Facility: Shearon Harris Task No.: 301009H401

Task Title: Initiate Emergency Boration Following a Reactor Trip (AOP-002) JPM No.: 2009B NRC Exam JPM a

K/A Reference: APE024 AA1.17 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 was at 100% power when an automatic reactor trip occurred due to an inadvertent main turbine trip.

The crew has performed PATH-1 immediate actions and have transitioned to EPP-004, REACTOR TRIP RESPONSE

Initiating Cue: Your position is the RO and the CRS has directed you to perform EPP-004, REACTOR TRIP RESPONSE starting at step 1.

Another operator has been assigned to perform Step 3, Check RCS Temperature.

Task Standard:	Emergency Boration flow ≥30 GPM with Charging flow ≥30 GPM
Required Materials:	None
General References:	EOP-EPP-004 (Rev. 18), AOP-002 (Rev. 23)
Time Critical Task:	No
Validation Time:	10 minutes

Critical Step Justification

Step 6	Determines need for emergency boration.
Step 7	Needed to provide source of boric acid. Without the pump, will not be able to initiate emergency boration.
Step 14	Ensures suction source is from VCT
Step 15	Secures suction from RWST to ensure only one source is used
Step 17	Aligns flow path between boric acid source to blender.
Step 18	Ensures required minimum flow to CSIP to meet emergency boration criteria.
Step 19	Ensures required minimum flow to RCS to meet emergency boration criteria.

2009B NRC Exam - SIMULATOR SETUP

Simulator Operator

- Reset to IC-161 (saved exam IC PW 9newguys)
- Go to RUN and wait ~ 10 seconds then silence and acknowledge alarms.
- NOTE: If this is the first time this JPM is ran the Simulator switch check will show that the Generator lockout needs to be reset. It may also show that the pot settings for BA and Batch count. Make the adjustments for the Makeup system then Override the gen lockout switch check. With the Simulator in FREEZE load and then start exercise APP file "Roll Gen 86 Relays". Both 86 relays may roll in FREEZE or when the Simulator is placed in RUN (either way is OK).
- Go to RUN and wait ~10 seconds then silence and acknowledge alarms.
- NOTE: A conditional trigger (Trigger 1) is set to actuate when 1CS-113A is opened. DO NOT RUN THIS TRIGGER it will run itself.
- There are no actions for the Booth Operator other than communications in this JPM

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.)

To recreate the IC setup for this JPM:

- Initial Simulator IC was IC-19
- Go to run
- Ensure step counters are correct

Insert malfunction to prevent two control rods from inserting on the trip

- CRF16a 220.0 4 (This is rod N7)
- CRF16b 220.0 27 (This is rod F14)

Insert malfunction to prevent 1CS-278 from opening

- IDI XA2I150 SHUT

Place FCV-122a in "Local control" – this will limit the flow on FI-122A.1 to about 55 gpm (this will be the as is value for the IC and not allow flow from the RWST to be >90 gpm)

- IRF CVC185 (n 0 0) LOCAL_MANUAL

Setup continued:

How to create the conditional trigger used in this JPM:

- Open remote function for CVC open CVC177 select LOCAL control and select Event Trigger 1
- Now go to CVC178 and select 8% open, again select Event Trigger 1
- Go to the Event Trigger Summary, you should now have '2' in the assigned count for Trigger 1. Now single click on Trigger 1
- Click on Assign File. A window will open – find file (cs113a open) and then click assign. You have now set Trigger 1 to activate when the control switch for valve 113A is taken to OPEN. Trigger 1 should show a source file and a description. This file will go TRUE when 113A is opened.

When 1CS-113A is taken to open the valve will only open 8% and have both a Red and Green light for indication. You will get approximately 21.3 gpm flow through the valve in this position. This is below the flow required and will procedurally force the candidate to use the RNO for this low flowrate.

After the conditional trigger is created then:

Initiate a MANUAL Main Turbine trip, perform immediate actions per PATH-1 and stabilize RCS temperature between 555°F and 559°F per EPP-004

- Silence Acknowledge and Reset Annunciators

- Freeze and Snap these conditions for future use

START TIME: _____

Evaluator Note:	**The applicant is expected to silence all alarms and direct another board operator to respond to alarms that are not pertaining to this task.**

EPP-004, Step 1

Performance Step: 1 Obtains Procedure

NOTE: Foldout Apply

Implement Function Restoration Procedures As Required.

Standard: Reviews Critical Safety Functions on plant computer screen.

May inform CRS that none apply.

Evaluator Cue:	**Communicate as necessary.**

Evaluator Note:	The applicant may periodically review Critical Safety Functions and FOLDOUT criteria. No CSF's apply in this JPM.

Comment:

EPP-004, Step 2

Performance Step: 2 Evaluate EAL Network Using Entry Point X.

Standard: Informs CRS/SM.

Evaluator Cue:	**Communicate as necessary.**

Comment:

EPP-004, Step 3

Performance Step: 3 Check RCS Temperature:

Standard: Acknowledge that, per Initial Conditions, another operator is performing this task.

Comment:

EPP-004, Step 4

Performance Step: 4 Check RCP Status:

- Check RCP's – at least one running

Standard: Verifies all three RCP's running.

Comment:

EPP-004, Step 5

Performance Step: 5 Check Feed System Status:

- RCS temperature – less than 564˚F
- Verify feed reg valves – SHUT
- Check feed flow to SG's – greater than 210 KPPH

Standard:

- Verifies RCS temperature indication less than 564˚F (yes)
- Verifies each Feed Reg Valve indicating SHUT (yes)
- Verifies total AFW flow greater than 210 KPPH (yes)

Comment:

EPP-004, Step 6

√ **Performance Step: 6** Check control rod status:

- Check DRPI – available
- Verify all control rods – fully inserted

Standard:

- Determines DRPI available by indicating lights on AEP-1
- Determines two rods stuck fully out
- Takes RNO path to AOP-002

Evaluator Note:	**Applicant may go to AEP-1 to determine which rods are stuck. They should find CB-A rod F-14 and SDB-A rod N-7 stuck full out. This is critical because if these rods are NOT identified they will not perform the AOP-002 actions.**

Comment:

AOP-002, Step 1

√ **Performance Step: 7** VERIFY a Boric Acid (BA) Pump RUNNING.

Standard: Starts at least one BA Pump

Comment:

AOP-002, Step 2.a

Performance Step: 8 ESTABLISH boration flow path using 1CS-278 as follows:

- OPEN 1CS-278, Emergency Boric Acid Addition (NO)

Standard: Identifies 1CS-278 will not open. GO TO Step 3.

Comment:

AOP-002, 3.a,b

Performance Step: 9

- OPEN the following valves
- 1CS-283, Boric Acid To Boric Acid Blender FCV-113A (yes)
- 1CS-156, Make Up To CSIP Suction FCV-113B (NO – valve is partially open)

  (NOTE: Candidate should use RNO GO TO Step 6 but may continue with valve indication red/green)
- VERIFY at least 30 gpm boric acid flow to CSIP suction on recorder panel or ERFIS point FCS0113A. (NO – with 1CS-156 less than full open the flow rate is <30 gpm)
- GO TO Step 6.

Standard: Identifies < 30 GPM flow indicated by ERFIS point FCS0113A

Evaluator Note:

- **If the CRS is informed of the failure then acknowledge report and direct them to continue with the procedure to establish the boration flow path.**
- **They may / may not close FCV-113A & B. It is OK if they do or do not as long as they continue.**
- **May use QP BAFLOW to check flow rate of FCS0113A**

Comment:

AOP-002, Step 6.a

Performance Step: 10 **ESTABLISH** boration flow from RWST as follows:

OPEN the following valves:

- 1CS-291, Suction From RWST LCV-115B
- 1CS-292, Suction From RWST LCV-115D

Standard: Locates control switch and OPENS

- 1CS-291, Suction From RWST LCV-115B
- 1CS-292, Suction From RWST LCV-115D

Comment:

AOP-002, Step 6.b

Performance Step: 11 **SHUT the following valves:**

- 1CS-165, VCT Outlet LCV-115C
- 1CS-166, VCT Outlet LCV-115E

Standard: Locates control switch and SHUTS

- 1CS-165, VCT Outlet LCV-115C
- 1CS-166, VCT Outlet LCV-115E

Comment:

AOP-002, Step 6.c

Performance Step: 12

VERIFY and **MAINTAIN** at least 90 gpm charging flow from the RWST to the RCS (FI-122A.1) until required boration is completed. (indication is < 90 gpm in progress)

Step 6.c RNO - Perform the following:

(1) IF a Boric Acid Pump is available, **THEN GO TO** Step 7.

Standard:

Identifies that Charging flow from RWST to RCS is below required and performs RNO actions. Based on BA Pump available goes to step 7.

Comment:

Performance Step: 13

NOTE prior to step 7: The alternate boric acid flow path will supply sufficient boric acid for emergency boration but is slower to respond than other flow paths.

Standard:

Reads and initials NOTE

Comment:

AOP-002, step 7.a

√ **Performance Step: 14** **ALIGN** alternate boric acid flowpath as follows:

a. VERIFY the following valves **OPEN**:

- 1CS-165, VCT Outlet LCV-115C
- 1CS-166, VCT Outlet LCV-115E

Standard: Locates and OPENS 1CS-165 and 1CS-166

Comment:

AOP-002, step 7.b

√ **Performance Step: 15** **VERIFY** the following valves **SHUT:**

- 1CS-291, Suction From RWST LCV-115B
- 1CS-292, Suction From RWST LCV-115D

Standard: Locates and SHUTS 1CS-291 and 1CS-292

Comment:

AOP-002, step 7.c

Performance Step: 16 **VERIFY** a Boric Acid Pump RUNNING

Standard: Locates and verifies that a BA Pump is RUNNING

Evaluator Note:	**May have to restart if secured previously.**

Comment:

AOP-002, step 7.d

√ **Performance Step: 17** **OPEN** the following valves:

- 1CS-283, Boric Acid To Boric Acid Blender FCV-113A
- 1CS-155, Make Up To VCT FCV-114A

Standard: Locates and OPENS 1CS-283 (may already be open) and 1CS-155 (must open)

Comment:

AOP-002, step 7.e

√ **Performance Step: 18** **VERIFY** at least 30 gpm boric acid flow to CSIP suction on recorder panel or ERFIS point FCS0113A.

Standard: Locates and verifies > 30 gpm boric acid flow to CSIP suction on recorder panel or EFRIS point FCS0113A

Comment:

AOP-002, step 7.f

√ **Performance Step: 19** **VERIFY** and **MAINTAIN** at least 30 gpm charging flow to RCS (FI-122A.1) until required boration is completed.

Standard: Locates and verifies > 30 gpm boric acid flow to RCS (FI-122A.1)

Comment:

Terminating Cue:	**After Charging flow is verified > 30 gpm, the evaluation on this JPM is complete.** **END OF JPM**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam JPM a - Initiate Emergency Boration Following a Reactor Trip (EOP-EPP-004 and AOP-002)

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

Initial Conditions:	The plant was at 100% power when an automatic reactor trip occurred due to an inadvertent main turbine trip. The crew has performed PATH-1 immediate actions and have transitioned to EPP-004, REACTOR TRIP RESPONSE

Initiating Cue:	Your position is the RO and the CRS has directed you to perform EPP-004, REACTOR TRIP RESPONSE starting at step 1. Another operator has been assigned to perform Step 3, Check RCS Temperature.

DRAFT

Worksheet

Facility: Shearon Harris Task No.: 006003H101

Task Title: Fill A Cold Leg Accumulator JPM No.: 2009B NRC Exam JPM b

K/A Reference: 006 A1.13 RO 3.5 SRO 3.7 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 at 100 percent power. All parameters are normal.

Initiating Cue: The "A" Cold Leg Accumulator level has decreased to 68 percent. The CRS has directed you to increase the level in the 'A' Cold Leg Accumulator to 72 percent IAW OP-110 Section 8.1.

Task Standard:	"A" Cold Leg Accumulator level filled to 72 % (±2%), IAW OP-110 Section 8.1
Required Materials:	None
General References:	OP-110 Rev. 30
Time Critical Task:	No
Validation Time:	15 minutes

Critical Step Justification

Step 8	Provides flow path to fill accumulator.
Step 13	Provides flow path to fill accumulator.
Step 15	Establishes makeup flow to fill accumulator.
Step 18	Stop makeup flow to the accumulator to prevent overfilling accumulator.

2009B NRC Exam - SIMULATOR SETUP

Simulator Operator

- Reset to IC-162 (saved exam IC PW 9newguys)
- Go to RUN, wait ~ 10 seconds then silence and acknowledge alarms.

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.)

To recreate the IC setup for this JPM:

- Initial Simulator IC was IC-19
- Go to run
- Ensure step counters are correct
- You may have to equalize 'B' and 'C' Accumulator pressure and adjust 'A' pressure to within 4 psig of 'B' and 'C' prior to draining.
- Drain "A" Cold Leg Accumulator to 68 percent. Ensure level decrease causes annunciator ALB-001-7-2 "Accumulator Tank A High-Low Level" to alarm.
- Turn the Hydrotest pump ON – irf SIS009 ON
- Open 1SI-368 – irf SIS001 100
- Silence Acknowledge and Reset Annunciators
- Freeze and Snap these conditions to an IC for future use

START TIME: _____

Simulator Operator:	**The IC has the Hydro Test Pump turned ON and 1SI-368 OPEN. 1CT-22 is not modeled on the Simulator but will be reported as OPEN. You will not have to look for anything to turn on or open in this JPM.** **Prior to starting the JPM open Monitor Parameters and then open the "Plant Status Monitor Tank" you will find that there are all 3 accumulator levels and one line with 21XAAD028M HC947 meter percentage. You will need information from this page later to report the Hydropump pressures locally.**

OP-110

Performance Step: 1 Obtains OP-110, and refers to Section 8.1

Standard: Reviews Initial Conditions

Evaluator Cue:	**All initial conditions have been satisfied. Local operators are standing by at the Hydro Test Pump and at 1CT-22. The operator at 1CT-22 is dedicated to this valve.**

Comment:

Reviews NOTE prior to Step 1

Performance Step: 2 **NOTE:** To minimize any potential sluicing between Accumulators through leaking valves, Accumulator pressures should normally be left approximately equal (at or below 4 psid between lowest and highest ERFIS indications) at the completion of this Section.

Standard: Reviews and initials note prior to proceeding.

Comment:

Step 1

Performance Step: 3 Perform the following Steps on only one Accumulator at a time.

Standard: Reviews directions of step 1 and initials step 1

Comment:

Step 2

Performance Step: 4 Locally, unlock and open 1SI-368, Hydro Test Pmp Disch to Accum Fill.

Standard: Directs local operator to unlock and open 1SI-368, Hydro Test Pmp Disch to Accum Fill.

Simulator Operator:	**Acknowledge request and after ~10 seconds - report that 1SI-368 is unlocked and open (previously opened during initial setup)**

Comment:

Note prior to step 3

Performance Step: 5 A portion of the line to the hydrotest pump and to the Accumulators is Non-Safety. Opening 1CT-22 will cause the RWST to be inoperable per Tech Spec 3.1.2.5, 3.1.2.6, and 3.5.4 (a one hour action statement in Modes 1 through 4).

Standard: Reviews and initials note prior to proceeding.

