).

The operator converts Reactor Pressure to absolute pressure by adding 14.7 psia to gage pressure of 942 psig and determines absolute pressure to be 956.7 psia.

The operator determines from Table 1 of the Steam Tables that the saturation temperature is between 536 and 540°F, and determines that the recorded saturation temperature is in error.

The operator calculates the actual saturation temperature to be 539.3°F (962.23-930.63 psi = 31.6 psi/4 °F; Actual > 536 °F = 31.6psi/(965.7-930.63 x 4 °F = 3.3 °F + 536 °F = 539.3 °F)

**Evaluation**

**Performance Steps**

**SAT/UNSAT**

**\*Step 3: Correct Reactor Coolant Temperature Check Data Sheet already in progress, and determine a course of action**

Standard: The operator places a line through 604 °F, initials it, and enters 539.3 °F.

The operator places a line through 148.1 °F, initials and calculates a new  $\Delta T$  between the saturation temperature and the bottom head drain temperature of 93.4 °F. ( $539.3\text{ °F} - 445.9\text{ °F} = 93.4\text{ °F}$ )

The operator observes that the  $\Delta T$  between the saturation temperature and the bottom head drain temperature will support Recirc Pump B start, and directs the RO to continue with the Recirc Pump B start.

TIME FINISH: \_\_\_\_\_

**Terminating Cue:** The JPM is complete.

**Evaluator Comments:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**System Generic K/A:** 2.2.12 (3.7/4.1)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- The plant is 50% power with Recirc Pump B shutdown for corrective maintenance on its associated MG Set.
- ERFIS is NOT available, and attempts to restore it have been unsuccessful for the last hour.
- The MG Set maintenance has been completed, and Recirc Pump restart is in progress in accordance with OP 2110, Reactor Recirculation System.
- The Reactor Operator has just indicated that while performing the Reactor Coolant Temperature Check Data Sheet of OP 4110, Reactor Recirculation System Surveillance, he has determined that the criteria necessary to start Recirc Pump B is NOT met.

### **Initiating Cues:**

As the CRS, evaluate the surveillance and determine if the RO is correct.

**VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009**

**Task Identification:**

Title: Assess Radiological Conditions and Determine Required Actions  
Failure Mode: N/A  
Reference: EN-RP-101, Access Control for Radiologically Controlled Areas (Rev. 4)  
Task Number: 2990100301

**Task Performance:** AO/RO/SRO  RO/SRO Only  SE Only

Sequence Critical: Yes  No

Time Critical: Yes  No

Individual Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation  Performance  Discuss

Setting: Classroom  Simulator  Plant

Performance Expected Completion Time: 15 minutes

Evaluation Results:

Performance: PASS  FAIL  Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Instructor

Reviewed by: \_\_\_\_\_ Date \_\_\_\_\_  
SRO Licensed/Certified Reviewer

Approved by: \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Superintendent

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the individual has failed the Job Performance Measure.

After providing the initiating cue, ask the individual "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Classroom** and you are to **perform** all actions.

You are requested to **"talk-through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- You have been requested to verify that the RCU Pump A suction, CU-19A, is open and to observe the pump run.
- You have an accumulated dose (TEDE) of 1920 mr for the year.
- You are the only one available for the job.
- It is expected that you will need to be near the suction valve for approximately 10 minutes, and within the pump room, at low dose areas, for a total of about 15 minutes.

**Initiating Cues:**

Given the Room Survey Map identify the following:

- The dose rate at the valve.
- The lowest dose rate area.
- The highest dose rate area.
- Your expected dose based on the stated job time estimates.

And identify whether or not you will need to get a dose extension to perform this job.

**Task Standards:**

The operator identifies the:

- The dose rate at the valve as 240 mr/hr.
- The lowest dose rate area as 18 mr/hr.
- The highest dose rate area as 250 mr/hr.
- The expected dose as 45.5 mr/hr.
- That a dose extension is NOT needed.

**Required Materials:**

**Handout 1** – Book of survey maps containing at least 12 survey maps, and as a minimum the Radiological Survey Map for the RWCU A and RWCU B Pump Room.

**Simulator Setup:**

N/A

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

**Evaluation**

**Performance Steps**

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

**SAT/UNSAT**

**\*Step 1: Obtain and review survey map.**

Standard: The operator reviews the Book of Survey Maps and identifies Map RB280D for the RCWU A Pump Room.

**SAT/UNSAT**

**\*Step 2: Determine the doserate in the area of CU-19A.**

Standard: The operator reviews the RCWU A Pump Room Survey Map and determines that the dose rate in the vicinity of CU-19A is 240 mr/hr.  
**NOTE:** The operator may use print G191178 to determine which valve on the survey map is the suction valve.

**SAT/UNSAT**

**\*Step 3: Determine area with lowest dose rate.**

Standard: The operator reviews the RCWU A Pump Room Survey Map and determines that the area with the lowest dose rate is 18 mr/hr by the Step-Off pad.

**SAT/UNSAT**

**\*Step 4: Determine area with highest dose rate.**

Standard: The operator reviews the RCWU A Pump Room Survey Map and determines that the area with the highest dose rate is 250 mr/hr.

**SAT/UNSAT**

**\*Step 5: Calculate the expected dose.**

Standard: The operator determines that dose expected at the valve by:

$$240 \text{ mr/hr} \times 10 \text{ minutes} \times 1 \text{ hour}/60 \text{ minutes} = 40 \text{ mr}$$

The operator determines the dose expected at the low dose area by:

$$18 \text{ mr/hr} \times 15 \text{ minutes} \times 1 \text{ hour}/60 \text{ minutes} = 4.5 \text{ mr}$$

The operator determines the total expected dose by adding the dose expected at the valve, and the dose expected in the low dose areas as 44.5 mr.

SAT/UNSAT

**\*Step 6: Identify whether or not a dose extension is needed to perform this job.**

Standard: The operator identifies that the routine admin limit of 2000 mr is imposed, and determines that 80 mr of dose accumulation is allowable for the job.

The operator determines that a dose extension is NOT needed.

\* Critical Step

TIME FINISH: \_\_\_\_\_

Terminating Cue: This JPM is complete.

Evaluator Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

System Generic K/A's: 2.3.4 (3.2/3.7)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- You have been requested to verify that the RCU Pump A suction, CU-19A, is open and to observe the pump run.
- You have an accumulated dose (TEDE) of 1920 mr for the year.
- You are the only one available for the job.
- It is expected that you will need to be near the suction valve for approximately 10 minutes, and within the pump room, at low dose areas, for a total of about 15 minutes.

### **Initiating Cues:**

Given the Room Survey Map identify the following:

- The dose rate at the valve.
- The lowest dose rate area.
- The highest dose rate area.
- Your expected dose based on the stated job time estimates.

And identify whether or not you will need to get a dose extension to perform this job.

**VERMONT YANKEE NUCLEAR POWER CORPORATION  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009**

**Task Identification:**

Title: Authorize Emergency Exposure Limits  
Failure Mode: N/A  
Reference: OP 3507, Emergency Radiation Exposure Control, (Rev. 39)  
Task Number: 34302903

**Task Performance:** AO/RO/SRO  RO/SRO  SRO Only

Sequence Critical: Yes  No

Time Critical: Yes  No

Operator Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation  Performance  Discuss

Setting: Classroom  Simulator  Plant

Performance Expected Completion Time: 10 minutes

**Evaluation Results:**

Performance: PASS \_\_\_\_\_ FAIL \_\_\_\_\_

Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_  
Operations Training Instructor

\_\_\_\_\_  
Date

Reviewed by: \_\_\_\_\_  
SRO Licensed/Certified Reviewer

\_\_\_\_\_  
Date

Approved by: \_\_\_\_\_  
Operations Training Manager

\_\_\_\_\_  
Date

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Classroom** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- With the plant shutting down due to failed fuel causing high Reactor Coolant System Activity, a LOCA Outside of Containment occurred.
- A Site Evacuation is in progress in accordance with Attachment 9.7 of OP 3540 (General Emergency Announcement).
- An RP Technician reports that an operator working with him in the Reactor Building has fallen and is severely injured. He has moved the injured person to an area that is somewhat shielded. Due to rapidly increasing dose rates, the RP Technician leaves to get help. He believes the injuries are life-threatening. He also stated that the individual could be retrieved but it would take two people to do so.
- The RP Technician estimates that it will take at least ten minutes to retrieve the victim.
- Reactor Building Area Radiation Monitors indicate extremely high radiation levels.
- Dose rates at the area needing access are 420 Rem/Hr.
- The Senior Radiation Protection representative has already concurred with the dose exposure authorization.

**Initiating Cues:**

As the Shift Manager, select two rescuers from those individuals available in accordance with Attachments 9.1 and 9.5 of OP 3507, Emergency Radiation Exposure Control; and then complete the Emergency Dose Commitment portion of Attachment 9.8 to approve the Emergency exposure.

**Task Standards:**

The operator chooses Madigan and Walker as rescuers and completes the Emergency Dose Commitment Authorized portion of Attachment 9.8 of OP 3507.

**Required Materials:**

**Handout 1** – List of Available Rescuers in Control Room (Page 6 of 7 of this JPM).

**Handout 2** – OP 3507, Emergency Radiation Exposure Control, (Rev 39)

Calculator

**Simulator Set-Up:**

NA

**Provide Candidate with Initial Conditions/Cue, and Handout 1 (Last two Pages of this JPM).**

**Evaluation**

**Performance Steps**

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

**SAT/UNSAT**

**Step 1: Obtain Procedure and locates Attachments 9.1, 9.5 and 9.8.**

Standard: The operator obtains OP 3507 and locates Attachments 9.1, 9.5 and 9.8.

Interim Cue:

When it is apparent that the operator is seeking to find OP 3507, Examiner provide copy (**Handout 2**).

**SAT/UNSAT**

**\*Step 2: As the Plant Emergency Director, select two rescuers from those individuals available in accordance with Attachments 9.1 and 9.5 of OP 3507, Emergency Radiation Exposure Control.**

Standard: The operator recognizes from initial conditions that Dose rates at the area needing access is greater than 420 Rem/Hr, and that based on 10 minute rescue time, each individual could receive as much as 70 Rem.

The operator determines that rescuers will need to be authorized to receive Emergency Exposure Dose Limits.

The operator reviews List of Available Rescuers in Control Room and determines qualification of potential rescuers.

The operator determines that Jaffe cannot be dispatched as a rescuer (Showing signs of pregnancy).

The operator determines that Gibbs cannot be dispatched as a rescuer (Does NOT Volunteer).

The operator determines that Pearson cannot be dispatched as a rescuer (Has too much Lifetime Exposure).

The operator determines that Fiske cannot be dispatched as a rescuer (Only STA – TRM/OP0894 requires her in Control Room).

The operator determines that Taylor cannot be dispatched as a rescuer (Too young).

The operator selects Madigan and Walker as rescuers.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 3: As the Plant Emergency Director, complete Attachment 9.8 to approve the Emergency exposure.**

---

Interim Cue: When asked provide Job Number, 047 and RWP number 09-003.

---

Standard: The operator places 70-75 REM in the Individual TEDE Dose Commitment Authorized block on Page 1 of Attachment 9.8 (Emergency Dose Commitment Authorized Section).

The operator places 140-150 REM in the TEDE Dose Commitment Authorized Collective For Task block on Page 1 of Attachment 9.8 (Emergency Dose Commitment Authorized Section).

The operator approves the Emergency Dose by signing their name in the Approved By block on Page 1 of Attachment 9.8 (Emergency Dose Commitment Authorized Section).

The operator asks the RP Technician to brief Madigan and Walker in accordance with Attachment 9.8.

\*Critical Step

TIME FINISH: \_\_\_\_\_

Terminating Cue: This JPM is complete.

Evaluator Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

System Generic K/A's: 2.3.4 (3.2/3.7)

**Handout 1: List of Available Rescuers in Control Room:**

RP Badge #	Name	Gender/ Age	Job Assignment	Employer	Current Exposure (yr)	Lifetime Exposure	Special Status
12345	Gibbs	Male/ 49	Maintenance	VY	1800 mr	5.2 R	Would prefer not to go/ Reports good physical health
12456	Madigan	Female/ 48	Engineer	VY	45 mr	400 mr	Volunteers/ Reports good physical health
12567	Pearson	Male /45	NLO	VY	125 mr	35.4 R	Volunteers/ Reports good physical health
12579	Walker	Male/ 52	Training Supervisor	VY	6 mr	1400 mr	Volunteers/Reports good physical health
12110	Jaffe	Female/ 32	Security Supervisor	VY	10 mr	65 mr	Showing signs but NOT Declared Pregnant/Volunteers/ Reports good physical health
12238	Fiske	Female/ 46	STA	VY	4 mr	120 mr	Volunteers/Only STA qualified individual in Control Room.
12198	Woods	Male/ 34	U2 BOP	VY	78 mr	1.7 R	Volunteers/ Reports good physical health

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- With the plant shutting down due to failed fuel causing high Reactor Coolant System Activity, a LOCA Outside of Containment occurred.
- A Site Evacuation is in progress in accordance with Attachment 9.7 of OP 3540 (General Emergency Announcement).
- An RP Technician reports that an operator working with him in the Reactor Building has fallen and is severely injured. He has moved the injured person to an area that is somewhat shielded. Due to rapidly increasing dose rates, the RP Technician leaves to get help. He believes the injuries are life-threatening. He also stated that the individual could be retrieved but it would take two people to do so.
- The RP Technician estimates that it will take at least ten minutes to retrieve the victim.
- Reactor Building Area Radiation Monitors indicate extremely high radiation levels.
- Dose rates at the area needing access are 420 Rem/Hr.
- The Senior Radiation Protection representative has already concurred with the dose exposure authorization.

### **Initiating Cues:**

As the Shift Manager, select two rescuers from those individuals available in accordance with Attachments 9.1 and 9.5 of OP 3507, Emergency Radiation Exposure Control; and then complete the Emergency Dose Commitment portion of Attachment 9.8 to approve the Emergency exposure.

VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009

**Task Identification:**

Title: Perform Control Room Emergency Communications Checks  
Failure Mode: N/A  
Reference: OP 3506, Emergency Equipment Readiness Check, (Rev. 62)  
Task Number: 2997270301

**Task Performance:** AO/RO/SRO \_\_\_ RO/SRO X SRO Only \_\_\_

Sequence Critical: Yes \_\_\_ No X

Time Critical: Yes \_\_\_ No X

Individual Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation \_\_\_ Performance X Discuss

Setting: Classroom \_\_\_ Simulator X Plant

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS \_\_\_ FAIL \_\_\_ Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_  
Operations Training Instructor Date

Reviewed by: \_\_\_\_\_  
SRO Licensed/Certified Reviewer Date

Approved by: \_\_\_\_\_  
Operations Training Manager Date

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the individual has failed the Job Performance Measure.

After providing the initiating cue, ask the individual "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** all actions.

You are requested to **"talk-through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

The plant is operating at 100% power with all systems operable.

**Initiating Cues:**

The CRS directs you to perform the Monthly Communications Checks in accordance with Section 5.1.1 and 5.1.2 of OP 3506 and to complete any associated paperwork.

**Task Standards:**

One of the five State Police Agencies, the Group Call, and the ENS phone notification systems are tested in accordance with Section 5.1 of OP 3506, and the results are recorded on Attachment 9.1 of OP 3506.

**Required Materials:**

**Handout 1** - OP 3506, Emergency Equipment Readiness Check (Rev. 62)

**Simulator Setup:**

Reset to IC -820.

This JPM should be conducted simultaneously with A1a SRO.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

Evaluation

Performance Steps

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

SAT/UNSAT

**Step 1: Acquire OP 3506 and review procedure.**

Standard: The operator acquires OP 3506 and reviews Section 5.1.

Interim Cue:

When it is apparent that the operator is seeking to find OP 3506, Examiner provides copy (**Handout 1**).

SAT/UNSAT

**Step 2: (NOTES prior to Step 5.1):**

**The quantities listed in this procedure are to be considered the minimum required. Quantities above those listed are acceptable. Pens, pencils and scratch paper are readily available and therefore will not be maintained in the EOF and TSC kits. Material location may change as long as the material remains within the facility.**

Standard: The operator reads the Notes and proceeds to Step 5.1.

SAT/UNSAT

**Step 3: (Step 5.1/5.1.1) Control Room Emergency Communications Check (Operations) (Use Attachment 9.1)**

**Monthly, the Operations Department shall test the Nuclear Alert System by contacting, and requesting a callback from, each of the three states (Vermont, New Hampshire, Massachusetts) using the following procedure:**

Standard: The operator obtains Attachment 9.1 and records date and time.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 4:** **(NOTE prior to Step 5.1.1.a) The 3-digit number initiates a point-to-point call to each of the five State Police agencies. The 2-digit alphanumeric number initiates the group call feature.**

Standard: The operator reads Note and proceeds to Step 5.1.1.a.

SAT/UNSAT

**\*Step 5:** **(Step 5.1.1.a) Lift handset and dial 213 for Waterbury, VT, 317 for Rockingham, VT, 210 for Northampton, MA, 318 for Shelburne, MA, 212 for Concord, NH.**

Standard: The operator lifts the handset and dials 213 for the Waterbury, Vermont Police Station.

---

NOTE:

The Simulator Instructor will answer as "Vermont State Police, Waterbury" and initiate requested callbacks to the operator by dialing phone extension 126.

---

SAT/UNSAT

**Step 6:** **(Caution prior to Step 5.1.1.b) Press down and hold the push-to-talk button on the handset prior to speaking. Release after speaking. Refer to OP 3504 for instructions on use of the NAS phone.**

Standard: The operator reads Caution and proceeds to Step 5.1.1.b.

**Evaluation**

**Performance Steps**

JAT/UNSAT

**\*Step 7: (Step 5.1.1.b) Advise each State Police agency that answers of the test of the Nuclear Alert System, and record the results on Attachment 9.1.**

Standard: The operator presses the “push to talk” button and indicates that “This is the ENVY Control Room, Vernon;” and that “a test of the NAS Phone” is in progress, request a call back and release the button. Then, after acknowledgement, replace the handset.

---

NOTE: The Simulator Instructor will answer as “Vermont State Police, Waterbury” and initiate requested callbacks to the operator by dialing phone extension 126.

---

When the NAS Phone rings back, the operator will pick up the handset, press the “push to talk” button and indicate that “This is the ENVY Control Room, Vernon,” releasing the button after speaking.

After hearing of the test in progress from the initiating station, the operator will press the “push to talk” pushbutton, acknowledge the test, release the button, and replace the handset.

The operator records the successful test by checking the YES Box on Attachment 9.1, Section A.1, for Waterbury, Vermont (213), and the associated YES Box for the callback.

---

NOTE: Only one of the calls to the five State Police Agencies will be performed.

Interim Cue: Examiner inform operator that subsequent NAS Phone Tests to Rockingham, Vermont, Concord, New Hampshire, Northampton, Massachusetts, and Shelburne Falls, Massachusetts, have been completed satisfactorily.

---

After cue, the operator records the successful tests by checking the YES Boxes on Attachment 9.1, Section A.1, for Rockingham, Vermont, Concord, New Hampshire, Northampton, Massachusetts, and Shelburne Falls, Massachusetts, and the associated YES Boxes for the callback.

**Evaluation**

**Performance Steps**

**SAT/UNSAT**

**\*Step 8: (Step 5.1.1.c) Test the Group Call capability with the five State Police agencies by lifting handset and dialing A1. State Emergency Operations facilities may also answer, but are not required for the test. After the test is complete disconnect the group call by dialing A#, then hang up handset.**

Standard: The operator picks up the handset, and recognizes that no one else is on the line.

The operator dials A1 and waits for the five State Police Agencies to respond.

NOTE

The Simulator operator will answer as each state police agency as follows:

- Massachusetts State Police, Troop B – Northampton
- Massachusetts State Police, Shelburne Falls
- New Hampshire State Police, Concord
- Vermont State Police, Waterbury
- Vermont Secondary Warning Point – Rockingham

After hearing the five Police Agencies respond, the operator presses the “push to talk” button and indicates that “This is the ENVY Control Room, Vernon;” and that “a test of the NAS Phone” is in progress.

NOTE

Once made aware of the test, the Simulator operator will acknowledge the test as each state police agency.

After the acknowledgement of all five agencies, the operator disconnects the Group Call by pressing the A#, and replacing the handset.

The operator records the successful test by checking the YES Box on Attachment 9.1, Section A.6, for Successful Group Call Test with VT/NH/MA(A1).

**SAT/UNSAT**

**Step 9: (Step 5.1.1.d) If any part of the NAS system fails to operate.....**

Standard: The operator recognizes that the NAS did NOT fail to operate, and proceeds to Step 5.1.1.e.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 10: (Step 5.1.1.e) Notify the affected state Emergency Management office if any part of the system fails to operate.**

Standard: The operator recognizes that the NAS did NOT fail to operate, and proceeds to Step 5.1.2.

SAT/UNSAT

**\*Step 11: (Step 5.1.2/5.1.2.a) Monthly the Operations Department shall test the NRC FTS ENS phone in the Control Room as follows: Lift the receiver and listen for the dial tone.**

Standard: The operator lifts the handset and listens for a dial tone.

SAT/UNSAT

**\*Step 12: (Step 5.1.2.b) After receiving a dial tone, dial the first number listed below (or on the sticker located on the telephone base) using all 11 digits. If the first number is busy, proceed with the second number.**  
**1-301-816-5100**  
**1-301-951-0550**

---

Examiner NOTE: Examiner ask the operator what the actual phone number to be used would be.

---

Standard: The operator indicates that they would dial 1-301-816-5100.

---

Interim Cue: Examiner direct the operator to dial 4050.

---

Standard: The operator dials 4050.

---

NOTE: Simulator Instructor answer as NRC Operations Center.

---

**Evaluation**

**Performance Steps**

**JAT/UNSAT**

**\*Step 13: (Step 5.1.2.c) State your name, location, and the fact that you are testing the NRC ENS. Request that the NRC staff member call back at 700-661-4323.**

Standard: Operator informs NRC operator who he is, where he is calling from, that he is testing the ENS, and requests callback at 700-661-4323.

---

Note: Simulator operator will acknowledge call as NRC operator, and will initiate callback using the "NRC to Control Room" auto dial button.

---

Standard: When the ENS Phone rings back, the operator will pick up the handset, and indicate that "This is the ENVY Control Room, Vernon."

After hearing of the test in progress from the NRC, the operator will acknowledge the test, and replace the handset.

The operator records the successful test by checking the YES Box on Attachment 9.1, Section B.1 for Successful Test with the NRC, and Section B.2 for Callback from the NRC Successful.

TIME FINISH: \_\_\_\_\_

**Terminating Cue:** This JPM is complete.

**Evaluator Comments:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**System Generic K/A's:** 2.4.43 (3.2/3.8)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

The plant is operating at 100% power with all systems operable.

### **Initiating Cues:**

The CRS directs you to perform the Monthly Communications Checks in accordance with Section 5.1.1 and 5.1.2 of OP 3506 and to complete any associated paperwork.

**VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009**

**Task Identification:**

Title: Off-Site Protective Action Recommendations (evacuate)  
Failure Mode: N/A  
Reference: OP 3511 Off-Site Protective Action Recommendations, (Rev. 26)  
OP 3513, Evaluation of Offsite Radiological Conditions, (Rev. 33)  
Task Number: 2007150501

**Task Performance:** AO/RO/SRO  RO/SRO  SRO Only

Sequence Critical: Yes  No

Time Critical: Yes  No

Operator Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation  Performance  Discuss

Setting: Classroom  Simulator  Plant

Performance Expected Completion Time: 20 minutes

Evaluation Results:

Performance: PASS  FAIL  Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Instructor

Reviewed by: \_\_\_\_\_ Date \_\_\_\_\_  
SRO Licensed/Certified Reviewer

Approved by: \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Manager

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- A reactor transient has occurred resulting in fuel damage.
- An elevated release through the plant stack has just begun, and a General Emergency EAL has been declared 5 minutes ago.
- There is no ground release in progress.
- Another SRO has been assigned to Use OP 3511, Off-Site Protective Action Recommendations, Section 5.6, Protective Action Recommendation Based on Plant Conditions, Attachment 9.4, General Emergency Protective Action Recommendations (PARs) Flowchart.
- ODPS is operable.
- The EOF is NOT yet manned.

**Initiating Cues:**

You have been assigned by the PED to implement OP 3513, Evaluation of Off-Site Radiological Conditions, Section 5.9, Initial Evaluation; and prepare a PAR based on Off-Site Radiological Conditions and return it to the PED.

**Task Standards:**

Operator makes off site Protective Action Recommendations per OP 3511 and OP 3513 and transmits to the PED indicating that Vernon, Hinsdale, Bernardston and Northfield must be evacuated.

**Required Materials:**

**Handout 1** - OP 3513, Evaluation of Offsite Radiological Conditions (Rev. 33)

**Handout 2** - OP 3511, Off-Site Protective Action Recommendations (Rev. 25)

**Handout 3** – Completed PAR based on Plant Conditions (Attachment 9.5 of OP3511) filled out as follows:

Current Date  
Current Time

Section I – an “S” is placed in front of Guilford, Vernon, Hinsdale, Winchester, Bernardston, and Northfield.

Approved By and Date/Time (This PAR should be accomplished just a few minutes before the operator needs to use the completed PAR)

Shift Manager Box Checked

This JPM requires the use of a Computer with ODPS capability, and the ERFIS Printer to be available for printing.

**Simulator Setup:**

Any full power IC.

Insert malfunction RMO1F at .04 (4000 mr/hr).

Ensure all HVAC systems are normal and no group 3 isolation is present.

Ensure that simulator is in RUN for a minimum of 15 minutes prior to conduct of JPM to allow Met Data average readings to stabilize.

**OR**

Reset to IC-824

**Examiner Notes:**

**This JPM should be conducted simultaneously with A1a RO.**

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

**Evaluation**

**Performance Steps**

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

SAT/UNSAT

**Step 1: Obtain Procedure OP 3513.**

Standard: The operator obtains OP 3513.

The operator turns to Section 5.9, Initial Evaluation.

---

Interim Cue:

When it is apparent that the operator is seeking to find OP 3513, Examiner provides copy (**Handout 1**).

---

SAT/UNSAT

**Step 2: (Steps 5.9.1/5.9.1.a) Immediate Action by the SM/PED or Designated Plant Staff Member. Upon receiving an indication of a significant release of radioactivity is occurring and the EOF has not been activated, initiate or assign a qualified individual to perform the appropriate calculations in this procedure to evaluate the off-site radiological conditions.**

Standard: The operator recognizes that they have been assigned to evaluate the off-site radiological conditions and proceeds to Step 5.9.1.b.

SAT/UNSAT

**Step 3: (NOTE prior to Step 5.9.1.b) Attachment 9.11 is a flow chart available to assist in the identification of dose assessment activities to be considered and implemented.**

Standard: The operator reads the Note, refers to Attachment 9.11, and proceeds to Step 5.9.1.b.

<u>Evaluation</u>	<u>Performance Steps</u>
SAT/UNSAT	<p><b><u>Step 4: (Step 5.9.1.b) For an actual ground release.....</u></b></p> <p>Standard: The operator recognizes that a ground release is NOT in progress, and proceeds to Step 5.9.1.c.</p>
SAT/UNSAT	<p><b><u>*Step 5: (Step 5.9.1.c) If the Stack High Range Monitor equals or exceeds 20 mR/hr, request the Chemistry Technician to obtain a silver zeolite cartridge air sample from the main stack sample point for an iodine release rate determination.</u></b></p> <p>Standard: The operator observes the Stack High Range Monitor to be reading 4000 mr/hr.</p> <p>The operator contact and directs the Chemistry Technician to obtain a silver zeolite cartridge air sample from the main stack sample point for an iodine release rate determination.</p>
Interim Cue:	<hr/> <p>When action is taken, Examiner inform operator that the Chemistry Technician acknowledges.</p> <hr/>
SAT/UNSAT	<p><b><u>*Step 6: (Step 5.9.1.d) If ODPS is operable, then implement Attachment 9.5 to access off-site dose projection information from ODPS.</u></b></p> <p>Standard: The operator proceeds to Attachment 9.5.</p>
SAT/UNSAT	<p><b><u>Step 7: (Attachment 9.5, Steps 1, 1.a and NOTE prior top Step 1.a.1) Obtain the necessary off-site dose projection information for stack and ground release as follows: IF A STACK RELEASE IS OCCURRING: Meteorological and source term data are automatically input to model. Manual input of data is not necessary.</u></b></p> <p>Standard: The operator reads the Note and proceeds top Step 1.a.1.</p>

valuation

Performance Steps

SAT/UNSAT

**Step 8:** **(Step 1.a.1) Click the "ODPS" menu item on the RTIME menu bar to access the "ODPS Menu"; OR if the workstation has an ERFIS terminal keyboard, press the "ODPS" key.**

Standard: The operator accesses ODPS to "ODPS Menu" screen.

SAT/UNSAT

**Step 9:** **(Step 1.a.2) Click on the "SOURCE TERM DATA" box to display screen.**

Standard: The operator Clicks on the "SOURCE TERM DATA" box, and observes VYOPF 3513.01 "Source Term Data" screen.

SAT/UNSAT

**Step 10:** **(NOTE prior to Step 1.a.3) ERFIS Printer must be on-line now.**

Standard: The operator reads the Note, and proceeds to Step 1.a.3.

SAT/UNSAT

**Step 11** **(Step 1.a.3) Click on the PRINTER icon to obtain record of stack release projection information (Reactor Trip Status and Stack).**

Standard: The operator Clicks on the PRINTER icon, and obtains the printout.

SAT/UNSAT

**Step 12:** **(Step 1.a.4) Click the "ODPS" menu item on the RTIME menu bar to access the "ODPS Menu"; OR if the workstation has an ERFIS terminal keyboard, press the "ODPS" key.**

Standard: The operator clicks the "ODPS" menu item on the RTIME menu bar; OR if the workstation has an ERFIS terminal keyboard, presses the "ODPS" key.

SAT/UNSAT

**Step 13:** **(Step 1.a.5) Click on the "PROTECTIVE ACTION RECOMMENDATIONS LIVE STACK MR/HR" box to display screen.**

Standard: The operator clicks on the "PROTECTIVE ACTION RECOMMENDATIONS LIVE STACK MR/HR" box.

SAT/UNSAT

**Step 14:** **(Step 1.a.6) If ODPS aborts due to bad input (as indicated on screen display).....**

Standard: The operator recognizes that ODPS does NOT abort, and proceeds to Step 1.a.7.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 15: (Step 1.a.7) When "PROTECTIVE ACTION RECOMMENDATION" screen is displayed, click on the PRINTER icon to obtain stack release off-site dose projection information.**

Standard: When the "PROTECTIVE ACTION RECOMMENDATION" screen is displayed, the operator clicks on the PRINTER icon, and obtains the printout.

