Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility:	Three Mile Island Unit 1	Task No.:	0010160101
Task Title:	Respond to a rod sequence fault while raising power.	JPM No.:	2007 NRC Simulator JPM A
K/A Reference:	001 A4.03 (4.0/3.7)	**Bank JPM 11.2.05.159, modified.**	

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- The reactor is critical with power at 8 %.
- The operating crew is ready to perform OP-1102-2, PLANT STARTUP, Step 3.2.3.a - **WITHDRAW** control rods in sequence to raise reactor power.
- After power is raised, main turbine generator startup will begin.
- All systems are properly aligned for plant startup.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: **In the "Ready Room": Provide the applicant with the CUE SHEET and OP-1102-2. Have them review 1102-2 in order to be prepared to perform the task when they assume the watch.**

General References:
- OP-1102-2, PLANT STARTUP, Revision 144
- OP-TM-622-000, CONTROL ROD DRIVE SYSTEM, Revision 2
- OP-TM-622-412, RECOVERING FROM A SEQUENCE INHIBIT CAUSED BY EXCESSIVE OVERLAP, Revision 1
- OP-TM-MAP-G0202, CRD SEQUENCE FAULT, Revision 1

Handout: ***None***

Initiating Cue:	Perform OP-1102-2, Step 3.2.3. Raise power to 10% at 0.5% per minute, then hold.
Time Critical Task:	No
Validation Time:	12 Minutes

SIMULATOR SETUP

- **Critical reactor, 8%, use Temporary IC 205.**
- **Ensure setup is consistent with being at 1102-2, Step 3.2.3.**
- **Build IC from controlled IC-8 Raise power to approximately 8%**
- **Use Remote Function THR02 to reach 1552 ppmb**
- **Place Diamond in manual**
- **Place Diamond in Sequence Override**
- **Move Group 6 rods to 75.9% by PPC**
- **Move Group 7 rods to 3.8% by PPC**
- **Place Diamond in Sequence**
- **Place Diamond back in Auto**

(Denote Critical Steps with a check mark)

START TIME: _____

Procedure CAUTION:	**DO NOT EXCEED A STABLE STARTUP RATE OF 1 DPM, OR EXCEED A TRANSIENT START-UP RATE OF 1.5 DPM DURING ACTUAL ROD MOTION. LIMIT THE RATE OF POWER INCREASE PER ENCLOSURE 4.**
Procedure NOTE:	**If conditions required by Enclosure 2 are not satisfied or any time as directed by the CRS, HOLD Reactor power level stable, using the reactor control mode applicable for that power level.** 1102-2, Step 3.2.3
Performance Step: 1	Raise reactor power to 100% as follows: • WITHDRAW control rods in sequence to raise reactor power.
Standard:	Withdraws rods to raise power.
Comment:	

Performance Step: 2	Respond to alarm G-2-2, CRD SEQUENCE FAULT
Standard:	Enters OP-TM-MAP-G0202.
Comment:	

OP-TM-MAP-G0202, Step 3.0

√ **Performance Step: 3** AUTOMATIC ACTIONS:

- SEQUENCE INHIBIT lamp energizes (Diamond Panel).

The following alarms actuate:

- MAP G-2-6 Pwr Distrib Limits Exceeded (due to rod index/overlap).
- L2722 CRD Sequence Fault
- L3057 Control Rod Overlap Abnormal

Standard:

- Stops withdrawing rods (√).
- Verifies alarm validity and automatic actions.
- Determines Group 7 withdrawing out of sequence has caused the alarm.

Comment:

OP-TM-MAP-G0202, Step 4.0/4.1

Performance Step: 4 MANUAL ACTIONS REQUIRED:

- PLACE Diamond to Hand IAW OP-TM-621-471, ICS Manual Control.

Standard: Places Diamond in Manual.

Comment:

OP-TM-MAP-G0202, Step 4.2

Performance Step: 5 REFER to Tech Spec 3.5.2.5 for limits on OVERLAP.

Standard: Requests CRS Evaluate T.S. 3.5.2.5

Comment:

Evaluator Cue **As CRS Acknowledge need to Address Tech. Spec. 3.5.2.5**

Procedure Note:	**Although the CRD system monitors for excessive overlap (i.e. greater than 25%), Tech Specs does have a low overlap limit of 20%.** OP-TM-MAP-G0202, Step 4.3
Performance Step: 6	DETERMINE overlap between sequential regulating groups (Refer to OP-TM-622-000, Control Rod Drive System 'definitions' section).
Standard:	Calculates overlap. ***Should be approximately (100-78.3)+6.2 = 27.9 numbers may differ but overlap is approximately 27.9 due to initial simulator setup.***
Evaluator Note:	**OP-TM-622-000, DEFINITION 6.5.27: OVERLAP** **Operating group overlap is defined as percentage of travel during which sequential regulating groups are both traveling. The normal overlap is 25 Percent and overlap must not exceed 30 Percent or be less than 20 Percent. Overlap can be determined by taking difference in group average positions, then subtracting that difference from 100 Percent. For example: Suppose group 6 average position is 70 Percent and group 7 average position is 10 Percent:** • **The difference in group average position is 70 - 10 or 60 Percent.** • **100 Percent minus difference in group average positions is 100 - 60 or 40 Percent.** • **The overlap is 40 Percent, which exceeds operating limit.**
Booth Operator Cue:	**After the applicant has completed OP-TM-MAP-G0202, Step 4.3 "DETERMINE overlap between sequential regulating groups": For the purpose of this JPM, time compression is being used to resolve the rod control problem. A fault in the sequencer was identified and has been corrected.**
Comment:	

OP-TM-MAP-G0202, Step 4.3

Performance Step: 7 If the following conditions exist:

- MOTOR FAULT lamp is Off.
- Rod groups are skewed beyond T.S. overlap limits.

then ADJUST overlap to 25 ±5% IAW OP-TM-622-412, Recovering from a Sequence Inhibit Caused by Excessive Overlap.

Standard:

- Determines overlap must be corrected.
- Proceeds to OP-TM-622-412.

Evaluator Cue: ***Check need for cue during validation.***

The CRS directs you to restore overlap to 25 ± 2% before proceeding with the power increase.

Comment:

OP-TM-622-412, Sections 1.0/2.0/3.0

Performance Step: 8 Reviews PURPOSE/MATERIAL AND SPECIAL EQUIPMENT/PRECAUTIONS, LIMITATIONS, AND PREREQUISITES.

Standard:

- Based on INITIAL CONDITIONS, specifies the CRD system is in standby or operating mode IAW OP-TM-622-000, Control Rod Drive System (CRD).
- VERIFIES no asymmetric rod condition exists (i.e. dropped rod).
- VERIFIES at least one of the following:
  - A Sequence Fault condition exists as indicated by SEQUENCE INHIBIT lamp Lit.
  - Shift Management has directed overlap adjustment to be performed.

Comment:

	Procedure Note:	**This procedure can also be used to adjust overlap when overlap is too little - i.e. < 25%.**
	Procedure Note:	**Overlap must be maintained at 25 +/- 5%. Changing overlap may affect imbalance.**
		OP-TM-622-412, Section 4.0, Step 4.1
	Performance Step: 9	REFER to Tech Spec 3.5.2.5.
	Standard:	Completed in OP-TM-MAP-G0202.
	Comment:	
		OP-TM-622-412, Step 4.2
	Performance Step: 10	ENSURE Diamond in Manual.
	Standard:	Verifies Diamond in Manual.
	Comment:	
		OP-TM-622-412, Step 4.3
√	**Performance Step: 11**	ENSURE SEQ-OR selected on SEQ/SEQ OR switch.
	Standard:	ENSURES SEQ-OR selected on SEQ/SEQ OR switch.
	Comment:	

	Procedure Note:	**It is desirable to insert a group to correct overlap rather than withdrawing the group in sequence with it.** **Example: If overlap between Groups 6 and 7 is 33%, then insert Group 7 to correct overlap rather than withdrawing Group 6.** **Example: If overlap between Groups 6 and 7 is 18%, then insert Group 6 to correct overlap rather than withdrawing Group 7.**
		OP-TM-622-412, Step 4.4
√	**Performance Step: 12**	SELECT affected regulating group on GROUP SELECT SWITCH.
	Standard:	SELECTS Group 7 on GROUP SELECT SWITCH.
	Comment:	
		OP-TM-622-412, Step 4.5
√	**Performance Step: 13**	INSERT group 1 – 2% from its present position.
	Standard:	Inserts Group 7 ≥ 1% but ≤ 2% and allows conditions to stabilize.
	Comment:	

OP-TM-622-412, Step 4.6

√ **Performance Step: 14** When plant is stable, then REPEAT step 4.5 until overlap is adjusted to 25%.

Standard:

- Inserts Group 7 ≥ 1% but ≤ 2% and allows conditions to stabilize.
- Repeats step until overlap is ≥ 23% but ≤27%.