Comment:

Step 3

Performance Step: 6 Declare the RWST inoperable.

Standard: Reports to the CRS that the RWST is inoperable per TS 3.1.2.5, 3.1.2.6 and 3.5.4 with a 1 hour action

Evaluator Cue:	**CRS acknowledges the report.**

Comment:

Step 4

Performance Step: 7 Locally, unlock and open 1CT-22, SIS Hydro Test Pump Suction from RWST.

Standard: Directs local operator to unlock and open 1CT-22

Simulator Operator:	**Acknowledge request and after ~10 seconds - report that 1CT-22 is unlocked and open (not modeled on Simulator)**

Comment:

Step 5

√ **Performance Step: 8** At the MCB perform the following:

- Open 1SI-179, ACCUM FILL FROM RWST
- Adjust HC-947 to 0% to fully open 1SI-369, HYDROTEST PUMP RECIRC

Standard: Locates control switch for 1SI-179 and takes it to OPEN

Locates control switch for HC-947 and positions controller to 0%

Comment:

Step 6

Performance Step: 9 Locally at 216 RAB, place the Hydrotest Pump breaker 1D22-1E in ON.

Standard: Contacts AO at Hydrotest pump and directs AO to place the Hydrotest Pump breaker 1D22-1E in ON

Simulator Operator:	**Acknowledge request and after ~10 seconds - report that breaker 1D22-1E for the Hydrotest pump is ON (breaker is not modeled on Simulator)**

Comment:

Step 7

Performance Step: 10 Establish communication between the Control Room and the operator at the Hydrotest Pump Local Control Panel

Standard: Verifies communications with AO at the Hydrotest pump local control panel

Simulator Operator:	**IF contacted as the AO at the Hydrotest pump, verify communications are established.**

Comment:

Step 8

Performance Step: 11 At the Hydrotest Pump Local Control Panel, place the control switch HYDROTEST PUMP to START

Standard: Directs AO to place control switch for Hydrotest pump to start

Simulator Operator:	**Acknowledge communications and wait ~5 seconds then report that the Hydrotest pump is ON.** **(NOTE: The pump has been started in this saved IC there is no need to start or stop the pump for the JPM.)**

Comment:

Step 9

Performance Step: 12 Declare the associated Accumulator inoperable per Tech Spec 3.5.1, due to being connected to Non-Safety piping (a one hour action statement in Modes 1 through 3 above 1000 psig).

Standard: Report to CRS that 'A' Accumulator is inoperable per Tech Spec 3.5.1 (one hour action statement)

Evaluator Cue:	**CRS acknowledges the report.**

Comment:

Step 10

√ **Performance Step: 13** At the MCB, open the fill valve for the Accumulator to be filled:

- 1SI-186, ACCUMULATOR A FILL

Standard: Locates control switch for 1SI-186 and takes switch to OPEN

Comment:

Note and Caution prior to step 11

Performance Step: 14

NOTE: 1SI-369, HYDROTEST PUMP RECIRC, is fully open when HC-947 is adjusted to 0% and fully shut when HC-947 is adjusted to 100%.

CAUTION: Do not exceed 660 psig Accumulator pressure (MCB) or 700 psig Hydrotest Pump discharge pressure (PI-947).

Standard: Reviews and initials note and caution prior to proceeding

Comment:

Step 11

✓ **Performance Step: 15** Coordinate with the operator at the Hydrotest Pump to start filling the selected Accumulator by adjusting HC-947 (1SI-369) in the closed direction until the Hydrotest Pump discharge pressure (PI-947) is greater than the Accumulator pressure.

Standard: Contacts AO at Hydrotest pump and coordinates with this operator a method of how to report pressure increase until the Hydrotest pump discharge pressure is > the 'A' Accumulator pressure while maintaining pressure < 660 # per caution.

Simulator Operator:	**When contacted to report pressure increase; acknowledge the method you are directed to use.** **(This idea is cumbersome when using the radio but it works.)** **Suggest is that you will report pressure increasing in 100# increments until 600# then you will report 10# increments but will not exceed 660#.** **Using the Monitor Parameter for "Plant Status Monitor Tank" watch the percent open on HC-947 as the operator opens the valve. There is a direct correlation between pressure and % valve open. Pressure is 10 times the % open.** **Report 100# increments for every 10% the valve is open and after 60% is reached report in 10# increments until directed to stop.** **NOTE: you should see level increase in 'A' Accumulator when the valve is ~55% open.**

Comment:

Step 12

Performance Step: 16

If Accumulator pressure reaches 660 psig, perform the following:

- Adjust HC-947 to 0% to fully open 1SI-369, HYDROTEST PUMP
- RECIRC.
- Shut 1SI-179
- Vent the Accumulator per Section 8.3
- Open 1SI-179
- Adjust HC-947, 1SI-369 HYDROTEST PUMP RECIRC in the closed direction until the Hydrotest Pump discharge pressure, (PI-947) is greater than the Accumulator pressure.

Standard:

Reads step 12 and watches pressure rise during fill operation.

(Pressure should not get above 660 psig if the operation is performed correctly.)

Comment:

Step 13

Performance Step: 17

Fill the Accumulator to the desired level as indicated by the associated instruments:

LI-920, 922, ACCUMULATOR A LEVEL

Standard:

Watches level rise in 'A' Accumulator and when LI-920, 922 reach 72% secures filling the accumulator (may also be using ERFIS "QP CLA LVL" with an individual plot of level)

Comment:

Step 14

✓ **Performance Step: 18** At the MCB perform the following:

- Adjust HC-947 to 0% to fully open 1SI-369, HYDROTEST PUMP
- RECIRC.
- Shut the fill valve for the Accumulator that was filled:
- 1SI-186, ACCUMULATOR A FILL.
- If desired, direct Chemistry to sample the affected Accumulator.
- Shut 1SI-179, Accumulator Fill From RWST.

Standard: When 72% (± 2%) level is reached:

- Adjusts HC-947 to 0% to fully open 1SI-369, HYDROTEST PUMP RECIRC
- Shuts 1SI-186, ACCUMULATOR A FILL
- Contacts Chemistry to sample the affected Accumulator
- Shuts 1SI-179, Accumulator Fill From RWST.

Simulator Operator:	**Acknowledge request for sample**

Comment:

Steps 15

Performance Step: 19 At the Hydrotest Pump local control panel, place the control switch HYDROTEST PUMP to STOP

Standard: Directs operator to stop the Hydrotest pump

Simulator Operator:	**Acknowledge request – wait ~10 seconds and report pump is in stop**

Comment:

Steps 16

Performance Step: 20 Place 1D22-1E, CVCS HYDROSTATIC TEST PUMP 1X-NNS, in OFF.

Standard: Directs operator to place breaker 1D22-1E, CVCS HYDROSTATIC TEST PUMP 1X-NNS to OFF

Simulator Operator:	Acknowledge request – wait ~10 seconds and report breaker 1D22-1E, CVCS HYDROSTATIC TEST PUMP 1X-NNS is OFF

Comment:

Steps 17

Performance Step: 21 Locally, shut and lock the following valves:

- 1SI-368, Hydro Test Pmp Disch to Accum Fill
- 1CT-22, SIS Hydro Test Pump Suction from RWST

Standard: Directs operators to locally, shut and lock

- 1SI-368, Hydro Test Pmp Disch to Accum Fill
- 1CT-22, SIS Hydro Test Pump Suction from RWST

Simulator Operator:	**Acknowledge request and after ~ 10 seconds report that both valves are shut and locked.**

Comment:

Steps 18

Performance Step: 21 **Complete Attachment 5**

Standard: Turns to Attachment 5 and completes attachment

Comment:

Terminating Cue:	**After completing 'A' Accumulator fill to 72% and completing all steps up through step 17 (starting Attachment 5 on step 18) this JPM is complete.** **END OF JPM**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam JPM b - Fill A Cold Leg Accumulator (OP-110 Section 8.1)

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 at 100 percent power. All parameters are normal.

INITIATING CUE:	The "A" Cold Leg Accumulator level has decreased to 68 percent. The CRS has directed you to increase the level in the 'A' Cold Leg Accumulator to 72 percent IAW OP-110 Section 8.1.

Facility: Shearon Harris Task No.: 301083H401

Task Title: Loss of Service Water (Line Break) JPM No.: 2009B NRC Exam JPM c

K/A Reference: APE 062 AK 3.03 RO 4.0 SRO 4.2 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 operating at 100% power steady state conditions.

Initiating Cue: The CRS instructs you to maintain present plant conditions.

Task Standard: Service Water leak isolated IAW AOP-022

Required Materials: None

General References: AOP-022 (Rev. 29)

Time Critical Task: No

Validation Time: 20 minutes

Critical Step Justification

Step 2	Need to identify appropriate procedure to mitigate plant conditions.
Step 6	Critical to determine location of SW problem and identifying which procedure section to utilize for this problem.
Step 9	Critical in order to establish pump operation to supply ESW and NSW headers.
Step 11	Splits service water headers to allow for determination of leak location.
Step 13	Identifies leak location in order to determine appropriate procedure transition.
Step 16	Critical to determine location of SW problem and identifying which procedure section to utilize for this problem.
Step 17	Prevents damage to pump and allows for leak isolation.
Step 19	Prevents damage to pump and allows for leak isolation.

2009B NRC Exam - SIMULATOR SETUP

Simulator Operator

- Reset to IC-163 (saved exam IC PW 9newguys)
- Go to RUN, wait ~ 10 seconds then silence and acknowledge alarms.

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.)

To recreate the IC setup for this JPM:

- Initial Simulator IC was IC-19
- Create Trigger 1
    - Service water line break
- Silence Acknowledge and Reset Annunciators
- Freeze and Snap these conditions to your exam IC

START TIME: _____

Evaluator:	**After applicant takes shift wait ~15 seconds then have Simulator Operator run Trigger 1**

Indications Available:	• **ALB 02-4-5 alarms (SW leakage annunciator)** • **Service water flow CCW Heat Exchanger B Low status panel light comes on**

Performance Step: 1 **Responds to changing plant conditions**

Standard: Announces and acknowledges alarm, pulls APP and dispatches operator to investigate cause

Simulator Operator:	**Acknowledge request to investigate** **Report back ~ 20 seconds later that there is a large Service Water leak on the 236' in the RAB. Leakage is too large to get close to see where it's coming from.**

Comment:

✓ **Performance Step: 2** **Entry conditions for AOP-022**

Standard: Identifies that with report of leak and control board indications that AOP-022 entry conditions are met

Comment:

AOP-022 Note prior to Step 1

Performance Step: 3 **NOTE**

Steps 1 and 2 are immediate actions.

(**Continuous Action**) **CHECK** ESW flow lost to ANY RUNNING CSIP - MORE THAN 1-minute:

Standard: Identifies that ESW flow has not been lost

GO TO Step 2

Comment:

AOP-022 Step 2

Performance Step: 4 (Continuous Action) **CHECK** ESW flow lost to ANY RUNNING EDG - MORE THAN 1-minute:

Standard: Identifies that no EDG's are running

GO TO Step 3

Comment:

OBTAINS PROCEDURE

Performance Step: 5 AOP-022, Loss Of Service Water

Standard: Obtains copy of AOP-022 and reviews immediate action steps 1 and 2.

Comment:

AOP-022, Step 3

✓ **Performance Step: 6** **GO TO** the appropriate step as indicated by the parameter
LOST: ESW or NSW Header Any ESW or NSW Header Rupture
GO TO Section 3.0 Step 7 (page 7)

Standard: Reads step 3 and transitions to Section 3.0 Step 7 for a SW header rupture

Comment:

AOP-022, CAUTION prior to Step 7

Performance Step: 7 **CAUTION:** Severe damage may occur to multiple safety-related plant components if Service Water flooding is not promptly terminated. A preliminary attempt is made to diagnose the break location, but the overriding priority is to terminate flooding before extensive damage to equipment occurs.

Standard: Reads and initials Caution

Comment:

AOP-022, NOTE prior to Step 7

Performance Step: 8 **NOTE:**

- Starting both ESW Pumps should isolate NSW flow to the ESW Headers, supply ESW Pump flow to the respective ESW Header at a much lower flow rate than with the NSW Pump, and aid in determination of the break location.
- Starting with this step, the remaining steps in this section address Service Water System ruptures.
- Attachment 4, Service Water System Drawing, is an information use only drawing available to help in determining the leak location.

Standard: Reads and initials Note

Comment:

AOP-022, Step 7.a

✓ **Performance Step: 9** **ISOLATE** ESW and NSW Headers, as follows:

START BOTH ESW Pumps.

Standard: STARTS BOTH ESW Pumps

Evaluator NOTE:	**After starting the ESW pumps the ESW valves automatically align. During this time :** **ALB 02-6-5 will alarm and window 4-5 will clear.** **SW Low Flow light CCW Ht Ex B will go OFF.** **ALB 02-7-1 and ALB 23-1-16 will alarm then both clear after the SW valves complete positioning**

Comment:

AOP-022, Step 7.b

Performance Step: 10 **VERIFY proper ESW valve alignment:**

- **1SW-270, A Header to Auxiliary Reservoir OPEN**
- **1SW-271, B Header to Auxiliary Reservoir OPEN**
- **1SW-39, NSW Supply to Header A SHUT**
- **1SW-40, NSW Supply to Header B SHUT**
- **1SW-275, Hdr A Return to Normal Hdr SHUT**
- **1SW-274, Hdr B Return to Normal Hdr SHUT**

Standard: Verifies ESW valve alignment:

- 1SW-270, A Header to Auxiliary Reservoir OPEN **(YES)**
- 1SW-271, B Header to Auxiliary Reservoir OPEN **(YES)**
- 1SW-39, NSW Supply to Header A SHUT **(YES)**
- 1SW-40, NSW Supply to Header B SHUT **(YES)**
- 1SW-275, Hdr A Return to Normal Hdr SHUT **(YES)**
- 1SW-274, Hdr B Return to Normal Hdr SHUT **(YES)**

Comment:

AOP-022, Step 7.c

✓ **Performance Step: 11** **SHUT** 1SW-276, Hdrs A&B Return to NSW Hdr.

Standard: Locates 1SW-276 MCB switch and takes it to SHUT

Comment:

AOP-022, Note Prior to Step 8

Performance Step: 12

NOTE: A ruptured ESW or NSW Header is typically indicated by lower pressure and higher flow in the same header than those existing prior to the breach. Trends rather than specific values should be used. Magnitude will vary depending on location and severity of the breach.