SAT/UNSAT

**Step 16: (Step 1.a.8) Click the "ODPS" menu item on the RTIME menu bar to access the "ODPS Menu"; OR if the workstation has an ERFIS terminal keyboard, press the "ODPS" key.**

Standard: The operator clicks the "ODPS" menu item on the RTIME menu bar to; OR if the workstation has an ERFIS terminal keyboard, presses the "ODPS" key.

SAT/UNSAT

**Step 17: (Step 1.a.9) If no ground release is occurring, skip Attachment 9.5, Step 1.b for ground release and then continue with Attachment 9.5, Step 2.**

Standard: The operator recognizes that there is no ground release in progress, and proceeds to Step 2 of Attachment 9.5.

SAT/UNSAT

**Step 18: (Steps 2/2.a) Use printed screen information from above to do the following: If multiple release points exist (stack and ground),.....**

Standard: The operator recognizes that only one release point exists, and proceeds to Step 2.b.

SAT/UNSAT

**Step 19: (Steps 2.b/2.b.1) If only one release point exists (stack or ground), then continue with the following actions: Implement OP 3511 Section 5.7 Step 5.7.5 to formulate Protective Action Recommendations for State authorities.**

Standard: The operator recognizes that only one release point exists, and seeks to find OP3511.

The operator proceeds to Step 5.7.5.

---

Interim Cue:

When it is apparent that the operator is seeking to find OP3511, Examiner provides copy (**Handout 2**).

---

<u>Evaluation</u>	<u>Performance Steps</u>
SAT/UNSAT	<p><b><u>*Step 20:</u></b> <b><u>(Step 5.7.5/5.7.5.a) Determine appropriate Protective Action Recommendations (PAR) as follows: (Use Section II of Attachment 9.5) Compare the calculated dose projection results with EPA Protective Action Guidelines delineated below to determine whether EPA Protective Action Guidelines have been exceeded. If the EPA Protective Action Guidelines have not been exceeded, then complete Attachment 9.5 Section II, indicating that there is no PAR based on radiological conditions.</u></b></p> <p>Standard: The operator uses information from ODPS or obtained in previous printout and notes that Total Effective Dose is &gt;1 REM between the Site Boundary and 5 miles and recognizes that evacuation is needed.</p>
SAT/UNSAT	<p><b><u>Step 21:</u></b> <b><u>(Step 5.7.5.b) Attachment 9.2 and Attachment 9.3 are conservatively based on METPAC plume trajectories, the river valley effect for stability classes E, F and G, and plume width.</u></b></p> <p>Standard: The operator reads step and proceeds to Note prior to Step 5.7.5.c.</p>
SAT/UNSAT	<p><b><u>Step 22:</u></b> <b><u>(NOTE prior to Step 5.7.5.c) The Town of Marlboro, VT is not a VY EPZ town.</u></b></p> <p>Standard: The operator reads Note and proceeds to Step 5.7.5.c.</p>
SAT/UNSAT	<p><b><u>Step 23:</u></b> <b><u>(Step 5.7.5.c) In the EOF, in the initial stages of the event, the plume trajectory is determined by calculating a "what if" METPAC 10-mile plume projection with a default source term and actual meteorology using the METPAC Batch Mode with 8 time steps per OP 3513, Attachment 9.9</u></b></p> <p>Standard: The operator recognizes that the EOF is NOT manned, and proceeds to Step 5.7.5.d.</p>
SAT/UNSAT	<p><b><u>Step 24:</u></b> <b><u>(Step 5.7.5.d) In all cases, use the field team data to verify the actual downwind direction of the plume. Adjust the PAR as appropriate.</u></b></p> <p>Standard: The operator recognizes that the Field Team data and the ODPS data are the same, and proceeds to Step 5.7.5.e.1.</p>
Interim Cue:	Examiner inform the operator that the Field Team data reflects the ODPS data.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 25: (Step 5.7.5.e/(3)) Choose the towns affected by the PAR as follows: If ODPS shows that the PAR (evacuation) is exceeded between the site boundary and five miles, then use Attachment 9.3 and appropriate meteorological data (wind direction and stability class) to obtain affected towns out to five miles downwind.**

Standard: The operator observes that ODPS shows that the PAR is exceeded between five miles and the Site Boundary.

The operator observes the previously obtained printout and determines the wind direction to be 3-7°.

The operator observes the previously obtained printout and determines the Stability Class to be A.

The operator refers to Attachment 9.3, using Sector A (3-7°), with a Stability Class A, and determines that Vernon, Hinsdale, Bernardston and Northfield must be evacuated.

AT/UNSAT

**Step 26: (Step 5.7.5.f) Any prior protective action recommendations that are still in effect should be included with updated information and documentation (Attachment 9.5).**

Standard: The operator recognizes that an initial PAR is being prepared by another operator, and proceeds to Step 5.7.5.g.

---

Interim Cue:

When the operator is seeking any previous PARs, Examiner provide the PAR completed minutes earlier based on Plant Conditions (**Handout 3**).

---

SAT/UNSAT

**Step 27: (Step 5.7.5.g) Barring impediments, (e.g., weather or a competing disaster) once a town has been recommended to evacuate, the more conservative action will be followed even if updated analyses or conditions indicate that sheltering in place would be sufficient.**

Standard: The operator recognizes that an initial PAR is being prepared by another operator, and proceeds to Step 5.7.5.h.

---

Interim Cue:

If asked, Examiner cue the operator that there is no unusual weather conditions, nor is there a competing disaster.

<u>Valuation</u>	<u>Performance Steps</u>
SAT/UNSAT	<b>*Step 28: <u>(Step 5.7.5.h) Record appropriate PAR information in Section II of Attachment 9.5.</u></b>
	Standard: The operator records the current Date and Time on Attachment 9.5.
	The operator places an "E" in the Vermont Town of Vernon, and the New Hampshire Towns of Hinsdale, the Massachusetts Towns of Bernardston and Northfield on Section II of Attachment 9.5.
	The operator places a check in the "ODPS" Box on Section II of Attachment 9.5.
	The operator places their name in the "Performed By" Box on Section II of Attachment 9.5.
	The operator seeks and independent verification of the PAR.

---

Interim Cue: Examiner as independent verifier, sign Attachment 9.5 independent verification.

---

SAT/UNSAT	<b>Step 29: <u>(Step 5.7.6) Forward completed Attachment 9.5 to the Site Recovery Manager or senior manager in charge.</u></b>
-----------	--

Standard: The operator presents the completed Attachment 9.5 to the PED, and indicates that the initial PAR either has been recently prepared, or is still in progress.

\* Critical Step

TIME FINISH: \_\_\_\_\_

Terminating Cue: This completes the JPM.

Evaluator Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

System Generic K/A's: 2.4.44 (2.4/4.4)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- A reactor transient has occurred resulting in fuel damage.
- An elevated release through the plant stack has just begun, and a General Emergency EAL has been declared 5 minutes ago.
- There is no ground release in progress.
- Another SRO has been assigned to Use OP 3511, Off-Site Protective Action Recommendations Section 5.6, Protective Action Recommendation Based on Plant Conditions, Attachment 9.4, General Emergency Protective Action Recommendations (PARs) Flowchart.
- ODPS is operable.
- The EOF is NOT yet manned.

### **Initiating Cues:**

You have been assigned by the PED to implement OP 3513, Evaluation of Off-Site Radiological Conditions, Section 5.9, Initial Evaluation; and prepare a PAR based on Off-Site Radiological Conditions and return it to the PED.

**VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009**

**Task Identification:**

Title: Shift Rx Level Control From The Main Feed Reg Valve To The Auxiliary Feed  
Reg Valve  
Failure Mode: Aux Feed Reg Valve Controller fails such that valve fully opens  
Reference: OP 0105, Reactor Operations, (Rev. 86)  
EN-OP-115, Conduct of Operations, (Rev. 6)  
Task Number: 2590060101, 2590070101, 2590080101

**Task Performance:** AO/RO/SRO \_\_\_ RO/SRO X SRO Only \_\_\_

Sequence Critical: Yes \_\_\_ No X

Time Critical: Yes \_\_\_ No X

Operator Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation \_\_\_ Performance X Discuss \_\_\_

Setting: Classroom \_\_\_ Simulator X Plant \_\_\_\_\_

Performance Expected Completion Time: 17 minutes

Evaluation Results:

Performance: PASS \_\_\_ FAIL \_\_\_

Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_

Operations Training Instructor

\_\_\_\_\_ Date

Reviewed by: \_\_\_\_\_

SRO Licensed/Certified Reviewer

\_\_\_\_\_ Date

Approved by: \_\_\_\_\_

Operations Training Superintendent

\_\_\_\_\_ Date

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- A normal plant shutdown in progress.
- Reactor Power is  $\approx$  5-10%.
- OP 0105, Reactor Operations Phase 5C, is completed through Step 2.b.6.g.

**Initiating Cues:**

The CRS directs you to transfer Rx level control from the A FRV to the Auxiliary FRV in accordance with OP 0105, Phase 5C, Step 2.c (Page 136 of 152).

**Task Standards:**

The operator shifts the Reactor level control in accordance with procedures from the Main Feed Reg Valve to the Aux Feed Reg Valve, and then responds to a failure of the Aux Feed Reg Valve Control by placing the controller in MANUAL, and controlling Reactor level manually.

**Required Materials:**

**Handout 1** - OP 0105, Reactor Operations, (Rev. 86)

**Simulator Setup:**

Reset to IC-8

Lower power to 5-10% using OP0105.

Ensure "A" FRV in Auto with "V" displayed on Controller.

Ensure "B" FRV in Manual and closed.

Ensure FDW-11B is closed.

Insert FDW-13 Controller failure to open valve fully (malf FW\_13 to 100% with no ramp) on Key 1.

**OR**

Reset to IC-850

Ensure "A" FRV in Auto with "V" displayed on Controller.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

**Evaluation**

**Performance Steps**

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

SAT/UNSAT

**Step 1: Obtain Procedure.**

Standard: The operator obtains OP 0105, Rev 86.

Proceeds to Step 2.c of Phase 5C, Page 136 of 152.

Interim Cue:

When it is apparent that the operator is seeking to find OP 0105, Examiner provides copy (**Handout 1**).

SAT/UNSAT

**\*Step 2: (Step 2.c.1/2.c.1.a-b) In manual, slowly open the aux. feed reg. valve as follows:  
On AUX FEED REG VLV FDW-13 CONTROLLER use the display pushbutton to display AUXFRV.V.  
Adjust output as required by plant conditions using the adjustment knob.**

Standard: The operator presses the "D" display button until V is displayed (0.0)

The operator turns the knob on the AUX FRV Controller in the clockwise direction to slowly open the FDW-13 valve.

NOTE: The operator may observe FDW-13 Red status lights are ON (two sets, 9-5 and 9-6) (NOT Critical).

SAT/UNSAT

**Step 3: (Step 2.c.2) Check that the main feedwater regulator valve in service closes.**

Standard: As the operator is adjusting the FDW-13 Controller, the operator observes the valve position indication on FDW-13 to be increasing, and valve position on A FRV controller decreases toward 0.

The operator observes Reactor Water Level on LI-6-94A/B in Green Band.

The operator observes the Red status light OFF on FRV A.

Evaluation

Performance Steps

SAT/UNSAT

**\*Step 4:** (Steps 2.c.3/3.a/3.a.1) When the main feedwater regulator valve indicates fully closed perform the following:

Transfer AUX FEED REG VLV FDW-13 CONTROLLER from manual to automatic as follows:

On AUX FEED REG VLV FDW-13 CONTROLLER use the display pushbutton to observe the value of the following:

AUXFRV.S

AUXFRV.P

Standard: The operator observes the valve position indication on A FRV controller at 0.

NOTE: The operator may observe A FRV Red status lights are ON (two sets, 9-5 and 9-6) (NOT Critical).

The operator presses the "D" display button to observe the S and P values.

SAT/UNSAT

**\*Step 5:** (Step 2.c.3.a.2.a-b) Using one or both of the following steps as plant conditions dictate, adjust the FWLC system so that AUXFRV.S and AUXFRV.P indicate the same value.

Adjust AUX FEED REG VLV FDW-13 CONTROLLER to raise/lower reactor water level.

Adjust AUXFRV.S.

Standard: The operator balances S and P by using the controller knob to change RPV level, or by changing the setpoint.

---

NOTE: To change the setpoint, S is selected. To change RPV level P or V is displayed.

---

SAT/UNSAT

**\*Step 6:** (Step 2.c.3.a.3) WHEN AUXFRV.S and AUXFRV.P indicate the same value, on AUX FEED REG VLV FDW-13 CONTROLLER depress the A/M pushbutton.

Standard: The operator observes that P (level) and S (setpoint) are equal by changing the number displayed by using the "D" display pushbutton.

The operator presses the A/M button on the controller.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 7: (Steps 2.c.3.a.3.a-b) On AUX FEED REG VLV FDW-13 CONTROLLER verify the green auto LED illuminates.**

**On AUX FEED REG VLV FDW-13 CONTROLLER verify the red manual LED extinguishes.**

Standard: The operator observes the Green M/A LED is ON.

The operator observes the Red M/A LED is OFF.

SAT/UNSAT

**Step 8: (Steps 2.c.3.a.4/4.a-b) To adjust the AUX FEED REG VLV FDW-13 CONTROLLER setpoint proceed as follows:**

**On AUX FEED REG VLV FDW-13 CONTROLLER use the display pushbutton to display the AUXFRV.S value.**

**Adjust setpoint as required by plant conditions using the adjustment knob.**

Standard: The operator adjusts level as necessary by ensuring S is displayed and changing the setpoint using the knob on the FDW-13 controller.

NOTE: The operator may not need to adjust the controller.

SAT/UNSAT

**\*Step 9: (Step 2.c.3.b) Close BLOCKING VALVE FDW-11A(B) for the main feedwater regulating valve just removed from service.**

Standard: The operator places FDW-11A control switch to close, spring return to normal, and observe Green light to ON and Red light to OFF.

---

SIMULATOR INSTRUCTOR:

When FDW 11A is CLOSED, insert malfunction on FDW-13 Controller causing valve to go full open.

NOTE: Use Panel Override for Panel 9-6 to watch Blocking Valve position.

---

Evaluation

Performance Steps

SAT/UNSAT

**Step 10:** **(Step 2.c.3.c/2.c.3.c.1) Transfer the RX VESSEL LEVEL MASTER CONTROLLER to manual as follows: Verify MASTER.S and MASTER.P indicate the same value THEN depress the A/M pushbutton**

**Verify the green auto LED extinguishes**  
**Verify the red manual LED illuminates**

Standard: The operator presses the "D" display button to observe the S and P values.

When the Reactor level on the Controller is observed, the operator will note that Reactor water level is higher than expected.

NOTE:

If the operator does not notice the unexpectedly high Reactor water level, MCB Annunciator 9-5/E-6, FW CONTROL SYSTEM TROUBLE, will alarm within 1.5-2 minutes, and 9-5/E-1, RX WATER LEVEL HI/LO, will alarm shortly thereafter.

SAT/UNSAT

**\*Step 11:** **(EN-OP-115, Step 5.3) If an automatic control malfunctions, immediately place that control in manual.**

Standard: The operator presses the A/M button on the AUX FEED REG FDW-13 controller.

The operator observes the Red M/A LED is ON and the Green M/A LED is OFF.

The operator adjusts level as necessary by ensuring V is displayed and using the knob on the FDW-13 controller to control level at 160".

TIME FINISH: \_\_\_\_\_

Terminating Cue: This JPM is complete.

Evaluators Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

System: 259002      K/A: A4.01 (3.8/3.6)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- A normal plant shutdown in progress.
- Reactor Power is  $\approx$  5-10%.
- OP 0105, Reactor Operations Phase 5C, is completed through Step 2.b.6.g.

### **Initiating Cues:**

The CRS directs you to transfer Rx level control from the A FRV to the Auxiliary FRV in accordance with OP 0105, Phase 5C, Step 2.c (Page 136 of 152).

**VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009**

**Task Identification:**

Title: Swap Pressure Regulators (EPR to MPR)  
Failure Mode: N/A  
Reference: OP 2160, "Turbine Generator Support Systems Operation," (Rev. 24)  
Task Number: 241000

**Task Performance:**

AO/RO/SRO  RO/SRO Only  SE Only

Sequence Critical: Yes  No

Time Critical: Yes  No

Individual Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation  Performance  Discuss

Setting: Classroom  Simulator  Plant

Performance Expected Completion Time: 13 minutes

Evaluation Results:

Performance: PASS  FAIL

Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_

Operations Training Instructor

\_\_\_\_\_ Date

Reviewed by: \_\_\_\_\_

SRO Licensed/Certified Reviewer

\_\_\_\_\_ Date

Approved by: \_\_\_\_\_

Operations Training Superintendent

\_\_\_\_\_ Date

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the individual has failed the Job Performance Measure.

After providing the initiating cue, ask the individual "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** all actions.

You are requested to **"talk-through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- The plant is operating normally at power
- The white light for the EPR Regulator is lit.

**Initiating Cues:**

The CRS directs you to transfer control from the EPR to the MPR and secure the EPR for I&C maintenance using Section B.1 of OP 2160, Turbine Generator Support Systems Operation.

**Task Standards:**

The MPR is placed in service in accordance with Procedure OP 2160, Section B.1.

**Required Materials:**

**Handout 1** - OP 2160, Turbine Generator Support Systems Operation, (Rev. 24)

**Simulator Setup:**

- 100% power
- EPR Regulator in service

**OR**

- Reset to IC 854
- Adjust MPR Stroke to ~ 10% less than EPR Stroke

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

**Evaluation**

**Performance Steps**

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

SAT/UNSAT

**Step 1: Obtain Procedure.**

Standard: The operator obtains OP 2160, Rev 24.

Proceeds to Section B.1, Swapping Pressure Regulators.

Interim Cue:

When it is apparent that the operator is seeking to find OP 2160, Examiner provides copy (**Handout 1**).

SAT/UNSAT

**Step 2: (Steps 1/1.a) If desired, transfer pressure control from EPR to MPR (White light lit for EPR) as follows: If time permits, verify that the MPR pilot bushing is rotating.**

Standard: The operator contacts the AO and directs that the MPR pilot bushing be verified rotating.

Interim Cue:

As AO, Examiner inform the operator that the MPR pilot bushing is rotating.

SAT/UNSAT

**Step 3: (Step 1.b) Verify MPR OUTPUT STROKE is approximately 10% below EPR OUTPUT STROKE setting.**

Standard: The operator observes stroke on MPR Stroke (POI-110-22) and EPR Stroke (POI-110-24), compares the two and determines that MPR Output Stroke is ~ 10% below EPR Output Stroke.

SAT/UNSAT

**Step 4: (Step 1.c) Verify bulb for oncoming pressure regulator is sound.**

Standard: The operator removes MPR white light bulb and places bulb in a known-energized lamp socket to verify that the bulb is good, then replaces bulb in the MPR white light socket, or verifies it is sound by observing the intact filament.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 5: (Step 1.d) Using MPR SET-POINT switch, slowly lower the MPR SET-POINT by going to LOWER until the MPR OUTPUT STROKE moves in the direction of the EPR OUTPUT STROKE setting.**

Standard: The operator rotates MPR Output Switch to the LOWER position, and observes that the MPR Output Stroke (POI-110-22) moves in the direction of the EPR Output Stroke (POI-110-24) setting.

SAT/UNSAT

**Step 6: (NOTES prior to Step 1.e) Both white lights will be lit for a brief time and then only the light for the MPR will be lit. Reactor pressure may drop slightly following regulator transfer.**

Standard: The operator reads the Notes and proceeds to Step 1.e.

SAT/UNSAT

**\*Step 7: (Step 1.e) Continue to slowly lower the MPR SET-POINT until the MPR begins to take control**

Standard: The operator rotates MPR Output Switch to the LOWER position, and observes that the MPR Output Stroke (POI-110-22) moves in the direction of the EPR Output Stroke (POI-11-24) setting until the MPR takes control.

SAT/UNSAT

**Step 8: (Step 1.f.1) Verify MPR has pressure control as follows: Verify white light above MPR SET-POINT switch is illuminated.**

Standard: The operator observes the White light above MPR Setpoint Switch is ON.

---

NOTE:

Both the MPR and EPR White lights are ON.

---

SAT/UNSAT

**Step 9: (Step 1.f.2) Verify white light above EPR SET-POINT switch is extinguished**

Standard: The operator observes the White light above EPR Setpoint Switch is OFF.

SAT/UNSAT

**Step 10: (Step 1.f.3) On CRP 9-5, verify stable reactor pressure.**

Standard: The operator observes reactor pressure constant (as indicated on CRP 9-5).

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 11: (Step 1.g) If either pressure regulator fails to control pressure, refer to OT 3115, Reactor Pressure Transients, for immediate actions.**

Standard: The operator observes that the MPR is controlling pressure and proceeds to Step 1.h.

SAT/UNSAT

**\*Step 12: (Step 1.h) Using EPR SET-POINT switch, slowly RAISE the EPR SET-POINT, by going to RAISE. EPR OUTPUT STROKE will slowly decrease to zero with MPR in control.**

Standard: The operator rotates the EPR Setpoint Switch to the RAISE position until the EPR Output Stroke slowly lowers to zero.

SAT/UNSAT

**Step 13: (Step 1.i/1.i.1) EPR cutout switch may be placed in CUTOUT (OFF), if required. Verify alarm 7-G-2, "EPR CONTROL POWER LOSS/TROUBLE" is energized.**

Standard: The operator places the EPR Cutout Switch to OFF and verifies that alarm 7G-2, "EPR CONTROL POWER LOSS/TROUBLE" is energized.

SAT/UNSAT

**Step 14: (Step 1.j) Adjust reactor pressure as necessary.**

Standard: The operator observes reactor pressure and determines that further adjustment is NOT needed.

\*Critical Step

TIME FINISH: \_\_\_\_\_

Terminating Cue:

This JPM is complete.

Evaluator Comments:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

System: 241000 K/A: A4.19 (3.5/3.4)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- The plant is operating normally at power
- The white light for the EPR Regulator is lit.

### **Initiating Cues:**

The CRS directs you to transfer control from the EPR to the MPR and secure the EPR for I&C maintenance using Section B.1 of OP 2160, Turbine Generator Support Systems Operation.

VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009

**Task Identification:**

Title: Secure RHR from the Shutdown Cooling Mode  
Failure Mode: N/A  
Reference: OP 2124, Residual Heat Removal System, (Rev. 113)  
Task Number: 2050110101

**Task Performance:** AO/RO/SRO \_\_\_ RO/SRO Only X SE Only \_\_\_

Sequence Critical: Yes \_\_\_ No X

Time Critical: Yes \_\_\_ No X

Individual Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation \_\_\_ Performance X Discuss \_\_\_

Setting: Classroom \_\_\_ Simulator X Plant \_\_\_

Performance Expected Completion Time: 12 minutes

Evaluation Results:

Performance: PASS \_\_\_ FAIL \_\_\_ Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Instructor

Reviewed by: \_\_\_\_\_ Date \_\_\_\_\_  
SRO Licensed/Certified Reviewer

Approved by: \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Supervisor

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the individual has failed the Job Performance Measure.

After providing the initiating cue, ask the individual "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** all actions.

You are requested to **"talk-through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- The plant is operating with RHR in the Shutdown Cooling Mode in accordance with OP 2124, Residual Heat Removal System, Section G, Normal Shutdown Cooling Operational Sequence.
- The A RHR Pump is in operation.
- The RWCU System is in its normal alignment in accordance with OP 2112, Reactor Water Cleanup System.
- The Condensate System is available.

**Initiating Cues:**

The CRS has directed you to secure from the Shutdown Cooling Mode in accordance with OP 2124, Section J, Securing the Shutdown Cooling Mode.

**Task Standards:**

The RHR System has been secured from the Shutdown Cooling Mode in accordance with Steps 1-12 of Section J of OP 2124, Residual Heat Removal System.

**Required Materials:**

**Handout 1** - OP 2124, Residual Heat Removal System (Rev. 113)

**Simulator Setup:**

Reset to IC-852

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).**

**Evaluation**

**Performance Steps**

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

**SAT/UNSAT**

**Step 1: Obtain Procedure and review prerequisites**

Standard: The operator obtains OP 2124, Rev 113.

Proceeds to Section J, Securing Shutdown Cooling Mode.

Interim Cue:

When it is apparent that the operator is seeking to find OP 2124, Examiner provides copy (**Handout 1**).

**SAT/UNSAT**

**Step 2: (Step 1) If RWCU return to RHR SDC suction line is in service, return RWCU to normal alignment, or secure the RWCU system per OP 2112.**

Standard: The operator recognizes that the RWCU is NOT aligned with its return to RHR SDC (Initial Conditions), and proceeds to Step 2.

**SAT/UNSAT**

**\*Step 3: (Step 2) On CRP 9-3, close OUTBD INJECTION, RHR-27A(B).**

Standard: The operator takes the RHR-27A control switch to CLOSE, and observes the Green light ON, and the Red light OFF.

The operator observes A RHR Pump amps and flow on FI-10-139A decreases.

**SAT/UNSAT**

**\*Step 4: (Step 3) Secure the running RHR pumps.**

Standard: The operator takes the A RHR Pump control switch to STOP, and observes the Green light ON, and the Red light OFF.

The operator observes A RHR Pump amps decreases to 0.

NOTE:

The operator may make a plant announcement concerning the shutdown of the A RHR Pump (Not Critical).

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 5: (NOTE prior to Step 4) Reactor recirculation pump startup may be performed in parallel with securing shutdown cooling.**

Standard: The operator reads the Note and proceeds to Step 4.

SAT/UNSAT

**Step 6: (Step 4) If possible, start the recirc pump(s) at this time per OP 2110.**

Standard: The operator seeks direction regarding the operation of the Recirculation Pumps from the CRS.

After cue, the operator proceeds to Step 5.

---

Interim Cue:

Examiner cue operator that another operator will be starting the recirculation pumps in accordance with OP 2110, and that the securing of the Shutdown Cooling Mode should continue.

---

SAT/UNSAT

**Step 7: (Step 5) On CRP 9-3, open HX BYPASS, RHR-65A.**

Standard: The operator opens RHR-65A by taking the control switch to OPEN and observes the Red light ON and the Green light OFF.

SAT/UNSAT

**Step 8: (Step 6) On CRP 9-3, open HX BYPASS, RHR-65B.**

Standard: The operator observes the Red light ON and the Green light OFF for RHR-65B, and determines the valve is OPEN.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 9: (Step 7) On CRP 9-3, close the following:**

**S/D CLG SUCTION, RHR-17**  
**S/D CLG SUCTION, RHR-18**  
**PUMP SUCTION, RHR-15A**  
**PUMP SUCTION, RHR-15C**  
**PUMP SUCTION, RHR-15B**  
**PUMP SUCTION, RHR-15D**

Standard: The operator closes RHR-17 by taking the control switch to CLOSE, and observing the Green light ON and the Red light OFF.

The operator closes RHR-18 by taking the control switch to CLOSE, and observing the Green light ON and the Red light OFF.

The operator closes RHR-15A by taking the control switch to CLOSE, and observing the Green light ON and the Red light OFF.

The operator closes RHR-15C by taking the control switch to CLOSE, and observing the Green light ON and the Red light OFF.

The operator observes the Green light ON and the Red light OFF for RHR-15B, and determines the valve is CLOSED.

The operator observes the Green light ON and the Red light OFF for RHR-15D, and determines the valve is CLOSED.

---

NOTE: The operator may close another valve before the one presently stroking closed is CLOSED.

---

SAT/UNSAT

**Step 10: (Step 8) Place Isolation switch (Radwaste corridor) for shutdown cooling valves RHR-17/18 in LOCKOUT position.**

Standard: The operator contacts the AO and directs that the Isolation Switch for RHR-17/18 be placed in the LOCKOUT position.

---

Interim Cue: As the AO, Examiner inform the operator that the Isolation Switch for RHR-17/18 has been placed in the LOCKOUT position.

---

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 11: (Step 9) Open:**

**PUMP SUCTION, RHR-13A**  
**PUMP SUCTION, RHR-13C**  
**PUMP SUCTION, RHR-13B**  
**PUMP SUCTION, RHR-13D**  
**MINIMUM FLOW, RHR-16A**  
**MINIMUM FLOW, RHR-16B**

Standard: The operator opens RHR-13A by taking the Key control switch to OPEN, and observing the Red light ON and the Green light OFF.

The operator opens RHR-13C by taking the Key control switch to OPEN, and observing the Red light ON and the Green light OFF.

---

NOTE: MCB Annunciator 9-3/L-3, RHR TORUS SUCT VLV CLOSED, is expected to clear after this action.

---

The operator observes the Red light ON and the Green light OFF, and determines that RHR-13B is OPEN.

The operator observes the Red light ON and the Green light OFF, and determines that RHR-13D is OPEN.

The operator opens RHR-16A by taking the control switch to OPEN, and observing the Red light ON and the Green light OFF.

The operator observes the Red light ON and the Green light OFF, and determines that RHR-16B is OPEN.

---

NOTE: The operator may close another valve before the one presently stroking closed is CLOSED.

---

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 12: (Steps 10/10.a) Establish keep fill pressure as follows: If condensate system pressure is available open RHR-30A(B), RHR Loop A(B) Pressurizing Line.**

Standard: The operator contacts the AO and directs that RHR-30A be opened.

The operator contacts the AO and directs that RHR-30B be opened.

---

Interim Cue:

As the AO, Examiner cue operator that RHR-30A and RHR-30B are OPEN.

---

SAT/UNSAT

**Step 13: (CAUTION prior to Step 10.b) Reactor coolant temperature must be <212°F to use this procedure section.**

Standard: The operator reads the Caution and proceeds to Step 10.b.

SAT/UNSAT

**Step 14: (Step 10.b) IF condensate transfer system will be used to provide keep fill water .....**

Standard: The operator recognizes that the Condensate Transfer System will NOT be used and proceeds to Step 11.

SAT/UNSAT

**Step 15: (Step 11) Open/check open and lock RHR Hx A(B) Inlet, RHR-23A(B).**

Standard: The operator directs that RHR-23A be checked open and that the valve be locked in the open position.

The operator directs that RHR-23B be checked open and that the valve be locked in the open position.

---

Interim Cue:

Examiner cue operator that RHR-23A and RHR-23B are OPEN.

---

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 16:** (NOTE prior to Step 12) **Manually closing RHR-89A(B) with an RHRSW pump running can result in lifting safety relief valve SR-10-80A(B).**

Standard: The operator reads the Note and proceeds to Step 12.

SAT/UNSAT

**\*Step 17:** (Steps 12/12.a) **When the RHRSW pump has run at least 10 minutes after the RHR pump is stopped, then secure the running RHRSW pumps. Observe RHRSW DISCHARGE valve, RHR-89A(B), closes automatically.**

Interim Cue:

Examiner cue operator that the RHRSW Pump has run 10 minutes since the RHR Pump A has been stopped.

