NRC FINAL

Facility: E. I Hatch **Scenario No.:** 10-1 **Op-Test No.:** 2016-301

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions. Unit 2 is operating at 85% RTP. 2B21-F013D, SRV 2D, is inoperable for LLS, RAS written. RCIC is inoperable, RAS written. "A" Type Secondary Containment with both RF plugs removed.

Turnover: IAW 34SO-E51-001-2, unisolate RCIC and place in standby. 34SV-E51-001-2, RCIC Pump Operability, will be performed at the end of the next shift. After RCIC is placed in standby, increase Reactor power to 90% RTP using Recirc.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP)	IAW 34SO-E51-001-2, unisolate RCIC and place in standby.
2	N/A	R (ATC)	Raise Reactor power to 90% using Recirc.
3	mfB21_130F	I (BOP) TS (SRO)	SRV 2F (LLS) cycles open/close until fuses are pulled. (Critical Task)
4	mfC11_31A	C (ATC)	CRD Flow Control Valve 2A Failure
5	mfG31_242 EGT46-11 EGT46-12	C (BOP) TS (SRO)	Leak in Drywell requiring DW venting. First SBGT started will fail to start, must use opposite train to vent the Drywell.
6	mfB31_41A	C (ATC) TS (SRO)	Recirc Pump 2A High Vibration requiring reducing reactor power in an attempt to clear alarm. Alarm remains in until pump is tripped.
7	mfG31_242	M (ALL)	Leak worsens in Drywell causes High Drywell pressure scram.
8	diE11-F016A diE11-F016B	C (ATC)	RHR 2E11-F016A/B stuck closed requiring swapping to other loop of DW spray (Critical Task)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Appendix D **Scenario Outline** **Form ES-D-1**

NRC FINAL

Facility: **E. I Hatch** **Scenario No.:** **10-1** **Op-Test No.:** **2016-301**

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initiating Conditions:	Unit 2 is operating at 85% RTP. 2B21-F013D, SRV 2D, is inoperable for LLS, RAS written. RCIC is inoperable, RAS written. "A" Type Secondary Containment with both RF plugs removed.
Turnover	IAW 34SO-E51-001-2, unisolate RCIC and place in standby. 34SV-E51-001-2, RCIC Pump Operability, will be performed at the end of the next shift. After RCIC is placed in standby, increase Reactor power to 90% RTP using Recirc.

Summary:

- **Event 1:** Normal; IAW 34SO-E51-001-2, unisolate RCIC and place in standby.
- **Event 2:** Reactivity; The ATC will raise Reactor power to 90% RTP.
- **Event 3:** Instrument; SRV 2F (LLS) cycles open and close until fuses are removed. (**Critical Task**)
- **Event 4:** Component; The CRD FCV 2A will slowly fail causing a loss of CRD. The operator will take manual actions to swap FCV and return the CRD system to normal.
- **Event 5:** Component/TS; A leak in the Drywell causes DW pressure to increase. The team will receive a P603 alarm that will direct DW venting to be placed in service. BOP operator will attempt to start Standby Gas Treatment (SBGT). The first SBGT system the operator attempts to start will fail. The opposite SBGT train will then be started and DW venting will be aligned. The SRO will address TS for an inoperable train of SBGT.
- **Event 6:** Component/TS; Recirc Pump 2A will experience high vibration requiring reducing reactor power in an attempt to clear the alarm. Alarm remains in until pump is tripped. The SRO addresses TS for single loop operation. The plant will be operating in the Immediate Exit Region of the Power-to-Flow map. The ATC operator will insert control rods to exit the Immediate Exit Region of the P/F map.
- **Event 7:** Major; Pipe leak in Drywell worsens causing a High Drywell pressure scram.
- **Event 8:** Component; When Torus pressure exceeds 11 psig, the operator will attempt to spray the Drywell but one RHR DW spray valve will NOT open. The other loop of RHR will be used to spray the Drywell. The first DW spray valve attempted will NOT open but the other loop of RHR DW spray valve will work. (**Critical Task**)

Critical Tasks

NRC FINAL

Facility: E. I Hatch **Scenario No.: 10-1** **Op-Test No.: 2016-301**

Critical Tasks

- SRV 2F (LLS) valve cycles open/close and then remains open until the fuses are removed which will preclude a failure that will result in challenging Primary Containment integrity if manual action is not taken in a timely manner (prior to exceeding the BIIT curve) or challenge exceeding the Tech Spec cooldown rate limit. **(Event 3)**

- RHR 2E11-F016A (B) is stuck closed requiring the operator to swap to other loop of RHR to spray the Drywell while in the safe region of the Drywell Spray Initiation Limit (DSIL), prior to exceeding 340°F. **(Event 8)**

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	6	1. SRV 2F cycles open and closed **(Event 3)** 2. CRD FCV 2A failure **(Event 4)** 3. SBGT 2A(2B) failure **(Event 5)** 4. Recirc Pump 2A high vibration **(Event 6)** 5. RWCU pipe break LOCA **(Event 7)** 6. 2E11-F016A(B) fails to open **(Event 8)**
2.	Malfunctions After EOP Entry	1-2	1	1. 2E11-F016A(B) fails to open **(Event 8)**
3.	Abnormal Events	2-4	4	1. SRV 2F cycles open and closed **(Event 3)** 2. CRD FCV 2A failure **(Event 4)** 3. SBGT 2A(2B) failure **(Event 5)** 4. Recirc Pump 2A high vibration **(Event 6)**
4.	Major Transients	1-2	1	1. RWCU pipe break LOCA **(Event 7)**
5.	EOPs entered, requiring substantive actions	1-2	2	1. 31EO-EOP-010-2, RC (Non ATWS) **(Event 7)** 2. 31EO-EOP-012-2, PC **(Event 7)**
6.	EOPs contingencies requiring substantive actions	0-2	0	N/A
7.	EOP Based Critical Tasks	2-3	2	1. Remove fuses for SRV 2F **(Event 3)** 2. Spray the Drywell **(Event 8)**

ILT 10 NRC FINAL Scenario 1

SHIFT TURNOVER

target ZERO Every day, every job, safely.	**Safety Focus**
UNIT 1 STATUS	
Plant Conditions:	Unit 1 is operating at 100% RTP.
UNIT 2 STATUS	
Plant Conditions:	• Unit 2 is operating at 85% RTP. • RCIC has been isolated for maintenance. Maintenance is complete and RCIC is ready to be placed in Standby. • "A" Type Secondary Containment with both RF plugs removed.
Protected Train: ☐ Division I ☒ Division II	**EOOS:** ☒ Green ☐ Yellow ☐ Orange ☐ Red
Scheduled evolutions:	☐ IAW 34SO-E51-001-2, unisolate RCIC and place in standby. ☐ After RCIC is placed in standby, increase Reactor power to 90% RTP using Recirc (No fuel preconditioning limitations).
Surveillances due this shift:	☐ NONE; 34SV-E51-001-2, RCIC Pump Operability, will be performed at the end of the next shift.
Inop Equipment:	☐ 2B21-F013D, SRV 2D, is inoperable for LLS, RAS written ☐ RCIC, RAS written
Active tagouts:	☐ NONE
Rod Configuration:	☐ See RWM

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 1 Page 2 of 29

Event Description: IAW 34SO-E51-001-2, unisolate RCIC and place in standby.

Time	Position	Applicant's Actions or Behavior
10 Min	SRO	Directs BOP to unisolate RCIC and place in standby IAW 34SO-E51-001-2, RCIC System, starting at step 7.1.1.36.
		NOTE: *The RCIC Steam Line can be warmed and pressurized by performing either step 7.1.1.36.1 (2E51-F007)* *OR* *7.1.1.36.2 (2E51-F008).* *If the BOP chooses step **7.1.1.36.1**, (2E51-F007), then the following steps are applicable.*
	BOP	Pressurizing RCIC steam supply with 2E51-F007: • Confirm closed 2E51-F007, Steam Supply Isol Valve. • Opens 2E51-F008 Steam Supply Line Isol Valve. • Opens 2E51-F054 Steam Line Drain Valve. • Slowly throttles open 2E51-F007 Steam Supply Isol Valve. • Fully Opens 2E51-F007 when turbine steam inlet pressure (2E51-R602) is within 50 psig of reactor pressure on 2B21-R623A or B (P601 panel). • Confirms RCIC ISOLATION VLV F007/F008 NOT FULLY OPEN, (602-336) alarm clears. • Closes 2E51-F054, Steam Line Drain Valve, when alarm, RCIC TURBINE INLET DRAIN POT LEVEL HIGH, (602-308), clears. *NOTE: Alarm 602-308 is not expected to be in alarm due to RCIC out of service time.* • Completes Attachment 1 and notifies SRO to be verified.
	BOP	Notifies SSS to complete verification of Attachment 1.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 1 Page 3 of 29

Event Description: IAW 34SO-E51-001-2, unisolate RCIC and place in standby.

Time	Position	Applicant's Actions or Behavior
	BOP	***NOTE:*** *The RCIC Steam Line can be warmed and pressurized by performing either step 7.1.1.36.1 (2E51-F007)* *OR* *7.1.1.36.2 (2E51-F008).* *If the BOP chooses step **7.1.1.36.2**, (2E51-F008), then the following steps are applicable.*
		Pressurizing RCIC steam supply with 2E51-F008: • Confirm closed 2E51-F008, Steam Supply Line Isol Valve. • Opens 2E51-F007 Steam Supply Isol Valve. • Opens 2E51-F054 Steam Line Drain Valve. • Slowly throttles open 2E51-F008 Steam Supply Line Isol Valve. • Fully Opens 2E51-F008 when turbine steam inlet pressure (2E51-R602) is within 50 psig of reactor pressure on 2B21-R623A or B (P601 panel). • Confirms RCIC ISOLATION VLV F007/F008 NOT FULLY OPEN, (602-336) alarm clears. • Closes 2E51-F054, Steam Line Drain Valve, if RCIC TURBINE INLET DRAIN POT LEVEL HIGH, (602-308), was in alarm and clears, otherwise closes 2E51-F054. *NOTE: Alarm 602-308 is NOT expected to be in alarm due to RCIC out of service time.* • Completes Attachment 1 and notifies SRO to be verified.
	SRO	May notify SSS to complete verification of Attachment 1.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 2 Page 4 of 29

Event Description: Raise Reactor power to 90% using Recirc.

