

Facility: Shearon Harris Task No.: 3301002H401

Task Title: Continuous Withdrawl of a Control Bank (Pull to POAH / Take Corrective Actions IAW AOP-001) JPM No.: 2011 NRC Exam Sim JPM A

K/A Reference: APE001 AA2.03 RO 4.5 SRO 4.8 **ALTERNATE PATH - YES**

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance: _____ Actual Performance: X
 Classroom _____ Simulator X Plant _____

Examiner Note: *To expedite the examination schedule, the candidate should review the INITIAL CONDITIONS, INITIATING CUE, and completed steps of GP-004 prior to entering the simulator to perform the JPM.*

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 in Mode 2.
- The Reactor is critical.
- The crew is performing GP-004, REACTOR STARTUP, and has completed Step 44.
- Control Bank "D" withdrawal was halted at 1×10^{-8} amps, at the point of taking critical rod height data, when the RO became violently ill.
- Control Bank D is currently at 101 steps.

Initiating Cue: You have been directed to assume the OAC position. The CRS has authorized the watch relief without a face-to-face turnover. Continue the Reactor startup to the POAH in accordance with GP-004, Step 45

Task Standard:	<ul style="list-style-type: none"> • Power raised to the POAH. • Maintain stable SUR \leq 1 DPM. <p>Reactor trip initiated when continuous Control Rod withdrawal is detected per AOP-001 actions.</p>
Required Materials:	None
General References:	GP-004, Reactor Startup, Revision 52 OP-104, Rod Control System, Revision 30
Handouts:	OP-104, Section 5.4 Simulator copy of GP-004, completed through Step 44
NOTE:	<i>To expedite the examination schedule, the candidate should review the INITIAL CONDITIONS, INITIATING CUE, and the GP-004 prior to entering the simulator to perform the JPM.</i>
Time Critical Task:	N/A
Validation Time:	10 minutes

Critical Step Justification

Step 4	<p>Manually tripping the Reactor during continuous rod withdrawal is an immediate action step of AOP-001, Malfunction of Rod Control and Indication System and the most conservative course of action.</p> <p>It is critical that the operator prevents an uncontrolled addition of positive reactivity from the Control Rods. The operator should:</p> <ol style="list-style-type: none"> 1. Identify that Continuous Rod withdrawal is occurring 2. Recognize that entry conditions are met for AOP-001 3. Does NOT place the Control Rod system to AUTO (procedurally Rod Control should be placed to Manual – and is already in Manual) 4. Performs a required manual Reactor Trip based on the uncontrolled addition of positive reactivity with rod control in Manual. (AOP-001 Basis Document - If spurious rod movement was in progress and efforts to stop the movement fails, the most conservative course of action is to regain control of the plant by tripping the Reactor. If allowed to continue, it could lead to flux anomalies, fuel damage, and/or undesirable and unpredictable plant transients.)
Step 5	Reactor Trip verification indicates the Reactor is shutdown

SIMULATOR SETUP

For the 2011 NRC Exam Simulator JPM 'a'

Simulator Operator - Exam Setup

Reset to IC-165 password "hotwheels"

Go to RUN

Set screens to the following: CRT-1 to SPTOP, CRT-2 to QP VCT, CRT-3 to QP STARTUP, CRT-4 to QP POAH, CRT-5 to QP SGLVL

Post reactivity signs on all 3 swing gates

Silence and Acknowledge annunciators

GO TO FREEZE and inform the lead examiner the Simulator is ready. DO NOT GO TO RUN until directed by the lead examiner. (The examiner has provided to the candidate with initial conditions and the initiating cues prior to placing the simulator in RUN.)

The following setup information is how this exam IC was developed.

- IC-34 (Critical, reactor startup in progress)
- Rod height 101 steps
- GP-004 with Step 45 in progress
- Verify simulator copy of GP-004 is clean
- Select NR-45 to Power Range Instrument
- For Continuous Rod Withdrawl in Auto and Manual control positions
 - imf crf14a (1 00:00:00 00:00:00) true
 - imf crf15a (1 00:00:00 00:00:00) true

PERFORMANCE INFORMATION

Simulator Operator:	<i>When directed by the Lead Examiner go to Run.</i>
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START TIME: _____

- Performance Step: 1** GP-004, Step 5.45
RECORD Bank Rod Position
- Standard:** Records step counter information displayed for each group of Shutdown and Control Bank rods.
- Comment:**
- Performance Step: 2** GP-004, Step 5.46 NOTE
NOTE: When performing startup with a positive Moderator Temperature Coefficient, all reactivity additions must be slow and controlled due to the compounding effects of the positive Moderator Temperature Coefficient.
NOTE: The point of adding heat is usually between 1×10^{-6} to 1×10^{-5} amps. [R Reference 88H0766 (SOER 88-2)]
- Standard:**
- Reads note prior to performing step.
- Comment:**
- Performance Step: 3** GP-004, Step 5.46
ESTABLISH a startup rate not to exceed one decade per minute AND ALLOW power to increase to the Point of Adding Heat.
- Standard:** Withdraws controls rods in MANUAL in the outward direction to raise reactor power.
Ensures steady state stable SUR does not exceed 1 DPM
- Comment:**

PERFORMANCE INFORMATION

Lead Examiner:

Examiner NOTE: Continuous rod withdrawal will occur when the candidate releases the Rod Control OUT switch and will continue with the rod selector switch in either manual or auto.

If the candidate selects any other rod control position (other than Manual) to prevent rod motion – the candidate will fail the JPM. There is no justification (procedurally) to do so.

Additionally, AOP-001 immediate actions must be performed prior to obtaining the procedure.

✓ **Performance Step: 4**

AOP-001 Entry conditions met (Immediate Actions steps 1-3

Announces rods are continuing to move which meets AOP-001 entry conditions.

(Steps 1-3 are immediate actions)

1. CHECK that LESS THAN TWO control rods are dropped (YES)
2. POSITION Rod Bank Selector Switch to MAN (already in MAN position)
3. CHECK Control Bank motion STOPPED. (NO – RNO action.
4. Step 3 RNO – TRIP the Reactor AND GO TO EOP Path-1.

Standard:

Announces that rods are continuing to move out with no rod motion demanded, enters AOP-001, leaves rod selector switch in MANUAL. Manually trips the Reactor.

Comment:

PERFORMANCE INFORMATION

✓ **Performance Step: 5** PATH-1, Step 1 Immediate Action
 Verify Reactor Trip:
 Automatic **OR** manual reactor trip - SUCCESSFUL
 Check for any of the following:
 Trip breakers RTA **AND** BYA – OPEN
 OR
 Trip breakers RTB **AND** BYB - OPEN
 Rod bottom lights – LIT
 Neutron flux - DECREASING

Standard: Identifies Reactor is Tripped

Comment:

Examiner Cue and Terminating Cue:	After the candidate verifies that the Reactor is Tripped: Evaluation on this JPM is complete. Announce END OF JPM
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STOP TIME: _____

Simulator Operator:	<i>When directed by the Lead Examiner go to Freeze.</i>
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VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 NRC Exam Sim JPM A

Continuous Withdrawal of a Control Bank

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature:	Date:
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JPM CUE SHEET

INITIAL CONDITIONS:

- The Unit is in Mode 2.
- The Reactor is critical.
- The crew is performing GP-004, REACTOR STARTUP, and has completed Step 44.
- Control Bank "D" withdrawal was halted at 1×10^{-8} amps, at the point of taking critical rod height data, when the RO became violently ill.
- Control Bank D is currently at 101 steps.

INITIATING CUE:

You have been directed to assume the OAC position. The CRS has authorized the watch relief without a face-to-face turnover. Continue the Reactor startup to the POAH in accordance with GP-004, Step 45.

Facility: Shearon Harris Task No.: 301069H401

Task Title: Loss of Seal Injection to RCPs
(Take Corrective Actions IAW
AOP-018) JPM No.: 2011 NRC Exam
Sim JPM B

K/A Reference: APE015/017 AA2.10 **ALTERNATE PATH - YES**
RO 3.7 SRO 3.7

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 operating at 100% power.
- The 'B' CSIP has just been secured and has been placed under clearance for seal repairs
- The CRS is reviewing the actions to get 'C' CSIP in service.

Initiating Cue: You have been directed to assume the OAC position.
Maintain current plant conditions.

Examiners Note:

**DO NOT READ TO
THE CANDIDATE**

This JPM will require another board operator to silence MCB annunciators AFTER the manual Reactor Trip is performed.

Task Standard:	<ul style="list-style-type: none"> • Letdown is isolated IAW the Immediate action step 1 of AOP-018 • FCV-122.1 is placed in manual and shut • HC-186.1, RCP Seal Water Injection flow valve is shut • Reactor trip initiated when ASI pump is running and there are NO standby CSIP's available IAW AOP-018 RNO actions.
Required Materials:	None
General References:	AOP-018, Reactor Coolant Pump Abnormal Conditions, Revision 39
Handouts:	None
Time Critical Task:	N/A
Validation Time:	10 minutes

Critical Step Justification	
Step 2	Isolation of Letdown prevents loss of RCS inventory
Step 8	Analyzing plant conditions and selecting the appropriate procedure section to proceed with is required to mitigate the event.
Step 17	Required action to prevent eventual Pressurizer overfill
Step 18	Isolation of RCP Seal Water Injection is required for CVCS lineup during ASI actuation where ASI will be providing RCP seal water
Step 22	Manual Reactor Trip will prevent Automatic Reactor Trip/SI if ASI were allowed to continue to inject highly borated water into RCP seals while plant was maintained at power and no operator actions were taken.

SIMULATOR SETUP

For the 2011 NRC Exam Simulator JPM 'B'

Simulator Operator - Exam Setup

Reset to IC-166 password "hotwheels"

Go to RUN

Place a CIT on "B" CSIP MCB switch

Silence and Acknowledge annunciators

GO TO FREEZE and inform the lead examiner the Simulator is ready. DO NOT GO TO RUN until directed by the lead examiner. (The examiner has provided to the candidate with initial conditions and the initiating cues prior to placing the simulator in RUN.)

The following setup information is how this exam IC was developed.

- IC-19 (100% power steady state - MOL)

- Rack out the 'B' CSIP
 - irf cvc049 (n 00:00:00 00:00:00) OFF
 - irf cvc050 (n 00:00:00 00:00:00) RACK_OUT

- Assign Trigger 1 to trip the 'A' CSIP
 - lmf cvc05a (1 00:00:00 00:00:00) TRUE

- After the candidate has taken the shift the Lead Examiner - cue the Simulator Booth Operator to activate Trigger 1

PERFORMANCE INFORMATION

Simulator Operator:	<i>When directed by the Lead Examiner go to Run.</i>
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Lead Examiner:	<i>After the candidate has taken the shift and when appropriate inform Simulator Operator to insert Trigger 1 (Trip of 'A' CSIP).</i>
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Simulator Operator:	<i>When directed by the Lead Examiner insert Trigger 1</i>
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START TIME: _____

Performance Step: 1 Annunciator ALB-006-1-3 Alarms
CHRG PUMPS A TRIP OR CLOSE CKT TROUBLE

Standard: Identifies that the 'A' CSIP has tripped
Announces entry conditions met for AOP-018, Reactor Coolant Pump Abnormal Conditions
Performs Immediate Action from memory

Comment: **Soon after the 'A' CSIP trip Annunciator ALB-008-2-2 will alarm:**

**ASI Pump Auto Start Timer Initiated
(RCP seal wtr flow <4 gpm)**

If RCP Seal Injection flow remains below 4 gpm for 2 minutes and 30 seconds, the ASI SQUIB valves (1ASI-21 & 1ASI-22) are actuated and the ASI Pump starts 15 seconds later.

NOTE: When the ASI pump starts annunciator ALB-008-2-4 will alarm: ASI PUMP START

PERFORMANCE INFORMATION

- AOP-018, Section 3.0 (Immediate Actions step 1)
- ✓ **Performance Step: 2** Step 1
 CHECK ANY CSIP RUNNING
 RNO – ISOLATE letdown by verifying the following valves SHUT:
- 1CS-7, 45 GPM LETDOWN ORIFICE A
 - 1CS-8, 60 GPM LETDOWN ORIFICE B
 - 1CS-9, 60 GPM LETDOWN ORIFICE C

Standard: Identifies that NO CSIP's are running and isolates letdown then informs CRS "Immediate Actions Complete".

Examiner Cue: Acknowledge completion of Immediate Actions.

(Candidate may mark time since ASI pump will auto start in 2 minutes and 30 seconds after RCP seal wtr flow is < 4 gpm.)

Comment:

- AOP-018, Section 3.0 step 1
- Performance Step: 3** Obtains copy of AOP-018 and reviews NOTE prior to step 1
 Step 1 is an immediate action
 RCP abnormal conditions may require implementation of the SHNPP Emergency Plan

Standard: Obtains AOP-018 and reviews NOTE

Comment:

PERFORMANCE INFORMATION

Performance Step: 4	AOP-018, Section 3.0 step 1 CHECK ANY CSIP RUNNING
Standard:	Identifies that NO CSIP's are running ('A' CSIP is tripped, 'B' CSIP is under clearance and 'C' CSIP has not been readied for operation)
Comment:	
Performance Step: 5	AOP-018, Section 3.0 step 1 RNO ISOLATE letdown by verifying the following valves SHUT: 1CS-7, 45 GPM LETDOWN ORIFICE A 1CS-8, 60 GPM LETDOWN ORIFICE B 1CS-9, 60 GPM LETDOWN ORIFICE C
Standard:	Verifies that letdown is isolated
Comment:	
Performance Step: 6	AOP-018, Section 3.0 step 2 REFER TO PEP-110, Emergency Classification And Protective Action Recommendations, AND ENTER the EAL Matrix.
Standard:	Reads step 2 and informs SM to refer to PEP-110 and enter the EAL Matrix.
Comment:	
Performance Step: 7	AOP-018, Section 3.0 Note prior to step 3 Minimum allowable flow for a CSIP is 60 gpm which is provided by normal miniflow during normal operation and alternate miniflow during safety injection. Maintaining CSIP flow greater than or equal to 60 gpm also satisfies this requirement.
Standard:	Reads note
Comment:	

PERFORMANCE INFORMATION

- ✓ **Performance Step: 8** AOP-018, Section 3.0 step 3
EVALUATE plant conditions AND GO TO the appropriate section:

Loss of CCW and/or Normal Seal Injection to RCPs
Section 3.1 Page 5
- Standard:** Evaluates plant conditions and using the provided table determines that Section 3.1 is appropriate
- Comment:**
- Performance Step: 9** AOP-018, Section 3.1 step 1
CHECK ALB-5/1-2A, RCP THERMAL BAR HDR HIGH FLOW, alarm CLEAR.
- Standard:** Identifies that ALB-5/1-2A, RCP THERMAL BAR HDR HIGH FLOW, alarm is CLEAR.
- Comment:**
- Performance Step: 10** AOP-018, Section 3.1 step 2
CHECK ALL RCPs operating within the limits of Attachment 1 (continuous actions step)
- Standard:** Reviews AOP-018 Attachment 1 RCP operating limits and compares ERFIS and MCB indications to limits. Identifies that NO operating limits have been exceeded and goes to step 12.
- Comment:**
- Performance Step: 11** AOP-018, Section 3.1 step 12
CHECK ALL RCPs RUNNING (continuous actions step) YES
- Standard:** Identifies that ALL 3 RCP's are in operation
- Comment:**

PERFORMANCE INFORMATION

	AOP-018, Section 3.1 step 13
Performance Step: 12	CHECK the following NORMAL for ALL RCPs: <ul style="list-style-type: none">• CCW flow• Seal Injection flow from CSIPs
Standard:	Determines that Seal Injection flow from CSIP's is NOT NORMAL (no CSIP's are operating) RNO action – RESTORE using the applicable attachment
Comment:	
	AOP-018, Section 3.1 step 13 RNO
Performance Step: 13	Malfunction - LOSS of Seal Injection flow from CSIPs ONLY Attachment 4 (page 33)
Standard:	Reads RNO for step 13 step and determines that Attachment 4 is required to be performed to restore the loss of RCP seal injection
Comment:	
	AOP-018 Attachment 4, Note prior to step 1
Performance Step: 14	NOTE: The ASI System will actuate in 2 minutes and 45 seconds from timer initiation.
Standard:	Reads note
Comment:	
	AOP-018 Attachment 4, step 1
Performance Step: 15	CHECK at least one CSIP RUNNING. – NO – RNO action GO TO Step 14
Standard:	Reads step 1 and identifies NO CSIP is running then takes RNO to step 14
Comment:	The ASI pump will auto start after a 2 minute and 45 second time delay.