Standard: After the cue, the operator takes the A RHRSW Pump to STOP, and observes the Green light ON and the Red light OFF.

After stopping the RHRSW Pump, the operator observes RHR-89A automatically closes by observing the Green light ON and the Red light OFF.

The operator observes flow on FI-10-132A decreases to 0.

NOTE:

MCB Annunciator 9-3/K-4, RHR SW PUMP A/C Running, is expected to clear after this action.

TIME FINISH: \_\_\_\_\_

**Terminating Cue:**

This JPM is complete.

**Evaluator Comments:** \_\_\_\_\_

System: 205000

K/A: A4.01 (3.7/3.7)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- The plant is operating with RHR in the Shutdown Cooling Mode in accordance with OP 2124, Residual Heat Removal System, Section G, Normal Shutdown Cooling Operational Sequence.
- The A RHR Pump is in operation.
- The RWCU System is in its normal alignment in accordance with OP 2112, Reactor Water Cleanup System.
- The Condensate System is available.

### **Initiating Cues:**

The CRS has directed you to secure from the Shutdown Cooling Mode in accordance with OP 2124, Section J, Securing the Shutdown Cooling Mode.

**VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009**

**Task Identification:**

Title: Line-up for Primary Containment Spray Using Fire System to RHR Loop "A"  
Failure Mode: NA  
Reference: OE 3107, OE Appendices, Appendix S, (Rev. 25)  
Task Number: 2000070501

**Task Performance:** AO/RO/SRO  RO/SRO  SRO Only

Sequence Critical: Yes  No

Time Critical: Yes  No

Operator Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation  Performance  Discuss

Setting: Classroom  Simulator  Plant

Performance Expected Completion Time: 17 minutes

Evaluation Results:

Performance: PASS  FAIL  Time Required: \_\_\_\_\_

**Prepared by:** \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Instructor

**Reviewed by:** \_\_\_\_\_ Date \_\_\_\_\_  
SRO Licensed/Certified Reviewer

**Approved by:** \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Supervisor

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- Drywell pressure is high.
- Torus Spray is required per EOP-3 and RHR and RHRSW Pumps are unavailable for use.
- The Emergency Diesel Generators have been stopped.
- No Service Water Pumps are available.
- Fire Water Pumps are running.

**Initiating Cues:**

The CRS has directed you to line-up and spray the TORUS using the Fire System to RHR Loop "A" from the Control Room, IAW OE 3107, Appendix S, Step 2.

Auxiliary Operators have been briefed and are standing by in the field to perform their required actions.

NOTE: All communications with the AO should be made using the plant communications systems and NOT with the Examiner.

**Task Standards:**

Complete the valve line-up and spray the Torus using the Fire System to RHR from the Control Room.

**Required Materials:**

JPM-S4

**Handout 1 - OE 3107 OE Appendices, Appendix S (Rev. 25)**

**Simulator Set-Up:**

Reset to any IC.

Insert malfunction mfRR\_01A at 1%. Delete when drywell pressure is 8 psig.

Stop both EDGs.

Trip all four SW Pumps on overcurrent.

Verify both Fire Pumps are running.

Place all RHR & RHRSW Pumps in PTL.

**OR**

Reset to IC-853

**Note to Simulator Instructor:**

An instructor should be available to control plant parameters and silence alarms unrelated to the JPM.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

**Evaluation**

**Performance Steps**

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

SAT/UNSAT

**Step 1: Obtain Procedure**

Standard: The operator obtains OE 3107, Appendix S, Rev 25.

Proceeds to Step 2, Primary Containment Spray Using Fire Water.

Interim Cue:

When it is apparent that the operator is seeking to find OE 3117, Examiner provides copy (**Handout 1**).

SAT/UNSAT

**Step 2: (NOTE prior to Step 2.a) Substep 2.a may be performed concurrently with the remainder of Step 2.**

Standard: The operator reads the Note, and proceeds to Step 2.a

SAT/UNSAT

**Step 3: (Steps 2.a/2.a.1) Isolate unnecessary Service Water loads as follows: Close /Check Closed the following RBCCW HX Service Water Outlet valves:**

- **SW-92A SW discharge from A HX**
- **SW-92B SW discharge from the B HX**

Standard: The operator contacts the AO and directs that SW-92 A and B be closed.

Interim Cue:

Simulator Instructor as the AO reports SW-92A and SW-92B closed (this action is simulated).

NOTE:

The operator may assign the AO to perform more than one procedure step during one communication.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 4: (Step 2.a.2) CLOSE/check CLOSED the following to isolate Turbine**

**Building loads:**

- **SW-20 TURB BLDG INLET**

**OR**

- **SW-19A SW HEADER CROSS CONNECT and**
- **SW-19B SW HEADER CROSS CONNECT**

Standard: The operator places the SW-20 control switch on CRP 9-6 to CLOSE and observes Green light ON and Red light OFF.

OR

The operator places the SW-19A control switch on CRP 9-6 to CLOSE, and observes Green light ON and Red light OFF.

and

The operator places the SW-19B control switch on CRP 9-6 to CLOSE, and observes Green light ON and Red light OFF.

NOTE:

The operator should perform only one or the other, however performance of both steps is allowed.

SAT/UNSAT

**Step 5: (Step 2.a.3) Consider isolating RRUs to provide increased flow to the vessel by closing the following valves:**

- **SW-315A RRU-5 Inlet**
- **SW-316A RRU-6 Inlet**
- **SW-317A RRU-7 Inlet**
- **SW-318A RRU-8 Inlet**
- **SW-307A RRU-9 Inlet**
- **SW-308A RRU-17A Inlet**
- **SW-309A RRU-17B Inlet**

Standard: The operator contacts the AO and directs that the RRUs be isolated.

Interim Cue:

Simulator Instructor as the AO informs the operator that the RRUs are isolated.

Interim Cue:

If the operator asks the CRS, Examiner inform the operator that the RRUs are isolated.

Evaluation

Performance Steps

SAT/UNSAT

Step 6 (NOTE prior to Step 2.a.4) **IF a LOCA signal is present, THEN the diesels can be shut down locally using the MANUAL ENG STOP pushbutton with the REMOTE/AT ENGINE control switch in AT ENGINE.**

Standard: The operator reads the Note and proceeds to Step 2.a.4.

SAT/UNSAT

Step 7 (Step 2.a.4) **If a diesel generator is idling with the output breaker open, THEN consider shutting down the diesel to provide increased flow to the vessel.**

Standard: The operator observes that both Diesel Generators are shutdown.

SAT/UNSAT

Step 8: (Steps 2.b/2.b.1/2.b.2) **If the Fire Water pumps are running, THEN stop the Fire Water pump(s) as follows:  
Electric Fire Pump - Open circuit breaker on Bus 9 Cubicle 7D  
Diesel Fire Pump – Place control switch to OFF.**

Standard: The operator checks status of Fire Pumps by checking alarms on Panel 9-6, J-9, DIESEL FIRE PUMP RUNNING, and L-9, ELEC FIRE PUMP RUNNING, are LIT and determines that both Fire Water pumps are operating.

The operator contacts the AO and directs that both Fire Pumps be shutdown.

---

Interim Cue:

When the operator calls the AO, Simulator Instructor place rFFP\_01 to OFF and rFFP\_02 to OFF.

THEN, call operator as AO and report that both Fire Pumps are OFF.

---

The operator checks status of Fire Pumps by checking alarms on Panel 9-6, J-9, DIESEL FIRE PUMP RUNNING, and L-9, ELEC FIRE PUMP RUNNING, are DARK and determines that both Fire Water pumps are shutdown.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 9: (Step 2.c) OPEN SW-8, Fire Water to Service Water crossie.**

Standard: Operator directs AO to open SW-8.

---

Interim Cue:

When the operator calls the AO, Simulator Instructor insert rf\_SWR35.

THEN, call operator as AO and report that SW-8 is OPEN.

---

SAT/UNSAT

**Step 10: (Steps 2.d/2.d.1) IF RHR loop A is available, THEN Close/check closed RHR 34A TORUS COOLING.**

Standard: The operator checks shut RHR-34A by observing Green light ON and Red light OFF.

SAT/UNSAT

**Step 11: (Steps 2.d.2/2.d.2.a) If a LPCI initiation signal is or was present THEN: In CRP 9-32, locate 10A-K45A-1, timing device for relay 10A-K45A.**

Standard: The operator opens cabinet in back of CRP 9-32 and identifies timing device.

SAT/UNSAT

**\*Step 12: (Step 2.d.2.b) Rotate set screw in 10A-K45A-1 fully in the counter clockwise direction, to disable the time delay logic for RHR-27A.**

Standard: The operator obtains a screwdriver.

The operator uses screwdriver to turn set screw counter clockwise until it stops rotating.

SAT/UNSAT

**\*Step 13: (Step 2.d.2.c) On CRP 9-32, place switch 10A-S36A UPS FDR TRIP keylock switch to BLOCK.**

Standard: The operator uses Key #13 and places the keylock switch 10AS36A to BLOCK.

The operator observes MCB Annunciator 9-3/C-2, RHR-27A AUTO OPEN/UPS FDR TRIP BLK, is LIT.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 14: (Steps 2.d.3) Close/check closed one of the following:**

- **RHR-25A INBD INJECTION**
- **RHR 27A. OUBD INJECTION**

Standard: The operator places the RHR-27A control switch in CLOSE, and observes Green light ON and Red light OFF, and determines that RHR-27A is CLOSED.

SAT/UNSAT

**Step 15: (Steps 2.d.4) Go to Step 2.f.**

Standard: The operator proceeds to Step 2.f.

SAT/UNSAT

**Step 16: (Steps 2.f/2.f.1) Start available Fire Pumps by performing the following:**

**Electric Fire Pump**  
**Close circuit Breaker on Bus 9 Cubicle 7D**  
**Press control START pushbutton**

Standard: The operator contacts the AO and directs that the Electric Fire Pump be started.

---

Interim Cue:

When the operator calls the AO, Simulator Instructor place rfFP\_01 to HAND.

THEN, call operator as AO and report that the Electric Fire Pump is Running.

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SAT/UNSAT

**Step 17: (Step 2.f.2) Diesel Fire Pump Place Control Switch to TEST**

Standard: The operator contacts the AO and directs that the Diesel Fire Pump be started.

---

Interim Cue:

When the operator calls the AO, Simulator Instructor place rfFP\_02 to HAND.

THEN, call operator as AO and report that the Diesel Fire Pump is Running.

---

The operator checks status of Fire Pumps by checking alarms on Panel 9-6, J-9, DIESEL FIRE PUMP RUNNING, and L-9, ELEC FIRE PUMP RUNNING, are LIT and determines that both Fire Water pumps are operating.

Evaluation

Performance Steps

SAT/UNSAT

**\*Step 18: (Step 2.g/2.g.1) OPEN RHR-89A RHRSW DISCHARGE as follows:  
Place RHR-89A TEST keylock switch 10AS89A1 to TEST**

Standard: The operator uses the 89A/B Test Switch Key and places the switch to TEST.

The operator observes MCB Annunciator 9-3/M-2, RHR KEYLOCK SW TO MAN OVRD, is LIT.

SAT/UNSAT

**\*Step 19: (Step 2.g.2) Throttle open RHR-89A to 40% (white light is lit)**

Standard: The operator places the control switch for RHR-89A to OPEN, and observes the Red light ON, and THEN the White Light is ON.

When the White light is ON, the operator allows the control switch for RHR-89A to return to AUTO.

SAT/UNSAT

**\*Step 20: (Step 2.h) OPEN RHRSW/RHR emergency inter-tie keylock valves:  
• RHR-184 EMERGENCY FILL  
• RHR-183 EMERGENCY FILL**

Standard: The operator uses Key #13 places the Key Lock switch for RHR-184 to OPEN and observes the Red light ON and Green light OFF.

The operator uses Key #13 places the Key Lock switch for RHR-183 to OPEN and observes the Red light ON and Green light OFF.

SAT/UNSAT

**Step 21: (CAUTION prior to Step 2.i) It may be necessary to throttle spray flow using SW-8 to prevent overloading the Fire Water system pump(s).**

Standard: The operator the Caution and proceeds to Step 2.i.

SAT/UNSAT

**Step 22: (Step 2.i/2.i.1) When Spray is required THEN: Place RHR A/C LOGIC CTMT SPRAY VLV SHROUD LVL OVRD Keylock Switch to MANUAL OVRD.**

Standard: The operator uses Key #13 and places the RHR A/C LOGIC CTMT SPRAY VLV SHROUD LVL OVRD Keylock Switch to MANUAL OVRD.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 23: (Step 2.i.2) Place RHR A/C LOGIC CTMT SPRAY VLV LPCI SIG BYPASS (pistol grip) to MAN.**

Standard: The operator momentarily places the RHR A/C LOGIC CTMT SPRAY VLV LPCI SIG BYPASS Pistol grip switch to MAN and releases the switch (spring returns to OFF).

SAT/UNSAT

**Step 24: (NOTE prior to Step 2.i.3) Torus and Drywell sprays may be operated concurrently.**

Standard: The operator reads the Note and proceeds to Step 2.i.3.

SAT/UNSAT

**\*Step 25: (Step 2.i.3/2.i.3.a) For Torus Spray: OPEN RHR-39A TORUS SPRAY/CLG**

Standard: The operator places the control switch for RHR-39A to OPEN and observes Red light ON and Green light OFF.

SAT/UNSAT

**\*Step 26: (Step 2.i.3.b) OPEN RHR-38A TORUS SPRAY**

Standard: The operator places the control switch for RHR-38A to OPEN and observes Red light ON and Green light OFF.

The operator observes flow increases on FI-10-139A and FI-10-132A.

SAT/UNSAT

**\*Step 27: (Step 2.i.3.c) CLOSE/check CLOSED RHR 89A, RHRSW DISCHARGE**

Standard: The operator places the control switch to CLOSE and observes the Green light is ON and the Red and White light is OFF.

SAT/UNSAT

**\*Step 28: (Step 2.i.3.d) Place RHR 89A TEST keylock Switch 10AS89A-1 to AUTO and remove key.**

Standard: The operator uses Key #13 and places the RHR 89A TEST keylock switch to AUTO and removes the key from keylock switch.

TIME FINISH: \_\_\_\_\_

**Terminating Cue:** This JPM is complete.

**Evaluators Comments:**

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**System:** 226001    **K/A:** A4.02 (3.1/3.1)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- Drywell pressure is high.
- Torus Spray is required per EOP-3 and RHR and RHRSW Pumps are unavailable for use.
- The Emergency Diesel Generators have been stopped.
- No Service Water Pumps are available.
- Fire Water Pumps are running.

### **Initiating Cues:**

The CRS has directed you to line-up and spray the TORUS using the Fire System to RHR Loop "A" from the Control Room, IAW OE 3107, Appendix S, Step 2.

Auxiliary Operators have been briefed and are standing by in the field to perform their required actions.

NOTE: All communications with the AO should be made using the plant communications systems and NOT with the Examiner.

**VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009**

**Task Identification:**

Title: Swap RBCCW & TBCCW Pumps  
Failure Mode: Complete Loss of RBCCW  
Reference: OP 2182, Reactor Building Closed Cooling Water, (Rev. 34)  
RP 2183, Turbine Building Closed Cooling Water, (Rev. 28)  
ARS 21004, CRP 9-6 Alarm Response Sheets (Rev. 3)  
EN-OP-115, Conduct of Operations, (Rev. 6)  
Task Number: 2087170401

**Task Performance:** AO/RO/SRO \_\_\_ RO/SRO Only X SE Only \_\_\_

Sequence Critical: Yes \_\_\_ No X

Time Critical: Yes \_\_\_ No X

Individual Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation \_\_\_ Performance X Discuss

Setting: Classroom \_\_\_ Simulator X Plant

Performance Expected Completion Time: 8 minutes

Evaluation Results:

Performance: PASS \_\_\_ FAIL \_\_\_ Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_  
Operations Training Instructor Date

Reviewed by: \_\_\_\_\_  
SRO Licensed/Certified Reviewer Date

Approved by: \_\_\_\_\_  
Operations Training Supervisor Date

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the individual has failed the Job Performance Measure.

After providing the initiating cue, ask the individual "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** all actions.

You are requested to **"talk-through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- The plant is operating at power.
- Scaffolding is being erected around RBCCW Pump A and TBCCW Pump A to support work scheduled during an upcoming Outage.

**Initiating Cues:**

The CRS has directed you to swap the RBCCW Pumps in accordance with Section D of OP 2182, Reactor Building Component Cooling Water.

THEN, swap of the TBCCW Pumps in accordance with Section H of RP 2183, Turbine Building Component Cooling Water.

Auxiliary Operators have been briefed and are standing by in the field to perform their required actions.

**Task Standards:**

The operator starts RBCCW Pump B and places RBCCW Pump A in standby, starts the TBCCW Pump B and places TBCCW Pump A in standby, and then re-starts RBCCW Pump A on a failure of the RBCCW Pump B.

**Required Materials:**

**Handout 1** - OP 2182, Reactor Building Component Cooling Water (Rev. 34)

**Handout 2** - RP 2183, Turbine Building Component Cooling Water (Rev. 28)

**Simulator Setup:**

Reset to any 100% power IC.

Ensure RBCCW Pump A and TBCCW Pump A are running.

Enter mfSW\_23A, RBCCW A PMP AUTO START FAILURE.

Key 1 malfunction mfSW\_01B, RBCCW PUMP B TRIP

**OR**

Reset to IC-854

**Note to Simulator Instructor:**

An instructor should be available to control plant parameters and silence alarms unrelated to the JPM.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).**

**Evaluation**

**Performance Steps**

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

**SAT/UNSAT**

**Step 1: Obtain Procedure.**

Standard: The operator obtains OP 2182, Rev 34.

Proceeds to Section D, Transfer of RBCCW Pumps.

Interim Cue:

When it is apparent that the operator is seeking to find OP 2182, Examiner provides copy (**Handout 1**).

**SAT/UNSAT**

**\*Step 2: (Step 1) Start the standby pump from CRP 9-6.**

Standard: The operator places RBCCW Pump B control switch to START, and releases to AUTO, and then observes the Red light ON and the Green light OFF.

The operator observes increasing pressure on PI-104-19.

**SAT/UNSAT**

**\*Step 3: (Step 2) Allow system pressure to stabilize, then secure the first pump and place its control switch in AUTO.**

Standard: The operator observes PI-104-19 stabilizes at  $\approx 105$  psig, and determines that RBCCW pressure has stabilized.

The operator places RBCCW Pump A control switch in STOP, and releases to AUTO, and then observes the Green light ON and the Red light OFF.

The operator observes PI-104-19 stabilizes at  $\approx 77$  psig, and determines that RBCCW pressure has stabilized.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 4: Obtain Procedure.**

Standard: The operator obtains RP 2183, Rev 28.

Proceeds to Section H, Transfer of TBCCW Pumps.

---

Interim Cue:

When it is apparent that the operator is seeking to find RP 2183, Examiner provides copy (**Handout 2**).

---

SAT/UNSAT

**\*Step 5: (Step 1) On CRP 9-6, start the standby TBCCW PUMP A(B) P-58-1A(B).**

Standard: The operator places TBCCW Pump B control switch to START, and releases to AUTO, and then observes the Red light ON and the Green light OFF.

The operator observes increasing pressure on PI-104-52.

SAT/UNSAT

**Step 6: (NOTE prior to Step 2) Annunciator 6-J-8, TBCCW HDR PRESS LO may come in while performing the next step.**

Standard: The operator reads the Note and proceeds to Step 2.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 7: (Step 2) Allow system pressure to stabilize, then secure the previously running pump and place its control switch in AUTO.**

Standard: The operator observes PI-104-52 stabilizes at  $\approx 110$  psig, and determines that TBCCW pressure has stabilized.

The operator places TBCCW Pump A control switch in STOP, and releases to AUTO, and then observes the Green light ON and the Red light OFF.

The operator observes PI-104-52 stabilizes at  $\approx 65$  psig, and determines that TBCCW pressure has stabilized.

---

Simulator Instructor: When the operator stops TBCCW Pump A, operate Key 1, which will cause RBCCW Pump B to trip, and RBCCW Pump A to fail to start.

---

The operator observes MCB Annunciators 9-6/L-7, RBCCW PUMP A/B TRIP, and L-8, RBCCW HDR PRESS LO, as well as the Red light off and Green/Yellow lights ON for RBCCW Pump B, and determines that the running RBCCW Pump B has tripped and that RBCCW Pump A has failed to start.

SAT/UNSAT

**\*Step 8: (EN-OP-115, Step 5.3 or ARS 21004 for L7 or L8, Operator Action 1) If an automatic control malfunctions, immediately place that control in manual.**  
**OR**  
**Ensure that the standby RBCCW pump is running.**

Standard: The operator places RBCCW Pump A control switch in START, and releases to AUTO, and then observes the Green and Amber lights ON and the Red light OFF.

The operator observes PI-104-19 stabilizes at  $\approx 77$  psig, and determines that RBCCW pressure has stabilized.

---

NOTE: MCB Annunciator 9-6/L-8 will clear when RBCCW Pump A is restarted.

---

TIME FINISH: \_\_\_\_\_

Terminating Cue: This JPM is complete.

**Evaluator Comments:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**System:** 400000      **K/A:** A2.01 (3.3/3.4)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- The plant is operating at power.
- Scaffolding is being erected around RBCCW Pump A and TBCCW Pump A to support work scheduled during an upcoming Outage.

### **Initiating Cues:**

The CRS has directed you to swap the RBCCW Pumps in accordance with Section D of OP 2182, Reactor Building Component Cooling Water.

THEN, swap of the TBCCW Pumps in accordance with Section H of RP 2183, Turbine Building Component Cooling Water.

Auxiliary Operators have been briefed and are standing by in the field to perform their required actions.

**VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009**

**Task Identification:**

Title: Initiate SLC to the Vessel  
Failure Mode: RWCU Fails to Isolate  
Reference: OP 2114, Operation of the Standby Liquid Control System (Rev. 33)  
Task Number: 2110050101

**Task Performance:** AO/RO/SRO \_\_\_ RO/SRO Only X SE Only \_\_\_

Sequence Critical: Yes \_\_\_ No X

Time Critical: Yes \_\_\_ No X

Individual Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation \_\_\_ Performance X Discuss \_\_\_

Setting: Classroom \_\_\_ Simulator X Plant

Performance Expected Completion Time: 5 minutes

Evaluation Results:

Performance: PASS \_\_\_ FAIL \_\_\_ Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Instructor

Reviewed by: \_\_\_\_\_ Date \_\_\_\_\_  
SRO Licensed/Certified Reviewer

Approved by: \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Superintendent

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the individual has failed the Job Performance Measure.

After providing the initiating cue, ask the individual "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** all actions.

You are requested to **"talk-through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

The plant is experiencing an ATWS.

**Initiating Cues:**

The CRS has directed you to initiate SLC injection to the reactor vessel in accordance with Appendix B, Injecting SLC Into the Reactor Vessel, of OP 2114, Operation of the Standby Liquid Control System.

**Task Standards:**

Boron is injected to the reactor vessel in accordance with Appendix B of OP 2114.

**Required Materials:**

**Handout 1** - OP 2114, Operation of the Standby Liquid Control System (Rev. 33)

**Simulator Setup:**

Reset to any 100% power IC.

Set up the simulator for ATWS conditions:

Any malfunctions to cause an ATWS (e.g. mfRP\_01A, Failure to Auto Scram, mfRP\_01B, Failure to Manual Scram, mfRP\_01C, Failure of ARI/RPT)

Insert mfRP\_09A (Group V failure to isolate)

Insert mfRP\_09B (Group V failure to isolate)

Insert mfNM\_05A, (APRM A Failure) 100% Severity

Insert mfNM\_05B (APRM B Failure) 100% Severity

**OR**

Reset to IC-855

**AND**

Activate Scenario 2009 NRC JPM S6

**OR**

Fail both SL Squib Valves to fire in SLC System.

Insert mfSL\_02A, SL Squib Valve A Fails to Fire

Insert mfSL\_02B, SL Squib Valve B Fails to Fire

Will need to remove one of the two malfunctions during the performance of the JPM.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

**Evaluation**

**Performance Steps**

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

SAT/UNSAT

**Step 1: Obtain Procedure.**

Standard: The operator obtains OP 2114, Rev 33.

Proceeds to Appendix B, Injecting SLC Into the Reactor Vessel.

Interim Cue:

When it is apparent that the operator is seeking to find OP 2114, Examiner provides copy (**Handout 1**).

SAT/UNSAT

**Step 2: (NOTE prior to Step 1) Unless specified otherwise, all controls and indications are on CRP 9-5.**

Standard: The operator reads the Note, and proceeds to Step 1.

SAT/UNSAT

**\*Step 3: (Step 1) Unlock SLC Switch by positioning the key to the two o'clock position.**

Standard: The operator places Key in the SLC Switch to the two o'clock (right hand) position.

SAT/UNSAT

**\*Step 4: (Step 2) Turn SLC switch to SYS 1 or SYS 2.**

Standard: The operator places the SLC Switch to the SYS 1 or SYS 2 position.

The operator observes the yellow light for the SLC System selected is OFF.

SAT/UNSAT

**Step 5: (Steps 3/3.a) Verify the following events occur: SLC PUMP A(B) P-45-1A(B) starts.**

Standard: The operator observes that SLC Pump A is running by observing the Red light ON and Green light OFF.

valuation

Performance Steps

SAT/UNSAT

**Step 6:** (Step 3.b) SLC discharge pressure increases as indicated on **PI-11-65.**

Standard: The operator observes rising pressure indicated on PI 11-65, stabilizing at ≈1500 psig.

SAT/UNSAT

**\*Step 7:** (Step 3.c) On CRP 9-4, RWCU system isolation valves automatically **close:**

- CU-15 (Outlet Isolation)
- CU-18 (Inlet Isolation)
- CU-68 (Return Isolation)

Standard: The operator observes valve position for CU valves and recognizes that the RWCU System did NOT isolate.

The operator places the CU-15 control switch to CLOSE, and releases to NORM, and observes Green light ON and red light OFF.

The operator places the CU-18 control switch to CLOSE, and releases to NORM, and observes Green light ON and red light OFF.

The operator places the CU-68 control switch to CLOSE, and releases to NORM, and observes Green light ON and red light OFF.

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NOTE: To successfully complete the Critical nature of this step either CU-15 or CU-18 must be closed.

---

NOTE: The operator may elect to take SLC switch to the other position (per step 4 of Appendix B) before manually closing the RWCU valves. If so, continue on with JPM Steps 8-10, and then return to Step 7.

---

SAT/UNSAT

**Step 8:** (NOTE prior to Step 3.d) SLC discharge pressure cycling at relief valve setpoint (1400-1490 psig) may indicate failure of squib valve to **fire.**

Standard: The operator reads the Note and proceeds to Step 3.d.

Evaluation

Performance Steps

SAT/UNSAT

**Step 9:** (Step 3.d) Squib valve SLC-14A(B) fires, as indicated by:

- **Red flow indicator light on (flow greater than 30 gpm).**
- **SLC tank level decreases as indicated on LI-11-66.**

Standard: The operator observes the Red light OFF.

SAT/UNSAT

**\*Step 10:** (Step 4) **If the above actions did not result in SLC injection, then turn the SLC switch to the other position (SYS 2 or SYS 1), and repeat verifications of Step 3**

Standard: The operator places the SLC Switch to the SYS 1 or SYS 2 position.

The operator observes Red Flow Indicator light is ON.

The operator observes rising pressure indicated on PI 11-65, stabilizing at  $\approx$  Reactor Pressure.

The operator observes SLC Tank Level indicator (LI 11-66) and that level indication is lowering.

TIME FINISH: \_\_\_\_\_

**Terminating Cue:** This JPM is complete.

**Evaluator Comments:** \_\_\_\_\_

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**System:** 211000

**K/A:** A4.02 4.2/4.2

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

The plant is experiencing an ATWS.

### **Initiating Cues:**

The CRS has directed you to initiate SLC injection to the reactor vessel in accordance with Appendix B, Injecting SLC Into the Reactor Vessel, of OP 2114, Operation of the Standby Liquid Control System.

**VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009**

**Task Identification:**

Title: Transfer Station Load from the Auxiliary Transformer to the Startup Transformer  
Failure Mode: NA  
Reference: OP 2142, 4 KV Electrical System (Rev. 50)  
Task Number: 2620010101

**Task Performance:** AO/RO/SRO \_\_\_ RO/SRO X SRO Only \_

Sequence Critical: Yes \_\_\_ No X

Time Critical: Yes \_\_\_ No X

Operator Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation \_\_\_ Performance X Discuss \_\_\_\_\_

Setting: Classroom \_\_\_ Simulator X Plant \_\_\_\_\_

Performance Expected Completion Time: 5 minutes

Evaluation Results:

Performance: PASS \_\_\_ FAIL \_\_\_ Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_  
Operations Training Instructor Date

Reviewed by: \_\_\_\_\_  
SRO Licensed/Certified Reviewer Date

Approved by: \_\_\_\_\_  
Operations Training Superintendent Date

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

A normal plant shutdown is in progress in accordance OP 0105, Reactor Operations, to support an upcoming Refueling Outage.

**Initiating Cues:**

The CRS directs you to transfer station load from the auxiliary transformer to the Startup Transformer per Section D of OP 2142, 4 KV Electrical System (Page 21 of 30).

**Task Standards:**

Station loads are transferred from the Auxiliary to Startup Transformer.

**Required Materials:**

**Handout 1** - OP 2142, 4 KV Electrical System, (Rev. 50)

**Simulator Set-Up:**

Reset to IC-856

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

**Evaluation**

**Performance Steps**

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

SAT/UNSAT

**Step 1: Obtain Procedure**

Standard: The operator obtains OP 2142, Rev 50.

Proceeds to Section D, Transfer of Station Load from Auxiliary Transformer to Startup Transformer.

Interim Cue:

When it is apparent that the operator is seeking to find OP 2142, Examiner provides copy (**Handout 1**).

NOTE:

The operator may believe that Appendix D, rather than Section D, of OP 2142 is the appropriate proceed section to use. Appendix D would be used in an Emergency, rather than in a normal situation, and is kept in a side pocket on the MCB so that it is readily available in an emergency. If the operator uses Appendix D rather than Section D of OP 2142, the same steps will be accomplished however, the JPM Script will NOT flow precisely with the actions on Appendix D. IF the operator attempts to use Appendix D, rather than Section D of OP 2142, the Examiner should direct the operator to use Section D of the procedure rather than Appendix D.

