FINAL

Facility: **Vogtle Nuclear Plant**	Date of Examination: **June 1-5, 2009**
Exam Level (circle one): RO / SRO-I / SRO-U **(see each JPM)**	Operating Test No.: **2009-301**

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
a. **Emergency Borate due to Rods below insertion limits (RIL)** **Description:** RWST flow path required due to equipment failures. This JPM has been modified to require the student to determine if rods are below RIL by responding to a rod bank lo-lo limit alarm using the Core Operating Limits Report prior starting the emergency boration. (RO / SRO-I) K/A: 004A2.14 (3.8 / 3.9)	M,A,S	1
b. **Transfer ECCS to Cold Leg Recirculation** **Description:** Equipment failures will prevent cold leg recirculation. Required to identify a loss of emergency coolant recirculation. This JPM has been modified by adding a failure of an RWST suction valve to close. (RO / SRO-I / SRO-U) K/A: 006A4.05 (3.9 / 3.8)	M,E,A,S,L EN	2
c. **Fill SI Accumulator at low RCS pressure** **Description:** Required to use SI pump B. This requires a different alignment to prevent injecting into the RCS while at low RCS pressure. The SI pump common suction valve will be shut. The student will have to open this valve prior to starting the SI pump to prevent pump damage. This is based on recent plant operating experience. (RO / SRO-I) K/A: 006A1.13 (3.5 / 3.7)	M,L,S	3
d. **Identify and Isolate Ruptured SG with Failures** **Description:** MSIVs for ruptured SG fail to close requiring isolation of main steam loads from the ruptured SG. These include TDAFW steam supplies, condenser spargers, SJAE's, and steam dumps. (RO / SRO-I) K/A: 035A4.06 (4.5 / 4.6)	D,P,E,L,A,S	4P
e. **Transfer CNMT Spray to Recirculation** **Description:** Train A IRC suction valve fails to open requiring student to secure one train of CNMT spray to prevent damage to the ESF pump. (RO / SRO-I / SRO-U) K/A: 026A2.07 (3.6 / 3.9)	D,A,S EN	5

f. **DG Parallel Operation with voltage regulator failure** **Description:** DG KVAR lowers uncontrollably after paralleling with bus. This requires tripping the DG output breaker. These actions are to protect the diesel generator from damage. (RO / SRO-I / SRO-U) K/A: 062A1.01 (3.4 / 3.8)	M,A,S EN	6
g. **Place CR HVAC on Recirculation with High Radiation** **Description:** CRI will fail to automatically or manually actuate. Students required to manually align dampers to isolate control room from high radiation. (RO / SRO-I) K/A: 072A3.01 (2.9 / 3.1)	N,A,S	7
h. **Place CNMT Main Purge In-Service** **Description:** Unit in mode 5. Student required to shutdown mini-purge system and then place main purge system in service with equipment hatch open. Main purge supply fan should not be placed in service. (RO) K/A: 029A2.03 (2.7 / 3.1)	N,S,L	8

Job Performance Measure "A"

Facility: **Vogtle**

Task No: V-LO-TA-09029

Task Title: Emergency Borate from the RWST

JPM No: V-RQ-JP-13009-005

K/A Reference: 004A2.14

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 per AOP-18013-C, "Rapid Power Reduction" has just been performed by the operating crew.**

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

Required Materials:
1. SOP 13009-1
2. Control Room Simulator

General References: None

Initiating Cue: **The SS has directed you to emergency borate the RCS using SOP 13009-1 to clear the rod bank Lo-Lo Limit alarm.**

Time Critical Task: No

Validation Time: 6 minutes

SIMULATOR SETUP:

Simulator Setup:

1. Reset to IC # 95 for HL-15 NRC Exam
2. Place a Red Danger Tag on HS-0276A (Boric Acid Transfer # 1)

Simulator Setup from Scratch:

1. Reset to IC # 14 (100% MOL)

2. Insert the following overrides:

LV-112D	closed
HS-276A	stop
HS-276A	green light – off
HS-276A	Red Danger Tag on hand switch
HS-277A	stop – on Trigger 1 (T1)
HS-277A	amber light on – on Trigger 1 (T1)
ALB37 window D01 (BBD Trouble) on - on Trigger 1 (T1)	

3. Select the following hand switch positions:

HS-277A	auto

4. Place 75 gpm letdown in service and adjust charging flow as appropriate to maintain PRZR level stable.

5. Reduce reactor power to ~ 70% power and stabilize the plant, ensure that CBD rods are below the RIL to ensure ALB-10, D04 for ROD BANK LO-LO LIMIT is illuminated. (Recommend 5 to 10 steps below the RIL to ensure the alarm does not inadvertently clear, some patience is required to accomplish this (~ 106 steps on CBD should be pretty close).

6. Acknowledge / Reset alarms

7. Freeze

Setup time: 10 minutes

Performance Information

Critical steps denoted with an asterisk

***Student selects section 4.9 of SOP 13009-1**

Standard: Section 4.9 referenced

Comment:

_____:

Reviews note at beginning of section 4.9 and may refer to table 1 for available flow paths

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

Student may use any method. Most likely method will be using HV-8104 or the charging flow path

Standard: N/A

Comment:

4.9.1 Emergency Boration Through 1-HV-8104

OR

4.9.2 Emergency Boration Through The Normal Charging Flow Path

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

Standard: Boric acid transfer pump hand switch placed in START
Red light – ON
Green light - OFF

Comment:

CUE: Simulator operator actuates trigger 1

* **Determines that boric acid transfer pump has tripped**

Standard: Boric acid transfer pump:
Red light – OFF
Green light – ON
Amber light – ON
1BBD Trouble Alarm

Comment:

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* **Determines that sections 4.9.1 and 4.9.2 are N/A due to both boric acid transfer pumps being unavailable.**

Standard: Refers 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 asked, Auxiliary Building Operator reports NCP is supplied with cooling water.**

Standard: NCP: Red light – ON
Green light – OFF
Amber light - OFF

Comment:

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

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

Standard: Places 1-LV-112D in open position: Green light – stays ON
Red light - stays OFF

Places 1-LV-112E in open position: Green light – OFF
Red light - ON

Comment:

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

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

Standard: Places 1-LV-112B to close position: Green light - ON
Red light - OFF

Places 1-LV-112C to close position: Green light - ON
Red light - OFF

Comment:

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

Standard: Places 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: Checks 1-FIC-0121 in MANUAL
Auto light – OFF
Manual light - ON

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: Charging Flow 1-FI-0121C 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: RCP seal injection flows 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: Turns on Pressure back up heaters as needed:
1HS-10469A
1HS-10470A
1HS-10472

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 boron concentration and terminate emergency boration flow when the rod bank Lo-Lo Limit Alarm is clear.***

Standard: N/A

Comment:

Reports to the SS that emergency boration from the RWST has been initiated per 13009-1.

Standard: N/A

Comment:

Terminating cue: Student returns initiating cue sheet

Verification of Completion

Job Performance Measure No. V-RQ-JP-13009-005

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 per AOP-18013-C, "Rapid Power Reduction" has just been performed by the operating crew.

Initiating Cue: The SS has directed you to emergency borate the RCS using SOP 13009-1 to clear the rod bank Lo-Lo Limit alarm.

Job Performance Measure "B"

Facility: **Vogtle**

Task No: V-LO-TA-37009

Task Title: Transfer ECCS Pumps To Cold Leg Recirculation

JPM No: V-LO-JP-19013-003

K/A Reference: 006A4.05

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: **THIS IS A TIME CRITICAL JPM**

A large break LOCA has occurred. While performing 19013, RWST level decreased below 29%. Transition to 19013 is required based on foldout page guidance.

Task Standard: Determines Cold Leg recirculation flow path **NOT** available per 19013, Attachment A and a transition is required to 19111-C, Loss of Emergency Coolant Recirculation.

Required Materials: 19013-C, Transfer to Cold Leg Recirculation.

General References: None

Initiating Cue: **The SS has directed you to "Transfer the ECCS pumps to cold leg recirculation using 19013".**

Time Critical Task: Yes

Validation Time: 6 minutes

SIMULATOR SETUP:

Snapped to IC # 97 for HL-15 NRC Exam.

If new setup is required, then perform the following:

1. Reset to IC 14 (MOL 100%).
2. Override HV-8812A to the **OPEN** position.
3. Override HV-8811B to the **SHUT** position.
4. Insert malfunction RC03C at 100% (DBA LOCA)
5. Trip all RCPs
6. Reset SI
7. After CNMT Emergency Sump levels are $\geq$ 14 inches, set RF: TK02 = 28% (RWST)
8. Ensure HV-8811A is **FULL OPEN**
9. Acknowledge/Reset alarms
10. Freeze Simulator

Setup time: 18 minutes

Performance Information

Critical steps denoted with an asterisk

START TIME FOR TIME CRITICAL_____

Reviews NOTES prior to step 1 regarding FRP implementation, steps 1 – 12 performance without delay, and RWST inventory time limits.

Standard: N/A

Comment:

Reviews CAUTION prior to step 1 regarding offsite power loss after SI reset.

Standard: N/A

Comment:

Step 1 Verifies SI reset

Standard: BPLP window 1.5 (white Auto SI blocked light) – ON

BPLP window 1.4 (red SI Actuated light) - OFF

Comment:

Step 2 Checks CNMT Emergency Sump levels $\geq$ 13.5 inches.

Standard: Both LI-764 and LI-765 $\geq$ 13.5 inches (should be ~ 60+ inches)

Comment:

Step # 3 Initiate **ATTACHMENT A** to align ECCS Pumps to the Cold Leg Recirculation flow path and continue with Step 4.

CUE: **The SS will continue with step 4 while you perform Attachment A.**

Standard: Initiates ATTACHMENT A

Comment:

ATTACHMENT A
COLD LEG RECIRCULATION VALVE ALIGNMENT

Step 1 Check CCW cooling for RHR heat exchangers.

a. CCW pumps – 2 running in each train.

b. CCW pumps discharge pressures and flows – NORMAL

c. NSCW cooling for CCW heat exchangers

- NCSW Pumps – TWO RUNNING EACH TRAIN.
- NSCW CLG TOWER Fans - FOUR IN AUTO EACH TRAIN.

Standard: Determines the following:

2 CCW **and** 2 NSCW pumps per train

Red lights - ON
Green lights – OFF
Amber lights - OFF

CCW pressures – in green bands (PI-1874 and PI-1875 ~ 90 psig)

CCW flows – in green bands (FI-1876 and FI-1877 ~ 9500 gpm)

NSCW Cooling Tower Fans, all 8 hand switches in AUTO.

Comment:

Step 2 Align RHR Pump A flow path:

a. Check RHR Pump A – RUNNING.

Standard: Red light – ON,
Green light – OFF
Amber light - OFF

Comment:

Step 2b Check CNMT SUMP TO RHR PMP-A SUCTION HV-8811A - OPEN.