Time	Position	Applicant's Actions or Behavior
10 Min	SRO	• Directs ATC to increase reactor power to 90% by increasing Recirc flow. Power increases are NOT to exceed 10 MWe/min.
		***NOTE**: May get the RBM UPSCALE, (603-202) and ROD OUT BLOCK, (603-238) alarm, if a peripheral control rod is NOT selected. This is expected and the operator MAY select a peripheral rod at this time.* *MAY also get Alarm HEATER TROUBLE, (650-135), alarm. This is expected at this power level.*
	ATC	• IAW 34SO-B31-001-2 (step 7.1.5) & 34GO-OPS-005-2, the ATC increases Recirc pump speed, NOT to exceed 10 MWE per minute by depressing the RAISE SLOW or RAISE MEDIUM pushbuttons on the Master (P603 panel) or Individual controls (P602 panel) until reactor power is 90%. • If using Individual Controls, pump speed increases will alternate between the "A" & "B" Recirc pumps to prevent excessive flow mismatches. • Monitors power increase by observing APRM and generator output indications.
	ATC	• Complies with 34SO-B31-001-2 , Limitation 5.2.15, which states: WHEN changing Recirc pumps speed while in Two Loop operation maintain pump speeds to limit recirculation loop jet pump mismatch within the following limits: • <10% of rated core flow (7.7 E6 lbm/hr) WHEN operating < 70% of rated core flow; AND • <5% of rated core flow (3.85 E6 lbm/hr) WHEN operating at > 70% of rated core flow.
	ATC	Notifies the SRO that reactor power has been increased to 90%.
		Simulator Operator, at the Chief Examiners direction OR after power has been increased to 90%, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 3 Page 5 of 29

Event Description: SRV 2F (LLS) cycles open/close until fuses are pulled.

Time	Position	Applicant's Actions or Behavior
10 Min		*Simulator operator: At the Chief Examiner's direction, INSTRUCT the ATC operator by phone to stay on the line until told to hang up, then ENTER (**RB-3**) mfB21_130F, Main Steam Relief Valve Fails Open.* *ENSURE Event Trigger **EGB21-12** ACTIVATES. This SRV will cycle such that it is open for 15 seconds, then stays closed for 45 seconds, then repeats this cycle for 5 minutes or until fuses for SRV 2F are removed. After 5 minutes, the SRV will fail open if fuses are not pulled.*

	ALL	• Receive alarms:
		  • SAFETY/BLOWDOWN VALVE LEAKING, (603-122)
		  • SAFETY BLOWDOWN PRESSURE HIGH, (602-311)

	SRO	Directs operator to enter 34AB-B21-003-2, Failure of Safety/Relief Valves • Enters a RAS for TS LCO 3.6.1.6, Condition A, for 2 or more LLS valves inop, which requires the unit to be in mode 3 in 12 hours and mode 4 in 36 hours.

	BOP	• Enters 34AB-B21-003-2, Failure of Safety/Relief Valves
		  • Determines SRV 2F is cycling open then close.
		  • Cycles the SRV 2F Control Switch several times.
		  • May depress the ADS Logic A Timer Reset pushbutton (2B21-S2A).
		  • May depress the ADS Logic B Timer Reset pushbutton (2B21-S2B).
		  • Depresses the LLS Channel A / C Reset pushbutton (2B21-S15A).
		  • Depresses the LLS Channel B / D Reset pushbutton (2B21-S15B).
		  • Informs SRO that SRV 2F is cycling and the fuses will have to be removed for the valve.
		  • Notifies the SSS to remove the fuses for SRV 2F. **(Critical Task)**

	BOP	Receives DRYWELL/TORUS RCDR R627 TEMP HIGH, (650-204) alarm
		  • Determines Torus Water Temp (Point 2) is high at 98°F
		  • When the SRV is closed Point 2 starts decreasing.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 3 Page 6 of 29

Event Description: SRV 2F (LLS) cycles open/close until fuses are pulled.

Time	Position	Applicant's Actions or Behavior
		*Simulator Operator, if requested to remove fuses for SRV 2F, wait 4 minutes, then DELETE mfB21_130F, 2F LLS Valve or Scenario **EGB21-12**, then ENTER (**RB-1**), rfB21_305, to simulate removing the fuses for SRV 2F.* *Then, NOTIFIES the crew that the fuses have been removed for SRV 2F.*

	BOP	• Confirms that SRV 2F is closed by monitoring one or more of the following:
		  • SRV tailpipe temperature decreasing (Panel 2H11-P614).
		  • Torus water level increase has stopped.
		  • Torus temperature increase has stopped.
		  • Reactor and Generator power return to the pre-event level.
		  • Resets the SRV leak detection by placing the Leak Detection Logic A Reset keylock switch and Leak Detection Logic B Reset keylock switch to Reset position and back to Normal position.
		  • Confirms that the Amber SRV indicating lights have Extinguished.
		  • SAFETY BLOWDOWN PRESSURE HIGH, (602-311), clears.
		  • Informs the SRO that SRV 2F is closed.

	SRO/ BOP	Informs the crew that operability of the suppression chamber-drywell vacuum breakers must be performed within 12 hours per 34SV-T48-002-2, Suppression Chamber To Drywell Vacuum Breaker System Operability. Notifies Chemistry and initiates a CR to initiate increased monitoring of vessel moisture content carryover per 64CH-SAM-025-0. Notifies the Shift Manager to make appropriate notifications for the failed SRV.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 3 Page 7 of 29

Event Description: SRV 2F (LLS) cycles open/close until fuses are pulled.

Time	Position	Applicant's Actions or Behavior
		NOTE: *If Torus temperature exceeds 95°F, then the following steps will be done to place Torus Cooling in service.* *At this time, Torus temperature will still be below 95°F, therefore RHR is NOT required to be placed into Torus Cooling. The SRO may elect to place Torus Cooling in service, since steam was admitted to the Torus.* *The following steps are written **IF** the SRO elects to place Torus Cooling in service.*
		NOTE: *The operator may place torus cooling in service by using the Placard that's available or using the appropriate section of the procedure. These steps assume the Placard is used. The A or B loop of RHR may be used. The following steps are written assuming "B" loop and "B" pump is used. If "A" loop is used, substitute "A" for "B" for valves and if "B" pump is not used substitute "A", "C", or "D" for "B" pump.*
	BOP	• Enters 34SO-E11-010-2, Residual Heat Removal • Places RHRSW in service • Prelube RHRSW pump. • Overrides 2E11-F068B Low Discharge Pressure Interlock. • Positions 2E11-F068B to 45% OPEN. • Starts RHRSW pump B. • Places 2E11-F068B Low Discharge Pressure Interlock switch to normal position. • Positions 2E11-F068B to obtain < 4400 gpm AND < 450 psig.
	BOP	• IF desired to start a SECOND RHRSW pump, • Throttles 2E11-F068B to achieve max flow rate (not to exceed 4400 GPM). • Opens 2E11-F068B an additional 5%. • Starts second RHRSW Pump. • Positions 2E11-F068B to obtain < 8800 gpm AND < 450 psig.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 3 Page 8 of 29

Event Description: SRV 2F (LLS) cycles open/close until fuses are pulled.

Time	Position	Applicant's Actions or Behavior
	BOP	• Places RHR B Loop in Torus cooling per the placard by performing the following steps: • Opens 2E11-F048B. • Closes 2E11-F047B. • Opens 2E11-F003B. • Starts RHR Loop B pump • Receives alarm, RHR LOW FLOW, (601-222). • Opens 2E11-F028B. • Receives alarm, AUTO BLOWDOWN CS OR RHR PRESS PERMISSIVE, (602-312). • Receives alarm, SEC SYSTEM AUTO INITIATION SIGNAL PRESENT, (650-234). • Throttles OPEN 2E11-F024B. • Alarm, RHR LOW FLOW, (601-222), clears. • Opens 2E11-F047B. • Ensures RHR flow is < 11,500 GPM, THEN Closes 2E11-F048B. • Notifies the SRO that RHR "B" loop is in service. • May place the second pump in service.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 4 Page 9 of 29

Event Description: CRD FCV 2A Slow Failure; Places standby FCV in service

Time	Position	Applicant's Actions or Behavior
12 Min		*Simulator operator: At the Chief Examiner's direction, ENTER (**RB-4**) mfC11_31A, CRD Flow Control Valve Failure.*
	ALL	• Receives the following annunciator: • CRD HYDRAULIC TEMP HIGH, (603-140).

	ATC	• Determines that the CRD Flow Control Valve A has failed closed.
		• Notifies SRO that the CRD Flow Control Valve A has failed closed.
		• Enters:
		  • CRD HYDRAULIC TEMP HIGH, (603-140).
		  • 34AB-C11-001-2, Loss of CRD System.

		***NOTE**: With the loss of the CRD FCV, the ATC may FIRST address 34AB-C11-001-2, Loss of CRD System.*
	SRO	• Dispatches a SO & Maintenance to investigate the cause of the FCV failing closed. • Directs the operator to perform actions per the ARP and 34AB-C11-001-2, Loss of CRD System. • May direct operator to swap Flow Control Valves at this time, or may wait for report from SO, before ordering the swap.
	ATC	• IAW CRD HYDRAULIC TEMP HIGH, (603-140): • Dispatches a SO to monitor CRD temperatures locally at 2C11-R018 (130 Rx Bldg).

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 4 Page 10 of 29

Event Description: CRD FCV 2A Slow Failure; Places standby FCV in service

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, wait 2 minutes and report, as SO at the FCV, that the FCV has failed closed due to an air leak on the supply line, and that you have isolated the air line and stopped the leak. *Simulator Operator, IF/WHEN requested and if CRD HYDRAULIC TEMP HIGH is illuminated, as the SO checking CRD temps, report that 2 CRD drives are >250°F; 30-11 and 22-35 at 260°F and some others are slowly increasing.*
	SRO	Directs operator to shift Flow Control Valves

	ATC	• Enters 34SO-C11-005-2, CRD Hydraulic System, section 7.1.6, to shift Flow Control valves:
		  • Confirms 2C11-R600 is in AUTO.
		  • Directs the SO to locally shift CRD FCV to B IAW step 7.1.6.1.2 through 7.1.6.1.9.