SAT/UNSAT

**Step 2: (Step 1) Verify that startup transformers are powered from 115KV yard.**

Standard: The operator observes that power indicated on 115 KV meter on CRP 9-8.  
The operator checks 115 KV line-up to the S/Up transformers.

SAT/UNSAT

**Step 3: (Step 1.a) If auto transformer is not supplying the 115 KV yard.....**

Standard: The operator observes that the Auto Transformer is supplying the 115 KV Yard, and proceeds to Note prior to Step 2.

SAT/UNSAT

**Step 4: (NOTE prior to Step 2) Steps 2 through 7 only apply if Bus 1 is available and is to be place in service.**

Standard: The operator reads the Note, and proceeds to Step 2.

Valuation

Performance Steps

SAT/UNSAT

**\*Step 5: (Step 2) Insert sync check handle in BKR 13 socket and turn sync switch on.**

Standard: The operator inserts the 4KV sync check handle into breaker 13 switch on CRP 9-8 and turns sync check switch to ON.

SAT/UNSAT

**Step 6: (Step 3) Verify bus 1 in phase with startup transformer (synchroscope at 12 o'clock position).**

Standard: The operator observes that the synchroscope is at 12:00 position, White lights OUT, Red lights ON.

SAT/UNSAT

**Step 7: (CAUTION prior to Step 4) If they are not In Phase, do not transfer.**

Standard: The operator reads the Caution, and proceeds to Step 4.

SAT/UNSAT

**\*Step 8: (Step 4) Close BKR 13.**

Standard: The operator places the switch for breaker 13 on CRP 9-8 to CLOSE and then releases.  
The operator observes the Red light ON above breaker control switch on CRP 9-8.

---

NOTE:

The operator may make a plant announcement concerning the transfer of electrical loads to the Startup Transformer (Not Critical).

---

SAT/UNSAT

**Step 9: (Step 5) Check that BKR 12 trips open when BKR 13 switch is released**

Standard: The operator verifies Breaker 12 open by observing Green and Amber lights ON above breaker 12 control switch on CRP 9-8.

SAT/UNSAT

**Step 10: (Step 6) Reset BKR 12 amber light.**

Standard: The operator places the switch for breaker 12 on CRP 9-8 to TRIP and then releases.  
The operator observes the Amber light OFF above breaker 12 switch on CRP 9-8.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 11: (Step 7) Turn sync check handle to OFF and remove it from the socket.**

Standard: The operator turns the Sync check handle at breaker 13 on CRP 9-8 positioned to OFF, and removes the handle from the breaker 13 socket.

SAT/UNSAT

**Step 12: (NOTE prior to Step 8) Steps 8 through 13 only apply if Bus 2 is available and is to be place in service.**

Standard: The operator reads the Note and proceeds to Step 8.

SAT/UNSAT

**\*Step 13: (Step 8) Insert sync check handle in BKR 23 socket and turn sync switch on.**

Standard: The operator inserts the 4KV sync check handle into breaker 23 switch on CRP 9-8 and turns sync check switch to ON.

SAT/UNSAT

**Step 14: (Step 9) Verify bus 2 in phase with startup transformer (synchroscope at 12 o'clock position).**

Standard: The operator observes that the synchroscope is at 12:00 position, White lights OUT, Red lights ON.

SAT/UNSAT

**Step 15: (CAUTION prior to Step 10) If they are not In Phase, do not transfer.**

Standard: The operator reads the Caution, and proceeds to Step 10.

SAT/UNSAT

**\*Step 16: (Step 10) Close BKR 23.**

Standard: The operator places the switch for breaker 23 on CRP 9-8 to CLOSE and then releases.  
The operator observes the Red light ON above breaker control switch on CRP 9-8.

SAT/UNSAT

**Step 17: (Step 11) Check that BKR 22 trips open when BKR 23 switch is released.**

Standard: The operator verifies Breaker 22 open by observing Green and Amber lights ON above breaker 22 control switch on CRP 9-8.

**Evaluation**

**Performance Steps**

**SAT/UNSAT**

**Step 18: (Step 12) Reset BKR No 22 amber light.**

Standard: The operator places the switch for breaker 22 on CRP 9-8 to TRIP and then releases.

The operator observes the Amber light OFF above breaker 22 switch on CRP 9-8.

**SAT/UNSAT**

**Step 19: (Step 13/13.a) Turn sync check handle OFF and remove from socket, Place sync check handle on CRP 9-8.**

Standard: The operator turns the Sync check handle at breaker 23 on CRP 9-8 positioned to OFF, and removes the handle from the breaker 23 socket.

The operator places the synch handle on CRP 9-8

TIME FINISH: \_\_\_\_\_

**Terminating Cue:** This JPM is complete.

**Evaluators Comments:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**System:** 262001      **K/A:** A4.04 (3.6/3.7)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

A normal plant shutdown is in progress in accordance OP 0105, Reactor Operations, to support an upcoming Refueling Outage.

### **Initiating Cues:**

The CRS directs you to transfer station load from the auxiliary transformer to the Startup Transformer per Section D of OP 2142, 4 KV Electrical System (Page 21 of 30).

VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009

**Task Identification:**

Title: Rx Startup to Criticality  
Failure Mode: Short period during startup  
Reference: OP 0105, Reactor Operations, (Rev. 86)  
Task Number: 2987240201

**Task Performance:** AO/RO/SRO \_\_\_ RO/SRO Only X SE Only \_\_\_

Sequence Critical: Yes \_\_\_ No X

Time Critical: Yes \_\_\_ No X

Individual Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation \_\_\_ Performance X Discuss \_\_\_

Setting: Classroom \_\_\_ Simulator X Plant \_\_\_

Performance Expected Completion Time: 8 minutes

Evaluation Results:

Performance: PASS \_\_\_ FAIL \_\_\_ Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_  
Operations Training Instructor Date

Reviewed by: \_\_\_\_\_  
SRO Licensed/Certified Reviewer Date

Approved by: \_\_\_\_\_  
Operations Training Superintendent Date

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the individual has failed the Job Performance Measure.

After providing the initiating cue, ask the individual "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk-through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- A plant startup is in progress in accordance with Phase 1A of OP 0105, Reactor Operations.
- The procedure is complete through step A.26 (Page 21 of 152).
- The control rods have been withdrawn in the specified sequence of OP 2404.
- There have been two (2) doublings, and these are recorded on VYOPF 0105.03.
- The next control rod to be withdrawn is Rod 10-39.

**Initiating Cues:**

The CRS directs you to continue the startup and take the reactor critical starting with Phase 1A Step 27 of OP 0105, Reactor Operations (Page 21 of 152).

**Task Standards:**

While pulling control rods to take the reactor critical, a high worth rod takes reactor period to shorter than 30 seconds. The operator takes action to take the reactor subcritical per OP 0105.

**Required Materials:**

**Handout 1 - VYOPF 0105.03 with doubling count rates filled in as follows:**

Reactor Startup:		X	In-Sequence:			
SRM A	SRM C	SRM B	SRM D	Time	Initial	
13	12	13	14	0800	initialed	
Average Count Rate		13				
				<b>TIME</b>	<b>INITIAL</b>	
Average Count Rate		13	<b>X2</b>	26	0824	Initialed
			<b>X4</b>	52	0843	Initialed
			<b>X8</b>	104		
			<b>X16</b>	208		
			<b>X32</b>	416		
			<b>X64</b>	932		
			<b>X128</b>	1864		

**Handout 2 - VYOPF 2404.01 (Page 1) filled in as follows:**

Group	Array	Insert Limit	Withdraw Limit	Rods	Out	In
1	1	0	48			
				2623	Initialed	
				1807	Initialed	
				0223	Initialed	
				1839	Initialed	
				3431	Initialed	
				3415	Initialed	
				1015	Initialed	
				1031	Initialed	
				2639	Initialed	
				4223	Initialed	
				2607	Initialed	
				1823	Initialed	
2	2	0	48			
				3439	Initialed	
				3407	Initialed	
				1007	Initialed	
				1039		

**Handout 3 - OP 0105, Reactor Operations, (Rev 86.)**

**Simulator Setup:**

JPM-S8

1. Reset to IC 857 (just before critical).
2. Set up mfNM\_01D, SRM D failing high at 100% with ramp of 100 seconds on Key 1.
3. Set up mfNM\_01D, SRM D failing low at 41% with ramp of 5 seconds on Key 2.
4. Ensure:
  - C120 is on the CRP 9-3 Digital Display.
  - C023 is on the CRP 9-4 Digital Display.
  - C121 is on the CRP 9-7 Digital Display
5. Initialize the Rod Worth Minimizer

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) along with Handouts 1 and 2.

Evaluation

Performance Steps

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

SAT/UNSAT

**\*Step 1: (Step 27) Continue to withdraw control rods in such a manner as to avoid having a sustained period shorter than 30 seconds (desired 100 to 200 seconds).**

- Standard: The operator places the Rod Select Power Switch to ON.
- The operator depresses the 10-39 Select Pushbutton, and observes the White Pushbutton light is ON, and the White Rod Out Permit light ON above the Rod Movement control switch.
- The operator places the Notch Out Ovr Emergency In Switch in NOTCH OVERRIDE and observes the yellow light ON.
- The operator simultaneously places the Rod Movement Control Switch to NOTCH OUT and observes the Red Rod Out light ON.
- The operator observes the SRM level indications (7-43A through D) for increasing count level.
- The operator observes the SRM period indications (7-44A through D) for changing Reactor period.
- The operator observes SRM for count rate increasing and reactor period.

---

Examiner NOTE: Just prior to critically the short period alarm will come in. (about 24 Notches on control rod)

---

Note: Simulator Instructor upon operator placing rod 10-39 20 notches, INSERT KEY 1.

---

SAT/UNSAT      **\*Step 2: (Step 28/28.a) If the sustained period becomes shorter than 30 seconds: Use the EMERGENCY IN switch to turn the period.**

Standard:      The operator observes MCB Annunciator 9-5/P-5, SRM PERIOD SHORT.

The operator observes that SRM Period indicator 7-44D indicates a short period, and that the yellow Period light is ON.

The operator observes that SRM Level indicator 7-43D is increasing.

The operator places the Notch Out Ovrdr Emergency In Switch the EMERGENCY IN position to reduce the reactor period.

---

Note:              Upon observing the operator using the Notch Out Ovrdr Emergency In Switch the EMERGENCY IN position after 2 notches, INSERT KEY 2.

---

SAT/UNSAT      **\*Step 3: (Step 28.b) Insert control rods until the reactor is subcritical.**

Standard:      The operator continues to insert control rods with EMERGENCY IN switch until the reactor is subcritical as indicated by infinite period on SRM Period indication 7-44A through D, and stable SRM level indications (7-43A through D).

SAT/UNSAT      **Step 4: (Step 28.c) Notify the Shift Manager, Operations Manager, and Superintendent Reactor Engineering.**

Standard:      The operator notifies the CRS of the situations and actions taken.

\* Critical Step

TIME FINISH: \_\_\_\_\_

Terminating Cue:    This JPM is complete.

Evaluator Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

System: 215004      K/A: A4.01 (3.9/3.8)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- A plant startup is in progress in accordance with Phase 1A of OP 0105, Reactor Operations.
- The procedure is complete through step A.26 (Page 21 of 152).
- The control rods have been withdrawn in the specified sequence of OP 2404.
- There have been two (2) doublings, and these are recorded on VYOPF 0105.03.
- The next control rod to be withdrawn is Rod 10-39.

### **Initiating Cues:**

The CRS directs you to continue the startup and take the reactor critical starting with Phase 1A Step 27 of OP 0105, Reactor Operations (Page 21 of 152).

**VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009**

**Task Identification:**

Title: Place Charger BC-1-1B in Service  
Failure Mode: N/A  
Reference: OP 2146, Operation of Station and Alternate Shutdown System 125-Volt Battery  
Chargers, (Rev. 21)  
Task Number: 2630070104

**Task Performance:** AO/RO/SRO  RO/SRO Only \_\_\_ SE Only \_\_\_

Sequence Critical: Yes  No

Time Critical: Yes \_\_\_ No

Individual Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation  Performance \_\_\_ Discuss

Setting: Classroom \_\_\_ Simulator \_\_\_ Plant

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS \_\_\_ FAIL \_\_\_ Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Instructor

Reviewed by: \_\_\_\_\_ Date \_\_\_\_\_  
SRO Licensed/Certified Reviewer

Approved by: \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Superintendent

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the individual has failed the Job Performance Measure.

After providing the initiating cue, ask the individual "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** all actions.

You are requested to **"talk-through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

There is currently no battery charger supplying power to DC Bus 2. Electrical Maintenance personnel are available for support if needed.

**Initiating Cues:**

The CRS has directed you to place the BC-1-1B Battery Charger in service in accordance with Section B of OP 2146.

**Task Standards:**

Battery Charger BC-1-1B is placed in service.

**Required Materials:**

**Handout 1** - OP 2146, Operation of Station and Alternate Shutdown System 125-Volt Battery Chargers (Rev. 21)

**Simulator Setup:**

N/A

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

**Evaluation**

**Performance Steps**

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

SAT/UNSAT

**Step 1: Obtain Procedure.**

Standard: The operator obtains OP 2146, Rev 21.

Proceeds to Section B, Placing Charger BC-1-1B (BC-1-1D) in Service.

Interim Cue:

When it is apparent that the operator is seeking to find OP 2146, Examiner provides copy (**Handout 1**).

SAT/UNSAT

**Step 2: (NOTEs prior to Step 1) This procedure section assumes that no chargers are in service. Use Section D for transfer.**

**These instructions are for BC-1-1B. Use the description in parentheses for BC-1-1D.**

Standard: The operator reads the Notes and proceeds to the Caution prior to Step 1.

SAT/UNSAT

**Step 3: (CAUTION prior to Step 1) Tripping and damage of DC components may occur if the battery is not tied to its respective bus.**

Standard: The operator reads the Caution and proceeds to Step 1.

SAT/UNSAT

**+Step 4: (Step 1) Close/check closed DC-2 125 VDC MAIN BREAKER.**

Standard: The operator verifies that the DC-2 125 VDC Main Breaker is shut by observing the breaker position indicating flag in the CLOSED (Red) condition.

Interim Cue:

After checking, Examiner inform Operator that the breaker position indicating flag is Red.

<u>Valuation</u>	<u>Performance Steps</u>
SAT/UNSAT	<b>+Step 5: (Steps 2.a-d) At MAIN STATION BATTERY CHARGER BC-1-1B (BC-1-1D), perform the following: Open/check open the AC BREAKER (Input). Open/check open the DC BREAKER (Output). Check or set the EQUALIZE timer to minimum. Adjust the FLOAT Adjustment Pot counterclockwise 10 Turns.</b>
	Standard: The operator verifies that the BC-1-1B AC Breaker is OPEN by observing the breaker switch in the OFF (Down) position.
Interim Cue:	After checking, Examiner inform Operator that breaker switch is in the Down position.
	Standard: The operator verifies that the BC-1-1B DC Breaker is OPEN by observing the breaker switch in the OFF (Down) position.
Interim Cue:	After checking, Examiner inform Operator that breaker switch is in the Down position.
	Standard: The operator observes that the BC-1-1B Equalize timer is set to zero (0).
Interim Cue:	After checking, Examiner inform Operator that the timer is set to zero (0).
	Standard: Using a screwdriver (simulated) the operator turns the FLOAT adjustment pot 10 turns in the counter-clockwise direction.
Interim Cue:	After checking, Examiner inform Operator that the FLOAT Adjustment Pot has been turned 10 turns in the Counter-Clockwise direction.
SAT/UNSAT	<b>+*Step 6: (Step 3) Close/check closed Ckt. 6, BATTERY CHARGER BC-1-1B on DC-2 (Ckt. 5, BATTERY CHARGER BC-1-1D on DC-2).</b>
	Standard: The operator closes/checks closed the Ckt. 6 breaker on DC-2 by positioning the breaker handle to the ON (Left) position.
Interim Cue:	After checking, Examiner inform Operator that breaker handle is in the Left position.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**+Step 7: (Step 4) Ensure DC-1 TIE TO DC-2 and DC-2 TIE TO DC-1 breakers are both open.**

Standard: The operator verifies that the DC-1 TIE TO DC-2 Breaker is OPEN by observing the DC-1 Tie DC-2 breaker position indicating flag on DC-1 is in the OPEN (Green) condition.

---

Interim Cue:

After checking, Examiner inform Operator that the breaker position indicating flag is Green.

---

Standard: The operator verifies that the DC-2 TIE TO DC-1 Breaker is OPEN by observing the DC-2 Tie DC-1 breaker position indicating flag on DC-2 is in the OPEN (Green) condition.

---

Interim Cue:

After checking, Examiner inform Operator that the breaker position indicating flag is Green.

---

SAT/UNSAT

**+\*Step 8: (Step 5) At MCC-9A (9B), close/check closed the 125 VDC BATTERY CHARGER BC-1-1B (BC-1-1D) breaker.**

Standard: The operator closes/checks closed the 125VDC Battery Charger breaker by observing the breaker handle in the ON (UP) position.

---

Interim Cue:

After checking, Examiner inform Operator that the breaker handle in the UP position

---

SAT/UNSAT

**+\*Step 9: (Step 6/6.a) At MAIN STATION BATTERY CHARGER BC-1-1B (BC-1-1D):  
Close the DC output breaker.**

Standard: The operator closes the DC output breaker by positioning the breaker handle to the ON (Up) position.

---

Interim Cue:

After action, Examiner inform Operator that the breaker handle in the UP position.

---

<u>Evaluation</u>	<u>Performance Steps</u>
SAT/UNSAT	<b><u>+*Step 10: (Step 6/6.b) At MAIN STATION BATTERY CHARGER BC-1-1B (BC-1-1D):</u></b> <b>Close the AC input breaker.</b>
	Standard: The operator closes the AC input breaker by positioning the breaker handle to the ON (up) position.
Interim Cue:	After action, Examiner inform Operator that the breaker handle in the UP position.
SAT/UNSAT	<b><u>+*Step 11: (Step 6.c) Increase voltage by turning the Float Adjust Pot clockwise slowly enough to limit the voltage to 132 V or until the charger current is about 100 amps.</u></b>
	Standard: The operator rotates the Float Adjust Pot clockwise slowly enough to limit the DC voltage to 132 V or until charger DC current is about 100 amps
Interim Cue:	When Operator indicates that he is rotating the potentiometer slowly clockwise, Examiner inform Operator that voltage is approximately 132 volts and that current is approaching 100 amps.
SAT/UNSAT	<b><u>Step 12: (Step 7) Request assistance from Electrical Maintenance for final calibration of the charger</u></b>
	Standard: The operator requests that Electrical Maintenance perform final calibration of the battery charger.
Interim Cue:	When Electrical Maintenance is contacted, Examiner inform Operator that Electricians are on their way to perform final calibration.
Note:	(+) JPM Steps 4 through 11 are Sequence Critical
	TIME FINISH: _____
Terminating Cue:	This JPM is completed.

**Evaluator Comments:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**System:** 263000      **K/A's:** A3.01 (3.2/3.3)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

There is currently no battery charger supplying power to DC Bus 2. Electrical Maintenance personnel are available for support if needed.

### **Initiating Cues:**

The CRS has directed you to place the BC-1-1B Battery Charger in service in accordance with Section B of OP 2146.

**NOTE: All actions must be simulated. At NO time shall any plant equipment be operated.**

**VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009**

**Task Identification:**

Title: Boron Injection from the SLC Tank Using the CRD System  
Failure Mode: N/A  
Reference: OE 3107, Appendix K, Boron Injection Using CRD System from the SLC Tank, (Rev. 25).  
Task Number: 2007600501

**Task Performance:** AO/RO/SRO  RO/SRO Only  SE Only

Sequence Critical: Yes  No

Time Critical: Yes  No

Individual Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation  Performance  Discuss

Setting: Classroom  Simulator  Plant

Performance Expected Completion Time: 20 minutes

Evaluation Results:

Performance: PASS  FAIL  Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_ Date \_\_\_\_\_  
Operations Training Instructor

Reviewed by: \_\_\_\_\_ Date \_\_\_\_\_  
SRO Licensed/Certified Reviewer

Approved by: \_\_\_\_\_ Date \_\_\_\_\_  
Superintendent Operations Training

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the individual has failed the Job Performance Measure.

After providing the initiating cue, ask the individual "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** all actions.

You are requested to **"talk-through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

- An ATWS has occurred.
- The EOPs have been entered.
- The SLC Tank is available.
- CRD Pump B is in service and CRD Pump A is in Standby.

**Initiating Cues:**

The CRS directs you to line up the CRD System for boron injection from the SLC Tank in accordance with OE 3107, Appendix K, to CRD Pump B. Inform the Control Room when the CRD Pumps can be started.

**Task Standards:**

The SLC tank and CRD System are lined up to inject into the reactor vessel using CRD Pump B in accordance with Procedure OE 3107, Appendix K

**Required Materials:**

**Handout 1** - OE 3107, Appendix K, (Rev. 25)

**Simulator Setup:**

N/A

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

**Evaluation**

**Performance Steps**

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

SAT/UNSAT

**Step 1: Obtain Procedure.**

Standard: The operator obtains OE 3107, Appendix K, Rev 25.

Proceeds to Procedure Step 1.

Interim Cue:

When it is apparent that the operator is seeking to find OE 3107, Appendix K, Examiner provides copy (**Handout 1**).

SAT/UNSAT

**Step 2: Acquire Necessary Tools and Equipment**

Standard: Tools, fittings, and hose acquired from EOP Toolbox located in the Reactor Building (318' elevation)

Interim Cue:

Inform Operator that necessary tools, fittings, and hose have been acquired.

SAT/UNSAT

**\*Step 3: (Steps 1.a-d) Establish a flowpath from the SLC tank to the CRD pumps using the following hose route: From the SLC tank on the 318' elevation down the pipe chase on West wall labeled EOP SLC Pipe Chase, Down the pipe chase on 303' elevation labeled EOP SLC Pipe Chase, Down the pipe chase on the 280' elevation labeled EOP SLC Pipe Chase, Down the HPCI hatch on the 252' elevation to the CRD pumps.**

Standard: The operator locates the hoses to be used in the SLC Hallway.

The operator routes the hose from the SLC Tanks, down the EOP SLC pipe chase on RB 318' elevation west, down through the EOP pipe chase on RB 303' and 280' elevations, and down through the equipment hatch on the 252' elevation to the CRD Pumps.

Interim Cue:

As each step of hose routing is simulated, Examiner inform Operator that hose has been routed and connected.

<u>valuation</u>	<u>Performance Steps</u>
SAT/UNSAT	<b>*Step 4: (Step 2/2.a) At the SLC tank: CLOSE/confirm CLOSED SLC-23 Standby Liquid Control Tank Drain.</b>
	Standard: The operator verifies that SLC-23 closed by rotating the valve operating handle in the clockwise direction.
Interim Cue:	After the simulated action, Examiner inform the operator that the valve operating does not move.
SAT/UNSAT	<b>*Step 5: (Step 2.b) Remove Pipe Cap from the 1 ½ inch tank drain.</b>
	Standard: The operator removes the pipe cap from the 1 1/2-inch tank drain.
Interim Cue:	After the simulated action, Examiner inform Operator that the pipe cap is OFF.
SAT/UNSAT	<b>*Step 6: (Step 2.c) Connect hose adaptor to the tank drain.</b>
	Standard: The operator connects a hose adaptor to the drain tank.
Interim Cue:	After the simulated action, Examiner inform Operator that the hose adaptor is installed.
SAT/UNSAT	<b>*Step 7: (Step 2.d) Connect Hose</b>
	Standard: The operator connects the CRD Pump suction hose to the SLC Tank drain line.
Interim Cue:	After the simulated action, Examiner inform Operator that the hose is connected.
SAT/UNSAT	<b>Step 8: (Step 2.e) Place the SLC tank heater control switch to ON(located on side of large junction box, Rack 25-19, Rx Bldg. elevation 318').</b>
	Standard: The operator rotates the SLC tank heater control switch to the ON position.
Interim Cue:	After the simulated action, Examiner inform Operator that the switch is in the ON position, and the heaters are energized.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 9: (Steps 3/3.a) In the CRD pump room: CLOSE/confirm CLOSED the following valves:  
DW-65 CST Header Demin Water Isol  
DW-66 CST Header Demin Water Isol**

Standard: The operator checks DW-65 Closed by rotating the handwheel in the clockwise direction.

Interim Cue:

After the simulated action, Examiner inform the operator that the handwheel does not move.

Standard: The operator checks DW-66 Closed by rotating the handwheel in the clockwise direction.

Interim Cue:

After the simulated action, Examiner inform the operator that the handwheel does not move.

SAT/UNSAT

**\*Step 10: (Step 3.b) Remove top flange from check valve DW-67 (located between DW-66 and DW-65) and replace with mechanical bypass flange with hose connection.**

Standard: The operator removes the top flange from check valve DW-67, and attaches the hose connection flange.

Interim Cue:

After the simulated action, Examiner inform the operator that the flange is removed, and the hose connection flange is installed.

SAT/UNSAT

**\*Step 11: (Step 3.c) Connect hose to bypass flange**

Standard: The operator connects the SLC suction hose to the mechanical bypass flange.

Interim Cue:

After the simulated action, Examiner inform the operator that the SLC suction hose is connected to the mechanical bypass flange.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 12: (Step 3.d) Request the Control Room to secure both CRD pumps, and verify neither are running prior to continuing with this procedure.**

Standard: The operator contacts the Control Room and requests both CRD Pumps be secured.

Interim Cue:

When requested, Examiner inform Operator that both CRD Pumps are secured.

Standard: The operator enters the CRD Pump Room and determines that both pumps are secured.

Interim Cue:

After action, Examiner inform Operator neither CRD Pump is running.

SAT/UNSAT

**\*Step 13: (Step 3.e) CLOSE CST-63C, CRD Sys CST Suction Isol.**

Standard: The operator closes CST-63C by rotating handwheel in the clockwise direction.

Interim Cue:

After the simulated action, Examiner inform the operator that the handwheel rotated clockwise, and has now stopped.

SAT/UNSAT

**\*Step 14: (Step 3.f) OPEN DW-66, CST Header Demin Water Isol.**

Standard: The operator opens DW-66 by rotating handwheel in the counter-clockwise direction.

Interim Cue:

After the simulated action, Examiner inform the operator that the handwheel rotated counter-clockwise, and has now stopped.

SAT/UNSAT

**\*Step 15: (Step 3.g) OPEN CRD-158A (B), CRD Pump A (B) Suction Filter Bypass.**

Standard: The operator opens DW-158B by rotating handwheel in the counter-clockwise direction.

Interim Cue:

After the simulated action, Examiner inform the operator that the handwheel rotated counter-clockwise, and has now stopped.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 16: (Step 3.h) CLOSE CRD-35A (B), CRD Pump A (B) Suction Filter Inlet.**

Standard: The operator closes CRD-35A by rotating handwheel in the clockwise direction.

Interim Cue:

After the simulated action, Examiner inform the operator that the handwheel rotated clockwise, and has now stopped.

SAT/UNSAT

**\*Step 17: (Step 3.i) CLOSE CRD-37A (B), CRD Pump A (B) Main Flow Stop Check, to maximize CRD flow to the reactor vessel.**

Standard: The operator closes CRD-37A by rotating handwheel in the clockwise direction.

Interim Cue:

After the simulated action, Examiner inform the operator that the handwheel rotated clockwise, and has now stopped.

SAT/UNSAT

**\*Step 18: (Step 3.j) CLOSE/confirm CLOSED CRD-34A (B), CRD Pump A (B) min flow stop check, to maximize CRD flow to reactor vessel.**

Standard: The operator closes CRD-34A by rotating handwheel in the clockwise direction.

Interim Cue:

After the simulated action, Examiner inform the operator that the handwheel rotated clockwise, and has now stopped.

SAT/UNSAT

**\*Step 19: (Step 4) At the SLC tank, OPEN SLC-23, Standby Liquid Control Tank Drain.**

Standard: The operator opens SLC-23 by rotating the valve operating handle in the counter-clockwise direction.

Interim Cue:

After the simulated action, Examiner inform the operator that the valve operating handle rotated counter-clockwise, and has now stopped.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 20: (Steps 5/5.a-b) In the CRD pump room, ensure hose is filled by performing the following: OPEN CRD-151A(B) CRD Pump Suction Strainer Drain, to vent any entrapped air within the hose connected to the SLC tank, and CLOSE CRD-151A(B) when venting is complete.**

Standard: The operator opens CRD-151B by rotating the handwheel in the counterclockwise direction.

---

Interim Cue: After the simulated action, Examiner inform the operator that the handwheel is rotated counter-clockwise, and the effluent is an air/water mixture.

Then, Examiner inform Operator that effluent is water only.

---

The operator closes CRD-151B by rotating the handwheel in the clockwise direction.

---

Interim Cue: After the simulated action, Examiner inform the operator that the handwheel rotated clockwise, and has now stopped.

SAT/UNSAT

**\*Step 21: (Steps 6/6.a) At the CRD Flow Control Station: OPEN CRD-40, CRD Pump Test Bypass Line.**

Standard: The operator opens CRD-40 by rotating the valve operating handle in the counterclockwise direction.

---

Interim Cue: After the simulated action, Examiner inform the operator that the valve operating handle rotated counter-clockwise, and has now stopped.

SAT/UNSAT

**\*Step 22: (Step 6.b) OPEN CRD-40A, CRD Pump Test Bypass Line.**

Standard: The operator opens CRD-40A by rotating the valve operating handle in the counterclockwise direction.

---

Interim Cue: After the simulated action, Examiner inform the operator that the valve operating handle rotated counter-clockwise, and has now stopped.

---

**Evaluation**

**Performance Steps**

SAT/UNSAT

**\*Step 23: (Step 6.c) CLOSE CRD-42A (B), Drive Water Filter F-16-1A (B) Inlet.**

Standard: The operator closes CRD-42A or CRD-42B (Whichever is OPEN) by rotating the valve operating handle in the clockwise direction.

Interim Cue:

After the simulated action, Examiner inform the operator that the valve operating handle rotated clockwise, and has now stopped.

SAT/UNSAT

**\*Step 24: (Step 6.d) CLOSE CRD-94 Flow Control Station Disch to Rx Vessel.**

Standard: The operator closes CRD-94 by rotating the handwheel in the clockwise direction.

Interim Cue:

After the simulated action, Examiner inform the operator that the handwheel rotated clockwise, and has now stopped.

SAT/UNSAT

**Step 25: (Step 7) Confirm either: RWCU System is isolated or RWCU demins are isolated.**

Standard: The operator contacts the Control Room and confirms that the RWCU System or the Demins are isolated.

Interim Cue:

Examiner report as the ACRO that the RCWU System is isolated.