Standard: Red light - ON,
Green light - OFF.

Comment:

Step 2c Close RWST TO RHR PMP-A SUCTION HV-8812A.

Standard: Attempts to close HV-8812A by turning hand switch counter clockwise to the left. Determines HV-8812A will **NOT** close.

Red light remains – ON
Green light remains - OFF

Comment:

***Step 2c** **RNO - IF HV8812A will not close, THEN stop RHR Pump A.**

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Standard: Places RHR pump A hand switch to STOP.

Green light - ON
Red light – OFF
Amber light - OFF

Goes to step 3.

Comment:

Step 3 Align RHR Pump B flow path:

a. Check RHR Pump B – RUNNING.

Standard: Red light – ON
Green light – OFF
Amber light - OFF

Comment:

Step 3.b Check CNMT SUMP TO RHR PMP-B SUCTION HV-8811B – OPEN.

Standard: Determines HV-8811B is CLOSED

Green light – ON
Red light - OFF

Comment:

***Step 3.b** **RNO - IF HV-8811B is NOT open, THEN perform the following:**

1. Stop RHR Pump B.

STOP TIME FOR TIME CRITICAL_____

Standard: Places RHR pump B hand switch to STOP.

Green light – ON
Red light – OFF
Amber light - OFF

Comment:

RNO 3.b.2) Close RWST TO RHR PMP-B SUCTION HV-8812B.

Standard: Places HS-8812B to the CLOSE position.

Green light – ON
Red light - OFF

Comment:

RNO 3.b.3) Open HV-8811B.

Standard: Attempts to open HV-8811B by placing rotating hand switch clock wise to open.

Determines HV-8811B will **NOT** open.

Red light remains – OFF
Green light remains - ON

Comment:

RNO 3.b.4) Start RHR Pump B.

Standard: Does **NOT** start RHR pump B which has no suction source.

NOTE: If candidate starts RHR pump B, the step would become critical and be evaluated as **UNSAT**.

Comment:

RNO 3.b.5) Go to Step 3.d.

Standard: Goes to step 3.d.

Comment:

Step 3.d Check RHR PMP-B TO COLD LEG 3&4 ISO VLV HV-8809B – OPEN.

Standard: Red light – ON
Green light - OFF

Comment:

Step 3.e Check RHR Heat Exchanger B flow indicator FI-619A - GREATER THAN 500 GPM.

Standard: Determines on FI-0619A that RHR flow is < 500 gpm (~ 0 gpm)

Comment:

***Step 3.e**	**RNO - IF no RHR Pump is delivering CNMT Sump water to its discharge header, THEN go to 19111-C, ECA-1.1 LOSS OF EMERGENCY COOLANT RECIRCULATION.**
Standard:	Determines a transition to 19111-C is required and informs the SS.
CUE:	**The SS will initiate 19111-C, ECA-1.1 Loss of Emergency Coolant Recirculation". Another operator will perform the actions of 19111-C.**
Comment:	

Terminating cue: Student returns initiating cue sheet

Verification of Completion

Job Performance Measure No. V-LO-JP-19013-003

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: **THIS IS A TIME CRITICAL JPM**

A large break LOCA has occurred. While performing 19013, RWST level decreased below 29%. Transition to 19013 is required based on foldout page guidance.

Initiating Cue: **The SS has directed you to "Transfer the ECCS pumps to cold leg recirculation using 19013".**

Job Performance Measure "C"

Facility: **Vogtle**

Task No: V-LO-TA-13003

Task Title: **Increase Accumulator Level At Low RCS Pressure**

JPM No: V-LO-JP-13105-003

K/A Reference: 006A1.13

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 is in Mode 4 at 350 psig and stable.**

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

Task Standard: Student raises accumulator level using SOP 13105-1 until the accumulator low level and pressure alarms are clear.

Required Materials: 13105-1, Safety Injection System

General References: None

Initiating Cue: **The SS has directed you to "Restore level and pressure in Accumulator #2" using SOP-13105 section 4.4.1 to raise accumulator level to clear the level and pressure alarms.**

Time Critical Task: No

Validation Time: 20 minutes

SIMULATOR SETUP:

1. Reset to IC # 92 for the HL-15 NRC Exam
2. Place SIP "A" in PTL with a Red Danger Tag on the hand switch.

Simulator Setup From Scratch

1. Reset to IC # 3 (Mode 4, 350 psig)
2. Insert malfunction SI02B with a Final Value of 100%
3. Verify Accumulator Tank 2 Hi / Lo Level annunciator alarms
4. Remove malfunction when level annunciator illuminates
5. Place SIP "A" in PTL with a Red Danger Tag on the hand switch
6. Close 1-HV-8821A, SIP "A" Discharge Isolation valve
7. Close 1-HV-8806, SIP Common Suction Valve
8. Place HV-8806 Lockout Switch to OFF
8. Acknowledge / Reset alarms
9. Freeze simulator

Setup time: 5 minutes

Performance Information

Critical steps denoted with an asterisk

Reviews cautions at beginning of section 4.4.1

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: Places 1-HS-8835A to ON
White light - ON

Comment:

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

Standard: Green light – ON
Red light - OFF

Comment:

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

Standard: White light - OFF

Comment:

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

Standard: Green light – ON
Red light - OFF

Comment:

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

Standard: White light - OFF

Comment:

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

Standard: Green light – ON
Red light - OFF

Comment:

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

Standard: White light - OFF

Comment:

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

Standard: Opens 1-HV-8821A: Red light – ON
Green light - OFF

Opens 1-HV-8821B: Red light – ON
Green light - OFF

Comment:

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g. **Document** alignment changes per the controlling UOP checklist.

CUE: **"Alignment changes have been documented in the UOP checklist"**

Standard: N/A

Comment:

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

Standard: Determines 1-HV-8806 is closed

Green light - ON
Red light – OFF

Comment:

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.**

Standard: White light - ON

Comment:

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

Standard: Red light – ON
Green light - OFF

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: 1-HV-8923B: Red light – ON
Green light - OFF

Comment:

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

Standard: Red light – ON
Green light - OFF

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: 1-HV-8920: Red light – ON
Green light - OFF

Comment:

4.4.1.7 **Start** one SI Pump:

SI Pump A 1-HS-0998A

***SI Pump B 1-HS-0999A**

Standard: 1-HS-0999A to start
Red light – ON
Green light – OFF
Amber light – OFF
Discharge pressures (PI-919 & PI-923) ~ 1500 psig

Comment:

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

Standard: Red light – ON
Green light – OFF

Comment:

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

Standard: Red light – ON
Green light – OFF

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: Red light – ON
Green light – OFF
LI-0952 & LI-0953 rising

Comment:

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

CUE: **If asked, "Extra Operator will perform the IV".**

Standard: ACCUM TANK 2 HI/LO LEVEL alarm - CLEAR
ACCUM TANK 2 HI/LO PRESS alarm – CLEAR

1-HV-8878B placed in close
Green light – ON
Red light - OFF

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 asked, "Extra Operator will perform the IV".

Standard: Green light – ON
Red light - OFF

Comment:

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

CUE: If asked, "Extra Operator will perform the IV".

Standard: Green light – ON
Red light - OFF

Comment:

***4.4.1.15 Stop the SI Pump.**

Standard: Places 1-HS-0999A in stop
Green light – ON
Red light – OFF
Amber light – OFF
Discharge pressures (PI-919 & PI-923) remain ~ 1500 psig

Comment:

Reviews caution prior to next step.

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.

CUE: **"The Extra will complete this procedure".**

Standard: N/A

Comment:

Terminating cue: Student returns initiating cue sheet

Verification of Completion

Job Performance Measure No. V-LO-JP-13105-003

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 is in Mode 4 at 350 psig and stable.**

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

Initiating Cue: **The SS has directed you to "Restore level and pressure in Accumulator #2" using SOP-13105 section 4.4.1 to raise accumulator level to clear the level and pressure alarms.**

Job Performance Measure "D"

Facility: **Vogtle**

Task No: V-LO-TA-37011

Task Title: Isolate a ruptured SG with failure of TDAFW Steam and MSIV 3006A / B to close.

JPM No: V-LO-JP-19030-006

K/A Reference: 035A4.06

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: **THIS IS A TIME CRITICAL JPM**

A reactor trip occurred from 100% power. While the crew was attempting to stabilize the plant, a low PRZR pressure SI occurred. The crew transitioned from 19000, E-0 to 19030.

Task Standard: Identify SG # 1 as ruptured. Close all MSIVs and Bypasses on the intact SGs, set ARV loop # 1 potentiometer to 7.73, close the TDAFW pump T & T valve, close the Steam dumps, close the MDAFW throttle valve to SG # 1, closes SJAE # 2 steam supply 4085B.

Required Materials: 19030-C, Steam Generator Tube Rupture

General References: None

Initiating Cue: **The SS has directed you to "Isolate the ruptured SG using 19030 starting at step # 4".**

Time Critical Task: Yes

Validation Time: 15 minutes (12 minutes time critical after ID of SG # 1 as ruptured).

SIMULATOR SETUP:

IC # 99 for HL-15 NRC exam, pre-snapped.

Simulator setup from scratch if needed.

1. Reset to IC # 14 (MOL, 100%)
2. Insert Over ride on 1HV-3006A to OPEN
3. Insert Over ride on 1HV-3006A Green light to OFF
4. Insert Over ride on 1HV-3006B to OPEN
5. Insert Over ride on 1HV-3006B Green light to OFF
6. Insert Over ride on 1HV-3009 to OPEN
7. Insert malfunction SG01A at 50% severity.
8. Initiate manual Rx trip and SI
9. Throttle AFW flow to 200 gpm on ALL SGs.
10. Verify ruptured SG # 1 level > 10% NR
11. Acknowledge / Reset alarms
12. Freeze simulator

Setup time: minutes

Performance Information

Critical steps denoted with an asterisk

Step # 4 Check if RCPs should be stopped:

a. ECCS Pumps - AT LEAST ONE RUNNING:

- CCP or SIP

Standard: Checks CCPs and SIPs all running

Red lights – ON
Green lights – OFF
Amber lights – OFF

Note: The candidate may also check BIT flow (FI-0917) or SIP discharge pressure indications (PI-0919 and PI-0923) for confirmation the pumps are actually running.

Comment:

_____:

Step # 4 b. RCS pressure LESS THAN 1375 psig

Standard: Checks any of various pressure indications.

Determines RCS pressure to be ~ 2000 psig.

Comment:

Step # 4.b RNO - IF RCS pressure lowers to less than 1375 psig prior to initiation of RCS cooldown in Step 20, THEN stop all RCPs and return to Step in affect.

__ Go to step 5

Standard: Notes RNO continuous actions.

Goes to step 5.