		*Simulator Operator, ENTER (**RB-2**) rfC11_24, CRD Flow Control F002 to "B", then as the SO, report that the CRD FCV's have been shifted locally.*
		Simulator Operator, If asked, as SO, INFORMS ATC that local controller is in Automatic.

	ATC	• Returns CRD System to normal configuration:
		  • Places 2C11-R600 to MANUAL.
		  • Adjusts 2C11-R600 to desired flow (~50 gpm).
		  • Places 2C11-R600 to AUTO.
		  • Confirms system parameters are normal.

	ATC	• CRD HYDRAULIC TEMP HIGH, (603-140) alarm clears. • Reports to SRO that CRD flow control valves have been shifted and the CRD System has been restored to normal configuration.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 5 Page 11 of 29

Event Description: Leak in Drywell requiring DW venting. First SBGT started will fail to start, must use opposite train to vent the Drywell.

Time	Position	Applicant's Actions or Behavior
10 Min		*Simulator operator: At the Chief Examiner's direction, ENTER (**RB-5**) mfG31_242, RWCU Non-Isol Leak in Drywell (final 0.02, ramp 100).*
	ALL	Recognizes increasing Drywell Pressure from the following alarm: • PRIMARY CNMT PRESSURE HIGH, (603-115).
	SRO	• Directs an operator to enter 34AB-T23-002-2, Small Pipe Break Inside Primary Containment. • When venting is required; Directs the BOP to vent the drywell with BOTH loops of CAD.
		Simulator Operator, if asked to perform 34SV-SUV-019-2, Leakage Determination, INFORM that you will get another operator to perform the determination and will contact you back later for assistance.
	ATC	• IAW 34AB-T23-002-2, performs the following using Placard: • Trips RWCU Pump "2B". • Places control switch for 2G31-F001 to close. • Places control switch 2G31-F004 to the close. • Enters 34AB-G31-001-2, RWCU System Isolation. • Notifies SRO of conductivity monitoring requirements of TRM T3.4.1.
		***NOTE**: EVENT TRIGGERS **EGT46-11** & **EGT46-12** will INSERT overrides to keep the first SBGT fan from starting and then remove the event trigger from the opposite SBGT train. The applicant will not be successful with the first SBGT train; however, the second SBGT train will work.*

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 5 Page 12 of 29

Event Description: Leak in Drywell requiring DW venting. First SBGT started will fail to start, must use opposite train to vent the Drywell.

Time	Position	Applicant's Actions or Behavior
	BOP	• Enters 34SO-T48-002-2, Containment Atmosphere Dilution System or uses placard to vent the Drywell. • Enters 34SO-T46-001-2, Standby Gas Treatment System, procedure or uses placard to start SBGT 2A or 2B. • Opens 2T46-F001 (A or B) and/or 2T46-F003 (A or B). • Places SBGT Fan (A or B) control switch to "RUN. • Receives alarm 2B (OR 2A) SBGT SWITCH NOT IN AUTO, (654-076) or (657-091). • Determines that the first SBGT fan will not start. • At this time, may inform SRO that SBGT (A or B) cannot be started or may wait until other SBGT is in service (either is acceptable).
	BOP (Placard)	• Vents with the opposite train of SBGT per 34SO-T46-001-2 SBGT System procedure or uses placard. • Opens 2T46-F001 (A or B) and/or 2T46-F003 (A or B) for the subsequent train. • Places SBGT Fan (A or B) control switch to RUN. • Receives alarm 2B (OR 2A) SBGT SWITCH NOT IN AUTO, (654-076) or (657-091). • Confirms 2T46-F002 (A or B) OPENS. • Confirms SBGT Heater red light illuminates.
	BOP (Placard)	• Opens 2T48-F334A or 2T48-F334B (both valves may be opened) • Receives alarm DW VENT EXH BYPASS VLV OPEN, (654-002) or (657-008). • Receives alarm DRWL/TORUS N_2 M/U 2 INCH ISOL VALVES OPEN, (654-035) or (657-042). • Opens 2T48-F335A or 2T48-F335B (both valves may be opened). • Opens 2T48-F336A or 2T48-F336B. (both valves may be opened). • Monitors DW pressure. • Notifies SRO DW venting is in progress and of the SBGT failure (if not notified previously).

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 5

Event Description: Leak in Drywell requiring DW venting. First SBGT started will fail to start, must use opposite train to vent the Drywell.

Time	Position	Applicant's Actions or Behavior
	SRO	• Reviews TS 3.6.4.3, Standby Gas Treatment System. • IAW TS 3.6.4.3 Condition B, • Declares SBGT fan A or B inoperable, • Must restore SBGT fan A or B to operable status within 7 days AND 30 days from discovery of failure to meet the LCO. • Direct that maintenance be contacted to determine problem with failed SBGT fan. • IAW TRM T3.4.1 if RWCU is isolated performs conductivity monitoring requirements.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 6 Page 14 of 29

Event Description: Recirc Pump 2A High Vibration requiring reducing reactor power in an attempt to clear alarm. Alarm remains in until pump is tripped.

Time	Position	Applicant's Actions or Behavior
18 Min		*Simulator operator: At the Chief Examiner's direction, contact BOP and as Chemistry REQUEST Off-Gas Flow, and then ENTER (**RB-6**) mfB31_41A, Recirc Pump A High Vibration.*
	ALL	• Receives the following annunciator: • RECIRC PUMP A HIGH VIBRATION, (602-104)
		Simulator operator: If dispatched to the ASD locally, wait two minutes and report, as SO, that you have not found anything yet, but will continue monitoring.

	ATC	• IAW RECIRC PUMP A HIGH VIBRATION, (602-104):
		  • Depresses the High vibration reset pushbutton and determines that the alarm does NOT clear.
		  • Notifies the SRO that the vibration alarm did NOT clear.
		  • Notifies the SRO that the ARP requires reducing Recirc flow UNTIL the alarm will clear when the reset pushbutton is depressed.

	SRO	• Directs the operator to reduce Reactor Power with Recirc flow per 34GO-OPS-005-2 and 34SO-B31-001-2, section 7.1.6, Two Loop Operation From Rated To Minimum Speed. • Notifies Plant Management, Load Dispatcher, and Engineering that Recirc Pump 2A is experiencing a high vibration condition.
		***NOTE**: IAW 34GO-OPS-005-2, Power Changes, Limitation 5.2.3, entry into the Immediate Exit Region is ALLOWED during a manual OR automatic power reduction initiated in response to an equipment problem.*
		***NOTE**: IAW 34GO-OPS-005-2, Power Changes, a rapid power reduction may be performed at a rate > 10 MWE/min to put the plant in a safe condition.*

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 6

Event Description: Recirc Pump 2A High Vibration requiring reducing reactor power in an attempt to clear alarm. Alarm remains in until pump is tripped.

Time	Position	Applicant's Actions or Behavior

	ATC	• IAW 34GO-OPS-005-2, Power Changes:
		  • Decreases Recirc Pump speed per 34SO-B31-001-2, Reactor Recirc System.
		• IAW 34SO-B31-001-2, Reactor Recirc System:
		  • Decreases Recirc pump speed by depressing the desired LOWER pushbuttons on the Master or Individual controls.

	ATC	• Periodically stops the power reduction and depresses the High vibration reset pushbutton. • Monitors power decrease by observing APRM and generator output indications. • Notifies SRO when BOTH Recirc Pump speeds are at minimum. • Notifies the SRO that the vibration alarm DID NOT clear after reducing BOTH Recirc pumps. • Notifies SRO of entering Region of Potential Instabilities/Immediate Exit Region of Power to Flow Map.
		***NOTE**: RECIRC PUMP A HIGH VIBRATION, (602-104) will NOT remain clear UNTIL the 2A Recirc Pump is tripped.*
	BOP	IAW 34GO-OPS-005-2, Power Changes, Step 5.2.14, notifies Chemistry of 15% power change in 1 hour.
		***NOTE:** HEATER TROUBLE ALARM, (650-135) may alarm due to plant conditions.* ***NOTE:** 15% power change sample required IAW 34GO-OPS-005-2, Limitation 5.2.14.*

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 6 Page 16 of 29

Event Description: Recirc Pump 2A High Vibration requiring reducing reactor power in an attempt to clear alarm. Alarm remains in until pump is tripped.

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs the ATC operator to shutdown ASD A IAW 34SO-B31-001-2, section 7.2.1.3, Abnormal Recirc Pump/ASD A Shutdown. • As time allows, directs the BOP operator to secure one Condensate and one Condensate Booster Pump plus one RFPT.

	ATC	• IAW 34SO-B31-001-2, Reactor Recirc System:
		  • Places ASD A control switch 2B31-S002A to Pull to Lock.
		  OR
		  depresses the ASD A Shutdown pushbutton and places ASD A control switch to Pull to Lock on panel 2H11-P602.
		• Enters 34AB-B31-001-2, Reactor Recirculation Pump(s) Trip, Recirc Loops Flow Mismatch, Or ASD Cell Bypass, for single Recirc pump trip.
		  • Closes 2B31-F031A, Pump Discharge Valve.
		  Time: _____
		  • After 4-5 minutes, throttles 2B31-F031A, Pump Disch Valve OPEN.
		  Time: _____

	ALL	• Receives the following annunciators:
		  • ASD A TRIP WARNING, (602-101).
		  • ASD A FATAL FAULT, (601-102).
		  • ASD A TROUBLE, (601-108).
		  • RECIRC LOOP A OUT OF SERVICE, (601-127).

		NOTE: *IAW 34AB-B31-001-2, During single loop operation, WHEN the speed of the running pump decreases below approximately 35% speed, positive flow through the idle pump loop due to natural circulation overcomes the negative flow due to reverse flow. The total core flow summing circuitry will continue to subtract this positive idle loop flow from the running loop flow AND give a misleading LOW core flow indication. Total core flow can be calculated by adding the JET PUMP LOOP "A" AND the JET PUMP LOOP "B" flows.*

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 6

Event Description: Recirc Pump 2A High Vibration requiring reducing reactor power in an attempt to clear alarm. Alarm remains in until pump is tripped.