SAT/UNSAT

**Step 26: (Step 8/8.a) At CRP 9-5: START the CRD pump(s) and verify flow by observing decreasing SLC tank level.**

Standard: The operator contacts the Control Room and reports that the CRD System for boron injection from the SLC Tank has been aligned to CRD Pump B in accordance with OE 3107, Appendix K; and that CRD Pump B can now be started.

TIME FINISH: \_\_\_\_\_

**Terminating Cue:** This JPM is complete.

**Evaluators Comments:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**System:** 295037      **K/A's:** EA1.10 (3.7/3.9)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

- An ATWS has occurred.
- The EOPs have been entered.
- The SLC Tank is available.
- CRD Pump B is in service and CRD Pump A is in Standby.

### **Initiating Cues:**

The CRS directs you to line up the CRD System for boron injection from the SLC Tank in accordance with OE 3107, Appendix K, to CRD Pump B. Inform the Control Room when the CRD Pumps can be started.

**NOTE: All actions must be simulated. At NO time shall any plant equipment be operated.**

**VERMONT YANKEE  
JOB PERFORMANCE MEASURE  
WORKSHEET  
NRC EXAM 2009**

**Task Identification:**

Title: Shifting Air Compressors  
Failure Mode: The Low Oil Pressure LED is Illuminated  
Reference: OP 4190, Service and Instrument Air System Surveillance, (Rev. 19)  
Task Number: 27970301

**Task Performance:** AO/RO/SRO  RO/SRO Only  SE Only

Sequence Critical: Yes  No

Time Critical: Yes  No

Operator Performing Task: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_

Activity Code: \_\_\_\_\_

Method of Testing: Simulation  Performance  Discuss

Setting: Classroom  Simulator  Plant

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS  FAIL  Time Required: \_\_\_\_\_

Prepared by: \_\_\_\_\_  
Operations Training Instructor

\_\_\_\_\_  
Date

Reviewed by: \_\_\_\_\_  
SRO Licensed/Certified Reviewer

\_\_\_\_\_  
Date

Approved by: \_\_\_\_\_  
Operations Training Superintendent

\_\_\_\_\_  
Date

**Directions:**

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (\*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the individual has failed the Job Performance Measure.

After providing the initiating cue, ask the individual "Do you understand the task?"

**Read to the person being evaluated:**

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk-through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

**Initial Conditions:**

The plant is operating at 100% power.

**Initiating Cues:**

The CRS directs you to shift the LAG Air Compressors to LEAD and the LEAD Air Compressors to LAG in accordance with Section A of OP 4190, Service and Instrument Air System Surveillance.

**Task Standards:**

The Air Compressors are shifted in accordance with Section A of OP 4190.

**Required Materials:**

**Handout 1** - OP 4190, Service and Instrument Air System (Rev. 19)

**Simulator Setup:**

N/A

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

**Evaluation**

**Performance Steps**

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

SAT/UNSAT

**Step 1: Obtain Procedure.**

Standard: The operator obtains OP 4190, Rev 19.

Proceeds to Section A, Shifting Air Compressors.

Interim Cue:

When it is apparent that the operator is seeking to find OP 4190, Examiner provides copy (**Handout 1**).

SAT/UNSAT

**Step 2: (NOTE prior to Step 1) If one of the compressors is inoperable, the compressor which will become the lag compressor should be the one with the most operating hours indicated on the timer.**

Standard: The operator reads the Note and proceeds to Step 1.

SAT/UNSAT

**Step 3: (Step 1) Verify that the test switches on the test panel, TP-1, for operable pressure switches are in the NORM position.**

Standard: After the cue, the operator observes that all test switches are in NORM.

Interim Cue:

If switches are not in NORM, Examiner inform operator that all switches are in the NORM position.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 4:** **(Step 2) On air compressor control cubicle 1A(B,C,D) for all inservice air compressors, verify the following LEDs are extinguished:**  
**Oil Pressure**  
**Air Temp LP Out**  
**Motor Overload**  
**Air Temp HP Out**

Standard: The operator observes the LEDs on Compressor A Control Panel.  
The operator observes the LEDs on Compressor B Control Panel.  
The operator observes the LEDs on Compressor C Control Panel.  
The operator observes the LEDs on Compressor D Control Panel.

---

NOTE:

The compressors in LEAD will be operating, the compressors in LAG will be not running.

Interim Cue:

After checking, Examiner inform the Operator that the LEDs for the two compressors in LEAD are extinguished.

After checking, Examiner inform the operator that the LEDs for the first compressor in LAG are extinguished.

After checking, Examiner inform the operator that the LED for oil pressure is illuminated on the last compressor that is in LAG.

---

SAT/UNSAT

**\*Step 5:** **(Steps 2.a/2.a.1) If one or more of the LEDs are illuminated, for the affected compressor, proceed as follows: On panel CP-1, place the associated compressors control switch, CS1-A(B,C,D), to HOLD.**

Standard: The operator rotates the affected compressor control switch from LAG to HOLD.

---

Interim Cue:

After the simulated action, Examiner inform the operator the affected compressor control switch is in HOLD.

---

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 6: (Step 2.a.2) Determine and correct the cause of the problem.**

Standard: The Operator contacts the CRS, or I&C directly, and reports the problem.

---

Interim Cue:

After the simulated action, Examiner inform the Operator that using Time Compression the oil pressure switch had been replaced by I&C personnel.

---

SAT/UNSAT

**\*Step 7: (Step 2.a.3) On the associated air compressor control cubicle, depress S1, the START/RESET pushbutton.**

Standard: The operator depresses the S1 pushbutton.

---

Interim Cue:

After the simulated action, Examiner inform the operator the S1, Start/Reset pushbutton has been depressed

---

SAT/UNSAT

**Step 8: (Step 2.a.3.a) On the associated air compressor control cubicle 1A(B, C, D), verify the following LEDs are extinguished:**  
**Oil Pressure**  
**Air Temp LP Out**  
**Motor Overload**  
**Air Temp HP Out**

Standard: The operator verifies the LEDs are extinguished on the associated air compressor control cubicle.

---

Interim Cue:

Examiner inform the Operator that the LED for the oil pressure is extinguished.

---

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 9: (Step 3) On air compressor control cubicle 1A(B,C,D), verify that all inservice air compressors LOAD/UNLOAD switches are in the LOAD position.**

Standard: The operator observes that all in-service air compressors LOAD/UNLOAD switches are in the LOAD position.

Interim Cue:

Examiner inform the Operator that all in-service air compressors LOAD/UNLOAD switches are in the LOAD position.

SAT/UNSAT

**\*Step 10: (Steps 4/4.a-b) On panel CP-1, place control switch CS1-A(B,C,D) for the units which are to become the running compressors to LEAD and verify:  
The machines start, load, and sound normal.  
Oil pressure is between 20 and 44 psig.**

Standard: The operator places the LEAD/LAG Switches for LAG Air Compressors placed in LEAD.

**Interim Cue:**

After the simulated action, Examiner inform the operator that the switches are in LEAD.

The operator observes that the machine starts, loads and sounds normal.

**Interim Cue:**

After the action, Examiner inform the operator that the machine starts, load, and sounds normal.

The operator observes the oil pressure is between 20 and 44 psig.

**Interim Cue:**

After the action, Examiner inform the operator that the oil pressure is  $\approx$ 30 psig.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 11:** (NOTE prior to Step 5) **With a compressor selected to LAG, it will run for approximately 6-7 minutes before shutting down provided there is no air demand for that compressor. If a compressor is selected to LEAD, the compressor will run continuously, cycling on the unloader. Normally, two compressors are in LEAD and two in LAG.**

Standard: The operator reads the Note and proceeds to Step 5.

SAT/UNSAT

**\*Step 12:** (Step 5) **On panel CP-1, place control switch CS1-A(B,C,D) for the standby compressors to LAG.**

Standard: The operator rotates the LEAD/LAG Switches for the Standby Compressors taken to LAG.

---

Interim Cue: After the simulated action Examiner inform the operator that the switches are in LAG.

---

SAT/UNSAT

**Step 13:** (Step 6) **If air demand is normal, verify that the LAG compressors shutdown.**

Standard: The operator checks for normal air demand.

---

Interim Cue: After the simulated action, Examiner inform the operator that air demand is normal.

---

The operator observes that the LAG compressors remain unloaded and shutdown after approximately 6 - 7 minutes.

---

Interim Cue: When the operator indicates that he must wait 6 - 7 minutes, Examiner inform the operator that air pressure is normal, 7 minutes have passed, and the LAG air compressors have stopped.

---

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 14: (Step 7) Verify that the running compressors load and unload to maintain receiver pressure between 98-107 psig.**

Standard: The operator observes air header pressure gage PI-105-51 and determines that the compressor is loading and unloading between  $\approx$ 98-107 psig.

Interim Cue:

When the operator observes air pressure, Examiner inform operator that the compressor loads at 98 psig, and unloads at 107 psig.

SAT/UNSAT

**Step 15: (NOTEs prior to Step 8) An air compressor must have either the manual or thermostat controlled discharge damper open to allow air flow across the air coolers, otherwise the compressor may trip on high temperature.**

**Unless conditions warrant (i.e., air cooler outlet temperatures are high), the discharge dampers should not be repositioned except as directed by OP 2196.**

Standard: The operator reads the Notes and proceeds to Step 8.

SAT/UNSAT

**Step 16: (Step 8) Verify air flow path across the air compressor's air coolers.**

Standard: The operator verifies the air flow path across the air compressor air coolers.

Interim Cue:

When the operator indicates that he will be verifying the air flow across the air compressor air coolers, Examiner inform the operator that the air flow across the air coolers is normal.

SAT/UNSAT

**Step 17: (Step 9) Report any abnormal noises or indications to the Control Room.**

Standard: The operator contacts the Control Room, and reports that there are no abnormalities.

Interim Cue:

After action, Examiner inform the operator that the Control Room acknowledges that there are no abnormalities.

**Evaluation**

**Performance Steps**

SAT/UNSAT

**Step 18: (Step 10) Log Completion in the surveillance logbook.**

Standard: The operator logs completion in the Surveillance Logbook.

---

Interim Cue:

When operator indicates he will log result, Examiner inform the operator that the Shift Manager or CRS will perform this.

---

TIME FINISH: \_\_\_\_\_

**Terminating Cue:**

This JPM is complete.

**Evaluator Comments:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**System:** 300000

**KA:** K4.01 (2.8/2.9)

## **EXAMINEE HANDOUT**

### **Initial Conditions:**

The plant is operating at 100% power.

### **Initiating Cues:**

The CRS directs you to shift the LAG Air Compressors to LEAD and the LEAD Air Compressors to LAG in accordance with Section A of OP 4190, Service and Instrument Air System Surveillance.

**NOTE: All actions must be simulated. At NO time shall any plant equipment be operated.**

Facility:	VERMONT YANKEE	Scenario No.:	1	Op Test No.:	2009 NRC
Examiners:	_____	Operators:	SRO -	RO -	BOP -
	_____				
	_____				
Initial Conditions:	<p>At 100% power</p> <p>DG "A" has been operating for 30 minutes for Monthly Diesel Generator Slow Start Operability Test (Tech Spec) per OP 4126, Sect B. The test is being performed following a diesel lube oil change. The test must be run for at least two hours at 2700 to 2750 kW and 1600 ± 50 kVAR OUT.</p> <p>RHR Pump B is OOS for severe vibrations that occurred during surveillance testing and is tagged out for Maintenance investigation.</p>				
Turnover:	<p>RHR Pump B is OOS for severe vibrations that occurred during surveillance testing and is tagged out for Maintenance investigation.</p> <p>DG "A" is in operation for the Monthly Diesel Generator Slow Start Operability Test per OP 4126, Sect B. This requires DG B being declared inop IAW T.S. 3.10.B.1</p>				
Critical Tasks:	<ol style="list-style-type: none"> <li>1. With a reactor scram required and the reactor not shutdown, INHIBIT ADS to prevent an uncontrolled RPV depressurization to prevent causing a significant power excursion.</li> <li>2. During an ATWS with conditions met to perform power/level control TERMINATE AND PREVENT INJECTION into the RPV using appendix GG, until conditions are met to re-establish injection.</li> <li>3. With a reactor scram required and the reactor not shutdown, TAKE ACTION TO REDUCE POWER by injecting boron and/or inserting control rods, to prevent exceeding the primary containment design limits.</li> </ol>				
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	N - BOP N - SRO	Raise Main Generator output to heavy load schedule and maximum Lagging (OUT) VAR Load IAW OP 2140, Sect. H.		
2	mfTU_03A 60% over 300 sec.	R - RO R - SRO	Turbine Vibration respond per ARS 7-F-2 (lower power stop test) Lower power OP 0105, Reactor Operations (vibrations stop after stopping test and lowering generator load)		
3	mfDG_03A 100% 120 sec	I - BOP I - SRO TS - SRO	DG Voltage Regulator Malfunction requires removing DG "A" from service. Declare DG "A" inoperable and appropriate T.S.		
4	mfRR_11B 100% over 600 sec	I - RO I - SRO	"B" Recirc speed controller will fail and will begin to run away requiring the RO to take manual control and rebalance flows.		

5	mfED_05Da	C - RO C - SRO TS - SRO	Loss of MCC-9A with a failure of the Group 3 Isolation (AC-6B will not auto close) Consult Tech Specs
6	mfED05Cb	C - BOP C - SRO	480V MCC-8B will trip causing a half scram (if RPS B was transferred to its alternate supply) also the loss of the bus will challenge DW pressure by the loss of power to RRUs 1A and 1B, alternate RRUs must be started. (This power lost will affect ATWS recovery by preventing the use of cooling water flow to insert the control rods.)
7	mfRP_02A mfRD_12A mfRD_12B (20/20%)	M- ALL	Loss of RPS MG Set A, Hydraulic ATWS with MSIV closure
8	mfSL_02A	C - RO C - SRO	SLC Squib Valve "A" failure (the loss of 8B takes away SLC Pump B) Candidate must recognize that the Squib Valves must be fired locally using the battery.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario Event Description  
NRC Scenario 1

**Vermont Yankee 2009 NRC Scenario #1**

The crew takes the watch with the plant at 100% power and DG # A in operation for the Monthly Diesel Generator Slow Start Operability Test per OP 4126, Sect B. The test must be run for at least two hours at 2700 to 2750 kW and 1600 ±50 kVAR OUT. Immediately after turnover, the crew is contacted by VELCO and requested to Raise Main Generator output to heavy load schedule and maximum Lagging (OUT) VAR Load (OP 2140, Sect. H) because a large unit within the system has tripped. The crew will raise Main Generator voltage and VARs but after the Main Generator has been raised to the limit a high turbine vibration will occur requiring the crew to terminate the voltage and VAR increase and lower reactor power to lower the turbine vibration to within vibration limits.

As the reactor and turbine are stabilized at a lower power level the crew must respond to a DG Voltage Regulator Malfunction, caused by the system voltage changes. This requires removing DG "A" from service, declaring DG A inoperable and entering the appropriate T.S.

The "A" Recirculation Pump controller will have failed and be slowly increasing "A" recirc pump speed, requiring the operator to diagnose the condition and go to manual and rebalance flows if/when the flow difference between the two loops exceeds 5%.

After conditions have stabilized MCC-9A will fail and one of the Group 3 Isolation Valves (AC-6B) will fail to auto close, the crew will recognize the failure and manually close the valve. Additionally FRV B will lockup requiring a reset by the RO. The SRO will consult Tech Specs and identify the LCO per TS 3.5.A.6

After Tech Specs have been addressed for the loss of MCC-9A, and the isolation valve failure corrected, the 480V MCC-8B will have a fault and trip resulting in a loss of power to the bus, this will result in a loss of all AC power to the Vital MG and the alternate power supply to RPS Bus B. If RPS bus B was transferred to its alternate supply (9A) a reactor half scram will result. The crew must diagnose multiple power supply failures and start additional RRUs to maintain DW pressure.

A loss of RPS Bus A will cause a scram condition; some control rod insertion occurs; however, ATWS conditions will remain due to hydraulic lock on the scram discharge volume. The crew will be evaluated controlling and shutting down the plant in accordance with EOP-1 and EOP-2. When SLC is initiated, the SLC Squib Valve "A" will fail to fire. Because of the previous loss of MCC-8B the B SLC Pump/Squib Valve will not be available. The crew must send an AO to the Squib Valves and manually fire the Squib Valves with a battery. This will allow the "A" Pump to discharge through the open Squib Valve and alternate means to insert control rods will be required to shutdown the reactor (**Critical Task**). The crew will inhibit auto ADS initiation (**Critical Task**) and terminate and prevent injection as required by EOP-2 (**Critical Task**). EOP-2 actions to reduce reactor power via control rod insertion and lowering RPV level will be required.

Critical tasks are to inhibit ADS prior to automatic initiation, to terminate and to prevent injection as required by EOP-2, to inject boron into the reactor using the SLC system and/or take alternate means to insert the control rods.



**CREW BRIEF:**

**-Power level:** 100%

**-Rod Sequence:** Rapid Shutdown Sequence Latched (EOC)      **-Rod Group:** 22

**-Equipment out of service and/or tagged or abnormalities:**

1. RHR Pump B OOS, tagged out for Maintenance investigation yesterday at 1600.

**-Reason For Equipment out of Service or tagged:**

1. RHR Pump B OOS for severe vibrations during surveillance testing.

**-Applicable Tech Spec LCOs:**

1. Seven (7) day LCO, TS 3.5.A.3
2. Seven (7) day LCO, TS 3.10.B.1

**EOOS Color:**

Green 3.10 E-6

**-Plant evolutions in progress/Scheduled Shift Evolutions:**

1. DG A operating for 30 minutes for Monthly Diesel Generator Slow Start Operability Test (Tech Spec) per OP 4126, Sect B.

## **SCENARIO SUMMARY:**

### **TERMINATING CONDITION(S):**

1. Once all control rods are inserted and EOP-2 is exited to EOP-1, the scenario may be terminated at the discretion of the Lead Evaluator.

### **REFERENCES:**

1. OP 2140, Main Generator
2. ARS CRP 9-7 Alarm Response Sheets (F-2)
3. ARS CRP 9-8 Alarm Response Sheets (F-2)
4. OP 2126, Diesel Generators
5. OP 4126, Diesel Generators Surveillance Testing
6. OP 0105, Reactor Operations
7. OT 3110, Positive Reactivity Insertion
8. OP 2110, Reactor Recirculation System
9. AP 0156, Notification of Significant Events
10. ON 2143 480 VAC
11. ON 3174, Loss of Instrument AC
12. OT 3122, Loss of Normal Power
13. OT 3100, Reactor Scram
14. EOP-1
15. EOP-2
16. EOP-3
17. OE 3107
18. Technical Specifications

**SIMULATOR OPERATOR INSTRUCTIONS**

**Simulator Set Up:**           100% Power

1. IC-805
2. CRD Pump B in service

**Discretionary Distracter Malfunctions/RFs/IOs:**

1. rNM\_71-76 All APRM Gain adjusts made to get APRM GAFs in spec (modeled to the plant at 100%): 71 (1.385), 72 (1.448), 73 (1.378), 74 (1.383), 75 (1.287), 76 (1.375)

No.	MF/RF/IO #	Severity	Ramp	REM #	Act. Time	Description
1.	mfPC_1SB06B			Pre-insert		Failure of AC-6B to close on a Group 3 isol (SB-06B Closure Failure)
2.	AETAC-6B			Pre-insert		Event Trigger for deleting AC-6B Closure Failure
3.	mfRD_12A	20%		Pre-insert		Partial Scram 'A'
4.	mfRD_12B	20%		Pre-insert		Partial Scram 'B'
5.	mfSL_02A			Pre-insert		SLC Squib Valve 'A' fails to fire
6.	rRH_12	Open		Pre-insert		RHR B ACB
7.	mfTU_03A	~60%	300	1		Turbine Vibration
8.	mfDG_03A	100%	180	2		DG Voltage Regulator Malfunction
9.	mfRR_11B	100%	600	3		Recirc loop "B" controller failure
10.	mfED_05Da			4		Loss of 480V MCC-9A
11.	mfED_05Cb			5		Trip MCC-8B Supply Bkr
11.	mfRP_02A			6		Loss of RPS MG Set A

**SIMULATOR OPERATOR INSTRUCTIONS  
(Continued)**

**Additional Instructions:**

1. RHR Pump B is in PTL and Danger Tagged
2. Call the Control Room as VELCO and request that they go to their heavy load schedule and their maximum VAR limit, due to a trip of a large unit on the grid
3. Begin the ramp up in turbine vibration after the crew has raised Generator output voltage and maximized the VAR load. The turbine high vibration alarm (Annunciator 7-F-2) should be received immediately after the voltage and VAR is increased. The increase in turbine vibration should stop at ~7.5 mils, and will NOT cause a turbine trip.
4. When the crew starts power reduction, modify mfTU\_03A to ~28 to ramp turbine vibration back (over a two minute ramp) to the pre-transient level, then delete the malfunction.
5. The Recirc controller failure will be investigated, with no cause being found for the duration of the scenario.
6. If directed to adjust Alterex Cooling, respond as directed.

## OPERATOR ACTIONS EVENT NUMBER 1

### Crew Task Description:

**Place Main Generator in the Heavy Load Schedule with Maximum VARs IAW OP 2140, Sect. h.**

1.	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
2.	RO	Acknowledges request from VELCO to go to the Heavy Load Schedule with Maximum VARs IAW OP 2140, Sect. H.  Informs SRO/SRO				
3.	SRO	Acknowledges request from VELCO and directs Crew to go to the Heavy Load Schedule with Maximum VARs IAW OP 2140, Sect. H.				
4.	SRO	Briefs crew				
5.	BOP	Obtains and reviews procedure OP 2140 Section H and checks prereqs.				
6.	BOP	Notify VELCO and ISO-NE that the VY is going to the Heavy Load Schedule.				
<b>ROLE PLAY: When/If notified of the VY Generator status respond as VELCO acknowledging the communication.</b>						

- NOTES:**
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7.	BOP	<p>Determines Main Generator parameters</p> <ul style="list-style-type: none"> <li>• Generator MWe from ERFIS point G002, or on panel 9-7, EI 9-7-7. Circle instrument used.</li> <li>• 345 KV System Voltage</li> <li>• Generator VARS from ERFIS point G009, or on panel 9-7 EI 9-7-6. Circle instrument used.</li> </ul>				<p><b>NOTE:</b> SRO may designate RO and BOP to coordinate the voltage adjustments between the Main Generator and the DG.</p>
8.	BOP	<p>On panel 9-7, raise main generator VARS using VOLTAGE ADJUST AC until system voltage reaches 358 KV and the maximum MVARs lagging (out) allowed per the generator 45 pound capability curve of OP 2140, Figure 1, for the gross MWe output is achieved</p>				<p><b>NOTE:</b> The crew may receive the Alterex temperature alarm. If so, respond as directed.</p>
9.	SRO	<p>Monitors Crew and plant performance.</p> <p>May direct BOP to monitor the output of the A DG per OP 4126</p>				
10.	BOP	<p>Monitor the output of DG A per OP 4126 and adjust as necessary</p>				

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## OPERATOR ACTIONS EVENT NUMBER 2

### Crew Task Description:

#### High Main Turbine Vibration Requires Power Reduction IAW OP 0105

	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize/Announce Annunciator 7-F-2 (Turbine Excessive Vibration)				<b>NOTE:</b> It takes about 2 minutes for the vibration alarm to occur following initiating the malfunction.
2.	SRO	Determines turbine bearings vibrations on ERFIS.  Direct power reduction IAW OP-0105 if vibrations approach 10 mils.  May direct reducing VARs back to the normal VAR load.  Notifies or directs notifying ISO New England and VELCO.  Notifies Maintenance.				
3.	BOP	Notify VELCO and ISO-NE that raising VY voltage and VARS will be terminated due to high turbine vibration.				
4.	RO	Reduce load as directed using Recirc flow.  May shift to coarse control to quickly lower recirc flow				

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5.	BOP	Monitors Turbine Vibration and other plant parameters and reports to crew  Responds to Annunciators 9-4 B-3 and F-3 and sends an AO up to adjust Recirculation MG Set oil temperatures.				
<b>ROLE PLAY:</b> As AO respond as directed. In the booth rSW_58 adjusts Recirc MG Set oil temps.  Responds as directed if asked to walk down the turbine/generator						
<b>EVALUATOR'S CUE:</b> OP 0105 allows power reduction at 10% per minute						
6.	SRO	When Turbine vibrations lower directs stop lowering power				
<b>EVALUATOR'S NOTE:</b> May receive alarm 5-E-6 "FW Control System trouble". Due to mismatch of level and setpoint during power reduction. The alarm is expected and will clear.						
7.	RO	Stops lowering power and determines position on the P/F Operating Map				
<b>EVALUATORS CUE:</b> Go to next event at the Examiners discretion.						

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### OPERATOR ACTIONS EVENT NUMBER 3

**Crew Task Description:**

**DG Voltage Regulator Malfunction requires removing the "A" DG from service. Declaring DG A inoperable and appropriate T.S.**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Acknowledge/respond to DG "A" FIELD VOLTS INCREASE VARS INCREASE 8-G-1, DG-A OVERLOAD <ul style="list-style-type: none"> <li>• Inform SRO</li> <li>• Dispatch an AO to investigate</li> <li>• Diagnose A Standby Diesel Generator Auto Voltage Regulator Failure</li> </ul>				<b>NOTE:</b> If transfer from auto voltage regulator to manual voltage regulator is not made prior to reaching the trip setpoint DG "A" will trip. Causing Annunciator 8-F-2
2.	SRO	Direct the following <ul style="list-style-type: none"> <li>• Dispatch AO/Maintenance to investigate</li> <li>• Enter OP 2126</li> <li>• May direct attempting to control voltage manually</li> <li>• Direct Manual S/D from the Control Room (Sect. B.)</li> <li>• When DG inoperability is determined, consult TS and enter an additional 7-day LCO (TS 3.10.B.1)</li> </ul>				<b>NOTE:</b> May direct the AO to locally trip the A DG.  <b>NOTE:</b> May continue on in OP 4126 to remove the A DG from service

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
3.	BOP	<p>Mat transfer from Auto Voltage regulator to Manual Voltage Regulator</p> <p>Reduce load to approximately 50% using the DIESEL GEN SPEED GOVERNOR control switch</p> <p>Control DG voltage and VAR loading using Manual Voltage Control.</p> <p>Run unit at 50% load for 5 minutes.</p> <p>Using the DIESEL GEN SPEED GOVERNOR control switch, unload unit to &lt; 200 kw.</p> <p>Open BKR NO. DG-A, diesel generator output breaker.</p> <p>Run unloaded for approximately 1 minute.</p> <p>Reset the SPEED DROOP to "Zero".</p> <p>May make plant announcement that the A DG is being shutdown</p> <p>Take the DIESEL GEN STOP-START switch to STOP</p> <p>Contact VELCO and inform them that the DG is no longer paralleled to the grid and that normal VY capacitor bank operation may be resumed.</p>				<p><b>NOTE:</b> May direct the AO to locally trip the A DG.</p>
<b>ROLE PLAY: Respond as VELCO and acknowledge report.</b>						
4.	SRO	Provide a crew brief				

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**OPERATOR ACTIONS  
EVENT NUMBER 4**

**Crew Task Description:**

**Respond to positive reactivity addition caused by failure of the "B" Recirc loop controller**

	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize Power/Recirc flow increasing  Identify the Loop "B" controller ramping upward; inform SRO  Notify SRO				OT 3110 Immediate Actions
2.	SRO	Enter/direct actions IAW OT 3110 <ul style="list-style-type: none"> <li>Transfer the loop "B" controller to individual manual control</li> <li>Attempt to lower Recirc flow at &lt; 10% RTP/min to reduce power to pre-transient level</li> </ul>				
3.	RO	<ul style="list-style-type: none"> <li>Transfer the loop "B" controller to individual manual control</li> </ul>				
		<ul style="list-style-type: none"> <li>Lower Recirc flow at &lt; 10% RTP/min to reduce power to pre-transient level</li> </ul>				
4.	RO	Verifies position on P/F Operating Map  MAY determine that MELLLA has been exceeded and have to insert Rapid Shutdown Sequence rods.				