Comment:

***Step # 5** **Identify ruptured SG(s) by any of the following conditions:**

__ **Unexpected rise in any SG NR level.**

__ High radiation from any SG sample.

__ High radiation from any SG steam line.

__ High radiation from any SG blow down line.

CUE: IF asked, SG sample results are NOT available at this time.

Standard: Identifies SG # 1 as the ruptured SG on unexpected level rise.

Note: The candidate may throttle AFW flow to the SG (HV-5139) to help in determining the ruptured SG or he may just call the SG ruptured on the level differential.

Comment:

---:

START TIME CRITICAL_____ (once ruptured SG # 1 identified)

Reviews CAUTION for maintaining one SG for cooldown.

***Step # 6** **Isolate ruptured SG ARV(s):**

a. **Adjust ruptured SG ARV(s) controller set point to 1160 psig (pot setting 7.73).**

b. Check ruptured SG ARV – CLOSED

PV-3000 (SG 1)

Standard: Sets PV-3000 (SG 1) potentiometer to 7.73 and in AUTO

Checks SG # 1 ARV – closed as indicated on ZLB – 4, Miscellaneous Status Lights.

Comment:

Step # 7 Check at least one MDAFW Pump - RUNNING AND CAPABLE OF FEEDING SG(s) NEEDED FOR RCS COOLDOWN.

Standard: Checks MDAFW pumps A and B running

Red lights – ON
Green lights – OFF
Amber lights - OFF

Comment:

Step # 8 Close affected TDAFW Pump Steam Supply Valve(s):

__ HV-3009 (SG 1) LP-1 MS SPLY TO AUX FW TD PMP-1

Standard: Attempts to close HV-3009 by rotating the hand switch counter clockwise to the CLOSE position.

Determines HV-3009 will NOT close.

Red light – ON
Green light – OFF

Comment:

***Step # 8 RNO - IF at least one MDAFW Pump running, THEN trip the TDAFW Pump by closing PV-15129 using HS-15111.**

Standard: Trips the TDAFW pump by rotating the hand switch HV-15111 counter Clockwise to the CLOSE position.

Green light – ON
Red light – OFF
Amber light – OFF.
Speed on SI-15109A lowering

Comment:

Step # 9 Verify SG Blowdown Isolation Valves - CLOSED WITH HANDSWITCHES IN CLOSE POSITION.

Standard: Observes SGBD isolation valves closed.

Green lights – ON
Red lights – OFF

Places hand switches for all 4 SGBD (HS-7603A, B, C, D) to CLOSE position.

Comment:

Step # 10 Isolate flow from the ruptured SG(s) by closing its Main Steamline Isolation and Bypass Valves.

Standard: Attempts to close SG # 1 MSIVs using HS-3006A and HS-3006B

Determines HV-3006A and HV-3006B will NOT close

Red lights – ON
Green lights – OFF

Closes MSIV bypasses using HS-13005A and HS-13005B

Green lights – ON
Red lights - OFF

Comment:

***Step # 10** **RNO - Perform the following:**

a. Close all remaining Main Steam line Isolation and Bypass Valves.

Standard: Initiates an SLI using either hand switch (HS-3007A or HS-3007B) OR

Individually closes SG 2, 3, and 4 MSIVs and Bypass valves.

SG 2, 3, and 4 MSIV and Bypass valves.

Green lights – ON
Red lights - OFF

Comment:

***Step # 10** **RNO – b. Verify the following valves are closed:**

- **Steam dump valves**
- **Status light board ZLB - 2**

Standard: Determines that steam dump valves are open using ZLB – 2, miscellaneous status lights.

Closes the steam dumps by using one of the following methods (not specified how in the procedure step).

- Selecting an OFF / RESET switch to the OFF position (HS-0500A or B)

  OR

- Selecting Steam Pressure Mode on HS-0500C and manually lowering demand on PIC-507 until the green down arrow is lit.

Comment:

Step # 10 RNO – b. Verify the following valves are closed:

- AUX AND MAIN STEAM SPARGER valve
  - HV-6194

Standard: Checks HV-6194 Aux and Main Steam Sparger valves closed.

Green lights – ON
Red lights - OFF

Comment:

***Step # 10 RNO – b. Verify the following valves are closed:**

- **Steam Jet Air Ejector valves**
  - HV-4084B, SJAE-1 MN & AUX STM SPLY VLV
  - **HV-4085B, SJAE-2 MN & AUX STM SPLY VLV**

Possible - STOP TIME CRITICAL_____

Note: If, the operator closed the MDAFW isolation valve HV-5139 to SG # 1 earlier when identifying the ruptured SG and left the valve closed, this is the last critical step. IF the valve is open the critical time does NOT stop here.

Standard: Checks HV-4084B closed on ZLB-2, Miscellaneous Status Light Board.

Green light – ON
Red light - OFF

Places SJAE HS-4085 to the OFF position.

Checks HV-4085B closes (takes ~ 10 – 15 seconds) on ZLB-3, Miscellaneous Status Light Board.

Green light – ON
Red light - OFF

Note: HV-4085A takes several minutes to close but is NOT specified in the procedure as this is a SJAE suction valve. The candidate should NOT wait on this valve to close.

Comment:

Step # 10 RNO – b. Verify the following valves are closed:

- MSR steam supply
  - HV-6030, MSR A & C REHEAT STEAM SOURCE STOP VALVE
  - HV-6015, MSR B & D REHEAT STEAM SOURCE STOP VALVE

Standard: Checks valves are closed.

Green lights – ON
Red lights - OFF

Comment:

Step # 10 RNO – c. Use intact SG ARV(s) for dumping steam.

IF at least one intact SG can NOT be isolated from any ruptured SG,

THEN go to 19131-C, ECA-3.1 SGTR WITH LOSS OF REACTOR COOLANT SUBCOOLED RECOVERY DESIRED.

Standard: Notes RNO step c to use intact SG ARV(s).

Determines a transition to 19131-C is NOT required.

Comment:

Reviews CAUTION prior to step # 11 regarding performing procedure in a timely manner.

Step # 11 <u>Maintain any ruptured SG that is also faulted, isolated during subsequent recovery actions unless needed for RCS cooldown or SG activity sample.</u>

Standard: Reviews CAUTION and step # 11

Comment:

Step # 12 Check ruptured SG(s) isolated from intact SG(s):

a. Check either of the following conditions satisfied:

__ Ruptured SG(s) steamline(s) ISOLATED

OR

__ Intact SG(s) to be used for cooldown, steamlines - ISOLATED

Standard: Checks SG # 2, # 3, and # 4 steamlines isolated.

Green lights – ON
Red lights - OFF

Comment:

Step # 12 Check ruptured SG(s) isolated from intact SG(s):

b. Check TDAFW Pump steam supply from ruptured SG(s) - CLOSED.

Standard: Checks steam to TDAFW pump still isolated.

T & T valve – CLOSED

Green light – ON
Red light - OFF

Comment:

***Step # 13** **<u>Check ruptured SG(s) level</u>:**

a. **<u>SG NR level - GREATER THAN 10% [32% ADVERSE]</u>**

b. **<u>Stop feed flow to ruptured SG(s)</u>**

STOP TIME CRITICAL_____

Note: If MDAFW throttle HV-5139 has NOT previously been closed, closing the valve at this time would stop the time critical clock.

Standard: Checks SG # 1 NR level > 10%

Rotates HS-5139 counter clockwise to the CLOSED position

Green light – ON
Red light – OFF
White Light – ON

Checks no AFW flow to SG # 1 (FI-5152A)

Note: The candidate may also elect to close the TDAFW throttle valve at this time (HV-5122), however, the TDAFW is NOT feeding forward at this time and is not part of the critical step.

Green light – ON
Red light – OFF
White light - ON

Comment:

Terminating cue: **"The SS will have another operator complete the procedure".**

Verification of Completion

Job Performance Measure No. V-LO-JP-19030-006

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: THIS IS A TIME CRITICAL JPM

A reactor trip occurred from 100% power. While the crew was attempting to stabilize the plant, a low PRZR pressure SI occurred. The crew transitioned from 19000, E-0 to 19030.

Initiating Cue: The SS has directed you to "Isolate the ruptured SG using 19030 starting at step # 4".

Job Performance Measure "E"

Facility: **Vogtle**

Task No: V-LO-TA-15003

Task Title: Transfer Containment Spray To Recirculation

JPM No: V-LO-JP-19013-005

K/A Reference:

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 large break LOCA has occurred. The crew performed the cold leg recirculation lineup using 19013, and returned to 19010. After transitioning to 19010, RWST level decreased below 8%. The Auxiliary Building Operator is standing by the local Containment Spray suction and discharge pressure gauges.**

Task Standard: Containment Spray aligned for recirculation with Containment Spray pump A stopped, Train B CNMT sump suctions HV-9002B and HV-9003B both open, Train B RWST suction HV-9017B shut, Containment Spray pump B running.

Required Materials: 19013-C, Transfer to Cold Leg Recirculation

General References: None

Initiating Cue: **The SS has directed you to "Align Containment Spray for recirculation beginning with step 17 of 19013".**

Time Critical Task: No

Validation Time: 10 minutes

SIMULATOR SETUP:

This JPM has been snapped to IC # 98 for the HL-15 NRC Exam.

Simulator Setup from scratch.

1. Reset to IC # 14 (100%, MOL)
2. Insert malfunction RC03C (DBA LOCA)
3. Trip all RCPs
4. Throttle AFW flow to ~ 200 gpm/SG.
5. When Containment Emergency Sump levels are ~ `5"
   Set RF: TK02 = 29% (RWST)
6. Perform 19013-C steps 1 through 16.
7. Set RF: TK02 = 8%
8. Use Panel Drawings to over ride HV-9002A to SHUT
9. Acknowledge / Reset alarms
10. Freeze simulator

Setup time: 20 minutes

Performance Information

Critical steps denoted with an asterisk

Reviews CAUTION prior to step # 17 regarding performance of steps 17 – 19 and dispatching personnel to locally monitor spray pumps rad levels permitting.

***Step # 17 Reset Containment Spray.**

Standard: Rotates both Containment Spray reset hand switches to RESET position.

HS – 40058 to RESET
HS – 40059 to RESET
Checks CNMT SPRAY ACTUATION annunciator window resets (ALB06, D06)

Comment:

_____:

Step # 18 Align CS Pump A for recirculation:

a. Open CS Pump A suction valves from Containment Emergency Sump:

- HV-9002A, CNMT SPRAY PUMP A CNMT SUMP SUCT IRC
- HV-9003A, CNMT SPRAY PUMP A CNMT SUMP SUCT ORC

Standard: Determines HV-9002A will **NOT** open.

Green light – ON
Red light - OFF

Comment:

***Step # 18** RNO – a. Locally open:

1-HV-9003A (AB-C134)
2-HV-9003A (AB-C124)

<u>IF</u> valves can <u>NOT</u> be opened, <u>THEN</u> stop CS pump A.