PERFORMANCE INFORMATION

AOP-018 Attachment 4, step 14

Performance Step: 16 DISPATCH an operator to monitor operation of the ASI System.**Standard:** Contacts an available AO to monitor ASI system operation.

Simulator Operator: Acknowledge request to monitor ASI system operation.

Comment:

AOP-018 Attachment 4, step 15

✓ **Performance Step: 17** PLACE controller FK-122.1, Charging Flow in MANUAL AND lowers output to 0.**Standard:** Locates FK-122.1 on MCB, places control to MANUAL and shuts**Comment:**

AOP-018 Attachment 4, step 16

✓ **Performance Step: 18** SHUT HC-186.1, RCP Seal WTR INJ Flow.**Standard:** Locates HC-186.1 on MCB and lowers output to 0.**Comment:**

PERFORMANCE INFORMATION

- AOP-018 Attachment 4, step 17
- Performance Step: 19** VERIFY a suction path for the standby CSIP by performing the following:
- a. VERIFY CSIP suction flowpath from VCT as follows:
 - 1) VERIFY greater than 5% level is established in VCT.
 - 2) VERIFY the following valves are OPEN:
 - LCV-115C, VCT OUTLET (1CS-165)
 - LCV-115E, VCT OUTLET (1CS-166)
 - a. GO TO Step 19
- Standard:** Locates MCB / ERFIS or OSI-PI VCT level indication and verifies level is > 5%
Locates MCB indications for VCT outlet valves and identifies they are OPEN then GOES TO STEP 19
- Comment:**
- AOP-018 Attachment 4, step 19
- Performance Step: 20** MAINTAIN CCW HX outlet temperature less than 105°F.
(continuous action step)
- Standard:** Locates MCB / ERFIS or OSI-PI indication for CCW HX outlet temperature and verifies temperature is being maintained < 105°.
- Comment:**
- AOP-018 Attachment 4, note prior to step 20
- Performance Step: 21** NOTE: The ASI System is adding negative reactivity to the RCS and VCT. If ASI cannot be secured a reactor trip will be initiated.
- Standard:** Reads note
- Comment:**

PERFORMANCE INFORMATION

- AOP-018 Attachment 4, step 20.a
- ✓ **Performance Step: 22** START the standby CSIP. (Standby pump is NOT available)
 RNO - IF No CSIP will start, THEN PERFORM ONE of the following steps:
- a. IF seal injection flow is being supplied by the ASI System, THEN PERFORM the following:
 - 1). VERIFY the Reactor is TRIPPED AND GO TO EOP PATH-1.
 NOTE – Perform Step 2) **as time allows.**
 - 2) SHUT ONE of the following to isolate the Seal Return Flowpath:
 - 1CS-470, RCP SEAL WATER RETURN
 - 1CS-472, RCP SEAL WATER RETURN

Standard: Informs CRS that they are about to manually trip the Reactor then Manually Trips the Reactor and performs the immediate actions of PATH-1

Comment:

- PATH-1 Immediate Actions – Steps 1-4
- Performance Step: 23**
1. Verify Reactor Trip: Auto or Manual Rx Trip successful – YES
 2. Verify Turbine Trip – YES
 3. Verify Power to AC Emergency Buses energized by offsite power OR EDGs – YES
 4. Check SI Actuation – NO – RNO – GO TO EPP-004, Reactor Trip Response

Standard: Performs PATH-1 immediate actions

<p>Examiner Cue:</p>	<p>(When PATH-1 immediate actions are completed) Another operator will continue with EPP-004. You are being directed to continue with AOP-018 actions.</p>
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NOTE: Another operator should be silencing annunciators not related to the task of continuing in AOP-018.

Comment:

PERFORMANCE INFORMATION

AOP-018 Attachment 4, step 20 a. continued

- Performance Step: 24** SHUT ONE of the following to isolate the Seal Return Flowpath:
- 1CS-470, RCP SEAL WATER RETURN
 - 1CS-472, RCP SEAL WATER RETURN

Standard: Locates either 1CS-470 or 1CS-472 and SHUTS one of the valves

Comment:

Examiner Cue and Terminating Cue:

After the candidate completes step RNO 20.a: Evaluation of this JPM is complete.
Announce END OF JPM

STOP TIME: _____

Simulator Operator:

When directed by the Lead Examiner go to Freeze.

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 NRC Exam Sim JPM B

Loss of Seal Injection to RCPs

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature:	Date:
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JPM CUE SHEET

Initial Conditions:

- The Unit is operating at 100% power.
- The 'B' CSIP has just been secured and has been placed under clearance for seal repairs
- The CRS is reviewing the actions to get 'C' CSIP in service.

INITIATING CUE:

You have been directed to assume the OAC position.
Maintain current plant conditions.

Worksheet

Facility: Shearon Harris Task No.: 301161H601

Task Title: SGTR Without Pressurizer Pressure Control JPM No.: 2011 NRC Exam Sim JPM C

K/A Reference: G2.1.20 RO 4.6 SRO 4.6 **ALTERNATE PATH - YES**

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 SGTR has occurred on the "A" SG
 - Off-site power has been lost
 - Containment conditions are normal
 - Instrument Air to Containment is not available and none of the PRZ PORVs will open
 - The Pressurizer Aux Spray Valve will not open
 - The crew is implementing emergency procedures and a transition has just been made to EOP-EPP-022 from PATH-2

Initiating Cue: You are to implement EOP-EPP-022 for SGTR without Pressurizer pressure control

Worksheet

Task Standard:	EPP-022 correctly implemented for given conditions
Required Materials:	None
General References:	EOP-EPP-022, SGTR Without Pressurizer Pressure Control, Rev 23
Handouts:	None
Time Critical Task:	N/A
Validation Time:	10 minutes

Critical Step Justification	
Step 12	IF any step is answered incorrectly then the applicant will loop back into the procedure and repeat steps that will be unnecessary while the ruptured SG level continues to increase. The wasted time could potentially lead to a SG overfill condition. The overfill condition could challenge SG piping. Overfill could also potentially lead to an unmonitored release to the environment via SG PORV's and/or Safety valves.
Step 13	Stopping one CSIP will reduce the rate of RCS pressure increase and slow the ruptured SG fill rate.
Step 16	Shutting the BIT outlet valves will reduce the rate of RCS pressure increase and slow the ruptured SG fill rate.

Worksheet

SIMULATOR SETUP

For the 2011 NRC Exam Simulator JPM 'C'

Simulator Operator - Exam Setup

Reset to IC-167 password "hotwheels"

Go to RUN

Silence and Acknowledge annunciators

GO TO FREEZE and inform the lead examiner the Simulator is ready. DO NOT GO TO RUN until directed by the lead examiner. (The examiner has provided to the candidate with initial conditions and the initiating cues prior to placing the simulator in RUN.)

Worksheet

The following setup information is how this exam IC was developed.

1. Insert an SGTR on A SG of sufficient size to require an SI.
2. Insert a loss of off-site power and verify both EDGs energize their safety bus.
3. Fail all three PZR PORVs shut.
4. Override the accumulator low-pressure alarms ON (ALB-009 Windows 1-1,1-2,1-3).
5. Override IA and N2 to Containment
6. Adjust SG tube rupture size to get Pressurizer level to 0% (start with a 700 gpm leak then go back to 420 gpm after establishing PZR level)
7. Secure 1 CSIP for periods of time to reduce flow to the RCS
8. Run APPs for IA and CSIP cross connect valve power
9. Align ESW to the Air Compressors, start the A/Cs and restore IA to CNMT.
10. Take all PATH 1 and PATH-2 actions up to the point of starting the depressurization.
11. Ensure the following conditions exist:
 - a. A SG level is less than 82.478 percent (approximately 80%76% and increasing such that it will be greater then 82.4%78% after JPM step 3 but before JPM step 9.)
 - b. PRZ level is less than 10%.
 - c. Subcooling is greater than 10°F.
 - d. RVLIS Full range is greater than 63%.

I developed a CAEP with the following information to accomplish the above setup

- o IC-19 (100% power steady state - MOL)

! Fail IA and N2 valves to Containment AS IS

idi xa1i060(n 00:00:00 00:00:00) ASIS

idi xaai048(n 00:00:00 00:00:00) ASIS

! SGTR in A SG - will need to vary up to 700 gpm during development to get level up

imf sgn07b (n 00:00:00 00:00:00) 420 00:00:00 0

! I had to reduce to one running CSIP to keep PRZ level <10%

imf eps01 (1 00:00:00 00:00:00) W/O_DELAY

imf prs03d (n 00:00:00 00:00:00) 0 00:00:00 0

imf prs03e (n 00:00:00 00:00:00) 0 00:00:00 0

imf prs03f (n 00:00:00 00:00:00) 0 00:00:00 0

ian xn09a01 (n 00:00:00 00:00:00) ALARM_ON,CRYWOLF,ASI

ian xn09b01 (n 00:00:00 00:00:00) ALARM_ON,CRYWOLF,ASI

ian xn09c01 (n 00:00:00 00:00:00) ALARM_ON,CRYWOLF,ASI

dmf sgn07b

imf sgn05a (n 00:00:00 00:00:00) 420 00:00:00 0

Run Trigger 1 to simulate a Loss of Offsite Power

PERFORMANCE INFORMATION

Simulator Operator:	When directed by the Lead Examiner then go to Run.
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START TIME: _____

Performance Step: 1 Obtains Procedure
Obtains EOP-EPP-022.

Standard: Locates and obtains a copy of EOP-EPP-022 from one of three locations in MCR

Examiners Cue:	When the candidate locates the MCR copy of EPP-022 provide them with a copy for use.
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Comment:

Performance Step: 2 EOP-022, NOTE Prior to Step 1
Step 1 NOTE
Foldout applies

Standard: Reads Note and circle/slashes Note

Examiners Cue:	The BOP will monitor Foldout items.
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Comment:

PERFORMANCE INFORMATION

	EOP-022, Step 1
Performance Step: 3	Check Ruptured SG(s) Level - LESS THAN 78% (High-High alarm) [60%]
Standard:	Observes level in 'A' SG (< 78% - YES)
Comment:	
	EOP-022, Caution and Note prior to Step 2
Performance Step: 4	CAUTION Following a complete loss of normal seal cooling, the affected RCP(s) should NOT be started prior to a status evaluation.
	NOTE RCPs should be run in order of priority (B only, A AND C, A only, C only) to provide normal PRZ spray
Standard:	Reads and circle/slashes Caution and Note
Comment:	
	EOP-022, Step 2
Performance Step: 5	Try To Establish Normal PRZ Spray: Check RCP B - RUNNING
Standard:	Locates MCB indication for 'B' RCP and identifies it is NOT running (RNO - GO TO Step 2c.) Continues with procedure step 2.c
Comment:	

PERFORMANCE INFORMATION

	EOP-022, Step 2.c
Performance Step: 6	Check all of the following – IN SERVICE <ul style="list-style-type: none">• CCW to motor oil coolers (YES)• CCW to thermal barrier HXs (YES)• Normal seal injection from CSIP (YES)
Standard:	Observes MCB indications
Comment:	
	EOP-022, Step 2.d
Performance Step: 7	Establish support conditions AND start RCP(s) to provide normal PRZ spray: With loss of offsite power in progress RCPs will not be able to be started should identify conditions and perform RNO action GO TO Step 3 (continues in procedure to step 3)
Standard:	Observes current plant conditions and continues with step 3
Comment:	

 PERFORMANCE INFORMATION

	EPP-022, step 3
Performance Step: 8	<p>Try to Restore PRZ PORV:</p> <p>Establish condition for opening a PRZ PORV:</p> <ul style="list-style-type: none"> • Verify power to PRZ PORVs – AVAILABLE (YES) • Verify power to PRZ PORV block valves – AVAILABLE (YES) • Verify PRZ PORV block valves - OPEN (UNLESS SHUT TO ISOLATE A LEAKING PORV) (YES) • Nitrogen OR instrument air to PRZ PORVs – AVAILABLE (NO) (Locates 1SI-287 and 1IA-819 may attempt opening each valve but valves will not open) <p>At least one PRZ PORV AND block valve – AVAILABLE (NO – IF PORV control switch is taken to OPEN the valve will NOT open)</p> <p>Observe CAUTION prior to Step 4 AND GO TO Step 4. (proceeds to step 4)</p>
Standard:	Reviews step 3 and determines that RNO for step 3 is required and proceeds to step 4

Examiners Note:	Candidate may attempt to reset Phase A to restore IA and N2 to Containment this action will not work because both valves are failed closed.
------------------------	--

Comment:

	EPP-022, Caution prior to step 4
Performance Step: 9	<p>CAUTION</p> <p>When SG level decreases to 25%, AFW actuation occurs and the AFW flow control valves receive a full open signal.</p>
Standard:	Reads caution and Circle/Slashes

Comment:

PERFORMANCE INFORMATION

EPP-022, Step 4

Performance Step: 10 Check Intact SG Levels:
Any Level - GREATER THAN 25% [40%] (YES)
AFW flow - AT LEAST 210 KPPH (YES)

Control feed flow to maintain intact SG levels between 30% and 50% [40% and 50%]

Standard: Observes MCB indications of SG levels and AFW flow and determines intact SG levels are > 25% and AFW flow is available but not required

Examiners Cue:	(IF candidate attempts to control AFW flow cue) Another operator will control AFW flow to maintain intact SG levels.
-----------------------	---

Comment:

EPP-022, Step 5

Performance Step: 11 Check PRZ Level - GREATER THAN 10% [30%] (YES)

Standard: Locates Pressurizer level indications and determines level greater than 10%

Comment:

PERFORMANCE INFORMATION

EPP-022, Step 6

✓ **Performance Step: 12**

Check SI Termination Criteria:

RCS subcooling – GREATER THAN 10°F [40°F] – C or 20°F [50°F] – M (YES)

Check for any of the following:

- Total feed flow to SGs - GREATER THAN 210 KPPH AVAILABLE (YES)
- Level in at least one intact SG - GREATER THAN 25% [40%] (YES)

Check RVLIS indication based on RCP status:

No RCP running: full range - GREATER THAN 63% (YES)

Any ruptured SG level - INCREASING IN AN UNCONTROLLED MANNER **OR** OFFSCALE HIGH (YES)**Standard:**

Checks ERFIS RCS Subcooling > 10°F

Check RVLIS indications and verifies with NO RCPs running full range indication is > 63%

Checks ruptured SG level and determines it is increasing in an uncontrolled manner

Comment:

EPP-022, Step 7

✓ **Performance Step: 13**

Stop All But One CSIP.