Comment:

Terminating Cue: **When applicant proceeds to Section 5.0 (RETURN TO NORMAL): Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC Simulator JPM A

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The reactor is critical with power at 8 %.
- The operating crew is ready to perform OP-1102-2, PLANT STARTUP, Step 3.2.3.a - **WITHDRAW** control rods in sequence to raise reactor power.
- After power is raised, main turbine generator startup will begin.
- All systems are properly aligned for plant startup.

INITIATING CUE: Perform OP-1102-2, Step 3.2.3. Raise power to 10% at 0.5% per minute, then hold.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Three Mile Island Unit 1 Task No.: 0058010101

Task Title: Take corrective action for a low pressure (LPI) failure during an ESAS actuation JPM No.: 2007 NRC Simulator JPM B

K/A Reference: 006 A3.02 (4.1/4.1) **Bank JPM 11205195**
Alternate Path

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- A large Break LOCA has occurred.
- The crew has entered OP-TM-EOP-006, LOCA COOLDOWN as directed by OP-TM-EOP-002, LOSS OF 25 °F SUBCOOLED MARGIN.
- EOP-006, Step 3.1 "ENSURE HPI and LPI are operated IAW Rule 2" has been completed.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: None

General References:
- EOP-006, LOCA COOLDOWN, Revision 5
- OP-TM-211-901, EMERGENCY INJECTION (HPI/LPI), Revision 0

Handout: ***OP-TM-211-901***

Initiating Cue: Beginning at Step 3.2, perform EOP-006.

Time Critical Task: No

Validation Time: 12 Minutes

SIMULATOR SETUP

1. Reset the simulator to IC 16, if applicable, Temporary IC 206
2. LEAVE the Simulator in FREEZE.
3. INSERT malfunction DH11B, DH-P-1B ES start failure and activate it immediately.
4. INSERT malfunction TH04A, RCS LOCA at 10% and activate immediately.
5. INSERT remote function DHR14 to OPEN on Event Trigger #1 – DH-V-38A and DH-V-38B.
6. INSERT override 03A6S34-ZDICSDHP1B(2) STR to OFF.
7. INSERT override 03A6S34-ZDICSDHP1B(4) NAS to OFF.
8. PLACE the Simulator in RUN.
9. Perform EOP's through EOP-006, Step 3.1
10. FREEZE and SNAP

(Denote Critical Steps with a check mark)

START TIME: _____

	EOP-006, Step 3.2
Performance Step: 1	IAAT an ES Actuation setpoint is reached, then ENSURE all ESAS components have actuated.
Standard:	• Determines DH-P-1B has not started. • Attempts to start DH-P-1B. • Proceeds to RNO column
Booth Operator Cue:	**If/when an AO is dispatched to investigate DH-P-1B failure – report the breaker is in the tripped position.**
Comment:	

	EOP-006, Step 3.2 RNO
Performance Step: 2	INITIATE contingency actions IAW Section 4.2 of the applicable procedure(s): • OP-TM-211-901 "Emergency Injection"
Standard:	Transitions to OP-TM-211-901.
Evaluator Cue:	**Provide a copy of OP-TM-211-901.**
Comment:	

OP-TM-211-901, Sections 1.0/2.0/3.0

Performance Step: 3 Reviews PURPOSE, MATERIALS and SPECIAL EQUIPMENT, PRECAUTIONS/LIMITATIONS/PREREQUISITES.

Standard:

- Notes HPI must remain in service since LPI flow is < 1250 gpm through each line.
- Verifies 1D and 1E buses are energized.
- Verifies a valid automatic actuation has occurred.
- Acknowledges the cue that the MU System and DH System were aligned for ES Standby prior to the actuation.

Evaluator Cue:

- **The Make Up system was in ES standby IAW OP-TM-211-000, "Make Up and Purification" prior to the event.**
- **The Decay Heat system was in ES standby IAW OP-TM-212-000, "Decay Heat Removal" prior to the event.**

Comment:

Procedure Note: **There are special usage requirements for Section 4.1 and Attachments 7.1, 7.2 and 7.3. These actions are memory items (IAW OS 24) and performed from memory when required. The sequence of actuation and verification of ES is not train dependent. Either train may be performed first or trains may be performed in parallel.**

OP-TM-211-901, Step 4.1/4.1.1

Performance Step: 4 Initiation of injection:

- If 1D 4160V bus is not energized, then GO TO step 4.1.5.

Standard: Verifies ID 4160V bus energized and continues to next step.

Comment:

OP-TM-211-901, Step 4.1.2

Performance Step: 5 If ESAS Train A "Load Seq Block 4" lights (PCR) are not BLUE, then PRESS "Manual ES Actuation" "1600 PSIG RC PRESS" (Train A CC).

Standard: Verifies all ESAS Train A "Load Seq Block 4" BLUE.

Comment:

Procedure Note: **PCR graphic display is equivalent to Attachment 7.1.**

OP-TM-211-901, Step 4.1.3

Performance Step: 6 If any of the components on Attachment 7.1 are not in the required condition, then INITIATE Section 4.2.

Standard: Verifies all Train "A" components in required condition.

Comment:

OP-TM-211-901, Step 4.1.4

Performance Step: 7 If 1E 4160V bus is not energized, then GO TO Section 4.3.

Standard: Verifies 1E 4160V bus energized and continues to next step.

Comment:

OP-TM-211-901, Step 4.1.5

Performance Step: 8 If ESAS Train B "Load Seq Block 4" lights (PCR) are not BLUE, then PRESS "Manual ES Actuation" "1600 PSIG RC PRESS" (Train B CC).

Standard: Verifies all ESAS Train B "Load Seq Block 4" BLUE.

Comment:

Procedure Note: **PCR graphic display is equivalent to Attachment 7.2.**

OP-TM-211-901, Step 4.1.6

Performance Step: 9 If any of the components on Attachment 7.2 are not in the required condition, then INITIATE Section 4.2.

Standard:

- Determines DH-P-1B NOT in required condition.
- Proceeds to Section 4.2
- Determines Step 4.2.7 applies [IAAT DH-P-1A or DH-P-1B fails to start or is shut down unexpectedly (e.g. cavitation), then perform the following].

Comment:

OP-TM-211-901, Step 4.2.7.1

Performance Step: 10 If DH-P-1A failed to start - - -

Standard: Verifies DH-P-1A running.

Comment:

OP-TM-211-901, Step 4.2.7.2

Performance Step: 11 If DH-P-1B failed to start, then perform the following:

A. VERIFY DC-P-1B is operating.

B. START DH-P-1B

Standard:

- VERIFIES DC-P-1B is operating.
- Attempts to START DH-P-1B and notes failure.

Evaluator Note: **If one re-start attempt has already been made, the applicant may elect to NOT attempt to start DH-P-1B.**

Comment:

OP-TM-211-901, Step 4.2.7.3

Performance Step: 12 If DH-P-1A or DH-P-1B is not operating, then perform the following:

A. If DH-V-38A or B are inaccessible, then perform the following:

Standard:
- Acknowledges that DH-V-38A and B are accessible.
- Proceeds to Step 4.2.7.3.B.

Evaluator Cue: **DH-V-38A and DH-V-38B are both accessible, at this time.**

Comment:

Evaluator Note: **This step is not in the procedure. However, it must be completed in order to re-position DH-V-4B in the subsequent steps. The applicant may also BYPASS/DEFEAT ESAS Train A (JPM Performance Step 16) at this time since DH-V-4A will also be operated.**

√ **Performance Step: 13** BYPASS/DEFEAT ESAS Train B.

Standard: Defeats the ESAS signal for the B Train 1600 psig, 500 psig and 4 psig signals.
- Verifies the BYPASS/DEFEAT lights for all three channels of the 1600 psig and the 500 psig actuations are LIT.
- Verifies the BYPASS/DEFEAT lights for two of the three channels of the 4 psig actuation are LIT.

Comment:

OP-TM-211-901, Step 4.2.7.3.B(1)

√ **Performance Step: 14** If DH-V-38A and B are accessible, then perform the following:
- CLOSE DH-V-4 on the train with the inoperable DH pump

Standard: Closes DH-V-4B.

Comment:

OP-TM-211-901, Step 4.2.7.3.B(2)

√ **Performance Step: 15** OPEN DH-V-38A and DH-V-38B (Aux. Bldg. 281' El).

Standard:
- Dispatches an AO to open DH-V-38A and DH-V-38B.
- Acknowledges that DH-V-38A and DH-V-38B are OPEN.

Booth Operator Cue: **Acknowledge the order, activate the trigger for DH-V-38A and 38B operation and state: For the purpose of this JPM, time compression techniques are being applied to opening DH-38A and DH-38B. DH-V-38A and DH-V-38B are OPEN.**

Comment:

Evaluator Note: **This step may have been performed when the actions were performed for Train "B".**

This step is not in the procedure. However, it must be completed in order to re-position DH-V-4A in the subsequent steps.

√ **Performance Step: 16** BYPASS/DEFEAT ESAS Train A.