Go to step 19.

Standard: Stops Containment Spray pump A by rotating hand switch HS-10940 counter clockwise and verifying the pump stops by:

Red light – OFF
Green light – ON
Amber light - OFF

Comment:

***Step # 19** **Align CS Pump B for recirculation:**

a. Open CS Pump B suction valves from Containment Emergency Sump:

- **HV-9002B, CNMT SPRAY PUMP B CNMT SUMP SUCT IRC**
- **HV-9003B, CNMT SPRAY PUMP B CNMT SUMP SUCT ORC**

Standard: Opens HV-9002B

Red light – ON
Green light – OFF

Opens HV-9003B

Red light – ON
Green lights – OFF

Comment:

***Step # 19** **b. Close CNMT SPRAY PUMP A RWST SUCT ISO VLV:**

- **HV-9017B**

Standard: Closes HV-9017B

Green light – ON
Red light - OFF

Comment:

Step # 19 c. Check Train B CS proper operation using the following indications, if available:

__ Pump suction pressure, PI-0973 greater than 7 psig.

__ Pump discharge pressure, PI-0975 approximately 185 psig above suction pressure.

__ Containment pressure stable or lowering.

CUE: "Containment Spray pump B suction pressure is 18 psig"

CUE: "Containment Spray pump B discharge pressure is 204 psig"

Standard: Determines suction and discharge pressures are adequate.

Determines from IPC computer point that CNMT pressure is lowering.
Note: Candidate may also use control board meters for CNMT pressure.

Comment:

Step # 20 Initiate RWST makeup using 13701, BORIC ACID SYSTEM

CUE: "Another operator will complete this task"

Standard:

Comment:

Terminating cue: Student returns initiating cue sheet

Verification of Completion

Job Performance Measure No. V-LO-JP-19013-005

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 large break LOCA has occurred. The crew performed the cold leg recirculation lineup using 19013, and returned to 19010. After transitioning to 19010, RWST level decreased below 8%. The Auxiliary Building Operator is standing by the local Containment Spray suction and discharge pressure gauges.**
Initiating Cue:	**The SS has directed you to "Align Containment Spray for recirculation beginning with step 17 of 19013".**

Job Performance Measure "F"

Facility: **Vogtle**

Task No: V-LO-TA-11014

Task Title: **Parallel DG with Voltage Regulator Failure**

JPM No: V-NRC-JP-13427-002

K/A Reference: 062A1.01

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: **Following a 7 day D/G 1B outage, Maintenance and Engineering Support are standing by for a D/G 1B test run. D/G 1B was just started, and is now operating unloaded with the D/G output breaker open. You are relieving the UO, and will be performing the remainder of this test run. The outside area SO is stationed at the D/G to support the evolution.**

Task Standard: DG-1B paralleled to bus 1BA03 using 13427B-1, and DG-1B output breaker opened when KVAR load goes negative.

Required Materials: 13427B-1, 4160V AC BUS 1BA03 1E ELECTRICAL DISTRIBUTION SYSTEM

Instructions: ***Students should be pre-briefed to save simulator time for this JPM.***

Initiating Cue: **The applicable portions of 13145-1 have been completed for starting DG-1B. In accordance with procedure 13427B-1, parallel D/G 1B to 1BA03 and raise DG-1B load to 7000 kw per Section 4.2.1., starting with step 4.2.1.3.**

Time Critical Task: No

Validation Time: 10 minutes

SIMULATOR SETUP:

1. Reset to IC # 94 for HL-15 NRC Exam

Simulator Setup from Scratch:

1. Reset to IC 14 (100% MOL)
2. Start D/G 1B allow it to run unloaded until all annunicators are clear
3. Set **Trigger 1** with the following overrides:
   DG 1B Voltage Decrease push button- ON
   DG 1B Voltage increase light – OFF
   DG 1B Voltage decrease light - OFF
4. Acknowledge alarms and freeze simulation

Setup time: 5 minutes

Performance Information

Critical steps denoted with an asterisk

Student review precautions and limitations section of 13427B-1.

4.2.1.3 **Verify** DG1B SYNC MODE SELECTOR Switch 1TS-DG1B in AUTO.

Standard: 1TS-DG1B in AUTO

Comment:

Reviews CAUTION about synchronizing switches

4.2.1.4 **Verify** Breaker 1BA0305 and1BA0301 Synchronizing Switches are OFF:

- 1BA0305 SYNCHRONIZING SWITCH OFF
- 1BA0301 SYNCHRONIZING SWITCH OFF

Standard: 1BA0305 SYNCHRONIZING SWITCH OFF
1BA0301 SYNCHRONIZING SWITCH OFF

Comment:

***4.2.1.5 Place the BRKR 1BA0319 SYNCHRONIZING SWITCH to ON.**

Standard: 1BA0319 SYNCHRONIZING SWITCH - ON.
Synchroscope starts rotating

Comment:

***4.2.1.6** **Momentarily place DSL GEN 1B UNIT/PARALLEL switch 1HS-4452B to PARALLEL and check blue DSL GEN 1B UNIT MODE/FAST START light NOT lit.**

Standard: Blue light - OFF

Comment:

4.2.1.7 **Set** DSL GEN 1B LOADING SET PT CONTROL 1SE-4916 to 1.00.

Standard: 1SE-4916 set at 1.00.

Comment:

4.2.1.8 **Select** the highest 1BA03 4160V Bus phase voltage on the QEAB Voltmeter by moving the BUS 1BA03 Normal Incoming Voltmeter Switch through all positions.

Standard: Highest reading 1BA03 bus voltage selected

Comment:

Reviews CAUTION on bus voltage limits.

4.2.1.9 **Check** 1BA03 4160V Bus voltage between 4025V and 4250V.

a. IF NOT, **coordinate** with PCC to establish 1BA03 4160V Bus voltage between 4025V and 4250V.

Standard: 1BA03 4160V Bus voltage between 4025V and 4250V.

Comment:

4.2.1.10 **Select** the lowest DG 1B voltage on the QEAB Voltmeter by moving the DG 1B Voltmeter Switch through all positions.

Standard: Lowest DG-1B voltage selected on voltmeter

Comment:

NOTES

- It may be necessary to adjust DG speed slightly in order to verify the next step.
- Synchronizing lights are bright at the 6 o'clock position. Synchronizing lights are dark at the 12 o'clock position. The red AUTO SYNC PERMISSIVE light is lit near the 12 o'clock position.

4.2.1.11 **Check** Sync Scope Meter is rotating.

Standard: Sync Scope Meter - rotating

Comment:

NOTE

The following step adjusts DG voltage to slightly higher than bus voltage to ensure the DG kVAR loading will be positive. The DG voltage should be approximately 50 volts higher than the bus voltage.

4.2.1.12 **Adjust** DG voltage to slightly above the bus voltage.

Standard: DG-1B voltage ~ 50 V > 1BA03 bus voltage

Comment:

NOTE

The following step adjusts DG frequency slightly higher than bus frequency to ensure the DG will start loading when the breaker is closed. The speed of rotation of the sync scope needle should be slow (at least 10 seconds per revolution).

4.2.1.13 **Adjust** the DG speed until the Sync Scope needle is rotating slowly in the clockwise (Fast) direction.

Standard: Sync Scope needle is rotating in the clockwise (Fast) direction with at least a 10 second period.

Comment:

CAUTION

As soon as the DG Output breaker closes, kVAR must be controlled in the acceptable range specified in Figure 1, "Emergency Diesel Generator Operating Limits."

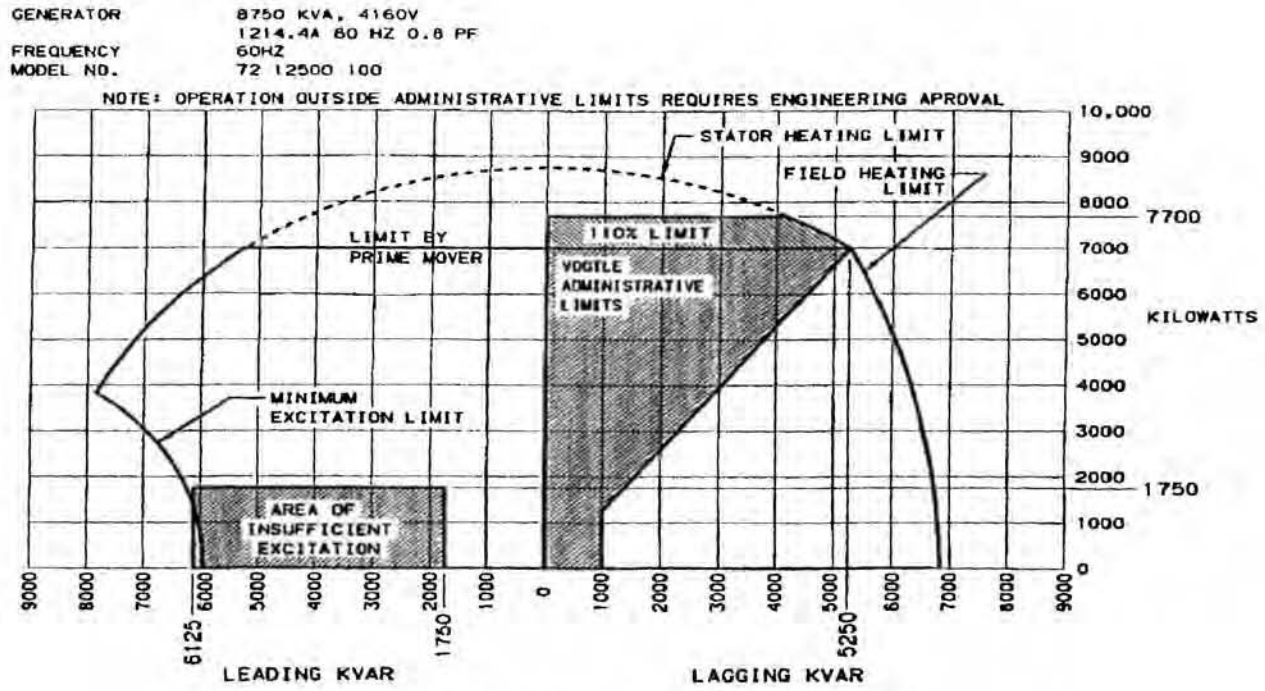
***4.2.1.14** **<u>WHEN</u> Sync Scope needle reaches the 11 o'clock position, depress and hold the DG 1B AUTO SYNC PERMISSIVE pushbutton PB-DG1B.**

NOTE: ***Concurrent Verification should be requested for this step***

NOTE: Insert TRIGGER 1 as soon as DG output breaker is closed.