Standard:

Locates MCB controls for 'A' or 'B' CSIP and stops ONE CSIP

Comment:

PERFORMANCE INFORMATION

	EPP-022, Step 8.a
Performance Step: 14	Isolate High Head SI Flow: Check CSIP suction – ALIGNED TO RWST
Standard:	Locates CSIP SUCTIONS FROM RWST LCV-115B and LCV-115D and verifies open. (May locate VCT OUTLETs LCV-115C and LCV-115E and verify shut.)
Comment:	
	EPP-022, Step 8.b
Performance Step: 15	Open normal miniflow isolation valves: <ul style="list-style-type: none">• 1CS-182• 1CS-196• 1CS-210• 1CS-214
Standard:	Locates MCB control switches for 1CS-182, 1CS-196, 1CS-210, 1CS-214 and takes each valve to OPEN
Comment:	
	EPP-022, Step 8.c
✓ Performance Step: 16	Shut BIT outlet valves: <ul style="list-style-type: none">• 1SI-3• 1SI-4
Standard:	Locates MCB control switches for 1SI-3 and 1SI-4 and takes them to shut.
Comment:	

PERFORMANCE INFORMATION

EPP-022, Step 8.d

Performance Step: 17 Verify cold leg **AND** hot leg injection valves – SHUT

- 1SI-52
- 1SI-86
- 1SI-107

Standard: Locates MCB control switches for 1SI-52, 1SI-86, and 1SI-107 and verifies they are shut.**Comment:**

Examiner Cue:	After the candidate has shut charging line isolation and BIT valves: Evaluation on this JPM is complete. Announce END OF JPM
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Terminating Cue:	After the candidate has shut charging line isolation and BIT valves
-------------------------	--

STOP TIME: _____

Simulator Operator:	When directed by the Lead Examiner then go to Freeze.
----------------------------	--

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 NRC Exam Sim JPM C

SGTR Without Pressurizer Pressure Control

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature:	Date:
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JPM CUE SHEET

Initial Conditions:

- A SGTR has occurred on the "A" SG
- Off-site power has been lost
- Containment conditions are normal
- Instrument Air to Containment is not available and none of the PRZ PORVs will open
- The Pressurizer Aux Spray Valve will not open
- The crew is implementing emergency procedures and a transition has just been made to EOP-EPP-022 from PATH-2

INITIATING CUE:

You are to implement EOP-EPP-022 for SGTR without Pressurizer pressure control

PERFORMANCE INFORMATION

Facility: Shearon Harris

Task No.: 301078H401

Task Title: Loss of RCS Inventory with RHR
Cooling in ProgressJPM No.: 2011 NRC Exam
Sim JPM D

K/A Reference: 005 A4.01 (3.6/3.4)

ALTERNATE PATH - YES

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 is in Mode 5 on RHR.
 - There is a bubble in the pressurizer.
 - Containment integrity is established.
 - Pressurizer level is 88% Cold Cal (LI-462) and being maintained high in anticipation of going solid.
 - RCS temperature is stable at ~140°F.
 - All 3 RCP's are in operation

Initiating Cue: Your position is the OAC. Maintain current plant conditions.

PERFORMANCE INFORMATION

Task Standard:	Perform AOP-020 actions required to maintain RCS inventory/cooling with a leak in progress.
Required Materials:	None
General References:	AOP-020, LOSS OF RCS INVENTORY OR RHR WHILE SHUTDOWN, Rev. 34
Handout:	Use simulator copy of AOP-20. Ensure that a cleaned copy replaces the one used by the student after each use.
Time Critical Task:	NO
Validation Time:	15 minutes

Critical Step Justification	
Step 1	Identification that AOP-020 entry is required. Without this identification then an incorrect procedure could be entered.
Step 5	Critical to identify which procedure section to use. If wrong section chosen incorrect actions could be taken. Time would also be wasted where the leak may be isolated if the correct procedure section were chosen.
Step 16	This isolates normal and RHR letdown in an attempt to stop the RCS leak.
Step 17	Increasing Charging flow to < 150 gpm and checking for leak conditions will determine if the leak is a major (defined as leakage > makeup capabilities) or minor leak. Time is limited if leakage exceeds 150 gpm and will send the operator to a different procedure section to provide higher flow rates to the RCS and establish a heat removal mechanism.
Step 24	Securing RCP's when ΔP is < 200 psig limit appears in OP-100 and is a vendor specified operating limit related to maintaining RCP pump seal integrity.
Step 26	Shutting at least one RHR loop suction valve to each pump isolates the RHR suction piping from the RCS. Securing RHR may stop any potential leak paths from RHR.

PERFORMANCE INFORMATION

SIMULATOR SETUP

For the 2011 NRC Exam Simulator JPM 'D'

Simulator Operator - Exam Setup

Reset to IC-168 password "hotwheels"

Place CIT's on the "B" CSIP and the "B" RMUW Pump for GP-006

Set CRT Screen #2 to QP A RHR

Set CRT Screen #3 to QP VCT

Go to RUN

Silence and Acknowledge annunciators

GO TO FREEZE and inform the lead examiner the Simulator is ready. DO NOT GO TO RUN until directed by the lead examiner. (The examiner has provided to the candidate with initial conditions and the initiating cues prior to placing the simulator in RUN.)

NOTE: Since the candidate will be using the Simulator copy of AOP-020 ensure that replacement copies are made prior to starting the JPM. REPLACE THE ENTIRE PROCEDURE AFTER EACH CANDIDATE COMPLETES THIS JPM.

The following setup information is how this exam IC was developed.

- Initialize to IC-17 a Mode 5 condition with both RHR pumps and at least one RCP in service.
- Establish stable RCS temperature at 140 °F.
- Reduce charging to stabilize PRZ level.
- Tag one CSIP and one RMUW Pump.
- FREEZE and SNAP for NRC JPM d.
- RUN
- When the applicant has read the Initial Conditions sheet: Assign trigger 1 with a Small Break LOCA (3% break) in the B cold leg
 - <IMF RCS18B 3>
- Place the command <IMF RCS18B 50> on a trigger. Insert at the completion of JPM Step 14 to increase the size of the leak and thereby drive the applicant through the desired procedure path.

PERFORMANCE INFORMATION

Simulator Operator:	<i>When directed by the Lead Examiner go to Run.</i>
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Lead Examiner:	<i>After the candidate has taken the watch and when appropriate inform Simulator Operator to insert Trigger 1 (Small Break LOCA on B RCS Cold Leg)</i> <i>NOTE: VCT auto makeup will occur sometime during the JPM. When auto makeup occurs cue the candidate that another operator will monitor makeup.</i>
-----------------------	---

Simulator Operator:	<i>When directed by the Lead Examiner then insert Trigger 1</i>
----------------------------	--

START TIME: _____

AOP-020, Loss of RCS Inventory or Residual Heat Removal While Shutdown - Entry Conditions:

Dropping PZR level (Cold Cal Channel)

Dropping RCS pressure

Rising CNMT Sump level

Annunciator ALB-01-6-1 Containment Unidentified Leakage

Performance Step: 1 Identifies Entry Conditions are met for AOP-020.

Standard: Enters AOP-020 and announces "No Immediate Actions"
Obtains a copy of AOP-020

Comment:

AOP-020 Section 3.0 Step 1

Performance Step: 2 CHECK that an RCS or Refueling Cavity leak exists.

Standard: Determines that a leak does exist

Comment:

PERFORMANCE INFORMATION

Performance Step: 3 AOP-020 Section 3.0 Step 2
CHECK that all fuel assemblies are safely positioned in one of the following storage locations
Reactor vessel
A Spent Fuel Pool fuel rack
An area isolated from the Refueling Cavity by: A Spent Fuel Pool gate OR Transfer Tube Isolation Valve

Standard: Determines no fuel handling in progress.

Comment:

Performance Step: 3 AOP-020 Section 3.0 Step 3
SUSPEND fuel handling activities.

Standard: Determines no fuel handling is in progress.

Comment:

Performance Step: 4 CHECK that the leak meets one of the following conditions:

- Refueling cavity seal has failed.
- A SG Nozzle Dam has failed.

Standard: Answers NO – the RCS is filled.

Comment:

✓ **Performance Step: 5** GO TO the appropriate section.

Standard: Proceeds to Section 3.3, RCS Leak—Bubble in PRZ

Comment:

PERFORMANCE INFORMATION

	AOP-020 Section 3.3 NOTE prior to Step 1
Performance Step: 6	NOTE <ul style="list-style-type: none">• RHR Pumps operating normally will not exhibit any signs of cavitation, air binding, or fluctuations in flow, pressure, or current.• If standpipe indication and RVLIS are unavailable in the MCR, RCS level can be determined by sending someone in CNMT to read level locally.
Standard:	Reads and Circle/Slashes note
Comment:	
	AOP-020 Section 3.3 Step 1 (Continuous Action)
Performance Step: 7	MONITOR RCS and RHR to ensure BOTH of the following: <ul style="list-style-type: none">• Each RHR pump that is running (if any) is operating normally.• Reactor Vessel level 82 inches below the RV flange OR HIGHER.
Standard:	Verifies RHR Pumps running properly and level in PZR.
Comment:	
	AOP-020 Section 3.3 Step 2 (Continuous Action)
Performance Step: 8	CHECK at least one RHR pump RUNNING.
Standard:	Identifies that at least one RHR pump is running.
Comment:	

PERFORMANCE INFORMATION

Performance Step: 9 AOP-020 Section 3.3 Note Prior to Step 3
NOTE
 Loss of RHR or exceeding an RCS temperature of 200°F without CNMT integrity may require initiation of the HNP Emergency Plan.

Standard: Reads note and Circle/Slash

Comment:

Performance Step: 10 AOP-020 Section 3.3 Step 3
 REFER TO PEP-110, Emergency Classification and Protective Action Recommendations, AND ENTER the EAL Matrix.

Standard: Informs SM.

Evaluator Cue:	Acknowledge report.
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Comment:

Performance Step: 11 AOP-020 Section 3.3 Note Prior to Step 4
NOTE
 If the location of the leak is already known, or is discovered before completing all steps in this section, the following step will permit a transition directly to procedure steps dealing with leak isolation and RHR function.

Standard: Reads note and Circle/Slash

Comment:

Performance Step: 12 AOP-020 Section 3.3 Step 4
 CHECK that leak location is KNOWN.

Standard: Answers NO.

Comment:

PERFORMANCE INFORMATION

Performance Step: 13 AOP-020 Section 3.3 Step 4 RNO (Continuous Action)
PERFORM the following: IF leak location is discovered prior to completing leak isolation sequence in this section, THEN GO TO step 37. GO TO step 6.

Standard: Proceeds to Section 3.3, Step 6.

Comment:

Performance Step: 14 AOP-020 Section 3.3 Step 6
VERIFY SHUT the following:

- 1SI-326 SA, Low Head SI Train A to Hot Leg Crossover.
- 1SI-327 SB, Low Head SI Train B to Hot Leg Crossover.

Standard: Verifies/shuts 1SI-326 SA and 1SI-327 SB. (Both are shut)

Comment:

Performance Step: 15 AOP-020 Section 3.3 Step 7 (Continuous Action)
ADJUST charging flow:

- MAINTAIN PRZ level ABOVE 25%.
- MAINTAIN flow at or below VCT makeup capability.

Standard: Raises charging flow not to exceed M/U capability.

Evaluator Note:	May use VCT trend as means to monitor.
------------------------	---

Comment:

PERFORMANCE INFORMATION

- ✓ **Performance Step: 16** AOP-020 Section 3.3 Step 8
 ISOLATE letdown as follows:
 SHUT letdown orifice isolations:
- 1CS-7
 - 1CS-8
 - 1CS-9
- SHUT 1CS-28, RHR Letdown HC-142.1

Standard:

Shuts:

- 1CS-7
- 1CS-8
- 1CS-9
- 1CS-28

Comment:

- ✓ **Performance Step: 17** AOP-020 Section 3.3 Step 9 (Continuous Action)
 ADJUST CSIP flow to maintain the following:
- PRZ level ABOVE 25%.
 - Charging flow 150 gpm or less.

Standard:

Raises charging flow while maintaining <150 gpm.

Comment:**Lead Evaluator:****Signal Simulator Operator to insert Trigger 2 (Size of Small Break LOCA increases)****Simulator Operator:****When directed by the Lead Evaluator insert Trigger 2**

PERFORMANCE INFORMATION

Performance Step: 18 AOP-020 Section 3.3 Step 10
CHECK RCS leak STILL PRESENT.

Standard: Answers YES.

Comment:

Performance Step: 19 AOP-020 Section 3.3 Step 11
VERIFY VCT level is automatically or manually maintained within the following limits:

- MAINTAIN level ABOVE 5%. (Continuous Action)

Standard: Maintains VCT level > 5% or verifies CSIP suction swap over to RWST occurs

Comment:

Performance Step: 20 AOP-020 Section 3.3 Note Prior to Step 11.b
Low VCT level is a precursor to gas binding the CSIPs.