Time	Position	Applicant's Actions or Behavior
	ATC	• Determines that the plant is in the Immediate Exit Region of the Power to Flow map.
		NOTE: *IF the crew makes the decision to SCRAM the Reactor, at the Chief Examiners direction, PROCEED to the MAJOR EVENT.*
		EXAMINER NOTE: *Log time when Region of Instabilities/Immediate Exit Region has been ENTERED.* ***Time:*** _____
		NOTE*: IAW 34GO-OPS-005-2, Power Changes, Limitation 5.2.3.1:* *If the 'Region Of Potential Instabilities' (RPI) is entered, IMMEDIATELY initiate actions to exit the (RPI), to return operation to the Analyzed Region of the Power/Flow Map outside of the RPI.* *If the Immediate Exit Region is entered, within 5 minutes the operators are to initiate control rod movement to return to the Analyzed Region.* *Operation within the Analyzed Region AND outside of the RPI must be restored within 1 hour.*
	SRO	• Directs ATC operator to insert rods to exit the RPI and Immediate Exit Region to return operation to the Analyzed Region of the Power/Flow Map. • References Tech Spec 3.4.1.A.1 and has 24 hours to meet requirements for Single Loop Operation.
		NOTE: *RBM Downscale alarm may alarm during this movement due to the significant rod worth of these rods. The RBM Downscale and Rod Out Block alarms may be flagged.*

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 6

Event Description: Recirc Pump 2A High Vibration requiring reducing reactor power in an attempt to clear alarm. Alarm remains in until pump is tripped.

Time	Position	Applicant's Actions or Behavior

	ATC	• Inserts control rods per 34GO-OPS-065-0, Control Rod Movement:
		  • Inserts control rods per the Reactivity Briefing Sheet and rod pull sheets.
		  • Selects first Rod to be inserted Group 45 26-11.
		  • Places Control Rod movement switch to the IN position.
		  • Verifies Rod moves using Rod display information and Rx and Generator power decreasing.
		  • Releases Rod movement switch so that the control rod stops 1 position before the insert limit, unless the insert limit is 00.
		  • Initials Rod movement Sheet.
		  • Verifier, if available, Initials Rod movement sheet.
		  • Notifies the SRO when they are out of the RPI.
		• If required, adjust 2C11-F003 to get 220 – 280 psid drive water dp

		EXAMINER NOTE: *Log time when Region of Instabilities/Immediate Exit Region has been EXITED.* ***Time****:* _____
		NOTE: *AFTER Control Rods are being inserted, at the Chief Examiners direction, PROCEED to the MAJOR EVENT.*

	BOP	• May remove condensate pumps (CP & CBP) from service prior to CBP discharge pressure < 525 psig OR power <70% OR as soon as practical.
		  • For removal of CBP:
		  • If 2C is to be removed, removes the Hydrogen Injection System from service.
		  • Sends SO to closed selected pumps discharge valve.
		  • Prior to discharge valve being full closed, trips pump and places control switch in Auto or PTL.
		  • Has SO complete the procedure.
		  • For removal of CP:
		  • Sends SO to closed selected pumps discharge valve.
		  • Trips pump and places control switch in Auto or PTL.
		  • If pump left in Standby, has SO reopen discharge valve.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 6 Page 19 of 29

Event Description: Recirc Pump 2A High Vibration requiring reducing reactor power in an attempt to clear alarm. Alarm remains in until pump is tripped.

Time	Position	Applicant's Actions or Behavior
		NOTE: *IAW 34GO-OPS-005-2, WHEN Feedwater flow is less than 7 mlbm/HR AND two Reactor Feed Pumps are running, one Reactor Feed Pump MAY be shutdown*
	BOP	Enters 34SO-N21-007-2, Condensate And Feedwater System, section 7.2.1, First Reactor Feed Pump Shutdown and Leaving in Standby. • Confirms Feedwater Flow is less than 7 Mlbm/hr. • Confirms RFPT 2A AND RFPT 2B are in Automatic control on 2C32-R600, Master Controller. • Places 2C32-R601A (2C32-R601B), RFP A (B) M/A Station, in Manual, by depressing the 'M' pushbutton until it illuminates, panel 2H11-P603. • Slowly decrease RFPT 2A (2B) speed with RFP A (B) M/A Station until the other RFP is controlling RWL.
		NOTE: *At this point the operator may stop here with the RFPT NOT injecting and continue with this section as time allows.*
	BOP	• When the other RFP has control of water level, slowly decrease RFPT 2A (2B) speed with RFP A (B) M/A Station until no speed decrease is observed AND/OR place the RFPT A (B) TMR switch to SS AND confirm Speed Setter yellow light illuminates. • Slowly lower RFPT 2A (2B) Speed Setter switch until RFPT speed is at 1000 rpm, at 2H11-P650. • IF desired, reduce the RFPT 2A (2B) speed to minimum AND allow the RFPT to “windmill”, provided seal water, steam seals, AND lube oil systems remain in service.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the MAJOR EVENT.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 7

Event Description: Leak worsens in Drywell causes High Drywell pressure scram

Time	Position	Applicant's Actions or Behavior
10 Min		*Simulator Operator, at the Chief Examiners direction, MODIFY mfG31_242, RWCU Non-Isol Leak in Drywell:* • *Final 1.0* • *Ramp 1000*
	ALL	Recognizes increasing Containment Pressure from the following alarms: • PRIMARY CNMT HIGH PRESSURE TRIP, (603-106). • PRIMARY CNMT PRESSURE HIGH, (603-115). • DRYWELL PRESSURE HIGH, (602-210).
		NOTE: *The SRO may direct the BOP to vent the Drywell, but there will NOT be time to complete the task before the LOCA signal is received.*
	SRO	• With Drywell pressure increasing and alarms PRIMARY CNMT PRESSURE HIGH, (603-115) and DRYWELL PRESSURE HIGH, (602-210), alarms being received, directs the ATC enter 34AB-C71-001-2, Scram Procedure, and Scram the reactor. • Assigns the ATC to perform RC-1. • Assigns the BOP operator to perform RC-2 and RC-3. • Enters 31EO-EOP-010-2, RC (Non ATWS) &31EO-EOP-012-2, PC Control, EOP flow charts.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 7

Event Description: Leak worsens in Drywell causes High Drywell pressure scram

Time	Position	Applicant's Actions or Behavior
		*Simulator Operator, WHEN the reactor is scrammed, ENSURES EVENT TRIGGER **EGC71-12** MODIFIES mfG31_242 Final to 1.5 with a ramp of 1000 AFTER 180 seconds.*

	ATC	• Performs RC-1 consisting of:
		  • Inserts a manual scram.
		  • Places the mode switch to SHUTDOWN.
		  • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display.
		  • Notifies SRO of rod position check.
		  • Places SDV isolation valve switch to "isolate" & confirms closed.
		  • If NOT tripped, places the Recirc pumps at minimum speed.
		  • Inserts SRMs and IRMs.
		  • Shifts recorders to read IRMS, when required.
		  • Ranges IRMS to bring reading on scale.
		  • Notifies the SRO when the above actions are complete.

	BOP	• Performs RC-2 actions consisting of:
		• Confirms proper Level Control response:
		  • Checks ECCS Injection Systems and secure as necessary.
		  • Ensures FW Master Controller setpoint reduces to 9 inches and output reduces to 25% of previous value.
		  • IF set down does NOT auto function, then manually reduces FW Master Controller setpoint to approximately 9 inches.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 7

Event Description: Leak worsens in Drywell causes High Drywell pressure scram

Time	Position	Applicant's Actions or Behavior

	BOP	• Controls HPCI operation for level control by performing one or more of the following:
		  • Adjusts 2E41-R612, HPCI Flow Control, to the desired injection rate.
		  • Transfers the flow controller to manual and adjust its speed demand output to obtain the desired pump flow.
		  • Shutdown HPCI by:
		  • Depresses and holds the HPCI Turbine Trip pushbutton.
		  • When HPCI turbine has stopped, places 2E41-C002-3, HPCI Aux Oil Pump, in Pull-To-Lock.
		  • When HPCI TURBINE BRG OIL PRESS LOW alarm is received, releases the HPCI Turbine Trip push-button..

	BOP	• When feed flow is less than the capacity of the S/U level control valve (≈ 1.5 mlbm/hr), then:
		  • Opens 2N21-F125.
		  • Confirms 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches.
		  • Closes 2N21-F110.
		  • May attempt to restart the CRD pumps.
		  • May attempt maximize CRD flow IAW 34SO-C11-005-2.
		  • Controls RWL with the HPCI/FW System.
		  • Notifies SRO if RWL gets outside assigned band.

		NOTE to EXAMINER: *SRVs actuate in LLS at 1120 psig and then control pressure between 850 - 990 psig.*

	BOP	• Performs RC-3 consisting of:
		  • Monitors RPV pressure.
		  • If necessary, allows RPV pressure to exceed 1074 psig then cycles any SRV to initiate LLS.
		  • If necessary, verifies LLS actuates at 1120 psig
		  • Maintains RPV Pressure between 1074 and 800 psig.
		  • Notifies SRO of pressure control system operation.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 7

Event Description: Leak worsens in Drywell causes High Drywell pressure scram

Time	Position	Applicant's Actions or Behavior
		NOTE: *The SRO may select a RPV pressure band which will lower the driving head of the leak while maintaining <100°F/hr RPV cool down (typically between 500 psig & 920 psig).*
	SRO	As time allows, may; • Direct the ATC to decrease reactor pressure to reduce the driving head of the leak using EHC pressure set. • Remove RWCU from service IAW 34AB-T23-002-2, Small Pipe Break in Primary Containment.
	ATC	Enters Attachment 11 of 34SO-N30-001-2, Main Turbine, or 34GO-OPS-013-2, Normal Plant Shutdown, and at the DEHC panel computer, performs ONE of the following: 1. Throttle Pressure Set • Selects the **Control** → **psi- load** screen. • Selects the *Ramp Rate* button. • Enters a ramp rate. • Selects the *Pressure* button. • Enters desired target pressure. 2. Bypass Valve Jack Positioning. • **Control** BPV position by intermittently using the ***Raise*** / ***Lower*** buttons until BYPASS VALVE JACK STATUS changes to ***ACTIVE*** AND desired cooldown rate is established.
	ATC	Notifies the SRO that RPV Pressure is at the target psig.
		Simulator Operator PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 8

Event Description: RHR 2E11-F016A/B stuck closed requiring swapping to other loop of DW spray