Standard: Reads and initials Note

Comment:

AOP-022, Step 8

✓ **Performance Step: 13** **DETERMINE** the ruptured header using the following as a guide:

A ESW Header

- **PI-9101A1 SA**, A Disch Press, LESS THAN EXPECTED (Normal: 60 to 105 psig)
- **ALB-002/6-1**, SERV WTR SUPPLY HDR A LOW PRESS - ALARMED
- **FI-9101A1 SA**, A Hdr Flow, GREATER THAN EXPECTED (Normal: 8200 to 22,000 gpm)
- **ALB-002/5-5**, SERV WTR HEADER A HIGH-LOW FLOW - ALARMED

B ESW Header

- **PI-9101B1 SB**, B Disch Press, LESS THAN EXPECTED (Normal: 60 to 105 psig)
- **ALB-002/7-1**, SERV WTR SUPPLY HDR B LOW PRESS - ALARMED
- **FI-9101B1 SB**, B Hdr Flow, GREATER THAN EXPECTED (Normal: 8200 to 22,000 gpm)
- **ALB-002/6-5**, SERV WTR HEADER B HIGH-LOW FLOW - ALARMED

Standard: Inspects MCB indications for ESW header rupture:

A ESW Header:

PI-9101A1 SA, A Disch Press (95 psig)

ALB-002/6-1 (clear)

FI-9101A1 SA (16,500 gpm)

ALB-002/5-5 (clear)

B ESW Header:

PI-9101B1 SB (**LOW 53 psig**)

ALB-002/7-1 (clear)

FI-9101B1 SB (**HIGH 22,500 gpm**)

ALB-002/6-5 (clear)

Determines ruptured header is 'B' ESW Header

Comment:

AOP-022, Step 8 NOTE

Performance Step: 14

NOTE: CNMT Fan Coil Units flow indication (FI-9276) is located downstream of return side isolation valve 1SW-242 and will indicate low flow for a breach in the coils.

Standard: Reads and initials Note

Comment:

AOP-022, Step 8 continued

Performance Step: 15

(Determine rupture header continued)

NSW Header

- **PI-9302.1**, Disch Hdr Press, LESS THAN EXPECTED (Normal: 45 to 105 psig)
- **ALB-002/7-2**, SERV WTR PUMPS DISCHARGE LOW PRESS - ALARMED
- **FI-9301.1**, Turbine Bldg Flow, HIGH FLOW
- **FI-9304**, WPB SW Flow, HIGH FLOW
- **FI-9276**, Containment Coil Units SW Return, LOW FLOW (Normal: 1700 to 2400 gpm)

Standard: Inspects MCB indications for NSW rupture:

PI-9302.1 9(MORE than expected 113 psig)

ALB-002/7-2 (clear)

FI-9301.1 (not high flow started at 7,000 now 7,400 gpm)

FI-9304 (not high flow started at 10,000 now 12,600 gpm)

FI-9276 (not low flow – high flow started at 1800 now $\geq$ 3000 gpm)

Comment:

AOP-022, Step 9

✓ **Performance Step: 16** **GO TO** the appropriate step as indicated by the parameter LOST:

NOTE- A rupture affecting NSW and ESW Header(s) could be caused by an NSW/ESW boundary rupture, or a rupture in any header with failure of ESW Headers to isolate.

IF...LOST (ESW Header) DUE TO ANY (ESW Header Rupture Only) GO TO (Section 3.0 Step 10 page 9)

Standard: Reads step and initials Note goes to Section 3.0 step 10

Comment:

AOP-022, Step 10.a

✓ **Performance Step: 17** **ISOLATE** the ruptured ESW Header, as follows:

PLACE AND HOLD the ruptured header ESW Pump control switch to STOP.

Standard: Locates MCB switch for the 'B' ESW pump and places it to STOP and HOLD switch

Evaluator Note:	**ALB 02-7-1 and 4-5 will alarm when 'B' ESW pump is stopped**

Comment:

AOP-022, Step 10.b

Performance Step: 18 **VERIFY** the corresponding Header A (B) to Auxiliary Reservoir valves SHUT: 1SW-271

Standard: Locates 1SW-271 and verifies valve is shut

Comment:

AOP-022, Step 10.c

✓ **Performance Step: 19** **WHEN** pump discharge pressure has been less than 53 psig for at least 1-minute, **THEN RELEASE** the ESW Pump control switch.

Standard: Reads step and continues to hold 'B' ESW pump switch until discharge pressure is < 53 psig for at least 1 minute prior to releasing switch

Comment:

AOP-022, Step 10.d

Performance Step: 20 **ISOLATE** ESW to affected header CNMT Fan Coolers:

ESW Header B

- 1SW-225 (AH-1 Supply)
- 1SW-227 (AH-4 Supply)
- 1SW-98 (AH-1 Return)
- 1SW-110 (AH-4 Return)

Standard: Locates switches for B ESW CNMT Fan Coolers:

- 1SW-225 (AH-1 Supply) (takes to shut)
- 1SW-227 (AH-4 Supply) (takes to shut)
- 1SW-98 (AH-1 Return) (takes to shut)
- 1SW-110 (AH-4 Return) (takes to shut)

Evaluator Note:	**While the valves are shutting ALB 01-7-5 will alarm and ESF Bypass panel B Cont Fan Coolers Light comes on**

Comment:

AOP-022, Step 10.e

Performance Step: 21 **OPEN** applicable DC knife switch at 6.9 KV Emergency Bus:

1B-SB-1, ESW PUMP 1B-SB

Standard: Directs local operator to open DC knife switch

Simulator Operator:	**Acknowledge request for operator to open DC knife switch on B ESW pump.**

Comment:

Terminating Cue:	**END OF JPM**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC JPM c - Loss of Service Water (Line Break) (AOP-022)

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 operating at 100% power steady state conditions.

Initiating Cue:	The CRS instructs you to maintain present plant conditions.

Facility: Shearon Harris Task No.: 301057H401, 001010H101

Task Title: Decreasing CCW Surge Tank Level JPM No.: 2009B NRC Exam JPM d

K/A Reference: APE 026 AA1.05 RO 3.1 SRO 3.1 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 at 100 percent power. All parameters are normal.

Initiating Cue: The CRS instructs you to maintain present plant conditions.

Task Standard:	All actions for a decreasing CCW surge tank level to less than 4% have been performed per AOP-014.
Required Materials:	None.
General References:	AOP-014 (Rev. 31)
Time Critical Task:	No
Validation Time:	15 minutes

Critical Step Justification

Step 3	Identifies appropriate procedure to address CCW leak.
Step 6	Must evaluate plant conditions and go to the appropriate section
Step 8	Continuous action step that provides a source of makeup to the CCW system to slow decrease in CCW surge tank level
Step 13	Isolates non-essential header from essential header to allow determination of leak location.
Step 14	Minimizes pressurizer level increase
Step 18	Securing CCW pumps prevents damage which allows for later recovery once the system has been restored.
Step 20	Trips reactor to allow securing of RCPs due to loss of cooling. Prevents challenging RPS. Secures RCPs to prevent damage to RCPs which would allow recovery of forced flow when CCW system is restored.

2009B NRC Exam - SIMULATOR SETUP

Simulator Operator

- Reset to IC-164 (saved exam IC PW 9newguys)
- DO NOT GO TO RUN
- NOTE: This IC has been saved with an active CCW leak of 100 gpm. When the simulator is placed in run the leak will cause ALB 05—8-5 "Computer alarm CCW Systems" to alarm after ~ 30 second run time.

STAY IN 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.)

To recreate the IC setup for this JPM:

- Initial Simulator IC was IC-19
- Go to run
- Insert malfunction for CCW leak
  - IMF CCW08B 200 0
  - Wait until CCW surge tank level is ~ 47%
- Modify CCW leak
  - MMF CCW08B 100 0
- Silence Acknowledge and Reset Annunciators
- Freeze and Snap these conditions for future use

START TIME: _____

Examiners Note:	**Approximately 30 seconds after the simulator is placed in run, annunciator ALB 05-8-5 will alarm "Computer alarm CCW Systems" due to an active CCW leak of 100 gpm.** **During this JPM CCW surge tank level will continue to decrease to < 4%. The applicant should promptly identify the low level and perform the continuous action step 2 of placing and holding the control switch for all affected CCW pumps to STOP until CCW header pressure is <52 psig.** **At this point the Reactor must be tripped within 10 minutes. Allow the applicant to work through AOP-014 to step 11. After reading step 11 CUE will be that CCW is not expected to be recovered within 10 minutes.**

MCB annunciator alarms "ALB 05-8-5"

Performance Step: 1 Respond to annunciator

Standard: Announces unexpected annunciator and checks ERFIS Alarm for details on which alarm has occurred

Evaluator Cue:	**CRS acknowledges annunciator** **(using proper communications)**

Examiners Note:	**Approximately 30 seconds later CCW surge tank level reaches 40% and ALB 05-6-1 "CCW Surge Tank High Low Level" and ALB 26-2-1 "Gross Fuel Det Trouble" will alarm**

Comment:

MCB annunciator alarms "ALB 05-6-1" and ALB 26-2-1

Performance Step: 2 Respond to annunciator

Standard: Announces unexpected annunciator and reviews APP for details on the alarms

Evaluator Note:	**The Operator may choose to initiate makeup via DW-15, per OMM-001, prior to AOP-014 directions.**

Comment:

Entry Conditions exist for AOP-014

✓ **Performance Step: 3** Recognition of entry conditions for AOP-014.

Standard: Operator announces entry conditions are met for AOP-014.

Obtains procedure

Comment:

AOP-014 Section 3.0, Note prior to Step 1

Performance Step: 4 **NOTE**

- This procedure contains no immediate actions.
- Loss of CCW may require implementation of the SHNPP Emergency Plan.

Standard: Reads and initials note

Comment:

AOP-014 Section 3.0, Step 1

Performance Step: 5 Refer to PEP-110, Emergency Classification and Protective Action Recommendations, and ENTER the EAL Network at entry point X

Standard: Informs Shift Manager to refer to EAL network at entry point X

Evaluator Cue:	**Shift Manager acknowledges EAL network entry point X**

Comment:

AOP-014 Section 3.0, Step 2

✓ **Performance Step: 6** Evaluate plant conditions and go to the appropriate section:

Malfunction Leakage From CCW System

Section 3.2

Standard: (Transitions to Section 3.2)

Comment:

Section 3.2, Note prior to Step 1

Performance Step: 7 **NOTE**: THE GFFD AND RCS SAMPLE PANEL WILL ISOLATE ON LOW CCW SURGE TANK LEVEL OF LESS THAN OR EQUAL TO 40%

Standard: Reads and initials note

Comment:

Section 3.2, Step 1

✓ **Performance Step: 8** **CONTINUOUS ACTION:**

MAINTAIN CCW Surge Tank level between 45% and 75% using 1DW-15, CCW Make Up.

Standard: Acknowledges continuous action, locates control switch and OPENS 1DW-15

Comment:

Section 3.2, Note prior to Step 2

Performance Step: 9 **NOTE**: AN AFFECTED CCW PUMP IS ONE TO WHICH ANY OF THE FOLLOWING APPLY:

- Less than 4% level indicated on the CCW surge tank
- Exhibits abnormal flow
- Aligned to an affected Train pump through the non-essential header

Standard: Reads and initials note

Comment:

Section 3.2, Step 2

Performance Step: 10 **CONTINUOUS ACTION:**

CHECK BOTH OF THE FOLLOWING CONDITIONS EXIST:

- ALL CCW SURGE TANK LEVEL INDICATORS SHOW GREATER THAN 4%
- CCW Pump flow indication is NORMAL

Standard: Acknowledges continuous action, checks CCW surge tank level. Reports as found.

Evaluator Cue:	**If report made to CRS – CRS acknowledges reported indications made**

Comment:

Section 3.2, Step 3

Performance Step: 11 CHECK EITHER RHR Train in Shutdown Cooling Mode

Standard: Identifies/reports RHR not in service.

RNO - GO TO Step 8

Comment:

Section 3.2, Step 8

Performance Step: 12 **CHECK** RCS temperature greater than 200°F.

Standard: Identifies RCS greater than 200˚F.

Comment:

Section 3.2, Step 9.a

✓ **Performance Step: 13** **CHECK** the Non-Essential header affected or previously isolated (insufficient flow, known to be the leak source, or other indication).

VERIFY SHUT the following valves:

- 1CS-7, 45 gpm Letdown Orifice A
- 1CS-8, 60 gpm Letdown Orifice B
- 1CS-9, 60 gpm Letdown Orifice C
- 1CS-460, Excess Letdown
- 1CS-461, Excess Letdown
- 1CS-28, RHR Letdown (HC-142.1)
- 1SP-948 SB, RCS Loop B & C Hot Leg Cnmt Isol
- 1SP-949 SA, RCS Loop B & C Hot Leg Cnmt Isol
- 1SP-40 SB, Pressurizer Liquid Sample Isol
- 1SP-41 SA, Pressurizer Liquid Sample Cnmt Isol
- 1SP-59 SB, Pressurizer Stm Space Sample Isol
- 1SP-60 SA, Pressurizer Stm Space Sample Isol

Standard: Identifies/reports that the Non-Essential header is affected then **Verifies** the following valves shut:

- 1CS-7, **(OPEN – Must Shut)**
- 1CS-8, **(OPEN – Must Shut)**
- 1CS-9, (Shut)
- 1CS-460, **(OPEN – Must Shut)**
- 1CS-461, **(OPEN – Must Shut)**
- 1CS-28, (Shut)
- 1SP-948 SB, **(OPEN – Must Shut)**
- 1SP-949 SA, **(OPEN – Must Shut)**
- 1SP-40 SB, **(OPEN – Must Shut)**
- 1SP-41 SA, **(OPEN – Must Shut)**
- 1SP-59 SB, **(OPEN – Must Shut)**
- 1SP-60 SA, **(OPEN – Must Shut)**

Evaluator Cue:	**CRS acknowledges report of non-essential header is affected**

Comment:

Section 3.2, Step 9.b

✓ **Performance Step: 14** **ISOLATE** Charging flow as follows:

1) **PLACE** controller FK-122.1, Charging Flow, in MANUAL AND SHUT.
2) **SHUT** 1CS-235 SB, Charging Line Isolation.
3) **SHUT** 1CS-238 SA, Charging Line Isolation.

Standard: Locates FK-122.1, selects MANUAL and lowers output to 0.

Locates 1CS-235 SB, and shuts valve

Locates 1CS-238 SA, and shuts valve

Evaluator Note:	**1 of 3 (1, 2, or 3) required to satisfy critical element of step 12**

Comment:

Section 3.2, Note prior to Step 9.c

Performance Step: 15 **NOTE**

The intent of the following step is to stop the running CSIP if the potential exists for over pressurizing the RCS.

Standard: Reads and initials note

Comment:

Section 3.2, Step 9.c

Performance Step: 16 **CHECK** that ONE of the following EXISTS:

- Bubble in the PZR
- RPV Head removed or detensioned
- RCS vented per Tech Specs

Standard: Identifies that a bubble exists in the pressurizer

Comment:

Section 3.2, Step 10

Performance Step: 17 **CHECK** CCW lost to ANY operating RHR Train:

- **VERIFY** affected RHR pump STOPPED.
- **REFER TO** AOP-020, Loss of RCS Inventory or Residual Heat Removal While Shutdown. (Continue with this procedure, as time permits.)

Standard: Identifies/reports RHR not in service.

Goes to RNO then Step 11

Comment:

Section 3.2, Step 2 Continuous Action

✓ **Performance Step: 18** CCW surge tank level <4% on operable level indicators

PLACE AND **HOLD** the control switch for ALL affected CCW Pumps to STOP until CCW header pressure is less than 52 psig.

Standard: Reports CCW level and takes 'A' and 'B' CCW pump control switches to stop and hold until header pressure is < 52 psig.

Evaluator Cue:	**CRS acknowledges report**

Comment:

Section 3.2, Caution prior to Step 11

Performance Step: 19 **CAUTION**

Operation of RCPs for greater than 10 minutes without CCW cooling to the motor oil coolers may result in RCP bearing damage.

