

Facility: <u>Vogtle 1 & 2</u>		Date of Examination: <u>04/15/2013</u>
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input checked="" type="checkbox"/>		Operating Test Number: <u>2013-301</u>
Control Room Systems® (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
<p>a. V-NRC-JP-13105-HL18: Increase Accumulator Level at Low RCS Pressure</p> <p>Description: The unit is in Mode 4 at 340 psig and stable. A leak on Accumulator #2 has been repaired, but low pressure and low level annunciators remain lit. The candidate is directed to restore Accumulator #2 level and pressure sufficiently to clear the low level and low pressure annunciators using 13105-1.</p> <p>(RO / SRO-I / SRO-U)</p> <p>006A1.13 (3.5 / 3.7)</p>	D, EN, L, S	3
<p>b. V-NRC-JP-13011-HL18: Perform an RCS Cooldown Using RHR Train A</p> <p>Description: A unit cooldown from Mode 4 to Mode 5 is in progress. RHR Train 'A' warm-up is complete. The candidate is directed to initiate full RHR Train 'A' flow and cool down the RCS to 315°F ± 5°F without exceeding 100°F in any hour.</p> <p>(RO / SRO-I / SRO-U)</p> <p>005A4.01 (3.6 / 3.4)</p>	D, L, S	4P
<p>c. V-NRC-JP-18009-HL18: Transfer Steam Dumps to Steam Pressure Mode</p> <p>Description: The reactor has been shut down due to a steam generator tube leak. The candidate will transfer steam dumps to the steam pressure mode using 18009-C, but they will not control properly and ARV usage will be required to control heat-up.</p> <p>(RO / SRO-I / SRO-U)</p> <p>039A2.04 (3.4 / 3.7)</p>	A, D, L, S	4S

<p>d. V-NRC-JP-13009-HL18: Emergency Borate from the RWST</p> <p>Description: The candidate will be required to initiate an emergency boration in response to a ROD BANK LO-LO LIMIT alarm using 13009-1. The RWST flow path will be required for emergency boration due to equipment failures.</p> <p>(RO / SRO-I)</p> <p>024AA2.01 (3.8* / 4.1)</p>	A, D, P, S	1
<p>e. V-NRC-JP-19001-HL18: Establish Safety Grade Letdown</p> <p>Description: The unit was manually tripped due to a non-isolable instrument air break. Candidate is required to place safety grade letdown in service and establish a 40 gpm flow rate to control RCS inventory.</p> <p>(RO / SRO-I)</p> <p>004A2.11 (3.6 / 4.2)</p>	D, L, P, S	2
<p>f. V-NRC-JP-13130-HL18: Place Containment Hydrogen Monitors in Service</p> <p>Description: A LOCA has occurred and the candidate is directed to place the Containment Hydrogen Monitors in service using 13130-1. The Common Failure light will illuminate requiring the candidate to return the monitor to standby.</p> <p>(RO / SRO-I)</p> <p>028A4.03 (3.1 / 3.3)</p>	A, EN, L, M, P, S	5
<p>g. V-NRC-JP-13320-HL18: Post-Accident Cleanup of the FHB Using the Normal Exhaust Units</p> <p>Description: A spent fuel assembly was dropped in the Spent Fuel Pool. To expedite cleanup of airborne radioactivity, the candidate will be required to use 13320-C to perform post-accident clean up of the Fuel Handling Building using the normal exhaust units.</p> <p>(RO / SRO-I)</p> <p>034A2.01 (3.6 / 4.4)</p>	N, S	8

<p>h. V-NRC-JP-13830-HL18: Establish Field Excitation Using Manual Voltage Regulation for Main Generator</p> <p>Description: The unit is starting up following a refueling outage. The main turbine is at 1800 rpm and main generator / exciter preparations are complete. The candidate will use 13830-1 to establish main generator field excitation with manual voltage regulation.</p> <p>(RO)</p> <p>062A4.04 (2.6)</p>	D, S	<p><u>RO ONLY</u></p> <p>6</p>
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In-Plant Systems® (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
<p>i. V-NRC-JP-13903-HL18: Locally Emergency Start Diesel-Driven Fire Pump</p> <p>Description: With a diesel fire pump tagged out for repairs, a large fire caused fire header pressure to drop. The standby diesel fire pump failed to start, so the candidate will be dispatched to perform a local manual start of the standby diesel fire pump. The local pushbutton start for the first battery will not work, which will require the use of the second battery to start the engine.</p> <p>(RO / SRO-I / SRO-U)</p> <p>086A2.02 (3.0 / 3.3)</p>	A, D, E	8
<p>j. V-NRC-JP-17213-HL18: Respond to 1-RE-0018 Alarm During a Liquid Radwaste Release</p> <p>Description: During a liquid radwaste release, a high alarm is received on 1-RE-0018. The candidate will be directed to respond to the Waste Process Liquid Panel (PLPP) and take the appropriate actions per 17213-1. 1-RE-0018 will not close, so manual isolation will be required.</p> <p>(RO / SRO-I / SRO-U)</p> <p>059AA2.05 (3.6 / 3.9)</p>	A, E, M, R	9
<p>k. V-NRC-JP-18038-HL18: Start Emergency Diesel Generator From Outside the Control Room</p> <p>Description: The control room has been evacuated and control has been established at the shutdown panels. To re-energize 2AA02, the candidate will locally start 2A EDG using Attachment B of 18038-2. After starting, high jacket water temperature will require tripping the diesel locally.</p> <p>(RO / SRO-I)</p> <p>064A1.03 (3.2 / 3.3)</p>	A, E, L, N	6

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	- / - / ≥ 1 (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

NRC Job Performance Measure

Facility: Vogtle

Task No: V-LO-TA-61004

Task Title: Increase Accumulator Level at Low RCS Pressure

JPM No: V-NRC-JP-13105-HL18

K/A Reference: 006A1.13 RO 3.5 SRO 3.7

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance _____

Actual Performance _____

Classroom _____

Simulator _____

Plant _____

Read to the examinee:

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

Initial Conditions: The Unit is in Mode 4 at 340 psig and stable.

SI Pump 'A' is tagged out.

Maintenance personnel have just reported that a leak on Accumulator #2 has been repaired.

Initiating Cue: The Shift Supervisor has directed you to, "Restore level and pressure in Accumulator #2 using Section 4.4.1 of 13105-1, 'Safety Injection System', to clear the low level and pressure alarms".

Task Standard: Candidate initiates raising accumulator level using 13105-1 to clear the accumulator low level and low pressure alarms.

Required Materials: 13105-1, "Safety Injection System"

General References: None

Time Critical Task: No

Validation Time: 14 minutes

SIMULATOR SETUP:

1. Reset to IC169 for the HL-18 NRC Exam
2. Place SIP "A" in PTL with a Red Danger Tag on the handswitch.

Simulator Setup From Scratch:

1. Reset to IC003 (Mode 4, 350 psig)
2. Insert malfunction SI02B with a Final Value of 100%
3. Verify Accumulator Tank 2 Level annunciator alarms
4. Remove malfunction when level annunciator illuminates
5. Place SIP "A" in PTL
6. Close 1-HV-8821A, SIP "A" Discharge Isolation valve
7. Place HV-8806 Lockout Switch to ON
8. Close 1-HV-8806, SIP Common Suction Valve
9. Place HV-8806 Lockout Switch to LOCKOUT
10. Acknowledge / Reset alarms
11. Freeze simulator

Setup time: 10 minutes

Performance Information

Critical steps denoted with an asterisk and bolded.

4.4.1 Filling the Accumulators at Low RCS Pressure using SI Pump, Modes 4, 5, and 6

NOTE

Do not pressurize until Accumulator temperature is checked locally to be greater than 70°F. RWST water may be less than 70°F, as indicated on 1-TIS-10980 on QPCP.

CAUTION

In Modes 4, 5 and 6 with the reactor vessel head installed, SI injection capability should remain defeated by at least two independent means per TS 3.4.12. The following steps verify the LCO remains satisfied during the fill.

CUE: If requested, “Local Accumulator #2 temperature is 80° F”.

Standard: Candidate reviews NOTE and CAUTION prior to performing Step 4.4.1.

Comment:

* 4.4.1.1 Check SI Pump Injection Capability to the RCS remains isolated:

- a. Check 1-HV-8835, CL INJ FROM SIS, is closed. If necessary, close 1-HV-8835, CL INJ FROM SIS as follows:

***(1) Place SI PMP DISCH TO ALL CL LP Power Lockout Switch 1-HS-8835A in ON.**

Standard: Candidate places 1-HS-8835A to ON (white light ON).

Comment:

*** 4.4.1.1** Check SI Pump Injection Capability to the RCS remains isolated:

- a. Check 1-HV-8835, CL INJ FROM SIS, is closed. If necessary, close 1-HV-8835, CL INJ FROM SIS as follows:

***(2) Close CL INJ FROM SIS 1-HV-8835.**

Standard: Candidate closes 1-HV-8835 (green light ON, red light OFF).

Comment:

4.4.1.1 Check SI Pump Injection Capability to the RCS remains isolated:

- a. Check 1-HV-8835, CL INJ FROM SIS, is closed. If necessary, close 1-HV-8835, CL INJ FROM SIS as follows:

(3) Place 1-HS-8835A in LOCKOUT.

Standard: Candidate places 1-HS-8835A in LOCKOUT (white light OFF).

Comment:

4.4.1.1 Check SI Pump Injection Capability to the RCS remains isolated:

- b. Check closed SI PMP-A TO HOT LEG 1 & 4 ISO VLV 1-HV-8802A.

Standard: Candidate checks closed 1-HV-8802A (green light ON, red light OFF).

Comment:

4.4.1.1 Check SI Pump Injection Capability to the RCS remains isolated:

c. Check 1-HS-8802C in LOCKOUT.

Standard: Candidate checks 1-HS-8802C in LOCKOUT (white light OFF)

Comment:

4.4.1.1 Check SI Pump Injection Capability to the RCS remains isolated:

d. Check closed SI PMP-B TO HOT LEG 2 & 3 ISO VLV 1-HV-8802B.

Standard: Candidate checks closed 1-HV-8802B (green light ON, red light OFF).

Comment:

4.4.1.1 Check SI Pump Injection Capability to the RCS remains isolated:

e. Check 1-HS-8802D in LOCKOUT.

Standard: Candidate checks 1-HS-8802D in LOCKOUT (white light OFF).

Comment:

* 4.4.1.1 Check SI Pump Injection Capability to the RCS remains isolated:

*f. **IF SI Pump B will be used, open 1-HV-8821A and 1-HV-8821B.**

Standard: Candidate verifies opens 1-HV-8821A and 1-HV-8821B (red lights ON, green lights OFF).

Comment:

-
- 4.4.1.1 Check SI Pump Injection Capability to the RCS remains isolated:
- g. Document alignment changes per the controlling UOP checklist.

CUE: ***If requested, “Shift Supervisor will update the UOP checklist”.***

Standard: N/A

Comment:

-
- 4.4.1.2 Check RWST TO SI PUMPS ISOLATION 1-HV-8806 open.

Standard: Candidate determines that 1-HV-8806 is NOT open (green light ON, red light OFF).

Comment:

-
- * 4.4.1.3 **IF 1-HV-8806 is NOT open, perform the following:**

- a. Place Lockout Switch 1-HS-8806A in the ON position.

Standard: Candidate places 1-HS-8806A to ON (white light ON).

Comment:

-
- * 4.4.1.3 **IF 1-HV-8806 is NOT open, perform the following:**

- b. Open 1-HV-8806 using 1-HS-8806.

Standard: Candidate opens 1-HV-8806 using 1-HS-8806 (green light OFF, red light ON).

Comment:

4.4.1.4 Open or check suction isolation valve for the SI pump to be used is open:

SI Pump A 1-HV-8923A

SI Pump B 1-HV-8923B

Standard: Candidate checks open 1-HV-8923B (green light OFF, red light ON).

Comment:

4.4.1.5 Open or check 1-HV-8813, SIS PMPS COMMON MINI FLOW ISO VLV, is open.

Standard: Candidate checks open 1-HV-8813 (green light OFF, red light ON).

Comment:

4.4.1.6 Open or check the Mini-flow for the pump to be started is open:

SI Pump A 1-HV-8814

SI Pump B 1-HV-8920

Standard: Candidate checks open 1-HV-8920 (green light OFF, red light ON).

Comment:

*** 4.4.1.7 Start one SI Pump:**

SI Pump A 1-HS-0998A

SI Pump B 1-HS-0999A

Standard: **Candidate starts SI Pump B using 1-HS-0999A (green light OFF, red light ON).**

Comment:

*** 4.4.1.8 Open ACCUM FILL ISO 1-HV-8888.**

Standard: **Candidate opens 1-HV-8888 (green light OFF, red light ON).**

Comment:

*** 4.4.1.9 Open SIS CHECK VALVE TEST CNMT ISO 1-HV-8871.**

Standard: **Candidate opens 1-HV-8871 (green light OFF, red light ON).**

Comment:

*** 4.4.1.10 Open ACCUM WTR FILL VLV for the tank to be filled and monitor level indication:**

- | | | | |
|----|----------------------|-------------------|-----------------------|
| a. | Accumulator 1 | 1-HV-8878A | 1-LI-0950/0951 |
| b. | Accumulator 2 | 1-HV-8878B | 1-LI-0952/0953 |
| c. | Accumulator 3 | 1-HV-8878C | 1-LI-0954/0955 |
| d. | Accumulator 4 | 1-HV-8878D | 1-LI-0956/0957. |

Standard: Candidate opens 1-HV-8878B (green light OFF, red light ON).

Comment:

*** 4.4.1.11 WHEN the desired Accumulator level is reached, close the Fill Valve opened in the previous step. (IV REQUIRED)**

CUE: If desired level requested, “Refer to initiating cue sheet”.

CUE: If requested, “An Extra Operator will perform the IV”.

Standard: Candidate closes 1-HV-8878B (green light ON, red light OFF) when:
ACCUM TANK 2 HI/LO LEVEL annunciator - CLEAR
ACCUM TANK 2 HI/LO PRESS annunciator – CLEAR

Comment:

4.4.1.12 Repeat Steps 4.4.1.10 and 4.4.1.11 if required to adjust levels in additional Accumulators.

Standard: N/A

Comment:

* 4.4.1.13 Close 1-HV-8871. (IV REQUIRED)

CUE: *If requested, “An Extra Operator will perform the IV”.*

Standard: Candidate closes 1-HV-8871 (green light ON, red light OFF).
Comment:

* 4.4.1.14 Close 1-HV-8888. (IV REQUIRED)

CUE: *If requested, “An Extra Operator will perform the IV”.*

Standard: Candidate closes 1-HV-8888 (green light ON, red light OFF).
Comment:

* 4.4.1.15 Stop the SI Pump.

Standard: Candidate stops SI Pump B using 1-HS-0999A (green light ON, red light OFF).

Comment:

CAUTION

While aligned to depressurize the Safety Injection Header, all four Accumulator levels should be monitored for leakage back to the RWST. If level loss is unacceptable, the depressurization should be terminated and Accumulator level(s) should be increased as needed.

- 4.4.1.16 Relieve Safety Injection Header pressure to less than or equal to Accumulator pressure by performing the following:

CUE: “An Extra Operator will complete the remainder of the procedure”.

Standard: N/A

Comment:

Terminating cue: Candidate returns initiating cue sheet.

Verification of Completion

Job Performance Measure No: V-NRC-JP-13105-HL18

Examinee's Name:

Examiner's Name:

Date Performed:

Number of Attempts:

Time to Complete:

Question Documentation:

Question: _____

Response: _____

Result: Satisfactory/Unsatisfactory


Examiner's signature and date: _____

Initial Conditions: The Unit is in Mode 4 at 340 psig and stable.

SI Pump 'A' is tagged out.