Standard: Reads and Circle/Slashes note

Comment:

PERFORMANCE INFORMATION

AOP-020 Section 3.3 Step 11.b

Performance Step: 21 • MAINTAIN level ON SCALE. (Continuous Action)

Standard: Checks VCT level being maintained.

Comment: Low level in the VCT may necessitate CSIP suction swap to RWST at any time. Step 11 RNO actions follow
VERIFY CSIP suction shifted to RWST:
OPEN 1CS-291 (LCV-115B), CSIP Suction From RWST
OPEN 1CS-292 (LCV-115D), CSIP Suction From RWST
SHUT 1CS-165 (LCV-115C), VCT Outlet
SHUT 1CS-166 (LCV-115E), VCT Outlet

AOP-020 Section 3.3 Step 12 (Continuous Action)

Performance Step: 22 MONITOR core exit thermocouples to determine RCS heatup rate.

Standard: MONITORS core exit thermocouples.

Comment:

AOP-020 Section 3.3 Step 13 (Continuous Action)

Performance Step: 23 CHECK that RCS temperature can be maintained AT OR BELOW 200°F.

Standard: Answers YES.

Evaluator Note: This may be answered YES or NO but the path will be the same because CNMT Integrity is established.

Comment:

PERFORMANCE INFORMATION

- ✓ **Performance Step: 24** AOP-020 Section 3.3 Step 14 (Continuous Action)
MAINTAIN Seal ΔP on running RCPs ABOVE 200 psid.
- STOP any RCP with seal ΔP at or below 200 psid.

Standard: Unable to maintain proper ΔP then stops all running RCP's.

Examiners Note:

The candidate may have already secured the RCP's as soon as RCP seal ΔP decreased to < 200 psid based on ALB-008 guidance or the Precautions and Limitations of OP-100 for operating the RCPs.

Comment:

- AOP-020 Section 3.3 Step 15
Performance Step: 25 CHECK charging flow rate ABOVE 50 gpm.

Standard: Answers YES.

Comment:

PERFORMANCE INFORMATION

AOP-020 Section 3.3 Step 16

- ✓ **Performance Step: 26** ISOLATE RHR as follows:
- a. STOP ALL running RHR pumps.
 - b. SHUT AT LEAST ONE RHR pump loop suction valves:
 - 1RH-1, RCS Loop A to RHR Pump A
 - 1RH-2, RCS Loop A to RHR Pump A
 - 1RH-39, RCS Loop C to RHR Pump B
 - 1RH-40, RCS Loop C to RHR Pump B

Standard: Stops both RHR Pumps.
Shuts at least 1RH-1 or 1RH-2 and 1RH-39 or 1 RH-40.

Evaluator Note:	The critical task is to stop both RHR Pumps and close at least one series valve in each line. Evaluation on this JPM is complete. Announce – END OF JPM
------------------------	--

Comment:

Terminating Cue:	After both RHR Pumps are stopped and the suction lines are isolated.
-------------------------	---

STOP TIME: _____

Simulator Operator:	<i>When directed by the Lead Examiner go to Freeze.</i>
----------------------------	--

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 NRC Exam Sim JPM D

Loss of RCS Inventory with RHR Cooling in Progress

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 is in Mode 5 on RHR.
- There is a bubble in the pressurizer.
- Containment integrity is established.
- Pressurizer level is 88% Cold Cal (LI-462) and being maintained high in anticipation of going solid.
- RCS temperature is stable at ~140°F.
- All 3 RCP's are in operation

INITIATING CUE:

Your position is the OAC. Maintain current plant conditions.

Worksheet

Facility: Shearon Harris Task No.: 061007H101

Task Title: Using ESW System As A Backup JPM No.: 2011 NRC Exam
Source Of Water To AFW Sim JPM E

K/A Reference: 054 AA1.01 4.5 / 4.4 **ALTERNATE PATH - NO**

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 LOCA has occurred and PATH-1 is being implemented. Both A and B Motor Driven AFW pumps are in operation.

Initiating Cue: A leak has developed in the Condensate Storage Tank (CST) and level has decreased to less than 10 percent.

Your directions are to secure the B Motor Drive AFW pump then switch the AFW water supply from the CST to ESW Header A for the A Motor Driven AFW pump and the Turbine Driven AFW pump per OP-137, Section 8.1.

ONLY one Train of ESW will be aligned to the suction of the AFW pumps to prevent both Trains of Containment Fan Coolers from becoming inoperable.

Worksheet

Task Standard: Train A ESW is supplying AFW pumps.

Required Materials: None

General References: OP-137 Rev. 30, OP-169 Rev. 19

Time Critical Task: No

Validation Time: 10 Minutes

CRITICAL STEP JUSTIFICATION	
Step 10	Opening 1SW-121SA provides ESW suction from the A header to the "A" MDAFW pump
Step 11	Opening 1SW-123SA provides ESW suction from the A header to the "A" MDAFW pump
Step 22	Opening 1SW-124SA provides ESW suction from the A header to the TDAFW pump
Step 23	Opening 1SW-126SA provides ESW suction from the A header to the TDAFW pump

Worksheet

SIMULATOR SETUP

For the 2011 ILC NRC exam

***Simulator Operator - Exam Setup**

- **Reset to IC-169 password "hotwheels"**
- **NOTE: It may be necessary to override the 86 Generator lockouts if they are tripped prior to going to run.**
- **Go to RUN**
- **Silence and Acknowledge annunciators**
- **GO TO FREEZE** and inform the lead examiner the Simulator is ready. **DO NOT GO TO RUN** until directed by the lead examiner. (The examiner has provided to the candidate with initial conditions and the initiating cues prior to placing the simulator in RUN.)

The following setup has been saved to IC-169 on the Master Portable Hard Drive

- Initial Simulator IC was IC-19
- IMF LT:901a (n 0 0) 8.5 0
(Level transmitter LI-9010A1 SA should read 8.5 %)
- IMF LT:901b (n 0 0) 8.3 0
(Level transmitter LI-9010B1 SB should read 8.3%)

- 3 Annunciators will be on due to these actions:
ALB-017-4-5 CST Empty
ALB-017-5-5 CST Low Minimum Level
ALB-017-6-5 CST Hi-Hi/Lo-Lo Level
- IMF RCS18A (n 0 0) 15 0
Small Break LOCA A Loop 15% of 4.5" line
- Implement PATH-1
- Secure the TDAFW Pump
 - Close 1MS-70
 - Close 1MS-72

- Restore power to 1A-1 and 1B-1
- Reduce AFW flow to 300 KPPH total
- Silence, acknowledge and reset annunciators
- GO TO FREEZE and create a snap IC

PERFORMANCE INFORMATION

START TIME: _____

Simulator Operator:	When directed by the Lead Examiner go to Run.
----------------------------	--

Evaluator Note:	There isn't a step in OP-137 that directs when to secure the B MDAFW Pump. It will be at the candidate's discretion when to stop the pump. The JPM step to stop the pump is placed after lining up ESW to the A MDAFW Pump just as a place keeper. The candidate can secure the B MDAFW at any time prior to, during, or after the ESW alignment.
------------------------	--

Performance Step: 1 OBTAIN PROCEDURE**Standard:** Locates OP-137 and refers to Section 8.1 and reviews initial conditions.**Evaluator Cue:** Provide the candidate with OP-137 section 8.1 (**and** a copy of OP-169 section 7.1 when candidate determines the need to secure fans per OP-169)**Initial conditions have been met for OP-137 Section 8.1.****Comment:**

OP-137 section 8.1 Cautions prior to step 1

Performance Step: 2 Caution: The Emergency Service Water System serves as a backup source of water to the Auxiliary Feedwater System if the Condensate Storage Tank volume is exhausted or unavailable. Since the Emergency Service Water System uses raw reservoir water, it is only used in extreme emergencies.

Caution: Isolating Service Water to the Containment Fan Coolers will make the Coolers inoperable, therefore only one Train of ESW should be aligned to the suction of the AFW pumps unless a determination has been made on the desirability of making both Trains of Containment Fan Coolers inoperable.

Standard: Read cautions and circle/slashes each**Comment:**

PERFORMANCE INFORMATION

Performance Step: 3 OP-137 section 8.1 Step 1
 To supply AFW Pump 1A-SA from ESW header A, Perform the following:
 a. Declare A train Containment Fan Coolers inoperable

Standard: Notifies CRS to declare A Train of Containment Fan Coolers INOPERABLE

Evaluator Cue:	CRS acknowledges 'A' CFCs are inoperable
-----------------------	---

Comment:

Evaluator NOTE:	After Candidate determines that they need to use OP-169 to perform the next step then provide the candidate with a marked up copy of OP-169 Sect. 7.1
------------------------	--

CUE: The CRS has reviewed OP-169 and has N/A'd the steps that are not required to be performed.

Performance Step: 4 OP-137 section 8.1 Step 1.b
 Verify A Train Containment Fan Coolers are secured per OP-169

Standard: Obtains copy of OP-169 Rev. 17 and refers to step 2
 Locates switch for AH-2 A-SA and positions switch to STOP
 Locates switch for AH-3 A-SA and positions switch to STOP

Comment:

Performance Step: 5 OP-137 section 8.1 Step 1.c
 SHUT 1SW-92 SA, CNMT FAN COOLER AH-3 INLET

Standard: Locates MCB switch for 1SW-92. Positions switch to SHUT

Comment:

PERFORMANCE INFORMATION

OP-137 section 8.1 Step 1.d
Performance Step: 6 SHUT 1SW-97 SA, CNMT FAN COOLER AH-3 OUTLET
Standard: Locates MCB switch for 1SW-97. Positions switch to SHUT

Comment:

OP-137 section 8.1 Step 1.e
Performance Step: 7 SHUT 1SW-91 SA, CNMT FAN COOLER AH-2 INLET
Standard: Locates MCB switch for 1SW-91. Positions switch to SHUT

Comment:

OP-137 section 8.1 Step 1.f
Performance Step: 8 SHUT 1SW-109 SA, CNMT FAN COOLER AH-2 OUTLET
Standard: Locates MCB switch for 1SW-109. Positions switch to SHUT

Comment:

OP-137 section 8.1 Step 1.g
Performance Step: 9 CLOSE 1SW-122, AFW PUMP 1A-SA SW DRAIN ISOLATION.
Standard: Directs AO to SHUT 1SW-122

Simulator Operator:	<p>NOTE: 1SW-122 is not modeled on the Simulator</p> <p>AO acknowledges direction to shut 1SW-122, AFW Pump 1A-SA SW Drain Isolation.</p> <p>Pause 10-15 seconds then report that 1SW-122, AFW Pump 1A SW Drain Isolation has been SHUT</p>
----------------------------	--

Comment:

PERFORMANCE INFORMATION

- OP-137 section 8.1 Step 1.h
- ✓ **Performance Step: 10** OPEN 1SW-121SA, SW HEADER A TO AUX FW MOTOR PUMP A-SA.
- Standard:** Locates MCB control switch for 1SW-121 and takes it to OPEN.
- Comment:**
- OP-137 section 8.1 Step 1.i
- ✓ **Performance Step: 11** OPEN 1SW-123SA, SW HEADER A TO AUX FW MOTOR PUMP A-SA.
- Standard:** Locates MCB control switch for 1SW-123 and takes it to OPEN.
- Comment:**
- OP-137 section 8.1 Step 1.j
- Performance Step: 12** Monitor AFW system parameters to ensure proper operation.
- Standard:** Monitors PI-2150A1 A DISCH PRESS and PI-2250A1 A SUCT PRESS/ Monitors Aux Feedwater Flow on FI-2050A1, B1, and C1.
(Candidate may report to CRS that ESW is aligned to A AFW Pump. If so acknowledge information and direct candidate to continue lineup)
- Comment:**
- Performance Step: 13** STOPS B MDAFW PUMP
- Standard:** Locates MCB control switch for B MDAFW and positions switch to STOP.
- Comment:**

PERFORMANCE INFORMATION

Performance Step: 14 OP-137 section 8.1 Caution prior to step 3
CAUTION: Do NOT cross tie the ESW trains together via the TDAFW pump suction supply from ESW. Crosstie is prevented by performing only Step 8.1.2.3 OR 8.1.2.4

Standard: Reads caution and circle/slashes caution

Comment:

Performance Step: 15 OP-137 section 8.1 Step 3
To supply AFW Pump 1X-SAB from ESW header A:
a. Declare A train Containment Fan Coolers inoperable

Standard: No action required (already declared)

Comment:

Performance Step: 16 OP-137 section 8.1 Step 3.b
Verify A Train Containment Fan Coolers are secured per OP-169

Standard: No action required (already performed)

Comment:

Performance Step: 17 OP-137 section 8.1 Step 3.c
Verify shut 1SW-92 SA, Cnmt Fan Cooler AH-3 inlet

Standard: No action required (already performed)

Comment:

PERFORMANCE INFORMATION

Performance Step: 18 OP-137 section 8.1 Step 3.d
Shut 1SW-97 SA, Cnmt Fan Cooler AH-3 outlet

Standard: No action required (already performed)

Comment:

Performance Step: 19 OP-137 section 8.1 Step 3.e
Verify shut 1SW-91 SA, Cnmt Fan Cooler AH-2 inlet

Standard: No action required (already performed)

Comment:

Performance Step: 20 OP-137 section 8.1 Step 3.f
Verify Shut 1SW-109 SA, Cnmt Fan Cooler AH-2 outlet

Standard: No action required (already performed)

Comment:

Performance Step: 21 OP-137 section 8.1 Step 3.g
Shut 1SW-125, AFW Pump 1X-SAB SW Header A Drain Isolation

Standard: Contacts AO and tells him to close 1SW-125.

Simulator Operator: **NOTE: 1SW-125 is not modeled on the Simulator.**

AO acknowledges direction to shut 1SW-125, AFW Pump 1X-SAB SW Header A Drain Isolation.

(Pause 10 – 15 seconds) AO reports 1SW-125 closed.

Comment:

PERFORMANCE INFORMATION

- OP-137 section 8.1 Step 3.h
- ✓ **Performance Step: 22** Open 1SW-124SA, SW Header A To Aux FW Turbine Pump
- Standard:** Locates MCB control switch for 1SW-124 and takes it to OPEN.

Comment:

- OP-137 section 8.1 Step 3.i
- ✓ **Performance Step: 23** Open 1SW-126SA, SW Header A To Aux FW Turbine Pump
- Standard:** Locates MCB control switch for 1SW-126 and takes it to OPEN.

Comment:

- OP-137 section 8.1 Step 3.j
- Performance Step: 24** Monitor AFW System to ensure proper operation.

Standard: No action required 1X-SAB AFW pump is not running but TDAFW pump Suction pressure should be seen to increase.