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	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
5.	BOP	Responds to or anticipates Annunciators 9-4 B-3 and F-3 and sends an AO up to adjust Recirculation MG Set oil temperatures.				
<b>ROLE PLAY: As AO respond as directed. In the booth rfSW_58 adjusts Recirc MG Set oil temps.</b>						
6.	SRO	Notifies Workweek Manager/Maintenance/I&C Notifies RE				
7.	RO	Determines current control rod positions Determines next control rod to be inserted Inserts control rods IAW Rapid Shutdown Sequence Monitors P/F Map Secures from inserting control rods when directed or within MELLA limits Notifies SRO/Crew				
8.	SRO	Conducts Crew Brief				
<b>Booth Operator: When directed, move to Event 5</b>						

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**OPERATOR ACTIONS  
EVENT NUMBER 5**

**Crew Task Description:**

**Loss of 480 Volt Bus 9A, Failure of Group 3 Isolation Valve.**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Acknowledge and Recognize: Annunciator 8-P-2, BATT CHRG FAIL/DC-2 GRD Annunciator 5-E-2, FW VLV LOCKUP SIGNAL/AIR FAIL Half Scram Notify SRO/Crew of a loss of 480 volt MCC-9A. Diagnose loss of Instrument A.C. (shifts to alternate but may be restored)				
2.	RO	Inform SRO of half scram. Report power, pressure, level				
3.	BOP	Recognize/respond to a Group 3 isolation and bus loss. Board walkdown to recognize equipment affected <ul style="list-style-type: none"> <li>• Loss of RWCU</li> <li>• Diagnose loss of SGT Fan A</li> <li>• Diagnose failure of AC-6B to close</li> </ul>				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
4.	SRO	<p>Direct the following actions:</p> <ul style="list-style-type: none"> <li>• Close AC-6B</li> <li>• Backup Group III isolation</li> <li>• May direct crew to enter OP 2143, 480 VAC Buses to diagnose the loss of power</li> <li>• Direct call to chemistry for sampling per T.S. 4.6.B.3.b</li> <li>• Direct crew to initiate an investigation into bus loss.</li> <li>• Direct restoring the B FRV to auto IAW ARS for 5-E-2</li> <li>• May direct restoring RPS power by shifting to the Alternate Supply MCC-8B per OT 3122, Step 10 or may use OP 2143 (not a priority)</li> <li>• May direct resetting the ½ scram.</li> <li>• Enters ON 3174, Loss of Instrument AC</li> </ul>				
5.	RO	<ul style="list-style-type: none"> <li>• Restore FRV B to auto IAW ARS for 5-E-2 by resetting the lockup by depressing the lockup pushbutton.</li> <li>• Restore RPS power by shifting to the Alternate Supply MCC 8B IAW OT 3122, Step 10 or may use OP 2143 (not a priority)</li> <li>• Reset the scram</li> <li>• Notify the crew</li> </ul>				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
6.	BOP	When directed, backup Group 3 isolation <ul style="list-style-type: none"> <li>• Close AC-6B</li> <li>• Inform SRO</li> </ul>				
<b>EVALUATOR'S NOTE: If requested to investigate MCC 9A state that the bus tripped because of an apparent fault but that nothing specific is evident and request that the bus is not re-energized while you continue looking.</b>						
7.	SRO	Consult Tech Specs and identify 7 day LCO - 3.7.B.3 (Group III) 7 day LCO - 3.7.3 b (SGT Fan A) 24 hour LCO for 3.6.C.2 (CAMs) until group 2 is reset  Notifies Workweek Manager/Maintenance/I&C  May Notify RE				
	BOP	Isolates RWCU (The system may be re-started).				
<b>Booth Operator: When directed, move to event 6</b>						

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**OPERATOR ACTIONS  
EVENT NUMBER 6**

**Crew Task Description:**

**Respond to a loss of 480 Volt MCC-8B**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	BOP	Recognize and inform the SRO that 480V MCC-8B has tripped.  Diagnose loss of Alternate RPS Supply and ½ scram on RPS Bus B.				<b>NOTE:</b> ½ scram only if RPS B was swapped to alternate power supply
2.	SRO	May direct crew to enter OP 2143, 480 VAC Buses, to diagnose the loss of power				
3.	BOP	Diagnose loss of SLC Pump B  Diagnose Loss of RRUs 1A & 1B  Loss of power to RCIC RHR and Core Spray Valves  V13-15, V10-66 V10-31B V10-65B V10-89B V14-11B V10-183 V10-38B V10-39B V14-12B V14-5B V10-16B V14-7B V10-34B V14-26B V10-15B V10-15D V10-13B V10-13D V10-18 V10-26B  CRD Cooling Water Valve PCV-22				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
4.	SRO	<p>Direct crew member and maintenance to investigate reason for loss of 480V MCC-8B.</p> <p>Direct starting additional RRUs to control DW Pressure.</p> <p>Determine that the Vital AC is running on the Batteries and that alternate power is NOT available.</p>				
<p><b>EVALUATOR'S NOTE: If requested to investigate MCC-8B state that the bus tripped because of an apparent fault but that nothing specific is evident and request that the bus is not re-energized for at least another hour while you continue looking.</b></p>						
5.	BOP	Starts monitors DW Pressure and starts additional RRUs				
6.	SRO	<p>May start to enter TS for the inoperable RPS Power Supplies, ECCS Valves and B SLC</p> <p>Combined with the loss of the A DG earlier and the ECCS systems the plant is in a 24 hours LCO. Per TS 3.5 ECCS and 3.10 DGs.</p> <p>However the Vital Bus running on the Battery may require a shutdown earlier.</p> <p>May direct preparations to for a normal shutdown per OP 0105</p> <p>May provide a crew brief on conditions</p>				<p><b>NOTE:</b> Sufficient TS should have been observed at this time.</p>
<p><b>EXAMINERS CUE: When SRO enters T.S., go to Event 7.</b></p>						

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**OPERATOR ACTIONS  
EVENT NUMBER 7 and 8**

**Crew Task Description:**

**Loss of RPS MG Set A, ATWS (45%/55%) and failure of A SLC Squib Valve.**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize failure to scram and MSIV closure Diagnose SRV lifting				
2.	RO	Report Partial Rod Insertion. place Mode Switch in SHUTDOWN Initiate ARI				
3.	SRO	Direct RO to maintain level from 127" - 177".				
4.	RO/BOP	Maintain reactor level as directed. <ul style="list-style-type: none"> <li>• Determine HPCI not required for level control</li> <li>• HPCI tripped and inhibited</li> </ul>				
5.	SRO	Direct RO/BOP to maintain reactor pressure 800 - 1000 psig using SRVs.				
6.	RO / BOP	Maintain reactor pressure as directed.				
7.	SRO	Direct crew to monitor the plant cooldown.				
8.	BOP	When directed, monitor cooldown.				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
9.	SRO	When informed of the failure to scram enter and direct crew actions IAW EOP-1 and EOP-2				
10.	SRO	When directed, verify EOP-1 Table A automatic actions				
11.	CREW	Recognize/respond to high Drywell temperature and pressure, entry into EOP-3; inform SRO				
12.	SRO	Enter/direct actions per EOP-3 <ul style="list-style-type: none"> <li>Restart Drywell RRUs.</li> </ul>				
13.	BOP	When directed: <ul style="list-style-type: none"> <li>Restart Drywell RRUs.</li> </ul>				
14.	<b>*CREW EOP-2 CT-1</b>	<b>With a reactor scram required and the reactor not shutdown, INHIBIT ADS to prevent an uncontrolled RPV depressurization to prevent causing a significant power excursion.</b>  <b>Standard:</b> Inhibit ADS prior to automatic initiation.				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
15.	SRO	Direct per EOP-2: <ul style="list-style-type: none"> <li>Inhibit ADS</li> </ul>				
<b>EVALUATOR'S NOTE: This step is an Immediate Action, and may be performed without direction.</b>						
		<ul style="list-style-type: none"> <li>Verify ARI/RPT initiated</li> <li>Insert control rods with one or more appropriate appendices</li> <li>May direct AO to manually operate CRD-V-22</li> </ul>				
<b>EVALUATOR'S NOTE: Implement appendix F, BB or H of OE 3107.</b>						
		<ul style="list-style-type: none"> <li>Stabilize pressure RPV pressure 800-1,000 psig with BPVs.</li> </ul>				
16.	BOP	When directed: <ul style="list-style-type: none"> <li>Inhibit ADS.</li> <li>Stabilize pressure 800-1000 psig with SRVs.</li> </ul>				
17.	SRO	Direct terminate/prevent injection per Appendix GG.				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
18.	*CREW EOP-2 CT-2	<p><b>During an ATWS with conditions met to perform power/level control TERMINATE AND PREVENT INJECTION into the RPV using appendix GG, until conditions are met to re-establish injection.</b></p> <p><b>Standard:</b> Completion of Terminate and prevent injection IAW OE 3107 Appendix GG within 5 minutes of loss of forced circulation.</p>				
19.	SRO	Direct SLC injection with A SLC pump				
20.	*CREW EOP-2 CT-3	<p><b>With a reactor scram required and the reactor not shutdown, TAKE ACTION TO REDUCE POWER by injecting boron and/or inserting control rods, to prevent exceeding the primary containment design limits.</b></p> <p><b>Standard:</b> Actions taken within 10 minutes of the scram failure to implement appropriate appendices and/or inject SLC. Initially SLC will be NOT be available, OE 3107, App I, Alternate SLC injection, firing the squib valves with the local battery.</p>				<b>NOTE:</b> Must use local battery to fire Squib Valve B
<p><b>EVALUATOR'S NOTE: This step is an Immediate Action, and may be performed without direction. SLC Pump "A" will run however its Squib Valve will fail to fire.</b></p>						

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
21.	RO	Notify SRO/Crew of failure of the A Squib Valve to fire				
22.	SRO	Direct sending an AO to the Squib Valve RB 318' level (3 <sup>rd</sup> floor) and firing the squib using App I of OE 3107, Alternate SLC injection.				<b>NOTE:</b> 1.5 VDC Squib valve firing battery available with an alligator clip on each end. (Located in EOP toolbox, 318' elevation, Reactor Building.)
23.	RO	Direct AO to go the Squib Valves on the RB 318' level (3 <sup>rd</sup> floor) and fire the squib valves using the battery per App I of OE 3107, Alternate SLC injection  Turn SLC switch (keylock) to OFF				
<b>ROLE PLAY: Wait one minute and notify the control room that the squib valves have been fired.</b>						
24.	RO	When notified of successful local firing of a squib valve, start SLC Pump B.				
25.	RO	Insert control rods using directed appendices.				
26.	BOP	When directed, terminate/prevent injection per Appendix GG.				
<b>EVALUATOR NOTE: Torus temperature will reach 110 degrees before power drops to &lt; 2%. This along with an SRV open and level &gt; TAF will satisfy override to terminate and prevent / enter -19" to 90" level control leg.</b>						
27.	RO	Recognize when power drops below 2 %; inform SRO				
28.	SRO	Direct RPV level maintained between -19 and 90 inches				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
29.	RO	Maintain RPV level between -19 and 90 inches				
30.	*CREW EOP-2 CT-3	<p><b>With a reactor scram required and the reactor not shutdown, TAKE ACTION TO REDUCE POWER by inserting control rods, to prevent exceeding the primary containment design limits.</b></p> <p><b>Standard:</b></p> <p>Actions taken within 10 minutes of the scram</p> <p>Recognize all rods inserted; inform SRO</p>				<p><b>NOTE:</b> OE 3107, Section BB inserting Control Rods using Cooling Flow will not be available because CRD-PCV-22 CLG WTR PRESS has no power because of the loss of MCC-8B.</p>
31.	SRO	<p>When all control rods inserted, exit EOP-2 and enter/direct actions IAW EOP-1:</p> <ul style="list-style-type: none"> <li>• Verify Table A automatic actions</li> <li>• Restore / maintain RPV level 127 – 177 inches.</li> <li>• Commence cooldown at less than 100 degrees F per hour.</li> </ul>				
32.	BOP	When directed, commence cooldown at less than 100 degrees F per hour.				
33.	SRO	When all rods inserted, exit EOP-2, enter EOP-1, and direct RPV level restored and maintained 127 –177 inches.				
<p><b>Scenario may be terminated, once EOP-2 has been exited at the discretion of the Lead Evaluator.</b></p>						

- NOTES:**
- 1) S = Satisfactory; U - Unsatisfactory; N/O = Not Observed  
All Unsatisfactory ratings require comments; a comment sheet is attached.
  - 2) \* = Critical Task/Step



Facility:	VERMONT YANKEE	Scenario No.:	2	Op Test No.:	2009 NRC
Examiners:	_____	Operators:	SRO -	RO -	BOP -
	_____				
	_____				
Initial Conditions:	At ~1% power, Startup in progress. OP 0105, Phase 2.D Step 10 "A" IRM failed upscale during the startup and is bypassed. RHR Pump "C" is OOS				
Turnover:	Indefinite LCO due to IRM "A" OOS (TS Table 3.1.1 and TRM 3.2.5) RHR Pump "C" is OOS for severe vibrations during surveillance testing. Tagged out on previous shift; estimated return to service is 48 hours, 7-day LCO due to RHR Pump "C" OOS (TS 3.5.A.3) MSIV Isolation Testing is NOT required				
Critical Task:	<ol style="list-style-type: none"> <li>Following a Loss of Normal Power diagnoses "B" DG failed to auto-start and manually starts "B" DG and places on 4KV Bus 4.</li> <li>With the reactor shutdown and reactor pressure greater than the shutoff head of the low pressure systems, initiate RPV-ED BEFORE RPV level reaches -19 inches</li> <li>Restore and maintain RPV level above TAF (+6 inches)</li> </ol>				
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	R-RO R-SRO	Withdraw control rods to continue the startup		
2	mfNM_03C (100%)	I-RO I-SRO TS - SRO	IRM "C" Inop Failure, results in half scam.		
3	N/A	N - BOP N - SRO	Transfer Reactor Mode Switch to RUN and continue the startup.		
4	MfRD_15	I - RO I - SRO	Failure of CRD Flow Controller Automatic Output Signal		
5	mfHP_03 mfHP_04	C-BOP C-SRO TS-SRO	HPCI inadvertently injects to the vessel with a controller failure (low - to prevent a reactor scram). The crew will confirm that the HPCI injection is spurious and trip the HPCI turbine. Requires T.S. 3.5.E entry		
6	mfED_02A mfED_02B	M - ALL	Loss of the startup transformers which will result in a LNP and reactor scram.		
7	mfDG_05A mfDG_08B	C - BOP C-SRO	Both DGs fail to auto start, DG "A" cannot be started, DG "B" can be manually started.		

8	mfRR_01A OVRD ANN	M - ALL	Core spray line "B" break in the Drywell between the RPV and injection check valve resulting in a LOCA and loss of the remaining Core Spray system.
9	RH01D	C - ALL	"B" Loop RHR Pump "D" trips
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario Event Description  
NRC Scenario 2

**Vermont Yankee 2009 NRC Scenario #2**

The crew takes the watch with the plant at 1% power Startup in progress. Currently, they are in OP 0105, Phase 2.D Step 10. After assuming the watch the crew will withdraw control rods to continue the startup. After some control rod movement IRM "C" will fail inoperative causing a half scram. Because the "A" IRM failed upscale during the startup and is bypassed, IRM "C" cannot be bypassed. The SRO must enter Technical Specifications for the two inoperative IRMs. I & C investigates and determines that IRM "A" can be returned to service and un-bypassed then IRM "C" can be bypassed and the half scram reset.

After the IRM issue is addressed the crew will Transfer Reactor Mode Switch to RUN and continue the startup. After several more control rods are withdrawn the CRD Flow Controller will fail high, opening the flow control valve, this will result in higher than normal rod speeds, possibly double notching. The RO must diagnose the change in rod speeds and the controller failure then place the controller in Manual. After the CRD Flow failure a spurious HPCI initiation with a HPCI flow controller failure occurs, HPCI does not inject (to prevent a reactor scram). The crew will confirm that the HPCI injection is spurious and trip the HPCI turbine. Because both an RHR Pump and HPCI are inoperable Technical Specifications 3.5.E.3 places the plant in a 24 hour LCO.

After conditions have stabilized and the Tech Specs addresses a loss of the startup transformer will occur which will result in a LNP and reactor scram. The crew will execute OT 3100, ON 3150 and OT 3122. During the LNP both Emergency Diesel Generators will fail to auto start, DG "A" cannot be started; DG "B" can be manually started (**Critical Task**) and tied to 4 KV Bus 3. If the crew attempts to energize Bus 3 or Bus 4 from the Vernon tie the Vernon Tie will trip.

When the available power supplies are lined-up the Core spray line "B" will break in the Drywell between the RPV and testable check valve resulting in a LOCA and loss of the remaining Core Spray system. The "B" Core Spray pump will appear to be available because the pump is running. The break may be diagnosed using the CORE SPRAY HDR DP HI Annunciator which will alarm on break. If the crew does not diagnose the break when the "B" Core Spray starts the discharge pressure will be low and the flow high because it is discharging into the break and not the reactor. Because of the power failure only RHR Pump D will be available, however this pump will trip. When the crew cannot maintain RPV water level greater than -19" they will enter EOP-5 and emergency depressurize (**Critical Task**). The crew must lineup and inject with RHRSW and/or locally start the "A" DG and recover the ECCS equipment supplied by the "A" DG and/or recover the "D" RHR Pump. RPV level must be restored to above TAF (+6") (**Critical Task**).

Critical tasks are manually starting DG "B" and restoring power to 4kV Bus 4. Inhibit ADS and to prevent an auto blowdown. Then when RPV water level lowers to <6" enter EOP-5 and emergency depressurize before RPV water level reaches -19 in. After the blowdown restore water level above TAF (+6") by locally starting the "A" DG or restoring the "D" RHR Pump and/or lining up and injection with RHR SW.

## SIMULATOR EVALUATION GUIDE

Evaluators:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Senior Management Observer**

Crew: \_\_\_\_\_

SM

\_\_\_\_\_

SRO

\_\_\_\_\_

RO

\_\_\_\_\_

BOP

\_\_\_\_\_

STA

\_\_\_\_\_

Critical Task Performance:

SAT

UNSAT

(Circle One)

**Lead Evaluator:**

\_\_\_\_\_

Signature

**Date Administered:**

\_\_\_\_\_

**Activity Code:**

\_\_\_\_\_

Prepared by: \_\_\_\_\_

Date: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

Date: \_\_\_\_\_

Approved by: \_\_\_\_\_

Date: \_\_\_\_\_

**CREW BRIEF:**

**-Power level:** ~1%

**-Rod Sequence:**           **Rod Sequence:** A2                           **-Rod Group:**           14

**-Equipment out of service and/or tagged or abnormalities:**

1. "C" RHR Pump OOS, tagged out for Maintenance investigation yesterday at 1600.
2. "A" IRM failed upscale during the startup and is bypassed, I & C investigating.

**-Reason For Equipment out of Service or tagged:**

1. "C" RHR Pump OOS for severe vibrations during surveillance testing.

**-Applicable Tech Spec LCOs:**

1. Seven (7) day LCO, TS 3.5.A.3

**EOOS Color:**

Green 3.12 E-6

**-Plant evolutions in progress/Scheduled Shift Evolutions:**

1. Withdraw control rods to continue the startup continuing in OP 0105, Phase 2.D, Step 10.
2. Place reactor mode switch in RUN and continue the startup.
3. MSIV Isolation Testing is NOT required
4. Drywell inerting is in progress purging with RTF-5.
5. Another operator will perform OP 0105, Phase 2.D, Step 10.e to ensure actions to inert the containment and establish Drywell to Torus  $\Delta P$  per OP 2115 are initiated.

**Plant evolutions in progress/Scheduled Shift Evolutions:**

A plant S/U is in progress, OP 0105, Phase 2D, Step 9 is complete. The following is a list of equipment status:

1. Reactor Level Control - 1 condensate pump, 1 feed pump, the 10% FRV in auto, letting down to the main condenser at 65 gpm?
2. AOG is running with AOG Recombiners warmed up in Manual, the Hogger is secured with the SJAES in-service.
3. The EPR is controlling pressure.
4. Currently in OP 0105, Phase 2D Step 10 withdrawing control rods in preparation to shifting to RUN.
5. The Drywell is being air-purged with RTF-5 and is ready to be inerted.
6. Another operator will perform OP 0105, Phase 2.D, Step 10.e to ensure actions to inert the containment and establish Drywell to Torus  $\Delta P$  per OP 2115 are initiated.

**SCENARIO SUMMARY:**

**TERMINATING CONDITION(S):**

1. RPV water level under control

**REFERENCES:**

1. OP 0105, Reactor Operations
2. OT 3110, Positive Reactivity Insertion
3. OP 2131, IRM
4. EN-OP-115, Manual Control of Automatic Systems
5. Technical Specifications
6. OT 3110, Positive Reactivity Insertion
7. OE 3107, EOP/SAG Appendices
8. OP 2117, SBT
9. OT 3122, Loss of Normal Power
10. ON 3150, Loss of S/U Transformers
11. EOP-1
12. EOP-3
13. EOP-5
14. OT 3100, Scram

**SIMULATOR OPERATOR INSTRUCTIONS**

**Simulator Set Up:** ~1% Power

1. IC-806

**Discretionary Distracter Malfunctions/RFs/IOs:**

No.	MF/RF/IO #	Severity	Ramp	REM #	Act. Time	Description
1.	ET_CS_Break			Pre-insert		Event Trigger to Support Core Spray Break (Key 4)
2.	mfCS_03B			Pre-insert		CS Inject Vlv12B Fails to Auto Open
3.	mfNM_03A	100%		Pre-insert		IRM A Failure
4.	mfDG_05A mfDG_08B			Pre-insert Pre-insert		DG "A" Fails to Start DG "B" failure to Auto Start
5.	MF_ED18			Pre-insert		BKR 3V4 Switch Failure
6.	mfNM_03C	5%		1		IRM "C" INOP Failure
7.	MfRD_15	100%		2		Failure of CRD Flow Controller
8.	mfHP03 mfHP04	10%	5	3 3		HPCI inadvertently injects HPCI Flow controller failure
9.	mfED_02A mfED_02B			4 4		Loss of Startup Transformers Loss of Startup Transformers
10.	mfRR_01A mfAN03Q3	1% Spurious		5 5		Core spray line B break in the Drywell between the RPV and testable check valve. Core Spray B D/P Header HI
11.	RH01D			6		RHR Pump D Trip

## SIMULATOR OPERATOR INSTRUCTIONS (Continued)

### Additional Instructions:

1. "A" IRM should be bypassed and on range 6
2. Ensure the following: 1 condensate pump, 1 feed pump, aux FRV in auto, 55% FRVs blocking valves closed and all feed pump discharge valves open.
3. Roll the key locks in panel 9-41, 9-42 to Bypass to allow the 18-inch containment purge valves open when in run.
4. Fill out a current revision of VYOPF 0105.05
5. Update the Condensate Demineralizer status sheet on the 9-7 Panel to reflect the startup status; two demineralizers in service and three on the hold pumps.
6. Verify RWM initialized.
7. After IRM "C" fails and when contacted by the crew acknowledge the request then allow time for Technical Specifications entry and as I & C report that IRM "A" can be returned to service and that you will begin trouble-shooting the "C" IRM.
8. If asked, the cause of the startup transformer loss was due to a direct lightning strike. Maintenance is investigating to determine if any damage was done, they should know within a couple of hours.
9. If no attempts are made to cool/spray the drywell the leak may cause the crew to emergency depressurize to prevent exceeding PSP. This will not effect the outcome of the scenario and this would serve as a substitute critical task to emergency depressurizing on inability to maintain RPV water level >-19".
10. After the "D" RHR Pump trip respond as the AO when called to investigate the pump motor trip. Then after a realistic time report the breaker cubicle appears normal with only and over-current flag showing.
11. If the crew has sent AO/Maintenance to the 'A' DG wait until RPV water level is 6 inches and lowering and then remove the trip and reset the lockout and notify the Control Room that 'A' DG is available (the 100 second timer will prevent immediately starting the DG).

**OPERATOR ACTIONS  
EVENT NUMBER 1**

**Crew Task Description:**

**Withdraw control rods to continue the startup**

	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	SRO	Directs performance of OP 0105, PHASE 2D, Step 10 Briefs crew on the startup				
2.	RO	Verifies correct rod selected for the sequence.  Withdraws control rods IAW the sequence instructions until all APRMs are indicating on-scale.  Check that the APRMs are reading above 2% power by shifting the recorder select switches one at a time to APRM and returning them to the IRM positions.  Check that all APRM downscale alarms are clear.				
3.	BOP	May obtain and review procedure OP 0105, PHASE 2.  Verifies reactor vessel level between 155 and 165 inches.  Will serve as verifier for rod selection and movement and IRM range switching.				
<b>EXAMINERS NOTE:</b> Insert IRM malfunction prior to APRM downscales clearing.						

- NOTES:**
- 1) S = Satisfactory; U - Unsatisfactory; N/O = Not Observed  
All Unsatisfactory ratings require comments; a comment sheet is attached.
  - 2) \* = Critical Task/Step

**OPERATOR ACTIONS  
EVENT NUMBER 2**

**Crew Task Description:**

**IRM "C" Inop Failure, Requires T.S. entry and insertion of manual half scram.**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	<p>Recognize/Acknowledge Annunciators:</p> <p>5-D-3, Rod Withdraw Block</p> <p>5-N-1, IRM Ch A Hi-Hi/INOP</p> <p>5-K-1, Auto Scram Ch A</p> <p>5-L-2, Neutron Mon Power Hi</p> <p>Diagnoses IRM "C" failed INOP</p> <p>Diagnoses ½ scram</p>				
2.	SRO	<p>Acknowledges report</p> <p>Diagnoses IRM "C" INOP, references OP 2131, Section C.</p> <p>Directs confirmation of IRM "C" INOP.</p> <p>Directs I &amp; C to investigate.</p> <p>Consults Tech Specs – Table 3.1.1. for two IRMs Inop. (May enter TRM 3.2.5 which is a 7 day LCO.)</p> <p>Determines the inoperable instrument channels trip system must be placed in the tripped condition within 12 hours.</p> <p>When I &amp; C investigates and determines that IRM "A" can be returned to service directs un-bypassing IRM "A" then direct bypassing IRM "C".</p>				

- NOTES:**
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<b>EVALUATOR'S NOTE: If contacted as I &amp; C report that IRM "A" can be returned to service and that you will begin trouble-shooting the "C" IRM. If NOT contacted call the Control Room and notify them that IRM "A" can be returned to service.</b>						
3.	RO	Places IRM A Range switch to the correct range  Then un-bypasses IRM "A" then bypass IRM "C".  Resets the half scram				NOTE: before IRM A can be un-bypassed the.
4.	SRO	Exits Tech Specs – Table 3.1.1. for two IRMs Inop.  Crew Brief				

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## OPERATOR ACTIONS EVENT NUMBER 3

### Crew Task Description:

**Transfer Reactor Mode Switch to RUN and continue the startup.**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	SRO	Enter/direct placing the Reactor Mode Switch in RUN				<p><b>NOTE:</b> Proper IRM withdrawal may be determined by selecting each IRM channel for recording as its respective chamber is withdrawn and verify that indicated level is decreasing.</p>
2.	RO	<p>Check that the APRMs are reading above 2% power by shifting the recorder select switches one at a time to APRM and returning them to the IRM positions.</p> <p>Check that all APRM downscale alarms are clear.</p> <p>Smartly transfer Reactor Mode Switch to RUN.</p> <p>Transfer recorder switches to APRM channels.</p>				
3.	RO	Fully withdraw all IRM detectors.				
4.	SRO	<p>Request Reactor Engineering to initiate APRM GAF per OP 4400.</p> <p>Request RP perform high rad door checks and TB Heater Bay surveillance per OP 0532.</p>				
<p><b>EVALUATORS CUE: When sufficient operator actions are observed insert Event 4, CRD Flow Controller Failure.</b></p>						

- NOTES:**
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  - 2) \* = Critical Task/Step

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
5.	SRO	May direct: Close main steam line drain valves: MS-74 MS-77 MS-78  In the Torus Room, MS-23				
6.	BOP	If directed by SRO Close main steam line drain valves: MS-74 MS-77 MS-78  Direct AO to close (in the Torus Room) MS-23				
7.	SRO	Directs power ascension per OP 0105 until 1 ½ bypass valves open				

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## OPERATOR ACTIONS EVENT NUMBER 4

### Crew Task Description:

#### Failure of CRD Flow Controller Automatic Output Signal

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	RO	Recognize Faster control rod speeds CRD system pressures rising Flow Controller output rising  Diagnose CRD Flow Controller Failure  Announce to SRO/Crew				
2.	SRO	Direct entry into ON 3145, Loss of CRD Regulating Function  Direct placing the Flow Controller (FIC-3-301) in MANUAL  Directs contacting Work Week Manager and/or I & C to troubleshoot CRD FCV.				
3.	RO	Places the Flow Controller (FIC-3-301) in MANUAL  Verifies proper operation  Adjusts Drive Control and Cooling Control Valves as necessary to restore CRD System parameters				
4.	BOP	Contacts Work Week Manager and/or I & C to troubleshoot CRD FCV.				

- NOTES:**
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All Unsatisfactory ratings require comments; a comment sheet is attached.
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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
<b>ROLE PLAY: If contacted as I &amp; C report that you had just worked on the controller and will send a Tech to the Control Room after their break.</b>						
5.	SRO	May direct shifting CRD FCVs				
	RO/ BOP	May contacts AO to coordinate shifting FCVs				<b>NOTE:</b> If the crew starts to shift CRD FCVs go to the next malfunction
<b>EVALUATORS CUE: When CRD Parameters are restored insert Event 5, Inadvertent HPCI initiation.</b>						

- NOTES:**
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## OPERATOR ACTIONS EVENT NUMBER 5

### Crew Task Description:

HPCI inadvertently injects to the vessel with a controller failure. Requires T.S. 3.5.E entry

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize and inform the SRO of indications of a HPCI system initiation and injection.				
2.	SRO	When informed of the HPCI system start, verify adequate level IAW OT 3110.  May enter OT 3110 – Positive Reactivity Insertion, Step 2.5. after actions are taken IAW IAW EN-OP-115, Manual Control of Automatic Systems				
3.	BOP	Confirm no initiation signals present. Using two indications  Verifies Feedwater control system maintaining RPV water level.  Diagnoses HPCI Controller failure  Notifies Crew				
4.	SRO	When adequate level has been verified, direct the BOP to inhibit the HPCI system				
5.	BOP	When directed, inhibit the HPCI system IAW EN-OP-115, Manual Control of Automatic Systems				
						<b>NOTE:</b> The shutdown section of OP 2120 will <b>NOT</b> work in this situation because the faulty initiation signal will continue to start HPCI.