Maintenance personnel have just reported that a leak on Accumulator #2 has been repaired.

Initiating Cue: The Shift Supervisor has directed you to, "Restore level and pressure in Accumulator #2 using Section 4.4.1 of 13105-1, 'Safety Injection System', to clear the low level and pressure alarms".

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INITIALS

4.3 SHUTDOWN

NONE

4.4 NON PERIODIC OPERATION

NOTE

Do not pressurize until Accumulator temperature is checked locally to be greater than 70°F. RWST water may be less than 70°F, as indicated on 1-TIS-10980 on QPCP. ☐


CAUTION

In Modes 4, 5 and 6 with the reactor vessel head installed, SI injection capability should remain defeated by at least two independent means per TS 3.4.12. The following steps verify the LCO remains satisfied during the fill. ☐

4.4.1 Filling The Accumulators At Low RCS Pressure Using SI Pump, Modes 4, 5 And 6


4.4.1.1 Check SI Pump Injection Capability to the RCS remains isolated:

- a. **Check** 1-HV-8835, CL INJ FROM SIS, is closed. If necessary, **close** 1-HV-8835, CL INJ FROM SIS as follows:
 - (1) **Place** SI PMP DISCH TO ALL CL LP Power Lockout Switch 1-HS-8835A in ON. _____
 - (2) **Close** CL INJ FROM SIS 1-HV-8835. _____
 - (3) **Place** 1-HS-8835A in LOCKOUT. _____
- b. **Check** closed SI PMP-A TO HOT LEG 1 & 4 ISO VLV 1-HV-8802A. _____
- c. **Check** 1-HS-8802C in LOCKOUT. _____
- d. **Check** closed SI PMP-B TO HOT LEG 2 & 3 ISO VLV 1-HV-8802B. _____

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INITIALS

- | | | |
|---------|---|-------|
| e. | Check 1-HS-8802D in LOCKOUT. | _____ |
| f. | <u>IF</u> SI Pump B will be used, open 1-HV-8821A and 1-HV-8821B. | _____ |
| g. | Document alignment changes per the controlling UOP checklist. | _____ |
| 4.4.1.2 | Check RWST TO SI PUMPS ISOLATION 1-HV-8806 open. | _____ |
| 4.4.1.3 | <u>IF</u> 1-HV-8806 is <u>NOT</u> open, perform the following: | |
| a. | Place Lockout Switch 1-HS-8806A in the ON position. | _____ |
| b. | Open 1-HV-8806 using 1-HS-8806. | _____ |
| 4.4.1.4 | Open or check suction isolation valve for the SI pump to be used is open: | |
| | SI Pump A 1-HV-8923A | _____ |
| | SI Pump B 1-HV-8923B | _____ |
| 4.4.1.5 | Open or check 1-HV-8813, SIS PMPS COMMON MINI FLOW ISO VLV, is open. | _____ |
| 4.4.1.6 | Open or check the Mini-flow for the pump to be started is open: | |
| | SI Pump A 1-HV-8814 | _____ |
| | SI Pump B 1-HV-8920 | _____ |
| 4.4.1.7 | Start one SI Pump: | |
| | SI Pump A 1-HS-0998A | _____ |
| | SI Pump B 1-HS-0999A | _____ |
| 4.4.1.8 | Open ACCUM FILL ISO 1-HV-8888. | _____ |
| 4.4.1.9 | Open SIS CHECK VALVE TEST CNMT ISO 1-HV-8871. | _____ |

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INITIALS

4.4.1.10 **Open** ACCUM WTR FILL VLV for the tank to be filled and **monitor** level indication:

- | | | | | |
|----|---------------|------------|-----------------|-------|
| a. | Accumulator 1 | 1-HV-8878A | 1-LI-0950/0951 | _____ |
| b. | Accumulator 2 | 1-HV-8878B | 1-LI-0952/0953 | _____ |
| c. | Accumulator 3 | 1-HV-8878C | 1-LI-0954/0955 | _____ |
| d. | Accumulator 4 | 1-HV-8878D | 1-LI-0956/0957. | _____ |

4.4.1.11 WHEN the desired Accumulator level is reached, **close** the Fill Valve opened in the previous step. (IV REQUIRED)

4.4.1.12 **Repeat** Steps 4.4.1.10 and 4.4.1.11 if required to **adjust** levels in additional Accumulators.

4.4.1.13 **Close** 1-HV-8871. (IV REQUIRED)

4.4.1.14 **Close** 1-HV-8888. (IV REQUIRED)

4.4.1.15 **Stop** the SI Pump.

CAUTION

While aligned to depressurize the Safety Injection Header, all four Accumulator levels should be monitored for leakage back to the RWST. If level loss is unacceptable, the depressurization should be terminated and Accumulator level(s) should be increased as needed.



4.4.1.16 **Relieve** Safety Injection Header pressure to less than or equal to Accumulator pressure by performing the following:

- | | | |
|----|---|-------|
| a. | Open SIS CHECK VALVE TEST CNMT ISO Valve, 1-HV-8871. | _____ |
| b. | Open SIS CL INJ TEST LINE VLV, 1-HV-8823. | _____ |

NRC Job Performance Measure

Facility: Vogtle

Task No: V-LO-TA-12004

Task Title: Perform an RCS Cooldown Using RHR Train A

JPM No: V-NRC-JP-13011-HL18

K/A Reference: 005A4.01 RO 3.6* SRO 3.4

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance _____ Actual Performance _____

Classroom _____ Simulator _____ Plant _____

NOTE TO EXAMINER: For time considerations, the candidates may “pre-brief” and review 13011-1 prior to starting the JPM.

Read to the examinee:

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

Initial Conditions: A plant cooldown from Mode 4 to Mode 5 is in progress in accordance with 12006-C, “Unit Cooldown to Cold Shutdown”.

RHR Train ‘A’ has been placed in service for cooldown per 13011-1, “Residual Heat Removal System”.

RHR Train ‘A’ Letdown has been established and RHR Train ‘A’ warm-up is complete.

Initiating Cue: The Shift Supervisor has directed you to, “Begin with Step 4.3.9 of 13011-1 to initiate full RHR flow to the RCS, cool down the RCS to $315^{\circ}\text{F} \pm 5^{\circ}\text{F}$, and stabilize temperature within this band. Do not exceed 100°F cool down in any hour”.

Task Standard: Candidate initiates full RHR flow to the RCS, cools down the RCS to 315°F \pm 5°F, and stabilizes RCS temperature within this band.

Required Materials: 13011-1, "Residual Heat Removal System", performed through Step 4.3.8 for warm-up of RHR Train "A". Section 4.5 for placing RHR letdown in service is also completed. These steps will be initialed off by an exam team member.

General References: None

Time Critical Task: No

Validation Time: 12 minutes

SIMULATOR SETUP:

Reset to IC170 for HL-18 NRC Exam

Simulator Setup from Scratch:

1. Reset to IC021 (BOL Mode 4)
2. Ensure both trains of CCW are in service
3. Set RF RH01A1 to NORMAL
4. Set RF RH01A2 to NORMAL
5. Set RF RH07C to IN
6. Adjust steam dumps to obtain a 0 deg F/hr cooldown rate, if necessary
7. Set RF SI10 A to RKOUT
8. Set RF RH2 and place RHR letdown in service
9. Set potentiometer for FIC-0618 to 3.2
10. Perform Section 4.3 through Step 4.3.8
11. Acknowledge / Reset alarms
12. Freeze simulator

Setup time: 20 minutes

Performance Information

Critical steps are denoted with an asterisk and bolded.

4.3.9 WHEN RHR warm up is completed, initiate full flow to the RCS as follows:

NOTES

- >3200 gpm indicated flow ensures >3000 gpm actual flow for all temperatures.
- 3000 gpm RHR flow is required for Mode 6.

CAUTION

If the RCS is under vacuum, a minimum flow rate of about 1200 gpm for 3 minutes is needed to refill the voided section of RHR discharge piping. 1500 gpm should NOT be exceeded during the refill period. Flow rates are to be adjusted very slowly any time flow is being increased due to possible water hammer concerns.

Standard: Candidate reads NOTES and CAUTION and determines that the CAUTION does not apply.

Comment:

* 4.3.9 WHEN RHR warm up is completed, initiate full flow to the RCS as follows:

- a. **Throttle open the RHR HEAT EXCH BYPASS for Train A using 1-FIC-618A to the desired flow rate (nominally 3000 gpm).**

Standard: Candidate depresses the UP arrow pushbutton on 1-FIC-618A until flow is approximately 3000 gpm on 1FI-0618A.

Comment:

4.3.9 WHEN RHR warm up is completed, initiate full flow to the RCS as follows:

b. Verify the RHR PMP-A MINIFLOW ISO VLV 1-FV-0610 closes.

Standard: Candidate verifies 1-FV-0610 closes (red light OFF, green light ON).

Comment:

CAUTION

The RHR Heat Exchanger Train A Bypass Flow Controller Potentiometer should be set for a minimum flow of 3000 gpm (Pot setting: 3.6 for 3000 gpm, 4.1 for 3200 gpm) prior to placing controller in AUTO. The potentiometer setting for the desired flow rate (gpm) is approximately equal to $(\text{Desired Flow}/5000)^2 \times 10$.

Standard: Candidate reads CAUTION.

Comment:

* 4.3.9 **WHEN** RHR warm up is completed, initiate full flow to the RCS as follows:

- c. Place the RHR TRN-A HEAT EXCH BYPASS Flow Controller 1-FIC-0618A in AUTO if desired.

CUE: “Shift Supervisor desires automatic control”.

NOTE TO EXAMINER: Potentiometer initially will be set at 3.2, which is too low. Candidate will be required to manipulate the potentiometer to the correct setpoint.

NOTE TO EXAMINER: Potentiometer may be set at 3.6 or 4.1 since the 3000 gpm (actual) flow rate is a Mode 6 requirement only.

Standard: Candidate sets the potentiometer for 3.6 or 4.1, then depresses the AUTO/MAN pushbutton and verifies the AUTO portion of the light is lit.

Comment:

NOTE

During Solid Plant conditions, only 1-PIC-0131 should be used for letdown flow control and 1-HV-0128 should remain in the FULL OPEN position.

Standard: Candidate reads NOTE and determines that it does not apply for the current conditions.

Comment:

4.3.9 WHEN RHR warm up is completed, initiate full flow to the RCS as follows:

- d. Adjust the LOW PRESSURE LETDOWN Controller 1-PIC-0131 and/or LETDOWN FROM RHR Control Valve 1-HC-0128 as required to maintain desired letdown flow.

Standard: Candidate adjusts 1-HC-128 and/or 1-PIC-131 using the UP or DOWN arrow pushbuttons as necessary to maintain approximately 100 gpm flow on 1-FI-132C.

Comment:

* 4.3.9 WHEN RHR warm up is completed, initiate full flow to the RCS as follows:

- e. Slowly throttle RHR TRN-A HEAT EXCH OUTLET using 1-HIC-606A to establish desired RCS cooling.

CUE: If asked, “Refer to initiating cue sheet”.

Standard: Candidate depresses the UP and DOWN arrow pushbuttons on 1-HIC-606A as necessary to establish a cool down not to exceed 100°F in any hour and a target temperature of 315°F ± 5°F.

NOTE TO EXAMINER: Temperatures change slowly and will require multiple adjustments to stabilize. The candidate may wait and stabilize RCS temperature at 315°F ± 5°F during this step or initiate the cooldown and continue in the procedure. Either option is acceptable.

Comment:

4.3.10 IF RCS cooling using both RHR trains is desired, place the second train in service:

IF RHR B is in STANDBY READINESS, use Section 4.4.

IF RHR B is NOT in STANDBY READINESS, use Section 5.3.

CUE: ***If asked, “The Shift Supervisor does NOT desire placing the second RHR train in service”.***

Standard: Candidate determines second RHR train is not desired.

Comment:

4.3.11 Establish RCS Cool down per 12006-C, "Unit Cool down To Cold Shutdown".

CUE: ***“Another operator will perform 12006-C”.***

Standard: N/A

Comment:

Terminating cue: Candidate returns initiating cue sheet.

Verification of Completion

Job Performance Measure No: V-NRC-JP-13011-HL18

Examinee's Name:

Examiner's Name:

Date Performed:

Number of Attempts:

Time to Complete:

Question Documentation:

Question: _____

Response: _____

Result: Satisfactory/Unsatisfactory


Examiner's signature and date: _____

Initial Conditions: A plant cooldown from Mode 4 to Mode 5 is in progress in accordance with 12006-C, "Unit Cooldown to Cold Shutdown".

RHR Train 'A' has been placed in service for cooldown per 13011-1, "Residual Heat Removal System".

RHR Train 'A' Letdown has been established and RHR Train 'A' warm-up is complete.

Initiating Cue: The Shift Supervisor has directed you to, "Begin with Step 4.3.9 of 13011-1 to initiate full RHR flow to the RCS, cool down the RCS to $315^{\circ}\text{F} \pm 5^{\circ}\text{F}$, and stabilize temperature within this band. Do not exceed 100°F cool down in any hour".

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INITIALS

CAUTION

If the RCS is under vacuum, a minimum flow rate of about 1200 gpm for 3 minutes is needed to refill the voided section of RHR discharge piping. 1500 gpm should NOT be exceeded during the refill period. Flow rates are to be adjusted very slowly any time flow is being increased due to possible water hammer concerns. ☐

- b. **Throttle** open the RHR TRN-A HEAT EXCH BYPASS using 1-FIC-618A until RHR PMP A MINIFLOW ISO VLV 1-FV-0610 closes. _____
- c. **Complete** RHR warm-up by monitoring RHR Hx Inlet Temperature using Plant Computer T0630, until the temperature stabilizes. _____

4.3.9 WHEN RHR warm-up is completed, **initiate** full flow to the RCS as follows:


NOTES

- >3200 gpm indicated flow ensures >3000 gpm actual flow for all temperatures. ☐
- 3000 gpm RHR flow is required for Mode 6. ☐

CAUTION

If the RCS is under vacuum, a minimum flow rate of about 1200 gpm for 3 minutes is needed to refill the voided section of RHR discharge piping. 1500 gpm should NOT be exceeded during the refill period. Flow rates are to be adjusted very slowly any time flow is being increased due to possible water hammer concerns. ☐

- a. **Throttle** open the RHR HEAT EXCH BYPASS for Train A using 1-FIC-618A to the desired flow rate (nominally 3000 gpm). _____
- b. **Verify** the RHR PMP-A MINIFLOW ISO VLV 1-FV-0610 closes. _____

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INITIALS

CAUTION

The RHR Heat Exchanger Train A Bypass Flow Controller Potentiometer should be set for a minimum flow of 3000 gpm (Pot setting: 3.6 for 3000 gpm, 4.1 for 3200 gpm) prior to placing controller in AUTO. The potentiometer setting for the desired flow rate (gpm) is approximately equal to $(\text{Desired Flow}/5000)^2 \times 10$. □

- c. **Place** the RHR TRN-A HEAT EXCH BYPASS Flow Controller 1-FIC-0618A in AUTO if desired. _____

NOTE

During Solid Plant conditions, only 1-PIC-0131 should be used for letdown flow control and 1-HV-0128 should remain in the FULL OPEN position. □

- d. **Adjust** the LOW PRESSURE LETDOWN Controller 1-PIC-0131 and/or LETDOWN FROM RHR Control Valve 1-HC-0128 as required to maintain desired letdown flow. _____
- e. **Slowly throttle** RHR TRN-A HEAT EXCH OUTLET using 1-HIC-606A to establish desired RCS cooling. _____

4.3.10 IF RCS cooling using both RHR trains is desired, **place** the second train in service:

IF RHR B is in STANDBY READINESS, **use** Section 4.4. _____

IF RHR B is NOT in STANDBY READINESS, **use** Section 5.3. _____

4.3.11 **Establish** RCS Cool down per 12006-C, "Unit Cool down To Cold Shutdown." _____

Job Performance Measure

Facility: Vogtle

Task No: V-LO-TA-60020

Task Title: Transfer Steam Dumps to Steam Pressure Mode

JPM No: V-NRC-JP-18009-HL18

K/A Reference: 039A2.04 RO 3.4 SRO 3.7

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance _____

Actual Performance _____

Classroom _____

Simulator _____

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: Unit 1 has been shutdown due to a tube leak on Steam Generator #1.