Report to CRS that 'A' ESW Header is supplying the 'A' MDAFW pump and the TDAFW pump.

Evaluator Cue:	CRS acknowledges that 'A' ESW Header is supplying the 'A' MDAFW Pump and the TDAFW Pump.
-----------------------	---

Announce: End of JPM

Comment:

Terminating Cue:	Completion of ESW line up and report to CRS that 'A' ESW Header supplying both A MDAFW Pump and the TDAFW pump.
-------------------------	--

STOP TIME: _____

Simulator Operator:	When directed by the Lead Examiner go to Freeze.
----------------------------	---

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 NRC Exam Sim JPM E

Using ESW System As A Backup Source Of Water To AFW

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 LOCA has occurred and PATH-1 is being implemented. Both A and B Motor Driven AFW pumps are in operation.

Initiating Cue: A leak has developed in the Condensate Storage Tank (CST) and level has decreased to less than 10 percent.

Your directions are to secure the B Motor Drive AFW pump then switch the AFW water supply from the CST to ESW Header A for the A Motor Driven AFW pump and the Turbine Driven AFW pump per OP-137, Section 8.1.

ONLY one Train of ESW will be aligned to the suction of the AFW pumps to prevent both Trains of Containment Fan Coolers from becoming inoperable.

Worksheet

Facility: Shearon Harris Task No.: 301151H601

Task Title: Reduce Containment Spray flow JPM No.: 2011 NRC Exam
Sim JPM F

K/A Reference: 026 A4.01 (4.5) **ALTERNATE PATH - NO**

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.
 - Both RHR Pump breakers have tripped. Maintenance is investigating.
 - The RED on Integrity and the ORANGE on Core Cooling has been addressed and FRP-P.1 was exited.
 - The crew has transitioned to EPP-012, Loss of Emergency Coolant Recirculation, and has completed Step 4.

Initiating Cue: You are directed to perform EPP-012 beginning at Step 5.

Worksheet

Task Standard: Containment Spray Pump flow reduced to no pumps running.

Required Materials: None

General References: EPP-012, Loss of Emergency Coolant Recirculation, Revision 26

Handout: Use simulator copy of EPP-012. Ensure that a clean copy is ready to replace the used one after each JPM.

Time Critical Task: No

Validation Time: 5 minutes

CRITICAL STEP JUSTIFICATION

Step 5 Determining the number of Containment Spray Pumps required and then securing the not needed Containment Spray pumps will conserve RWST inventory.

SIMULATOR SETUP

For the 2011 ILC NRC exam

***Simulator Operator - Exam Setup**

- **Reset to IC-170 password “hotwheels”**
- **NOTE: it may be necessary to override the 86 Generator lockouts if they are not rolled prior to going to run**
- **Go to RUN**
- **Silence and Acknowledge annunciators**
- **GO TO FREEZE** and inform the lead examiner the Simulator is ready. **DO NOT GO TO RUN** until directed by the lead examiner. (The examiner has provided to the candidate with initial conditions and the initiating cues prior to placing the simulator in RUN.)

The following setup was used to create this JPM exam snap

- Initial Simulator IC to IC-19, 100% power
- Initiate a LBLOCA
 - imf rcs01 100%
- Perform PATH-1
- Trip both RHR Pumps near the EPP-012 transition point
 - Imf rhr01a TRIP
 - Imf rhr01b TRIP
- Transition to EPP-012
- Perform EPP-012 through Step 4 “Reset SI Suction Auto Switchover”
- Reset SI
- Run AMS file CVC/PATH-1 Att. 6 CSIP suction valves power
- Run AMS file SI Accum power apply

Clear annunciators

Go to FREEZE and save IC conditions

PERFORMANCE INFORMATION

Examiner Note:

If the candidate identifies a RED CSFST on Core Cooling cue them: The CRS and the other board operator will address this condition – Continue with implementation of EPP-012.

Simulator Operator:

When directed by the Lead Examiner go to Run.

START TIME: _____

- Performance Step: 1** EPP-012, Step 5
Verify Containment Fan Coolers – one fan per unit running in SLOW speed.
- Standard:** Determines Containment Fan Coolers are running with one fan per unit in SLOW speed.
- Comment:**
- Performance Step: 2** EPP-012, Step 6
Check RWST level - greater than 3% (Empty alarm)
- Standard:** Verifies RWST level greater than 3% by level indication and/or alarm ALB-004-2-5 clear.
- Comment:**
- Performance Step: 3** EPP-012, Step 7.a
Determine CNMT requirements.
- Spray Pump suction – aligned to RWST
- Standard:** Verifies RWST to CNMT Spray Pump suction valves 1CT-26 and 1CT-71 are aligned to RWST (RED lights).
- Comment:**

PERFORMANCE INFORMATION

	EPP-012, Step 7.b
Performance Step: 4	Determine the required number of CNMT Spray Pumps from Table
Standard:	<ul style="list-style-type: none">• Applies existing RWST level (~ 65%), CNMT Pressure (~ 18 PSIG) and number of CNMT Fan Coolers running (4) to Table.• Determines NO CNMT Spray Pumps are required.
Comment:	
	EPP-012, Step 7.c
✓ Performance Step: 5	Verify spray pumps – required number running.
Standard:	Stops both Containment Spray Pumps.
Comment:	
	EPP-012, Step 7.d
Performance Step: 6	Shut CNMT Spray Pumps discharge valves stopped in 7.c
Standard:	<ul style="list-style-type: none">• Shuts 1CT-50 (“A” CT Pump discharge)• Shuts 1CT-88 (“B” CT Pump discharge)
Comment:	
	EPP-012, Step 8
Performance Step: 7	Align CNMT Spray Pumps for Recirculation: Any CNMT spray pump RUNNING (NO) GO TO Step 9
Standard:	Reads step and determines RNO appropriate
Comment:	

PERFORMANCE INFORMATION

Performance Step: 8 EPP-012, Step 9
Add Makeup To RWST Using OP-107.01, "CVCS BORATION, DILUTION, AND CHEMISTRY CONTROL", Section 8.4

Standard: Reads step and determines RWST will need to have Makeup

Evaluator Cue: Another operator will perform the steps to add makeup to the RWST.

Announce: End of JPM

Comment:

Terminating Cue: When the applicant has secured both the 'A' and 'B' trains of Containment Spray
Evaluation on this JPM is complete.

STOP TIME: _____

Simulator Operator: When directed by the Lead Examiner go to Freeze.

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 NRC Exam Sim JPM F

Reduce Containment Spray flow

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.
- Both RHR Pump breakers have tripped. Maintenance is investigating.
- The RED on INTEGRITY has been addressed and FRP-P.1 was exited.
- The crew has transitioned to EPP-012, Loss of Emergency Coolant Recirculation, and has completed Step 4.

INITIATING CUE:

You are directed to perform EPP-012 beginning at Step 5

Facility: Shearon Harris Task No.: 064002H101
 Task Title: Start EDG 1A-SA From The MCB JPM No.: 2011 NRC Exam
Sim JPM G

K/A Reference: 064 A4.06 RO 3.9 SRO 3.9 **ALTERNATE PATH - YES**

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 is operating at 100% power. Monthly testing of the 1A-SA EDG is in progress.

Initiating Cue: Your position is the BOP; the CRS has directed you to Start Diesel Generator 1A-SA from the MCB, using section 5.1 of OP-155 for hot torques.
 The EDG was barred 20 minutes ago by the AO who is stationed locally at the 1A-SA EDG.
 For this JPM we will be using the telephone instead of headsets to communicate with the AO at the EDG.

Worksheet

Task Standard: EDG 1A-SA has been stopped after reports of the crankcase relief lifting, IAW OP-155 Precaution and Limitation #2.

Required Materials: Headphones (simulated)

General References: OP-155 Section 5.1 Rev. 52

Time Critical Task: No

Validation Time: 10 minutes

Critical Step Justification	
Step 7	The MCB EDG start switch must be placed to START for the test to begin and the engine to run.
Step 8	The MCB EDG Stop or Emergency Stop switch must be used to stop the EDG when it is operating with a condition identified as a major mechanical problem in the Precautions and Limitations of the Operating procedure.

SIMULATOR SETUP

For the 2011 NRC Exam Simulator JPM 'G'

Simulator Operator - Exam Setup

Reset to IC-170 password "hotwheels"

- **NOTE: A conditional trigger (Trigger 1) is set to actuate when 'A' EDG is started. DO NOT RUN THIS TRIGGER it will run itself.**
- When using this JPM, you must also load 3 APP files to simulate the annunciators and starting of the Aux Oil Pump during the AO testing at the Local Engine Control Panel. Six alarms come on with the local alarm test, one alarm comes on during the ground alarm test, and 1 alarm will illuminate during the Aux Oil Pump start. The APP files are:
 - dsg\DSG_A_LOCAL_Alarm_Test
 - dsg\DSG_A_LOCAL_Ground_Alarm_Test
 - dsg\DSG_A_Aux_OilPump_Start
- Go to RUN

Silence and Acknowledge annunciators

GO TO FREEZE and inform the lead examiner the Simulator is ready. **DO NOT GO TO RUN** until directed by the lead examiner. (The examiner has provided to the candidate with initial conditions and the initiating cues prior to placing the simulator in RUN.)

The following setup information is how this exam IC was developed.

- Reset to Simulator IC-19

How to create the conditional trigger used in this JPM:

- Open DSG malfunctions and place DSGO1 'A' (Diesel Generator Failure for 'A' EDG) with a 2 minute time delay on Event Trigger 1
- Go to the Event Trigger Summary, you should now have '1' in the assigned count for Trigger 1. Now single click on Trigger 1
- Click on Assign File. A window will open – find file (EDGASStart) and then click assign. You have now set Trigger 1 to activate when 'A' EDG is started. Trigger 1 should show a source file and a description. This file will go TRUE when 'A' EDG is started.

Trigger 1 will cause the EDG to trip on a non-emergency trip after 2 minutes. This will allow the candidate to have time to secure the EDG but simulate that the EDG will automatically trip if nothing is done.

After the conditional trigger is created then:

- Freeze and Snap these conditions to an IC for future use

PERFORMANCE INFORMATION

START TIME: _____

Evaluator Note:	<p>The candidates should be briefed outside of the Simulator prior to performing this JPM. Provide them with a copy of the procedure and inform them that ALL initial conditions are satisfied.</p> <p>This will allow them to review the Precautions and Limitations associated with OP-155 and have time for a task preview of the steps to accomplish starting the EDG. Expect that the candidates will take about 10 - 15 minutes to complete this review.</p>
------------------------	--

Simulator Operator:	<i>When directed by the Lead Examiner go to Run.</i>
----------------------------	---

Performance Step: 1	<p>OP-155 Obtains OP-155, observes note in Section 5.0 and refers to Section 5.1, Control Room Manual Start</p>
Standard:	Reviews Prerequisites, Precautions and Limitations and Initial Conditions

Evaluator Cue:	All initial conditions have been satisfied.
-----------------------	--

Comment:

Performance Step: 2	<p>Step 1 NOTIFY Maintenance of the approximate EDG start time to enable them to perform any desired EDG checks.</p>
Standard:	Contacts Maintenance of approximate EDG start time

Evaluator Cue:	Maintenance has previously been contacted and does not desire to perform any EDG checks.
-----------------------	---

Comment:

PERFORMANCE INFORMATION

Performance Step: 3 **Step 2**
VERIFY service water flow has been established to the EDG per OP-139.

Standard: Locates indications for A ESW header and determines A header is in service

Comment:

Performance Step: 4 **Step 3**
IF the EDG is to be operated as a result of entering an Action Statement of Tech Spec 3.8.1.1. **THEN PERFORM** the following:

Standard: Determines that Action Statement is not required by Initial Condition that this is a monthly test. May ask CRS if testing per 3.8.1.1 Action Statement.

Evaluator Cue: Tech. Spec. 3.8.1.1 Action Statement is not required.
--

Comment:

Performance Step: 5 **Step 4**
IF the EDG has NOT been operated OR barred in the past 8 hours, **THEN BAR** the EDG per Attachment 8.

Evaluator Cue: (Part of turnover) The EDG was barred 20 minutes ago.
--

Comment:

PERFORMANCE INFORMATION

Performance Step: 5 **Step 5**
STATION an Operator at the EDG to be started.

Evaluator Cue: **(Part of turnover) An AO is stationed at the 1A-SA EDG and is awaiting directions.**

Simulator Operator: **Using a copy of OP-155 section 5.0 (Startup), communicate as the AO stationed at EDG via telephone.**

Evaluator/Simulator Operator Note: **The candidate may direct the AO to perform steps 6-13 many different ways. Information is provided for some of the ways expected. After performing the actions ensure that the candidate is informed of completion. The following information is provided IF steps 6-11 are directed then steps 12-13.**

Simulator Operator: Steps 6 – 10.b do not require simulator actions

Step 10.c requires the local operator to test the annunciators (this test will cause 6 annunciators to alarm simultaneously)

Run APP File - **dsg\DSG_A_Local_Alarm_Test**

Wait for the candidate to acknowledge and clear the alarms:

Step 10.d requires the local operator to test the ground annunciator

Run APP File - **dsg\DSG_A_LOCAL_Ground_Alarm_Test**

Step 12 requires only a reply that the Lube Oil Circ Pump control switch is in STOP.

Step 13.a requires the local operator to start the Aux Lube Oil Pump

Run APP File - **dsg\DSG_A_Aux_OilPump_Start**

After completing steps 6-13 report you are standing by at the EDG and are ready monitor the EDG start.