Standard: Reads and initials caution – writes down time when CCW is lost – informs CRS of potential actions to trip Reactor

(may set 10 minute timer)

Evaluator Cue:	**CRS acknowledges report**

Comment:

Section 3.2, Step 11

✓ **Performance Step: 20** **CHECK** CCW expected to be lost for greater than 10 minutes.

a. **CHECK** the Reactor is TRIPPED

b. **STOP** ALL running RCPs

c. **SHUT** 1RC-107, PRZ Spray Loop A

d. **SHUT** 1RC-103, PRZ Spray Loop B

Evaluator Cue:	**The CCW system is NOT expected to be recovered within 10 minutes. Perform all actions of step 11.**

Standard:

Performs immediate actions of Path-1

Verify Reactor Trip (YES)

Automatic OR manual reactor trip – SUCCESSFUL (Manual)

Check for any of the following:

- Trip breakers RTA AND BYA - OPEN (YES)
- Trip breakers RTB AND BYB – OPEN (YES)

Rod bottom lights – LIT (YES)

Neutron flux DECEASING (YES)

Verify Turbine Trip (YES)

- All turbine throttle valves shut (YES)
- All turbine governor valves shut (YES)

Verify Power to AC Emergency Buses

Check AC emergency buses 1A-SA and 1B-SB energized by offsite power or EDGs (ENERGIZED BY OFFSITE POWER)

- Breakers 105 and 125 are closed

Check SI Actuation:

Check LIT:

- SI Actuated bypass permissive light (NO)
- ALB-11-2-2 (NO)
- ALB-11-5-1 (NO)
- ALB-11-5-3 (NO)
- ALB-12-1-4 (NO)

Check SI actuation criteria:

- CNMT pressure > 3.0 psig (NO)
- PRZ pressure < 1850 psig (NO)
- Steam pressure < 601 psig (NO)

GO TO EPP-004, "Reactor Trip Response", Step 1

IMMEDIATE ACTIONS OF PATH-1 ARE COMPLETE

AOP-014 continued:

Stop A, B, and C RCP

Shut 1RC-107 and 103

Evaluator Cue:	**NOTE: May need to stop applicant from getting Path-1. With Path-1 immediate actions completed, cue the applicant to now continue with AOP-014 actions.**

Comment:

Terminating Cue:	**After Path-1 immediate actions are performed and the RCP's secured with Spray valves shut;** **END OF JPM**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC JPM d - Decreasing CCW Surge Tank Level (AOP-014)

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 at 100 percent power. All parameters are normal.

Initiating Cue:	The CRS instructs you to maintain present plant conditions.

DRAFT

Facility: Shearon Harris Task No.: 301073H401

Task Title: High RCS Pressure JPM No.: 2009B NRC Exam JPM e

K/A Reference: APE 027 AA2.16 RO 3.6 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 reactor is at 100 percent power and all parameters are normal.

Initiating Cue: The CRS instructs you to maintain present plant conditions.

Task Standard:	All steps necessary to mitigate the RCS high-pressure transient have been performed.
Required Materials:	None
General References:	None
Time Critical Task:	No
Validation Time:	5 minutes

Critical Step Justification

Step 4	Identifies mispositioned components to be corrected.
Step 5	Establishes manual control of spray valves in order to control PRZ pressure increase which could lead to a reactor trip.

2009B NRC Exam - SIMULATOR SETUP

Simulator Operator

- Reset to IC-165 (saved exam IC PW 9newguys)
- Go to RUN and wait ~ 10 seconds then silence and acknowledge alarms.

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.)

To recreate the IC setup for this JPM:

- Initial Simulator IC was IC-19
- Create Trigger 1 Fail PT-444 to 0 ramp in over 30 seconds
    - Imf PT:444 (1 0 0) 0 00:00:30
- Silence and Acknowledge annunciators
- Freeze and Snap these conditions for future use

Evaluator Note:	Without operator actions – additional times and problems: Start to 3 min and 45 seconds - • ALB 09-5-1 "Pressurizer High – Low Pressure • ALB 10-8-5A "CMPTR Alarm Rx Coolant" At 5:00 minutes after start w/o actions • ALB 9-3-1 "Pressurizer Control High Pressure" • ALB 9-8-1 "Pressurizer Relief Tank High-Low Level Press Or Temp" • ALB 9-8-2 "Pressurizer Relief Discharge High Temp"

Evaluator Cue:	**Approximately 20 seconds after taking shift have Simulator Operator insert Trigger 1 (PT-444 fails to 0)**

START TIME: _____

Annunciator Alarms

Performance Step: 1 ALB 09-3-3 "PRZ CONT LOW PRESS AND HEATERS ON"

Standard: Announces annunciator and responds to alarm
Identifies that PI-444 has failed low
Recognizes entry conditions to AOP-019

Evaluator Cue:	**Acknowledges annunciator and entry into AOP-019 (using proper communications)**

Comment:

AOP-019, Step 1

Performance Step: 2 **NOTE:** Steps 1 through 3 are immediate actions.

CAUTION: A pressure transmitter or indicator malfunction may exist. When referred to throughout this procedure, actual RCS pressure should be obtained by cross-checking of diverse instrumentation, such as PI-455.1, PI-456, and PI-457.

CHECK THAT BUBBLE EXISTS IN THE PRESSURIZER.

Standard: Verifies bubble in pressurizer by checking parameters. (Pressure, Temperature, and Level.) (YES)

Comment:

AOP-019, Step 2

Performance Step: 3 **VERIFY** ALL PRZ PORVs **AND** associated block valves properly positioned for current PRZ pressure and plant conditions.

Standard: Identifies PRZ PORV PCV-445A, PCV-445B, and PCV-444B all indicate SHUT and all associated block valves indicate OPEN.

Determines all valves are properly positioned for current conditions.

Comment:

AOP-019, Step 3

✓ **Performance Step: 4** **CHECK** BOTH PRZ Spray Valves properly positioned for current PRZ pressure and plant conditions.

Standard: Determines both spray valves are not properly positioned (shut but should be open in response to high pressure condition) and transitions to RNO step.

Comment:

AOP-019, Step 3 RNO

✓ **Performance Step: 5**

CONTROL PRZ Spray Valves using ONE of the following methods (listed in order of preference):

- AFFECTED Spray Valve controller in MANUAL (if only one is obviously malfunctioning)

OR

- PK-444A, Master Pressure Controller, in MANUAL

OR

- BOTH individual Spray Valve controllers in MANUAL

Standard:

- Determines both spray valves are affected (not one); moves to next method in order of preference.
- Locates PK-444A Pressure Controller. Places controller in manual and increases output signal to secure the heaters and opens the spray valves as needed to stop the RCS pressure increase.
- No expected action (with previous step successful) but may locate PK-444C.1 PRZ Spray Loop A and PK-444D.1 PRZ Spray Loop B controllers and place them in manual; increase controller output signals to open sprays and stop RCS pressure increase.

Comment:

Terminating Cue:	**After the applicant has taken manual control of the PRZ pressure master controller (or both PRZ spray valve controllers) and has stopped the RCS pressure increase, the evaluation on this JPM is complete.** **END OF JPM**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam JPM e - High RCS Pressure (AOP-019)

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

Initial Conditions:	The reactor is at 100 percent power and all parameters are normal.

Initiating Cue:	The CRS instructs you to maintain present plant conditions.

DRAFT

Worksheet

Facility: Shearon Harris Task No.: 301140H601

Task Title: Loss Of All AC Power JPM No.: 2009B NRC Exam JPM f

K/A Reference: APE 056 AK3.02 RO 4.4 SRO 4.7 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 at 100 percent power. All parameters are normal.

Initiating Cue: The CRS instructs you to maintain present plant conditions.

Task Standard:	Steps 1-4 of EOP-EPP-001 completed satisfactorily with the immediate actions completed.
Required Materials:	None
General References:	EOP-EPP-001 (Rev. 31)
Time Critical Task:	No
Validation Time:	5 minutes

Critical Step Justification

Step 1	Identifies appropriate procedure entry
Step 7	Prevents loss of RCS inventory.
Step 10	Establishes AFW source to ensure minimum AFW flow for decay heat removal.

2009B NRC Exam - SIMULATOR SETUP

Simulator Operator

- Reset to IC-166 (saved exam IC PW 9newguys)
- Turn OFF RM-11 alarm

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.)

To recreate the IC setup for this JPM:

- Initial Simulator IC was IC-19
- Create Trigger 1
  - Disable both EDGs
    - imf DSG01 3
  - Fail the auto start relays for both TDAFW pump steam supply valves
    - icor Z1974TDI FAIL_ASIS
    - icor Z1975TDI FAIL_ASIS
  - Insert a loss of all AC power
    - imf EPS01 1
- Silence Acknowledge and Reset Annunciators
- Freeze and Snap these conditions for future use

START TIME: _____

Evaluators Note:	**The applicant is expected to silence all alarms and direct another board operator to respond to alarms that are not pertaining to this task.** **After the applicant takes the shift wait ~ 20 seconds and have the Simulator Operator insert Trigger 1 "Loss of AC Power"**

Loss of All AC Power

✓ **Performance Step: 1**

- Multiple Annunciators identifying loss of all AC power
- MCR lighting goes to emergency lighting conditions
- Reactor Trip / Turbine Trip
- 1A-SA and 1B-SB Emergency Buses are not energized

Standard: Identifies Loss of All AC power has occurred and announces entry conditions are met for EOP-EPP-001

Comment:

EPP-001, Step 1

Performance Step: 2

CAUTION: Critical Safety Function Status Trees should be monitored for information only. Function Restoration Procedures should NOT be implemented unless directed by this procedure.

NOTE: Steps 1 AND 2 are immediate action steps.

VERIFY REACTOR TRIP:

- CHECK FOR ANY OF THE FOLLOWING:
- TRIP BREAKERS RTA AND BYA – OPEN
- TRIP BREAKERS RTB AND BYB – OPEN
- NEUTRON FLUX – DECREASING

Standard:

Locates reactor trip and bypass breakers (BOTH ARE OPEN)

Locates Reactor power indications and verifies neutron flux is decreasing.

Comment:

EPP-001, Step 2

Performance Step: 3

VERIFY TURBINE TRIP:

- CHECK FOR ANY OF THE FOLLOWING:
- ALL TURBINE THROT-TLE VALVES – SHUT

  OR
- ALL TURBINE GOVERNOR VALVES - SHUT.

Standard:

Locates turbine throttle valves indications and verifies them shut and/or locates turbine governor valves indications and verifies them shut. (ALL are shut)

Comment:

Performance Step: 4 OBTAINS PROCEDURE

Standard: Obtains EOP-EPP-001.

Evaluator Note:	**Although EPP-001 can be entered directly, operator may choose to enter EPP-001 by going to Path-1.**

Comment:

EPP-001, Step 3.a

Performance Step: 5 CHECK RCS ISOLATED:

- CHECK PRZ PORVS - SHUT.

Standard: Locates PCV-445A, PCV-445B, and PCV-444B indications and verifies the PORVs are shut.

Comment:

EPP-001, Step 3.b

Performance Step: 6 CHECK LETDOWN ISOLATION VALVES SHUT:

1CS-1 (LCV-460)

1CS-2 (LCV-459)

Standard: Locates 1CS-1 (LCV-460) and 1CS-2 (LCV-459) and determines valves are still open.

Performs RNO actions for Step 3.b

Comment:

EPP-001, Step 3.b RNO

✓ **Performance Step: 7** Perform the following:

1. Shut all orifice isolation valves:
   1CS-7
   1CS-8
   1CS-9
2. Shut letdown isolation valves:
   1CS-1 (LCV-460)
   1CS-2 (LCV-459)

Standard: Shuts 1CS-7, 1CS-8, and 1CS-9 if open

Shuts letdown isolation valves:

1CS-1 **(LCV-460)** takes control switch for valve to **SHUT**

1CS-2 **(LCV-459)** takes control switch for valve to **SHUT**

Comment:

EPP-001, Step 3.c

Performance Step: 8 VERIFY EXCESS LETDOWN ISOLATION VALVES SHUT:

1CS-460

1CS-461

Standard: Locates 1CS-460 and 1CS-461 indications and verifies valves are shut.

Comment:

Examiners NOTE:	**The TDAFW pump has a fail to start signal. The applicant MUST start the TDAFW pump by opening either 1MS-70 or 1MS-72 and adjusting the pump speed controller as necessary to increase flow to the SG's.**

EPP-001, Step 4.a

Performance Step: 9 VERIFY AFW FLOW - GREATER THAN 210 KPPH.

Standard: Locates AFW flow indicators FI-2050A1, FI-2050B1, and FI-2050C1 and determines AFW flow is less than 210 KPPH.

Performs RNO actions for step 4.a

Comment:

EPP-001, Step 4.a RNO

✓ **Performance Step: 10** Perform the following:

1) Verify TDAFW pump – RUNNING
2) Adjust TDAFW pump speed controller as necessary to increase flow.
3) Verify TDAFW pump discharge pressure - GREATER THAN SG PRESSURE
4) Verify AFW valves - PROPERLY ALIGNED

Standard: Determines that 1MS-70 and 1MS-72 are shut and takes 1MS-70 and/or 1MS-72 control switch to **OPEN.**

AFTER 1MS-70 or 1MS-72 are OPEN then:

1) Adjusts TDAFW pump speed controller to increase flow.
2) Verifies TDAFW pump discharge pressure - GREATER THAN SG PRESSURE
3) Verifies AFW valves - PROPERLY ALIGNED

Locates AFW flow indicators FI-2050A1, FI-2050B1, and FI-2050C1 and verifies AFW flow greater than 210 KPPH.

Comment:

EPP-001, Step 4.b

Performance Step: 11 Any level - GREATER THAN 25% [40%]

Standard: Identifies ALL Steam Generator levels are < 25%

Comment:

EPP-001, Step 4.b RNO

Performance Step: 12 Maintain AFW flow greater than 210 KPPH until level greater than 25% [40%] in at least one intact SG.

Standard: Continues flow rates established in previous step (or may adjust flows) to raise level in at least one SG to > 25%

Comment:

EPP-001, Step 4.c

Performance Step: 13 Control AFW flow to maintain all intact levels between 25% and 50% [40% and 50%]

Standard: Reads step and continues flow rates established in previous step to raise level in at least one SG to > 25%

Comment:

EPP-001, Step 5

Performance Step: 14 Evaluate EAL Network Using Entry Point X.

Standard: Informs Shift Manager to evaluate EAL Network Using Entry Point X

Evaluator Cue:	**Acknowledge request**

Comment:

Terminating Cue:	**With the TDAFW pump delivering flow to the SG's and level recovering in the SG's** **END OF JPM** ***NOTE: At the conclusion of this JPM have the Simulator Operator turn the RM-11 alarm on.**

STOP TIME: _____

Simulator Operator:	**At the conclusion of this JPM turn the RM-11 alarm on.**

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam JPM f - Loss Of All AC Power (EOP-EPP-001)

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 at 100 percent power. All parameters are normal.

Initiating Cue:	The CRS instructs you to maintain present plant conditions.

DRAFT

Worksheet

Facility: Shearon Harris Task No.: 003001H101

Task Title: Start An RCP JPM No.: 2009B NRC Exam JPM g

K/A Reference: 003 A2.02 RO 3.7 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: A GP-002 heat-up is in progress. Two hours ago the "C" RCP was removed from service for a breaker modification. Maintenance has been completed and the 'C' RCP is ready for operation.