Initiating Cue: The Shift Supervisor has directed you to, "Complete Step 15 of 18009-C, 'Steam Generator Tube Leak'".

Task Standard: Tavg is controlled using Steam Generator ARVs.

Required Materials: 18009-C, "Steam Generator Tube Leak", initialed through Step 14

General References: None

Time Critical Task: No

Validation Time: 8 minutes

SIMULATOR SETUP:

Reset to IC155 for HL18 NRC Exam

Simulator setup from scratch:

1. Reset to IC14
2. Override HS-500A to OFF on Trigger 1
3. Manually trip the reactor
4. Throttle AFW flow to 150 gpm/SG
5. Perform first 14 Steps of 18009-C
6. Acknowledge / Reset alarms
7. Freeze the simulator after parameters stabilize

Setup time: 5 minutes

Performance Information

Critical steps denoted with an asterisk and bolded.

CAUTION

Use of SG ARVs should be avoided to preclude an unmonitored radioactive release to the environment.

Standard: Candidate reviews CAUTION.

Comment:

15. Maintain RCS temperature – AT 557 F:

a. Check Steam Dumps in Steam Pressure Mode.

Standard: Candidate determines that the Steam Dumps are in Tavg Mode on HS-500C.

Comment:

15.a. RNO

a. Transfer steam dumps to STEAM PRESSURE mode:

1) Check Condenser - AVAILABLE.

Standard: Candidate checks that BPLB C-9 status light is LIT.

Comment:

*** 15.a. RNO**

- a. Transfer steam dumps to STEAM PRESSURE mode:

2) Place PIC-507 STEAM DUMP CONTROL in MAN.

Standard: Candidate depresses up or down arrow on PIC-507. AUTO light is off and manual light is lit.

Comment:

*** 15.a. RNO**

- a. Transfer steam dumps to STEAM PRESSURE mode:

3) Match demand on PIC-507 and UI-500 STEAM DUMP DEMAND.

Standard: Candidate depresses up or down arrow on PIC-507 until demand meter on PIC-507 is equal to UI-500 demand.

Comment:

*** 15.a. RNO**

- a. Transfer steam dumps to STEAM PRESSURE mode:

4) Place HS-500C STEAM DUMP CONTROL MODE SELECT in STM PRESS.

NOTE TO SIMULATOR OPERATOR: When candidate places HS-500C to STM PRESS, actuate Trigger 1 (overrides HS-500A to OFF).

Standard: Candidate places HS-500C in STM PRESS.

Comment:

15. Maintain RCS temperature – AT 557 F:

b. Maintain RCS temperature using Steam Dumps:

Manual control.

-OR-

Place PIC-507 in AUTO at desired setpoint.

Standard: Candidate recognizes that steam dumps will not open in manual or automatic mode and performs RNO.

NOTE TO EXAMINER: If candidate does NOT recognize that the steam dumps are unavailable, then this becomes a critical step.

Comment:

*** 15.b. RNO**

b. Maintain RCS temperature using SG ARVs on the UNAFFECTED SGs.

Standard: Candidate uses SG ARVs on loops 2, 3, or 4 to control RCS temperature.

Comment:

Terminating cue: Candidate returns initiating cue sheet.

Verification of Completion

Job Performance Measure No: V-NRC-JP-18009-HL18

Examinee's Name:

Examiner's Name:

Date Performed:

Number of Attempts:

Time to Complete:

Question Documentation:

Question: _____

Response: _____

Result: Satisfactory/Unsatisfactory

Examiner's signature and date: _____

Initial Conditions: Unit 1 has been shutdown due to a tube leak on Steam Generator #1.

Initiating Cue: The Shift Supervisor has directed you to, "Complete Step 15 of 18009-C, 'Steam Generator Tube Leak'".

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

Use of SG ARVs should be avoided to preclude an unmonitored radioactive release to the environment. □

***15. Maintain RCS temperature - AT 557°F:**

- a. Check Steam Dumps in Steam Pressure Mode.

- a. Transfer steam dumps to STEAM PRESSURE mode:

- 1) Check Condenser – AVAILABLE.
- 2) Place PIC-507 STEAM DUMP CONTROL in MAN.
- 3) Match demand on PIC-507 and UI-500 STEAM DUMP DEMAND.
- 4) Place HS-500C STEAM DUMP CONTROL MODE SELECT in STM PRESS.

- b. Maintain RCS temperature using Steam Dumps:

- b. Maintain RCS temperature using SG ARVs on the UNAFFECTED SGs.

Manual control.

-OR-

Place PIC-507 in AUTO at desired setpoint.

NRC Job Performance Measure

Facility: Vogtle

Task No: V-LO-TA-09029

Task Title: Emergency Borate from the RWST

JPM No: V-NRC-JP-13009-HL18

K/A Reference: 024AA2.01 RO 3.8* SRO 4.1

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance _____

Actual Performance _____

Classroom _____

Simulator _____

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 rapid down power using 18013-C, "Rapid Power Reduction", has just been performed by the operating crew.

Boric Acid Transfer Pump #1 is tagged out.

Initiating Cue: The Shift Supervisor has directed you to, "Emergency borate the RCS using 13009-1, 'CVCS Reactor Makeup Control System', to clear the ROD BANK LO-LO LIMIT alarm".

Task Standard: Candidate initiates emergency boration from the RWST using 13009-1.

Required Materials: 13009-1, "CVCS Reactor Makeup Control System"

General References: None

Time Critical Task: No

Validation Time: 10 minutes

SIMULATOR SETUP:

1. Reset to IC163 for HL-18 NRC Exam
2. Place a Red Danger Tag on HS-0276A (Boric Acid Transfer #1)

Simulator Setup from Scratch:

1. Reset to IC14 (100% MOL).
2. Insert the following overrides:
 - LV-112D CLOSED
 - HS-276A STOP
 - HS-276A GREEN LIGHT – OFF
 - HS-276A Red Danger Tag on handswitch
 - HS-277A STOP – on Trigger 1 (T1)
 - HS-277A AMBER LIGHT ON – on Trigger 1 (T1)
 - ALB37-D01 (BBD Trouble) ON - on Trigger 1 (T1)
3. Select the following handswitch positions:
 - HS-277A AUTO
4. Place 75 gpm letdown in service and adjust charging flow as appropriate to maintain pressurizer level stable.
5. Reduce reactor power to ~ 70% power and stabilize the plant.
6. Ensure that CBD rods are below the RIL with ALB10-D04 for ROD BANK LO-LO LIMIT illuminated. 5 to 10 steps below the RIL will ensure the alarm does not inadvertently clear (~ 110 steps on CBD).
7. Acknowledge / Reset alarms.
8. Freeze the simulator.

Setup time: 20 minutes from scratch

Performance Information

Critical steps denoted with an asterisk and bolded.

Section 4.9 of 13009-1, "CVCS Reactor Makeup Control System", is selected for emergency boration.

Standard: 13009-1, "CVCS Reactor Makeup Control System", is opened to Section 4.9.

Comment:

4.9 Emergency Boration

NOTE

Table 1 provides a convenient tool for checking Emergency Boration flow path alternatives.

TABLE 1

EMERGENCY BORATION FLOW PATH ALTERNATIVES

Flow path	BATP	Valve Alignments	Other Pump Required	Flows	Flow	Note
HV8104	At least one	OPEN 1HV-8104	Any charging pump	>42 GPM 1FI-0121C	>30 GPM 1FI-0183A	Operate heaters
Charging Flow path	At least one	OPEN 1FV-0110A 1FV-0110B	Any charging pump	>42 GPM 1FI-0121C	>30 GPM 1FI-0110A	Operate heaters
RWST to Regen Hx	NA	OPEN 1LV-0112D 1LV-0112E CLOSE 1LV-0112B 1LV-0112C 1LV-0112A	Any charging pump	>100 GPM 1FI-0121C	8 to 13 GPM seal injection flow 1HV-0182	Operate heaters
RWST to BIT	NA	OPEN 1HV-8801A 1HV-8801B	Any charging pump	BIT flow (1FI-0917A) + total seal flow - seal return flow >87.5 GPM	Adjust 1FIC-0121C to <13 GPM per RCP	Operate heaters
RHR (Mode 6)	NA	OPEN HV-8812A/B HV-8809A/B	RHR other than S/D Cooling	>100 gpm	See Proc.	Establish water removal path to prevent vessel overflow
SI (Mode 6)	NA	OPEN HV-8923A/B HV-8821A/B HV-8835	SI	>100 gpm	See Proc.	Establish water removal path to prevent vessel or cavity overflow

NOTE TO EXAMINER: Candidate may choose any of the first four methods. Table 1 order is the same as the procedure, so boration through 1-HV-8104 will likely be the first choice.

Standard: Candidate reviews emergency boration flow path alternatives.

Comment:

4.9.1 Emergency Boration through 1-HV-8104

OR

4.9.2 Emergency Boration through the Normal Charging Flow Path

*** 4.9.1.1 OR 4.9.2.1 Start one (1) Boric Acid Transfer Pump.**

Standard: Boric Acid Transfer Pump #2 handswitch is placed in START (red light ON, green light OFF)

Comment:

CUE: Simulator operator actuates Trigger 1 to trip the Boric Acid Transfer Pump.

*** Candidate determines that the Boric Acid Transfer Pump has tripped.**

Standard: Candidate determines that the Boric Acid Transfer Pump has tripped by handswitch lights (red light OFF, green light ON, amber light ON) and 1BBD Trouble Annunciator.

Comment:

Candidate determines that Sections 4.9.1 and 4.9.2 are no longer applicable due to no available Boric Acid Transfer Pump.

Standard: Candidate continues to Section 4.9.3.

Comment:

4.9.3 Emergency Boration from the RWST through the Normal Charging Flow Path

4.9.3.1 Verify one (1) Charging Pump is running and supplied with cooling water.

CUE: ***If requested, “Auxiliary Building Operator reports NCP is supplied with cooling water”.***

Standard: Candidate verifies that the NCP is running.

Comment:

*** 4.9.3.2 Open the following Charging Pump Suctions from the RWST:**

- 1-LV-0112D
- 1-LV-0112E

NOTE TO EXAMINER: These valves are in parallel, so opening one valve will meet the critical step.

Standard: Candidate places the handswitches for 1-LV-0112D and 1-LV-0112E to OPEN. 1-LV-0112E opens (red light ON, green light OFF), but 1-LV-0112D will not open (red light OFF, green light ON).

Comment:

*** 4.9.3.3 Close the following VCT Outlet Isolations:**

- 1-LV-0112B
- 1-LV-0112C

NOTE TO EXAMINER: These valves are in series, so closing one valve will meet the critical step.

Standard: Candidate closes 1-LV-0112B and 1-LV-0112C (red light OFF, green light ON).

Comment:

*** 4.9.3.4 Place 1-LV-0112A to the HUT position.**

Standard: Candidate places handswitch 1-LV-0112A to the HUT position (red light OFF, amber light ON).

Comment:

4.9.3.5 Place 1-FIC-0121 in MANUAL.

Standard: Candidate verifies 1-FIC-0121 is in MANUAL.

Comment:

***4.9.3.6 Adjust Charging Line Flow Controller 1-FIC-0121 to obtain Charging Flow 1-FI-0121C greater than 100 gpm.**

Standard: Candidate adjusts charging flow as indicated on 1-FI-0121C to greater than 100 gpm.

Comment:

4.9.3.7 Adjust Charging Seal Flow Control 1-HV-0182 as necessary to maintain RCP seal injection flow at approximately 40 gpm (between 8 and 13 gpm per pump).

Standard: Candidate adjusts RCP seal injection flow to between 8 and 13 gpm per pump.

Comment:

4.9.3.8 IF required for RCS inventory control, place an additional letdown orifice in service per 13006-1.

CUE: “The extra operator will place an additional letdown orifice in service”.

Standard: N/A

Comment:

4.9.3.9 Operate the Pressurizer Backup Heaters as necessary to equalize boron concentrations between the RCS and the Pressurizer.

Standard: Candidate operates Pressurizer Backup Heaters as needed.

Comment:

4.9.3.10 Check for indications consistent with RCS boration:

RCS Tavg may be dropping.

NIS may be dropping.

CUE: ***“The extra operator will monitor RCS boron concentration and terminate emergency boration flow when required”.***

Standard: N/A

Comment:

Terminating cue: Candidate returns initiating cue sheet.

Verification of Completion

Job Performance Measure No: V-NRC-JP-13009-HL18

Examinee's Name:

Examiner's Name:

Date Performed:

Number of Attempts:

Time to Complete:

Question Documentation:

Question: _____

Response: _____


Result: Satisfactory/Unsatisfactory

Examiner's signature and date: _____

Initial Conditions: A rapid down power using 18013-C, "Rapid Power Reduction", has just been performed by the operating crew.

Boric Acid Transfer Pump #1 is tagged out.

Initiating Cue: The Shift Supervisor has directed you to, "Emergency borate the RCS using 13009-1, 'CVCS Reactor Makeup Control System', to clear the ROD BANK LO-LO LIMIT alarm".

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4.9 EMERGENCY BORATION

NOTE

Table 1 provides a convenient tool for checking Emergency Boration flow path alternatives. ☐

4.9.1 Emergency Boration Through 1-HV-8104

4.9.1.1 **Start** one (1) Boric Acid Transfer Pump. _____

4.9.1.2 **Verify** a Charging Pump is running. _____

4.9.1.3 **Open** EMERGENCY BORATE valve 1-HV-8104. _____

NOTE

The following step assumes that with 12 gpm of seal return, 30 gpm will be supplied to the RCS. ☐

4.9.1.4 **Place** 1-FIC-0121 in MANUAL. _____

4.9.1.5 **Adjust** 1-FIC-0121 to maintain flow greater than 42 gpm. _____


NOTES

- IPC computer point for Boric Acid flow Rate is F0183 (GPM). ☐
- Computer point for Boric Acid Totalized Flow is UF0183 (Gallons). ☐

4.9.1.6 **Verify** Emergency Boration flow 1-FI-0183A greater than 30 gpm. _____

4.9.1.7 IF flow is less than 30 gpm, **start** the second Boric Acid Transfer Pump. _____

4.9.1.8 **Operate** the Pressurizer Backup Heaters as necessary to equalize boron concentration between the RCS and the Pressurizer. _____

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4.9.1.9 **Check** plant conditions are consistent with the boration of the RCS:

RCS Tavg may be dropping.

NIS may be dropping.

4.9.1.10 **Determine** the amount of boric acid required to allow termination of Emergency Boration.

NOTE


Monitor Boric Acid Flow Rate computer point F0183. After flow has started the totalized flow should be reset by selecting "Reset Boric Acid Flow Totalizer" from the IPC System Menu.

4.9.1.11 WHEN the determined amount of boric acid has been added to the RCS, **close** 1-HV-8104.

4.9.1.12 **Return** the Boric Acid Transfer Pumps to the desired system configuration.

4.9.1.13 **Restore** 1-FIC-0121 to the AUTO position.

4.9.1.14 **Direct** Chemistry to sample and report the RCS boron concentration, or **monitor** the Boron Meter 1-AI-40134 if available.