Standard: Defeats the ESAS signal for the A Train 1600 psig, 500 psig and 4 psig signals.
- Verifies the BYPASS/DEFEAT lights for all three channels of the 1600 psig and the 500 psig actuations are LIT.
- Verifies the BYPASS/DEFEAT lights for two of the three channels of the 4 psig actuation are LIT.

Comment:

OP-TM-211-901, Step 4.2.7.3.B(3)

√ **Performance Step: 17** THROTTLE DH-V-4A and DH-V-4B to balance LPI flow between the two trains while maximizing total LPI flow within current limits.

Standard: Adjusts DH-V-4A and DH-V-4B OPEN – STOP – CLOSED pushbuttons to establish stable flow rates meeting both of the following:

- Total LPI flow ≥ 2500 gpm but ≤ 3300 gpm.
- Minimum of 1250 gpm flow per loop.

Comment:

Terminating Cue: **When DH flow is adjusted and stable: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC Simulator JPM B

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- A large Break LOCA has occurred.
- The crew has entered OP-TM-EOP-006, LOCA COOLDOWN as directed by OP-TM-EOP-002, LOSS OF 25 °F SUBCOOLED MARGIN.
- EOP-006, Step 3.1 "ENSURE HPI and LPI are operated IAW Rule 2" has been completed.

INITIATING CUE: Beginning at Step 3.2, perform EOP-006.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility:	Three Mile Island Unit 1	Task No.:	22301014
Task Title:	Respond to a failed narrow range PZR pressure instrument.	JPM No.:	2007 NRC Simulator JPM C
K/A Reference:	APE027 AA2.01 (4.0/3.9)	**Bank JPM TQ-TM-104-220-J001**	

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- The unit is at 100% power.
- All controls are in the normal, full power alignment.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: None

General References:
- OP-TM-MAP-G0106, PZR SAFETY OR PORV OPEN (DP), Revision 1
- OP-TM-MAP-G0107, PORV OPEN (ACOUSTIC), Revision 1
- OP-TM-MAP-G0308, RC PRESS NARROW RNG HI/LO, Revision 1

Handout: Use simulator copy of alarm response procedures.

Initiating Cue: You are the Unit Reactor Operator

Maintain current conditions.

Time Critical Task: No

Validation Time: 10 Minutes

SIMULATOR SETUP

- 100% power IC 16
- Malfunction IC48 immediately
- Insert MALF 15-30 seconds after applicant assumes the watch.
- Malfunction NI27A on Event #1 with a ramp time of 8 seconds to fail the RCS narrow range pressure instrument, RC3A-PT1 to 100%.

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Responds to multiple alarms:

- G0106, PZR SAFETY OR PORV OPEN (DP),
- G0107, PORV OPEN (ACOUSTIC)
- G0308, RC PRESS NARROW RNG HI/LO

Standard: Determines RCS Pressure instrument failed and/or enters alarm response procedures.

Evaluator Note:

- **The actions in G0106 and G0107 are identical. G0308 also provides overlapping actions.**
- **It is a management expectation that operators take compensatory action for failed equipment. It is acceptable for the applicant to terminate the transient before entering a procedure. The JPM is written as if G0106/07 is performed then G0308 is performed.**

Comment:

OP-TM-MAP-G0106/0107, Step 4.1

Performance Step: 2 **OBSERVE** ΔP indication on DPI 921, 922, or 923 (CC) to determine which valve is OPEN. Alarm G0107, PORV OPEN (ACOUSTIC) and tailpipe differential temperatures may also be used.

- RC-V-1A tailpipe delta temp (A0518)
- RC-V-1B tailpipe delta temp (A0519)
- RC-RV-2 tailpipe delta temp (A0517)

Standard: Determines RC-RV-2 is open.

Comment:

OP-TM-MAP-G0106/0107, Step 4.2

√ **Performance Step: 3** If PORV is OPEN without a valid demand, then:

- CLOSE RC-V-2
- If RCS temperature < 329 °F, then ENSURE compliance with Tech Spec 3.1.12

Standard:

- Determines RC-RV-2 is open without valid demand.
- CLOSES RC-V-2 (√).
- Determines RCS temperature > 329 °F; TS 3.1.12 does not apply.

Evaluator Note: **The applicant will likely move to terminate PZR Spray before completing OP-TM-MAP-G0106/0107.**

Comment:

OP-TM-MAP-G0106/0107, Step 4.3

Performance Step: 4 If Code Safety (RC-RV-1A or RC-RV-1B) is OPEN without a valid demand, then ENSURE reactor is shutdown.

Standard: Determines no code safeties are open.

Comment:

OP-TM-MAP-G0106/0107, Step 4.4

Performance Step: 5 ENSURE RCDT temperature and level are being controlled.

Standard: Verifies RCDT parameters are stable.

Comment:

OP-TM-MAP-G0106/0107, Step 4.5

Performance Step: 6 When PORV or code safety valve is closed, then MONITOR tailpipe delta temperature (A0517, A0518 and A0519) until DT reduces to less than 30 °F.

Standard: Monitors PZR PORV/SV tailpipe temperatures to verify closure/isolation.

Comment:

OP-TM-MAP-G0308, Step 4.1

Performance Step: 7 If RCS pressure is HI, then PERFORM the following:

Standard:
- Determines instrument is failed HI and actual pressure is LO for conditions.
- Proceeds to Step 4.2.

Comment:

OP-TM-MAP-G0308, Step 4.2/4.2.1

Performance Step: 8 If RCS pressure is LO, then PERFORM the following:
- If RC-RV-2 PORV is Open and RCS pressure <2400 psig, then CLOSE RC-V-2.

Standard: Ensures RC-V-2 is CLOSED.

Comment:

OP-TM-MAP-G0308, Step 4.2.2

√ **Performance Step: 9** ENSURE CLOSED RC-V-1 PZR Spray Control Valve.

Standard: Places RC-V-1 in MANUAL and closes (GREEN light) or closes isolation valve RC-V-3 (GREEN light).

Comment:

OP-TM-MAP-G0308, Step 4.2.3

Performance Step: 10 If failure of RC-V-1 is suspected, then CLOSE RC-V-3, Pressurizer Spray Line Isol Valve, as required.

Standard: RC-V-1 and/or RC-V-3 closed.

Comment:

OP-TM-MAP-G0308, Step 4.2.4

Performance Step: 11 IAAT (If At Any Time) Spray Line ΔT approaches 250 °F, then CYCLE RC-V-3.

Standard: Verifies spray line/PZR $\Delta T < 250$ °F.

Comment:

OP-TM-MAP-G0308, Step 4.2.5

√ **Performance Step: 12** If pressurizer level is > 80 inches, then ENSURE pressurizer heaters are energized.

Standard:

- Verifies PZR level > 80 inches.
- Performs at least one of the following;
  - Places ICS Heater Demand Station to hand and Raises Demand
  - Places Backup Heater Groups 4 and/or 5 to ON

Comment:

Terminating Cue: **After PZR heaters are energized: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC Simulator JPM C

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The unit is at 100% power.
- All controls are in the normal, full power alignment.

INITIATING CUE:

You are the Unit Reactor Operator

Maintain current conditions.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Three Mile Island Unit 1 Task No.:

Task Title: Respond to an RCP #1 seal problem JPM No.: 2007 NRC Simulator JPM D

K/A Reference: 003 A2.01 (3.5/3.9) **New JPM - Alternate Path**

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- You Are The Unit Reactor Operator
- The unit is at 100% power.
- All controls are in their normal, full power alignment.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: None

General References:
- OP-TM-MAP-F0103 (RCP SEAL #1 LEAK-OFF FLOW HI / LO), Revision 1
- OP-TM-AOP-040, RCP #1 SEAL FAILURE, Revision 0
- OP-TM-MAP-F0106, RC PUMP LAB SEAL D/P LO Revision 2

Handout: Have OP-TM-211-476, SEAL INJECTION CONTROL MU-V-32 CONSOLE OPERATIONS available if requested.

Initiating Cue: Maintain current conditions.

Time Critical Task: No

Validation Time: 10 Minutes

SIMULATOR SETUP

- 100% power IC.
- Create the following Events;
- EVENT 1 IMF MU19D 6
- EVENT 2 MMF MU19D 10
- EVENT 3 MMF MU19D 16

(Denote Critical Steps with a check mark)

START TIME: _____

Booth Operator	When directed enter event 1.
Performance Step: 1	Respond to alarms/indication.
Standard:	• Enters OP-TM-MAP-F0103 (RCP SEAL #1 LEAK-OFF FLOW HI / LO) • Identifies RCP "D" as affected pump.
Comment:	
	OP-TM-MAP-F0103, Step 4.0/4.1
Performance Step: 2	MANUAL ACTIONS REQUIRED: • If Seal Number 1 Leak-Off Flow (SLO) is ≥5 gpm, then PERFORM the following: • IAAT Seal Number 1 Leak-Off Flow (SLO) is > 6 gpm, then GO TO OP-TM-AOP-040, RC Pump Seal Failures.
Standard:	Determines seal leakoff < 6 gpm and continues in OP-TM-MAP-F0103.
Comment:	
	OP-TM-MAP-F0103, Step 4.1
Performance Step: 3	TREND the following parameters: • Seal Number 1 Leak-Off Flow (SLO) (MU-43-FR)(PC) • RCP Seal and Bearing Water Temperatures • Lab seal ΔP, RC-18-DPI-1/2/4 (CC)
Standard:	***May use RCP Group on Plant Process Computer. May trend temperatures on computer and use Console for Lab Seal, and Panel Center for Leak off Flow.***
Evaluator Prompt	If STA is requested to trend data, "STA is unavailable use your console and computer indications.