Initiating Cue: The CRS has instructed you to start "C" RCP in accordance with OP-100 Section 5.1. Attachments 1 and 2 have been completed.

Task Standard:	Start an RCP and secure the RCP when directed by AOP-018, Reactor Coolant Pump Abnormal Conditions due to RCP motor trouble (oil leak leading to increasing motor bearing temperatures).
Required Materials:	None
General References:	OP-100 (Rev. 31) and AOP-018 (Rev. 35)
Time Critical Task:	No
Validation Time:	25 minutes

Critical Step Justification

Step 8	Step provides support equipment to prevent damage to the RCP.
Step 12	Starts the RCP.
Step 16	Performance of immediate actions.
Step 21	Determines appropriate section of the procedure to implement.
Step 33	Action secures the affected RCP

2009B NRC Exam - SIMULATOR SETUP

Simulator Operator

- Reset to IC-167 (saved exam IC PW 9newguys)
- NOTE: A conditional trigger 1 (Trigger 1) is set to actuate when 'C' RCP is started. **DO NOT RUN TRIGGER 1** it will run itself. This trigger will simulate a bearing oil reservoir leak and approximately 1 minute later cause ALB-010 3-1b to alarm. The 'C' RCP bearing temperatures will increase 5 minutes after the start of the 'C' RCP.
- Go to RUN
- Set Source Range Audio Multiplier to 1000 to establish audible counts
- 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.)

To recreate the IC setup for this JPM:

- Initialize to IC-2 Mode 4 HSD conditions. RCS 335°F and ~355 psig.
- Secure the "C" RCP and operate Pressurizer sprays as necessary to stabilize RCS pressure.
- Adjust RHR if needed to stabilize RCS temperature.

How to create the conditional trigger used in this JPM:

- Open RCS malfunctions and place RCS11C on 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 (RCP_C_START) and then click assign. You have now set Trigger 1 to activate when the 'C' RCP is started. Trigger 1 should show a source file and a description. This file will go TRUE when 'C' RCP is started.

Trigger 1 – RCP 'C' bearing oil reservoir leak will now start after the 'C' RCP is started.

It will take ~ 1 minute for the malfunction to cause ALB-010 3-1b to alarm. The bearing temperatures will increase 5 minutes after the malfunction is inserted as indicated on both OSIPI and ERFIS screen AOP-018.

Evaluator Note:	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. This will allow them to review the Precautions and Limitations associated with OP-100 and have time for a task preview of the steps to accomplish starting the RCP. Expect that the candidates will take about 10 - 20 minutes to complete this review. **During the performance of the JPM the candidate may use either MCB indication or ERFIS indications when reviewing RCP pump indications.**

START TIME: _____

Performance Step: 1 Procedure obtained and begins the task of starting the RCP

Standard: Obtained OP-100 and reviews P & L's and Section 5.1 for 'C' RCP startup. Reviews and verifies initial conditions are satisfied.

Comment:

OP-100, Section 5.1.2 Caution prior to Step 1

Performance Step: 2 Only one RCP is to be started at any one time. If the motor is allowed to coast to a stop between starts, two successive starts are permitted. A third start may be made when the winding and the core have cooled by running for 20 minutes, or by standing idle for 45 minutes.

Standard: Reviews and initials caution prior to step 1.

Comment:

Steps 1a, b

Performance Step: 3

1. **VERIFY** the following before pump start:

   a. **IF** jogging RCPs per GP-001, **THEN VERIFY** RCS Pressure is greater than 325 psig.

   b. **VERIFY** # 1 Seal ΔP is greater than 200 psid.

Standard:

Step 1a is N/A

Step 1b – Locates PI-154A1 and verifies that the 'C' RCP #1 Seal ΔP is greater than 200 psid.

Comment:

Note prior to Step 1.c

Performance Step: 4

Reviews note prior to step 1.c

Standard:

Reads and initials note:

VCT Outlet Temp TE-116 should be used for seal injection water temperature.

Comment:

Step 1.c

Performance Step: 5

c. **VERIFY** Seal Injection flow is between 8 and 13 gpm at a temperature between 60 and 130°F.

Standard:

Locates seal injection flow indication FI-154A and verifies flow between 8-13 gpm and also verifies temperature indicator TI-116.1 reading between 60-130°F.

Comment:

Step 1.d

Performance Step: 6 **VERIFY** # 1 Seal Leakoff is in the normal operating range of Attachment 3.

Standard: Locates #1 Seal Leakoff flow indicator FR-154A and verifies that it meets Attachment 3 requirements.

Comment:

Caution prior to Step 2

Performance Step: 7 Reviews caution

Standard: Reviews and initials caution.

RCPs shall not be started with one or more of the RCS cold leg temperatures less than or equal to 325°F unless the secondary water temperature is less than 50°F above each of the RCS cold leg temperatures. This caution is only applicable to the first RCP to be started.

Understands the caution is N/A.

Comment:

Step 2

✓ **Performance Step: 8** **START** the RCP Oil Lift Pump.

Standard: Locates 'C' RCP Oil Lift Pump switch and starts the oil lift pump.

START Time _____

Comment:

Step 3

Performance Step: 9 **VERIFY** the amber permissive light on the lift pump control switch is lit indicating proper lift oil pressure has been achieved.

Standard: Locates amber permissive light on the 'C' RCP Oil Lift Pump Switch and verifies it is lit.

Comment:

Step 4

Performance Step: 10 **ALLOW** the RCP Oil Lift Pump to run for a minimum of 2 minutes before starting an RCP.

Standard: Waits minimum of 2 minutes after starting the oil lift pump prior to starting the 'C' RCP.

Comment:

Note prior to Step 5

Performance Step: 11 When an RCP is started, the RCP ammeter will go off scale high, and then decrease to the normal hot or cold running amps after 15 to 25 seconds.

Standard: Reads and initials Note.

Comment:

Step 5

✓ **Performance Step: 12** **START** the RCP.

Standard: Locates control switch for 'C' RCP and starts 'C' RCP

START Time _____ (≥ 2minutes since lift pump start)

Comment:

Step 6

Performance Step: 13 **VERIFY** the following normal operating parameters:

- Running amps: Hot 460 to 540 amps Cold 715 amps
- RCS flow: Greater than or equal to 98%
- # 1 Seal ΔP Greater than 200 psid
- # 1 Seal leakoff in the normal operating range of
- Attachment 3
- Motor Winding temperature <300°F

Standard: Locates and verifies each parameter is in the normal operating range (ERFIS or MCB indications may be used)

Comment:

Note prior to Step 7

Performance Step: 14 The oil lift pump should be run at least 1 minute after starting an RCP.

Standard: Waits at least 1 minute then secures the 'C' RCP oil lift pump.

Secure Time _____ (≥ 1 minute since RCP start)

Comment:

Performance Step: 15 **Identifies 'C' RCP Upper Oil Rsvr Lo Level alarm ALB-010 window 3-1b**

Standard: Acknowledges alarm, reports alarm to CRS, reviews APP, dispatches AO for local reading using LS-1RC-437 and enters AOP-018 (may wait for local confirmation of low oil level reading).

Evaluator Cue:	**Acknowledge report**

Comment:

AOP-018

✓ **Performance Step: 16** Performs immediate actions of AOP-018

Standard: When AOP-018 is entered **performs immediate action of AOP-018.**

- **CHECK** ANY CSIP RUNNING.

(CHECKS 'A' CSIP is running – voices immediate actions complete)

Simulator Operator:	**AO report after ~1 minute of being dispatched report 'C' RCP upper oil rsvr level is reading -1.37 inches and very slowly decreasing.** **NOTE: The gauge the AO reads is in 0.25 increments with -1.25 at the alarm setpoint. A reading of -1.375 would be approximately halfway between -1.25 and -1.50**

Comment:

Enters AOP-018 NOTE prior to Step 1

Performance Step: 17 Obtains Procedure

- Step 1 is an immediate action
- RCP abnormal conditions may require implementation of the SHNPP Emergency Plan.

Standard: Reads and initials Note.

May inform SM of the need to implement the SHNPP Emergency Plan

Evaluator Cue:	**SM acknowledges the report.**

Comment:

AOP-018 Step 1

Performance Step: 18 **CHECK** ANY CSIP RUNNING.

Standard: Check has been completed during immediate action.

Comment:

AOP-018 Step 2

Performance Step: 19 **REFER TO** PEP-110, Emergency Classification And Protective Action Recommendations, AND **ENTER** the EAL Network at entry point X.

Standard: Informs SM to Refer to PEP-110 and enter EAL Network at entry point X.

Evaluator Cue:	**SM understands Refer to PEP-110 and enter EAL Network at entry point X.**

Comment:

AOP-018 NOTE prior to Step 3

Performance Step: 20 Review note prior to step 3

Standard: Reads and initials note

NOTE: 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.

Comment:

AOP-018 Step 3

✓ **Performance Step: 21** **EVALUATE** plant conditions AND **GO TO** the appropriate section: Reactor Coolant Pump Motor Trouble Section 3.4

Standard: Reads step and goes to section 3.4

Comment:

AOP-018 Section 3.4 Step 1

Performance Step: 22 **Check** All RCPs operating within the limits of Attachment 1 (Page 27).

Standard: Reads step and goes to Attachment 1

Comment:

AOP-018 Attachment 1 Note

Performance Step: 23 Reviews note

Standard: Reads and initials note

False indications such as step changes or spikes on both the upper and lower thrust bearings are signs that the instrumentation transient may not be valid.

Validation of the temperatures should be performed by observing positive indications of any of the following:

- Simultaneous temperature increases in upper and lower thrust bearing and upper guide bearing (may indicate loss of CCW cooling or oil viscosity problems common to the upper reservoir)
- Vibration levels increasing along with increasing bearing temperatures.
- High or low RCP oil level alarms along with increasing bearing temperatures.

Comment:

AOP-018 Attachment 1 Step 1

Performance Step: 24 ANY of the following Motor Bearing temperatures exceeding 190°F:

	ERFIS Points		
	RCP A	RCP B	RCP C
Mtr Upper Thrust Brg Temp	TRC0417A	TRC0427A	TRC0437A
Mtr Lower Thrust Brg Temp	TRC0417B	TRC0427B	TRC0437B
Mtr Upper Radial Brg Temp	TRC0418A	TRC0428A	TRC0438A
Mtr Lower Radial Brg Temp	TRC0419	TRC0429	TRC0439

Standard: Reads RCP Trip Limits associated with RCP bearing temperatures and identifies that the temperatures for TRC0437A, TRC0437B, and TRC0438A are all trending up (but have not exceeded 190°F)

Comment:

AOP-018 Section 3.4 Step 2

Performance Step: 25 **GO TO** Step 11

Standard: Identifies that step 11 is appropriate

Comment:

Step 11

Performance Step: 26 **CHECK** ALL RCPs RUNNING

Standard: Reviews status of RCP's and confirms all 3 RCP's are running

Comment:

NOTE prior to step 12

Performance Step: 27 **Reviews NOTE**

ERFIS points TRC0417A and TRC0439 have been defeated from processing during Cycle 13.

Standard: Reviews and initials note and determines that TRC0439 ('C' RCP Mtr Lower Radial Brg Temp) has been defeated

Comment:

Step 12

Performance Step: 28 **Monitor** RCP Motor parameters (using ERFIS points listed below OR reference HNP POM Group Trends for AOP-018) AND RCP vibration levels:

Standard: Monitors RCP Motor parameters.

Comment:

Step 13

Performance Step: 29 **CHECK** ALL RCP oil level alarms CLEAR

Standard: Checks ALB-010 window 3-1b is still in alarm

RNO **GO TO** Step 15

Comment:

Step 15

Performance Step: 30 **DISPATCH** an operator to check the affected oil reservoir remote level indication: C Upper LIS-1RC-437 236'elev.-NW

Standard: Dispatches AO (should have already have dispatched and been provided with a reading. If asked for new reading at this time CUE: **-1.50 inches and still slowly decreasing**)

Comment:

Step 16

Performance Step: 31 **CHECK** ALL RCP Oil Reservoir level LOW alarms CLEAR.

Standard: NO- ALB-010 window 3-1b still in alarm

RNO 16. GO TO Step 18

Comment:

Step 18

Performance Step: 32 **CHECK** BOTH of the following conditions exist:

- The affected RCP Oil Reservoir local indication is ABOVE -1.25 inches
- Motor bearing temperatures are STABLE

Standard: NO- Both RCP Oil Reservoir level is below -1.25" and the motor bearing temperatures are rising

NOTE: the bearing temperatures will start to rise 5 minutes after the RCP has been started.

RNO step 18

Comment:

Step 18 RNO

✓ **Performance Step: 33** **PERFORM** the following::

- INITIATE a plant shutdown using ONE of the following:
- GP-006
- AOP-038

WHEN Reactor power is < P-8 (49%), THEN STOP the affected RCP.

Standard: Reactor is currently shutdown with power < P-8

Secures the 'C' RCP and reports to CRS that 'C' RCP has been secured

Evaluator Cue:	**CRS acknowledges that the 'C' RCP was secured**

Comment:

Terminating Cue:	**END OF JPM**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam JPM g - Start An RCP

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 GP-002 heat-up is in progress. Two hours ago the "C" RCP was removed from service for a breaker modification. Maintenance has been completed and the 'C' RCP is ready for operation.

Initiating Cue:	The CRS has instructed you to start "C" RCP in accordance with OP-100 Section 5.1. Attachments 1 and 2 have been completed.

DRAFT

Facility: Shearon Harris Task No.: 013002H101

Task Title: Place An Excore NI Channel Out Of Service JPM No.: 2009B NRC Exam JPM h

K/A Reference: 015 A4.03 RO 3.8 SRO 3.9 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 at 100 percent power. NI-44 has failed low. All other parameters are normal.

Initiating Cue: The CRS has directed you to remove NI-44 from service per OWP-RP-26.

Task Standard:	NI-44 removed from service.
Required Materials:	OWP-RP-26, Rev. 15
General References:	OWP-RP (Rev. 15)
Time Critical Task:	No
Validation Time:	15 minutes

Critical Step Justification

Step 4	Placing rod bank selector switch to manual prevents inadvertent reactivity event with unnecessary auto rod movement.
Step 6	Must select correct switch and correct switch position for channel to defeat upper detector comparator
Step 7	Must select correct switch and correct switch position for channel to restore rod control system to allow auto rod control
Step 8	Must select correct switch and correct switch position for channel to defeat comparison of NI channels
Step 14	Resets rate trip for NI-44
Step 16	Defeats NI-44 processing in ERFIS

2009B NRC Exam - SIMULATOR SETUP

Simulator Operator

- Reset to IC-168 (saved exam IC PW 9newguys)
- Go to RUN and wait ~ 10 seconds then silence and acknowledge alarms.

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-168 on the Master Portable Hard Drive

Initial Simulator IC was IC-19

- Insert IMF NIS08D 0.0, PRNIS Channel 44 failed low
- "When requested" run AMS file APP-rps-OWP-NI-08-TST

NOTE: Running AMS file APP-rps-OWP-NI-08-TST will simulate disconnecting P312 from J312 at the rear of N44 Drawer A.