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4.9.2 Emergency Boration Through The Normal Charging Flow Path

4.9.2.1 **Start** one (1) Boric Acid Transfer Pump. _____

4.9.2.2 **Verify** a Charging Pump is running. _____

4.9.2.3 **Open** the following valves:

- 1-FV-0110A, BA TO BLENDER _____
- 1-FV-0110B, BLENDER OUTLET TO CHARGING PUMPS SUCT _____

NOTE

The following step assumes that with 12 gpm of seal return, 30 gpm will be supplied to the RCS. □

4.9.2.4 **Place** 1-FIC-0121 in MANUAL. _____

4.9.2.5 **Adjust** 1-FIC-0121 to maintain flow greater than 42 gpm. _____

4.9.2.6 **Verify** Emergency Boration flow 1-FI-0110A is greater than 30 gpm. _____


4.9.2.7 IF flow is less than 30 gpm, **start** the second Boric Acid Transfer Pump. _____

4.9.2.8 **Operate** the Pressurizer Backup Heaters as necessary to equalize boron concentration between the RCS and the Pressurizer. _____

4.9.2.9 **Check** plant conditions are consistent with RCS boration: _____

RCS Tavg may be dropping.

NIS may be dropping.

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4.9.2.10 **Determine** the amount of boric acid required to allow termination of Emergency Boration.

4.9.2.11 WHEN the determined amount of boric acid has been added to the RCS, **close** the following valves:


- 1-FV-0110A

- 1-FV-0110B

4.9.2.12 **Establish** automatic makeup per Section 4.1.

4.9.2.13 **Restore** 1-FIC-0121 to the AUTO position.

4.9.2.14 **Direct** Chemistry to sample and report the RCS boron concentration, or **monitor** the Boron Meter 1-AI-40134 if available.

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4.9.3 Emergency Boration From The RWST Through The Normal Charging Flow Path

4.9.3.1 **Verify** one (1) Charging Pump is running and supplied with cooling water. _____

4.9.3.2 **Open** one or both of the following Charging Pump Suctions from the RWST:

• 1-LV-0112D _____

• 1-LV-0112E _____

4.9.3.3 **Close** one or both of the following VCT Outlet Isolations:

• 1-LV-0112B _____

• 1-LV-0112C _____

4.9.3.4 **Place** 1-LV-0112A to the HUT position. _____

4.9.3.5 **Place** 1-FIC-0121 in MANUAL, _____

4.9.3.6 **Adjust** Charging Line Flow Controller 1-FIC-0121 to obtain Charging Flow 1-FI-0121C greater than 100 gpm, _____

4.9.3.7 **Adjust** Charging Seal Flow Control 1-HV-0182 as necessary to maintain RCP seal injection flow at approximately 40 gpm (between 8 and 13 gpm per pump). _____


4.9.3.8 If required for RCS inventory control, **place** an additional letdown orifice in service per 13006-1. _____

4.9.3.9 **Operate** the Pressurizer Backup Heaters as necessary to equalize boron concentrations between the RCS and the Pressurizer. _____

4.9.3.10 **Check** for indications consistent with RCS boration: _____

RCS Tavg may be dropping.

NIS may be dropping.

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4.9.3.11 WHEN boration is complete, perform the following:

a. **Open** the following VCT OUTLET ISOLATION valves

• 1-LV-0112B

• 1-LV-0112C

b. **Close** the following Charging Pump Suctions from the RWST:

• 1-LV-0112D

• 1-LV-0112E

c. **Place** 1-HS-0112A to the AUTO position.

d. **Restore** 1-FIC-0121 to the AUTO position IF it was placed in MANUAL.

4.9.3.12 **Direct** Chemistry to sample and report the RCS boron concentration, or **monitor** Boron Meter 1-AI-40134 if available.

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TABLE 1

EMERGENCY BORATION FLOW PATH ALTERNATIVES

Flow path	BATP	Valve Alignments	Other Pump Required	Flows	Flow	Note
HV8104	At least one	OPEN 1HV-8104	Any charging pump	>42 GPM 1FI-0121C	>30 GPM 1FI-0183A	Operate heaters
Charging Flow path	At least one	OPEN 1FV-0110A 1FV-0110B	Any charging pump	>42 GPM 1FI-0121C	>30 GPM 1FI-0110A	Operate heaters
RWST to Regen Hx	NA	OPEN 1LV-0112D 1LV-0112E CLOSE 1LV-0112B 1LV-0112C HUT 1LV-0112A	Any charging pump	>100 GPM 1FI-0121C	8 to 13 GPM seal injection flow 1HV-0182	Operate heaters
RWST to BIT	NA	OPEN 1LV-0112D 1LV-0112E 1HV-8801A 1HV-8801B CLOSE 1LV-0112B 1LV-0112C HUT 1LV-0112A	Any charging pump	BIT flow (1FI-0917A) + total seal flow - seal return flow >87.5 GPM	Adjust 1FIC-0121C to <13 GPM per RCP	Operate heaters
RHR (Mode 6)	NA	OPEN HV-8812A/B HV-8809A/B	RHR other than S/D Cooling	>100 gpm	See Proc.	Establish water removal path to prevent vessel overflow
SI (Mode 6)	NA	OPEN HV-8923A/B HV-8821A/B HV-8835	SI	>100 gpm	See Proc.	Establish water removal path to prevent vessel or cavity overflow

NRC Job Performance Measure

Facility: Vogtle

Task No: V-LO-TA-37002

Task Title: Establish Safety Grade Letdown

JPM No: V-NRC-JP-19001-HL18

K/A Reference: 004A2.11 RO 3.6 SRO 4.2

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance _____

Actual Performance _____

Classroom _____

Simulator _____

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 manually tripped due to an un-isolable instrument air break. The crew has transitioned from 19000-C, "Reactor Trip or Safety Injection", to 19001-C, "Reactor Trip Response".

Safety Grade Charging has been placed in service.

Initiating Cue: The Shift Supervisor has directed you to, "Establish Safety Grade Letdown flow at 40 gpm using 19001-C, Step 10.a. RNO".

Task Standard: Safety grade letdown flow is established at 35 to 45 gpm.

Required Materials: 19001-C, "Reactor Trip Response". Steps prior to 10.a. RNO will be initialed off by an exam team member.

General References: None

Time Critical Task: No

Validation Time: 8 minutes

SIMULATOR SETUP:

Reset to IC162 for HL-18 NRC Exam

Simulator Setup from Scratch:

1. Reset to IC14 (MOL 100%)
2. Initiate manual reactor trip
3. Close MSIVs and BSIVs
4. Throttle total AFW flow to stabilize RCS temperature
5. Verify pressurizer level and pressure stable or rising
6. Insert malfunction IA01 (instrument air leak) at 100%
7. Place all air compressor handswitches in STOP
8. Verify instrument air pressure ~ 0 psig
9. Place Train B Safety grade charging in service per 13006-1 (RF CV11 set to 75% for RCP seal flow)
10. Acknowledge / Reset alarms
11. Freeze simulator

Setup time: 10 minutes

Performance Information

Critical steps denoted with an asterisk and bolded.

Step 10.a. RNO of 19001-C, "Reactor Trip Response", is selected for establishing Safety Grade Letdown.

Standard: 19001-C, "Reactor Trip Response", is opened to Step 10.a. RNO.

Comment:

10.a. RNO Perform the following:

- 1) Establish Safety Grade Charging by initiating 13006, "Chemical and Volume Control System".

CUE: If requested, "Refer to initial conditions".

Standard: N/A

Comment:

***10.a. RNO Perform the following:**

2) Establish Safety Grade Letdown:

a) Open RX HEAD VENT TO LETDOWN ISOLATION VLVS:

- HV-8095A
- HV-8096A
- HV-8095B
- HV-8096B

NOTE TO EXAMINER: Annunciator ALB12-D02, RV VENT HI TEMP, will alarm when valves are opened.

Standard: Candidate opens 1-HV-8095A, 1-HV-8096A, 1-HV-8095B, and 1-HV-8096B (red lights ON, green lights OFF).

Comment:

***10.a. RNO Perform the following:**

2) Establish Safety Grade Letdown:

b) Open REACTOR HEAD VENT TO PRT flow control valves as necessary:

- HV-0442A
- HV-0442B

NOTE TO EXAMINER: FI-406A and FI-407A are in series, so each will read the total flow. PRT annunciators may come in at thispoint.

Standard: Candidate depresses up/down arrow pushbuttons on controllers 1HC-442A and/or 1HC-442B to attain a 35 to 45 gpm letdown flow rate.

Comment:

Report completion of task to Shift Supervisor.

Standard: Candidate reports that Safety Grade Letdown flow has been established.

Comment:

Terminating cue: Candidate returns initiating cue sheet.

Verification of Completion

Job Performance Measure No: V-NRC-JP-19001-HL18

Examinee's Name:

Examiner's Name:

Date Performed:

Number of Attempts:

Time to Complete:

Question Documentation:

Question: _____

Response: _____

Result: Satisfactory/Unsatisfactory

Examiner's signature and date: _____

Initial Conditions: The plant was manually tripped due to an un-isolable instrument air break. The crew has transitioned from 19000-C, "Reactor Trip or Safety Injection", to 19001-C, "Reactor Trip Response".

Safety Grade Charging has been placed in service.

Initiating Cue: The Shift Supervisor has directed you to, "Establish Safety Grade Letdown flow at 40 gpm using 19001-C, Step 10.a. RNO".

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

- e. Initiate actions of AOPs in conjunction with remaining actions of this procedure.

***10. Check PRZR level control:**

- a. Instrument Air - AVAILABLE.

- a. Perform the following:

- 1) Establish Safety Grade Charging by initiating 13006, CHEMICAL AND VOLUME CONTROL SYSTEM.
- 2) Establish Safety Grade Letdown:
 - a) Open RX HEAD VENT TO LETDOWN ISOLATION VLVs:
 - HV-8095A
 - HV-8096A
 - HV-8095B
 - HV-8096B
 - b) Open REACTOR HEAD VENT TO PRT flow control valves as necessary:
 - HV-0442A
 - HV-0442B
- 3) Go to Step 10.d.

° Step 10 continued on next page

NRC Job Performance Measure

Facility: Vogtle

Task No: V-LO-TA-29008

Task Title: Place Containment Hydrogen Monitors in Service

JPM No: V-NRC-JP-13130-HL18

K/A Reference: 028A4.03 RO 3.1 SRO 3.3

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance _____

Actual Performance _____

Classroom _____

Simulator _____

Plant _____

Read to the examinee:

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

Initial Conditions: A LOCA has occurred on Unit 1. The crew is performing 19010-C, "Loss of Primary or Secondary Coolant".

Initiating Cue: The Shift Supervisor has directed you to, "Place the Containment Hydrogen Monitors in service using 13130-1, 'Post-Accident Hydrogen Control'". The hydrogen monitors have been in standby for three days.

Task Standard: Train 'A' Containment hydrogen monitor is placed in service, but Common Failure light will illuminate requiring monitor to be returned to standby.

Required Materials: 13130-1, "Post-Accident Hydrogen Control"

General References: None

Time Critical Task: No

Validation Time: 10 minutes

SIMULATOR SETUP:

Reset to IC161 for HL-18 NRC Exam

Simulator Setup from Scratch:

1. Reset to IC14 (MOL 100%)
2. Insert malfunction RC05C at 100% (hot leg break).
3. Stop RCPs and throttle AFW flow to ~ 200 gpm/SG.
4. Reset SI, reset CIA, and stop the RHR pumps.
5. Energize stub buses and establish instrument air to containment.
6. Override Lamp PCP-LO_H2A_MON_COM_A_COMMON ALARM MONITOR 1 A530P26-A5 to ON set for Trigger 1 (lamp is Hydrogen Monitor "A" Common Failure amber light).
7. Allow conditions to stabilize.
8. Acknowledge / Reset alarms.
9. Freeze simulator.

Setup time: 10 minutes

Performance Information

Critical steps denoted with an asterisk and bolded.

Section 4.2 of 13130-1, "Post-Accident Hydrogen Control", is selected for Train 'A' hydrogen monitor operation.

Standard: 13130-1, "Post-Accident Hydrogen Control", is opened to Section 4.2

Comment:

4.2.1.1

NOTE

The Hydrogen Monitors require a 6 hour warm-up period in STANDBY before accurate readings may be obtained.

CAUTION

The Hydrogen Monitor Isolation Valves must remain closed except during Hydrogen Monitor operation while in Modes 5 or 6 or during post accident conditions to ensure containment integrity is maintained.

CUE: If asked for Hydrogen Monitor warm-up period, "Refer to initial conditions".

Standard: Candidate reviews NOTE and CAUTION prior to step 4.2.1.1 and determines applicability.

Comment:

4.2.1.1 IF the following conditions exist, THEN notify maintenance to implement 28834-1, to provide power to Containment Isolation Valves 1-HV-2791B and 1-HV-2793B:

- a. A post accident condition (LOCA) exists AND
- b. 125 VDC Bus 1BD11 is not available AND
- c. Containment Hydrogen Concentration is required.

NOTE TO EXAMINER: Candidate may look at the valve handswitch lights or electrical board indications for verification of DC power availability.

Standard: Candidate recognizes that 125 VDC Bus 1BD11 is available and that maintenance assistance is not required.

Comment:

***4.2.1.2 Open the H₂ MONITOR A SPLY ISO IRC:**

- a) 1-HV-2792A
- b) 1-HV-2792B

Standard: **Candidate opens 1-HV-2792A and 1-HV-2792B (red lights ON, green lights OFF).**

Comment:

***4.2.1.3 Open H₂ MONITOR A SPLY ISO ORC 1-HV-2791B.**

Standard: **Candidate opens 1-HV-2791B (red light ON, green light OFF).**

Comment:

***4.2.1.4 Open H₂ MONITOR A RTN ISO ORC 1-HV-2793B.**

Standard: Candidate opens 1-HV-2793B (red light ON, green light OFF).

Comment:

***4.2.1.5 Place Mode Switch 1-HS-22900 in ANALYZE.**

Standard: Candidate places Switch 1-HS-22900 in ANALYZE (switch turned to the right).

Comment:

4.2.1.6 Verify Function Selector Switch 1-HS-22904 in Sample position.

Standard: Candidate verifies Function Selector Switch 1-HS-22904 is in the Sample position (switch turned to the left pointing towards SAMPLE lamp).

Comment:

***4.2.1.7 Momentarily depress Remote Control Selector Pushbutton 1-HS-22944 and verify Sample Light LIT.**

NOTE TO SIMULATOR OPERATOR: Insert Trigger 1 when 1-HS-22944 is depressed.

Standard: Candidate momentarily depresses Remote Control Selector Pushbutton 1-HS-22944 and verifies Sample Light lit (red light ON).

Comment:

***4.2.1.8** If the **COMMON FAILURE** light is lit, perform the following:

- a. Momentarily depress the remote reset pushbutton 1-HS-87024A (QPCP).

Standard: Candidate momentarily depresses 1-HS-87024A (light will remain ON).

Comment:

***4.2.1.8** If the **COMMON FAILURE** light is lit, perform the following:

- b. IF the **COMMON FAILURE** light does NOT reset,
- (1) Record the status of indicator lights.
- (2) IF the monitor is in **ANALYZE**, place 1-HS-22900 (QPCP) to **STANDBY**.

Standard: Candidate notes the status of the indicator lights and returns 1-HS-22900 to **STANDBY** (switch turned to the left one click).

Comment:

4.2.1.8

If the COMMON FAILURE light is lit, perform the following:

b. IF the COMMON FAILURE light does NOT reset,

(3) Notify TSC of status indication and that the monitor is returned to standby until a team can be dispatched to local panel.

CUE: ***“TSC is notified and will dispatch a team to the local panel”.***

CUE: ***“An extra operator will place Train ‘B’ Hydrogen Monitor in service”.***

Standard: Candidate informs TSC of hydrogen monitor status.

Comment:

Terminating cue: Candidate returns initiating cue sheet.