Comment:

OP-TM-MAP-F0103, Step 4.1

Performance Step: 4	RAISE Seal injection flow, as necessary to attempt to maintain lab seal DP positive on each RC pump. Adjust SI Flow H/A station setpoint or place MU-V-32 in manual. If lab seal DP indication is not available, then MAXIMIZE seal injection flow. Do not exceed 60 GPM.
Standard:	***Places MU-V-32 in hand and raises as required to maintain positive lab seal DP on Console center indication.***
Booth Operator:	**After lab seal DP is confirmed as positive: Insert Event 2**

Comment:

OP-TM-MAP-F0103, IAAT

Performance Step: 5	Determines seal leakoff is rising/greater than 6 gpm.
Standard:	Transitions to AOP-040.
Comment:	
Booth Operator:	**After AOP-040 has been entered: Insert Event 3**

AOP-040, Step 3.1

Performance Step: 6 IAAT any of the following exists:

- RC Pump #1 seal leakoff flow > 8 gpm
- Seal water temperature at radial bearing (A0521 through A0524) > 225 °F.
- #1 seal inlet temperature (A0525 thru A0528) > 235 °F.

THEN perform the following:

VERIFY Reactor power will not challenge RPS limit when RCP is shutdown.

Standard:

- Confirms RCP "D" seal leakoff > 8gpm or returns to the step when it does.
- Determines Reactor power will challenge RPS limit when RCP is shutdown.
- Proceeds to RNO column.

Comment:

AOP-040, Step 3.1 RNO

√ **Performance Step: 7** TRIP the Rx.

Standard: Initiates a MANUAL Rx trip.

Comment:

AOP-040, Step 3.1 RNO

Performance Step: 8 PERFORM IMAs of EOP-001.

Standard:

- PRESSES both Reactor Trip and DSS pushbuttons.
- VERIFIES REACTOR SHUTDOWN.
- PRESSES Turbine Trip PB.
- VERIFIES the turbine stop valves are closed.

Comment: **Candidate may use Global Silence IAW OS-24.**

Evaluator Cue: **If a Symptom check is requested or commenced inform candidate, "The ARO will perform the symptom check."**

AOP-040, Step 3.1 RNO

√ **Performance Step: 9** TRIP affected RCP.

Standard: Stops RCP "D"

Comment:

AOP-040, Step 3.1 RNO

Performance Step: 10 GO TO Step 3.5.

Standard: Proceeds to Step 3.5.

Comment:

Procedure Note: **There is no direct means of determining when a RCP stops rotating. The best indication is RCP vibration.**

AOP-040, Step 3.5

√ **Performance Step: 11** When affected RCP stops rotating, then promptly CLOSE the following for affected RCP:

Standard:

- Verifies RCP "D" vibration at ZERO or low and stable.
- Closes MU-V-33D.

Comment:

Terminating Cue: **After MU-V-33D is closed: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC Simulator JPM D

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- You Are The Unit Reactor Operator
- The unit is at 100% power.
- All controls are in their normal, full power alignment.

INITIATING CUE: Maintain current conditions.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility:	Three Mile Island Unit 1	Task No.:	0908040501
Task Title:	Cross-connect to supply the Nuclear River Water System from the Secondary River Water System	JPM No.:	2007 NRC Simulator JPM E
K/A Reference:	076 A2.01 (3.5/3.7)	**Bank JPM 11.2.05.150 Modified Alternate path.**	

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- The Reactor is in a Hot Shutdown condition.
- NR-P-1A tripped during the last shift - Maintenance is investigating.
- NR-P-1B is out of service for NR-S-1B repair.
- NR loads have been reduced:
  - NR-V-4A and NR-V-4B are closed
  - Two NSCCW Heat Exchangers are in service (NS-C-1B/1C).
- Followup actions of 1202-38 are in progress.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: None

General References: 1202-38, NUCLEAR SERVICES RIVER WATER FAILURE, Revision 40

Handout: Provide copy of 1202-38 with section 3.0 step 1. & 2. signed off..

Initiating Cue: Maintain current plant conditions.

Time Critical Task: No

Validation Time: 10 minutes

SIMULATOR SETUP

INITIALIZATION:

The below actions are snapped into IC 207.

_____ Initialize to IC06. Ensure that NR-P-1A/1C and SR-P-1A/1B are in service.

_____ Close NR-V-4A/4B and NR-V-16A to reduce the number of in-service NR coolers. (1B/1C)

_____ Place the extension controls for NR-P-1B on the 1R and 1T 480v busses in pull-to-lock and tag with Information Tags.

_____ Ensure that PPC is online, the alarms are needed for this Scenario.

EVENT TRIGGERS:

_____ Assign Remote RWR21 to Event #2 for use in closing NR-V-6 breaker.

MALFUNCTIONS:

_____ Activate Malfunction RW02A to trip NR-P-1A, Close NR-V-1A, Place NR-P-1A in PTL

_____ Assign Malfunction RW02C to Event #1 to trip NR-P-1C.

REMOTE FUNCTION:

_____ Set Remote Function RWR10 to OUT to rack out the breaker for NR-P-1B.

OVERRIDES: 02A6S54-ZDINRV6(1) set to OFF immediately.

MONITOR: N/A

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1	Assume the watch/monitor the control board.
Standard:	Responds to B-1-5, 480V ES MOTOR TRIP, and/or other indications of NR-P-1C trip.
Booth Operator Cue:	**When applicant assumes the watch, wait 15-30 seconds, then activate Malfunction RW02C on Event #1 to trip NR-P-1C.**
Evaluator Note:	**One re-start attempt is allowable. The applicant may go directly to 1202-38 since no other NR Pump is available.**
Comment:	
	1202-38, Step 2.0.B
Performance Step: 2	Perform immediate manual actions. • IF a NR Pump trips, THEN verify or start a standby NR Pump.
Standard:	Determines no other NR Pump is available.
Comment:	**Candidate may proceed directly to step 6, based on prior performance of the next to steps.**

Procedure Objective:	**Re-establish adequate river water flow for NSCCW and ICCW and protect equipment from damage due to inadequate cooling.**
	1202-38, Step 3.1
Performance Step: 3	IF non-ES selected NR pump cannot be started, THEN verify reset or reset 27/86 lockout relays for 1R & 1T buses on PCR [or locally on 1R & 1T buses] AND attempt to start second NR Pump.
Standard:	Determines no other NR Pump is available.
Evaluator Note:	**Applicant may perform this step and attempt to start NR-P-1C but should NOT repeatedly attempt to start NR-P-1C.**
Comment:	
	1202-38, Step 3.2
Performance Step: 4	IF only one NR pump is operating, THEN reduce to two NS coolers by closing NR-V-16A/B/C/D as required AND verify that NR-V-4A & B are CLOSED.
Standard:	Determines from INITIAL CONDITIONS and/or verifies only two NS coolers in service and NR-V-4A and 4B CLOSED.
Comment:	
	1202-38, Step 3.3
Performance Step: 5	IF all NR and SR pumps are inoperable, then GO TO OP-TM-AOP-005.
Standard:	• Determines SR Pumps are operable. • Continues in 1202-38.
Comment:	

1202-38, Step 3.4

Performance Step: 6 Ensure NR-V-1A(B)(C) is closed for any non-running NR pumps.

Standard:
- Verifies NR-V-1A and 1B closed.
- Closes NR-V-1C.

Comment:

1202-38, Step 3.5.a

√ **Performance Step: 7** IF NR supply pressure is inadequate (NR-PI-217 < 21 psig) and no additional NR pumps can be started, THEN cross-connect the SR system to the NR system as follows:

Start the third SR pump, if available.

Standard:
- Verifies NR Pressure < 21 psig.
- Starts SR-P-1C (RED light illuminated). **(√)**

Comment:

1202-38, Step 3.5.b, c

√ **Performance Step: 8** OPEN NR-V-6 (SR to NR Cross-tie Valve in HX Vault).

IF NR-V-6 cannot be opened, THEN OPEN NR-V-2 and NR-V-7 (NR to SR redundant Cross-tie valve in IPSH).