PERFORMANCE INFORMATION

IF the candidate wants to direct steps 6-13 individually to the AO then use this report:

Note: AO field reports are in BOLD

Step 6. Using TI-2479A, CHECK the following Jacket Water and Lube oil System temperatures are \geq to 137°F

- Lube Oil Inlet Indication 19 **(153°F)**
- Lube Oil Outlet Indication 20 **(155°F)**
- Jacket Water Inlet Indication 21 **(154°F)**
- Jacket Water Outlet Indication 22 **(157°F)**

Step 7 will be N/A because all temperatures are $>$ 137°F

Step 8. Verify actual governor controls are positions to the listed settings:

- Verify governor control settings for Load Limit **(Load Limit – Max Fuel)**
Speed Droop **(Speed Droop 1.0)**
Speed **(Speed 14.22)**

Step 9. At GCP, Verify the Unit-Parallel switch in Parallel **(in Parallel)**

Step 10. a. Verify the A Control circuit Operation Mode indicator light is LIT **(it is LIT)**

b. Verify the B Control Circuit Operational Mode indicator light is LIT **(it is LIT)**

c. Verify all annunciator windows test SAT

Run APP File - **dsg\DSG_A_Local_Alarm_Test**

d. Depress Ground Test pushbutton

Run APP File -

dsg\DSG_A_LOCAL_Ground_Alarm_Test

Check the Annunciator Ground window is LIT **(it is/was LIT)**

Release Ground Test pushbutton **(it is released)**

Step 11. Verify the Aux Lube Oil Pump has been stopped for 5 min

(It has been stopped for >5 minutes)

Step 12. At ECP, Place Lube Oil Circ Pump control switch to STOP **(Lube Oil Circ Pump switch is in stop)**

Step 13. At ECP, Perform the following to prelube the engine:

Run APP File - **dsg\DSG_A_Aux_OilPump_Start**

(report Aux Lube Oil Pump is running)

Check All of the following conditions exist for a minimum of 15 seconds, prior to starting the EDG:

Right Turbo Oil Press indication \geq 20 psig **(YES)**

Left Turbo Oil Press indication \geq 20 psig **(YES)**

Lube Oil Press indicator \geq 40 psig **(YES)**

PERFORMANCE INFORMATION

Comment:**Performance Step: 6****Caution before Step 14****CAUTION**

- EDG speed should exceed 200 RPM in 16 seconds or less during a manual start. EDG speed should exceed 200 RPM in 6 seconds or less during an emergency start. The Failure to Start annunciation will occur about 35 seconds after a start signal and would be indicated by engine speed only reaching 170 to 180 RPM or less and then slowly decreasing.
- EDG field flashing will occur at 360 to 380 RPM for a normal slow start. EDG field flashing will occur at 190 to 210 RPM for an emergency start. If EDG fails to start field flashing will remain energized resulting in possible fire in GCP control section. Placing the DIESEL GENERATOR A-SA (B-SB) control switch to STOP will deenergize field flashing circuit.

Standard:

Reviews and Circle/Slash Caution

Comment:✓ **Performance Step: 7****Step 14,15,16**

At MCB, PERFORM the following:

- **PLACE** DIESEL GENERATOR A-SA (B-SB) control switch to *START*.
- **MONITOR** engine speed.
- **IF** speed does not exceed 200 RPM within 16 seconds, **THEN PLACE** the DIESEL GENERATOR A-SA (B-SB) control switch to STOP.

Standard:

Directs Local Operator to be prepared to perform steps 16 – 20 then locates start switch for 1A-SA EDG and places switch to start, monitors engine speed for an increase of > 200 rpm.

Comment:**Simulator Operator:**

Report back as the local operator that you are standing by for the start and prepared to perform steps 16- 20.

PERFORMANCE INFORMATION

Simulator Operator: Wait ~ 10 seconds after start of EDG then report as the AO that the crank case relief is lifting and there is oil spraying on the side of the engine.
The operator could possibly direct the AO to secure the EDG locally. If this happens immediately report that you are unable to secure the EDG locally.

✓ **Performance Step: 8** Stop the EDG per Precaution and Limitations #2 – Crank case relief operation is indication of major mechanical problems. If trip does not occur diesel engine should be shut down immediately.

Standard: Informs the CRS of AO report and secures EDG by taking the control switch to STOP or the Emergency Stop Switch to STOP.

Evaluator Cue: **IF NEEDED: IF the CRS is informed that the crankcase relief is lifting - acknowledge the information. Direct the BOP to monitor the EDG and comply with OP-155.**

Comment:

Evaluator Note: The EDG will trip 2 minutes after starting IF not secured by the applicant. If allowed to run ALB 024 windows 3-1 and 3-2 will alarm indicating that the EDG has tripped and the start-stop switch indication will go from RED to GREEN. To protect the EDG and personnel at the EDG the Diesel should be immediately shutdown per P&L #2.

Evaluator Cue: After applicant reports the EDG problem AND secures the EDG: Evaluation on this JPM is complete.
Announce: END OF JPM

STOP TIME: _____

Simulator Operator: *When directed by the Lead Examiner go to Freeze.*

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 NRC Exam Sim JPM G

Start EDG 1A-SA From The MCB

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

Initial Conditions:

The plant is operating at 100% power. Testing of the 1A-SA EDG is in progress.

Initiating Cue:

Your position is the BOP; the CRS has directed you to Start Diesel Generator 1A-SA from the MCB, using section 5.1 of OP-155 for hot torques.

The EDG was barred 20 minutes ago by the AO who is stationed locally at the 1A-SA EDG. For this JPM we will be using the telephone instead of headsets to communicate with the AO at the EDG.

Worksheet

Facility: HARRIS Task No.: 301064H401

Task Title: Respond to a rupture in the Instrument Air Header at 50% power JPM No.: 2011 NRC Exam Sim JPM H

K/A Reference: APE065 AA2.06 (3.6/4.2) **ALTERNATE PATH - YES**

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

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 operating at 50% power during a startup
- Startup is on hold due to chemistry concerns

Initiating Cue: You are the OAC. Your directions are to maintain current plant conditions.

NOTE:

AFTER the Reactor Trip Immediate actions of PATH-1 are completed, in addition to a Simulator Operator this JPM will require a 2nd board operator to control AFW flow and silence annunciators not related to this JPM.

Worksheet

Task Standard: Trips the reactor, carries out immediate actions of PATH-1

Required Materials: AOP-017, Rev 32

General References: AOP-017, Rev 32

Handout:

Time Critical Task: No

Validation Time: 15 min

CRITICAL STEP JUSTIFICATION

Step 5 Identification of the need to trip the Reactor and carrying out the immediate actions of PATH-1 will place the plant in a known stable condition.

Step 12 The controllers listed in this attachment are positioned as specified by the operator at a point directed by the procedure main body, in order to ensure that the controlled devices will remain in an appropriate condition after restoring air pressure. At that point in the event, the operator can recover the systems in a controlled manner.

Step 13 The controllers listed in this attachment are positioned as specified by the operator at a point directed by the procedure main body, in order to ensure that the controlled devices will remain in an appropriate condition after restoring air pressure. At that point in the event, the operator can recover the systems in a controlled manner.

SIMULATOR SETUP

Simulator Operator - Exam Setup

Reset Simulator to IC-172 PW "hotwheels"

Initial conditions Reactor ~50% power

Plant status board updated per IC-5 data

Go to RUN

Silence and Acknowledge annunciators

GO TO FREEZE and inform the lead examiner the Simulator is ready. DO NOT GO TO RUN until directed by the lead examiner. (The examiner has provided to the candidate with initial conditions and the initiating cues prior to placing the simulator in RUN.)

NOTE: Since the candidate will be using the Simulator copy of AOP-017 ensure that replacement copies are made prior to starting the JPM. REPLACE THE ENTIRE PROCEDURE AFTER EACH CANDIDATE COMPLETES THIS JPM.

The following setup information is how this exam IC was developed.

- JPM is built from IC-5
- Disable 'A' and 'B' Air Compressors by shutting compressor discharge valves
- On Trigger 1 place a trip of the 'C' Air Compressor and an Instrument Air Header Rupture (severity of 100%)
 - ifr air002 (1 0 0) 0 0 0 (Air Comp 1A Disc Valve shut)
 - ifr air003 (1 0 0) 0 0 0 (Air Comp 1B Disc Valve shut)
 - imf air02 (1 0 0) 100 00:05:00 0 (Air header leak 100% 5 min ramp)

Trigger 1 directed by Lead Examiner

Trigger 2 directed by candidate to turn off All Air Compressors

- ifr air012 (2 0 0) LOCKED_OFF (Air Comp 1A Locked Off)
- ifr air013 (2 0 0) LOCKED_OFF (Air Comp 1B Locked Off)
- ifr air020 (2 0 0) STOP (Air Compressor C Stop)

Trigger 3 – Vent IA per request by candidate
(AFTER Instrument Air pressure is < 35 psig)

ifr air024 (3 0 0) 100 0 0 (Opens IA-814 to 100%)

PERFORMANCE INFORMATION

Simulator Operator:**When directed by Lead Examiner go to Run
10-15 seconds after the candidate assumes the watch, insert
Trigger 1****START TIME:** _____**Performance Step: 1**Responds to Instrument Air Header alarms
ALB-02-8-6, Computer Alarm Air Systems

- IF the alarm screen is checked the alarm is due to too many Air Compressors running

Standard:

Diagnoses loss of Instrument air, enters AOP-017

Comment:

AOP-017, Note prior to Step 1

Performance Step: 2

- This procedure contains no immediate actions.
- FW regulating valves receive a shut signal when pressure falls to 60 psig on the Control Air header.
- PI-9751.1, Instrument Air Header Pressure, may not be indicative of pressure throughout the Instrument Air System. The plant should be monitored closely for possible spurious valve operations due to low system pressure.

Standard:Reads note and circle/slashes
Evaluates current air pressure.
(rapidly decreasing and on the way to <35 psig)**Comment:**

PERFORMANCE INFORMATION

- Performance Step: 3** AOP-017, Section 3.0 Step 1
MAINTAIN BOTH of the following:
- ALL Steam Generator levels greater than 30% (YES)
 - Main Feedwater flow to ALL Steam Generators (YES/NO)

NOTE: Depending on how long it takes the operator to get to this step (evaluating Air Compressors, dispatching AO's ect.), Main Feedwater could be lost and/or SG levels could be < 30% Narrow Range.

Standard: Determines all SG levels can/cannot be maintained greater 30% and Feedwater flow continues via the Bypasses

Comment:

- Performance Step: 4** AOP-017, Section 3.0 Step 2
CHECK Instrument Air pressure MAINTAINED ABOVE 35 PSIG. but < 60 psig (NO)

Standard: Determines Instrument Air pressure is <60 psig and cannot maintain FW flows to ALL SG's

**Evaluator / Simulator
Operator Note:**

**Candidates may direct AO's to check Instrument Air compressors and look for air leaks.
Acknowledge any of the requests.**

Comment:

PERFORMANCE INFORMATION

- AOP-017, Section 3.0 Step 2 RNO a.
- √ **Performance Step: 5** IF Reactor is CRITICAL, THEN TRIP the Reactor AND PERFORM EOP PATH-1 while continuing with this AOP.
- Standard:** Trips the reactor and begins to carries out the Immediate Actions of PATH-1
- Verify the Reactor tripped (YES)
 - Verify the Turbine tripped (YES)
 - Safety Injection actuated or required (NO)
 - Emergency Buses energized from Offsite or the Diesels (YES)

Evaluator Cue: Once the immediate actions of PATH-1 have been completed then inform the candidate that “Additional operators will perform actions of PATH-1, CRS directs you to continue on with actions of AOP-017.”

Contact the Simulator Operator and have them act as the 2nd Operator (BOP) and maintain SG levels

Comment:

- AOP-017, Section 3.0 Step 2 RNO NOTE
- Performance Step: 6** Depressurizing Instrument Air precludes spurious valve actuations.

Standard: Reads note and circle/slashes note.

Comment:

PERFORMANCE INFORMATION

Performance Step: 7 AOP-017, Section 3.0 Step 2 RNO b.
STOP ALL air compressors.

Standard: Directs field operator to stop all air compressors.

Simulator Operator: When contacted, acknowledge direction to secure all Air Compressors – RUN TRG-2

Comment:

Performance Step: 8 AOP-017, Section 3.0 Step 2 RNO c.
VENT Instrument Air System until depressurized.

Simulator Operator: IF contacted to vent the IA system, acknowledge direction to do this task and then – RUN TRG-3
NOTE: IA pressure will continue to decrease to 0 psig if the system is vented or not

Standard: Verifies Instrument air system is completely depressurized by the rupture.

Comment:

PERFORMANCE INFORMATION

- Performance Step: 9** AOP-017, Section 3.0 Step 2 RNO d.
VERIFY SHUT ALL MSIVs and MSIV bypasses
- Standard:** Checks all three MSIVs and bypasses SHUT
- Comment:**
- Performance Step: 10** AOP-017, Section 3.0 Step 2 RNO NOTE
NOTE The fail positions of critical valves controlled by Instrument Air can be determined from:
- Drawing 2165-S-0801
 - Attachment 1, Fail Positions for Major Valves Controlled by Instrument Air.
- Standard:** Reads note and circle/slashes note
- Comment:**
- Performance Step: 11** AOP-017, Section 3.0 Step 2 RNO e.
REFER TO Attachment 2, Positioning MCB Controllers, AND PLACE listed controllers in the status indicated.
- Standard:** Goes to Attachment 2
- Comment:**

PERFORMANCE INFORMATION

AOP-017, Attachment 2, Step 1

✓ **Performance Step: 12** PLACE the following MCB controllers in MANUAL with ZERO demand:

- FK-122.1, CHARGING FLOW
- PK-464.1, STEAM DUMP HEADER PRESSURE CONTROLLER
- FK-605A1, RHR HEAT XCHG A BYPASS FLOW CONT
- FK-605B1, RHR HEAT XCHG B BYPASS FLOW CONT
- PK-444C.1, LOOP A (PRZ Normal Spray)
- PK-444D.1, LOOP B (PRZ Normal Spray)
- FK-478, MAIN FW A REGULATOR
- FK-488, MAIN FW B REGULATOR
- FK-498, MAIN FW C REGULATOR
- FK-479.1, MN FW A REG BYP
- FK-489.1, MN FW B REG BYP
- FK-499.1, MN FW C REG BYP

Standard:

Places each controller to MANUAL and lowers the demand to zero

Comment:

PERFORMANCE INFORMATION

AOP-017, Attachment 2, Step 2

- ✓ **Performance Step: 13** PLACE the following MCB controllers in MANUAL with 100% demand:
- HC-186.1, RCP SEAL WTR INJ FLOW
 - HC-603A1, RHR HEAT XCHG A OUT FLOW CONT
 - HC-603B1, RHR HEAT XCHG B OUT FLOW CONT

Standard: Places each controller to MANUAL and raises the demand to 100%

Examiner Cue:	When candidate exits Attachment 2 Announce: END of JPM
----------------------	---

Comment:

Terminating Cue:	When Attachment 2 is exited.
-------------------------	-------------------------------------

STOP TIME: _____

Simulator Operator:	When directed by Lead Examiner go to Freeze
----------------------------	--

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 NRC Exam Sim JPM H

Respond to a rupture in the Instrument Air Header at 50% power

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- The Unit is operating at 50% power during a startup
- Startup is on hold due to chemistry concerns

INITIATING CUE:

You are the OAC. Your directions are to maintain current plant conditions.

Worksheet

Facility: Shearon Harris Task No.: 061012H104

Task Title: Reset the Turbine-Driven AFW Pump Mechanical Overspeed JPM No.: 2011 NRC Exam In-Plant JPM I

K/A Reference: 061 K4.07 RO 3.1 SRO 3.3

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 plant was manually tripped from 100% power due to a loss of the 'A' MFW pump.
- The turbine-driven AFW pump is needed for plant cooldown but the pump tripped on overspeed.
- The cause of the overspeed trip has been identified and corrected.
- Main Steam isolation valves 1MS-70 and 1MS-72 are shut.