Verification of Completion

Job Performance Measure No: V-NRC-JP-13130-HL18

Examinee's Name:

Examiner's Name:

Date Performed:

Number of Attempts:

Time to Complete:

Question Documentation:

Question: _____


Response: _____

Result: Satisfactory/Unsatisfactory

Examiner's signature and date: _____

Initial Conditions: A LOCA has occurred on Unit 1. The crew is performing 19010-C, "Loss of Primary or Secondary Coolant".

Initiating Cue: The Shift Supervisor has directed you to, "Place the Containment Hydrogen Monitors in service using 13130-1, 'Post-Accident Hydrogen Control'". The hydrogen monitors have been in standby for three days.

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4.2 SYSTEM OPERATION

4.2.1 Containment Hydrogen Monitor A 1-1513-P5-HMA Operation (Hydrogen Measurement)

NOTE

The Hydrogen Monitors require a 6 hour warm-up period in STANDBY before accurate readings may be obtained. ☐

CAUTION

The Hydrogen Monitor Isolation Valves must remain closed except during Hydrogen Monitor operation while in Modes 5 or 6 or during post accident conditions to ensure containment integrity is maintained. ☐

4.2.1.1 IF the following conditions exist, THEN **notify** maintenance to implement 28834-1, to provide power to Containment Isolation Valves 1-HV-2791B and 1-HV-2793B:

- a. A post accident condition (LOCA) exist AND, _____
- b. 125 VDC Bus 1BD11 is not available AND, _____
- c. Containment Hydrogen Concentration is required. _____

4.2.1.2 **Open** the H₂ MONITOR A SPLY ISO IRC:


- a. 1-HV-2792A _____
- b. 1-HV-2792B _____

4.2.1.3 **Open** H₂ MONITOR A SPLY ISO ORC 1-HV-2791B. _____

4.2.1.4 **Open** H₂ MONITOR A RTN ISO ORC 1-HV-2793B. _____

4.2.1.5 **Place** Mode Switch 1-HS-22900 in ANALYZE. _____

4.2.1.6 **Verify** Function Selector Switch 1-HS-22904 in Sample position. _____

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4.2.1.7 Momentarily **depress** Remote Control Selector Pushbutton 1-HS-22944 and **verify** Sample Light LIT.

4.2.1.8 If the COMMON FAILURE light is lit, perform the following:

a. Momentarily **depress** the remote reset pushbutton 1-HS-87024A (QPCP).

b. IF the COMMON FAILURE light does NOT reset,

(1) **Record** the status of indicator lights.

(2) IF the monitor is in ANALYZE, **place** 1-HS-22900 (QPCP) to STANDBY.

(3) **Notify** TSC of status indication and that the monitor is returned to standby until a team can be dispatched to local panel.

NOTE

Indication of hydrogen concentration is available within 30 minutes of initiating flow through the monitors. This is accomplished by operating the monitors in Standby during normal plant operation.



4.2.1.9 **Note** containment hydrogen concentration as indicated by CONTAIN H₂ MONITOR TRN A 1-AI-12979 on QMCB WHEN indications stabilize.

4.2.1.10 WHEN hydrogen monitoring is no longer desired, **place** Mode Switch 1-HS-22900 in STAND BY.

4.2.1.11 **Close** the Hydrogen Monitor A Isolations by placing their control switches to close:

a. 1-HV-2792A

b. 1-HV-2792B

c. 1-HV-2791B

d. 1-HV-2793B

NRC Job Performance Measure

Facility: Vogtle

Task No: V-LO-TA-60039

Task Title: Post-Accident Cleanup of the FHB Using the Normal Exhaust Units

JPM No: V-NRC-JP-13320-HL18

K/A Reference: 034A2.01 RO 3.6 SRO 4.4

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance _____

Actual Performance _____

Classroom _____

Simulator _____

Plant _____

Read to the examinee:

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

Initial Conditions: **A spent fuel assembly was dropped in the Unit 1 Spent Fuel Pool.**

Both trains of FHB Post-Accident Filter Units are in service.

Initiating Cue: **The Shift Supervisor has directed you to, "Initiate post-accident cleanup of the FHB using the Normal FHB Exhaust Units in accordance with 13320-C, 'Fuel Handling Building HVAC System'".**

Task Standard: Candidate shuts down 'B' Train Post-Accident Filter Unit and places one Fuel Handling Building Normal Exhaust Unit in service using 13320-C to expedite cleanup of airborne radioactivity in the Fuel Handling Building.

Required Materials: 13320-C, "Fuel Handling Building HVAC System"

General References: None

Time Critical Task: No

Validation Time: 12 minutes

SIMULATOR SETUP:

Reset to IC160 for HL-18 NRC Exam

Simulator Setup from Scratch:

1. Reset to IC14 (100% MOL)
2. Insert malfunctions RM2532a, RM2532b, RM2533a, and RM2533b at 100% severity
3. Allow sufficient time for FHB Post-Accident and Normal HVAC to re-align
4. Acknowledge / Reset alarms
5. Freeze simulator

Setup time: 5 minutes

Performance Information

Critical steps denoted with an asterisk and bolded.

Section 4.6 of 13320-C, "Fuel Handling Building HVAC System", is selected for post-accident cleanup of the FHB using the Normal FHB Exhaust Units.

Standard: 13320-C, "Fuel Handling Building HVAC System", is opened to Section 4.6.

Comment:

4.6.1

NOTE

This section would normally be used to expedite clean up in the spent fuel pool area during accident conditions. It should be expected that the FHB rad monitors may initially be in high alarm and a FHB isolation signal be present.

CAUTION

The Train B Post Accident Filter Unit and the normal HVAC System discharge to a Common Exhaust stack. They should not be aligned to discharge to the exhaust stack at the same time.

Standard: Candidate reviews NOTE and CAUTION prior to Step 4.6.1.

Comment:

4.6.1 Verify FHB Post Accident Filter Unit Train A is operating, otherwise start per Section 4.2, Manual Actuation of FHB Isolation.

NOTE TO EXAMINER: Candidate may look at the red light on handswitch AHS-2540 (C54) or refer to initial conditions.

Standard: FHB Post Accident Filter Unit Train A verified operating.

Comment:

4.6.2 Verify the following damper alignment:

a. FHB NORM HVAC SPLY DMPRS:

- A-HV-2529 AHS-2529 (A56) CLOSED
- A-HV-2528 AHS-2528 (A57) CLOSED

Standard: Dampers verified closed (green lights ON, red lights OFF).

Comment:

4.6.2 Verify the following damper alignment:

b. NORM HVAC UNIT SPLY HDR ISO DMPRS:

- A-HV-2535 AHS-2535 (B56) CLOSED
- A-HV-2534 AHS-2534 (B57) CLOSED

Standard: Dampers verified closed (green lights ON, red lights OFF).

Comment:

4.6.2 Verify the following damper alignment:

c. FHB ISO DMPRS TO NORM EXH:

- A-HV-12479 AHS-12479 (D56) CLOSED
- A-HV-12480 AHS-12480 (D57) CLOSED

Standard: Dampers verified closed (green lights ON, red lights OFF).

Comment:

4.6.2 Verify the following damper alignment:

d. FHB ISO DMPRS TO STACK:

- A-HV-12481 AHS-12481 (C56) CLOSED
- A-HV-12482 AHS-12482 (C57) CLOSED

Standard: Dampers verified closed (green lights ON, red lights OFF).

Comment:

4.6.3

NOTE

If a FHB Isolation Signal is still present and either train's hand switch is taken to reset, then that Train's Isolation logic is rendered inoperable. A corresponding White Light will be LIT on AHS-2532B (AHS-2533B), and a corresponding alarm is received on the Unit One and Unit Two SSMP Panels and will bring in annunciators on BOTH Unit One and Unit Two (1/2ALB04-E01(E02)).

CUE: ***If requested, “Both control rooms have been notified”.***

Standard: Candidate reviews NOTE prior to Step 4.6.3.

Comment:

***4.6.3** **Reset the FHB ISOLATION by momentarily placing the following handswitches in RESET OVERRIDE:**

- Train A: **AHS-2532B (B54)**
- Train B: **AHS-2533B (B55)**

Standard: **FHB ISOLATION is reset (white lights ON).**

Comment:

4.6.4 Verify the FHB Isolation has been reset by observing a green light indication:

- FHB ISOLATION MANUAL ACTUATION, AHS-2532A (A54) green light lit
- FHB ISOLATION MANUAL ACTUATION, AHS-2533A (A55) green light lit

Standard: FHB Isolation verified reset by observing green lights on handswitches.

Comment:

***4.6.5 Shutdown the B Train Post Accident Filter Unit, A-1542-N7-002, IF running, using AHS-2541 (C55).**

NOTE TO EXAMINER: The B Train Post-Accident Filter Unit will be running when this step is reached.

Standard: B Train Post Accident Filter Unit, A-1542-N7-002, is shut down using AHS-2541 (green light ON, red light OFF).

Comment:

***4.6.6 Open the FHB Normal HVAC Exhaust Dampers:**

- **FHB ISO TO NORM EXH – TRN A: AHS-12479 (D56)**
- **FHB ISO TO NORM EXH – TRN B: AHS-12480 (D57)**

Standard: Dampers open (green lights OFF, red lights ON).

Comment:

***4.6.7** **Open the FHB RECIRC ISOL DMPR, A-HV-12553 using AHS-12553 (E56).**

Standard: **Damper open (green light OFF, red light ON).**

Comment:

***4.6.8** **Start one FHB Normal Exhaust Unit:**

FHB NORM EXH UNIT FAN-1: **AHS-12534 (A53)**

FHB NORM EXH UNIT FAN-2: **AHS-12536 (B53)**

CUE: ***Either unit is acceptable. If requested, “Start FHB Normal Exhaust Unit Fan – 2”.***

Standard: **FHB Normal Exhaust Unit Fan – 1 or 2 started (green light OFF, red light ON started unit’s handswitch).**

Comment:

4.6.9 **WHEN cleanup is no longer needed, stop the FHB Normal Exhaust Unit:**

FHB NORM EXH UNIT FAN-1: **AHS-12534 (A53)**

FHB NORM EXH UNIT FAN-2: **AHS-12536 (B53)**

CUE: ***“An extra operator will complete the procedure when cleanup is no longer needed”.***

Standard: **N/A**

Comment:

Terminating cue: **Candidate returns initiating cue sheet.**

Verification of Completion

Job Performance Measure No: V-NRC-JP-13320-HL18

Examinee's Name:

Examiner's Name:

Date Performed:

Number of Attempts:

Time to Complete:

Question Documentation:

Question: _____

Response: _____


Result: Satisfactory / Unsatisfactory

Examiner's signature and date: _____

Initial Conditions: A spent fuel assembly was dropped in the Unit 1 Spent Fuel Pool.

Both trains of FHB Post-Accident Filter Units are in service.

Initiating Cue: The Shift Supervisor has directed you to, "Initiate post-accident cleanup of the FHB using the normal FHB exhaust units in accordance with 13320-C, 'Fuel Handling Building HVAC System'".

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4.6 POST ACCIDENT CLEANUP OF THE FHB USING THE NORMAL EXHAUST UNITS

NOTE

This section would normally be used to expedite clean up in the spent fuel pool area during accident conditions. It should be expected that the FHB rad monitors may initially be in high alarm and a FHB isolation signal be present. ☐

CAUTION

The Train B Post Accident Filter Unit and the normal HVAC System discharge to a Common Exhaust stack. They should not be aligned to discharge to the exhaust stack at the same time. ☐

4.6.1 **Verify** FHB Post Accident Filter Unit Train A is operating, otherwise **start** per Section 4.2, Manual Actuation of FHB Isolation. _____

4.6.2 **Verify** the following damper alignment:

a. FHB NORM HVAC SPLY DMPRS:


- A-HV-2529 AHS-2529 (A56) CLOSED _____
- A-HV-2528 AHS-2528 (A57) CLOSED _____

b. NORM HVAC UNIT SPLY HDR ISO DMPRS:

- A-HV-2535 AHS-2535 (B56) CLOSED _____
- A-HV-2534 AHS-2534 (B57) CLOSED _____

c. FHB ISO DMPRS TO NORM EXH:

- A-HV-12479 AHS-12479 (D56) CLOSED _____
- A-HV-12480 AHS-12480 (D57) CLOSED _____

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d. FHB ISO DMPRS TO STACK:

- A-HV-12481 AHS-12481 (C56) CLOSED _____
- A-HV-12482 AHS-12482 (C57) CLOSED _____

NOTE

If a FHB Isolation Signal is still present and either train's hand switch is taken to reset, then that Train's Isolation logic is rendered inoperable. A corresponding White Light will be LIT on AHS-2532B(AHS-2533B), and a corresponding alarm is received on the Unit One and Unit Two SSMP Panels and will bring in annunciators on BOTH Unit One and Unit Two (1/2ALB04-E01(E02)).



4.6.3 **Reset** the FHB ISOLATION by momentarily placing the following handswitches in RESET OVERRIDE:

- Train A: AHS-2532B (B54) _____
- Train B: AHS-2533B (B55) _____

4.6.4 **Verify** the FHB Isolation has been reset by observing a green light indication:


- FHB ISOLATION MANUAL ACTUATION, AHS-2532A (A54) green light LIT _____
- FHB ISOLATION MANUAL ACTUATION, AHS-2533A (A55) green light LIT _____

4.6.5 **Shut down** the B Train Post Accident Filter Unit, A-1542-N7-002, IF running, using AHS-2541 (C55). _____

4.6.6 **Open** the FHB Normal HVAC Exhaust Dampers:

- FHB ISO TO NORM EXH - TRN A: AHS-12479 (D56) _____
- FHB ISO TO NORM EXH - TRN B: AHS-12480 (D57) _____

4.6.7 **Open** the FHB RECIRC ISOL DMPR, A-HV-12553 using AHS-12553 (E56). _____

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4.6.8 **Start** one FHB Normal Exhaust Unit:

FHB NORM EXH UNIT FAN-1: AHS-12534 (A53) _____

FHB NORM EXH UNIT FAN-2: AHS-12536 (B53) _____

4.6.9 WHEN cleanup is no longer needed, **stop** the FHB Normal Exhaust Unit.

FHB NORM EXH UNIT FAN-1: AHS-12534 (A53) _____

FHB NORM EXH UNIT FAN-2: AHS-12536 (B53) _____

4.6.10 **Close** the FHB RECIRC ISOL DMPR, A-HV-12553 using AHS-12553 (E56). _____

4.6.11 **Close** the FHB Normal HVAC Exhaust Dampers:

• FHB ISO TO NORM EXH - TRN A: AHS-12479 (D56) _____

• FHB ISO TO NORM EXH - TRN B: AHS-12480 (D57) _____

NRC Job Performance Measure

Facility: Vogtle

Task No: V-LO-TA-31008

Task Title: Establish Field Excitation Using Manual Voltage Regulation for Main Generator

JPM No: V-NRC-JP-13830-HL18

K/A Reference: 062A4.04 RO 2.6 SRO 2.7

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance _____

Actual Performance _____

Classroom _____

Simulator _____

Plant _____

NOTE TO EXAMINER: For time considerations, the candidates should “pre-brief” and review 13830-1 prior to starting the JPM.

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

Initial Conditions: The unit is starting up following a refueling outage. The main turbine is at 1800 rpm and main generator / exciter preparations are complete. The Shift Supervisor has given approval to establish main generator field excitation using manual voltage regulation.

Initiating Cue: The Shift Supervisor has directed you to, “Establish main generator field excitation using manual voltage regulation in accordance with 13830-1, ‘Main Generator Operation’”.

Task Standard: Main generator field excitation established using manual voltage regulation.