Standard: Orders NR-V-6 breaker closed, and attempts to OPEN NR-V-6 **Valve will not open forcing alternate path.**

OR

OPENS NR-V-2 (RED light illuminated). **(√)**

OPENS NR-V-6 (RED light illuminated). **(√)**

Comment: **Examinee may immediately interpret the Appendix "R" valve as not available and go to the alternate path.**

Booth Operator: **If requested to close NR-V-6 breaker [1B ESV MCC Unit 10D] insert event 2 and report breaker closed. If ordered to open the valve locally, "Valve will not open."**

1202-38, Step 3.5.d

Performance Step: 9 Throttle SR-V-2 until SR-PI-134 (console left) ≥21 psig.

Standard: Adjusts SR-V-2 as necessary to raise pressure on SR-PI-134 to ≥21 psig.

Comment:

1202-38, Step 3.5.e

Performance Step: 10 Reduce plant power if needed to maintain SCCW temperatures.

Standard: Determines plant is in HSD.

Comment:

Terminating Cue: **When NR-V-2 & NR-V-7 are OPEN SR-PI-134 pressure is under control at ≥21 psig and the plant operating condition is determined: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC Simulator JPM E

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The Reactor is in a Hot Shutdown condition.
- NR-P-1A tripped during the last shift - Maintenance is investigating.
- NR-P-1B is out of service for NR-S-1B repair.
- NR loads have been reduced:
  - NR-V-4A and NR-V-4B are closed.
  - Two NSCCW Heat Exchangers are in service (NS-C-1B/1C).
- Followup actions of 1202-38 are in progress.

INITIATING CUE: Maintain current plant conditions.

PERFORMANCE INFORMATION

Facility:	Three Mile Island Unit 1	Task No.:	53401003
Task Title:	Return RB Emergency Cooling to standby following an auto actuation.	JPM No.:	2007 NRC Simulator JPM F
K/A Reference:	022 A4.01 (3.6/3.6)	**Randomly selected repeat from 2003 NRC Exam (B.1.f)**	

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- Reactor power is 100%, with ICS in full automatic.
- A small Main Steam System leak began inside the RB approximately one hour ago.
- RB Emergency Cooling was manually initiated in accordance with OP-TM-534-901, RB EMERGENCY COOLING OPERATIONS, to limit RB pressure and temperature.
- The steam leak has been isolated and RB parameters have returned to normal.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: None

General References: OP-TM-534-901, RB EMERGENCY COOLING OPERATIONS, Revision 5

Handout: OP-TM-534-901

Initiating Cue: Return RB Emergency Cooling to normal in accordance with OP-TM-534-901, Section 5.0.

Time Critical Task: No

Validation Time: 15 Minutes

SIMULATOR SETUP

INITIALIZATION:

1. Select IC-16 - 100% hot full power (MOC) (Temporary snap built in IC 208)
2. Perform of OP-TM-534-901, RB Emergency Cooling Operations, Section 4.1 to manually start and operate the RB Emergency Cooling System. Operate RR-P-1A and RR-P-1B pumps and all three AH-E-1-A/B/C fans in slow speed.

EVENT TRIGGERS: N/A

MALFUNCTIONS: N/A

REMOTE FUNCTIONS: CCR32 – NS-V-85 Closed

OVERRIDES: N/A

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Obtain procedure.

Standard: Reviews Sections 1.0 – 3.0.

Evaluator Cue: **Provide handout.**

Comment:

OP-TM-534-901, 5.1.1/5.1.2

Performance Step: 2
- VERIFY RB pressure < 1.0 psig.
- VERIFY RB temperatures < 130 °F.

Standard:
- Verifies RB Pressure < 1.0 psig as indicated on RX BLDG PRESSURE PI-1186 and/or Plant Computer
- Verifies RB temperatures < 130 °F on REACTOR BUILDING AMBIENT TEMPERATURE RECORDER TR-655 and/or Plant Computer.

Comment:

OP-TM-534-901, 5.1.3

Performance Step: 3 VERIFY RB normal cooling system operation as follows:

- AH-P-2A or AH-P-2B operating
- RB-V-2A and RB-V-7 open
- Two or more AH-E-1's operating
- Industrial cooler spray pumps and fans are operating

Standard: Verifies:

- AH-P-2A or AH-P-2B operating on H&V panel
- RB-V-2A and RB-V-7 open May use Amber lights on PCR or Red Lights on PCR and PL
- Two or more AH-E-1's operating on Console Right
- Industrial cooler spray pumps and fans are operating on H&V panel

Comment:

OP-TM-534-901, 5.1.4

Performance Step: 4 If E-Plan was activated, then OBTAIN ED concurrence.

Standard: Determines ED concurrence not required.

Evaluator Cue: **Emergency Plan activation was not required for this event.**

Comment:

OP-TM-534-901, 5.1.5/5.1.6

√ **Performance Step: 5**

- SHUTDOWN RR-P-1A and PLACE control in Normal-After-Stop.
- CLOSE RR-V-1A

Standard:

- Stops RR-P-1A (GREEN light) and places control in Normal-After-Stop (GREEN flag).
- Closes RR-V-1A (GREEN light)

Comment:

OP-TM-534-901, 5.1.7/5.1.8

√ **Performance Step: 6**

- SHUTDOWN RR-P-1B and PLACE control in Normal-After-Stop.
- CLOSE RR-V-1B

Standard:

- Stops RR-P-1B (GREEN light) and places control in Normal-After-Stop (GREEN flag).
- Closes RR-V-1B (GREEN light)

Comment:

OP-TM-534-901, 5.1.9

√ **Performance Step: 7**

ENSURE CLOSED the following valves:

- RR-V-4A
- RR-V-4B
- RR-V-4C
- RR-V-4D
- RR-V-3A
- RR-V-3B
- RR-V-3C

Standard:

Note these are not order specific.

Closes (GREEN light):

- RR-V-4A ___
- RR-V-4B ___
- RR-V-4C ___
- RR-V-4D ___
- RR-V-3A ___
- RR-V-3B ___
- RR-V-3C ___

Comment:

OP-TM-534-901, 5.1.10, 5.1.11, 5.1.12

√ **Performance Step: 8** Stop by pressing down & turn CCW, then start by turning CW.

- START AH-E-1A in FAST SPEED.
- START AH-E-1B in FAST SPEED.
- START AH-E-1C in FAST SPEED.

Standard:

- STOPS AH-E-1A in SLOW SPEED (GREEN light) and STARTS AH-E-1A in FAST SPEED (Right side RED Light).
- STOPS AH-E-1B in SLOW SPEED (GREEN light) and STARTS AH-E-1B in FAST SPEED (Right side RED Light).
- STOPS AH-E-1C in SLOW SPEED (GREEN light) and STARTS AH-E-1C in FAST SPEED (Right side RED Light).

Comment:

Procedure Note: **System will remain filled with river water and NS isolated, until system is flushed and placed in layup per OP 1104-38.**

OP-TM-534-901, 5.1.13

Performance Step: 9 HANG EST tags on the following valves:

- NS-V-85
- RR-V-3A
- RR-V-3B
- RR-V-3C

Standard: Acknowledges requirement.

Evaluator Cue: **Another operator has been assigned to apply those tags.**

Comment:

OP-TM-534-901, 5.1.14

Performance Step: 10 NOTIFY Chemistry Manager to notify PADER.

Standard: Contacts Chemistry.

Booth Operator Cue: **Acknowledge the report and confirm the requirement.**

Comment:

Terminating Cue: **After the Chemistry Manger has been notified: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC Simulator JPM F

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- Reactor power is 100%, with ICS in full automatic.
- A small Main Steam System leak began inside the RB approximately one hour ago.
- RB Emergency Cooling was manually initiated in accordance with OP-TM-534-901, RB EMERGENCY COOLING OPERATIONS, to limit RB pressure and temperature.
- The steam leak has been isolated and RB parameters have returned to normal.

INITIATING CUE: Return RB Emergency Cooling to normal in accordance with OP-TM-534-901, Section 5.0.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Three Mile Island Unit 1 Task No.: 0648000101

Task Title: Operate the Station Blackout Diesel Generator JPM No.: 2007 NRC Simulator JPM G

K/A Reference: APE 056 AA2.37 3.7 / 3.8

- **Facility Bank JPM 131, Modified**
- **Alternate Path**

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- The plant was experiencing problems with the grid.
- The Turbine tripped due to actuation of the power load unbalance relay.
- The Turbine Trip resulted in a Reactor Trip.
- OP-TM-EOP-001 has been completed.
- A loss of offsite power occurred when the generator isolated.
- EG-Y-1A is under clearance with the turbocharger removed.
- EG-Y-1B has energized 1E 4160V Bus
- OP-TM-AOP-020, Loss of Station Power is in progress. EOP-10, GUIDE 15 actions have been completed.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: None

General References:
- EOP-10, GUIDE 15 Revision 7
- AOP-020, LOSS OF STATION POWER, Revision 10
- OP-TM-861-901and 902 EG-Y-1A/1B EMERGENCY OPERATIONS, Revision 8
- OP-TM-864-901, SBO DIESEL GENERATOR (EG-Y-4) OPERATIONS, Revision 7

Handout:
- AOP-020
- OP-TM-864-901
- OP-TM-861-902

Initiating Cue: You are the board operator. Perform AOP-020, beginning at Step 3.2.