Time	Position	Applicant's Actions or Behavior
	SRO	• Per the PC flowchart, verifies Torus level is <285 inches and directs an operator to place Torus Sprays in service.
	ATC	• Sprays the Torus per 34SO-E11-010-2 placard on the 2H11-P601 Panel as follows: • Places Cnmt Spray Vlv Cntl switch in the MANUAL position. • Starts RHR pump(s) in loop A/B, if NOT already running. • Opens 2E11-F028A/B. • Throttles Open 2E11-F027A/B. • Notifies SRO that RHR is in Torus Sprays.
		NOTE: *Only one loop of RHR will be placed in Torus Sprays. The flow is only 700 gpm.*
		Simulator Operator, ENSURE Event Triggers ***EGE11-4*** *&* ***EGE11-5*** *is ACTIVATED when the operator positions 2E11-F016A or B to open.*
	SRO	• When Torus pressure exceeds 11 psig, verifies that Torus Level is <215 inches, in the safe area of Graph 8 (DWSIL) and directs an operator to: • Place all DW cooling fans to OFF. • Place both Recirc pumps to PTL OFF.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 8 Page 25 of 29

Event Description: RHR 2E11-F016A/B stuck closed requiring swapping to other loop of DW spray

Time	Position	Applicant's Actions or Behavior
	ATC	• Places both Recirc pumps to PTL OFF on panel 2H11-P602. • Places the following DW cooling fans control switches to OFF on panels 2H11-P654 & P657: • 2T47-B007B, Drywell Cooling Top Head Area Unit. • 2T47-B008B, Drywell Cooling Pedestal/Annular Area Unit. • 2T47-B009B, Drywell Cooling Recirc Pump Area Unit. • 2T47-C001B, Drywell Cooling Return Air Fan. • 2T47-C002B, Drywell Cooling Return Air Fan. • 2T47-B010B, Drywell Cooling EL 114 Unit. • 2T47-B007A, Drywell Cooling Top Head Area Unit. • 2T47-B008A, Drywell Cooling Pedestal/Annular Area Unit. • 2T47-B009A ,Drywell Cooling Recirc Pump Area Unit. • 2T47-C001A, Drywell Cooling Return Air Fan. • 2T27-C002A, Drywell Cooling Return Air Fan. • 2T47-B010A, Drywell Cooling EL 114 Unit.
	SRO	• When all DW cooling fans are OFF AND both Recirc pumps are PTL OFF: • Directs an operator to spray the Drywell.

	ATC	• Sprays the Drywell per 34SO-E11-010-2 placard on the 2H11-P601 Panel as follows:
		  • Places Cnmt Spray Vlv Cntl switch in the Manual position.
		  • Starts RHR pump(s) in loop A (B), if NOT already running.
		  • Opens 2E11-F021A or B.
		  • Opens 2E11-F016A or B (ONE WILL NOT OPEN AND OPERATOR TRANSITIONS TO THE OTHER LOOP).
		  • Informs SRO that the 2E11-F016A (or B) will NOT Open.
		
		  • Opens 2E11-F021A or B.
		  • Throttles Open 2E11-F016A(B) to ≥5000 gpm. **(Critical Task)**
		  • Confirms Drywell pressure is reducing.
		  • Notifies SRO that RHR is in Drywell Sprays.

Op-Test No.: 2016-301 **Scenario No.:** 10-1 **Event No.:** 8 Page 26 of 29

Event Description: RHR 2E11-F016A/B stuck closed requiring swapping to other loop of DW spray

Time	Position	Applicant's Actions or Behavior
	BOP	Notifies the SSS to perform actions for RHR per 31EO-EOP-114-2. IAW 31EO-EOP-114-2, the operator performs the following: • CLOSES RHR OUTBD INJ VLV, 2E11-F017A. • CLOSES RHR OUTBD INJ VLV, 2E11-F017B. • Notifies SSS to OPEN links & INSTALL jumpers for 2E11-F017A. • Notifies SSS to OPEN links & INSTALL jumpers for 2E11-F017B. • Confirms/CLOSES RHR OUTBD INJ VLV, 2E11-F017A. • Confirms/CLOSES RHR OUTBD INJ VLV, 2E11-F017B. • Confirms/CLOSES INBD DISCHARGE VLV, 2E21-F005A. • Confirms/CLOSES INBD DISCHARGE VLV, 2E21-F005B. • Trips Core Spray pump A, 2E21-C001A. • Trips Core Spray pump A, 2E21-C001B. Notifies SRO 31EO-EOP-114-2 actions for RHR & CS are complete.
	SRO	• As time allows, directs H2/O2 Analyzers placed in service IAW 34SO-P33-001-2.
	ATC	• If directed, places H_2/O_2 Analyzers in service IAW 34SO-P33-001-2 or "Placard" by performing the following at 2H11-P700 panel: • Confirms closed 2P33-F605. • Places 2P33-S16, LOCA Override to 'Bypass." • Places 2P33-S17, LOCA Override to 'Bypass." • Confirms analyzers are running by either red analyzer lights illuminated or values indicated on the Primary Display of SPDS. • If analyzers red light is off, depresses Channel A and Channel B Reset pushbuttons on 2H11-P700 panel. • Notifies SRO H_2/O_2 Analyzers are running.
		With Chief Examiners Permission, the scenario should be terminated when the crew has sprayed the Drywell with the other Loop of RHR.

NRC FINAL

Facility: E. I Hatch **Scenario No.:** 10-2 **Op-Test No.:** 2016-301

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions. Unit 2 is operating at 100% RTP. 2B21-F013D, SRV 2D, is inoperable for LLS, RAS written.
Turnover: IAW 34SO-N62-001-2, swap Cooler Condensers from 2N62-B003A to 2N62-B003B, starting at step 7.2.2. System has been aligned for 15 minutes. Once complete, lower Reactor power to ~95% RTP to support Turbine Testing.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP)	Swap Cooler Condensers from 2N62-B003A to 2N62-B003B IAW 34SO-N62-001-2, starting at step 7.2.2.
2	N/A	R (ATC)	Lower reactor power to ~95% RTP using Recirc
3	aoN40R600 mf65111604 mf65111605	C (BOP)	UAT 2B Hi temp/lower reactor power/swap house loads/remove from service
4	mf65021482 (ON) mfP41_292	C (ATC) TS (SRO)	2B PSW pump overload – manually trip 2B PSW pump & start 2D PSW pump.
5	mf65702215	C (BOP)	RF Vent Filter 2T41-D007 high dP requiring swapping to D008
6	mfE51_114 diE51A-S17	C (ATC) TS (SRO)	RCIC Inadvertent start with Trip pushbutton failure.
7	mfE51_250 svoE51074 svoE51075 diT41-B009 diT41-B026	M (ALL)	Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram. RCIC Group 4 signal failure.
8	N/A	M (ALL)	Emergency Depress when Max Safe exceeded in more than one area. (Critical Task).
9	mfE11_202B mfE21_202A mfN21_99	C (BOP)	RHR & CS LOCA logic failure, SULCV closed – manual actions are required for proper RHR/CS & Cond/FW operation ensuring adequate core cooling. (Critical Task)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Appendix D **Scenario Outline** **Form ES-D-1**

NRC FINAL

Facility: **E. I Hatch** **Scenario No.:** **10-2** **Op-Test No.:** **2016-301**

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initiating Conditions:	Unit 2 is operating at 100% RTP. 2B21-F013D, SRV 2D, is inoperable for LLS, RAS written.
Turnover	IAW 34SO-N62-001-2, swap Cooler Condensers from 2N62-B003A to 2N62-B003B, starting at step 7.2.2.

Summary:

- **Event 1:** Normal; Swap Cooler Condensers from 2N62-B003A to 2N62-B003B IAW 34SO-N62-001-2.
- **Event 2:** Reactivity; The ATC will lower Reactor power to ~ 95% RTP using Recirc.
- **Event 3:** Component; UAT 2B will experience a Hi temperature requiring the removal from service.
- **Event 4:** Component/TS; 2B PSW pump overload requiring manual trip of 2B PSW pump & starting 2D PSW pump.
- **Event 5:** Component; RF Vent Filter 2T41-D007 high dP requiring swapping to D008.
- **Event 6:** Component/TS; RCIC will experience an inadvertent start with Trip pushbutton failing to trip RCIC. Operator will shutdown RCIC by either; closing T&TV or placing flow controller in manual and lowering speed to prevent injection.
- **Event 7:** Major; Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram.
- **Event 8:** Major; Emergency Depress when > Max Safe in more than one area. (**Critical Task**)
- **Event 9:** RHR & CS LOCA logic failure, SULCV closed – manual actions are required for proper RHR/CS & Cond/FW operation ensuring adequate core cooling. (**Critical Task**)

Critical Tasks

NRC FINAL

Facility: E. I Hatch **Scenario No.: 10-2** **Op-Test No.: 2016-301**

Critical Tasks

- Emergency Depress when > Max Safe in more than one area. **(Event 8)**
- SULCV closed, RHR & CS LOCA logic failure – manual actions are required for proper RHR/CS & Cond/FW operation ensuring adequate core cooling. **(Event 9)**

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	6	1. UAT 2B Hi temp **(Event 2)** 2. 2B PSW pump overload **(Event 4)** 3. RF Vent Filter 2T41-D007 high dP **(Event 5)** 4. RCIC inadvertent start **(Event 6)** 5. Unisolable RCIC Steam leak **(Event 7)** 6. RHR & CS LOCA logic failure, SULCV closed **(Event 9)**
2.	Malfunctions After EOP Entry	1-2	1	1. RHR & CS LOCA logic failure, SULCV closed **(Event 9)**
3.	Abnormal Events	2-4	3	1. 2B PSW pump overload **(Event 4)** 2. RF Vent Filter 2T41-D007 high dP **(Event 5)** 3. RCIC inadvertent start **(Event 6)**
4.	Major Transients	1-2	2	1. Unisolable RCIC Steam leak **(Event 7)** 2. Emergency Depress **(Event 8)**
5.	EOPs entered, requiring substantive actions	1-2	2	1. RC (Non-ATWS) **(Event 7)** 2. SC/RR **(Event 7)**
6.	EOPs contingencies requiring substantive actions	0-2	1	1. CP-1 **(Event 8)**
7.	EOP Based Critical Tasks	2-3	2	1. Emergency Depress **(Event 8)** 2. Manual actions for adequate core cooling. **(Event 9)**

ILT 10 NRC FINAL Scenario 2

SHIFT TURNOVER

target ZERO Every day, every job, safely.	**Safety Focus**
UNIT 1 STATUS	
Plant Conditions:	Unit 1 is operating at 100% RTP.
UNIT 2 STATUS	
Plant Conditions:	Unit 2 is operating at 100% RTP.
Protected Train: ☒ Division I ☐ Division II	**EOOS:** ☒ Green ☐ Yellow ☐ Orange ☐ Red
Scheduled evolutions:	☐ IAW 34SO-N62-001-2, swap Cooler Condensers from 2N62-B003A to 2N62-B003B, starting at step 7.2.2. System has been aligned for 15 minutes. Once complete, lower Reactor power to ~95% RTP to support Turbine Testing.
Surveillances due this shift:	☐ None
Inop Equipment:	☐ 2B21-F013D, SRV 2D, is inoperable for LLS, RAS written
Active tagouts:	☐ NONE
Rod Configuration:	☐ See RWM

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 1 Page 2 of 26

Event Description: IAW 34SO-N62-001-2, swap Cooler Condensers from 2N62-B003A to 2N62-B003B, step 7.2.2.