Required Materials: 13830-1, "Main Generator Operation"

General References: None

Time Critical Task: No

Validation Time: 20 minutes

SIMULATOR SETUP:

Reset to IC167 for HL-18 NRC Exam

Simulator Setup from Scratch:

1. Reset to IC007 (ready to synch to grid)
2. Insert Remote Function TU02 to reset 386M LOR
3. Ensure the PSS is NOT enabled on the EX2100
3. Ensure the EX2100 COI Touchscreen is NOT enabled
4. Acknowledge / Reset alarms
5. Freeze simulator

IMPORTANT NOTES TO SIMULATOR OPERATOR:

1. Verify that Generator Voltmeter Selector Switch 1-VS-G1 is NOT in the B-C position. This is to allow the examinee to re-position the switch during JPM performance.
2. Verify that 230kV Voltage/Frequency Selector Switch 1-VS-US1 is NOT in the UNIT 1 position. This is to allow the examinee to re-position the switch during JPM performance.
3. Verify the PSS is NOT enabled on the EX2100.
4. Verify that the EX2100 COI Touchscreen is NOT enabled.
5. Verify that LOR 386M is reset during simulator setup using RF TU02.

Setup time: 5 minutes

Performance Information

Critical steps denoted with an asterisk and bolded.

Section 4.1.2 of 13830-1, "Main Generator Operation", selected for establishing field excitation.

Standard: 13830-1, "Main Generator Operation", is opened to Section 4.1.2.

Comment:

4.1.2.1 Verify Main Turbine at set speed of 1800 rpm.

NOTE TO EXAMINER: Main Turbine speed indicator is located upper left of Main Turbine Control Panel.

Standard: Main turbine speed is verified to be 1800 rpm.

Comment:

NOTE

The COI panel in the Main Control Room is a touch to operate screen therefore care should be taken anytime the Touchscreen Commands ENABLED button is lit. (Attachment 1 may be used for definitions of COI buttons)



4.1.2.2 On EX2100 Exciter Control Room COI Control Panel Touchscreen Commands press ENABLE.

Standard: NOTE prior to step is reviewed and the ENABLE button on the EX2100 COI Control Panel is pressed (button turns orange and says ENABLED).

Comment:

4.1.2.3 Reset 386M Relay on QPRP.

CUE: ***“386M Relay has been reset”.***

NOTE TO EXAMINER: Examinee may also look at ALB31-E04, TURBINE MECHANICAL LOR TRIP, to verify relay has been reset. The QPRP panel is not modeled in the simulator.

Standard: NOTE prior to step is reviewed and 386M relay is verified reset.

Comment:

* 4.1.2.4 **IF the EX2100 Control Station COI displays “RESET TRIP” OR “RESET FAULTS”, reset by pressing the RESET TRIP OR RESET FAULTS button.**

Standard: **NO FAULTS is expected on display, but if required, RESET TRIP or RESET FAULTS button may be pressed. Step is critical if RESET TRIP or RESET FAULTS is present and the candidate does NOT reset it.**

Comment:

* 4.1.2.5 **IF the EX2100 Control Station COI displays “RESET XFR LATCH”, reset by pressing the RESET XFR LATCH button AND verify the color turns to grey AND displays “TRANSFER OK”.**

Standard: **TRANSFER OK is expected on display, but if required, RESET XFR LATCH button may be pressed. Step is critical if RESET XFR LATCH is present and the candidate does NOT reset it.**

Comment:

4.1.2.6 Check 86G Relay displays "CLOSED" on COI.

Standard: 86G Relay displays CLOSED on COI.

Comment:

4.1.2.7 On the EX2100 Control Station COI, verify "M1 Selected" is displayed AND the button is orange colored.

Standard: "M1 Selected" is displayed and the button is orange colored.

Comment:

4.1.2.8 On the EX2100 Control Station COI, verify the Regulator Control is selected to AUTO.

NOTE TO EXAMINER: Regulator Control will be in AUTO at this point, and will be transferred to Manual in a later step.

Standard: Regulator Control is selected to AUTO on the COI (button is orange).

Comment:

4.1.2.9 On the EX2100 Control Station COI, enable the Power System Stabilizer by performing the following:

- a. Press the "Enable PSS" button.
- b. Verify the button turns orange AND displays "PSS ENABLED".
- c. Verify Power Stabilizer displays "INACTIVE".

Standard: On the COI, the "Enable PSS" button is pressed and turns orange and displays PSS ENABLED with the Power Stabilizer displaying INACTIVE.

Comment:

4.1.2.10 Check Control Room EX2100 COI Control Station, 1-1328-Q5-COI (QMCB) status:

- EX2100 Running Status = STOPPED
- 41 Device = OPEN
- 52G Breaker = OPEN
- Volts Per Hertz (V/Hz) Limit = NOT ACTIVE
- OEL = NOT ACTIVE
- UEL = NOT ACTIVE

Standard: COI Control Station indicates:

- EX2100 Running Status = STOPPED
- 41 Device = OPEN
- 52G Breaker = OPEN
- Volts Per Hertz (V/Hz) Limit = NOT ACTIVE
- OEL = NOT ACTIVE
- UEL = NOT ACTIVE

Comment:

4.1.2.11 Verify the following links are CLOSED (opened by 12006-C) per NMP-AD-003, "Equipment Clearance and Tagging":

Links for Lockout Relays for the Generator Output Breakers PCB-161710 and 161810, located in Unit One Protective Relay Panel Bay 4.

- TBR-56 PCB-161710
- TBR-57 PCB-161710
- TBS-4 PCB-161810
- TBS-5 PCB-161810

NOTE TO EXAMINER: The Protective Relay Panel is not modeled in the simulator.

CUE: ***“Links for Lockout Relays for the Generator Output Breakers PCB-161710 and 161810 are CLOSED”.***

Standard: Lockout relay links for PCB 161710 and PCB 161810 are verified closed.

Comment:

4.1.2.12 At Panel 1NCQUFP, verify 381 Generator Underfrequency Relay in service as follows:

- a. Verify Relay 1 AND Relay 2 Toggle Switches in the IN-SERVICE position.
- b. Verify the six counter module toggle switches in the IN-SERVICE position.

NOTE TO EXAMINER: Panel 1NCQUFP is not modeled in the simulator.

CUE: ***“381 Generator Underfrequency Relay is in service”.***

Standard: 381 Generator Underfrequency Relay is verified in service.

Comment:

4.1.2.13 Dispatch an operator to check Generator Field Ground resistance greater than 50K OHMS, per Section 4.4.6.

CUE: ***“Generator Field Ground resistance is 75K OHMS”.***

Standard: Generator Field Ground resistance is checked greater than 50K OHMS.

Comment:

NOTE

If directed by the SS to establish Field Excitation using Manual Regulator use Attachment 3 and N/A the remaining steps in Section 4.1.2.

Attachment 3 is selected for use of Manual Regulator.

Standard: NOTE before Step 4.1.2.14 is read and Attachment 3 is initiated.

Comment:

NOTE TO EXAMINER: The remaining steps are from Attachment 3.

1. Check Main Turbine at set speed of 1800 rpm.

NOTE TO EXAMINER: Main Turbine speed indicator is located upper left of Main Turbine Control Panel.

Standard: Main turbine speed is verified to be 1800 rpm.

Comment:

2. Reset 386M Relay on QPRP.

CUE: ***“386M Relay has been reset”.***

NOTE TO EXAMINER: Examinee may also look at ALB31-E04, TURBINE MECHANICAL LOR TRIP, to verify relay has been reset. The QPRP panel is not modeled in the simulator.

Standard: 386M relay is verified reset.

Comment:

3. Place Synchronizing Selector Switch 1-TS-US1 in NORMAL.

Standard: Synchronizing Selector Switch 1-TS-US1 is in NORMAL.

Comment:

4. Place the following Synchronize Switches in OFF:

- Unit 1 1-SS-U1
- Bus 1 1-SS-BUS 1
- Goshen WHT 1-SS-GOS WHT

Standard: Synchronize Switches 1-SS-U1, 1-SS-BUS 1, and 1-SS-GOS WHT are OFF.

Comment:

5. On EX2100 Exciter Control Room COI Control Panel Touchscreen Commands, press ENABLE.

Standard: The ENABLE button on the EX2100 COI Control Panel was pressed earlier and the EX2100 COI is currently ENABLED.

Comment:

*** 6. On EX2100 Exciter Control Room COI Control Panel Touchscreen Commands, press MANUAL for Regulator Active.**

Standard: MANUAL is pressed for Regulator Active on the COI (a pop-up window will ask for confirmation).

Comment:

7. Check Control Room EX2100 COI Control Station, 1-1328-Q5-COI (QMCB) status:

- EX2100 Running Status = STOPPED
- Regulator Active = MANUAL
- 41 Device = OPEN
- 52G Breaker = OPEN
- Control Selection = M1 SELECTED
- Volts Per Hertz (V/Hz) Limit = NOT ACTIVE
- OEL = NOT ACTIVE
- UEL = NOT ACTIVE
- Enable Touchscreen Commands = ENABLED

Standard: COI Control Station status indicates:

- EX2100 Running Status = STOPPED
- Regulator Active = MANUAL
- 41 Device = OPEN
- 52G Breaker = OPEN
- Control Selection = M1 SELECTED
- Volts Per Hertz (V/Hz) Limit = NOT ACTIVE
- OEL = NOT ACTIVE
- UEL = NOT ACTIVE
- Enable Touchscreen Commands = ENABLED

Comment:

*** 8. Place Generator Voltmeter Selector Switch 1-VS-G1 in the B-C position.**

Standard: Generator Voltmeter Selector Switch 1-VS-G1 is placed in the B-C position.

Comment:

*** 9. Place 230 kV Voltage/Frequency Selector Switch 1-VS-US1 in the UNIT 1 position.**

Standard: 230 kV Voltage/Frequency Selector Switch 1-VS-US1 is placed in the UNIT 1 position.

Comment:

*** 10. Establish Generator field excitation by depressing the EX2100 Control "START" button on the COI.**

Standard: Generator field excitation is established by depressing the EX2100 Control START button on the COI (a pop-up window will ask for confirmation).

Comment:

11. Check on COI:

- 41 Device = CLOSED
- EX2100 Running status = RUNNING

Standard: COI Control Station indicates:

- 41 Device = CLOSED
- EX2100 Running status = RUNNING

Comment:

12. Verify Generator kilovolts 1-EI-40130 rise to ≈ 18 kV.

NOTE TO EXAMINER: 1-EI-40130 is expected to read ≈ 19.5 kV when generator is excited, which is acceptable. The generator voltage can also be read on the EX2100 COI screen as "Terminal Volts".

Standard: Generator voltage indicates ≈ 18 kV on 1-EI-40130.

Comment:

13. Adjust Generator kilovolts 1-EI-40130 to ≈ 25.0 kV using Volts/VARs Raise Lower pushbuttons on COI.

Standard: Generator voltage is adjusted to ≈ 25.0 kV using the Volts/VARs Raise Lower pushbuttons on the COI.

Comment:

14. Check 1-EI-40130 is reading about constant with 1-VS-G1 in each of the following positions:

A-B
B-C
C-A

Standard: 1-EI-40130 indicates ≈ 25.0 kV with 1-VS-G1 in A-B, B-C, and C-A positions.

Comment:

15. Check Field Volts between 140 AND 160 volts on COI.

NOTE TO EXAMINER: Field volts can be read on the left side of the EX2100 as "Generator Field Voltage" or on the right side under the "Field Volts" meter.

Standard: Field Volts indicate between 140 and 160 volts on the COI.

Comment:

16. Check Field Amps between 1800 AND 2000 amps on COI.

NOTE TO EXAMINER: Field amps can be read on the left side of the EX2100 as "Generator Field Current" or on the right side under the "Field Amps" meter.

Standard: Field Amps indicate between 1800 and 2000 amps on COI.

Comment:

17. Place 1-VS-US-1 Handswitch in the BUS 1 or GOS 3 position.

Standard: 1-VS-US-1 Handswitch placed in the BUS 1 or GOS 3 position.

Comment:

18. Check 230 kV System Hertz 1-SI-40126 at 60.0 Hertz.

Standard: 1-SI-40126 indicates approximately 60.0 Hertz.

Comment:

19. IF the EX2100 Control Station COI "RESET PT FAILURE" is red in color, THEN press the RESET PT FAILURE button AND check the color turns to grey.

Standard: RESET PT FAILURE button is pressed if red in color, and the color then turns grey.

Comment:

20. Return to Section 4.1.3 for synchronizing the main generator to the grid.

CUE: ***"An extra operator will complete Section 4.1.3".***

Standard: N/A

Comment:

Terminating cue: Candidate returns initiating cue sheet.

Verification of Completion

Job Performance Measure No: V-NRC-JP-13830-HL18

Examinee's Name:

Examiner's Name:

Date Performed:

Number of Attempts:

Time to Complete:

Question Documentation:

Question: _____


Response: _____

Result: Satisfactory / Unsatisfactory

Examiner's signature and date: _____

Initial Conditions: The unit is starting up following a refueling outage. The main turbine is at 1800 rpm and main generator / exciter preparations are complete. The Shift Supervisor has given approval to establish main generator field excitation using manual voltage regulation.

Initiating Cue: The Shift Supervisor has directed you to, "Establish main generator field excitation using manual voltage regulation in accordance with 13830-1, 'Main Generator Operation'".

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INITIALS

4.1.2 Establishing Field Excitation

4.1.2.1 **Verify** Main Turbine at set speed of 1800 rpm. _____

NOTE

The COI panel in the Main Control Room is a touch to operate screen therefore care should be taken anytime the Touchscreen Commands ENABLED button is lit. (Attachment 1 may be used for definitions of COI buttons) ☐

4.1.2.2 On EX2100 Exciter Control Room COI Control Panel Touchscreen Commands **press** ENABLE. _____

NOTE

In the following step, the EX2100 exciter Generrex Regulator and Exciter cubicle trips are reset. This verifies the system is ready to operate and prevents a Turbine/Generator trip and opening of the Main Generator output breakers when the links in Step 4.1.2.12 are closed. (Attachment 1 may be used for definitions of COI buttons) ☐

4.1.2.3 **Reset** 386M Relay on QPRP. _____


4.1.2.4 IF the EX2100 Control Station COI displays "RESET TRIP" OR "RESET FAULTS", **reset** by pressing the RESET TRIP OR RESET FAULTS button. _____

4.1.2.5 IF the EX2100 Control Station COI displays "RESET XFR LATCH", **reset** by pressing the RESET XFR LATCH button AND **verify** the color turns to grey AND displays "TRANSFER OK". _____

4.1.2.6 **Check** 86G Relay displays "CLOSED" on COI. _____

4.1.2.7 On the EX2100 Control Station COI, **verify** "M1 Selected" is displayed AND the button is orange colored. _____

4.1.2.8 On the EX2100 Control Station COI, **verify** the Regulator Control is selected to AUTO. _____

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4.1.2.9 On the EX2100 Control Station COI, **enable** the Power System Stabilizer by performing the following:

- a. **Press** the "Enable PSS" button. _____
- b. **Verify** the button turns orange AND displays "PSS ENABLED". _____
- c. **Verify** Power Stabilizer displays "INACTIVE". _____


4.1.2.10 **Check** Control Room EX2100 COI Control Station, 1-1328-Q5-COI (QMCB) status:

- EX2100 Running Status = STOPPED _____
- 41 Device = OPEN _____
- 52G Breaker = OPEN _____
- Volts Per Hertz (V/Hz) Limit = NOT ACTIVE _____
- OEL = NOT ACTIVE _____
- UEL = NOT ACTIVE _____

4.1.2.11 **Verify** the following links are CLOSED (opened by 12006-C) per NMP-AD-003, "Equipment Clearance And Tagging":

Links for Lockout Relays for the Generator Output Breakers PCB-161710 and 161810, located in Unit One Protective Relay Panel Bay 4.