- NOTES:**
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  - 2) \* = Critical Task/Step

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
6.	SRO	Direct SBGT aligned for an Auto Start per OP 2117				
7.	BOP	When directed, align SBGT per SRO direction				
8.	SRO	Direct crew to contact I&C and/or maintenance to investigate the HPCI initiation and controller problems.				
9.	CREW	When directed, contact I&C and maintenance and request they investigate the HPCI problem.				
<b>ROLE PLAY: When contacted as I&amp;C and/or maintenance and requested to investigate the HPCI problem respond that you will send a technician to the Control Room shortly and then delay.</b>						
10.	SRO	Recognize and enter T.S. 24 hr LCO IAW T.S. 3.5.E.3.				<b>NOTE:</b> T.S. Bases states that an RHR Subsystem consists of 2 pumps, since RHR Pump C is INOP, the subsystem is <b>NOT</b> operable.
11.	SRO	Direct the crew to confirm operability of RCIC. Conduct a Crew brief				
<b>EVALUATORS CUE: When ready advance to Events 5 and 6</b>						

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All Unsatisfactory ratings require comments; a comment sheet is attached.
  - 2) \* = Critical Task/Step



	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
4.	SRO  CT-1	<p>When notified the DGs failed to automatically start transition to App A of ON 3122, Station Blackout.</p> <p>Directs:</p> <p><b>Attempt to start the B DG IAW EN OP 115, Manual Control of Automatic Systems</b></p> <p>Placing the service water pump control switches to STOP, then NORMAL.</p> <p>Placing all ECCS pumps in PULL-TO-LOCK.</p> <p>Energizing Bus 4 from Vernon tie</p>				<p><b>NOTE:</b> Because the A DG has a Failure to Start Annunciator Maintenance must be contacted before attempting to start the A DG.</p>
5.	BOP	<p>Attempts to energize Bus 3 or Bus 4 from Vernon tie by closing 3V4 and a feeder breaker to 4KV Bus 3 or 4.</p> <p>Acknowledges/diagnoses failure of breaker 3V4 to close</p> <p>Reports failure of cross-tying to Vernon.</p>				
6.	SRO	<p>Directs operator to contact AO/Maintenance to investigate DG A failure to start</p> <p>May direct additional attempts to start the DGs per App A of OT 3122.</p>				

- NOTES:**
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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
7.	BOP	<p><b>If not previously done</b> acknowledge/respond to DG A Lockout Trip Annunciator (8-F-2)</p> <p>Contact AO/Maintenance and directs them to investigate DG A failure to start</p> <p>Diagnoses "B" DG failed to auto-start and manually starts "B" DG and places on 4KV Bus 4.</p> <p>Notifies Crew "B" DG in service</p>				
<p><b>ROLE PLAY: When directed as the AO/Maintenance to investigate the failure to start of the 'A' DG, respond as directed. Then wait until RPV water level is 6 inches and lowering and then remove the trip and reset the lockout and notify the Control Room that 'A' DG is available (the 100 second timer will prevent immediately starting the DG).</b></p>						
8.	SRO	When notified Bus 4 available directs cross-tying buses 8 and 9.				
<p><b>ROLE PLAY: If contacted as maintenance and directed to verify that buses 8 and 9 may be cross-tied, reply that you have checked the buses and that they may be cross-tied. If the Control Room does NOT contact Work Control or Maintenance then call the Control Room as Maintenance and notify them that the buses may be cross-tied. (This will re-establish Control Room Lighting.)</b></p>						
9.	BOP	Cross-tyes buses 8 and 9.				
10.	RO	<p>Carries out scram action IAW ON 3100</p> <p>Verifies RCIC operation when needed.</p>				
11.	SRO	Directs work week manager to check DG A and/or Back-feeding through the Auxiliary Transformer.				
<p><b>ROLE PLAY: If requested as work week manager to investigate DG A and/or Back-feeding through the Auxiliary Transformer respond as directed but delay.</b></p>						
<p><b>EVALUATORS CUE: When ready advance to Events 5 and 6</b></p>						

- NOTES:**
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### OPERATOR ACTIONS EVENT NUMBERS 8 and 9

**Crew Task Description:**

**Core spray line break in the Drywell between the RPV and testable check valve resulting in a LOCA and loss of the remaining Core Spray system and failure of the "D" RHR Pump.**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize/Acknowledge rising drywell pressure  Notify SRO  Diagnose and Report the "A" CS and "A" RHR Pumps have no power.				<b>NOTE:</b> Core Spray Injection valve 12B is failed closed but the open indication is over-ridden to indicate the valve is open.
2.	SRO	Enter / Direct actions IAW EOP-1 AND EOP-3: <ul style="list-style-type: none"> <li>• Re-start all available drywell RRUs</li> <li>• BEFORE torus pressure reaches 10 psig, spray the torus</li> </ul>				
3.	BOP	When directed: <ul style="list-style-type: none"> <li>• Re-start all available drywell RRUs</li> <li>• Spray the torus using only those pumps not required for adequate core cooling</li> </ul>				
4.	SRO	Direct RPV level maintained between 6 and 177 inches by maximizing CRD and injecting SLC and RCIC				

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All Unsatisfactory ratings require comments; a comment sheet is attached.
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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
5.	SRO	<p>WHEN torus pressure exceeds 10 psig, direct the following:</p> <ul style="list-style-type: none"> <li>Verify drywell RRU's secured</li> </ul>				(RHR Pump "D" is available and RPV pressure is too high to inject.)
6.	BOP	<p>When directed:</p> <ul style="list-style-type: none"> <li>Verify drywell RRU's secured</li> <li>Spray the drywell</li> <li>Diagnose trip of RHR Pump "D".</li> <li>Report RHR Pump "D" trip to the SRO</li> <li>Directs an AO to investigate the trip of the "D" RHR Pump.</li> </ul>				<b>NOTE:</b> As the crew is spraying the drywell with the "D" RHR Pump the pump will trip on overload.
<p><b>ROLE PLAY: As AO acknowledge the direction to investigate the trip of the "D" RHR Pump. Then after the RPV Blowdown report the breaker cubicle appears normal, but has an over-current flag on the breaker front.</b></p>						
7.	CREW	Recognize HPCI unavailable Only "A" Core Spray appears available.				
8.	SRO	<p>Direct RPV level maintained between 6 and 177 inches by maximizing CRD and injecting SLC and RCIC</p> <p>If not previously directed; directs lining up all available Alternate Injection Subsystems (<b>EOP-1, Table D</b>)</p>				
9.	RO	<p>When directed:</p> <ul style="list-style-type: none"> <li>Maximize CRD (if available)</li> <li>Inject SLC</li> </ul>				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
		<ul style="list-style-type: none"> <li>Inject with RCIC</li> </ul>				
10.	SRO	<p>When RPV level cannot be maintained above 6" direct/verify at least 2 injection subsystems lined up for injection. If RHR Pump "D" has tripped at this point SRO directs lining up all available Alternate Injection Subsystems (<b>EOP-1, Table D</b>)</p>				
<p><b>EVALUATORS NOTE: When RPV water level reaches 6" contact the Control Room as the AO/Maintenance at the A DG and report that starting problem has been corrected and the Lockout and Shutdown Relay have just been reset. (Note the 100 sec timer must time out before the DG A can be started.)</b></p>						
11.	SRO	Direct starting the A DG and placing Bus 4 on DG A				
12.	BOP	After the 100 second timer has timed out start DG A and place it on 4KV Bus 4				
13.	RO/ BOP	Lineup ECCS systems and Alternate Injection Subsystems as directed.				
14.	<b>*CREW</b> <b>EOP-1</b> <b>EOP-5</b> <b>CT-2</b>	<p><b>With the reactor shutdown and reactor pressure greater than the shutoff head of the low pressure systems, initiate RPV-ED BEFORE RPV level reaches -19 inches</b></p> <p><b>Standard:</b></p> <p>Enter EOP-5 and initiate RPV-ED (begin opening valves) BEFORE RPV level reaches -48 inches</p>				<p>Success path is restore RPV water level using</p> <p>RHR SW</p> <p>Send someone to locally start the "A" DG.</p> <p>Investigate the trip of the "D" RHR Pump and restore the pump.</p>

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
15.	SRO	BEFORE RPV level reaches – 19", enter / direct actions IAW EOP-5: <ul style="list-style-type: none"> <li>Prevent injection from those CS and RHR Pumps not required to ensure adequate core cooling</li> <li><b>Open all SRVs</b></li> </ul>				
16.	BOP/ RO	When directed: <ul style="list-style-type: none"> <li>Prevent injection from those CS and RHR Pumps not required to ensure adequate core cooling</li> <li><b>Open all SRVs</b></li> </ul>				
17.	SRO	Direct lining up Alternate Injection Systems per EOP-1, App D				
18.	RO/ BOP	Line up Fire System and/or RHRSW system				
19.	SRO	When RPV pressure drops below shutoff head of low pressure pumps, direct level restored and maintained 127 to 177 inches.				
20.	BOP	Observe/Recognize Core Spray "B" low discharge pressure and high flow.  Diagnose failure of "B" Core Spray Pump to inject and Core Spray line as the potential source of the break.				<b>NOTE:</b> Core Spray Pump "B" starts and appears to be OK. But when the injection valves opens the discharge pressure goes low and the flow high indicating runout and that the pump is discharging into the break.
21.	SRO	Direct securing the B Core Spray Pump				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
22.	RO/ BOP	Secure the B Core Spray Pump				
23.	SRO	If not previously lined up directs lining up all available Alternate Injection Subsystems ( <b>EOP-1, Table D</b> )				Success path is restore RPV water level using RHR SW Starting the "A" DG and supplying power to 4KV Bus 4. Investigate the trip of the "D" RHR Pump and restore the pump.
<p><b>ROLE PLAY: Provided SRO directed Work Week Manager/Maintenance to investigate the trip of the D RHR Pump report back that the D RHR Pump breaker problem has been corrected the pump may be restarted.</b></p> <p><b>If reasonable amount of time has elapsed since the SRO directed lining up RHRSW for injection, report that RHRSW is lined up to inject.</b></p>						
24.	SRO	Direct:  Start and inject with the "D" RHR Pump.  If DG "A" is restored inject with "A" RHR and "A" Core Spray.				
25.	BOP/ RO	Start and inject with D" RHR Pump, "A" RHR and/or "A" Core Spray as available.				
26.	CREW <b>EOP-1 CT-3</b>	<b>Restores RPV water level above TAF (+6")</b>				
27.	SRO	Conducts Crew Brief				
<p><b>TERMINATING CUE: RPV water level above TAF (+6 inches) and under control</b></p>						

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Facility:	VERMONT YANKEE	Scenario No.:	3	Op Test No.:	2009 NRC
Examiners:	_____	Operators:	SRO -		
	_____		RO -		
	_____		BOP -		
Initial Conditions:	85% power IC-807 "A" RHR OOS for severe vibration, maintenance is investigating.				
Turnover:	RHR Pump "A" is OOS while maintenance investigates high vibration. It was tagged out on the previous shift; estimated return to service is 48 hours, 7-day LCO due to RHR Pump "A" OOS (TS 3.5.A.3) Swap CRD Pumps, place CRD "B" in service and remove CRD "A" and from service to allow cooling for oil change scheduled for the next shift.				
Critical Tasks:	<ol style="list-style-type: none"> <li>1. When drywell temperature cannot be restored and maintained below 280°F, initiate RPV-ED (and/or anticipate ED and use bypass valves).</li> <li>2. IF Reactor water level cannot be determined, Enters EOP-6, RPV Flooding, opens all SRVs and commences injection using Shutdown RPV Flooding Systems until the Main Steam lines are flooded. <b>OR</b></li> <li>3. Restores RPV water level and containment parameters with Condensate injecting directly into the RPV AND/OR aligns alternate injection systems such as RHR.</li> </ol>				
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	N - RO N - SRO	Swap CRD Pumps, place CRD B in service and remove CRD A and from service		
2	N/A	R - RO R - SRO	Raise power using recirculation flow to 92%		
3	mfFW_28A 50% over 60 sec	I - RO I - SRO	Feedwater flow transmitter slow failure upscale, causing the crew to take manual control of feedwater in order to recover and stabilize RPV level.		
4	mfRH_01B (if necessary)	SRO - TS	Call from the Southeast RHR Corner Room that RHR Pump "B" lower motor bearing oil indicating sight glass is empty. Tech Specs Sections 3.5 and determine that a 24 hour LCO, requiring a plant shutdown, has been entered.		

5	IOR RRlo042AS7B IOR RRdi042AS7B IOR RRlo042AS7B IRF rfRR_12	C - BOP C - SRO	"B" Recirc Pump discharge valve full open indication fails causing the "B" Recirc Pump to runback to minimum flow.
6	mfED06A	C - RO C-SRO TS - SRO	Trip of CRD Pump B with a loss of 125 VDC Bus 1 (Inops 4 KV Bus 3 ECCS equipment). The crew will implement ON 3159, Loss of Bus DC 1. The SS/SRO will review Tech Specs Sections 3.10 and 3.5 and determine that a second 24 hour LCO, requiring a plant shutdown, has been entered. (STG 04)
7	mfTC_04A	I - BOP I - SRO	EPR Oscillations OT 3115, Reactor Pressure Transients – Place MPR in service.
8	mfMS_06	M - CREW	Main Steam Line Break in the Drywell
9	mfFW_08A mfFW_08B mfFW_08C mfCS_03A	C - BOP C - SRO	Failure of the Reactor Feedwater Pumps and Core Spray Pump A Injection Valve require lining up Condensate Pumps to restore RPV water level.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario Event Description  
NRC Scenario 3

**Vermont Yankee 2009 NRC Scenario #3**

The crew takes the watch with the plant at 85% power during a plant startup. The crew will be directed to place CRD B in service and remove CRD A and from service to allow cooling for oil change scheduled for the next shift. After the swap of CRD pumps the crew will raise power using recirculation flow to 92% as directed by Reactor Engineering while they determine if a rod pattern adjustment is required.

After the plant has stabilized a feedwater flow transmitter will slowly fail upscale, causing the crew to take manual control of feedwater in order to recover and stabilize RPV level.

When the RPV water level is stabilized a call will come from the Auxiliary Operator in the Southeast RHR Corner Room that the lower motor bearing sight glass is empty and there is evidence of oil leakage along the shaft. The crew must declare the RHR "B" Pump inoperative and notify maintenance. The SRO will enter Technical Specification and declare a 24 hr LCO IAW TS 3.5.A.6. After the Technical Specification is entered, the crew briefed and actions are under way to remove the pump from service the "B" Recirc Pump discharge valve full open indication fails causing the "B" Recirc Pump to runback to minimum flow. This will require entering OT 3176 and tripping the "B" Recirc Pump. The crew must respond to pump trip and stuck open Recirc Pump Discharge Valve.

The operating B CRD Pump will trip concurrently with a failure of 125 VDC Bus 1. The crew will implement ON 3159, Loss of Bus DC 1. The SRO will review Tech Specs Sections 3.10 and 3.5 and determine that another 24 hour LCO, exists. The crew will enter and take actions IAW ON 3159 including directing the crew to manually trip equipment associated with DC-1 (Main Turbine, Recirc MG Field Breakers). When the crew has completed the walkdown of the panels an EPR oscillation will occur; the crew will enter OT 3115, Reactor Pressure Transients and place MPR in service. If a reactor scram is required or occurs. Control power will be transferred for 4 KV Bus 1 and the crew may recover 4 KV Bus 1.

After the crew has addressed the initial portions of the loss of DC-1 a Main Steam Line Break will occur in the Drywell. The break size will raise Drywell Temperature and because of the previous malfunctions there will be no immediately available systems to spray the drywell. This will raise drywell temperature and pressure to the drywell temperature limit (280°F). The crew may anticipate emergency depressurization and depressurize with the Turbine Bypass Valves (TBVs). If TBVs are not used the crew must enter EOP-5 and emergency depressurize with the SRVs (**Critical Task**).

If TBVs are used for depressurization then RPV pressure could be lowered to 0 psig. If this occurs with the Drywell at elevated temperatures then RPV water level instruments may become inoperable and the crew must enter RPV Flooding. If RPV Flooding is required the scenario ends when the crew has positive indication of flooding the reactor up to the Main Steam Lines and Primary Containment Parameters are under control (**Critical Task**).

If SRVs are used then RPV pressure will remain above the saturation pressure for elevated Drywell temperatures. When Emergency Depressurized with the SRVs, the Reactor Feedwater Pumps will trip on High RPV water level and cannot be restarted. Also, the Core Spray Pump A Injection Valve will fail closed. These failures will require lining up Condensate Pumps to

Scenario Event Description  
NRC Scenario 3

restore RPV water level. The scenario is ended when Primary Containment parameters and reactor water level are trending to normal levels (**Critical Task**).

Critical tasks are: Emergency depressurize the drywell when drywell temperature cannot be restored and maintained below 280°F, If the RPV water level instruments become inoperable, flood the reactor to the Main Steam Lines **OR** Use alternate injection systems to restore RPV water level following the emergency depressurization. The RHR Pump B or Alternate Spray systems will used to control Primary Containment Parameters.



**CREW BRIEF:**

**-Power level:** 85%

In OP 0105, Phase 4B, Step 23 is completed

**-Rod Sequence:** Rapid Shutdown

**-Rod Group:** 20

**-Equipment out of service and/or tagged or abnormalities:**

1. A RHR Pump OOS, tagged out for Maintenance investigation yesterday at 1600. The plant entered a 7-day LCO (TS 3.5.A.3).

**-Reason For Equipment out of Service or tagged:**

1. A RHR Pump OOS for severe vibrations during surveillance testing.

**-Applicable Tech Spec LCOs:**

1. Seven (7) day LCO, TS 3.5.A.3

**EOOS Color:**

Yellow 1.47 E-5

**-Plant evolutions in progress/Scheduled Shift Evolutions:**

1. Place CRD "B" in service and remove CRD "A" and from service to allow cooling for oil change scheduled for the next shift.
2. Continue power ascension to 100% power, during this shift raise power to 92% using recirculation flow then allow 12 hour soak while RE determines if a rod pattern adjustment is necessary.

## **SCENARIO SUMMARY:**

### **TERMINATING CONDITION(S):**

1. RPV flooded and/or RPV Water Level and Primary Containment parameters under control.

### **REFERENCES:**

1. OP 2111, CRD System
2. OP 0105, Reactor Operations
3. OT 3115, Reactor Pressure Transients
4. OT 3110, positive Reactivity Insertion
5. OT 3113 Reactor Low Level
6. OT 3176, Recirculation Pump Runback Due to Low Feedwater Flow or Discharge Valve Not Full Open
7. ON 3159, Loss of DC-1
8. ON 3145, Loss of CRD Regulating Function
9. OT 3100, Reactor Scram
10. Technical Specifications
11. EOP-1, RPV Control
12. EOP-3, Primary Containment Control
13. EOP-5 Emergency Depressurization
14. Possibly EOP-6, RPV Flooding
15. OE 3107, EOP Appendices
16. RP 2170, Condensate System
17. OP 2172, Feedwater System

**SIMULATOR OPERATOR INSTRUCTIONS**

**Simulator Set Up:** 85% Power

1. IC-807

**Discretionary Distracter Malfunctions/RFs/IOs:**

No.	MF/RF/IO #	Severity	Ramp	REM #	Act. Time	Description
1.	IOR CSdi0314AS1A			Pre-insert		Override the A Core Spray Injection Valve CLOSED
2.	mfCS_03A			Pre-insert		CS-12A Fails to Auto Open
3.	rfRH_11	Open		Pre-insert		RHR Pump A ACB
4.	mfFW_28A	50%	60	1		"A" Feedwater transmitter slowly fails to a higher indicated flow
5.	IOR RRlo042AS7B_1  IOR RRdi042AS7B  IOR RRlo042AS7B  IRF rfRR_12			2		Recirc "B" Runback RV-53B, Recirc Discharge Valve, drifts off open seat
6.	mfRD_01B			3		CRD Pump B Trip
7.	mfED_06A			3		Loss of 125 VDC Bus 1
8.	mfTC_04A	75%		4		Pressure Reg Oscillations (EPR)
9.	mfMS_06	0.5	120	5		Main Steam Line Break in the Drywell
10.	mfMS_06	3	120	6	After scram actions carried out	Main Steam Line Break in the Drywell
11.	mfFW_08A mfFW_08B mfFW_08C			7		Trip of all RFPs
12.	mfRH_01B  This trip will be necessary if the crew starts pump to feed the RPV.			8		"B" RHR PUMP BKR TRIP

## SIMULATOR OPERATOR INSTRUCTIONS (Continued)

### Additional Instructions:

1. Place a Danger Tag on RHR Pump A control switch
2. If contacted as Work Week Manager / I&C concerning the Feedwater flow transmitter failure, delay determining the cause; no reason will be given before the scenario terminates.
3. If AO is directed to trip "A" Recirc MG locally, insert **Remote rfRR\_15**.
4. If AO is directed to trip "A" Recirc MG Field Bkr, insert **Remote rfRR\_17**.
5. When electrical maintenance is sent to investigate the loss of DC-1, report that the A charger and the battery breakers have tripped. Maintenance will work with the AO to determine when it is possible to transfer bus control power to alternate sources.
6. If an AO or maintenance is directed to strip DC-1 wait a few minutes and report that the bus has been stripped.
7. An AO may be directed to shift control power for Buses 1, 3 & 8 to alternate. This action should be delayed for buses 3 & 8 until RPV-ED. Maintenance troubleshooting is NOT complete on Buses 3 and 8.
8. When repowering Bus 1 use rfRR\_21A relay reset and rfED\_01 for Bus 1 control power to prevent tripping the Recirc Pump.
9. If directed to secure Recirc Pump Seal Purge, use rfRD\_11 and rfRD\_12.
10. If contacted as Work Week Manager / I&C concerning the pressure regulator failure, delay determining the cause; no reason will be given before the scenario terminates.

## OPERATOR ACTIONS EVENT NUMBER 1

**Crew Task Description:**

**Swap CRD Pumps, place CRD B in service and remove CRD A and from service**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	SRO	Directs performance placing CRD B in service and removing CRD A from service IAW OP 2111, Sect. U.				
2.	SRO	Briefs crew				
3.	RO	<p>Calls AO and requests they monitor the CRD pump</p> <p>Starts CRD pump 1B.</p> <p>Check that operating parameters have stabilized and readjust as required.</p> <p>Secure CRD pump 1A.</p> <p>Check that operating parameters have stabilized and readjust as required.</p> <p>Check charging header pressure at 1420-1470 psig (PI-3-234).</p> <p>If required, throttle CRD-36B to maintain required pressure.</p> <p>Report that CRD B is in service and CRD A has been removed from service</p>				
<b>ROLE PLAY: Respond as AO when directed to monitor CRD Pumps.</b>						

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**OPERATOR ACTIONS  
EVENT NUMBER 2**

**Crew Task Description:**

**Raise power using recirculation flow to 92%**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	SRO	Direct RO to raise reactor power using control rods and recirculation flow at 1% power every three minutes				
2.	RO	Contact and inform ISO NE/VELCO of power increase  Raise power as directed using control rods and recirc flow at 1% power every three minutes				
3.	BOP	Contact and inform plant personnel of power increase (Chemistry, RE)  Contact Rx Bldg AO to monitor recirc lube oil temperatures if required  Monitors plant parameters and reports to crew				
<b>ROLE PLAY: Respond as AO when directed to monitor and/or adjust Recirc MG Set oil temperatures.</b>						
<b>EXAMINERS NOTE: Go to the next event when sufficient reactivity control has been observed.</b>						

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### OPERATOR ACTIONS EVENT NUMBER 3

**Crew Task Description:**

**Feedwater flow transmitter slow failure upscale will occur, causing the crew to take manual control of feedwater in order to recover and stabilize RPV level.**

	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize/Acknowledge Annunciator:  5-E-1, RX LEVEL HI/LO  Diagnose lowering reactor water level; inform SRO				<b>NOTE:</b> Crew may notice level failure from instruments on the 9-5 Panel prior to the annunciator.
2.	RO	Determine that lowering level is a result of a failure of the Feedwater Controller and shift the controller to MANUAL; inform SRO				
3.	SRO	Enter and direct actions IAW OT 3113 (Reactor Low Level):  <ul style="list-style-type: none"> <li>• Shift the FW Master Level Controller to MANUAL</li> <li>• Restore water level to pre-transient level</li> </ul>				
4.	RO	When directed: Observe Steam Flow and Feed Flow indications for mismatch Restore water level to pre-transient level Gives RPV water level updates				
5.	RO	Identify/Report the cause of the problem as the Feedwater Flow Transmitter A failing upscale				

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	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
6.	SRO	Request Work Week Manager/Maintenance/I&C investigate problems with Feedwater Flow Summer				
<b>ROLE PLAY: If contacted as Work Week Manager / I&amp;C concerning the Feedwater flow transmitter failure, delay determining the cause; no reason will be given before the scenario terminates.</b>						
7.	SRO	Direct the RO to switch to single element and restore the controller to automatic				
8.	RO	Transfer control to single element  Transfer the controller to automatic				
9.	SRO	Conduct a crew brief				
<b>EVALUATORS CUE: When Feedwater is returned to automatic and crew briefed or when directed go to Event 4.</b>						

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**OPERATOR ACTIONS  
EVENT NUMBER 4**

**Crew Task Description:**

**Oil Leak on RHR Pump B**

	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
<b>ROLE PLAY: As an AO contact the Control Room on the Gai-tronics and notify them the 'B' RHR Pump lower bearing oil sight glass is empty and there is oil on the bottom of the motor and the floor around the motor.</b>						
1.	CREW	Repeat back the communication and inform SRO				
2.	SRO	May direct the AO to post the area with a slip sign and wipe up the oil. actions  Contact the Work Week Manager/Maintenance/I&C to investigate the loss of oil on the B RHR Pump  Enter T.S. 3.5.A.6 which requires initiating a reactor shutdown and being in cold shutdown in 24 hours.  Directs BOP to place the B RHR Pump in PTL				
<b>Role Play: As Maintenance contact the Control Room or answer if contacted that you will investigate the leak. Then within two minutes report that the RHR B Pump can be repaired within an hour.</b>						
3.	BOP	Places the B RHR Pump in PTL				
4.	SRO	Conduct a crew brief				
<b>EVALUATORS CUE: When TS is entered or when directed go to Event 5.</b>						

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**OPERATOR ACTIONS  
EVENT NUMBER 5**

**Crew Task Description:**

**“B” Recirc Pump discharge valve full open indication fails causing the “B” Recirc Pump to runback to minimum flow.**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize/Acknowledge Annunciators  Diagnose Runback of the “B” Recirc Pump  Diagnose that the “B” Recirc Pump Discharge Valve RV-53B Does NOT indicate full open.				
2.	SRO	Direct entry into OT 3176  Direct pushing PB-2 to lower RPV level setpoint  Direct Tripping the “B” Recirc Pump.  Directs NOT to close RV-53B  Directs closing RV-43B to prevent reverse rotation.  May enter OT 3118, Recirculation Pump Trip				
3.	RO	Pushes PB-2 to lower RPV level setpoint to 155 inches  Trips the “B” Recirc Pump MG Set Drive Motor Breaker.  Verifies Recirc Pump Disc Bypass Valve RV-54B is open  Closes Recirc Pump Suction Valve RV-43B				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
4.	RO	Determines if plant operation is above the MELLLA boundary on the power to flow map per Figure 2.4-1 and outside the Exclusion and Buffer Regions  Notifies SRO				
5.	SRO	Directs using the Rapid Shutdown Sequence to insert control rods until operation is below the MELLLA boundary and/or outside the Buffer Region and to lower power to less than 45%.				
6.	RO	Starting with the last rod in the last group of the Rapid Shutdown Sequence, insert control rods in reverse order.				
7.	SRO	Notifies Reactor Engineering.  May direct removing the third reactor feed pump from service per the guidance in OP 0105, Reactor Operations, Section 5.A.				
8.	BOP	Verifies the "A" Recirc Pump is operating $\leq 70\%$ rated speed.				
9.	BOP	Monitors Recirc Pump and Motor Currents  Recirc Pump Motor (max 333 amps).  Recirc MG Set Motor (max 450 amps).  Dispatch the RBAO to monitor and adjust RR Lube Oil cooling				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
10.	SRO	Conduct Crew Brief				
<b>EXAMINERS CUE: Insert Event 6, Loss of DC Bus 1</b>						

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**OPERATOR ACTIONS  
EVENT NUMBER 6**

**Crew Task Description:**

**Loss of CRD Pump B and 125V Bus DC-1.**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize/Acknowledge Annunciators: CRD PUMP B TRIP (9-C-1) DC-1/DC-2 BKR TRIP (8-N-1) BATT VOLTAGE LO (8-P-1) GEN LOSS OF FIELD TRIP (7-C-4) MG SET A SCP TUBE LOCK (4-B-1) 86 GP DC LOSS (7-A-6) BUS 3 CTRL PWR LOSS (8-J-7)  Diagnose and report the loss of CRD Pump B Diagnose and report the loss of 125 VDC Bus 1				
2.	SRO	Direct entry into ON 3145, Loss of CRD Regulating Function  Direct entry into ON 3159.  Direct tripping the RWCU Pump				
3.	BOP	Trip the RWCU Pump				
4.	SRO	Direct starting the A CRD Pump.				

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  - 2) \* = Critical Task/Step

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
5.	RO	<ul style="list-style-type: none"> <li>• Place CRD SYSTEM FLOW CONTROL station in MANUAL.</li> <li>• Adjust the flow controller to zero</li> <li>• Start CRD pump 1A</li> <li>• Adjust the CRD flow controller to establish 48-52 gpm</li> <li>• Balance the CRD flow controller, and then place in BAL or AUTO.</li> <li>• If required, throttle CRD-36A to maintain charging header pressure at 1420-1470 psig</li> <li>• Restore recirc pump seal purge to service.</li> </ul>				<b>NOTE:</b> IF CRD pumps are out of service for > 2 minutes, secure recirc pump seal purge
6.	SRO	Dispatch operators to manually trip/check open all breakers on DC-1 per ON 3159.				
7.	SRO	Request Work Week Manager/Electrical Maintenance concurrence on transferring control power.  Notify Chemistry that RWCU is secured and the need for sampling.				
<b>ROLE PLAY: Respond as personnel contacted.</b>  <b>When electrical maintenance is sent to investigate the loss of DC-1, report that the A charger and the battery breakers have tripped. Maintenance will work with the AO to determine when it is possible to transfer bus control power to alternate sources.</b>						

- NOTES:**
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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
8.	BOP	Contact AO and direct them to check the RWCU Demineralizers and Holding Pumps				
<b>ROLE PLAY: As AO respond as directed but delay reporting back to the Control Room on the RWCU Demineralizers.</b>						
9.	SRO	Direct BOP to transfer control power for Busses 1, 3, 8 and the DG.				Add steps from ON 3159, Rev 15
10.	BOP	Direct the AO to transfer DC control power for the Buses 1, 3 and 8 to Alternate.				
<b>ROLE PLAY: As the AO acknowledge direction.</b>						
11.	RO	Dispatch an AO to monitor and adjust RR Lube Oil cooling				
<b>ROLE PLAY: Respond as AO when directed to monitor and/or adjust Recirc MG Set oil temperatures.</b>						
12.	SRO	Brief the crew and direct the crew to manually trip the Turbine per ON 3159 if a turbine trip is required.				
<b>BOOTH OPERATOR: Shift 4Kv Bus 1 Control Power to Alternate</b>						
<b>ROLE PLAY: As the AO report that you have shifted control power for bus 1 to alternate. Maintenance troubleshooting is NOT complete on buses 3 and 8.</b>						
<b>ROLE PLAY: As Electrical Maintenance report that Bus 1 control power can be restored, but that you are still working on Buses 3 and 8.</b>						
<b>EXAMINERS CUE: When ready, insert Event 7, EPR Oscillations</b>						

- NOTES:**
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## OPERATOR ACTIONS EVENT NUMBER 7

### Crew Task Description:

#### EPR Oscillations

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize oscillating reactor pressure Enters OT 3115.  Diagnose/Announce EPR failure				
2.	SRO	Enter and direct actions IAW OT 3115 (Reactor Pressure Transients):  <ul style="list-style-type: none"> <li>• Place the EPR in CUTOOUT</li> <li>• Verify that the MPR has control</li> <li>• Lower MPR setpoint as necessary</li> </ul>				
3.	BOP	When directed: Place the EPR in CUTOOUT at peak pressure  <ul style="list-style-type: none"> <li>• Verify that the MPR has control</li> <li>• Lower MPR setpoint as necessary.</li> </ul>				
4.	SRO	Direct BOP to restore pressure to the pre-transient pressure.				
5.	BOP	When directed, adjust MPR to adjust pressure to pre-transient level.				
6.	SRO	Direct crew member to contact I&C to check and repair EPR.  May enter OT 3110, positive Reactivity Insertion  Notifies RE				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
7.	CREW	When directed, contract Work Week Manager / I&C, inform them of EPR problem and request repair efforts begin.				
<b>ROLE PLAY: As Work Week Manager / I&amp;C when contacted concerning the pressure regulator failure, delay determining the cause; no reason will be given before the scenario terminates.</b>						
8.	SRO	Brief the Crew.				