Silence and Acknowledge annunciators

Freeze and Snap these conditions for future use

START TIME: _____

Performance Step: 1 Obtain procedure (Provided by Examiner)

Standard: Obtains OWP-RP-Section 26.

Comment:

OWP-RP-26 Sheet 1

Performance Step: 2 Sheet 1 contains information on which component the OWP is written for, the scope, applicable requirements, precautions, the component lineup, testing requirements, testing action, component lineups restore, remarks and reviewed by.

Standard: Reads sheet 1 to ensure the correct component and scope is for N-44

Comment:

OWP-RP-26 Sheet 2

Performance Step: 3 **Reviews NOTE: This OWP must be performed in order to prevent possible spurious rod motion or level control swings.**

Standard: Reads and initials NOTE

Comment:

OWP-RP-26 Sheet 2 continued

✓ **Performance Step: 4** On Main Control Board Check position:

- Rod Bank Selector switch – MANUAL

Standard: Places Rod Bank Selector Switch in MANUAL.

Comment:

OWP-RP-26 Sheet 2 continued

Performance Step: 5 On Main Control Board check position:

FW Reg BYP Valve Controllers:

- FK-479.1 – MANUAL
- FK-489.1 – MANUAL
- FK-499.1 - MANUAL

Standard: Verifies FK-479.1, FK-489.1, and FK-499.1 controllers all in MANUAL.

Comment:

OWP-RP-26 Sheet 2 continued

✓ **Performance Step: 6** On Detector Current Comparator Drawer position:

- Upper Section Switch – to PR N44
- Lower Section Switch – to PR N44

Standard: Selects PR N44 on UPPER SECTION SWITCH

Selects PR N44 on LOWER SECTION SWITCH

Evaluator Note:	**Channel Defeat lights on drawer will illuminate.**

Comment:

✓ **Performance Step: 7** On Miscellaneous Control and Indication Panel position:

- Rod Stop Bypass Switch – to Bypass PR N44
- Power Mismatch Bypass Switch – to PR44

Standard: Selects BYPASS PR N44 on ROD STOP BYPASS SWITCH

Selects BYPASS PR N44 on POWER MISMATCH BYPASS SWITCH

Comment:

OWP-RP-26 Sheet 2 continued

✓ **Performance Step: 8** On Comparator and Rate Drawer position:

Comparator Channel Defeat Switch – to N44.

Standard: Selects N44 on the COMPARATOR CHANNEL DEFEAT switch

Evaluator Note:	Defeat light on drawer illuminates. PR CH DEV annunciator alarm clears.

Comment:

OWP-RP-26 Sheet 2 continued

Performance Step: 9 NOTE: The purpose of the sign installed below is to alert personnel of tripped bistables that may not be obvious at the NI drawer. The wording in quotations is the recommended wording, but similar words may also be used.

Standard: Reviews and initials Note

Comment:

OWP-RP-26 Sheet 2 continued

Performance Step: 10 Sign stating "Bistables Tripped - OWP-RP in Affect"

Standard: Locates sign and places it in an obvious position on the NI drawer for NI-44.

Comment:

OWP-RP-26 Sheet 3

Performance Step: 11

NOTE: Concurrent verification is preferred in the following step.

At the rear of N44 Drawer A, disconnect P312 from J312

Contact Maintenance to lift leads

Standard:

Calls Maintenance to lift leads at rear of N44 Drawer A and requests that second I&C person accompanies person lifting leads to perform Concurrent verification

Evaluator / Simulator Operator Cue:	**If candidate calls for Maintenance - acknowledge request with proper communications.** *** Inform the applicant that time compression is being used for I&C to report to MCR and that I&C is ready to lift leads.** **(Contact Simulator Operator to run AMS file to simulate lifting leads)** **NOTE: The applicant may request that the step to disconnect the lead is initialed prior to continuing.** **IF SO then cue them to assume that the step is initialed.**

Simulator Operator:	**Run AMS file: APP-rps-OWP-NI-08-TST** **This file simulates disconnecting P3122 from J312.** **After the file is completed wait 10 seconds then report back that the disconnect P312 from J312 has been completed.**

Comment:

OWP-RP-26 Sheet 3 continued

Performance Step: 12 On completion of the above lineup, check the following.
On TSLB-4
PR LO PWR LO FLUX NC 44P (Window 5-4) ENERGIZED

Standard: Locates window 5-4 and initials "ENERGIZED" line

Comment:

OWP-RP-26 Sheet 3 continued

Performance Step: 13 On TSLB-4
PR LO PWR HI FLUX NC 44P (Window 6-4) ENERGIZED

Standard: Locates window 6-4 and initials "ENERGIZED" line

Comment:

OWP-RP-26 Sheet 3 continued

✓ **Performance Step: 14** On TSLB-4
PR HI FLUX RATE NC 44U/K (Window 7-4) ENERGIZED

Standard: Resets rate trip locally at drawer.
Locates window 7-4 and initials "ENERGIZED" line

Evaluator Note:	**Rate trip annunciator alarm clears.**

Comment:

OWP-RP-26 Sheet 3 continued

Performance Step: 15 On BYPASS PERMISSIVE LIGHTS Panel.

PR OVERPWR ROD WTHDRWL BLK BYPASS CHAN IV

(Window 3-8) ENERGIZED

Standard: Locates window 3-8 and initials "ENERGIZED" line

Comment:

OWP-RP-26 Sheet 4

✓ **Performance Step: 16** On ERFIS Computer - After status lights have been checked, perform the following using the DR function.

ANM0123M - PWR RNG CHANNEL N44 Q3 1-MIN AVG

DELETED FROM PROCESSING

Standard: Logs onto ERFIS Computer using DR function and removes ANM0123M - PWR RNG CHANNEL N44 Q3 1-MIN AVG from processing

Comment:

OWP-RP-26 Sheet 4 continued

Performance Step: 17 On MAIN CONTROL BOARD: Circle appropriate position as determined by plant conditions.

ROD BANK SELECTOR Switch MAN/AUTO+

Standard: Checks Rod Bank Selector Switch position

(can circle MAN after cue provided)

Evaluator Cue:	**The applicant may determine that AUTO rod control can be accomplished - CUE them prior to obtaining the procedure:** **The CRS directs that the Rod Bank Selector Switch be left in MANUAL until a second operator is available in the MCR.**

Comment:

OWP-RP-26 Sheet 4 continued

Performance Step: 18 FW Reg Byp Valve Controllers:

Circle appropriate position as determined by plant conditions:

FK-479.1	MAN/AUTO+
FK-489.1	MAN/AUTO+
FK-499.1	MAN/AUTO+

Standard: (Per current plant conditions)

Circles MAN for FK-479.1, FK-489.1 and FK-499.1

Comment:

OWP-RP-26 Sheet 4 continued

Performance Step: 19	Reports to CRS
Standard:	Reports to CRS that N44 has been removed from service IAW OWP-RP-26

Evaluator Cue:	**The CRS acknowledges that N44 has been removed from service IAW OWP-RP-26**

Comment:

Terminating Cue:	**After lineup has been completed and the report provided to CRS this JPM is complete.** **END OF JPM**

STOP TIME: _____

Simulator Operator:	**When the Simulator is reset the ERFIS computer will reset and there is NO NEED to restore the point the applicant took out of processing.**

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam JPM h - Place An Excore NI Channel Out Of Service IAW OWP-RP-26

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 at 100 percent power. NI-44 has failed low. All other parameters are normal.

Initiating Cue:	The CRS has directed you to remove NI-44 from service per OWP-RP-26.

DRAFT

Worksheet

Facility:	Shearon Harris	Task No.:	064007H101
Task Title:	Restore Power to an Emergency Bus	JPM No.:	2009B NRC Exam JPM i
K/A Reference:	068 AA1.10 RO 3.7 SRO 3.9	ALTERNATE PATH: **No**	
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:

AOP-004 has been entered due to a fire in the MCR.

EDG 1A-SA is not in operation.

A Safety bus has subsequently been lost due to a SUT fault.

AOP-004 has directed that the 'A' EDG be started and 'A' safety bus re-energized.

Both safety and non-safety Plant DC Distribution Systems are in operation per OP-156.01 to support EDG operation.

OP-155, Diesel Generator Emergency Power System, Attachments 1, 3, 4 (1A-SA) are complete.

Initiating Cue:

The CRS has directed you to locally start the 'A' EDG IAW OP-155 Section 8.14 and then to energize the 'A' safety bus IAW OP-155 Section 8.13.

OP-155 Section 8.14 Initial conditions are met and step 1 has been completed

Task Standard:	EDG A is locally started and Bus 1A-SA bus is energized by the EDG IAW OP-155
Required Materials:	Copy of OP-155 Sections 8.13, 8.14 and Attachments 6 and 9. Mark Section 8.14 Initial Conditions and Step 1 as complete.
General References:	OP-155 (Rev. 47)
Time Critical Task:	No
Validation Time:	30 minutes

Critical Step Justification

Step 3	Must be completed to reset the starting circuit
Step 6	Ensures full fuel flow for EDG start
Step 8	Ensures adequate air pressure for EDG restart
Step 10	Starts EDG
Step 16	Ensures normal EDG parameters prior to loading EDG
Step 17	Ensures normal generator parameters prior to loading on bus
Step 21	Must be performed to satisfy the interlock for closing the EDG output breaker
Step 23	Energizes emergency bus 1A-SA

START TIME: _____

Performance Step: 1 Obtains Procedure

Standard: Operator obtains procedure

Evaluator Cue:	**Evaluator provides operator a copy of OP-155 Section 8.14 with Initial Conditions and Step 1 signed off as complete.**

Comment:

OP-155 Section 8.14 Step 2

Performance Step: 2 At GCP, VERIFY the UNIT-PARALLEL switch in PARALLEL

Standard: Operator verifies the UNIT-PARALLEL switch in PARALLEL

Evaluator Cue:	**Switch is in parallel**

Comment:

OP-155 Section 8.14 Step 3

✓ **Performance Step: 3** IF the FAILED TO START annunciator is in, THEN DEPRESS the STOP pushbutton

Standard: Operator checks annunciator clear

Evaluator Cue:	**Annunciator is lit**

Standard: Operator depresses stop pushbutton

Evaluator Cue:	**Annunciator is clear**

Comment:

OP-155 Section 8.14 Step 4

Performance Step: 4 At ECP, VERIFY the A CONTROL CIRCUIT and B CONTROL CIRCUIT OPERATIONAL MODE indicator lights are *LIT*.

Standard: Operator checks lights lit

Evaluator Cue:	**Lights are lit**

Comment:

OP-155 Section 8.14 Step 5

Performance Step: 5 PERFORM a general inspection of the EDG, looking for any obvious reasons that the EDG failed to start

Standard: Operator performs inspection

Evaluator Cue:	**There are no apparent reasons for the start failure to have occurred.**

Comment:

OP-155 Section 8.14 Step 6

✓ **Performance Step: 6** VERIFY the Fuel Limit Cylinder has retracted

Standard: Operator Verifies the Fuel Limit Cylinder has retracted

Evaluator Cue:	**NOTE: Due to having to climb on hot EDG piping have the applicant shine a flashlight at the Fuel Limit cylinder and explain what the retracted cylinder would look like then;** **Cue: The Fuel Limit Cylinder has retracted**

Comment:

OP-155 Section 8.14 note before step 7

Performance Step: 7 **NOTE:** If starting air receiver pressures are low, but still above 100 psig, isolating one of the receivers prior to attempting to start the EDG will maximize the potential

number of start attempts

Standard: Operator reads and initials note

Comment:

OP-155 Section 8.14 step 7

✓ **Performance Step: 8** VERIFY at least one starting air receiver is greater than 100 psig

Standard: Operator verifies at least one starting air receiver is greater than 100 psig

Evaluator Cue:	**Pressures are as read**

Comment:

OP-155 Section 8.14 note before step 8

Performance Step: 9 **NOTE:** If the STOP pushbutton was depressed in Step 8.14.2.03, the control circuitry must reset before another start can be attempted. This takes approximately three minutes.

NOTE: The EDG most likely will start in a fast start mode due to the undervoltage. Depending on what failure(s) occurred, however, the EDG may start in the slow start mode.

Standard: Operator reads and initials notes

Comment:

OP-155 Section 8.14 step 8

✓ **Performance Step: 10** DEPRESS EDG 1A-SA PUSH TO START pushbutton

Standard: Operator depresses EDG 1A-SA PUSH TO START pushbutton

Evaluator Cue:	**'A' EDG starts** **Diesel RPM rises to and stabilizes at 450 RPM**

Comment:

OP-155 Section 8.14 caution before step 9

Performance Step: 11 **CAUTION:** 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. Depressing the EDG 1A-SA (1B-SB) STOP pushbutton will de-energize field flashing circuit.

Standard: Operator reads and initials caution

Evaluator Cue:	**Field has flashed**

Comment:

OP-155 Section 8.14 note before step 9

Performance Step: 12 IF the FAILED TO START annunciator is received, THEN DEPRESS the STOP pushbutton

Standard: Operator checks annunciator

Evaluator Cue:	**Annunciator is clear**

Comment:

OP-155 Section 8.14 note before step 10

Performance Step: 13

NOTE: If EDG starts but the generator fails to flash:

- The EDG will be operating at 470 rpm with zero field volts.
- The K1 relay must be reset to enable any future field flashing.
- If EDG is left running, the EDG should self flash within 10 seconds, if the K1 relay is reset.

Standard: Operator reads and initials note

Evaluator Note:	**The fail to start annunciator would be on IF the Field did not flash**

Comment:

OP-155 Section 8.14 step 10

Performance Step: 14

IF EDG starts but the generator fails to flash, THEN PERFORM the following

Standard: Operator marks all of step 10 as N/A

Comment:

OP-155 Section 8.14 step 11

Performance Step: 15 VERIFY the following:

a. AUXILIARY LUBE OIL PUMP control switch in *AUTO.*

b. LUBE OIL CIRCULATING PUMP control switch in *AUTO.*

Standard: Operator verifies AUXILIARY LUBE OIL PUMP control switch in *AUTO*

Evaluator Cue:	**Switch is in auto**

Standard: Operator verifies LUBE OIL CIRCULATING PUMP control switch in *AUTO.*

Evaluator Cue:	**Switch is in auto**

Comment:

OP-155 Section 8.14 step 12

✓ **Performance Step: 16** At ECP, VERIFY the following:

a. Engine RPM increases to 445 to 455 RPM.
b. JACKET WATER PRESS increases to 10 to 20 psig.
c. SHUTDOWN SYSTEM ACTIVE light lit.
d. READY TO LOAD light lit.

Standard: Operator verifies Engine RPM increases to 445 to 455 RPM

Evaluator Cue:	**Engine RPM is 450**

Standard: Operator verifies JACKET WATER PRESS increases to 10 to 20 psig

Evaluator Cue:	**JACKET WATER PRESS is 16 psig**

Standard: Operator verifies SHUTDOWN SYSTEM ACTIVE light lit

Evaluator Cue:	**Red light is lit**

Standard: Operator verifies Blue READY TO LOAD light lit

Evaluator Cue:	**Blue light is lit**

Comment:

OP-155 Section 8.14 step 13

✓ **Performance Step: 17** At GCP, **VERIFY** the following:

a. EI-6955A1V, DG LOCAL CONTROL PANEL AC VOLTMETER, indicates 6210 to 7590 volts.

b. EI-6965A1V, DG 1A-SA GEN FIELD AMMETER, indicates an increased amperage.

c. EI-6954A1V, DG 1A-SA FIELD DC VOLTAGE, indicates an increased voltage.