- TBR-56 PCB-161710 _____
- TBR-57 PCB-161710 _____
- TBS-4 PCB-161810 _____
- TBS-5 PCB-161810 _____

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4.1.2.12 At Panel 1NCQUFP, **verify** 381 Gen. Underfrequency Relay in service as follows:

- a. **Verify** Relay 1 AND Relay 2 Toggle Switches in the IN-SERVICE position. _____
- b. **Verify** the six counter module toggle switches in the IN-SERVICE position. _____

4.1.2.13 **Dispatch** an operator to **check** Generator Field Ground resistance greater than 50K OMHS, per Section 4.4.6. _____

NOTE

If directed by the SS to establish Field Excitation using Manual Regulator use Attachment 3 and N/A the remaining steps in Section 4.1.2. ☐

4.1.2.14 **Place** Synchronizing Selector Switch 1-TS-US1 in NORMAL. _____

4.1.2.15 **Place** the following Synchronize Switches in OFF:

- Unit 1 1-SS-U1 _____
- Bus 1 1-SS-BUS 1 _____
- Goshen WHT 1-SS-GOS WHT _____

4.1.2.16 **Place** Generator Voltmeter Selector Switch 1-VS-G1 in the B-C position. _____


4.1.2.17 **Place** 230kV Voltage/Frequency Selector Switch 1-VS-US1 in the UNIT 1 position. _____

4.1.2.18 **Establish** Generator field excitation by depressing the EX2100 Control "START" button on the COI. _____

4.1.2.19 **Verify** on COI

- 41 Device = CLOSED _____
- EX2100 Running status = RUNNING _____

4.1.2.20 **Verify** Generator kilovolts 1-EI-40130 rise to 25.0kV. _____

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Attachment 3

INITIAL

Establishing Field Excitation With Manual Voltage Regulation

1. **Check** Main Turbine at set speed of 1800 rpm. _____
2. **Reset** 386M Relay on QPRP. _____
3. **Place** Synchronizing Selector Switch 1-TS-US1 in NORMAL. _____
4. **Place** the following Synchronize Switches in OFF:
 - Unit 1 1-SS-U1 _____
 - Bus 1 1-SS-BUS 1 _____
 - Goshen WHT 1-SS-GOS WHT _____
5. On EX2100 Exciter Control Room COI Control Panel
Touchscreen Commands, **press** ENABLE. _____
6. On EX2100 Exciter Control Room COI Control Panel
Touchscreen Commands, **press** MANUAL for Regulator Active. _____

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Attachment 3

INITIAL

7. **Check** Control Room EX2100 COI Control Station, 1-1328-Q5-COI (QMCB) status:

- EX2100 Running Status = STOPPED
- Regulator Active = MANUAL
- 41 Device = OPEN
- 52G Breaker = OPEN
- Control Selection = M1 SELECTED
- Volts Per Hertz (V/Hz) Limit = NOT ACTIVE
- OEL = NOT ACTIVE
- UEL = NOT ACTIVE
- Enable Touchscreen Commands = ENABLED

8. **Place** Generator Voltmeter Selector Switch 1-VS-G1 in the B-C position.

9. **Place** 230kV Voltage/Frequency Selector Switch 1-VS-US1 in the UNIT 1 position.


10. **Establish** Generator field excitation by depressing the EX2100 Control "START" button on the COI.

11. **Check** on COI

- 41 Device = CLOSED
- EX2100 Running status = RUNNING

12. **Verify** Generator kilovolts 1-EI-40130 rise to \approx 18kV.

13. **Adjust** Generator kilovolts 1-EI-40130 to \approx 25.0kV using Volts/VARs Raise Lower pushbuttons on COI.

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Attachment 3

INITIAL

14. **Check** 1-EI-40130 is reading about constant with 1-VS-G1 in each of the following positions:
 - A-B _____
 - B-C _____
 - C-A _____
15. **Check** Field Volts between 140 AND 160 volts on COI. _____
16. **Check** Field Amps between 1800 AND 2000 amps. on COI. _____
17. **Place** 1-VS-US-1 Handswitch in the BUS 1 or GOS 3 position. _____
18. **Check** 230kV System Hertz 1-SI-40126 at 60.0 hertz. _____
19. IF the EX2100 Control Station COI "RESET PT FAILURE" is red in color, THEN **press** the RESET PT FAILURE button AND **check** the color turns to grey. _____
20. **Return** to Section 4.1.3. for synchronizing the main generator to the grid. _____

NRC Job Performance Measure

Facility: Vogtle

Task No: V-LO-TA-43003

Task Title: Locally Emergency Start Diesel-Driven Fire Pump

JPM No: V-NRC-JP-13903-HL18

K/A Reference: 086A2.02 RO 3.0 SRO 3.3

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance _____

Actual Performance _____

Classroom _____

Simulator _____

Plant _____

Read to the examinee:

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

The recommended starting point for this JPM is adjacent to the main HP Control Point. The candidates will be sequestered in the TSC or OSC.

Initial Conditions: Diesel-Driven Fire Pump #2 is tagged out for repair.

The fire brigade is fighting a large fire at the warehouse.

The Motor-Driven Fire Pump started due to lowering fire header pressure.

Fire header pressure continued to lower to less than 95 psig, but Diesel-Driven Fire Pump #1 failed to start.

Initiating Cue:

The Shift Supervisor has directed you to, "Perform a local manual start of Diesel-Driven Fire Pump #1 from the ECM using Section A4.1.3 of 13903-C, 'Fire Protection System Operation'".

Task Standard: Candidate manually starts Diesel-Driven Fire Pump #1 using the second battery after start attempt with the first battery is unsuccessful.

Required Materials: 13903-C, "Fire Protection System Operation"
Hearing protection

General References: None

Time Critical Task: No

Validation Time: 12 minutes

Performance Information

Critical steps denoted with an asterisk and bolded.

Section A4.1.3 of 13903-C, "Fire Protection System Operation", is selected to manually start Diesel-Driven Fire Pump #1.

Standard: 13903-C, "Fire Protection System Operation", is opened to Section A4.1.3.

Comment:

A4.1.3.1

NOTES

- Manual Diesel-Driven Fire Pump starting may only be performed when authorized by the Shift Supervisor.
- Performing the following step will cause a Fire Computer Alarm.

CUE: If requested, "Shift Supervisor has been notified of incoming alarm".

Standard: Candidate reviews NOTES prior to performing Step A4.1.3.1.

Comment:

***A4.1.3.1 On ECM hold in orange button and place Control Switch in MANUAL.**

Standard: Control switch placed in MANUAL while pressing orange button.

Comment:

A4.1.3.2 Verify the Diesel-Driven Fire Pump suction and discharge valves are open:

C-2301-U4-T02 FIREWATER DIESEL PUMP # 5 SUCT ISO

C-2301-U4-026 FIREWATER # 5 DIESEL FIRE PUMP DISCH

CUE: If requested, “Valves are as you see them”.

Standard: Valves C-2301-U4-T02 and C-2301-U4-026 verified open.

Comment:

A4.1.3.3 If any alarms are present, refer to 17221-C as necessary.

CUE: If requested, “No alarm is present”.

Standard: Candidate checks alarm status.

Comment:

A4.1.3.4

NOTE

Observe the battery voltages displayed on the engine control panel. Use the battery with the highest indicated voltage in the following step.

CAUTION

When the engine starts, the oil pressure displayed should be on-scale within a few seconds. If oil pressure is not displayed within about 15 seconds, the engine should be stopped.

CUE: *If requested, “Battery voltages are as you see them”.*

Standard: Candidate reviews NOTE and CAUTION prior to performing Step A4.1.3.4.

Comment:

***A4.1.3.4** On ECM depress Control Switch to the CRANK BATT A or CRANK BATT B position and hold UNTIL diesel starts OR 15 seconds have elapsed.

CUE: *“Diesel did NOT start”.*

Standard: Control Switch held in BATT A or BATT B position for 15 seconds.

Comment:

A4.1.3.5 Within 15 seconds after engine start, verify that oil pressure is above 35 psig. on C-2301-P4-005-G01.

Standard: This step is not applicable since Diesel did not start.

Comment:

A4.1.3.6 IF oil pressure is less than 35 psig, trip the engine by placing the AUTO/MANUAL rocker to AUTO and momentarily pressing the RESET switch and notify the SS.

Standard: This step is not applicable since Diesel did not start.

Comment:

***A4.1.3.7 IF diesel does NOT start utilizing the CRANK BATT position selected in Step A4.1.3.4, depress Control Switch C-2301-P4-005-G01 in the other CRANK BATT position and depress and hold UNTIL diesel starts OR 15 seconds have elapsed.**

CUE: “Diesel did NOT start”.

Standard: Control Switch held in BATT A or BATT B position for 15 seconds.

Comment:

***A4.1.3.8** IF diesel still does NOT start, alternate 15 seconds attempts to start in CRANK BATT A and CRANK BATT B, two more times (a total of 3 attempts per position).

CUE: *On the second CRANK BATT B attempt, “Diesel STARTED”.*

CUE: *When candidate checks oil pressure is above 35 psig on C-2301-P4-005-G01, indicate pressure is 40 psig.*

Standard: Control Switch held in BATT A and BATT B positions until diesel engine starts.

Comment:

A4.1.3.9 IF the diesel still does NOT start, notify the SS.

Standard: This step is not applicable since Diesel did start.

Comment:

A4.1.3.10 IF the SS decides conditions warrant, Go To Section A4.1.4.

Standard: This step is not applicable since Diesel did start.

Comment:

A4.1.3.11 Monitor parameters per Step A4.1.1.5.

CUE: ***“The Outside Area Operator will monitor parameters per Step A4.1.1.5”.***

Standard: Parameter monitoring initiated.

Comment:

Terminating cue: Candidate returns initiating cue sheet.

Verification of Completion

Job Performance Measure No: V-NRC-JP-13903-HL18

Examinee's Name:

Examiner's Name:

Date Performed:

Number of Attempts:

Time to Complete:

Question Documentation:

Question: _____

Response: _____

Result: Satisfactory / Unsatisfactory

Examiner's signature and date: _____


Initial Conditions: Diesel-Driven Fire Pump #2 is tagged out for repair.

The fire brigade is fighting a large fire at the warehouse.

The Motor-Driven Fire Pump started due to lowering fire header pressure.

Fire header pressure continued to lower to less than 95 psig, but Diesel-Driven Fire Pump #1 failed to start.

Initiating Cue: The Shift Supervisor has directed you to, “Perform a local manual start of Diesel-Driven Fire Pump #1 from the ECM using Section A4.1.3 of 13903-C, ‘Fire Protection System Operation’”.

Approved By A. S. Parton	Vogle Electric Generating Plant 	Procedure Number Rev 13903-C 43.3
Date Approved 02/03/2011	FIRE PROTECTION SYSTEM OPERATION	Page Number 15 of 92

INITIALS

A4.1.3 Manual Diesel-Driven Fire Pump #1 Starting From ECM C-2301-P4-005-G01

NOTES

- Manual Diesel-Driven Fire Pump starting may only be performed when authorized by the Shift Supervisor. ☐
- Performing the following step will cause a Fire Computer Alarm. ☐

A4.1.3.1 On ECM **hold** in orange button and **place** Control Switch in MANUAL. _____

A4.1.3.2 **Verify** the Diesel-Driven Fire Pump suction and discharge valves are open: _____

C-2301-U4-T02 FIREWATER DIESEL PUMP # 5 SUCT ISO _____

C-2301-U4-026 FIREWATER # 5 DIESEL FIRE PUMP DISCH _____

A4.1.3.3 IF any alarms are present, **Refer To** 17221-C as necessary. _____

NOTE

Observe the battery voltages displayed on the engine control panel. Use the battery with the highest indicated voltage in the following step. ☐


CAUTION

When the engine starts, the oil pressure displayed should be on-scale within a few seconds. If oil pressure is not displayed within about 15 seconds, the engine should be stopped. ☐

A4.1.3.4 On ECM **depress** Control Switch to the CRANK BATT A or CRANK BATT B position and **hold** UNTIL diesel starts OR 15 seconds have elapsed. _____

A4.1.3.5 Within 15 seconds after engine start, **verify** that oil pressure is above 35 psig. on C-2301-P4-005-G01. _____

A4.1.3.6 IF oil pressure is less than 35 psig, **trip** the engine by placing the AUTO/MANUAL rocker to AUTO and momentarily pressing the RESET switch and **notify** the SS. _____

Approved By A. S. Parton	Vogle Electric Generating Plant 	Procedure Number Rev 13903-C 43.3
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INITIALS

- A4.1.3.7 IF diesel does NOT start utilizing the CRANK BATT position selected in Step A4.1.3.4, **depress** Control Switch C-2301-P4-005-G01 in the other CRANK BATT position and **depress** and **hold** UNTIL diesel starts OR 15 seconds have elapsed. _____
- A4.1.3.8 IF diesel still does NOT start, **alternate** 15 seconds attempts to start in CRANK BATT A and CRANK BATT B, two more times (a total of 3 attempts per position). _____
- A4.1.3.9 IF the diesel still does NOT start, **notify** the SS. _____
- A4.1.3.10 IF the SS decides conditions warrant, **Go To** Section A4.1.4. _____
- A4.1.3.11 **Monitor** parameters per Step A4.1.1.5. _____
- A4.1.3.12 WHEN directed by the SS to stop the Diesel Fire Pump, **Go To** Section A4.1.5. _____

NRC Job Performance Measure

Facility: Vogtle

Task No: V-LO-TA-47004

Task Title: Respond to 1-RE-0018 Alarm During a Liquid Radwaste Release

JPM No: V-NRC-JP-17213-HL18

K/A Reference: 059AA2.05 RO 3.6 SRO 3.9

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance _____

Actual Performance _____

Classroom _____

Simulator _____

Plant _____

Read to the examinee:

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

The recommended starting point for this JPM is adjacent to the main HP Control Point. The candidates will be sequestered in the TSC or OSC.

Initial Conditions: Unit 1 is performing a liquid radwaste release from Waste Monitor Tank #10.

Annunciator ALB05-A01, LIQUID PROCESS PANEL TROUBLE, is in alarm in the Unit 1 Control Room.

Initiating Cue: The Shift Supervisor has directed you to, "Respond to the Unit 1 Waste Process Liquid Panel (PLPP) and take all appropriate actions per 17213-1, 'Annunciator Response Procedures for ALB on Waste Process Liquid Panel (PLPP)'".

Task Standard: Candidate determines that 1-RE-0018 is in high alarm and did not automatically isolate, so the candidate manually isolates the release.

Required Materials: Cue Sheets for PLPP Rad Monitor reading and Annunciator Window 17213-1, "Annunciator Response Procedures for ALB on Waste Process Liquid Panel (PLPP)"
RWP reviewed and proper dosimetry for an RCA entry

General References: None

Time Critical Task: No

Validation Time: 10 minutes

Performance Information

Critical steps denoted with an asterisk and bolded.

Candidate reports to the Waste Process Liquid Panel (PLPP) to determine cause of alarm.

CUE: When candidate looks at the PLPP annunciator windows, provide Cue Sheet showing window A04, WATER DISCHARGE LINE HI RAD, is illuminated.

NOTE TO EXAMINER: When candidate locates 17213-1 at the PLPP, provide the exam copy for use.

Standard: Candidate identifies correct annunciator on PLPP.

Comment:

17213-1, "Annunciator Response Procedures for ALB on Waste Process Liquid Panel (PLPP)", is entered for annunciator window A04.

Standard: Candidate enters 17213-1, "Annunciator Response Procedures for ALB on Waste Process Liquid Panel (PLPP)", for annunciator window A04.

Comment:

1.0 PROBABLE CAUSE

Radiation level above setpoint

CUE: *If candidate looks at the PLPP rad monitor reading, 1RI-0018, provide Cue Sheet showing digital readout.*

CUE: *Though not expected, if candidate looks at the DPM (at end of hallway, not at PLPP), provide Cue Sheet showing DPM readout and red HIGH alarm light lit.*

Standard: Candidate reviews probable cause for alarm.