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**OPERATOR ACTIONS  
EVENT NUMBER 8**

**Crew Task Description:**

**Main Steam Line Break in the Drywell.**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize and inform the SRO of rising Drywell Pressure and reactor scram				
2.	SRO	Enter and direct crew actions IAW OT 3100.  May enter OT 3110				
3.	CREW	Report All Rods inserted				
4.	SRO	Enter EOP-1 and EOP-3 and direct actions to control RPV level and pressure and containment				
5.	SRO	Direct the RO to maintain level 127" to 177".				
6.	RO	When directed, maintain level between 127" and 177".				
7.	SRO	Direct pressure stabilized between 800-1000 using Bypass Valves.				
8.	SRO	Direct the BOP to maximize drywell cooling.				

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  - 2) \* = Critical Task/Step

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
9.	BOP	When directed, attempt to start/restart all available drywell RRUs.				
10.	SRO	Direct the RO/BOP to backup all appropriate PCIS group isolations.				
11.	RO/BOP	When directed, backup appropriate PCIS group isolations.				
12.	SRO	Direct the BOP to spray the torus				
13.	BOP	Attempt to spray the Torus, report the there are no RHR Pumps available				
14.	<b>CREW</b> <b>EOP-3</b> <b>EOP-5</b> <b>CCT-1</b>	<b>When drywell temperature cannot be restored or maintained below 280°F, initiate RPV-ED (or anticipate ED and use bypass valves)</b>  <b>Standard:</b>  RPV-ED initiated prior to exceeding 280°F. may use bypass valves in anticipation of ED.				
15.	SRO	May anticipate emergency depressurization and direct use of Bypass Valves  Directs defeating PCIS Group I isolation interlocks (Main Steam high steam flow not in RUN)				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
16.	BOP	Defeats PCIS Group I isolation interlocks (Main Steam high steam flow not in RUN) OE-3107, Section CC				
17.	SRO	Direct the RO/BOP to terminate and prevent injection from CS and RHR pumps.				
18.	BOP	May OPEN bypass valves as necessary to depressurize the RPV using the Bypass Valve Opening Jack.				
19.	SRO	Enter and direct crew actions IAW EOP-5, RPV-ED.				
20.	SRO	Direct the RO/BOP to terminate and prevent injection from CS and RHR pumps.				
21.	RO/BOP	When directed, place CS and RHR pumps in PTL.				
22.	SRO	Direct RO/BOP to open all SRVs.				
23.	RO/BOP	When directed, opens all SRVs.				
<b>EVALUATORS CUE: Transition to Event 9 after Alternate Emergency Depressurization or EOP-5 Emergency Depressurization is initiated.</b>						

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**OPERATOR ACTIONS  
EVENT NUMBER 9**

**Crew Task Description:**

**Failure of the Reactor Feedwater Pumps and Core Spray Pump A Injection Valve require lining up Condensate Pumps to restore RPV water level.**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	<p><b>IF the RPV was depressurized using BPVs</b></p> <p><b>Drywell temperature may be above saturation temperature for reactor pressure. RPV Level indication is not reliable</b></p> <p><b>Enters EOP-6 RPV Flooding</b></p> <p><b>IF NOT PROCEED TO STEP 7.</b></p>				
2.	SRO	Direct BOP to close or check closed MSIVs, main steam line drains, RCIC isolation valves.				
3.	BOP	Closes or checks closed MSIVs, main steam line drains, RCIC isolation valves.				
4.	CREW CT-2 EOP-6	<b>IF Reactor water level cannot be determined, Enters EOP-6, opens all SRVs and refloods the RPV to the Main Steam Lines</b>				

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5.	SRO	<p>Direct RO to commence and increase injection into the RPV to establish the Main Steam Lines Flooded as indicated by</p> <ol style="list-style-type: none"> <li>1. SRV Tailpipe Temperatures decreasing</li> <li>2. Increasing RPV pressure</li> <li>3. SRV Tailpipe Temperature Pressure Switches.</li> </ol>				
6.	RO and/or BOP	<p>When directed, commence and increase injection into the RPV with Shutdown RPV Flooding Systems – EOP-6 Table T (Include - Core Spray, Condensate/Feedwater, CRD, and RHR).</p>				
<p><b>EVALUATORS CUE: If RPV Water level instrument were determined to be inoperable the scenario may be terminated once EOP-6 has been exited at the discretion of the lead evaluator.</b></p>						
7.	CREW	<p><b>IF the RPV was depressurized using SRVs or EOP-6 was not required continue HERE.</b></p> <p>Diagnose trip of operating Feedwater Pumps</p> <p>Notify SRO/CREW</p>				
8.	SRO	<p>Direct AO, Work Week Manager, Maintenance to investigate the loss of Feedwater Pumps.</p> <p>Direct injection with the A Core Spray System</p>				
9.	BOP	<p>Lineup the A Core Spray System for injection</p> <p>Report failure of CS Injection Valve to open</p>				

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10.	RO/ BOP	Request AO, Work Week Manager, and/or Maintenance to investigate the loss of Feedwater Pumps and/or Core Spray Injection Valve failure to open.				
<b>ROLE PLAY: As AO, Work Week Manager, Maintenance to investigate the loss of Feedwater Pumps and/or Core Spray Injection Valve failure to open respond that you will investigate but that you are short on time/personnel and it may take awhile.</b>						
11.	SRO	Directs crew to line up as many Alternate Injection Subsystems as possible EOP-1, Table D.				
12.	RO	Lines up Condensate IAW RP 2170 and/or OP 2172  May also initiate lineups on other Alternate Injection Systems.				
13.	<b>CREW CT-3 EOP-1</b>	<b>Restores RPV water level with Condensate injecting directly into the RPV OR aligns alternate injection systems.</b>				
<b>ROLE PLAY: As Maintenance report that the B RHR Pump has been returned to service and may be used.</b>						
14.	SRO	Direct securing <ul style="list-style-type: none"> <li>• RRUs</li> <li>• Recirc Pumps</li> <li>• Placing RHR Pump B in Containment Spray.</li> </ul>				
15.	RO/ BOP	Verifies shutdown <ul style="list-style-type: none"> <li>• RRUs</li> <li>• Recirc Pumps</li> </ul> Places RHR Pump B in Containment Spray and manually opens spray valves.				

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16.	CREW CT-3 EOP-3	Restores Containment parameters using the Alternate Systems and manually opens the RHR-RHRSW Valve 183 or RHR Pump B and manually opens the injection valves.				
<b>TERMINATING CUE: RPV flooded and/or RPV Water Level and Primary Containment parameters under control.</b>						

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Facility:	VERMONT YANKEE	Scenario No.:	4	Op Test No.:	2009 NRC
Examiners:	_____	Operators:	SRO -	_____	
	_____		RO -	_____	
	_____		BOP -	_____	
Initial Conditions:	80% power (A and C RFP in service) "C" RHR OOS for severe vibration maintenance is investigating.				
Turnover:	RHR Pump "C" is OOS while maintenance investigates high vibration. Tagged out on previous shift; estimated return to service is 48 hours, 7-day LCO due to RHR Pump "C" OOS (TS 3.5.A.3) Perform VYOPF 4120.02, HCI Valve Tests for HPCI Steam Isolation Valves 15 and 16. HPCI Valve surveillance is due.				
Critical Task:	<ol style="list-style-type: none"> <li>1. During an RPV Blowdown with the reactor not shutdown under all conditions perform power/level control TERMINATE AND PREVENT INJECTION into the RPV using appendix GG, until conditions are met to re-establish injection.</li> <li>2. During an ATWS with a steam leak in the Secondary Containment and two areas exceeding MAX SAFE Emergency Depressurize.</li> <li>3. After Emergency Depressurization restore and maintain RPV water level +127 to +177 inches.</li> </ol>				
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	N - BOP N - SRO	Perform VYOPF 4120.02, Valve timing on HPCI Steam Isolation Valves 15 and 16. (TS)		
2	N/A	R - RO R - SRO	Lower power to remove the "A" Condensate Pump from service		
3	mfRD_021423	C - RO C - SRO	While inserting control rods a control rod will stick in the core after moving a notch, CRD drive pressure must be raised to move rod (ON 2143).		
4	mfFW_16A	I - RO I - SRO TS - SRO	Failure of the controlling reactor water level instrument LI-6-94A, will result in a lowering reactor water level (OT 3113) and a TS entry.		
5	mfRM_01P (100%)	I - BOP I - SRO TS - SRO	Failure of the Refuel Floor High Radiation Monitor. RP and I & C will immediately repair (After TS Call) The crew must restore the GP 3 isolation. (TS)		

6	mfMC_08 10% at 120 sec. mfOG_03A	C - BOP C - SRO	Respond to loss of condenser vacuum /Off-gas explosion
7	mfHP_09 25% at 450 sec	M - CREW	HPCI Steam Line Leak upstream of HPCI-14, this will result in Emergency Depressurization as Reactor Building temperatures in two areas are above Max Safe. Crew may anticipate RPV-ED.
8	mfPC_1HP15 mfPC_1HP16 mfRD_020615 mfRD_020611 mfRD_021011 mfRD_021015	C - RO  C - SRO	HPCI-15 and 16 will fail to isolate and four control rods fail to insert during the scram. Entry into EOP-2 should have occurred earlier on the scram caused by the loss of vacuum.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario Event Description NRC Scenario 4
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#### Vermont Yankee 2009 NRC Scenario #4

The crew takes the watch with the plant at 80% power and RHR Pump "C" is OOS. Immediately after turnover the crew is directed to perform VYOPF 4120.02, valve timing on HPCI Steam Isolation Valves 15 and 16. This places the plant in a 24 hour LCO, TS 3.5.E.3

Once the Tech Spec is identified, the valves tested and the system returned to operability the crew is directed to remove the "A" Condensate Pump from service. Crew must lower power to insure that RFP suction pressure is greater than 450 psig. When the operator attempts to insert a control the control rod will not move. The crew must enter the stuck rod procedure ON 3143. When the crew raises CRD drive water pressure the control rod will move. After verifying that the control rod is operable the crew will resume lowering power, then a failure of the controlling reactor water level instrument LI-6-94A, will result in a lowering reactor water level (OT 3113) and a TS entry. After the level instrument is addressed the power reduction will continue and the crew will remove the 'A' Condensate Pump from service.

After the Condensate Pump has been removed from service and the crew has been briefed the Refuel Floor High Radiation Monitor will fail upscale (INOP). The crew will take immediate actions and the SRO will enter T.S. 3.2.3. I & C/Radiation Protection will quickly repair the instrument and restore the Radiation Monitor to service. The crew will take actions to reset the group three isolation, restore Reactor Building HVAC and secure SBTG.

As the crew is recovering from the Group three isolation a pocket of Hydrogen Gas will ignite and cause a rupture of the Off-Gas Rupture Diaphragm and subsequent loss of Vacuum. Reactor power may be lowered in an attempt maintain vacuum, however vacuum will deteriorate to where a reactor scram is required. When the reactor is scrammed, four control rods remain stuck in the core requiring entry into EOP-2. Even though APRMs are downscale they must take EOP-2 actions to terminate and prevent injection (**Critical Task**). After the scram a HPCI steam line break will occur, requiring the crew to take actions IAW ON 3158, EOP-4.

With the steam leak in the Reactor Building the crew will attempt to manually close HPCI 15 and 16, however HPCI-15 / 16 will fail to close. As temperatures continue to rise two areas will exceed Max Safe which will require RPV-ED IAW EOP-5 (**Critical Task**). Because of the previous loss of vacuum the Main Condenser will not be available.

Following the RPV-ED the crew must take action to restore and control RPV water level IAW EOP-2 (**Critical Task**).

Critical tasks are: Emergency depressurize when above the Max Safe limit in two or more areas and terminate and prevent injection and restore and control RPV water level following emergency depressurization.



**CREW BRIEF:**

**-Power level:** 80%

**-Rod Sequence:** Rapid Shutdown Sequence Latched (EOC)      **-Rod Group:** 21

**-Equipment out of service and/or tagged or abnormalities:**

1. C RHR Pump OOS, tagged out for Maintenance investigation yesterday at 1600.

**-Reason For Equipment out of Service or tagged:**

1. RHR Pump C OOS for severe vibrations during surveillance testing.

**-Applicable Tech Spec LCOs:**

1. Seven (7) day LCO, TS 3.5.A.3
2. Tech Spec LCO 3.5.E.3 has been entered for the performance of OP 4120, Sections B.24 through 28 (24 hour LCO)

**EOOS Color:**

Green 3.12 E-6

**-Plant evolutions in progress/Scheduled Shift Evolutions:**

1. Immediately after shift turnover perform OP 4120, Sections B.24 through 28 (Valve timing on HPCI Steam Isolation Valves 15 and 16) to verify their operability.
2. After completing the HPCI Surveillance remove the "A" Condensate Pump from service for a inspection of the motor. A tagout will be developed later.

**SCENARIO SUMMARY:**

**TERMINATING CONDITION(S):**

1. RPV depressurized and reactor water level under control.

**REFERENCES:**

1. OP 4120, High Pressure Coolant Injection System Surveillance
2. RP 2170, Condensate System
3. OP 0105, Reactor Operations
4. ON 2143, Stuck Control Rod
5. ARS 21003 (9-5) Annunciators
6. OT 3113, Reactor Low Level
7. ON 3153, Excessive Radiation Levels
8. OP 2117, Standby Gas Treatment
9. AP 0156, Notification of Significant Events
10. OT 3120, Condenser High Back Pressure
11. ON 3151, Off-Gas Explosion
12. OT 3100, Reactor Scram
13. ON 3158, Reactor Building High Area Temperature/Water Level
14. EOP-2
15. EOP-4
16. EOP-5
17. Technical Specifications

**SIMULATOR OPERATOR INSTRUCTIONS**

**Simulator Set Up:** 80% Power

1. IC-808
2. Verify Feedwater Pump B is secured.
3. The next rod to be inserted is 14-23

**Discretionary Distracter Malfunctions/RFs/IOs:**

1. rNM\_71-76 All APRM Gain adjusts made to get APRM GAF's in spec (modeled to the plant at 100%): 71 (1.385), 72 (1.448), 73 (1.378), 74 (1.383), 75 (1.287), 76 (1.375)

No.	MF/RF/IO #	Severity	Ramp	REM #	Act. Time	Description
1.	rFRH_13	Open		Pre-insert		RHR Pump C Breaker
2.	mfRD_020615 mfRD_020611 mfRD_021015 mfRD_021011			Pre-insert		Stuck Control Rods 06-15, 06-11, 10-15, 10-11
3.	mfRD_021423			1		Stuck Control Rod 14-23
4.	mfFW_16A	100%	180	2		Failure of water level instrument LI-6-94A
5.	mfRM_01P	100%		3		Failure of the Refuel Floor High Radiation Monitor High
6.	mfMC_08 mfOG_03A	10%	120	4 4		Condenser air in-leakage Off-Gas Sys "A" Explosion
7.	mfHP_09 mfPC_1HP15 mfPC_1HP16	25%	450	5 5 5		HPCI Steam Line Leak upstream of HPCI-14 HPCI-15 and 16 will fail to isolate

## **SIMULATOR OPERATOR INSTRUCTIONS (Continued)**

### **Additional Instructions:**

1. Place RHR Pump C in PTL and Danger Tag its control switch
2. Reactor Feedwater Pump B must be secured at the beginning of the scenario.
3. After the HPCI MSIVs test is completed or when directed by the chief examiner call the Control Room as Maintenance and request that the "A" Condensate Pump be removed from service.
4. During Event 3, Stuck Control Rod; when CRD Drive pressure has been raised by 10 - 50 psig delete the malfunction to allow the rod to move.
5. The Level Instrument failure will be investigated, with no cause being found for the duration of the scenario.
6. As RP and/or I & C notified about the refueling floor rad monitor respond that the detector was bumped by a piece of equipment that was being moved and that a loose connection was found and repaired. Request they reset the monitor, re-start RB HVAC and secure SBGT to preserve the current filters.
7. When requested as AO/RP to investigate / conduct surveys in the Reactor Building, inform the Control Room that there is loud noise and steam in the HPCI Room.
8. If requested as Maintenance to attempt local closure of the HPCI-15 and 16 valves, report reactor building entry cannot be made at this time due to temperatures and the steam environment. The valves will remain open for the duration of the scenario.

## OPERATOR ACTIONS EVENT NUMBER 1

### Crew Task Description:

**Perform OP-4120, Sections B.24 through 28 (Valve timing on HPCI Steam Isolation Valves 15 & 16)**

	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	SRO	Directs performance of Test IAW OP 4120, Sect. B.				
2.	SRO	Briefs crew on the test Enter Tech Spec LCO 3.5.E.3, 24 hour LCO for the performance of OP 4120, Sections B.24 through 28				
3.	BOP	Obtains and reviews procedure OP 4120 Section B and checks prerequisites.				
4.	BOP	Close and time STEAM ISOLATION HPCI-15, record time				<b>NOTE:</b> May use two Stop Watches  Close between 30.49 to 41.25 secs.
5.	BOP	Open and time STEAM ISOLATION HPCI-15, record time				Open between 31.13 to 42.11 secs.
6.	BOP	Close and time STEAM ISOLATION HPCI-16, record time				Close between 32.44 and 43.88 secs.
7.	BOP	Open and time STEAM ISOLATION HPCI-16, record time				Open between 33.29 and 45.03 secs.
8.	BOP	Notify the crew that OP 4120, Sect. B. steps 24 through 28 are completed.				
9.	RO	Verifies correct switch positions				

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10.	SRO	Exit Tech Spec LCO 3.5.E.3				
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**OPERATOR ACTIONS  
EVENT NUMBER 2**

**Crew Task Description:**

**Remove Condensate Pump "A" from service.**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Acknowledge request from maintenance to remove the "A" Condensate Pump from service				
2.	SRO	Direct actions IAW OP 0105, Phase 5, Step 17 and RP 2170, Sect. J, Securing/Tripping of a Condensate Pump at Power <ul style="list-style-type: none"> <li>• Conduct a Crew brief on removing the Condensate Pump from service.</li> <li>• Lower reactor power to ≤ 80 percent (&lt;10% per minute)</li> <li>• Direct BOP contact VELCO and ISO New England and notify them of the power reduction</li> </ul>				
<b>ROLE PLAY: As AO directed to monitor Recirc MG Set oil temperatures respond as directed.</b>						
3.	RO	When directed, reduce Recirc flow to lower reactor power to ≤ 80 percent (at rate directed) until Recirculation Flow is 47.5 – 48 Mlbm/hr  When Recirculation Flow is 47.5 – 48 Mlbm/hr notify SRO				
4.	SRO	Directs inserting control rods in the reverse of sequence to lower power feed pump suction pressure is approximately 450 psig				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
<b>EVALUATORS CUE: During this event a Control Rod will become stuck – see the Event 3 for the response</b>						
5.	BOP	Inserts control rods in the reverse of sequence to lower power feed pump suction pressure is approximately 450 psig.				
6.	SRO	When feed pump suction pressure is approximately 450 psig , direct the BOP to secure the "A" Condensate Pump				
7.	BOP	When directed, secure the "A" Condensate Pump  Verify Running Condensate Pump amperage is below amber region of current meter.  Direct AO to monitor the A Condensate Pump				
<b>ROLE PLAY: As Turbine Building AO report that the check valve is holding that seal leakage is minimal and that the pump is not rotating.</b>						
8.	SRO	Conduct a Shift Brief				
<b>EVALUATORS CUE: When Condensate pump is secured insert Event 4, Failure of the controlling reactor water level instrument LI-6-94A</b>						

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**OPERATOR ACTIONS  
EVENT NUMBER 3**

**Crew Task Description:**

**While inserting control rods a control rod 14-23 will stick in the core after moving a notch and cannot be moved.**

	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	RO	Determines control rod 14-23 is stuck and notifies SRO				
2.	SRO	Enters ON 3143 – Stuck Control Rod and directs actions contained in ON 3143 flow chart.				
3.	RO	Takes actions as directed to un-stick control rod per ON 3143 flowchart <ul style="list-style-type: none"> <li>• attempt one notch insert</li> <li>• attempt a single notch withdraw</li> <li>• determines drive water pressure</li> <li>• raises drive water pressure 10-50 psig</li> <li>• attempt to insert control rod one notch (successful)</li> <li>• attempt to withdraw one notch (successful)</li> <li>• insert rod 14-23 one notch</li> <li>• withdraw rod 14-231 one notch</li> <li>• return drive water press. to 250-275</li> <li>• insert then withdraw rod 14-23 one notch (done twice)</li> </ul>				
4.	RO	<ul style="list-style-type: none"> <li>• Insert then withdraw rod 14-23 one notch (done twice).</li> </ul>				
5.	SRO	Crew Brief.				

- NOTES:**
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  - 2) \* = Critical Task/Step

**OPERATOR ACTIONS  
EVENT NUMBER 4**

**Crew Task Description:**

**Failure of the controlling reactor water level instrument LI-6-94A. T.S. Entry**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize/Acknowledge Annunciator  5-E-1, RX LEVEL HI/LO  Diagnose level instrument LI-6-94A Failure				<b>NOTE:</b> Crew may notice level failure from instruments on the 9-5 Panel prior to the annunciator.
2.	SRO	Direct entry into OT 3113, Reactor Low Level  Direct Shifting the RX VESSEL MASTER CONTROLLER (FC-6-83) to manual  Direct placing VESSEL LEVEL CHANNEL SEL switch to the LI 6-94B channel  Direct RO/BOP to contact Work Week Manager / I&C and request they investigate the failure of LI-6- 94A  Direct placing RX VESSEL MASTER CONTROLLER (FC-6-83) to auto.				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
3.	RO	Shift the RX VESSEL MASTER CONTROLLER (FC-6-83) to manual  Restore RPV water level to the normal band  Place VESSEL LEVEL CHANNEL SEL switch to the LI 6-94B channel  Return RX VESSEL MASTER CONTROLLER (FC-6-83) to auto				
4.	RO/ BOP	When directed, call I&C and ask for assistance to determine problem with LI-6-94A				
5.	SRO	Conduct a Crew Brief				
<b>EVALUATORS CUE: When Feedwater is stabilized and crew briefed insert Event 5.</b>						

- NOTES:**
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## OPERATOR ACTIONS EVENT NUMBER 5

### Crew Task Description:

**Failure of the Refuel Floor High Radiation Monitor. RP and I & C will immediately repair (After TS Cal) the crew must restore the GP 3 isolation.**

	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize/Acknowledge Annunciator:  RX BLDG/REFUEL FLR CH B RAD HI (5-J-1)  Recognize a GP 3 isolation caused by a Refuel Floor Rad Monitor failing upscale.				
2.	SRO	Direct entry into ON 3153, Excessive Radiation Levels  Direct confirming alarm conditions using other RB Rad Indications.  Direct an RP and/or I & C to investigate the Refuel Floor Rad Monitor.				
3.	BOP	Refer to ARS for Annunciators.  Verify that HVAC isolates and SBGT starts  May advise all personnel of potentially high radiation and evacuate Reactor Building.  Request Rad Protection to initiate local surveys.  Monitor radiation levels on other indications.  Refer to ON 3153, Excessive Radiation Levels				
4.	SRO	Direct PCIS GP 3 isolation backed up.				

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	POS	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
5.	BOP	Back up PCIS GP 3 isolation				
6.	SRO	Time permitting consults Tech Specs 3.2.3.  Enters 3.6.E.2 a 24 hour LCO while the Group 2 isolation Inops the CAM				
<p><b>ROLE PLAY: When sufficient actions have been taken and TS identified OR when directed by the Chief Examiner clear the Hi Rad Malfunction mFRN01P and notify the Control Room that the detector was bumped by a piece of equipment that was being moved and that a loose connection was found and repaired. Request they reset the monitor, restart RB HVAC and secure SBTG to preserve the current filters.</b></p> <p><b>Examiner may start the next malfunction when sufficient evolutions are observed.</b></p>						
7.	SRO	Directs resetting PCIS GP 3 isolation IAW OP 2115				
8.	BOP	If an evacuation was directed makes announcement that personnel may re-enter the Reactor Building.  Resets GP 3 Isolation and restores primary Containment lineup IAW OP 2115				
9.	SRO	Direct starting RB HVAC and securing SBTG				
10.	BOP	Restarts reactor building ventilation per OP 2192  Secures SBTG train per OP 2117, Securing SGT Trains After Auto or Manual Start.				
11.	SRO	Conduct a Crew Brief				
<p><b>EVALUATORS CUE: When sufficient manipulations have been observed insert Event 6.</b></p>						

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**OPERATOR ACTIONS  
EVENT NUMBER 6**

**Crew Task Description:**

**Respond to loss of condenser vacuum /Off-gas explosion**

	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize/Acknowledge Annunciators:  COND VAC LO alarm (7H3) AOG PRESS HI (6-H-1) TUBB BLDG RAD HI (3-F-3)  Diagnose lowering condenser vacuum/Off-Gas Explosion  Notify the SRO/Crew				<b>NOTE:</b> The operators may notice the lowering vacuum and/or high off-gas pressure prior to the Annunciators
2.	SRO	Enter/direct actions IAW OT 3120, Condenser High Back Pressure and ON 3151, Off-Gas Explosion/ Rupture Disk Failure: <ul style="list-style-type: none"> <li>• Suspect failure of the SJAE rupture disc.</li> <li>• Because of rapidly lowering Condenser Vacuum may immediately direct Reactor Scam and entry into OT 3100</li> <li>• Direct verifying closed all turbine building outside doors</li> <li>• May direct Turbine Building evacuation</li> </ul>				

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	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
3.	CRO	May commence a power reduction per OP 0105, until vacuum stabilizes or the plant is shut down  Scrams the reactor				
4.	BOP	May dispatch two operators to obtain the correct Radiation Protection equipment and enter the SJAE room and physically inspect the rupture disc for damage.  Direct verifying closed all turbine building outside doors				
<b>ROLE PLAY: As AO directed to enter the SJAE Room respond as directed. As AO directed to verify closed all turbine building outside doors respond as directed. Neither of these tasks will be completed during the scenario.</b>						
5.	BOP	When directed: <ul style="list-style-type: none"> <li>• May shift electrical loads to the Start-up Transformers</li> <li>• Trip the Turbine</li> </ul>				
6.	RO	Report four control rods NOT inserted to 00				<b>NOTE:</b> Condenser vacuum will continue to degrade.
7.	SRO	Direct entry into EOP-2  Directs inhibiting ADS if RPV water level is below Lo-Lo Level				
8.	RO	When steam flow < 0.5lbm/hr per steam line, place Mode Switch in SHUTDOWN				
9.	BOP	Trip the recirculation pumps and enter OT 3118.				
10.	BOP	If directed inhibits ADS				

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	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
11.	SRO	Direct RO to Manually insert individual control rods using OE 3107 Appendix G  Directs BOP to install App PP jumpers to bypass MSIV isolation on Lo-Lo Water Level. (9-15 Panel)				
12.	RO	Manually insert individual control rods using OE 3107, Appendix G				
13.	SRO	Provide a crew brief				
<b>BOOTH OPERATOR: When directed by the Chief Examiner insert HPCI Steam Line Break</b>						

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**OPERATOR ACTIONS**

**EVENT NUMBERS 7 & 8**

**Crew Task Description:**

**HPCI Steam Line Leak upstream of HPCI-14, this will result in Alternate or Emergency Depressurization as Reactor Building temperatures in two areas are above max safe.**

**HPCI-15 and 16 will fail to isolate and four control rods fail to insert during the scram. Entry into EOP-2 should have occurred earlier on the scram with a loss of vacuum.**

	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CREW	Recognize/Acknowledge Annunciators: STEAM LEAK DET PANEL TEMP HI (4-H-1) RX BLDG RAD HI (3-E-3) Fire Panel Audible Alarm Notify SRO				
2.	SRO	Directs entry into ON 3153, Excessive Rad Levels and/or ON 3158, Reactor Building High Area Temperature/Water Level				
3.	BOP	Enter ON 3153 and/or ON 3158				
		• Announce evacuation of the Reactor Building				
		• Monitor area radiation levels				
		• Backup Group 3 isolation				
		• Verify auto start of SBGT				
4.	SRO	Direct entry into EOP-4 while continuing in EOP-2				

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	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
5.	BOP	<ul style="list-style-type: none"> <li>Identify rising temps and area rad level in the torus catwalk area</li> <li>Identify HPCI area high temperatures on Allen Bradley; inform SRO</li> <li>Recognize failure of HPCI to isolate; attempt to close valves</li> <li>Report failure of HPCI 15 and 16 to isolate.</li> </ul>				
6.	SRO	<p>Direct BOP to contact Maintenance to investigate failure of HPCI-15 and 16 to isolate.</p> <p>Direct AO / RP to investigate steam leak in the Secondary Containment</p>				
7.	BOP	<ul style="list-style-type: none"> <li>Stabilize pressure at &lt; 1055 psig using BPVs</li> <li>Contacts Maintenance to investigate failure of HPCI-15 and 16 to isolate.</li> <li>Directs AO / RP to investigate steam leak in the Secondary Containment</li> </ul>				
<p><b>ROLE PLAY: As AO / RP report that you are evacuating the Reactor Building because there is steam coming from the HPCI/CRD Room.</b></p> <p><b>If requested as Maintenance to enter the Reactor Building state that RP has advised them NOT to enter the RB.</b></p>						
8.	RO	Initiate ARI/RPT				
		Restore/maintain RPV level between -19 to 177 inches using Feed and Condensate				

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	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
9.	SRO	<p>Time permitting briefs Crew on plan to E-Depress</p> <p>Determines that a primary system is discharging into the Secondary Containment and two areas are exceeding the same maximum safe operating levels in more than one area.</p> <p>Directs initiate entry into EOP-5 RPV-ED</p> <p>Directs Terminate and prevent</p>				
10.	<b>CREW EOP-2 CT-1</b>	<b>TERMINATE AND PREVENT INJECTION into the RPV using appendix GG</b>				
11.	BOP	<p>Verify actions IAW EOP-5:</p> <ul style="list-style-type: none"> <li>• Terminate and prevent injection IAW Appendix GG</li> </ul>				
12.	SRO	When injection terminated and prevented, direct all SRVs opened				
13.	<b>*CREW EOP-5 CT-2</b>	<p><b>During an ATWS with a steam leak in the Secondary Containment and two areas exceeding MAX SAFE Emergency Depressurize.</b></p> <p><b>Standard:</b></p> <p>When directed, open all SRVs</p>				
14.	SRO	When reactor pressure drops below 160 psig, direct level restored and maintained above -19 inches and slowly restored using Condensate to between -19 and 177 inches				

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	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
15.	*CREW EOP-5 CT-3	<p><b>After Emergency Depressurization Restore RPV water level. +127 to +177</b></p> <p><b>Standard:</b></p> <p>When directed, use Condensate to slowly restore level to between -19 and 177 inches</p>				
<p><b>EVALUATOR: This scenario is completed when the RPV has been depressurized and Feedwater flow is established and RPV water level is above -19 inches.</b></p>						

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