Standard: Operator verifies AC VOLTMETER, indicates 6210 to 7590 volts

Evaluator Cue:	**Voltage is 6900 volts**

Standard: Operator verifies GEN FIELD AMMETER, indicates an increased amperage

Evaluator Cue:	**Ammeter indicates 20 Amps**

Standard: Operator verifies FIELD DC VOLTAGE, indicates an increased voltage

Evaluator Cue:	**Field voltage is 45 volts**

Comment:

OP-155 Section 8.14 caution prior to step 14

Performance Step: 18 **CAUTION**

To prevent EDG damage, service water should be supplied as soon as possible following emergency bus reenergization.

Standard: Operator reads and initials caution

Comment:

OP-155 Section 8.14 step 14

Performance Step: 19 LOCALLY MONITOR the following EDG temperatures and if either temperature exceeds 185°F, secure the EDG:

a. TI-2476A2V, Temperature Indicator DG 1A-SA L.O. Temp From L.O.Cooler

b. TI-2465AV Temperature Indicator DG 1A-SA Jkt Wtr Temp To Main Hdr

Standard: Operator reads TI-2476A2V

Evaluator Cue:	**TI-2476A2V reads 145°F**

Standard: Operator reads TI-2476AV

Evaluator Cue:	**TI-2476AV reads 160°F**

Comment:

OP-155 Section 8.14 step 15

Performance Step: 20 PROCEED to Section 8.13 to load EDG.

Standard: Operator obtains Section 8.13 and reviews the Initial Conditions.

1. EDG 1A-SA is running (YES)
2. Reads and initials note: The UNIT'PARALLEL switch will automatically sway to the UNIT mode of operation upon EDG loading. Step 2 – At GCP, UNIT-PARALLEL switch in PARALLEL (Switch is in PARALLEL)
3. At GCP, VOLTAGE REGULATOR TRANSFER SWITCH in *AUTO*. (Switch is in AUTO)
4. Control has been transferred to LOCAL (in LOCAL)

Comment:

OP-155 Section 8.13 step 1

✓ **Performance Step: 21** At GCP, POSITION SYNCHRONIZING SWITCH #2 in *ON*.

Standard: Operator POSITIONS SYNCHRONIZING SWITCH #2 in *ON*.

Evaluator Cue:	**SYNCHRONIZING SWITCH #2 is *ON*.**

Comment:

OP-155 Section 8.13 note prior to step 2

Performance Step: 22 **NOTE:** The Synch Check Relay will be bypassed on an undervoltage on the safety bus.

NOTE: When EDG output breaker is closed, the sequencer will place loads onto the EDG and the maximum load will be that of the safety bus

Standard: Operator reads and initials note

Comment:

OP-155 Section 8.13 step 2

✓ **Performance Step: 23** POSITION CS-1702.2SA, BKR 106 CONTROL SWITCH ON D/G 1A-SA GEN CTRL PNL to *CLOSE*.

Standard: Operator places CS-1702.2SA to CLOSE position

Evaluator Cue:	**CS-1702.2SA has a red target**

Comment:

OP-155 Section 8.13 step 3

Performance Step: 24 VERIFY the associated EDG Output Breaker 106-SA indicates closed.

Standard: Operator verifies Breaker 106-SA indicates closed.

Evaluator Cue:	**Red light is lit, green light is out**

Comment:

OP-155 Section 8.13 caution before step 4

Performance Step: 25 **CAUTION** Do not exceed engine and generator limitations listed in Attachment 9.

Standard: Operator reads and initials note, and verifies attachment 9 limits are not exceeded

Evaluator Cue:	**EDG load is 4.5 MW and 1.5 MVARS**

Comment:

OP-155 Section 8.13 step 4

Performance Step: 26 POSITION EDG SYNCHRONIZING SWITCH #2 in *OFF*

Standard: Operator POSITIONS EDG SYNCHRONIZING SWITCH #2 in *OFF*

Evaluator Cue:	**Switch #2 is OFF**

Comment:

OP-155 Section 8.13 caution before step 5

Performance Step: 27 **CAUTION** To prevent EDG damage, service water should be supplied as soon as possible following emergency bus reenergization.

Standard: Operator reads and initials note

Evaluator Cue:	**IF asked - 'A' ESW pump is running**

Evaluator Note:

Comment:

OP-155 Section 8.13 step 5

Performance Step: 28 **MONITOR** EDG temperatures.

Standard: Operator MONITORS EDG temperatures at the engine control panel.

Evaluator Cue:	**All 'A' EDG temperatures are within the normal ranges per OP-155 Attachment 6.**

Comment:

OP-155 Section 8.13 step 6

Performance Step: 29 VERIFY service water is supplied to EDG

Standard: Operator contacts the CRS to VERIFY service water is supplied to EDG

Evaluator Cue:	**CRS informs you that the 'A' ESW is in service.**

Comment:

Terminating Cue:	**END OF JPM**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam JPM i - Restore Power to an Emergency Bus (OP-155)

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:	AOP-004 has been entered due to a fire in the MCR. EDG 1A-SA is not in operation. A Safety bus has subsequently been lost due to a SUT fault. AOP-004 has directed that the 'A' EDG be started and 'A' safety bus re-energized. Both safety and non-safety Plant DC Distribution Systems are in operation per OP-156.01 to support EDG operation. Attachments 1, 3, 4 (1A-SA) are complete.

Initiating Cue:	The CRS has directed you to complete OP-155 Section 8.14 and then to energize the 'A' safety bus IAW OP-155 Section 8.13. OP-155 Section 8.14 Initial conditions are met and step 1 has been completed

Facility: Shearon Harris Task No.: 064007H101

Task Title: Restore Power to an Emergency Bus JPM No.: 2009B NRC Exam JPM i (Alt Train B)

K/A Reference: 068 AA1.10 RO 3.7 SRO 3.9 ALTERNATE PATH: **No**

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:

AOP-004 has been entered due to a fire in the MCR.

EDG 1B-SB is not in operation.

B Safety bus has subsequently been lost due to a SUT fault.

AOP-004 has directed that the 'B' EDG be started and 'B' safety bus re-energized.

Both safety and non-safety Plant DC Distribution Systems are in operation per OP-156.01 to support EDG operation.

OP-155, Diesel Generator Emergency Power System, Attachments 2, 3, 5 (1B-SB) are complete.

Initiating Cue:

The CRS has directed you to locally start the 'B' EDG IAW OP-155 Section 8.14 and then to energize the 'B' safety bus IAW OP-155 Section 8.13.

OP-155 Section 8.14 Initial conditions are met and step 1 has been completed

Task Standard:	EDG B is locally started and Bus 1B-SB bus is energized by the EDG IAW OP-155
Required Materials:	Copy of OP-155 Sections 8.13, 8.14 and Attachments 6 and 9. Mark Section 8.14 Initial Conditions and Step 1 as complete.
General References:	OP-155 (Rev. 47)
Time Critical Task:	No
Validation Time:	30 minutes

Critical Step Justification

Step 3	Must be completed to reset the starting circuit
Step 6	Ensures full fuel flow for EDG start
Step 8	Ensures adequate air pressure for EDG restart
Step 10	Starts EDG
Step 16	Ensures normal EDG parameters prior to loading EDG
Step 17	Ensures normal generator parameters prior to loading on bus
Step 21	Must be performed to satisfy the interlock for closing the EDG output breaker
Step 23	Energizes emergency bus 1B-SB

START TIME: _____

Performance Step: 1 Obtain Procedure

Standard: Operator obtains procedure

Evaluator Cue:	**Evaluator provides operator a copy of OP-155 Section 8.14 with Initial Conditions and Step 1 signed off as complete.**

Comment:

OP-155 Section 8.14 Step 2

Performance Step: 2 At GCP, VERIFY the UNIT-PARALLEL switch in PARALLEL

Standard: Operator verifies the UNIT-PARALLEL switch in PARALLEL

Evaluator Cue:	**Switch is in parallel**

Comment:

OP-155 Section 8.14 Step 3

✓ **Performance Step: 3** IF the FAILED TO START annunciator is in, THEN DEPRESS the STOP pushbutton

Standard: Operator checks annunciator clear

Evaluator Cue:	**Annunciator is lit**

Standard: Operator depresses stop pushbutton

Evaluator Cue:	Annunciator is clear

Comment:

OP-155 Section 8.14 Step 4

Performance Step: 4 At ECP, VERIFY the A CONTROL CIRCUIT and B CONTROL CIRCUIT OPERATIONAL MODE indicator lights are *LIT*.

Standard: Operator checks lights lit

Evaluator Cue:	**Lights are lit**

Comment:

OP-155 Section 8.14 Step 5

Performance Step: 5 PERFORM a general inspection of the EDG, looking for any obvious reasons that the EDG failed to start

Standard: Operator performs inspection

Evaluator Cue:	**There are no apparent reasons for the start failure to have occurred.**

Comment:

OP-155 Section 8.14 Step 6

✓ **Performance Step: 6** VERIFY the Fuel Limit Cylinder has retracted

Standard: Operator Verifies the Fuel Limit Cylinder has retracted

Evaluator Cue:	**NOTE: Due to having to climb on hot EDG piping have the applicant shine a flashlight at the Fuel Limit cylinder and explain what the retracted cylinder would look like then;** **Cue: The Fuel Limit Cylinder has retracted**

Comment:

OP-155 Section 8.14 note before step 7

Performance Step: 7 **NOTE:** If starting air receiver pressures are low, but still above 100 psig, isolating one of the receivers prior to attempting to start the EDG will maximize the potential

number of start attempts

Standard: Operator reads and initials note

Comment:

OP-155 Section 8.14 step 7

✓ **Performance Step: 8** VERIFY at least one starting air receiver is greater than 100 psig

Standard: Operator verifies at least one starting air receiver is greater than 100 psig

Evaluator Cue:	**Pressures are as read**

Comment:

OP-155 Section 8.14 note before step 8

Performance Step: 9 **NOTE:** If the STOP pushbutton was depressed in Step 8.14.2.03, the control circuitry must reset before another start can be attempted. This takes approximately three minutes.

NOTE: The EDG most likely will start in a fast start mode due to the undervoltage. Depending on what failure(s) occurred, however, the EDG may start in the slow start mode.

Standard: Operator reads and initials notes

Comment:

OP-155 Section 8.14 step 8

✓ **Performance Step: 10** DEPRESS EDG 1B-SB PUSH TO START pushbutton

Standard: Operator depresses EDG 1B-SB PUSH TO START pushbutton

Evaluator Cue:	**'B' EDG starts** **Diesel RPM rises to and stabilizes at 450 RPM**

Comment:

OP-155 Section 8.14 caution before step 9

Performance Step: 11 **CAUTION:** 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. Depressing the EDG 1A-SA (1B-SB) STOP pushbutton will de-energize field flashing circuit.

Standard: Operator reads and initials caution

Evaluator Cue:	**Field has flashed**

Comment:

OP-155 Section 8.14 note before step 9

Performance Step: 12 IF the FAILED TO START annunciator is received, THEN DEPRESS the STOP pushbutton

Standard: Operator checks annunciator

Evaluator Cue:	**Annunciator is clear**

Comment:

OP-155 Section 8.14 note before step 10

Performance Step: 13

NOTE: If EDG starts but the generator fails to flash:

- The EDG will be operating at 470 rpm with zero field volts.
- The K1 relay must be reset to enable any future field flashing.
- If EDG is left running, the EDG should self flash within 10 seconds, if the K1 relay is reset.

Standard: Operator reads and initials note

Evaluator Note:	**The fail to start annunciator would be on IF the Field did not flash**

Comment:

OP-155 Section 8.14 step 10

Performance Step: 14

IF EDG starts but the generator fails to flash, THEN PERFORM the following

Standard: Operator marks all of step 10 as N/A

Comment:

OP-155 Section 8.14 step 11

Performance Step: 15 VERIFY the following:

a. AUXILIARY LUBE OIL PUMP control switch in *AUTO*.

b. LUBE OIL CIRCULATING PUMP control switch in *AUTO*.

Standard: Operator verifies AUXILIARY LUBE OIL PUMP control switch in *AUTO*

Evaluator Cue:	**Switch is in auto**

Standard: Operator verifies LUBE OIL CIRCULATING PUMP control switch in *AUTO*.

Evaluator Cue:	**Switch is in auto**

Comment:

OP-155 Section 8.14 step 12

✓ **Performance Step: 16** At ECP, VERIFY the following:

a. Engine RPM increases to 445 to 455 RPM.
b. JACKET WATER PRESS increases to 10 to 20 psig.
c. SHUTDOWN SYSTEM ACTIVE light lit.
d. READY TO LOAD light lit.

Standard: Operator verifies Engine RPM increases to 445 to 455 RPM

Evaluator Cue:	**Engine RPM is 450**

Standard: Operator verifies JACKET WATER PRESS increases to 10 to 20 psig

Evaluator Cue:	**JACKET WATER PRESS is 16 psig**

Standard: Operator verifies SHUTDOWN SYSTEM ACTIVE light lit

Evaluator Cue:	**Red light is lit**

Standard: Operator verifies Blue READY TO LOAD light lit

Evaluator Cue:	**Blue light is lit**

Comment:

OP-155 Section 8.14 step 13

✓ **Performance Step: 17** At GCP, **VERIFY** the following:

a. EI-6955B1V, DG LOCAL CONTROL PANEL AC VOLTMETER, indicates 6210 to 7590 volts.

b. EI-6965B1V, DG 1B-SB GEN FIELD AMMETER, indicates an increased amperage.

c. EI-6954B1V, DG 1B-SB FIELD DC VOLTAGE, indicates an increased voltage.

Standard: Operator verifies AC VOLTMETER, indicates 6210 to 7590 volts

Evaluator Cue:	**Voltage is 6900 volts**

Standard: Operator verifies GEN FIELD AMMETER, indicates an increased amperage

Evaluator Cue:	**Ammeter indicates 20 Amps**

Standard: Operator verifies FIELD DC VOLTAGE, indicates an increased voltage

Evaluator Cue:	**Field voltage is 45 volts**

Comment:

OP-155 Section 8.14 caution prior to step 14

Performance Step: 18 **CAUTION**

To prevent EDG damage, service water should be supplied as soon as possible following emergency bus reenergization.

Standard: Operator reads and initials caution

Comment:

OP-155 Section 8.14 step 14

Performance Step: 19 LOCALLY MONITOR the following EDG temperatures and if either temperature exceeds 185°F, secure the EDG:

a. TI-2476B2V, Temperature Indicator DG 1B-SB L.O. Temp From L.O.Cooler

b. TI-2465BV Temperature Indicator DG 1B-SB Jkt Wtr Temp To Main Hdr

Standard: Operator reads TI-2476B2V

Evaluator Cue:	**TI-2476B2V reads 145°F**

Standard: Operator reads TI-2476BV

Evaluator Cue:	**TI-2476BV reads 160°F**

Comment:

OP-155 Section 8.14 step 15

Performance Step: 20 PROCEED to Section 8.13 to load EDG.

Standard: Operator obtains Section 8.13 and reviews the Initial Conditions.