Time	Position	Applicant's Actions or Behavior
10 Min	SRO	Directs BOP to swap Cooler Condensers from 2N62-B003A to 2N62-B003B IAW 34SO-N62-001-2, step 7.2.2.
		The BOP will perform the following at 2N62-P001 panel. ***NOTE:*** *ALARM 600-020, Inlet Flow To Stack High, may alarm when 2N62-F025B is opened. This is normal for this condition and the alarm will clear in approximately one minute.*

	BOP	• Monitors 2N62-R605, Glycol Pump Disch pressure indicator
		• Opens the following valves:
		  • 2N62-F026B, Glycol Sys To Cndsr B (Already OPEN in setup).
		  • 2N62-F071B, Glycol Sys From Cndsr B (Already OPEN in setup).
		  • 2N62-F025B, Clr Cndsr B Inlet

	BOP	• Closes the following valves:
		  • 2N62-F026A, Glycol Sys To Cndsr A.
		  • 2N62-F071A, Glycol Sys From Cndsr A.
		  • 2N62-F025A, Clr Cndsr A Inlet.
		  • Stops 2N62-C001B, Glycol Sys Pump B.
		  • Confirms Glycol Pump discharge pressure remains at 10 to 20 psig, on 2N62-R605, Glycol Pump Disch pressure.
		  • Notifies SRO that the Cooler Condensers have been swapped.

		Simulator Operator – PROCEEDS with the next event at the Chief Examiners request.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 2 Page 3 of 26

Event Description: Reduce Reactor power to ~ 95% RTP to support Turbine Testing.

Time	Position	Applicant's Actions or Behavior
10 Min	SRO	• Directs ATC to decrease reactor power to 95% by decreasing Recirc flow. Power decreases are NOT to exceed 10 MWe/min.
		***NOTE**: May get the RBM UPSCALE, (603-202) and ROD OUT BLOCK, (603-238) alarm, if a peripheral control rod is NOT selected. This is expected and the operator MAY select a peripheral rod at this time.* *MAY also get Alarm HEATER TROUBLE, (650-135), alarm. This is expected at this power level.*
	ATC	• IAW 34SO-B31-001-2 (step 7.1.5) & 34GO-OPS-005-2, the ATC decreases Recirc pump speed, NOT to exceed 10 MWE per minute by depressing the LOWER SLOW or LOWER MEDIUM pushbuttons on the Master (P603 panel) or Individual controls (P602 panel) until reactor power is 95%. • If using Individual Controls, pump speed decreases will alternate between the "A" & "B" Recirc pumps to prevent excessive flow mismatches. • Monitors power decrease by observing APRM and generator output indications.
	ATC	• Complies with 34SO-B31-001-2 , Limitation 5.2.15, which states: WHEN changing Recirc pumps speed while in Two Loop operation maintain pump speeds to limit recirculation loop jet pump mismatch within the following limits: • <10% of rated core flow (7.7 E6 lbm/hr) WHEN operating < 70% of rated core flow; AND • <5% of rated core flow (3.85 E6 lbm/hr) WHEN operating at > 70% of rated core flow.
	ATC	Notifies the SRO that reactor power has been decreased to 95%.
		Simulator Operator, at the Chief Examiners direction OR after power has been decreased to 95%, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 3 Page 4 of 26

Event Description: UAT 2B Hi temp and removal from service

Time	Position	Applicant's Actions or Behavior
15 Min		*Simulator Operator At Lead Examiner's direction, ACTIVATE: (**RB-2**)* • *mf65111604, Unit Aux Xfmr "2B" Misc Alarm (Annunciator On)* • *aoN40R600, Gen & Transformer Temps, final of 110, ramp 100* *THEN, 2 minutes later ACTIVATE: (**RB-1**)* • *mf65111605, Unit Aux Xfmr "2B" Winding Temp High (Annunciator On)*
	ALL	UNIT AUX XMFR 2B MISC ALARM, (651-116), annunciates Two minutes later, UNIT AUX XMFR 2B WINDING TEMP HIGH, (651-117) annunciates.
	BOP	• Responds to alarm UNIT AUX XMFR 2B MISC ALARM, (651-116) • Notifies GCC of the alarm. • Dispatches an operator to check the transformer local panel in the Low Voltage Switchyard, 2H21-P214. • Responds to alarm UNIT AUX XMFR 2B WINDING TEMP HIGH, (651-117). • Notifies the SRO that per the ARPs Rx Power will need to be reduced if the winding temperature is increasing and to Transfer the loads to Startup Transformer (SUT) 2C, if the oil temperature is high.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 3 Page 5 of 26

Event Description: UAT 2B Hi temp and removal from service

Time	Position	Applicant's Actions or Behavior
		SIMULATOR OPERATOR: • *3 minutes from being dispatched, call the control room as the operator dispatched to the Unit 2B UAT and report that the 2B UAT oil temperature is 93°C and that the winding temperature is 106°C and both are slowly increasing.* *If asked, Transformer fans and oil pumps are running.* • *DO NOT PROMPT TO TRANSFER LOADS* • *If more updates of temperature are required, increase both temps 1°C/min EACH UPDATE, until load is transferred.* • *Temps will eventually stabilize above the setpoints.* *When the UAT is unloaded, temps will slowly decrease, however the afore mentioned alarms will NOT clear until locally reset.*
	SRO	• Directs BOP operator to enter 34SO-R22-001-2 for transferring 4160VAC buses from Unit Aux Transformer (UAT) 2B to Start-Up transformer (SUT) 2C.
	BOP	• Enters 34SO-R22-001-2, 4160 VAC System.
	BOP	Swapping of 2A 4160VAC from the UAT to the SAT. • Confirms power is available to Startup Aux XFmr 2C as indicated by the potential lights on panel 2H11-P651. • Confirms OPEN ACBs 135544, 135564 and 135584 (2H11-P652).
	BOP	• Places 135434/135454 Station Svc Interlock Cutout switch in OFF-(DOWN). • Places Sync Switch (SSW) ACB 135454 in ON. • Confirms the sources of power to 4160V Bus 2A are synchronized and voltage is normal on Start-Up Aux Transformer 2C.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 3 Page 6 of 26

Event Description: UAT 2B Hi temp and removal from service

Time	Position	Applicant's Actions or Behavior
	BOP	• Closes ACB 135454, 4160V Bus 2A Alternate Supply, AND confirms that current increases from Startup Auxiliary Transformer 2C. • Trips ACB 135434, 4160V Bus 2A Normal Supply. • Places Sync Switch (SSW) ACB 135454 in OFF. • Places 135434/135454 Station Svc Interlock Cutout switch in NORMAL-(UP) .
	BOP	Swapping of 2B 4160VAC from the UAT to the SUT • Confirms power is available to Startup Aux XFmr 2C as indicated by the potential lights on panel 2H11-P651. • Confirms OPEN ACBs 135544, 135564 and 135584 (2H11-P652).
		• Places 135444/135464 Station Svc Interlock Cutout switch in OFF-(DOWN). • Places Sync Switch (SSW) ACB 135464 in ON. • Confirms the sources of power to 4160V Bus 2B are synchronized and voltage is normal on Start-Up Aux Transformer 2C.
	BOP	• Closes ACB 135464, 4160V Bus 2B Alternate Supply, AND confirms that current increases from Startup Auxiliary Transformer 2C. • Trips ACB 135444, 4160V Bus 2B Normal Supply. • Places Sync Switch (SSW) ACB 135464 in OFF. • Places 135444/135464 Station Svc Interlock Cutout switch in NORMAL-(UP). • Notifies the SRO that 4160 VAC 2A and 2B buses have been transferred from the UAT to SUT 2C.
		SIMULATOR OPERATOR, after UAT 2B is removed from service, MODIFIES Override aoN40-R600 to a Final of 50 with a 5 ramp rate.
		SIMULATOR OPERATOR, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 Scenario No.: 10-2 Event No.: 4 Page 7 of 26

Event Description: 2B PSW pump overload – manually trip2B PSW pump & start 2D PSW pump.

Time	Position	Applicant's Actions or Behavior
10 Min		*At the Chief Examiner's direction, Simulator Operator; Contact BOP and instruct to stay on the phone until told to hang, then ENTERS (**RB-4**) malfunction mf65021482 – Window 20 PSW PUMP 2B OVLD/LOCKOUT RELAY TRIP (ANNUNCIATOR ON).*
	ALL	• Annunciator PSW PUMP 2B OVLD/LOCKOUT RELAY TRIP, (650-220) alarms .
	ATC	• Announces alarm to the SRO. • Enters ARP 650-220. • Determines that the 2B PSW pump is still running. • Informs the SRO that the 2B PSW pump failed to trip.
	SRO	• Directs the BOP to Trip the 2B PSW pump and place the 2D PSW pump is service. • Notifies Maintenance (if BOP has NOT) to investigate 2B PSW pump. • Enters Tech Specs LCO 3.7.2 and determines that a 30 day RAS is required IAW TS 3.7.2.A.
	ATC	• Trips PSW Pump 2B And Verifies Green light illuminates. • WHEN PSW Div. II pressure, as indicated on 2P41-R601B reaches 95 PSIG (decreasing), panel 2H11-P650, STARTS PSW Pump 2D. (*Standby pump start failure may not be recognized if PSW 2D is started before low header pressure is received*). • As time allows, may enter 34AB-P41-001-2, Loss of Plant Service Water. • Notifies Maintenance (if SRO has NOT) to investigate 2B PSW pump.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 5 Page 8 of 26

Event Description: RF Vent Filter 2T41-D007 high dP requiring swapping to D008.