Standard: PB-DG1B depressed when synch scope needle is at 11 o'clock

Comment:



EMERGENCY DIESEL GENERATOR
OPERATING LIMITS

4.2.1.15 **Check** DG1B OUTPUT BRKR 1BA03-19 closes WHEN Sync Scope needle reaches 12 o'clock position, THEN **release** Auto Sync Permissive pushbutton.

a. IF Sync Scope needle passes the 12 o'clock position, **release** Auto Sync Permissive pushbutton.

Standard: 1BA03-19: Red light – ON
Green light – OFF
Amber light - OFF

Comment:

4.2.1.16 **Verify** that DG loads to at least 700kW.

Standard: DG-1B load @ 700 KW

Comment:

4.2.1.17 **Adjust** DG voltage to obtain kVAR loading between 200 and 300 kVAR positive (Out).

***a. IF kVAR loading goes negative (In) and NO adjustment can be made With the voltage control to restore kVAR load positive (Out), trip DG Breaker 1BA0319.**

Standard: When recognizes KVAR loads negative attempts to raise by depressing raise DG voltage push button. Opens breaker 1BA0319 when KVAR load does not respond.

1BA0319 opened: Green light – ON
Red light - OFF
Amber light - OFF

Comment:

4.2.1.18 **Place** BRKR 1BA0319 SYNCHRONIZING SWITCH to OFF.

Standard: 1BA0319 SYNCHRONIZING SWITCH - OFF.

Comment:

Reports to the SS that DG-1B was paralleled to 1BA03 and that the output breaker was opened due to uncontrolled negative KVARs.

Standard: N/A

Comment:

Terminating cue: Student returns initiating cue sheet

Verification of Completion

Job Performance Measure No. V-NRC-JP-13427-002

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: Following a 7 day D/G 1B outage, Maintenance and Engineering Support are standing by for a D/G 1B test run. D/G 1B was just started, and is now operating unloaded with the D/G output breaker open. You are relieving the UO, and will be performing the remainder of this test run. The outside area SO is stationed at the D/G to support the evolution.

Initiating Cue: The applicable portions of 13145-1 have been completed for starting DG-1B. In accordance with procedure 13427B-1, parallel D/G 1B to 1BA03 and raise DG-1B load to 7000 kw per Section 4.2.1., starting with step 4.2.1.3.

Job Performance Measure "G"

Facility: **Vogtle**

Task No: V-LO-TA-23005

Task Title: Manually Align for CRI on High Radiation

JPM No: V-RQ-JP-13301-003

K/A Reference: 071A3.01

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: **You are the Unit Operator.**

Task Standard: Identify failure of CRI to auto actuate and manually align CR HVAC for CRI in accordance with 13301, section 4.4.1.

Required Materials: 13301, CBCR Normal HVAC and Emergency Filtration System

17102, Annunciator Response for the Safety Related Display Console

General References: None

Initiating Cue: **The SS has directed you to "Monitor the Control Room and respond to plant conditions".**

Time Critical Task: No

Validation Time: 10 minutes

SIMULATOR SETUP:

Snapped to IC # 96 for HL-15 NRC Exam.

If new setup is required, then perform the following:

1. Reset to IC 14 (MOL 100%).
2. Insert Malfunction **ES04A** (Failure of Train A CRI)
3. Insert Malfunction **ES04B** (Failure of Train B CRI)
4. Insert malfunctions for High Rad on RE-12116 and RE-12117 on Trigger 1
5. Override BOTH SSMP TROUBLE alarms to OFF
6. Acknowledge/Reset alarms.
7. Freeze simulator

Setup time: 3 minutes

Performance Information

Critical steps denoted with an asterisk

Annunciator Response 17005 Window C03 for High Radiation (IF referenced)

Annunciator response procedure should direct candidate to ARP 17102 for the Safety Related Display Console (SRDC)

Standard: References ARP-17102 (NOTE: The candidate may go directly to 17102 without referencing ARP-17005).

The candidate may also reference the IPC computer RAD button to determine which radiation monitors are in alarm or may look at the SRDC.

Comment:

Annunciator Response 17102 for Safety Related Display Console

References ARP-17102 for RE-12116 and RE-12117 High Radiation AUTOMATIC ACTIONS.

Standard: Determines Control Room and Technical Support Center ventilation should have automatically swapped to the Post Accident Mode.

Comment:

Step 1 SUBSEQUENT ACTIONS: Verify Control Room HVAC in the Recirculation Mode

Standard: Determines Control Room HVAC **NOT** in the Recirculation Mode

Observes green lights lit on 1-HS-12195A and 1-HS-12196A (yellow switches).

Attempts CRI actuation by placing both 1-HS-12195A and 1-HS-12196A to the ACTUATE position. (Rotates clockwise to actuate)

NOTE: It would be acceptable for candidate to reference procedure 13301 prior to attempting this actuation. There is no ARP direction to reference this procedure. This would be up to the candidate to determine the correct procedure.

Comment:

Refers to procedure 13301 and determines section 4.4.1 should be performed.

Standard: Section 4.4.1 used.

Comment:

4.4.1.1 To manually initiate Control Room Isolation, **place** either CR ISO MANUAL ACTUATION Switch in ACTUATE:

TRAIN A	TRAIN B
1-HS-12195A [A4]	1-HS-12196A [A6]

Standard: Rotates both hand switches clockwise to the ACTUATE position and determines that the actuation did **NOT** occur.

Green lights – ON
Red lights - OFF

Comment:

---:

***4.4.1.2 Verify that TRAIN B CR FLTR UNIT LEAD SUPPLY AIR FAN starts.**

TRAIN B

1-1531-N7-002 [B10]

Standard: Starts Train B filter unit by rotating hand switch clockwise to the start position.

Red light – ON
Green light – OFF
Amber light - OFF

Comment:

4.4.1.3 **Verify** that TRAIN A CR FLTR UNIT STANDBY SUPPLY AIR FAN does NOT start:

TRAIN A

1-1531-N7-001 [B8]

Standard: Checks green light remains – ON
Red light remains – OFF
Amber light remains - OFF

Comment:

***4.4.1.4 Verify that both KIT TOIL + CONF RM EXH ISO DMPRs close:**

TRAIN A	**TRAIN B**
A-HV-12162 [D6]	**A-HV-12163 [D7]**

Standard: Rotates both hand switches counter clockwise to the CLOSED position.

Green lights – ON
Red lights - OFF

Comment:

***4.4.1.5 Verify that both CR NORM AIR SUPPLY ISO DMPRs close:**

TRAIN A	TRAIN B
1-HV-12146 [C6]	1-HV-12147 [C7]

Standard: Rotates hand switch for HV-12146 counter clockwise to the CLOSE position.

HV-12146

Green light - ON
Red light - OFF.

Observes HS-12147 already closed by:

Green light - ON
Red light - OFF.

Comment:

*** 4.4.1.6 Verify that both CR NORM AIR RTN ISO DMPRs close:**

TRAIN A	TRAIN B
1-HV-12149 [E6]	1-HV-12148 [E7]

Standard: Rotates hand switch for HV-12149 counter clockwise to the CLOSE position.

HV-12149

Green light - ON
Red light - OFF.

Observes HV-12148 already closed by:

Green light - ON
Red light - OFF.

Comment:

4.4.1.7 **Verify** that the CR FILTER UNIT OUTLET AIR DMPR on the running train is open:

TRAIN B

1-HV-12129 [C11]

Standard: Red light – ON
Green light - OFF.

Comment:

4.4.1.8 **Verify** that the CR RTN FAN INLET AIR DMPR on the running train is open:

TRAIN B

1-HV-12131 [D10]

Standard: Red light – ON
Green light - OFF.

Comment:

4.4.1.9 **Verify** that the CR NORMAL HVAC UNIT INTAKE ISO DMPR on the running train is closed:

TRAIN B

A-HV-12152 [B7]

Standard: Green light - ON
Red light - OFF.

Comment:

4.4.1.10 **Verify** that the CR NORM AC UNIT SUPPLY FANS, A-1531-A7-001 [C4] and A-1531-A7-002 [C5], shut down.

Standard: Both AC units

Green lights – ON
Amber lights – ON
Red lights - OFF

Comment:

4.4.1.11 **Verify** that the CR NORM AC UNIT EXH FAN, A-1531-B7-009 [D4] and A-1531-B7-010 [D5], shut down.

Standard: Both exhaust units

Green lights – ON
Red lights – OFF

Comment:

4.4.1.12 Verify that the KITCH TOILET AND CONF RM EXH FAN, A-HS-12164 in the Shift AA's Office, stops.

CUE: **The Control Building Operator reports A-HS-12164's green light is lit and the fan has stopped.**

Standard: Determines Kitchen Toilet and Conference room exhaust fan is stopped.

Comment:

Reviews NOTE prior to step 4.4.1.13 regarding isolation of outside air dampers.

4.4.1.13 IF Control Room outside air is restricted for Control Room habitability due to smoke or toxic gas intake, THEN **close** the CR OUTSIDE AIR SUPPLY DAMPERS for BOTH Units:

UNIT 1	UNIT 2
1-HS-12114 [E8]	2-HS-12114
1-HS-12115 [E10]	2-HS-12115

Standard: Determines this step Not Applicable.

Comment:

4.4.1.14 **Verify** proper operation of the TSC Air Filtration System per 13303-C, "Technical Support Center And Central Alarm Station HVAC Systems."

CUE: Another operator will verify proper operation of the TSC Air Filtration System.

Standard: Not applicable.

Comment:

4.4.1.15 **Verify** proper Essential Chiller operation.

CUE: Another operator will verify proper operation of the ESF Chiller.

Standard:

Comment:

Terminating cue: Student returns initiating cue sheet

Verification of Completion

Job Performance Measure No. V-RQ-JP-13301-003

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: **You are the Unit Operator.**

Initiating Cue: **The SS has directed you to "Monitor the Control Room and respond to plant conditions".**

Job Performance Measure "H"

Facility: **Vogtle**

Task No: V-LO-TA-29006

Task Title: Place Containment Main Purge in Service

JPM No: V-LO-JP-13125-002

K/A Reference: 029A2.03

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 is in Mode 5 with the Containment Equipment Hatch Open.**

Task Standard: Student shuts down the mini-purge exhaust system and then starts the main purge exhaust system per 13125-1.

Required Materials: 13125-1, Containment Main Purge System

General References: None

Initiating Cue: **The SS has authorized Gaseous Release Permits and has directed you to "Place Containment Main (Preaccess) Purge in service" using procedure 13125-1.**

"Checklist 1 for Main Purge isolation dampers and valves has been performed".

Time Critical Task: No

Validation Time: 20 minutes

SIMULATOR SETUP:

Snapped IC is 93. If new setup is required, then perform the following:

1. Reset to mode 5 mid loop IC
2. Place Mini-Purge supply fan in service per 13125 and ensure Containment Pressure is atmospheric.
3. Verify Power to the Containment Main Purge dampers is on
4. Acknowledge / Reset alarms
5. Freeze simulator

Setup time: 10 minutes

Performance Information

Critical steps denoted with an asterisk

Student refers to SOP 13125-1 and determines section 4.1.2 should be performed.