Comment:

2.0 AUTOMATIC ACTIONS

Valve 1-RV-0018 closes.

NOTE TO EXAMINER: Candidate may attempt to close 1-RV-0018 at this time as a verification of an automatic action that should have occurred.

CUE: *If candidate checks 1-RV-0018 handswitch status, "Red light ON, green light OFF".*

CUE: *If candidate attempts to close 1-RV-0018 with the handswitch, "Red light ON, green light OFF".*

CUE: *If candidate attempts to manually close 1-RV-0018 (locally), "Valve will not close".*

Standard: Candidate determines 1-RV-0018 is open.

Comment:

3.0 INITIAL OPERATOR ACTIONS

NONE

Standard: N/A

Comment:

* 4.0 SUBSEQUENT OPERATOR ACTIONS

1. Verify 1-RV-0018 is closed and the release stopped using 1-HS-0018 on PLPP.

NOTE TO EXAMINER: If candidate performed this action in Step 2.0, then the critical step is accomplished.

CUE: If candidate checks 1-RV-0018 status, “Red light ON, green light OFF”.

CUE: When candidate attempts to close 1-RV-0018 with the handswitch, “Red light ON, green light OFF”.

Standard: Candidate places 1-HS-0018 in CLOSE to isolate release.

Comment:

* 4.0

SUBSEQUENT OPERATOR ACTIONS

2. IF 1-RV-0018 will NOT close, verify closed the following:
 - a. 1-1901-U4-175.
 - b. A-1901-U4-239.

NOTE TO EXAMINER: These valves would NOT be closed and locked during a liquid release, so discussion of key retrieval is not necessary.

NOTE TO EXAMINER: Location of valves (room 1-AB-D-59) is not given in 17213-1. Radiological conditions allow entry into the room for the JPM.

CUE: When candidate simulates turning the valve handwheels clockwise, "Valves are closed".

Standard: 1-1901-U4-175 and A-1901-U4-239 are closed.

Comment:

4.0

SUBSEQUENT OPERATOR ACTIONS

3. Request the Control Room to verify high alarm at the Radiation Monitoring System Communications Console per 17100-1, "Annunciator Response Procedures For The Process And Effluent Radiation Monitoring System (RMS)".

CUE: "The Shift Supervisor will verify the high alarm".

Standard: Control Room is notified to verify high alarm.

Comment:

4.0 SUBSEQUENT OPERATOR ACTIONS

4. Notify Chemistry of the alarm and stopping of the release.

CUE: ***“Chemistry has been notified of the alarm and stopping of the release”.***

Standard: Chemistry is notified of the alarm and stopping of the release.

Comment:

4.0 SUBSEQUENT OPERATOR ACTIONS

5. Refer to the requirements of the ODCM Manual.

CUE: ***“An extra operator will evaluate ODCM requirements”.***

Standard: ODCM referral initiated.

Comment:

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

Standard: N/A

Comment:

Terminating cue: Candidate returns initiating cue sheet.

Verification of Completion

Job Performance Measure No: V-NRC-JP-17213-HL18

Examinee's Name:

Examiner's Name:

Date Performed:

Number of Attempts:

Time to Complete:

Question Documentation:

Question: _____

Response: _____

Result: Satisfactory / Unsatisfactory

Examiner's signature and date: _____

Initial Conditions: Unit 1 is performing a liquid radwaste release from Waste Monitor Tank #10.

Annunciator ALB05-A01, LIQUID PROCESS PANEL TROUBLE, alarms in the Unit 1 Control Room.

Initiating Cue: The Shift Supervisor has directed you to, "Respond to the Unit 1 Waste Process Liquid Panel (PLPP) and take all appropriate actions per 17213-1, 'Annunciator Response Procedures for ALB on Waste Process Liquid Panel (PLPP)'".

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A	REACTOR COOLANT DRAIN TANK HI-LO LEVEL	REACTOR COOLANT DRAIN TANK HI TEMP	REACTOR COOLANT DRAIN TANK HI PRESS	WATER DISCHARGE LINE HI RAD	LAUNDRY, HOT SHOWER TANK HI-LO LEVEL	WASTE MONITOR TANK NO. 13 HI-LO LEVEL	SPENT RESIN STORAGE TANK HI-LO LEVEL	WASTE MONITOR TANK NO. 1 HI-LO LEVEL
B	REACTOR COOLANT DRAIN TANK RECIRC LO FLOW	WASTE MONITOR TANK NO. 12 HI-LO LEVEL		WASTE HOLDUP TANK HI-HI LEVEL	WASTE HOLDUP TANK HI-LO LEVEL	WASTE EVAPORATOR CONDENSATE TANK HI-LO LEVEL	CHEMICAL DRAIN TANK HI-LO LEVEL	WASTE MONITOR TANK NO. 2 HI-LO LEVEL
C			FLOOR DRAIN TANK HI-LO LEVEL		SPENT RESIN SLUICE DISCHARGE LO FLOW	SPENT RESIN STORAGE TANK HI PRESS	ANNUNCIATOR GROUND DETECTOR	DC POWER FAILURE

W100 W1001 W1002 W1003

+ 9.3 E - 04


CAUTION
DOWN POWERING DPM CAN EFFECT OTHER CHANNELS
S.S. NOTIFICATION REQUIRED BEFORE DOWN POWERING DPM.
POWERING DOWN DPM-AFFECTS RADWASTE EFFLUENT
EFFECTS-FT09/REC09

+9.3 E-04

$\mu\text{Ci}/\text{cm}^2$

CLEAN WASTE DISCH
RAD MONITOR
IRI-0018

LIQUID
EFFLUENT
MONITOR

Approved By C. S. Waldrup	Vogtle Electric Generating Plant 	Procedure Number Rev 17213-1 10.1
Date Approved 6/14/06	ANNUNCIATOR RESPONSE PROCEDURES FOR ALB ON WASTE PROCESS LIQUID PANEL (PLPP)	Page Number 10 of 28

WINDOW A04

ORIGIN

1-RE-0018

SETPOINT

Variable

WATER DISCHARGE
LINE
HI RAD

1.0

PROBABLE CAUSE

Radiation level above setpoint.

2.0

AUTOMATIC ACTIONS

Valve 1-RV-0018 closes.

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. **Verify** 1-RV-0018 is closed and the release stopped using 1-HS-0018 on PLPP.
2. **IF** 1-RV-0018 will **NOT** close, **verify** closed the following:
 - a. 1-1901-U4-175.
 - b. A-1901-U4-239.
3. **Request** the Control Room to verify high alarm at the Radiation Monitoring System Communications Console per 17100-1, "Annunciator Response Procedures For The Process And Effluent Radiation Monitoring System (RMS)."
4. **Notify** Chemistry of the alarm and stopping of the release.
5. **Refer** to the requirements of the ODCM Manual.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: 1X4DB126, AX4DB152-2, 1X6AA00-448

NRC Job Performance Measure

Facility: Vogtle

Task No: V-LO-TA-11016

Task Title: Start Emergency Diesel Generator From Outside the Control Room

JPM No: V-NRC-JP-18038-HL18

K/A Reference: 064A1.03 RO 3.2 SRO 3.3

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance _____

Actual Performance _____

Classroom _____

Simulator _____

Plant _____

Read to the examinee:

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

The recommended starting point for this JPM is adjacent to the main HP Control Point. The candidates will be sequestered in the TSC or OSC.

Initial Conditions: The Unit 2 control room has been evacuated due to a fire, and the crew is performing the actions of 18038-2, "Operation from Remote Shutdown Panels".

Local control has been established at all Shutdown Panels.

2AA02 is de-energized and attempts to energize the bus from preferred off-site sources have failed.

Initiating Cue: The Shift Supervisor has directed you to, "Energize 2AA02 from Emergency Diesel Generator '2A' using ATTACHMENT B of 18038-2".

Task Standard: Candidate locally starts Emergency Diesel Generator '2A' using Attachment B of 18038-2, and then trips Emergency Diesel Generator '2A' when jacket water temperature exceeds 200 F.

Required Materials: 18038-2, "Operation from Remote Shutdown Panels", Attachment B
Hearing protection

General References: None

Time Critical Task: No

Validation Time: 16 minutes

Performance Information

Critical steps denoted with an asterisk and bolded.

Candidate selects Sheet 1 of 10 from 18038-2, "Operation from Remote Shutdown Panels", Attachment B.

NOTE TO EXAMINER: Sheet 5 of 10 in Attachment B is for starting Emergency Diesel Generator '2B'.

Standard: Sheet 1 of 10 from 18038-2, "Operation from Remote Shutdown Panels", Attachment B, is selected.

Comment:

1. Establish communications between the diesel generator and affected 1E 4160V bus.
 - At the Generator Control Panel PDG1.

Standard: Candidate describes how to communicate with operator at 2AA02 using sound powered phones, telephone, or radio.

Comment:

2. Reset lockout relays A, B, C if required.

NOTE TO EXAMINER: Relays are on the right side of PDG1.

CUE: When candidate looks at the Relay handswitches and indicator lights, "Indications are as you see them".

Standard: Lockout relays A, B, and C are verified reset.

Comment:

* 3. Place Local/Remote Switch 2-HS-4516 in LOCAL.

CUE: *When done, “Handswitch 2-HS-4516 RED light is LIT”.*

Standard: 2-HS-4516 placed in LOCAL (on PDG1).

Comment:

4. If tripped, then reset control power breakers on front of engine control panel.

CUE: *When candidate looks at the breakers and lights, “All indications are as you see them”.*

Standard: Control power breakers are closed (on PDG2).

Comment:

* 5. Place Unit/Parallel switch 2-HS-4414A in UNIT.

CUE: *When done, “Handswitch 2-HS-4414A is in the UNIT position”.*

Standard: 2-HS-4414A placed in UNIT position (on PDG1).

Comment:

6. Alert personnel in the vicinity that the diesel generator is starting.

Standard: Personnel in area notified of diesel starting.

Comment:

* 7. Depress Manual Start pushbutton 2-HS-4569A.

Standard: Pushbutton 2-HS-4569A is depressed (PDG2).

CUE: If requested, "The engine can be heard starting up".

Comment:

8. Observe the following:

a. Red STARTING lamp energizes.

NOTE TO EXAMINER: Lamp is labeled 2ZL-4680.

CUE: "Lamp is LIT".

Standard: 2ZL-4680 STARTING lamp checked (on PDG2).

Comment:

8. Observe the following:

b. Red SHUTDOWN SYSTEM ACTIVE lamp energizes.

NOTE TO EXAMINER: Lamp is labeled 2ZL-4599.

CUE: ***“Lamp is LIT”.***

Standard: 2ZL-4599 SHUTDOWN SYSTEM ACTIVE lamp checked (on PDG2).

Comment:

8. Observe the following:

c. Starting air is admitted to cylinders and engine begins to roll.

CUE: ***“The engine can be heard starting up”.***

Standard: Engine start-up is observed.

Comment:

8. Observe the following:

d. Red RUNNING lamp energizes when engine speed reaches 200 rpm.

NOTE TO EXAMINER: Lamp is labeled 2ZL-4672.

CUE: *If candidate checks speed on 2SI-19186, "Speed is 200 rpm and rising".*

CUE: *"Lamp is LIT".*

Standard: 2ZL-4672 lamp checked (on PDG2).

Comment:

8. Observe the following:

e. Blue READY TO LOAD lamp energizes when engine speed reaches 400 rpm.

NOTE TO EXAMINER: Lamp is labeled 2ZL-4670.

CUE: *If candidate checks speed on 2SI-19186, "Speed is 450 rpm".*

CUE: *"Lamp is LIT".*

Standard: 2ZL-4670 lamp checked (on PDG2).

Comment:

8. Observe the following:

- f. Generator field flashes and generator voltage raises to 3750 to 4300 volts.

NOTE TO EXAMINER: Bus voltmeter is labeled 2EI-40137A. Field voltmeter is labeled 2EI-40139

CUE: If candidate checks bus voltmeter 2EI-40137A, "Voltage is 4200 VAC".

CUE: If candidate checks field voltmeter 2EI-40139, "Voltage is 72 VDC".

Standard: Generator voltage checked (on PDG1).

Comment:

-
- * 9. Monitor diesel generator jacket water temperature using selector switch positions 21 and 22 on Engine Control Panel PDG2. If jacket water temperature(s) exceed(s) 200°F, then trip the Diesel Generator 2A.

NOTE TO EXAMINER: Meter is labeled 2TI-19168. Selector switch is labeled 2-TS-19168. Switch positions 21 and 22 are labeled JW IN and JW OUT.

CUE: *“Temperatures are 190°F and rising”.*

CUE: *If annunciators are checked, “Window C04 is LIT”.*

CUE: *When candidate re-checks, “Temperatures exceed 200°F and are rising”.*

CUE: *If annunciators are again checked, “Window C05 is LIT”.*

Standard: Jacket water temperatures checked and Diesel Generator 2A tripped by either:

Depressing STOP pushbutton 2-HS-4571A (on PDG2).

CUE: *“Engine is stopping”.*

OR, engine can be stopped by depressing EMER STOP pushbutton 2-HS-4567A (on PDG2).

CUE: *“Engine is stopping”.*

Comment:

Terminating cue: Candidate returns initiating cue sheet.

Verification of Completion

Job Performance Measure No: V-NRC-JP-18038-HL18

Examinee's Name:

Examiner's Name:

Date Performed:

Number of Attempts:

Time to Complete:

Question Documentation:

Question: _____

Response: _____

Result: Satisfactory / Unsatisfactory

Examiner's signature and date: _____

Initial Conditions: The Unit 2 control room has been evacuated due to a fire, and the crew is performing the actions of 18038-2, "Operation from the Remote Shutdown Panels".

Local control has been established at all Shutdown Panels.

2AA02 is de-energized and attempts to energize the bus from preferred off-site sources have failed.

Initiating Cue: The Shift Supervisor has directed you to, "Energize 2AA02 from Emergency Diesel Generator '2A' using ATTACHMENT B of 18038-2".

Approved By J. Thomas	Vogtle Electric Generating Plant	Procedure Number Rev 18038-2 26.2
Date Approved 02/17/2012	OPERATION FROM REMOTE SHUTDOWN PANELS	Page Number 77 of 126

ATTACHMENT B

Sheet 1 of 10

**STARTING AND PLACING DIESEL GENERATOR A ON
A DEAD BUS FROM OUTSIDE THE CONTROL ROOM**

1. Establish communications between the diesel generator and affected 1E 4160V bus.
 - At the Generator Control Panel PDG1.
2. Reset lockout relays A, B, C if required.
3. Place Local/Remote Switch 2-HS-4516 in LOCAL.
4. If tripped, then reset control power breakers on front of engine control panel.
5. Place Unit/Parallel switch 2-HS-4414A in UNIT.
6. Alert personnel in the vicinity that the diesel generator is starting.
7. Depress Manual Start pushbutton 2-HS-4569A.
8. Observe the following:
 - a. Red STARTING lamp energizes.
 - b. Red SHUTDOWN SYSTEM ACTIVE lamp energizes.
 - c. Starting air is admitted to cylinders and engine begins to roll.
 - d. Red RUNNING lamp energizes when engine speed reaches 200 rpm.
 - e. Blue READY TO LOAD lamp energizes when engine speed reaches 400 rpm.
 - f. Generator field flashes and generator voltage raises to 3750 to 4300 volts.
9. Monitor diesel generator jacket water temperature using selector switch positions 21 and 22 on Engine Control Panel PDG2. If jacket water temperature(s) exceed(s) 200°F, then trip the Diesel Generator 2A.
10. Control generator voltage at 4160V using 2-HS-4488A.