Time Critical Task: No

Validation Time: 7 minutes

SIMULATOR SETUP

- 100% power IC 16 (Temporary IC buit in IC 209)
- Clear and tag EG-Y-1A
  - Place G1-02 in 'PTL' and INFO TAG
  - Place Starting Switch in Manual (EXERCISE) and INFO TAG
  - REMOTE EGR01 to OUT
- Place SBO Frequency low by;
  - Starting SBO
  - Lower frequency to <59 Hz
  - Ensure Voltage above 4100, readjust frequency as required.
  - Stop SBO
  - IO Override Governor HIGH light on 03A8DS05-ZLODGSBOSPD14 WHT ON.
- MALF to trip the Main Turbine TC01
- Loss of off-site power coincident with the generator trip ED01
- Perform EOP-001 through Step 3.8 (transition to AOP-020)
- Perform GUIDE 15 IAW AOP-020, Step 3.1
- FREEZE and SNAP

(Denote Critical Steps with a check mark)

START TIME: _____

	AOP-020, Step 3.2
Performance Step: 1	INITIATE both OP-TM-861-901, "EG-Y-1A Emergency Operations" and OP-TM-861-902, "EG-Y-1B Emergency Operations".
Standard:	May verify proper operation of EG-Y-1B IAW Section 4.2
Evaluator Cue:	**Provide copy of AOP-020.**
Evaluator Note:	• **No actions will result from implementing OP-TM-861-902.** • **OP-TM-861-901 is not required since it is under clearance.**
Comment:	

	AOP-020, Step 3.3
Performance Step: 2	VERIFY 1D 4160V and 1E 4160V bus are energized.
Standard:	• Answers No – Only 1E is energized. • Refers to RNO Column.
Comment:	

AOP-020, Step 3.3 RNO

Performance Step: 3

- If neither ES 4160V bus is energized, then GO TO Section 4.0 STATION BLACKOUT.
- If only one ES 4160V bus is energized, then INITIATE OP-TM-864-901, "SBO Diesel Generator (EG-Y-4) Operations" to energize the affected ES 4160V bus.

Standard: Transitions to OP-TM-864-901.

Evaluator Cue: **Provide a copy of OP-TM-864-901.**

Comment:

OP-TM-864-901

Performance Step: 4 Obtain procedure.

Standard:

- Reviews Sections 1.0, 2.0, 3.0
- Determines Section 4.1, MANUALLY START & LOAD EG-Y-4 onto 1D 4160V bus, applies.

Evaluator Cue:

- **Provide copy of OP-TM-864-901.**
- **Inform applicant: EG-Y-4 was in standby per 1107-9 when the event began.**

Comment:

Procedure Note: **Perform only one of Sections 4.1, 4.2 or 4.3 (mark the other two sections NA).**

OP-TM-864-901, 4.1.1

Performance Step: 5 VERIFY 1D 4160V bus is de-energized.

Standard: Verifies 1D voltage at ZERO.

Comment:

OP-TM-864-901, 4.1.2

Performance Step: 6 ENSURE 1SA-D2 and 1SB-D2 are OPEN.

Standard: Verifies 1SA-D2 and 1SB-D2 OPEN (GREEN light).

Comment:

OP-TM-864-901, 4.1.3

Performance Step: 7 ENSURE one of the following is TRUE.
A. FS-P-1, FS-P-2 or FS-P-3 is operating.
B. FS-P-2 is operable except that power is not available.

Standard: Verifies Fire Header Pressure.
Verifies FS-P-1 Red Running light LIT.

Evaluator Cue: **All Fire Pumps were operable at the time of the event.**

Comment:

OP-TM-864-901, 4.1.4

Performance Step: 8 ENSURE the following control switches are in PTL:
A. BS-P-1A
B. The ES selected MU pump: MU-P-1A
C. DH-P-1A
D. RR-P-1A
E. EF-P-2A

Standard: Places each of the following pistol grips in PTL:
A. BS-P-1A
B. The ES selected MU pump: MU-P-1A
C. DH-P-1A
D. RR-P-1A
E. EF-P-2A

Comment:

OP-TM-864-901, 4.1.5

√ **Performance Step: 9** PRESS and HOLD for approx. 8 seconds SBO DIESEL GENERATOR START PB.

Standard: PRESSES and HOLDS SBO DIESEL GENERATOR START PB for approx. 8 seconds and/or until the running light is illuminated.

Booth Operator Cue: **An AO may be dispatched to check the SBO Diesel. Acknowledge, as necessary.**

Comment:

OP-TM-864-901, 4.1.6

Performance Step: 10 If generator voltage is not between 4.1 and 4.3 kV, then ADJUST Unit Voltage Rheostat (SBO: Inside Rear of Exciter Control Cabinet: Key #21).

Standard: Verifies voltage between 4.1 and 4.3 kV.

Comment:

OP-TM-864-901, 4.1.7

√ **Performance Step: 11** If generator frequency is NOT between 59 and 61 Hz, then adjust governor.

Standard: Recognizes Generator Frequency outside band and adjusts governor to obtain 59 – 61 Hz.

Comment:

OP-TM-864-901, 4.1.8

Performance Step: 12 ENSURE G1-02 is in P-T-L.

Standard: ENSURES G1-02 in P-T-L.

Comment:

OP-TM-864-901, 4.1.9

Performance Step: 13 PLACE T1-C2 in P-T-L.

Standard: Places pistol grip for T1-C2 in P-T-L.

Comment:

OP-TM-864-901, 4.1.10

√ **Performance Step: 14** CLOSE G2-12 (EG-Y-4 output breaker).

Standard: CLOSES G2-12 (RED light).

Comment:

OP-TM-864-901, 4.1.11

√ **Performance Step: 15** CLOSE T1-D2 (1F 4160V bus cross tie to 1D 4160V).

Standard: CLOSES T1-D2 (RED light).

Comment:

OP-TM-864-901, 4.1.12

Performance Step: 16 GO TO Section 4.4.

Standard: Proceeds to Section 4.4, WHILE EG-Y-4 is loaded (UNIT Ops) on a 4160V bus

Comment:

Terminating Cue: **Terminate when the 1D bus is energized at 59-61 hz.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC Simulator JPM G

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The plant was experiencing problems with the grid.
- The Turbine tripped due to actuation of the power load unbalance relay.
- The Turbine Trip resulted in a Reactor Trip.
- OP-TM-EOP-001 has been completed.
- A loss of offsite power occurred when the generator isolated.
- EG-Y-1A is under clearance with the turbocharger removed.
- EG-Y-1B has energized 1E 4160V Bus
- OP-TM-AOP-020, Loss of Station Power is in progress. EOP-10, GUIDE 15 actions have been completed.

INITIATING CUE: You are the board operator. Perform AOP-020, beginning at Step 3.2.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility:	Three Mile Island Unit 1	Task No.:	82601005
Task Title:	Respond to a Radiation Monitor alarm (RM-A1, Control Room Monitor)	JPM No.:	2007 NRC Simulator JPM H
K/A Reference:	073 A4.02 (3.7/3.7)	• **Bank JPM TQ-TM-104-826-J001, Modified** • **Alternate Path**	

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- The unit is at 100% power.
- All controls are in normal alignment.

Task Standard: ***Control Tower is in forced recirculation***

Required Materials: None

General References:
- MAP C, C-1-1 (RADIATION LEVEL HI), Revision 38
- EP 1202-12, EXCESSIVE RADIATION LEVELS, Revision 51
- OP-TM-826-901, CONTROL BUILDING VENTILATION SYSTEM RADIOLOGICAL RESPONSE OPERATIONS, Revision 1

Handout: OP-TM-826-901
Use simulator copy of 1202-12 and MAP C-1-1

Initiating Cue: Maintain current plant conditions.

Time Critical Task: No

Validation Time: 9 Minutes

SIMULATOR SETUP

- 100% power IC 16

- Malfunction RM01G assign to event 1 to fail RM-A-1 Gas interlock.
- Assign RMA1.bat to Event 1 (COMMAND bat RMA1.bat)
- Build RMA1.bat as follows in BAT folder;
  - set RMPASSWORD=168
  - set RM:NEWFILE=TRUE
  - set RMRAMPIN=1
  - set RMARMA1Gnew = 3000
  - set rmarma1pnew = 4020

- Insert MALF(s) 15-30 seconds after the applicant assumes the watch

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Respond to alarm C-1-1, RADIATION LEVEL HI

Standard:
- Verifies RM-A-1 alarm on RMS panel.
- Enters MAP C-1-1 for RM-A-1

Evaluator Note: **At this point the applicant would be justified in taking MANUAL action to place equipment in the position associated with the interlock:**
- **The following fans trip: AH-E-21, AH-E-93 A(B), AH-E-94 A(B), AH-E 17 A or B, AH-E-95 A or B, AH-E-20 A or B, AH-E-26.**
- **The following dampers close: AH-D-28 and AHD-617.**

The JPM is written as if these actions will be completed in OP-TM-826-901.