Time	Position	Applicant's Actions or Behavior
8 Min		*Simulator Operator, at the direction of the Chief Examiner, ENTERS: (**RB-5**) malfunction mf65702215 RF D007 Filter Diff Pressure High alarm and override 2T41-R618P4. **EGT41-2** will be used to clear alarm after filter swap.*
	ALL	• On the 2H11-P650 panel alarm, PANEL 2H11-P657 SYSTEM TROUBLE, (650-224), is received.
	BOP	• Acknowledges and enters, RF VENT FLTR 2T41-D007 DIFF PRESS HIGH, (657-036) and performs the following: • Dispatches a SO/Maintenance to confirm the Refuel Floor Vent Filter differential pressure is > 7" WC as indicated on 2T41-dpi-R004A.
		*SIMULATOR OPERATOR, when dispatched to confirm Refuel Floor Vent Filter differential pressure as indicated on 2T41-dpi-R004A, wait two minutes and **REPORT**, **as SO, that differential pressure is > 10" WC**.* *If the crew decides to enter section 4.3.7 of 34SO-T41-006-2, as Shift Manager, INFORM that Maintenance cannot support section 4.3.7 at this time.*
	BOP	Enters 34SO-T41-006-2 step 4.3.3 to remove 2T41-D007, Refueling Floor Vent Filter, from service and performs the following:
		• Places 2T41-C005A, Refuel Flr Vent Exh Fan, control switch, in OFF • Confirms 2T41-C005B, Refuel Flr Vent Exh Fan, starts. • Places 2T41-C005B, Refuel Flr Vent Exh Fan, control switch, in RUN. • Dispatches a SO to adjust 2T41-R032 and 2T41-R037, Flow Controller, to obtain approximately 15 KCFM through 2T41-C002A Refueling Floor Supply Fan AND 2T41-C005B, Refueling Floor Exhaust Fan.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 5

Event Description: RF Vent Filter 2T41-D007 high dP requiring swapping to D008.

Time	Position	Applicant's Actions or Behavior
		*Simulator Operator, when dispatched, DEPRESS **RB-3**, which modifies RF Supply flow indication, THEN waits approximately 2 minutes and reports to the BOP, as a SO, that you have adjusted 2T41-R032 and 2T41-R037, to approximately 15 KCFM.*
		• Confirms 0.25 inches water negative pressure on the Refueling Floor as indicated on2T46-R604A AND 2T46-R604B, Sec Cnmt Diff Press A&B, on 2H11-P700. • Closes 2T41-F041A, Refuel Flr Vent Filter D007 Inlet Damper. • Notifies SRO Vent Filter D007 is out of service and 657-036 has cleared.
	SRO	• Dispatches a SO/Maint to determine why the RF Fan D007 experienced a high dP.
		Simulator Operator proceeds to the next event at the Chief Examiner's direction.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 6 Page 10 of 26

Event Description: RCIC Inadvertent start with Trip pushbutton failure.

Time	Position	Applicant's Actions or Behavior
6 Mins		*At the Chief Examiner's direction, Simulator Operator; Contact BOP and request EDG 1A Main Fuel Oil Storage tank level, ACTIVATE: (**RB-6**) to ENTERS mfE51_114 and diE51A-S17 to "off".*
	ALL	• Recognizes that RCIC has started. • Receives SEC SYSTEM AUTO INITIATION SIGNAL PRESENT, (650-234), is received.
	ATC	• Determines RCIC has auto started and that RWL is normal.
	SRO	• May tell ATC that RWL is normal. • Directs operator to trip RCIC.

	ATC	• Attempts to Trip RCIC by depressing the RCIC Trip pushbutton and recognizes that the Trip pushbutton is failed.
		• Notifies the SRO that the RCIC trip pushbutton has failed and Trips RCIC by ONE of the following methods:
		  • Closes the Trip and Throttle valve, 2E51-F524.
		  OR
		  • Places controller 2E51-R612 to Manual and reduces output to lower RCIC discharge pressure to below reactor pressure.
		  • Receives RCIC TURBINE BRG OIL PRESS LOW, (602-304) & RCIC PUMP DISCHARGE FLOW LOW, (602-322).

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 6

Event Description: RCIC Inadvertent start with Trip pushbutton failure.

Time	Position	Applicant's Actions or Behavior
	ATC	• Enters 34AB-E10-001-2, Inadvertent Initiation of ECCS/RCIC. • Enters 34SO-E51-001-2, RCIC System. • Dispatches RO/Maintenance to determine cause of initiation signal and the cause of the Trip pushbutton failure. • May attempt to reset the Initiation signal. • Will close 2E51-F524, Trip and Throttle Vlv, if not already closed. • Notifies SRO that RCIC is shutdown.
	SRO	• May have the operator run the Trip and Throttle Valve down to in case RCIC is needed later. • Enters TS RAS for RCIC 3.5.3 Condition A, which requires verifying HPCI is operable within 1 hour and restoring RCIC in 14 days.
		NOTE: *It is intended that RCIC is left in its' current condition and not returned to standby.*
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 7

Event Description: Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram. RCIC Group 4 signal failure.

Time	Position	Applicant's Actions or Behavior
15 Min		*At the Chief Examiner's direction, Simulator operator, ENTER (**RB-7**) mfE51_250, RCIC Steam Line, break 70/3.5, diT41-B009 & diT41-B026 to off.* ***NOTE:*** *SVOs svoE51074 (2E51-F007 Stuck Open) and svoE51075 (2E51-F008 Stuck Open), are activated at the beginning.* ***NOTE:*** *It takes approximately 3 minutes for the first alarm, LEAK DET DIFF TEMP HIGH, (601-321), to alarm.* ***NOTE:*** *SIMULATOR OPERATOR, AFTER the crew scrams the reactor, ENSURES Event Trigger **EGC71-13** modifies mfE51_250 Ramp rate to 7.0 with a Final of 100.*

	ALL	• Receives the following:
		  • LEAK DET DIFF TEMP HIGH, (601-321) in 3 minutes.
		  • RCIC ISOL TIMER INITIATED, (602-303) in 3.5 minutes.
		  • LEAK DET AMBIENT TEMP HIGH, (601-327) in 4 minutes.
		  • RCIC ISOLATION SIGNAL LOGIC A INITIATED, (602-307) after timer times out.
		  • RCIC ISOLATION SIGNAL LOGIC B INITIATED, (602-313) after timer times out.

	SRO	• Orders BOP to evaluate leak detection alarms on 2H11-P601. • Orders RCIC to be isolated. • Orders BOP to evacuate the Reactor Building. • May notify Maintenance for assistance in closing RCIC valves if ATC/BOP does not.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 7

Event Description: Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram. RCIC Group 4 signal failure.

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	• Responds to RCIC alarms. • Observes RCIC Isolation valves have failed to close. • Places 2E51-F007, RCIC Isolation valve switch to Close. • Places 2E51-F008, RCIC Isolation valve switch to Close. • Notifies SRO of RCIC valve failures. • May notify Maintenance for assistance in closing RCIC valves if SRO does NOT.

	BOP	• Respond to annunciator LEAK DET DIFF TEMP HIGH, (601-321).
		• Addresses 2G31-R604 OR 2G31-R608 on 2H11-P614.
		• Identifies the following points on R604 increasing:
		  • 113, TORUS NW WALL is ~ 112°F.
		  • 114, TORUS SE WALL is ~ 97°F.
		  • 115, TORUS VENT AIR DIFF is ~ 31°F.
		  • 116, TORUS VENT AIR DIFF is ~ 18°F.
		• Identifies the following points on R608 increasing:
		  • 115, TORUS WEST WALL is ~ 112°F.
		  • 116, TORUS NE WALL is ~ 98°F.
		  • 117, TORUS VENT AIR DIFF is ~ 31°F.
		  • 118, TORUS VENT AIR DIFF is ~ 18°F.
		  • 119, MAIN STEAM TNL ~ 140°F.
		• Reports temperatures to the SRO.

Op-Test No.: 2016-301 Scenario No.: 10-2 Event No.: 7 Page 14 of 26

Event Description: Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram. RCIC Group 4 signal failure.

Time	Position	Applicant's Actions or Behavior

	SRO	• Enters the SC flow chart.
		• Progresses down each path.
		• Proceeds down the SC/T path, directing:
		  • All available area coolers are operated.
		  • Operate the refueling floor ventilation.
		  • Operate the reactor building ventilation.
		  • Isolate all systems discharging into the area except those needed for ACC, shutdown the reactor, suppress a fire, maintain primary containment.

	SRO	• Orders the reactor shutdown before any area exceeds Max Safe operating temperatures or delta temps since a primary system (RCIC) is discharging into Secondary Containment. (May direct this prior to Max Safe received).
	SRO	• Assigns the ATC to perform RC-1. • Assigns the BOP operator to perform RC-2 and RC-3. • Enters 31EO-EOP-010-2, RC EOP flow chart if RWL decreases below 3 inches or if any area exceeds Max Safe. • Directs RWL band of 3 to 50 inches.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 7 Page 15 of 26

Event Description: Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram. RCIC Group 4 signal failure.

Time	Position	Applicant's Actions or Behavior
	ATC	• Performs RC-1 consisting of: • Inserts a manual scram. • Places the mode switch to shutdown. • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display. • Notifies SRO of rod position check. • Places SDV isolation valve switch to "isolate" & confirms closed. • If not tripped, places the Recirc pumps at minimum speed. • Inserts SRMs and IRMs. • Shifts recorders to read IRMS, when required. • Ranges IRMS to bring reading on scale. • Notifies the SRO when the above actions are complete. ***NOTE:*** *SIMULATOR OPERATOR, AFTER the crew scrams the reactor, modify mfE51_250 Ramp rate to 7.0 with a Final of 100.*
	BOP	• Performs RC-2 actions consisting of: • Confirms proper Level Control response: • Checks ECCS Injection Systems (will not be in service if RWL >-35 inches). • Ensures FW Master Controller setpoint reduces to 9 inches and output reduces to 25% of previous value. • If Set down does not auto function, manually reduces FW Master Controller setpoint to approximately 9 inches. • When feed flow is less than the capacity of the S/U level control valve (≈ 1.5 mlbm/hr), then: • Confirms/Opens 2N21-F125. • Confirms/places 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches. • Closes 2N21-F110. • If RFPTs are no longer available, will transition to HPCI to control RWL.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 7

Event Description: Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram. RCIC Group 4 signal failure.