Standard: Section 4.1.2 used

Comment:

_____:

Student reviews precautions and limitations of 13125-1

Student reviews notes and cautions at the beginning of section 4.1.2

Standard: N/A

Comment:

4.1.2.1 IF the unit is in MODE 5, 6 OR defueled, AND the Containment Equipment Hatch is open, operate the Containment Main Purge System with the Exhaust Fan on, and Supply Fan off to verify airflow is maintained into the building.

Standard: Student determines this step IS applicable from initial conditions.

Comment:

4.1.2.2 **Perform** Checklist 1 as required, to restore power to the Main Purge Isolation dampers and fans.

Standard: Determines checklist 1 has been completed from initial conditions.

Comment:

---:

Reviews NOTE concerning interlocks between main and mini-purge fans.

4.1.2.3 IF the Mini-Purge System is operating, **perform** the following:

a. **Notify** Chemistry that containment purge will be shifted from the Mini-Purge to the Main Purge System.

CUE: **Chemistry has been notified that containment purge will be shifted from mini to main purge.**

b. **Go To** Section 4.3.2 and **shut down** the Mini-Purge System.

Standard: Determines that section 4.3.2 needs to be performed

Comment:

SECTION 4.3.2

Reviews note at beginning of section 4.3.2

4.3.2.1 **Terminate** Mini-Purge Supply flow as follows:

a. **Stop** the CTB MINI-PURGE SPLY FAN using 1-HS-2630B. (B32)

b. **Close** CTB NORM PURGE SPLY ORC ISO VLV-MINI 1-HV-2627B using 1-HS -2627B (D32).

c. **Close** CTB NORM PURGE SPLY IRC ISO VLV-MINI 1-HV-2626B using 1-HS -2626B (C32).

Standard: Determines that these steps are N/A from initial conditions given and control board indications.

Comment:

***4.3.2.2 Terminate Mini-Purge Exhaust flow as follows:**

a. Stop the CTB MINI-PURGE EXH FAN using 1-HS-2631B. (D34)

Standard: 1HS-2631B hand switch rotated counter clockwise.
Red light –OFF
Green light -ON

Comment:

***4.3.2.2b. Close CTB MINI PURGE EXH ORC ISO VLV-MINI 1-HV-2629B using 1-HS -2629B (B34).**

Standard: 1HS-2629B hand switch rotated counter clockwise.
Red light –OFF
Green light -ON

Comment:

***4.3.2.2c. Close CTB NORM PURGE EXH IRC ISO VLV-MINI 1-HV-2628B using 1-HS -2628B (A34).**

Standard: 1HS-2628B hand switch rotated counter clockwise.
Red light –OFF
Green light -ON

Comment:

***4.3.2.2d. Place CTB MINI-PURGE EXH DMPR 1-HV-12592 in CLOSE using 1-HS -12592 (C34).**

Standard: 1HS-12592 hand switch rotated counter clockwise.
Red light –OFF
Green light -ON

Comment:

4.3.2.2e. **Log** the Containment Mini-Purge Termination TIME and DATE on the Release Permit on the same line where flow is recorded.

CUE: **Containment Mini-Purge Termination TIME and DATE have been entered on the Release Permit**

Standard: N/A

Comment:

***4.3.2.3** **Close CTB PREACCESS PURGE SPLY UNIT INLET DMPR, 1-HV-2593 using 1-HS -2593 (A31).**

Standard: Hand switch 1-HS-2593 rotated counter clockwise.
Green light – ON
Red light - OFF

Comment:

4.3.2.4 **Notify** Chemistry that Containment Mini-Purge has been terminated, and the Containment Gaseous Release Permit has been closed.

CUE: **Chemistry has been notified that containment mini-purge has been terminated and the containment gaseous release permit has been closed.**

Standard: N/A

Comment:

4.3.2.5 **Record** the name of the person contacted in the Unit Control Log.

CUE: **Name of person contacted has been recorded in the unit control log.**

Standard: N/A

Comment:

4.3.2.6 **Restore** the Mini-Purge System per Checklist 3:

COMPONENT	DESCRIPTION	POSITION
1-HS-2593 (A31)	CTB PREACCESS PURGE SPLY UNIT INLET DMPR	CLOSED
1-HS-2628B (A34)	CTB NORM PURGE EXH IRC ISO VLV-MINI	CLOSED
1-HS-2629B (B34)	CTB NORM PURGE EXH ORC ISO VLV-MINI	CLOSED
1-HS-2626B (C32)	CTB NORM PURGE SPLY IRC ISO VLV-MINI	CLOSED
1-HS-2627B (D32)	CTB NORM PURGE SPLY ORC ISO VLV-MINI	CLOSED

CUE: **If asked, "the extra operator will perform the independent verification of checklist 3".**

Standard: Each damper verified closed by Green light – ON and Red light OFF. Student requests an independent verification for these steps.

Comment:

4.3.2.7 IF the Main Purge System is being placed in service, **Return To** Step 4.1.2.4.

Standard: Determines that this step is applicable and returns to step 4.1.2.4

Comment:

Reviews note prior to next step

4.1.2.4 IF the Mini-Purge System is NOT operating, **perform** the following:

a. **Notify** Chemistry of the upcoming Main Purge operation:

Obtain the current approved Containment Gaseous Release Permit.

IF an updated permit is unavailable, **request** that Chemistry sample the containment atmosphere and prepare for the gaseous release.

b. WHEN a current approved Containment Gaseous Release Permit is obtained, **continue** with this section.

Standard: Determines release permit obtained from initial conditions given and proceeds.

Comment:

4.1.2.5 **Verify** all conditions that must be satisfied prior to the release are met.

Standard: Determines all conditions satisfied:
Release permit obtained

Comment:

4.1.2.6 Place CTB PREACCESS PURGE EXH DMPR 1-HS-2632A (C33) in AUTO.

Standard: 1-HS-2632A verified in the AUTO position

Comment:

Reviews cautions prior to next step

4.1.2.7 **Initiate** Main Purge Exhaust flow as follows:

***a. Open CTB PREACCESS PURGE SPLY UNIT INLET DMPR 1-HV-2593 using 1-HS -2593 (A31).**

Standard: 1-HS-2593 rotated clockwise
Red light – ON
Green light - OFF

Comment:

***4.1.2.7b Open CTB NORM PURGE EXH ORC ISO VLV-MAIN 1-HV-2629A using 1-HS -2629A (B33),**

Standard: 1-HS-2629A rotated clockwise
Red light – ON
Green light - OFF

Comment:

***4.1.2.7c. Open CTB NORM PURGE EXH IRC ISO VLV-MAIN 1-HV-2628A using 1-HS -2628A (A33),**

Standard: 1-HS-2628A rotated clockwise
Red light – ON
Green light - OFF

Comment:

***4.1.2.7d.** **Start the CTB PREACCESS PURGE EXH FAN using 1-HS-2631A (D33),**

Standard: 1-HS-2631A rotated clockwise
Red light – ON
Green light - OFF

Comment:

4.1.2.7e. **Log** the Release Start Time and Date on the Chemistry data sheet provided.

CUE: **Release start time and date has been logged on the Chemistry data sheet.**

Standard: N/A

Comment:

Reviews note prior to next step

4.1.2.7 f. **Note** the Main Purge Exhaust Flow rate, and **verify** it is within allowable value as stated on Release Permit,

CUE: **Main Purge Exhaust flow rate is within its allowable value on the release permit.**

Standard: N/A

Comment:

4.1.2.7 g. IF both Radiation Monitors 1-RE-12442C and 1-RE-12444C, become inoperable, immediately **shut down** the Main Purge System per section 4.3.1 and **notify** the SS.

Standard: N/A

Comment:

Reviews caution prior to next step

4.1.2.8 Initiate Main Purge Supply flow if desired as follows:

a. Open CTB NORM PURGE SPLY ORC ISO VLV-MAIN 1-HV-2627A using 1-HS -2627A (D31).

b. Open CTB NORM PURGE SPLY IRC ISO VLV-MAIN 1-HV-2626A using 1-HS -2626A (C31).

c. Start the CTB PREACCESS PURGE SPLY FAN using 1-HS-2630A (B31).

4.1.2.9 Note the Main Purge Exhaust Flow rate with Supply and Exhaust Fans in service, and verify it is within allowable value as stated on Release Permit.

4.1.2.10 Log flow rate on Chemistry data sheet provided.

CUE: **If asked, "Flow rate is logged on the Chemistry data sheet".**

Standard: These steps are determined to be N/A from initial conditions given. **If step 4.1.2.8 is performed, then it becomes critical and is unsatisfactory.**

Comment:

4.1.2.11 Notify Chemistry that the Main Containment Purge System is operating, and record the name of the person contacted in the Unit Control Log.

CUE: **Chemistry has been notified that the Main Containment Purge System is operating, and the name of the person contacted has been recorded in the Unit Control Log.**

Standard: N/A

Comment:

Student notifies SS that the main purge system has been placed in service per 13125-1.

Standard: N/A

Comment:

Terminating cue: Student returns initiating cue sheet

Verification of Completion

Job Performance Measure No. V-LO-JP-13125-002

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 is in Mode 5 with the Containment Equipment Hatch Open.**

Initiating Cue: **The SS has authorized Gaseous Release Permits and has directed you to "Place Containment Main (Preaccess) Purge in service" using procedure 13125-1.**

"Checklist 1 for Main Purge isolation dampers and valves has been performed".

FINAL

In-Plant Systems@ (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
i. **Establish RWST Gravity Drain through SI Pumps to RCS Cold Legs** **Description:** Use attachment B of AOP 18019-C (Loss of RHR cooling) to establish gravity drain during mid-loop operations to restore temporary core cooling. (RO / SRO-I / SRO-U) K/A: 025AK1.01 (3.9 / 4.3)	D,E,L,R	4P
j. **Shutdown 120V AC 1E Inverter During Loss of All AC Power** **Description:** Battery voltage less than 105 VDC on loss of all AC power. Requires student to shutdown AC inverter to prevent equipment damage. (RO / SRO-I) K/A: 055EK3.02 (4.3 / 4.6)	P,D,E,L,R	6
k. **Bypass CNMT HI-1 Bistables Following Loss of Heat Sink** **Description:** Bistables must be bypassed using the BTI equipment in order to align a feedwater flow path to the SGs during a loss of secondary heat sink. This will also require knowledge of how / where to obtain multiple BTI keys to bypass 2 trains of equipment (RO / SRO-I / SRO-U) K/A: 012A4.03 (3.6 / 3.6)	D,C,E,L	7

@ All control room (and in-plant) systems must be different and 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	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥1 / ≥ 1
(EN)gineered Safety Feature	- / - / > 1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Job Performance Measure "i"

Facility: **Vogtle**

Task No: V-LO-TA-60025

Task Title: **Establish RWST Gravity Drain Through SI Pumps to RCS Cold Legs**

JPM No: V-RQ-JP-18019-005

K/A Reference: 025AK1.01

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: **During mid-loop operations, Unit 1/2 experienced a loss of all AC power to the 1E buses. The crew is performing step B15 of AOP 18019-C, "Loss of RHR", attempting to a restore RCS level to greater than or equal to 188 feet.**

RV head is on, RCS level is 188 ', all cold legs are intact (no openings), and all 3 Pressurizer Code Safeties are removed

Task Standard: Student determines an adequate vent path exists and opens the SI pump cold leg injection valves 1/2HV8821A and 1/2HV8821B.