RM-A-1 indications will build in over 1 minute.

Comment:

MAP C-1-1, MANUAL ACTION

Performance Step: 2 Announce alarm over GAI-Tronics Paging System

Standard: Makes announcement regarding alarm and may repeat it.

Comment:

MAP C-1-1, MANUAL ACTION

Performance Step: 3 Refer to EP 1202-12, Excessive Radiation Levels

Standard:
- Continues in MAP C, C-1-1.
- May refer to 1202-12 for associated actions.

Evaluator Note: **"Refer" does not mean transition. It identifies another procedure which may have applicable actions or necessary information for actions in the controlling procedure. While 1202-12 may be referenced, the JPM is written as if the applicant continues in MAP C, C-1-1.**

Comment:

MAP C-1-1, HI ALARM

Performance Step: 4 Perform OP-TM-826-901.

Standard: Implements OP-TM-826-901.

Evaluator Cue: **Provide a copy of OP-TM-826-901.**

Comment:

OP-TM-826-901, Sections 1.0/2.0/3.0

Performance Step: 5 Reviews PURPOSE, MATERIALS and SPECIAL EQUIPMENT, PRECAUTIONS/LIMITATIONS/PREREQUISITES.

Standard:
- Determines OP-TM-826-901 applies to the situation.
- Proceeds to Section 4.0.

Comment:

Evaluator Cue: **If requested as to whether to enter OP-TM-826-901, order, "Place the Control Tower on Pressurized Recirc."**

OP-TM-826-901, Step 4.1/4.1.1

Performance Step: 6 Aligning the System for Emergency Recirc:

- If RM-A-1 high alarm or 4 psig ESAS did not actuate, then NOTIFY chemistry and ANNOUNCE over the page and radio, the intent to shift CB ventilation.

Standard: Determines step does NOT apply since C-1-1 actuated.

Comment:

OP-TM-826-901, Step 4.1.2

√ **Performance Step: 7** ENSURE the following fans are shutdown:

- AH-E-17A and AH-E-17B
- AH-E-95A and AH-E-95B
- AH-E-20A and AH-E-20B

Standard: ENSURES the control switches for the following fans are in NORMAL AFTER STOP:

- Stops AH-E-17A by rotating control switch CCW (Green Light LIT)(√)
- Verifies Green Lights for AH-E-95A and AH-E-95B on H&V panel.
- Stops AH-E-17A by rotating control switch CCW (Green Light LIT) (√)

Comment:

OP-TM-826-901, Step 4.1.3

√ **Performance Step: 8** SHUTDOWN AH-E-19A and AH-E-19B.

Standard: PLACES the control switches for the following fans in NORMAL AFTER STOP:

- Stops AH-E-19A by rotating control switch CCW (Green Light LIT) (√)

Comment:

OP-TM-826-901, Step 4.1.4

Performance Step: 9 ENSURE AH-D-28 or AH-D-617 are CLOSED.

Standard: Ensures either AH-D-28 ___ or AH-D-617 ___ are CLOSED.

Evaluator Note: **AH-D-28/AH-D-617 YELLOW light on H&V Panel and/or BLUE light on PCR illuminated.**

Comment:

OP-TM-826-901, Step 4.1.5

Performance Step: 10 PLACE ext. control for AH-E-93/94A and AH-E-93/94B to the OFF position.

Standard: Places control switche for the following fans in OFF (GREEN light):

- AH-E-93A ___
- AH-E-93B ___
- AH-E-94A ___
- AH-E-94B ___
- Off indicated by Green Lights for the above.

Comment:

OP-TM-826-901, Step 4.1.6

√ **Performance Step: 11** START AH-E-18B (A) if AH-E-17A (B) was previously operating.

Standard: Hold Control Switch for AH-E18B in START and verifies RED light illuminated.

Comment:

OP-TM-826-901, Step 4.1.7

Performance Step: 12 If the opposite train of ventilation is unavailable, then WAIT 5 minutes after AH-E-17A (B) was shutdown and START AH-E-18A (B).

Standard: Determines step is N/A.

Comment:

OP-TM-826-901, Step 4.1.8

Performance Step: 13 ENSURE AH-E-19A or B is operating.

Standard: Verifies AH-E-19A in starts (RED light illuminated).

Comment:

OP-TM-826-901, Step 4.1.9

Performance Step: 14 ENSURE AH-E-95A or B is operating.

Standard: Places AH-E-95A or AH-E-95B in START and verifies RED light illuminated.

Comment:

OP-TM-826-901, Step 4.1.10

Performance Step: 15 START AH-E-90 and AH-E-91 (FHB 305: hallway next to Hot Tool Room).

Standard: Dispatches an AO.

Booth Operator Cue: **Acknowledge order (Report AH-E-90 and 91 started).**

Comment:

OP-TM-826-901, Step 4.1.11

Performance Step: 16 IF CB return flow (FR-271) < 36000 SCFM, then ENSURE AH D-41 on the IDLE train is closed (CB 380: A or B fan room, by the door, 25' overhead).

Standard: Verifies CB return flow > 36000 SCFM on FR-271.

Comment:

Terminating Cue: **After CB return flow is verified: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC Simulator JPM H

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The unit is at 100% power.
- All controls are in normal alignment.

INITIATING CUE: Maintain current plant conditions.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility:	Three Mile Island Unit 1	Task No.:	42404004
Task Title:	RESET EMERGENCY FEEDWATER PUMP	JPM No.:	2007 NRC IP JPM I
K/A Reference:	061 G2.1.30 (3.9/3.4)	**Randomly selected repeat from 2003 NRC Exam (B.2.c)**	

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: _____

Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- The Reactor tripped due to a loss of Main Feedwater.
- Emergency Feedwater Pump EF-P-1 tripped on overspeed during the AUTO start. Steam binding is NOT suspected.
- Emergency Feedwater Pump EF-P-2A is cleared and tagged.
- Emergency Feedwater Pump EF-P-2B is running but vibrating and needs to be stopped.
- OP-TM-EOP-010 Guide 16.1 is in progress.
- Steam pressure on MS-PI-204 reads150 psig.
- MS-V-13A and MS-V-13B are closed.
- EFW Actuation Switches are in DEFEAT.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: None

General References: EOP-010, EMERGENCY PROCEDURE RULES, GUIDES AND GRAPHS – Revision 7

Handout:	EOP-010, Guide 16.1 EFW Failure, Failure of EF-P-1, with steps 1 through 7 signed off.
Initiating Cue:	The CRS has directed you to reset the trip lever on EF-P-1 so that the control room crew can attempt a re-start.
Time Critical Task:	No
Validation Time:	5 Minutes

SIMULATOR SETUP

N/A

(Denote Critical Steps with a check mark)

START TIME: _____

EOP-010, Guide 16.1, Steps 1-7

Performance Step: 1 Review procedure/locate equipment.

Standard:
- Proceeds to EF-P-1 in IB Basement.
- Determines from Initial Conditions that conditions in Steps 1-7 are met to reset trip lever.

Evaluator Cue: **Provide JPM I handout.**

Comment:

EOP-010, Guide 16.1, Step 8.1

√ **Performance Step: 2** If MS-PI-204 (CR or locally) indicates > 50 psig, then OPEN MS-V-52 (IB 295': MS-ST-11 Trap Drain Isolation Valve).

Standard:
- Determines from Initial Conditions that steam pressure is > 50 PSIG.
- Locates MS-V-52 and simulates rotating handwheel in the counter-clockwise direction. (√)

Evaluator Cue:
- **If necessary: MS-PI-204 reads 150 PSIG.**
- **MS-V-52 has stopped rotating and the shaft is fully extended.**

Comment:

EOP-010, Guide 16.1, Step 8.2

√ **Performance Step: 3** When MS-PI-204 < 50 psig, then CLOSE MS-V-52.

Standard:
- Monitors pressure.
- Simulates rotating MS-V-52 handwheel in the clockwise direction. **(√)**

Evaluator Cue:
- **MS-PI-204 has dropped rapidly and reads 5 PSIG.**
- **MS-V-52 has stopped rotating and the shaft is fully inserted.**

Comment:

EOP-010, Guide 16.1, Step 8.3

√ **Performance Step: 4** RAISE the valve lever into the notch of the lower portion of the trip lever and POSITION the overspeed trip latch spring in the topnotch of the upper portion of the trip lever. (IB 295: at EF-U-1)

Standard:
- Raises the valve lever to the horizontal position and into the notch of the lower portion of the trip lever.
- Positions the overspeed trip latch spring in the topnotch of the upper portion of the trip lever and allows the trip finger locking device to rest on the trip finger.

Evaluator Cue: **The valve arm is being held in the horizontal position by the trip finger.**

Comment:

EOP-010, Guide 16.1, Step 8.4

Performance Step: 5 VERIFY ANN J-1-2, EFW TURB PMP OS TRIP clears.

Standard: Simulates contacting the control room.