1. EDG 1B-SB is running (YES)
2. Reads and initials note: The UNIT PARALLEL switch will automatically swap to the UNIT mode of operation upon EDG loading. Step 2 – At GCP, UNIT-PARALLEL switch in PARALLEL (Switch is in PARALLEL)
3. At GCP, VOLTAGE REGULATOR TRANSFER SWITCH in *AUTO*. (Switch is in AUTO)
4. Control has been transferred to LOCAL (in LOCAL)

Comment:

OP-155 Section 8.13 step 1

✓ **Performance Step: 21** At GCP, POSITION SYNCHRONIZING SWITCH #2 in *ON*.

Standard: Operator POSITIONS SYNCHRONIZING SWITCH #2 in *ON*.

Evaluator Cue:	**SYNCHRONIZING SWITCH #2 is *ON*.**

Comment:

OP-155 Section 8.13 note prior to step 2

Performance Step: 22 **NOTE:** The Synch Check Relay will be bypassed on an undervoltage on the safety bus.

NOTE: When EDG output breaker is closed, the sequencer will place loads onto the EDG and the maximum load will be that of the safety bus

Standard: Operator reads and initials note

Comment:

OP-155 Section 8.13 step 2

✓ **Performance Step: 23** POSITION CS-1750.2SB, BKR 126 CONTROL SWITCH ON D/G 1B-SB GEN CTRL PNL to *CLOSE*.

Standard: Operator places CS-1750.2SB to CLOSE position

Evaluator Cue:	**CS-1750.2SB has a red target**

Comment:

OP-155 Section 8.13 step 3

Performance Step: 24 VERIFY the associated EDG Output Breaker 126-SB indicates closed.

Standard: Operator verifies Breaker 126-SB indicates closed.

Evaluator Cue:	**Red light is lit, green light is out**

Comment:

OP-155 Section 8.13 caution before step 4

Performance Step: 25 **CAUTION** Do not exceed engine and generator limitations listed in Attachment 9.

Standard: Operator reads and initials note, and verifies attachment 9 limits are not exceeded

Evaluator Cue:	**EDG load is 4.5 MW and 1.5 MVARS**

Comment:

OP-155 Section 8.13 step 4

Performance Step: 26 POSITION EDG SYNCHRONIZING SWITCH #2 in *OFF*

Standard: Operator POSITIONS EDG SYNCHRONIZING SWITCH #2 in *OFF*

Evaluator Cue:	**Switch #2 is OFF**

Comment:

OP-155 Section 8.13 caution before step 5

Performance Step: 27 **CAUTION** To prevent EDG damage, service water should be supplied as soon as possible following emergency bus reenergization.

Standard: Operator reads and initials note

Evaluator Cue:	**IF asked - 'B' ESW pump is running**

Evaluator Note:

Comment:

OP-155 Section 8.13 step 5

Performance Step: 28 **MONITOR** EDG temperatures.

Standard: Operator MONITORS EDG temperatures at the engine control panel.

Evaluator Cue:	**All 'B' EDG temperatures are within the normal ranges per OP-155 Attachment 6.**

Comment:

OP-155 Section 8.13 step 6

Performance Step: 29 VERIFY service water is supplied to EDG

Standard: Operator contacts the CRS to VERIFY service water is supplied to EDG

Evaluator Cue:	**CRS informs you that the 'B' ESW is in service.**

Comment:

Terminating Cue:	**END OF JPM**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam JPM i (Alt Train B) - Restore Power to an Emergency Bus (OP-155)

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:	AOP-004 has been entered due to a fire in the MCR. EDG 1B-SB is not in operation. B Safety bus has subsequently been lost due to a SUT fault. AOP-004 has directed that the 'B' EDG be started and 'B' safety bus re-energized. Both safety and non-safety Plant DC Distribution Systems are in operation per OP-156.01 to support EDG operation. Attachments 1, 3, 4 (1B-SB) are complete.

Initiating Cue:	The CRS has directed you to complete OP-155 Section 8.14 and then to energize the 'B' safety bus IAW OP-155 Section 8.13. OP-155 Section 8.14 Initial conditions are met and step 1 has been completed

Facility: Shearon Harris Task No.: 301013H401

Task Title: Transfer Control To The ACP JPM No.: 2009B NRC Exam JPM j

K/A Reference: 068-AA1.21 RO 3.9 SRO 4.1 ALTERNATE PATH: **No**

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 in Hot Standby at 557°F when a fire started in the Main Control Room. The SM has directed that the Control Room be evacuated. The reactor has been tripped and the CRS has relocated to the ACP.

Initiating Cue: The CRS has directed you to perform AOP-004 Section 3.0 Step 5, to transfer B Train Components to the ACP.

Inform the CRS when you have completed this action.

Task Standard: B train transfer relays are actuated.

Required Materials: None

General References: AOP-004 (Rev. 46)

Time Critical Task: No

Validation Time: 13 Minutes

Critical Step Justification

Step 2	Must obtain key and switch to perform transfer
Step 3	Transfers relays
Step 4	Transfers relays
Step 5	Transfers relays
Step 6	Transfers relays

START TIME: _____

AOP-004 Step 1

Performance Step: 1	OBTAIN PROCEDURE (provided by examiner) and discuss need for KEY and transfer relay handle
Standard:	Evaluator will provide the candidate with a copy of AOP-004, Section 3.0.

Evaluator Cue:	**Steps 1-3 have been completed, step 4 is being performed by the RO**

Evaluator Note:	Caution from AOP-004: Transfer to the ACP in the next two steps (4 and 5)must be done as soon as possible to minimize spurious actuations caused by Control Room area fire. The transfer should be **complete within 10 minutes.**

Comment:

AOP-004 Step 5 - PERFORM A TRANSFER OF B TRAIN COMPONENTS TO THE ACP:

AOP-004 Step 5a

✓ **Performance Step: 2** OBTAIN KEYS AND SWITCH HANDLES

Standard: Locates break-glass key case and simulates breaking glass to obtain ACP room key locker key OR checks out ACP room key locker key.

Evaluator Cue: **You now have the ACP room key locker key**

Standard: Opens ACP key locker and obtains switch handle.

Evaluator Cue: **You now have the transfer relay switch handle**

Comment:

At Switchgear Room B

AOP-004 Step 5b

✓ **Performance Step: 3** **PLACE** ALL slave relays at Transfer Panel 1B-SB except 43T-1/NB, 43T-11/SB, and 43T-24/SB to TRANSFER.

Standard: Locates transfer panel 1B-SB and places all slave relays (except 43T-1/NB, 43T-11/SB, and 43T-24/SB) to TRANSFER.

Evaluator Note: **For each relay transferred there will be a red light that comes on above the relay**

Evaluator Cue: **All slave relays (except 43T-1/NB, 43T-11/SB, and 43T-24/SB) are in TRANSFER.**

Comment:

At Aux Transfer panel SB

AOP-004 Step 5c

✓ **Performance Step: 4** **PLACE** ALL slave relays at Auxiliary Transfer Panel SB except 43T-2/SB, 43T-6/SB, and 43T-9/SB to TRANSFER

Standard: Locates auxiliary transfer panel SB and places all slave relays (43T-2/SB, 43T-6/SB, and 43T-9/SB) to TRANSFER

Evaluator Note: **For each relay transferred there will be a red light that comes on above the relay**

Evaluator Cue: **All slave relays (except 43T-2/SB, 43T-6/SB, and 43T-9/SB) are in TRANSFER**

Comment:

At Aux Transfer Panel SB

AOP-004 Step 5d

✓ **Performance Step: 5** **PLACE** Auxiliary Transfer Panel SB slave relays 43T-2/SB, 43T-6/SB, and 43T-9/SB to TRANSFER..

Standard: Places 43T-2/SB, 43T-6/SB, and 43T-9/SB to TRANSFER

Evaluator Note:	**For each relay transferred there will be a red light that comes on above the relay**

Evaluator Cue:	**43T-2/SB, 43T-6/SB, and 43T-9/SB are in TRANSFER**

Comment:

At Switchgear Room B

AOP-004 Step 5e

✓ **Performance Step: 6** **PLACE** Transfer Panel 1B-SB slave relays 43T-1/NB, 43T-11/SB, and 43T-24/SB to TRANSFER

Standard: Proceeds to Transfer Panel 1B-SB and places 43T-1/NB, 43T-11/SB, and 43T-24/SB to TRANSFER.

Evaluator Note:	**For each relay transferred there will be a red light that comes on above the relay**

Evaluator Cue:	**43T-1/NB, 43T-11/SB, and 43T-24/SB slave relays are in TRANSFER**

Comment:

At Switchgear Room B AND Aux transfer panel SB

AOP-004 Step 5f

Performance Step: 7 CHECK THE RED LIGHTS ON ALL B TRAIN SLAVE RELAY CONTROL SWITCHES **ON.**

Standard: Checks the RED lights ON for all relay control switches on TRANSFER PANEL 1B-SB **and** AUXILIARY TRANSFER PANEL SB.

Evaluator Note: **For each relay transferred there will be a red light that comes on above the relay**

Evaluator Cue: **RED lights for all relay control switches on TRANSFER PANEL 1B-SB and AUXILIARY TRANSFER PANEL SB are ON**

Comment:

Performance Step: 8 Informs CRS that AOP-004 Section 3.0 Step 5 is complete.

Standard: Informs CRS that AOP-004 Section 3.0 Step 5 is complete using proper three way communications.

Evaluator Cue: **Acknowledge that AOP-004 Section 3.0 Step 5 is complete.**

Comment:

Terminating Cue: **END OF JPM**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam JPM i - Transfer Control To The ACP (AOP-004)

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

Initial Conditions:	The plant was in Hot Standby at 557°F when a fire started in the Main Control Room. The SM has directed that the Control Room be evacuated. The reactor has been tripped and the CRS has relocated to the ACP.

Initiating Cue:	The CRS has directed you to perform AOP-004 Section 3.0 Step 5, to transfer B Train Components to the ACP. Inform the CRS when you have completed this action.

DRAFT

Facility: Shearon Harris Task No.: 344102H404

Task Title: Locally Torque Shut The VCT Outlet Valves With Low VCT Level During A Loss Of Air JPM No.: 2009B NRC Exam JPM k

K/A Reference: 004 A1.06 RO 3.0 SRO 3.2 ALTERNATE PATH: **No**

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 operating at 100% power when Instrument Air pressure started decreasing. AOP-017 was entered, but air pressure continued to decrease to the point that a Reactor Trip was required. The operators performed the actions of Path-1 and have transitioned to EPP-004, "Reactor Trip Response" while continuing with AOP-017. The RO has just identified that VCT level cannot be maintained > 5%. The RO has performed the MCR operator actions of AOP-017 Section 3.2 step 1 and step 2 RNO's a and b.

Initiating Cue: The RO is directing you (the RAB operator) to perform the local operator actions of AOP-017, Section 3.2 step 2 RNO 2.c, realign RCP Seal return to the CSIP suction and step 3 RNO, locally torque shut the VCT outlet valves. Another operator has turned the MCC breakers off to the VCT outlet valves.

Notify the MCR when you have completed these actions.

Task Standard:	Realign the RCP Seal Return to the CSIP suction and locally torque shut the VCT outlet valves.
Required Materials:	None
General References:	AOP-017 Section 3.2 steps 2 and 3 (Rev. 30)
Time Critical Task:	No
Validation Time:	7 minutes

Critical Step Justification

Step 2	Provides seal return path
Step 3	Isolates seal return to the VCT
Step 5	Torques shut VCT outlet valve to prevent gas intrusion to CSIP suction
Step 6	Torques shut VCT outlet valve to prevent gas intrusion to CSIP suction

START TIME: _____

AOP-017

Performance Step: 1 OBTAIN PROCEDURE (provide applicant a copy)

Standard: Obtains AOP-017 and refers to Section 3.2 for Loss of Air When Shutdown – No RHR

Comment:

AOP-017 Section 3.2 Step 2 RNO 2.c. (1)

✓ **Performance Step: 2** REALIGN RCP Seal Return to the CSIP suction, as follows:

UNLOCK AND OPEN 1CS-321, SW Return Isol Vlv to CSIP Suction. (A-262-E31-W2-N2)

Standard: Operator locates 1CS-321, SW Return Isol Vlv to CSIP Suction and unlocks lock and demonstrates how to OPEN the closed valve.

Evaluator Note:	The RAB operator would have the key to unlock this valve

Evaluator Cue:	**1CS-321, SW Return Isol Vlv to CSIP Suction is unlocked and open.**

Comment:

AOP-017 Section 3.2 Step 2 RNO 2.c. (2)

✓ **Performance Step: 3** SHUT 1CS-318, Seal Water Return to VCT Spray Nozzle. (A-262-E31-E8-N2)

Standard: Operator locates 1CS-318, Seal Water Return VCT Spray Nozzle and demonstrates how to SHUT the open valve.

Evaluator Cue:	**1CS-318, Seal Water Return VCT Spray Nozzle is shut**

Comment:

Performance Step: 4 **Contacts the MCR**

Standard: Contacts MCR via radio or phone and informs operator that RNO step 2c has been completed.

Evaluator Cue:	**Acknowledge communication of RNO step 2c completion.** **The VCT level has continued to decrease and is now reading 0.**

Comment:

AOP-017 Section 3.2 Step 3 RNO

✓ **Performance Step: 5** VCT level cannot be maintained on scale –

Locally TORQUE SHUT the following valves:

1CS-165, VCT Outlet LCV-115C

Standard: Operator locates:

1CS-165, VCT Outlet LCV-115C and torques the valve in the shut position

Evaluator Cue:	**1CS-165, VCT Outlet LCV-115C is torqued shut.**

Comment:

AOP-017 Section 3.2 Step 3 RNO continued

✓ **Performance Step: 6** 1CS-166, VCT Outlet LCV-115E

Standard: Operator locates:

1CS-166, VCT Outlet LCV-115E and torques the valve in the shut position

Evaluator Cue:	**1CS-166, VCT Outlet LCV-115E is torqued shut**

Comment:

Performance Step: 7	Notifies MCR that AOP-017 Section 3.2 RNO steps 2.c and 3 are completed
Standard:	Operator contacts the MCR and reports that AOP-017 Section 3.2 RNO steps 2c and 3 are completed
Evaluator Cue:	**MCR acknowledges completion of AOP-017 Section 3.2 RNO steps 2c and 3**

Comment:

Terminating Cue:	**END OF JPM**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam JPM k - Locally Torque Shut The VCT Outlet Valves With Low VCT Level During A Loss Of Air When The Reactor Is Critical (AOP-017)

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

Initial Conditions:	The plant was operating at 100% power when Instrument Air pressure started decreasing. AOP-017 was entered but air pressure continued to decrease to the point that a Reactor Trip was required. The operators performed the actions of Path-1 and have transitioned to EPP-004, "Reactor Trip Response" while continuing with AOP-017. The RO has just identified that VCT level cannot be maintained > 5%. The RO has performed the MCR operator actions of AOP-017 Section 3.2 steps 1 and 2 RNO's a and b.

Initiating Cue:	The RO is directing you (the RAB operator) to perform the local operator actions of AOP-017, Section 3.2 step 2 RNO 2.c, realign RCP Seal return to the CSIP suction and step 3 RNO, locally torque shut the VCT outlet valves. Another operator has turned the MCC breakers off to the VCT outlet valves. Notify the MCR when you have completed these actions.