Initiating Cue: The CRS has directed you to reset the turbine-driven AFW pump mechanical overspeed trip linkage in accordance with OP-137, Section 8.4. The Trip and Throttle Valve will be reopened from the Control Room. All Initial Conditions are met.

Worksheet

Task Standard: The turbine-driven AFW pump turbine trip and throttle valve is latched.

Required Materials: Standard safety equipment

General References: OP-137, AUXILIARY FEEDWATER SYSTEM, Rev. 30

NOTE: The Probabilistic Safety Assessment for HNP identifies these actions as important to reduction of core damage frequency.

Handout: OP-137, Section 8.4, Rev. 30
OR OP-137, Attachment 6 (locally mounted on wall as an operator aid)

Time Critical Task: No

Validation Time: 7 minutes

Critical Task Justification

Step 7 If the connecting rod is not properly positioned and locked in place the overspeed reset cannot be accomplished.

Step 8 If the tappet nut is not held down properly and in this sequence the overspeed trip cannot be reset.

PERFORMANCE INFORMATION

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Obtain procedure.

Standard: Reviews Section 8.4 Initial Conditions.

Evaluator's Cue: **Provide handout for NRC JPM j.**

Assume that the Mechanical Overspeed Trip Linkage is currently in the tripped position.

Initial conditions are met.

Comment:

OP-137 Section 8.4.2

NOTES prior to step 1

Performance Step: 2 NOTE: Attachment 6 diagram may be used as a reference for nomenclature.

NOTE: If any of the following information is changed, Attachment 6 and local pump information should also be changed.

Standard: Reads and Circle/Slash notes

Comment:

PERFORMANCE INFORMATION

Performance Step: 3 OP-137 Section 8.4.2 step 1
 Resetting the Turbine-Driven AFW Pump Mechanical Overspeed Linkage
 Verify the following valves are shut:

- 1MS-70 SA, MAIN STEAM B TO AUX FW TURBINE
- 1MS-72 SB, MAIN STEAM C TO AUX FW TURBINE

Standard: Status provided in Initial Conditions.

Evaluator's Cue:	If necessary: 1MS-70 and 1MS-72 are shut.
-------------------------	--

Comment:

Performance Step: 4 OP-137 Section 8.4.2 step 2
 CHECK the local red indicating lamp for TURBINE OVERSPEED TRIP is ON

Standard: Verifies that the red lamp is lit for the TURBINE OVERSPEED TRIP on the local control panel.

Evaluator's Cue:	(Lamp is located on Aux Feedwater Control Panel 1X-SAB) The red TURBINE OVERSPEED TRIP lamp is lit.
-------------------------	---

Comment:

Performance Step: 5 OP-137 Section 8.4.2 step 3
 VERIFY the flat side of the tappet nut is aligned toward the tappet lever.

Standard: Verifies flat side of the tappet nut aligned toward the tappet lever.

Evaluator's Cue:	The flat side of tappet nut is aligned toward the tappet lever.
-------------------------	--

Comment:

PERFORMANCE INFORMATION

Performance Step: 6 OP-137 Section 8.4.2 NOTES prior to step 4
NOTE: The next two Steps must be coordinated to ensure proper reset of the Trip and Throttle valve.
NOTE: If the local red indicating lamp for TURBINE OVERSPEED TRIP does not extinguish, it is an indication that one of the limit switches did not reset, and further investigation may be warranted.

Standard: Reads and Circle/Slash notes

Comment:

✓ **Performance Step: 7** OP-137 Section 8.4.2 step 4
PULL the connecting rod toward the Trip and Throttle valve until the rod locks in place AND the local red indicating lamp for TURBINE OVERSPEED TRIP is OFF.

Standard: Locates connecting rod and pulls it toward the trip/throttle valve. Verifies rod locked in place AND the local red indicating lamp for TURBINE OVERSPEED TRIP is OFF.

Evaluator's Cue:	The connecting rod is locked in place and the red indicating lamp for TURBINE OVERSPEED TRIP is OFF. (Light is located on Aux Feedwater Control Panel 1X-SAB)
-------------------------	---

Comment:

PERFORMANCE INFORMATION

✓ **Performance Step: 8** OP-137 Section 8.4.2 step 5
PRESS DOWN AND HOLD the tappet nut in the fully seated position while releasing the connecting rod.

Standard: Presses down and holds the tappet nut in the fully seated position until the connecting rod is released.

Evaluator's Cue: The tappet remains fully seated and the connecting rod is locked in place.

Comment:

Performance Step: 9 OP-137 Section 8.4.2 step 6
VERIFY the Trip and Throttle valve operator in the shut position by observing the T & T VALVE OPERATOR CLOSED light on the Aux Feedwater Control Panel 1X-SAB.

Standard: Verifies trip/throttle valve operator is shut by observing indicating lights on local panel 1X-SAB.

Evaluator's Cue: **The green shut light is ON and the red open light is OFF.
(If necessary: Valve stem indication is at the shut position.)**

Comment:

Performance Step: 10 OP-137 Section 8.4.2 step 7
VERIFY the flat side of the tappet nut is against the tappet lever and fully seated.

Standard: Verifies flat side of the tappet nut against the tappet lever and fully seated.

Evaluator's Cue: **The flat side of tappet nut is against the tappet lever and fully seated.**

Comment:

PERFORMANCE INFORMATION

OP-137 Section 8.4.2 step 8

Performance Step: 11 VERIFY the latch lever is being held up by the trip hook.

Standard: Verifies latch lever is being held up by the trip hook.

Evaluator's Cue:	The latch is being held up by the trip hook.
-------------------------	---

Comment:

OP-137 Section 8.4.2 step 9

Performance Step: 12 VERIFY the TURBINE OVERSPEED TRIP light is extinguished on the AFW Control Panel 1X-SAB

Standard: Verifies TURBINE OVERSPEED TRIP light status on Panel 1X-SAB.

Evaluator's Cue:	The TURBINE OVERSPEED TRIP light is extinguished.
-------------------------	--

Comment:

OP-137 Section 8.4.2 step 10

Performance Step: 13 Notify the Control Room that the mechanical overspeed linkage is reset and inform them they can now open the Trip and Throttle valve.

Standard: Simulates notifying the Control Room.

Evaluator's Cue:	Acknowledge report. END OF JPM
-------------------------	---

Comment:

Terminating Cue: After the Control Room acknowledges the report: This JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 NRC Exam In-Plant JPM I

Reset the Turbine-Driven AFW Pump Mechanical Overspeed

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

Initial Conditions:

- The plant was manually tripped from 100% power due to a loss of the 'A' MFW pump.
- The turbine-driven AFW pump is needed for plant cooldown but the pump tripped on overspeed.
- The cause of the overspeed trip has been identified and corrected.
- Main Steam isolation valves 1MS-70 and 1MS-72 are shut.

Initiating Cue:

The CRS has directed you to reset the turbine-driven AFW pump mechanical overspeed trip linkage in accordance with OP-137, Section 8.4. The Trip and Throttle Valve will be reopened from the Control Room. All Initial Conditions are met.

JPM CUE SHEET

REFERENCE USE

8.4. Resetting the Turbine-Driven AFW Pump Mechanical Over Speed Trip Linkage

8.4.1. Initial Conditions

1. Mechanical Over speed Trip Linkage in the tripped position. _____
2. During normal operations, the cause of any over speed trip of the turbine-driven AFW pump has been investigated and corrected prior to resuming the operation of the pump. _____

8.4.2. Procedural Steps

NOTE: Attachment 6 diagram may be used as a reference for nomenclature.

NOTE: If any of the following information is changed, Attachment 6 and local pump information should also be changed.

1. **VERIFY** the following valves are shut
 - 1MS-70 SA, MAIN STEAM B TO AUX FW TURBINE _____
 - 1MS-72 SB, MAIN STEAM C TO AUX FW TURBINE _____
2. **CHECK** the local red indicating lamp for TURBINE OVERSPEED TRIP is ON. _____
3. **VERIFY** the flat side of the tappet nut is aligned toward the tappet lever _____

NOTE: The next two Steps must be coordinated to ensure proper reset of the Trip and Throttle valve.

NOTE: If the local red indicating lamp for TURBINE OVERSPEED TRIP does not extinguish, it is an indication that one of the limit switches did not reset, and further investigation may be warranted.

4. **PULL** the connecting rod toward the Trip and Throttle valve until the rod locks in place **AND** the local red indicating lamp for TURBINE OVERSPEED TRIP is OFF. _____
5. **PRESS DOWN AND HOLD** the tappet nut in the fully seated position while releasing the connecting rod. _____

JPM CUE SHEET

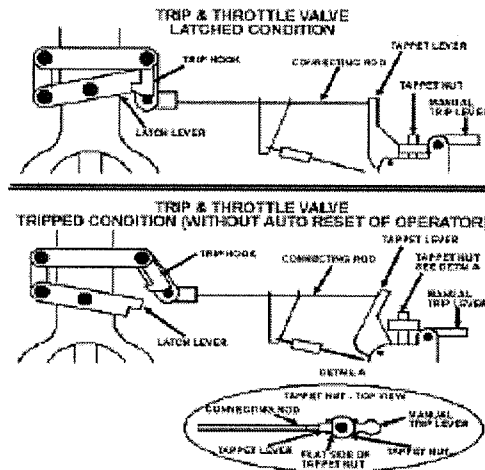
REFERENCE USE

8.4.2 Procedural Steps (continued)

6. VERIFY the Trip and Throttle valve operator in the shut position by observing the T & T VALVE OPERATOR CLOSED light on the Aux Feedwater Control Panel 1X-SAB. _____
7. VERIFY the flat side of the tappet nut is against the tappet lever and fully seated. _____
8. VERIFY the latch lever is being held up by the trip hook. _____
9. VERIFY the TURBINE OVERSPEED TRIP light is extinguished on the AFW Control Panel 1X-SAB. _____
10. OPEN the Trip and Throttle valve from the MCB. _____
11. IF TDAFW pump operation is desired,
THEN GO TO Section 5.5. _____

JPM CUE SHEET

REFERENCE USE

Attachment 6 - Resetting the TDAFW Pump Mechanical Overspeed Trip Linkage
Sheet 1 of 1

1. Verify shut 1MS-70 and 1MS-72.
2. Check the local red indicating lamp for TURBINE OVERSPEED TRIP is ON.
3. Verify the flat side of the tappet nut is aligned towards the tappet lever.

NOTE: The next two Steps must be coordinated to ensure proper reset of the Trip and Throttle Valve.

NOTE: If the local red indicating lamp for TURBINE OVERSPEED TRIP does not extinguish, it is an indication that one of the limit switches did not reset, and further investigation may be warranted.

4. Pull the connecting rod toward the Trip and Throttle valve until the rod locks in place and the local red indicating lamp for TURBINE OVERSPEED TRIP is OFF
5. Press down and hold the tappet nut in the fully seated position while releasing the connecting rod.
6. Verify the Trip and Throttle valve operator in the shut position by observing the T & T VALVE OPERATOR CLOSED light on the Aux Feedwater Control Panel 1X-SAB.
7. Verify the flat side of the tappet nut is against the tappet lever and fully seated.
8. Verify the latch lever is being held up by the trip hook.
9. Verify the TURBINE OVERSPEED TRIP light is extinguished on the Aux Feedwater Control Panel 1X-SAB.
10. Open the Trip and Throttle Valve from the MCB.

NOTE: If any of the above information is changed, also change Section 8.4 and local pump information.

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Worksheet

Facility: Shearon Harris Task No.: _____

Task Title: Align the Train 'A' Battery Charger to the Alternate Power Supply. JPM No.: 2011 NRC Exam In-Plant JPM J

K/A Reference: APE AA1.01 RO 3.4 SRO 3.5 **ALTERNATE PATH - NO**

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 is in Mode 3 following a Reactor Trip due to a loss of Off-Site power and a failure of the 'A' and 'B' EDG to start and load.
The MCR crew has entered EOP-EPP-001, Loss of AC Power to 1A-SA and 1B-SB Buses, they have verified that the Dedicated Shutdown Diesel Generator has started, loaded and is now supplying 1D23 bus.

Initiating Cue: The CRS has directed you to align the 1A-SA battery Charger to the alternate Power Supply IAW EOP-001 step 22 using OP-156.01, AC Electrical Distribution, Section 8.15. Initial conditions are met.

Task Standard: Align a Train 'A' battery Charger to the alternate Power Supply.

Required Materials: none

General References: OP-156.01 (Rev. 31), EOP-EPP-001 (Rev. 35)

Time Critical Task: No

Validation Time: XX minutes

Critical Task Justification

Step 6 Allows charger to be connected to alternate power

Step 7 Allows charger to be connected to alternate power

PERFORMANCE INFORMATION

START TIME: _____

Performance Step: 1 Obtain Procedure **OP-156.01 section 8.15**
(Provided with cue sheet)

Standard: Obtain procedure OP-156.01 section 8.15

Comment:

Performance Step: 2 **OP-156.01 section 8.15.1 Initial Condition**
Battery Charger 1A-SA or Battery Charger 1B-SA has been
removed from service per Section 7.3.

An evaluation of Technical specifications listed in Section 2.2.
has been completed.

Standard: Initial Conditions are met.

Comment:

PERFORMANCE INFORMATION

Performance Step: 3 (OP-156.01 section 8.15.2), Step 1.a
IF aligning Battery Charger 1A-SA to the Alternate Power Supply, THEN PERFORM the following steps:

At Battery Charger 1A-SA CHECK the following switch lineup:

<u>SWITCH</u>	<u>POSITION</u>
AC INPUT	OFF
DC OUTPUT	OFF
NORMAL/EQUALIZE	NORMAL

Standard: Align 1A-SA Battery charger to Shutdown lineup.

Evaluator Cue:	<ul style="list-style-type: none"> • AC INPUT BREAKER IS IN OFF • DC OUTPUT BREAKER IS IN OFF • NORMAL/EQUALIZE SWITCH IS IN NORMAL
-----------------------	--

Comment:

Performance Step: 4 (OP-156.01 section 8.15).2, Step1b.
Check DP-1A-SA-30, Battery Charger 1A-SA, in the OFF position.

Standard: Locate breaker DP-1A-SA-30 and turns it off.