Required Materials: AOP 18019-C

General References: Requires RCA entry

Initiating Cue: **The SS has directed you to perform step B15 of 18019-C, "Loss of RHR – Mode 5 or 6 Below PRZR IR Or SG Nozzle Dams Installed**

Time Critical Task: No

Validation Time: 15 minutes

Performance Information

Critical steps denoted with an asterisk

NOTE prior to step B15

Gravity drain paths through the RHR pumps are preferable since these can achieve the greatest flow rate. Gravity drain paths are listed in order of preferability.

Standard: N/A

Comment:

_____:

B15 AER

Makeup to RCS to restore level greater than or equal to 188 feet using any of the following:

a. Check RHR pump - AVAILABLE

Standard: RHR pump determined not available due to loss of all AC power from initial conditions

Comment:

B15 RNO:

Use any of the following:

ATTACHMENT A Section A, RWST GRAVITY DRAIN THROUGH RHR PUMPS TO COLD LEGS.

CUE: ***The SS reports the RHR flow paths to the RCS Cold Legs are NOT available.***

Standard: Bypasses Attachment A section A

Comment:

B15 RNO continued:

ATTACHMENT A Section B, RWST GRAVITY DRAIN THROUGH SI PUMPS TO COLD LEGS.

Standard: Attachment A Section B selected for use

Comment:

ATTACHMENT A
RWST GRAVITY DRAIN TO RCS

CAUTION: An RCS pressure of 35 psig allows no RWST to RCS gravity drain.

CUE: If asked: The SS reports RCS pressure is 0 psig

Standard: N/A

Comment:

NOTE: This attachment should not be used if an ECCS pump is available.

Standard: Determines Attachment A is applicable

Comment:

ATTACHMENT A STEP 1:

Check RCS pressure - LESS THAN 35 PSIG

CUE: ***If asked: The SS reports RCS pressure is 0 psig***

Standard: Determines RCS pressure < 35 psig

Comment:

Verify at least one of the following RCS Vent Paths:

a. RV head removed.

Standard: Determines RV head on from initial conditions

Comment:

---

b. RV head on and RCS level ≤ 191' and with a cold leg opening, an adequate RCS vent path is an SG hot leg manway on an SG with no nozzle dam installed.

Standard: Determines no RCS cold leg opening from initial conditions

Comment:

---

c. RV head on and RCS level ≤ 191' and with no cold leg opening:

(1) A minimum of three pressurizer code safeties removed,
-OR-
(2) The pressurizer manway removed,
-OR-
(3) An SG hot leg manway removed on an SG with no nozzle dams installed.

Standard: Determines vent path is adequate per step c.(1) from initial conditions

Comment:

NOTE:

- It is desirable to gravity drain to a closed cold leg using Section A or B.
- If a closed cold leg is unavailable, then go to Section C or D for gravity drain to a hot leg.
- Gravity drain paths through the RHR loops are preferable since these can achieve the greatest flow rate.

Standard: N/A

Comment:

---

3. If desired to gravity drain from RWST through RHR pumps to cold legs, then go to Section A of this attachment.

Standard: Determines section A should not be used from previous SS cue that RHR cold path is not available

Comment:

4. If desired to gravity drain from RWST through SI pumps to cold legs, then go to Section B of this attachment.

Standard: Selects Section B of ATTACHMENT A for use

Comment:

ATTACHMENT A

B. RWST GRAVITY DRAIN THROUGH SI PUMPS TO COLD LEGS

B1. Verify HV-8835 - OPEN

CUE: ***The SS reports that HV-8835 is OPEN***

Standard: Determines HV-8835 is open

Comment:

B2 Locally throttle open the following SI PMP-A(B) TO COLD LEG ISO VLV valves:

UNIT 1

- 1-HV-8821A (AB-B15)
- 1-HV-8821B (AB-B19)

UNIT 2

- 2-HV-8821A (AB-B119)
- 2-HV-8821B (AB-B117)

* **Locates valves and determines current position is closed based on valve position indicator**

CUE: ***IF ASKED:***

If valve is closed: "Valve is positioned as you see it"

If valve is open: provide visual cue that valve position pointer is aligned with closed indicator

Standard: Determines valves are closed

Comment:

---

* **Disengages clutch and opens valve HV-8821A or HV-8821B**

Standard: Depresses clutch level arm on motor operator towards the disengage direction and turns valve hand wheel in the open direction (counter clockwise) marked on the hand wheel until valve position pointer moves to the open position indicator

Comment:

---

* **Disengages clutch and opens valve HV-8821B or HV-8821A**

Standard: Depresses clutch level arm on motor operator towards the disengage direction and turns valve hand wheel in the open direction (counter clockwise) marked on the hand wheel until valve position pointer moves to the open position indicator

Comment:

Reports to the SS that the SI system has been aligned gravity drain the RWST through the SI pumps to the cold legs per ATTACHMENT A section B of AOP 18019-C.

Standard: N/A

Comment:

Terminating cue: Student returns initiating cue sheet

Verification of Completion

Job Performance Measure No. V-RQ-JP-18019-005

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:	**During mid-loop operations, Unit 1/2 experienced a loss of all AC power to the 1E buses. The crew is performing step B15 of AOP 18019-C, "Loss of RHR", attempting to a restore RCS level to greater than or equal to 188 feet.** **RV head is on, RCS level is 188 ', all cold legs are intact (no openings), and all 3 Pressurizer Code Safeties are removed**
Initiating Cue:	**The SS has directed you to perform step B15 of 18019-C, "Loss of RHR – Mode 5 or 6 Below PRZR IR Or SG Nozzle Dams Installed**

Job Performance Measure "j"

Facility: **Vogtle**

Task No: V-LO-TA-01014

Task Title: **Shutdown 120V AC 1E Vital Inverter during a Loss of All AC Power**

JPM No: V-RQ-JP-13431-001

K/A Reference: 055EK3.02

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 1/2 control room has experienced a prolonged Loss of All AC Power, 125V 1E DC Bus 1/2BD1 voltage is currently reading 103V DC.**

Task Standard: Student shuts down inverter per 13431-1/2 and opens associated bus battery breaker per 19100-C.

Required Materials:
1. EOP 19100-C, Loss of All AC Power step 28
2. SOP 13431-1/2, 120V AC 1E Vital Instrument Distribution System

General References: None

Initiating Cue: **You have been directed by the SS to perform step 28 of 19100-C, "Loss of All AC Power".**

Time Critical Task: No

Validation Time: 15 minutes

Performance Information

Critical steps denoted with an asterisk

EOP 19100-C
STEP 28 Check DC Bus loads:

a. Monitor all 1E Battery Bus voltages – GREATER THAN 105V DC

Standard: Determines 1/2BD1 bus voltage is 103 V DC from initial conditions

Comment:

STEP 28 RNO:

IF any 1E Inverter Battery Bus voltage drops to 105V DC or less, THEN perform the following:

1) Verify associated Inverter(s) shutdown per 13431, 120V AC 1E VITAL INSTRUMENT DISTRIBUTION SYSTEM

Standard: Determines 13431-1/2 must be completed to shutdown inverter(s)

Comment:

SOP 13431-1/2

Determines section 4.3.2 should be implemented to shutdown inverters 1/2BD1I2 and 1/2BD1I12

CUE: ***You are directed to shut down inverter 1/2BD1I2***

Standard: Goes to section 4.3.2 of SOP 13431-1/2

Comment:

Student notes the CAUTION at start of section 4.3.2

4.3.2.1 Verifies closed breaker 1/2BD1-01

Standard:
1. Green and Amber lights OFF
2. Red light ON
   OR
3. Green / Open flag - VISIBLE

Comment:

4.3.2.2 IF the associated Instrument Distribution Panel is to remain energized, transfer the panel to the alternate source per Section 4.2.1.

Standard: Determines this step is N/A due to loss of all AC power

Comment:

***4.3.2.3 Opens INVERTER 1/2BD1I2 OUTPUT breaker**

Standard: Moves the molded case circuit breaker to the open (down) position.

Comment:

***4.3.2.4 Opens Inverter 1/2BD1I2 DC INPUT breaker**

Standard: Moves molded case breaker to the open (down) position

Comment:

4.3.2.5 Check inverter completely shutdown, by observing zero volts on the Inverter AC OUTPUT Voltmeter.

CUE: ***When asked, indicate AC output voltmeter at 0 volts (This meter is located at the top right side of the inverter)***

Standard: Determines AC output meter is at 0 volts

Comment:

***4.3.2.6 At the associated 125V DC switchgear, open the Inverter DC Supply Breaker: 1/2BD1-10**

Standard:
1. Rotates hand switch to the TRIP position OR depresses trip push button
2. Red light - OFF, Green light - ON, Amber light - OFF
   OR,
3. Green / Open flag - VISIBLE

Comment:

19100-C
***STEP 28 RNO a.2)**

Open associated battery breaker after inverter(s) shutdown

CUE: ***If asked, The SS reports "inverter 1/2BD1I12 has been shutdown"***

Standard: Opens breaker 1/2BD1-01 by:

1. rotating hand switch to the TRIP position - OR - depressing trip push button
2. Red light - OFF, Green light - ON, Amber light - OFF.
   OR
3. Green / Open flag - VISIBLE

Comment:

STEP 28b RNO:

As time permits, perform the following:.....

CUE: ***"The SS will have another operator continue the procedure"***

Standard:

Comment:

Student reports to SS that Inverter 1/2BD1I2 has been shut down per 13431-1/2 and that the battery breaker for 1/2BD1 has been opened.

Standard: N/A

Comment:

Terminating cue: Student returns initiating cue sheet

Verification of Completion

Job Performance Measure No. V-RQ-JP-13431-001

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 1/2 control room has experienced a prolonged Loss of All AC Power, 125V 1E DC Bus 1/2BD1 voltage is currently reading 103V DC.

Initiating Cue: You have been directed by the SS to perform step 28 of 19100-C, "Loss of All AC Power".