Evaluator Cue: **Annunciator J-1-2, EFW TURB PMP OS TRIP, has cleared.**

Comment:

Terminating Cue: **After alarm J-1-2 is verified as clear: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC IP JPM I

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The Reactor tripped due to a loss of Main Feedwater.
- Emergency Feedwater Pump EF-P-1 tripped on overspeed during the AUTO start. Steam binding is NOT suspected.
- Emergency Feedwater Pump EF-P-2A is cleared and tagged.
- Emergency Feedwater Pump EF-P-2B is running but vibrating and needs to be stopped.
- OP-TM-EOP-010 Guide 16.1 is in progress.
- Steam pressure on MS-PI-204 reads150 psig.
- MS-V-13A and MS-V-13B are closed.
- EFW Actuation Switches are in DEFEAT.

INITIATING CUE: The CRS has directed you to reset the trip lever on EF-P-1 so that the control room crew can attempt a re-start.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility:	Three Mile Island Unit 1	Task No.:	21104016
Task Title:	Initiate emergency boration IAW EOP-020	JPM No.:	2007 NRC IP JPM J
K/A Reference:	004 G2.1.30 (3.9/3.4)	**Bank JPM TQ-TM-105-211-J001 (Modified)**	

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: ____

Classroom ____ Simulator ____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- The control room has been evacuated due to a fire.
- The operating crew is performing EOP-020, COOLDOWN FROM OUTSIDE OF CONTROL ROOM.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: None

General References: EOP-020, COOLDOWN FROM OUTSIDE OF CONTROL ROOM, Revision 5

Handout: EOP-020, Step 3.1.19 (pg. 9), and simulated Key #2

Initiating Cue: The CRS has assigned you to perform EOP-020, Step 3.1.19 – Initiate Emergency Boration. No other operators are available to assist with Emergency Boration.

Time Critical Task: No

Validation Time: 19 Minutes (includes time to sign on RWP)

SIMULATOR SETUP

N/A

(Denote Critical Steps with a check mark)

START TIME: _____

	Evaluator Note:	**If the plant is at power, the "as found position" for MU-V-14A and MU-V-14B will be CLOSED.**
		EOP-020, Step 3.1.19 – Initiate Emergency Boration as follows:
√	**Performance Step: 1**	ENSURE MU-V-14A and MU-V-14B are OPEN. (RSD panels)
	Standard:	• Determines MU-V-14A and MU-V-14B indicate CLOSED • Selects OPEN on MU-V-14A and MU-V-14B and verifies indication change.
	Evaluator Cue:	**After simulation of selecting each valve to OPEN: The RED light has illuminated and the GREEN light is out.**
	Comment:	

√ **Performance Step: 2** OPEN MU-V-51 (AB 281: North of seal return coolers)

Standard:

- Locates MU-V-51.
- Removes cotter pin from stem.
- Rotates handwheel in the CLOCKWISE direction.

Evaluator Note: **MU-V-51 is a reverse action valve (clockwise to OPEN). Procedure for operating valve is located on wall next to MU-V-51.**

Evaluator Cue:

- **The cotter pin is removed.**
- **The handwheel has stopped rotating and the stem is fully extended.**
- **Negative CUE if cotter pin is not removed or if valve is simulated turned counterclockwise, "handwheel would not turn."**

Comment:

√ **Performance Step: 3** START CA-P-1A or CA-P-1B (CB 322: 1A ES MCC Unit 14B or 1B ES MCC Unit 2C) [KEY#2]

Standard:
- Proceeds to CA-P-1A (CB 322: 1A ES MCC Unit 14B) or CA-P-1B (1B ES MCC Unit 2C)
- Simulates inserting and turning KEY #2 in the breaker cubicle for the selected pump.

Evaluator Cue:
- **After Key is turned, "A mechanical contacting noise was heard from inside the cubicle"**

Comment:

Terminating Cue: **After a CA-P has been started: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC IP JPM J

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The control room has been evacuated due to a fire.
- The operating crew is performing EOP-020, COOLDOWN FROM OUTSIDE OF CONTROL ROOM.

INITIATING CUE:

The CRS has assigned you to perform EOP-020, Step 3.1.19 – Initiate Emergency Boration. No other operators are available to assist with Emergency Boration.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility:	Three Mile Island Unit 1	Task No.:	53404004
Task Title:	Take local manual control of RR-V-6, RB Emergency Cooling Pressure Control Valve	JPM No.:	2007 NRC IN-PLANT JPM K
K/A Reference:	022 G2.1.30 (3.9/3.4)	**Bank JPM TQ-TM-105-534-J001**	

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: _____

Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- A major LOCA resulted in a Reactor Trip and ESAS actuation.
- Both Reactor Building Spray Pumps have tripped.
- Reactor Building pressure is 17 psig, rising slowly.
- Reactor Building Emergency Water Pressure is 48 psig; indicating that RR-V-6, RB Emergency Cooling Pressure Control Valve, is not operating properly.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: None

General References: OP-1104-38, Reactor Building Emergency Cooling Water System, Revision 60

Handout: OP-1104-38, Enclosure 6

Initiating Cue:	Simulate establishing communications with the control room and then take local manual control of RR-V-6 IAW OP 1104-38, RB Emergency Cooling Water System, Enclosure 6. Describe all operations and point out key components. I will provide all control room directions and feedback.
Time Critical Task:	No
Validation Time:	10 minutes

SIMULATOR SETUP

N/A

(Denote Critical Steps with a check mark)

START TIME: _____

	Performance Step: 1	Locate valve.
	Standard:	• Proceeds to small room just south of RR Valves and Piping Room, 281' IB Basement. • Simulates establishing communications with control room.
	Evaluator Cue:	**Provide handout (OP-1104-38, Enclosure 6).**
	Evaluator Note:	**The applicant may use the posted "operator aid" to perform this task.**
	Comment:	
		OP-1104-38, Enclosure 6, Step 1
√	**Performance Step: 2**	Fail open RR-V-6 by placing IA-V-2825 to vent. RR-V-6 should fail open to 64 degrees as indicated by the pointer on the valve stem.
	Standard:	Simulates rotating IA-V-2825 operator in the clockwise direction to place it in the vent position.
	Evaluator Cue:	**The RR-V-6 pointer indicates 64 degrees. Air is venting**
	Comment:	

OP-1102-38, Enclosure 6, Step 2

√ **Performance Step: 3** Open the cylinder bypass valve.

Standard: Simulates opening the cylinder bypass valve by rotating the handwheel in the counter-clockwise direction.

Evaluator Cue: **The cylinder bypass valve handwheel has stopped rotating.**

Comment:

OP-1102-38, Enclosure 6, Step 3

√ **Performance Step: 4** Remove the tie wire between the manual coupling lever and the right stop stud on the manual operator.

Standard: Simulates removing the tie wire.

Evaluator Cue: **The tie wire is removed.**

Comment:

OP-1102-38, Enclosure 6, Step 4

Performance Step: 5 Hand crank the handwheel until the coupling lever lines up with the slot in the engaging coupling on the valve stem.

Standard: Describes using the hand crank to adjust the handwheel until the coupling lever lines up with the slot in the engaging coupling on the valve stem.

Evaluator Cue: **The coupling lever is aligned with the slot in the engaging coupling.**

Comment:

OP-1102-38, Enclosure 6, Step 5

√ **Performance Step: 6** Push the coupling lever into the slot in the engaging coupling.

Standard: Simulates pushing the coupling lever into the slot in the engaging coupling.

Evaluator Cue: **The coupling lever is inserted into the slot in the engaging coupling.**

Comment:

OP-1102-38, Enclosure 6, Step 6

√ **Performance Step: 7** Remove the pin from the air actuator stem, jockey the handwheel as necessary.

Standard: Describes jockeying the handwheel in order to allow the pin to be removed from the air actuator stem.

Evaluator Cue: **The pin has been removed from the air actuator stem.**

Comment:

OP-1102-38, Enclosure 6, Step 7

√ **Performance Step: 8** Hand crank the valve to the desired location.

Standard:

- Simulates contacting the control room.
- Uses hand crank to adjust RR-V-6 in the closed direction to raise pressure. (√)

Evaluator Cue:

- **Adjust pressure to 55-60 psig using local gage RR-PI-7. RR-PI-7 is currently reading 48 psig.**
- **Provide pressure trend cues based on the direction of valve operation.**

Comment:

Terminating Cue: **When pressure is on a rising trend or cued at approximately 58 psig: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC IN-PLANT JPM K

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- A major LOCA resulted in a Reactor Trip and ESAS actuation.
- Both Reactor Building Spray Pumps have tripped.
- Reactor Building pressure is 17 psig, rising slowly.
- Reactor Building Emergency Water Pressure is 48 psig; indicating that RR-V-6, RB Emergency Cooling Pressure Control Valve, is not operating properly.

INITIATING CUE:

Simulate establishing communications with the control room and then take local manual control of RR-V-6 IAW OP 1104-38, RB Emergency Cooling Water System, Enclosure 6. Describe all operations and point out key components. I will provide all control room directions and feedback.