Evaluator Cue:	Breaker DP-1A-SA-30 is OFF
-----------------------	-----------------------------------

Comment:

PERFORMANCE INFORMATION

- Performance Step: 5** (OP-156.01 section 8.15.2), Note before 1.c.
NOTE
- 1EE-E533 MTS-1 is the A Train Alternate Source Selector Switch
 - 1EE-E534 MTS-2 is the Battery Charger 1A-SA Source Selector Switch
 - 1EE-E535 MTS-3 is the Battery Charger 1B-SA Source Selector Switch

Standard: Reads and Circle/Slash Note

Comment:

- ✓ **Performance Step: 6** (OP-156.01 section 8.15.2) step 1.c.
PERFORM the following steps at 1EE-E530,
A - TRAIN BATTERY CHARGERS TRANSFER PANEL
- PLACE 1EE-E533 MTS-1 in ALTERNATE 1D23 SUPPLY TO 1A-SA

Standard: Locate 'A' Train Battery Charger transfer Panel and operate transfer switch as described

Evaluator Cue:	Transfer Switch 1EE-E533 MTS-1 is aligned to ALTERNATE D23 SUPPLY TO 1A-SA
-----------------------	---

Comment:

PERFORMANCE INFORMATION

- ✓ **Performance Step: 7** (OP-156.01 section 8.15.2) step 1.c.
 PERFORM the following steps at 1EE-E530,
 A - TRAIN BATTERY CHARGERS TRANSFER PANEL
- PLACE 1EE-E534 MTS-2 in ALTERNATE 1D23 SUPPLY TO 1A-SA

Standard: Locate 'A' Train Battery Charger transfer Panel and operate transfer switch as described

Evaluator Cue:	Transfer Switch 1EE-E534 MTS-2 is aligned to ALTERNATE 1D23 SUPPLY TO 1A-SA
-----------------------	--

Comment:

- ✓ **Performance Step: 8** (OP-156.01 section 8.15.2) step 1.c.
 PERFORM the following steps at 1EE-E530,
 A - TRAIN BATTERY CHARGERS TRANSFER PANEL
- VERIFY 1EE-E535 MTS-3 in NORMAL 1A31-SA SUPPLY TO 1B-SA

Standard: Locate 'A' Train Battery Charger transfer Panel and operate transfer switch as described

Evaluator Cue:	Transfer Switch 1EE-E535 MTS-3 is aligned to NORMAL 1A31-SA SUPPLY TO 1B-SA Announce: END OF JPM
-----------------------	---

Comment:

Terminating Cue:	After performing step 8.15.1.c at 1EE-E530 Evaluation on this JPM is complete. END OF JPM
-------------------------	--

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011 NRC Exam In-Plant JPM J

Align the Train 'A' Battery Charger to the Alternate Power Supply

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

VERIFICATION OF COMPLETION

BATTERY CHARGER MANUAL TRANSFER SWITCHES

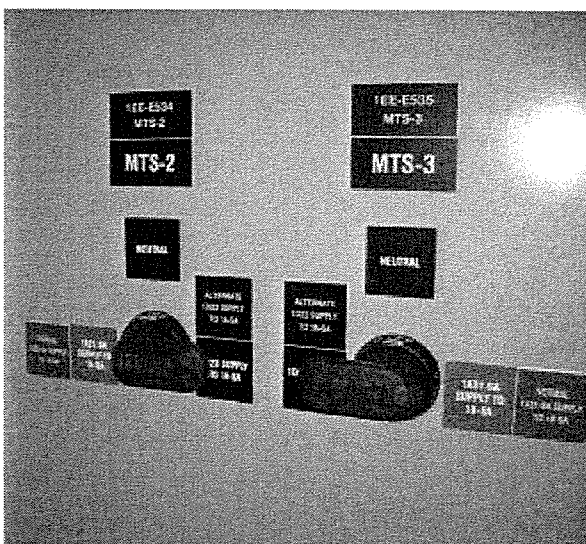
Each charger has a manual transfer switch that selects the normal or alternate AC power source (Figure 3). These switches are located on train specific panels in the RAB 286 Switchgear rooms. Another switch on each panel functions to allow only one charger per train to be selected to the alternate power supply at a time (Figure 2).

The alternate power supply for all 4 chargers is a non safety supply (when selected the charger is considered Non Operable per Technical Specifications). The alternate power comes from MCC 1D23 which is supplied by either 1D2 or the Dedicated Shutdown Diesel Generator.

Figure 2: Alternate Supply Manual Transfer Switch for



Figure 3: Charger Supply Manual Transfer Switches



JPM CUE SHEET

Initial Conditions:

The plant is in Mode 3 following a Reactor Trip due to a loss of Off-Site power and a failure of the 'A' and 'B' EDG to start and load.

The MCR crew has entered EOP-EPP-001; Loss of AC Power to 1A-SA and 1B-SB Buses, they have verified that the Dedicated Shutdown Diesel Generator has started, loaded and is now supplying 1D23 bus.

INITIATING CUE:

The CRS has directed you to align the 1A-SA battery Charger to the alternate Power Supply IAW EOP-001 step 22 using OP-156.01, AC Electrical Distribution, Section 8.15. Initial conditions are met.



JPM CUE SHEET

LOSS OF AC POWER TO 1A-SA AND 1B-SB BUSES**INSTRUCTIONS****RESPONSE NOT OBTAINED**

22. Transfer safety-related battery chargers to MCC 1D23:

- Align battery charger 1A-SA OR 1B-SA using OP-156.01, "AC ELECTRICAL DISTRIBUTION", Sections 8.15.

NOTE

The TDAFW controls are powered from DP-1B-SB.

- Align battery charger 1A-SB OR 1B-SB using OP-156.01, "AC ELECTRICAL DISTRIBUTION", Sections 8.16

8.15. Aligning a Train A Battery Charger to the Alternate Power Supply**8.15.1. Initial Conditions**

1. Battery Charger 1A-SA or Battery Charger 1B-SA has been removed from service per Section 7.3. _____
2. An evaluation of Technical Specifications listed in Section 2.2 has been completed. _____

8.15.2. Procedural Steps

1. **IF** aligning Battery Charger 1A-SA to the Alternate Power Supply, **THEN PERFORM** the following steps:
 - a. At Battery Charger 1A-SA **CHECK** the following switch lineup: _____

<u>SWITCH</u>	<u>POSITION</u>	_____
AC INPUT	OFF	_____
DC OUTPUT	OFF	_____
NORMAL/EQUALIZE	NORMAL	_____

- b. **CHECK** DP-1A-SA-30, Battery Charger 1A-SA, in the OFF position. _____

NOTE:

- 1EE-E533 MTS-1 is the A Train Alternate Source Selector Switch
- 1EE-E534 MTS-2 is the Battery Charger 1A-SA Source Selector Switch
- 1EE-E535 MTS-3 is the Battery Charger 1B-SA Source Selector Switch

- c. **PERFORM** the following steps at 1EE-E530, A - TRAIN BATTERY CHARGERS TRANSFER PANEL:
 - **PLACE** 1EE-E533 MTS-1 in ALTERNATE 1D23 SUPPLY TO 1A-SA. _____
 - **PLACE** 1EE-E534 MTS-2 in ALTERNATE 1D23 SUPPLY TO 1A-SA. _____
 - **VERIFY** 1EE-E535 MTS-3 in NORMAL 1A31-SA SUPPLY TO 1B-SA. _____

8.15 Aligning a Train A Battery Charger to the Alternate Power Supply (continued)

2. **IF** aligning Battery Charger 1B-SA to the Alternate Power Supply, **THEN PERFORM** the following steps:

- a. At Battery Charger 1B-SA **CHECK** the following switch lineup:

<u>SWITCH</u>	<u>POSITION</u>	
AC INPUT	OFF	_____
DC OUTPUT	OFF	_____
NORMAL/EQUALIZE	NORMAL	_____

- b. **CHECK** DP-1A-SA-31, Battery Charger 1B-SA, in the OFF position. _____

NOTE:

- 1EE-E533 MTS-1 is the A Train Alternate Source Selector Switch
- 1EE-E534 MTS-2 is the Battery Charger 1A-SA Source Selector Switch
- 1EE-E535 MTS-3 is the Battery Charger 1B-SA Source Selector Switch

- c. **PERFORM** the following steps at the 1EE-E530, A - TRAIN BATTERY CHARGERS TRANSFER PANEL:

- **PLACE** 1EE-E533 MTS-1 in ALTERNATE 1D23 SUPPLY TO 1B-SA. _____
- **VERIFY** 1EE-E534 MTS-2 in NORMAL 1A21-SA SUPPLY TO 1A-SA. _____
- **PLACE** 1EE-E535 MTS-3 in ALTERNATE 1D23 SUPPLY TO 1B-SA. _____

3. **COMPLETE** Section 8.15.3. _____
4. **IF** placing Battery Charger 1A-SA or Battery Charger 1B-SA in Service, **THEN GO TO** Section 5.3. _____

8.15.3. Aligning a Train A Battery Charger to the Alternate Power Supply Configuration Control Closeout

1. **IF** battery charger 1A-SA is aligned to Alternate Power Source, **THEN PERFORM** the following CHECK and VERIFY steps.

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION	CHECK	VERIFY
	1EE-E530 A - TRAIN BATTERY CHARGERS TRANSFER PANEL			
1EE-E533	MTS-1	ALTERNATE 1D23 SUPPLY TO 1A-SA	_____	_____
1EE-E534	MTS-2	ALTERNATE 1D23 SUPPLY TO 1A-SA	_____	_____
1EE-E535	MTS-3	NORMAL 1A31-SA SUPPLY TO 1B-SA	_____	_____

2. **IF** battery charger 1B-SA is aligned to Alternate Power Source, **THEN PERFORM** the following CHECK and VERIFY steps.

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION	CHECK	VERIFY
	1EE-E530 A - TRAIN BATTERY CHARGERS TRANSFER PANEL			
1EE-E533	MTS-1	ALTERNATE 1D23 SUPPLY TO 1B-SA	_____	_____
1EE-E534	MTS-2	NORMAL 1A21-SA SUPPLY TO 1A-SA	_____	_____
1EE-E535	MTS-3	ALTERNATE 1D23 SUPPLY TO 1B-SA	_____	_____

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Worksheet

Facility: Shearon Harris Task No.: 012003H504

Task Title: ATWS—Locally Trip the Reactor JPM No.: 2011 NRC Exam
In-Plant JPM K

K/A Reference: APE AA1.01 RO 3.4 SRO 3.5 **ALTERNATE PATH - NO**

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance: _____ Actual Performance: X
 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 Reactor trip signal has been received, but the Reactor did not trip. The control room is implementing FRP-S.1.

Initiating Cue: You are the Turbine Building operator and have responded to a page from the Main Control Room. The MCR has directed you to locally trip the Reactor.
 Operations Management has stated that this action should be started immediately, without reference to procedures.

Worksheet

Task Standard: The Reactor is tripped by opening either the rod drive MG set generator output breakers or the rod drive MG set motor breakers.

Required Materials: none

General References: FRP-S.1 Step 4.a RNO Rev. 17
Operator Post Aide locally mounted on wall near Reactor Trip Breakers

Time Critical Task: No

Validation Time: XX minutes

Critical Task Justification

Step 2 Tripping the Rod Drive MG Set Generator Output Breakers will de-energize power to the Control Rod Stationary Grippers thus all rods will insert and cause a Reactor Trip.

Step 3 Tripping the Rod Drive MG Set Motor Breakers will de-energize power to the Control Rod Stationary Grippers thus all rods will insert and cause a Reactor Trip.

PERFORMANCE INFORMATION

START TIME: _____

Performance Step: 1 Locally Trip Reactor Trip Breakers

Local wall Operator Aid for FRP-S.1
 Local Reactor Trip method listed in order of preference:
 Locally Trip Reactor Trip Breakers
 Locally Trip Both Rod Drive MG Set Generator Output Breakers
 Locally Trip Both Rod Drive MG Set Generator Motor Breakers

Standard: Locates REACTOR TRIP BREAKER A and depresses TRIP button.

Locates REACTOR TRIP BREAKER B and depresses TRIP button.

Evaluator Cue:

No change in sound was heard when REACTOR TRIP BREAKER A TRIP button was depressed

No change in sound was heard when REACTOR TRIP BREAKER B TRIP button was depressed.

IF checked, GENERATOR LINE VOLTS meter is reading 260 volts on each ROD PWR SUPPLY CNTL CABINET.

IF checked, GENERATOR LINE AMPS meter is reading 30 amps on each ROD PWR SUPPLY CNTL CABINET.

Comment:

NOTE: Of the following steps, Step 2, opening of the generator output breakers, is the preferred method per FRP-S.1.

However, the performance of either step (2 or 3) constitutes successful completion of the JPM.

PERFORMANCE INFORMATION

✓ **Performance Step: 2** Locally Trip Both Rod Drive MG Set Generator Output Breakers

Standard: Locates GENERATOR CIRCUIT BREAKER control switch for Generator 1A and takes it to TRIP
Locates GENERATOR CIRCUIT BREAKER control switch for Generator 1B and takes it to TRIP.

Evaluator Cue:

GENERATOR CIRCUIT BREAKER 1A indication goes from red to green

GENERATOR CIRCUIT BREAKER 1B indication goes from red to green.

IF checked, GENERATOR LINE VOLTS meter is reading 260 Volts on each ROD PWR SUPPLY CNTL CABINET.

IF checked, GENERATOR LINE AMPS meter is reading 0 (zero) Amps on each ROD PWR SUPPLY CNTL CABINET.

Comment:

PERFORMANCE INFORMATION

OR

- ✓ **Performance Step: 3** Locally trip BOTH Rod Drive MG Set Motor breakers.

Standard: Locates MOTOR CIRCUIT BREAKER 1A control switch and takes it to TRIP
 Locates MOTOR CIRCUIT BREAKER 1B control switch and takes it to TRIP.

Evaluator Cue:	<p>Motor Circuit Breaker 1A indication goes from red to green</p> <p>Motor Circuit Breaker 1B indication goes from red to green</p> <p>IF checked, Generator Line Volts meter is reading less than 260 Volts and is decreasing (to zero as MG SET slows down) on each Rod Power Supply Control Cabinet.</p> <p>IF checked, Generator Line Amps meter is reading less than 30 Amps and is decreasing on each Rod Power Supply Control Cabinet.</p> <p>Announce: END OF JPM</p>
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Comment:

Terminating Cue:	<p>Generator Circuit Breakers 1A and 1B indications are green or Motor Circuit Breaker 1A AND 1B are green.</p> <p>Evaluation on this JPM is complete.</p> <p>END OF JPM</p>
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STOP TIME: _____

Job Performance Measure No.: 2011 NRC Exam In-Plant JPM K

ATWS—Locally Trip the Reactor

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

Initial Conditions:

A Reactor trip signal has been received, but the Reactor did not trip. The control room is implementing FRP-S.1.

INITIATING CUE:

You are the Turbine Building operator and have responded to a page from the Main Control Room. The MCR has directed you to locally trip the Reactor.

Operations Management has stated that this action should be started immediately, without reference to procedures.