Job Performance Measure "K"

Facility: **Vogtle**

Task No: V-LO-TA-37051

Task Title: Bypass Containment Hi-1 following a Loss of Heat Sink

JPM No: V-RQ-JP-13509-001

K/A Reference: 012A4.03

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: **While responding to a Loss of Heat Sink on Unit 1/2, Containment pressure reached the Hi-1 set point. The crew is preparing to establish feed water flow in accordance with step 19 of 19231-C.**

Task Standard: Student locates and bypasses Containment Hi-1 pressure channel bistables 1/2 - PB936B and 1/2 - PB935B per SOP 13509-C

Required Materials:
1. SOP 13509-C (2 copies of section 4.2.1 needed)
2. NSSS protection cabinet key
3. 2 BTI panel bypass keys

General References: None

Initiating Cue: **The SS has directed you to "Bypass Containment Hi-1 pressure channels 1/2 - PB936B and 1/2 - PB935B by initiating 13509-C."**

Time Critical Task: No

Validation Time: 10 minutes

Performance Information

Critical steps denoted with an asterisk

Student determines that section 4.2.1 of 13509-C is applicable

Standard: Section 4.2.1 referenced

Comment:

---:

Student reviews 13509-C precautions and limitations:

2.1.2 .....Multiple BTI Keys may also be used as needed to respond to abnormal or emergency plant conditions.

2.1.4 The NSSS and BOP BTI Annunciators will illuminate when the Key Lock is placed in BYPASS ENABLE OR a BTI switch is placed in the BYPASS position. NSSS/BOP BTI switch LEDs will illuminate when the Key Lock is in BYPASS ENABLE AND individual BTI switch is in BYPASS.

2.1.6 To provide a reasonable assurance that a channel has been bypassed, the BTI annunciator (on ALB04 or ALB05) and the BTI switch LEDs must be illuminated. If a channel will be tripped or is already tripped, the TSLB should remain extinguished while bypassed.

Standard: N/A

Comment:

Student notes CAUTION at beginning of section 4.2.1 for LCO 3.0.3

***4.2.1.1 Circle the bistable(s) to be bypassed, on Checklist 1 (2, 3, 4) for the applicable channel.**

Standard: Student circles PB-936B on checklist 2 and PB-935B on checklist 3

Comment:

4.2.1.1 For I&C surveillances, **Refer To** I&C procedure Step 3.2 or 3.3.

Standard: Student marks this step as N/A

Comment:

4.2.1.2 For the bistable(s) circled on Checklist 1 (2, 3, 4), **obtain** the SS authorization to bypass,. Document on Checklist 1 (2, 3, 4).

CUE: The SS has authorized bypass of PB935B and 936B and signed the checklist.

Standard: Student requests SS to sign the SS AUTH. Block on Checklist 2 for PB936B and Checklist 3 for PB-935B

Comment:

***4.2.1.3 Obtain the BTI Enable Key from the SS.**

Standard: Requests BTI enable key from the SS.

NOTE: ***Student may also request NSSS protection cabinet key if these panel doors are locked. These keys are held by the control room operators.***

Comment:

Reviews precautions 2.1.1 and 2.1.2 as directed by a note in the procedure

Standard: N/A

Comment:

4.2.1.4 Except as noted in 2.1.1, **verify** no other channel NSSS AND BOP BTI Panels are in the bypass condition WHEN in Modes 1-4.

Standard: Requests a concurrent verification and Verifies all NSSS and BOP BTI annunciator windows are dark.

Comment:

Reviews NOTE prior step 4.2.1.5

4.2.1.5 On the BTI Panel on which bypassing is desired, **verify** all BTI switches are in the NORMAL position.

Standard: Verifies all switches on either BTI channel 2 or 3 panel are in the normal (down) position

Comment:

4.2.1.6 On the BTI NSSS Panel on which bypassing is desired:

a. Verify the circuit breaker is in the ON position,

AND

b. Verify power LED is illuminated.

Standard: Verifies BTI circuit breaker is on (upper portion of rocker switch in flush with panel) and the LED inside the switch is illuminated.

Comment:

Notes that ALB05-B02 (C02) NSSS PROT GR II (III) BYPASS alarm is expected in the following step

***4.2.1.7** **Perform the following:**

a. **Insert the BTI Enable Key in the Key Lock,**

b. **Place in the BYPASS ENABLE position,**

AND

c. Verify LED illuminates.

Standard: Inserts BTI key into the bypass enable switch for channel II (III) panel and rotates the switch clockwise. Verifies LED immediately above the bypass enable switch illuminates.

Comment:

4.2.1.8 **Verify** the annunciator for the applicable BTI NSSS Channel enabled illuminates:

NSSS PROT GR II BYPASS (ALB-05-B02)
OR
NSSS PROT GR III BYPASS (ALB-05-C02)

Standard: Verifies NSSS PROT GR II (III) BYPASS window is alarming

Comment:

4.2.1.9 **Notify** the SS that performance of the next step may require entry into one or more functional units of TS LCOs 3.3.1 AND/OR 3.3.2.

Standard: Notifies SS

Comment:

_____:

***4.2.1.10 Place BTI NSSS Switch(es) circled in Step 4.2.1.1 to the BYPASS position. Document on Checklist 1 (2, 3, 4). (CV REQUIRED)**

Standard: Requests a concurrent verification and then moves toggle switch 34 for PB-936B (PB-935B) to the up position.

Comment:

4.2.1.11 **Verify** BTI Switch LEDs are illuminated for Switch(es) in the BYPASS position.

Standard: Request concurrent verification and verifies LED immediately above toggle switch 34 for PB-936B (PB-935B) is illuminated.

Comment:

4.2.1.12 For the channel bistable(s) bypassed on Checklist 1 (2, 3, 4), **verify** the TSLB(s) is extinguished.

Standard: Verifies TSLB 4, 10.2 (10.3) is extinguished.

Comment:

4.2.1.13 **Notify** SS to document the time of channel bypass in the Shift Supervisor Logbook.

Standard: SS notified to document time channel was bypassed.

Comment:

4.2.1.14 WHEN surveillance testing is complete OR plant conditions require, restore the BTI NSSS Channel Switch(es) to NORMAL per Section 4.2.4

Standard: Student determines this step should not be performed until channel no longer requires bypassing.

If this step is performed, then it becomes critical and is unsatisfactory.

Comment:

Student repeats section 4.2.1 for the second channel to be bypassed.

4.2.1.1 For I&C surveillances, **Refer To** I&C procedure Step 3.2 or 3.3.

Standard: Student marks this step as N/A

Comment:

---:

4.2.1.2 For the bistable(s) circled on Checklist 1 (2, 3, 4), **obtain** the SS authorization to bypass,. Document on Checklist 1 (2, 3, 4).

Standard: Student requests SS to sign the SS AUTH. Block on Checklist 2 for PB-936B or Checklist 3 for PB-935B if not obtained when bypassing the first channel.

Comment:

***4.2.1.3 Obtain the BTI Enable Key from the SS.**

Standard: Requests BTI enable key from the SS.

NOTE: Student may also request NSSS protection cabinet key if these panel doors are locked. These keys are held by the control room operators.

Comment:

Reviews precautions 2.1.1 and 2.1.2 as directed by a note in the procedure

Standard: N/A

Comment:

4.2.1.4 Except as noted in 2.1.1, **verify** no other channel NSSS AND BOP BTI Panels are in the bypass condition WHEN in Modes 1-4.

Standard: Requests a concurrent verification and Verifies only the NSSS GR II (III) annunciator window is lit and all BOP BTI annunciator windows are dark.

Comment:

Reviews NOTE prior step 4.2.1.5

4.2.1.5 On the BTI Panel on which bypassing is desired, **verify** all BTI switches are in the NORMAL position.

Standard: Verifies all switches on either BTI channel 2 or 3 panel are in the normal (down) position

Comment:

4.2.1.6 On the BTI NSSS Panel on which bypassing is desired:

a. Verify the circuit breaker is in the ON position,

AND

b. Verify power LED is illuminated.

Standard: Verifies BTI circuit breaker is on (upper portion of rocker switch in flush with panel) and the LED inside the switch is illuminated.

Comment:

Notes that ALB05-B02 (C02) NSSS PROT GR II (III) BYPASS alarm is expected in the following step

***4.2.1.7** **Perform the following:**

a. **Insert the BTI Enable Key in the Key Lock,**

b. **Place in the BYPASS ENABLE position,**

AND

c. Verify LED illuminates.

Standard: Inserts BTI key into the bypass enable switch for channel II (III) panel and rotates the switch clockwise. Verifies LED immediately above the bypass enable switch illuminates.

Comment:

4.2.1.8 **Verify** the annunciator for the applicable BTI NSSS Channel enabled illuminates:

NSSS PROT GR II BYPASS (ALB-05-B02)
OR
NSSS PROT GR III BYPASS (ALB-05-C02)

Standard: Verifies NSSS PROT GR II (III) BYPASS window is alarming

Comment:

4.2.1.9 **Notify** the SS that performance of the next step may require entry into one or more functional units of TS LCOs 3.3.1 AND/OR 3.3.2.

Standard: Notifies SS

Comment:

***4.2.1.10** **Place BTI NSSS Switch(es) circled in Step 4.2.1.1 to the BYPASS position. Document on Checklist 1 (2, 3, 4). (CV REQUIRED)**

Standard: Requests a concurrent verification and then moves toggle switch 34 for PB-936B (PB-935B) to the up position.

Comment:

4.2.1.11 **Verify** BTI Switch LEDs are illuminated for Switch(es) in the BYPASS position.

Standard: Request concurrent verification and verifies LED immediately above toggle switch 34 for PB-936B (PB-935B) is illuminated.

Comment:

4.2.1.12 For the channel bistable(s) bypassed on Checklist 1 (2, 3, 4), **verify** the TSLB(s) is extinguished.

Standard: Verifies TSLB 4, 10.2 (10.3) is extinguished.

Comment:

4.2.1.13 **Notify** SS to document the time of channel bypass in the Shift Supervisor Logbook.

Standard: SS notified to document time channel was bypassed.

Comment:

4.2.1.14 WHEN surveillance testing is complete OR plant conditions require, restore the BTI NSSS Channel Switch(es) to NORMAL per Section 4.2.4

Standard: Student determines this step should not be performed until channel no longer requires bypassing.

If this step is performed, then it becomes critical and is unsatisfactory.

Comment:

Terminating cue: Student returns initiating cue sheet

Verification of Completion

Job Performance Measure No. V-RQ-JP-13509-001

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: **While responding to a Loss of Heat Sink on Unit 1/2, Containment pressure reached the Hi-1 set point. The crew is preparing to establish feed water flow in accordance with step 19 of 19231-C.**

Initiating Cue: **The SS has directed you to "Bypass Containment Hi-1 pressure channels 1/2 - PB936B and 1/2 - PB935B by initiating 13509-C."**