Time	Position	Applicant's Actions or Behavior
	BOP	• If necessary, starts HPCI for level control by performing the following at 2H11-P602 panel: • If required, depresses High Water Level Reset P/B. • Opens 2E41-F059. • Starts Barom Cndsr Vac Pump. • Opens 2E41-F001. • Starts Aux Oil Pump. • Opens 2E41-F006. • Confirms TCV. and • Confirms/Closes 2E41-F012 at flow > 790 gpm. • Adjusts controller for desired flow and with SRO permission will raise RWL to 32 to 42 inches.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 7

Event Description: Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram. RCIC Group 4 signal failure.

Time	Position	Applicant's Actions or Behavior

	BOP	• Performs RC-3 consisting of:
		  • Monitoring RPV pressure.
		  • Confirms proper operation of pressure control system (TBV, LLS, etc.), at 2H11-P650 panel, by confirming TBVs are responding to control reactor pressure at the desired pressure setpoint.
		  • Maintains RPV pressure between 1074 and 800 psig until a different band is directed.
		  • Notifies SRO of pressure control system operation.
		
		  • If the MSIVs are closed, then the operator will perform the following:
		  • Confirms closed Inboard MSIVs (2B21-F022A-D) and places control switches to close.
		  • Confirms closed Outboard MSIVs (2B21-F028A-D) and places control switches to close.
		  • If directed to lower the driving head of the leak, opens SRVs to maintain RPV pressure in band.
		
		  • If the MSIVs are still open, SRO orders "Anticipate Emergency Depress," then the operator will perform the following:
		  • At P650 HMI screen,
		  • Selects "Control".
		  • Selects "Bypass Valve".
		  • Inserts "Ramp Rate" of 100 then OK.
		  • Inserts BPV position of 100 then OK.
		  • Ensures Bypass Valve Jack Status is Active (controlling)
		  • Notifies SRO that Bypass Valves are opening.

	SRO	• May order a lower Reactor pressure band to reduce the driving head IAW RC/P Path of the RC (Non-ATWS) flowchart. • May direct an operator to perform Rx Power, Level, and Pressure control, so that the other operator can address Secondary Containment parameters.
		Simulator operator PROCEEDS to the next event.

Op-Test No.: 2016-301 Scenario No.: 10-2 Event No.: 8 Page 18 of 26

Event Description: Emergency Depress when Max Safe exceeded in more than one area.

Time	Position	Applicant's Actions or Behavior
	ATC	• Provides periodic updates on temperature readings and delta temp readings to the SRO. • Reports R604 points 115 is above Max Safe. • Reports R608 points 120 & 117 are above Max Safe. • When a second temperature or delta temp exceeds Max Safe levels, informs the SRO.
	SRO	• May order a lower Reactor pressure band to reduce the driving head. • Transitions to CP-1 and orders 7 ADS valves open for Emergency Depress.
	ATC	• Provides periodic updates on temperature readings and delta temp readings to the SRO. • When a second temperature or delta temp exceeds max safe levels, informs the SRO.
	SRO	• Transitions to CP-1 and orders 7 ADS valves open for emergency depress.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 8 Page 19 of 26

Event Description: Emergency Depress when Max Safe exceeded in more than one area.

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	• Places the switches for 7 ADS valves in the open position. (*Critical Task – Open 7 SRVs when Max Safe exceeded in more than one area. Critical task is met when 5 SRVs have been opened*). • The amber lights for the SRVs will not illuminate if pressure has been reduced to below approximately 300 psig. In this case the operator must use 2H11-P614 recorder indication to monitor tail pipe temperatures for the SRVs to verify the valves actually opened (Recorder 2B21-R614). • Depending on Reactor Water Level prior to opening ADS valves, RWL may swell to above 60 inches, requiring the operator to enter 34AB-C32-001-2, Reactor Water Level Above 60 inches. • Operator secures all injection other than CRD.
	SRO	• Enters Primary Containment Control (PC) EOP flow chart. • IAW PC/T path directs Torus Cooling to be placed into service. If Torus temperature is <100°F only one loop of RHR will be placed in Torus Cooling. If Torus temperature is >100°F both loops of RHR will be placed in Torus Cooling.
		NOTE: *The operator may place torus cooling in service by using the Placard that's available or using the appropriate section of the procedure. These steps assume the Placard is used. The A and/or B loop of RHR may be used depending on Torus temperature. The following steps are written assuming "B" loop and "B" pump is used. If/When "A" loop is used, substitute "A" for "B" for valves and if "B" pump is not used substitute "A", "C", or "D" for "B" pump.*
	ATC	Enters 34SO-E11-010-2, Residual Heat Removal, AND places RHRSW in service IAW Placard; • Prelubes RHRSW pump. • Overrides 2E11-F068B Low Discharge Pressure Interlock. • Positions 2E11-F068B to 45% OPEN. • Starts RHRSW pump B. • Places 2E11-F068B Low Discharge Pressure Interlock switch to normal position. • Positions 2E11-F068B to obtain < 4400 gpm AND < 450 psig.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 8 Page 20 of 26

Event Description: Emergency Depress when Max Safe exceeded in more than one area.

Time	Position	Applicant's Actions or Behavior

	ATC	• IF desired to start a SECOND RHRSW pump,
		  • Throttles 2E11-F068B to achieve max flow rate (not to exceed 4400 GPM).
		  • Opens 2E11-F068B an additional 5%.
		  • Starts second RHRSW Pump.
		  • Positions 2E11-F068B to obtain < 8800 gpm AND < 450 psig.

	ATC	IAW 34SO-E11-010-2, Placard; • IF RWL <2/3 core height, (-193 inches), PLACE the Cnmt Spray Vlv Cntl 2/3 Core Ht Permis keylock in the MANUAL OVERRD. (Not needed) • IF required by EOPs AND LOCA signal present, PLACE Cnmt Spray Vlv Cntl switch in the MANUAL position. (Not needed) • OPENS 2E11-F048A (2E11-F048B). • IF SPC is not required per the EOPs, CLOSE 2E11-F047A (2E11-F047B). (Not needed) • OPENS 2E11-F003A (2E11-F003B). • IF power is being provided by EDG, CHECK EDG loading prior to start of RHR pump(s).
	ATC	• STARTS RHR Loop A(B) pump(s). • OPENS 2E11-F028A (2E11-F028B. • THROTTLES OPEN 2E11-F024A (2E11-F024B). • OPEN 2E11-F047A (2E11-F047B). • IF it is desired to provide cooling of the Torus rather than mixing, ensure RHR flow is < 11,500 GPM, THEN CLOSES 2E11-F048A (2E11-F048B). • THROTTLES 2E11-F068A OR 2E11-F068B to maintain ≥ 20 PSID Hx A(B) dp. • REFERS to 34SO-E11-010-2.
		Simulator operator the next event was activated at the beginning of the scenario.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 9

Event Description: RHR & CS LOCA logic failure, SULCV closed – manual actions are required for proper RHR/CS & Cond/FW operation ensuring adequate core cooling.

Time	Position	Applicant's Actions or Behavior
		NOTE: *mfE11_202B (LOCA Signal failure) & mfE21_202A (LOCA Signal failure) was inserted at beginning.*
	BOP	• At panel 2H11-P601, Confirms the 4 RHR pumps did NOT auto start. • If a LOCA signal is received, notifies SRO of RHR pump logic failure and starts (Critical Task is met if one RHR pump is started) the 4 RHR pumps. • At panel 2H11-P601, Confirms 2 CS pumps did NOT auto start and starts (Critical Task is met if one CS pump is started) the CS pumps.

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 9 Page 22 of 26

Event Description: RHR & CS LOCA logic failure, SULCV closed – manual actions are required for proper RHR/CS & Cond/FW operation ensuring adequate core cooling.

Time	Position	Applicant's Actions or Behavior
		*Simulator Operator, At the Chief Examiner's direction AND AFTER the ADS valves have been opened **(Event 8)**; when Reactor pressure is < 500 psig, ENSURE **EGB21-5** INSERTS mfN21_99, SULCV fails closed.* (**Critical Task**) – *Throttle open 2N21-F110 for vessel injection to maintain RWL greater than -180 inches.* *If 2N21-F110 is NOT used, then a NEW Critical Task will be to align RHR/Core Spray systems for vessel injection to maintain RWL greater than -180 inches.* *EITHER IS ACCEPTABLE.*
	BOP	• The BOP recognizes the SULCV has failed closed. • Performs ONE or MORE of the following to inject water into the reactor. • Throttles open Condensate System, 2N21-F110, and injects water into the reactor (*Critical Task*).

		***NOTE**: mfE21_202A (LOCA Signal failure) inserted at beginning.*
		
		OR
		• If a LOCA signal is received, notifies SRO of CS pump logic failure and starts 2A (2B) Core Spray Pump. (**Critical Task**)
		  • Confirm discharge pressure >265 psig.
		  • Confirm 2E21-F031A (B) closes when flow >950 gpm.
		  • Confirm a CS and RHR room cooler automatically starts.
		  • When RPV pressure is <425 psig, throttles open 2E21-F005A(B).

Op-Test No.: 2016-301 **Scenario No.:** 10-2 **Event No.:** 9

Event Description: RHR & CS LOCA logic failure, SULCV closed – manual actions are required for proper RHR/CS & Cond/FW operation ensuring adequate core cooling.

Time	Position	Applicant's Actions or Behavior
		***NOTE**: mfE11_202B (LOCA Signal failure) inserted at beginning.* OR • At panel 2H11-P601, Confirms the 4 RHR pumps did NOT auto start and ONLY 2 Core Spray pumps are running. • If a LOCA signal is received, notifies SRO of RHR pump logic failure and starts (**Critical Task**) is met if one RHR pump is started) the 4 RHR pumps. • When RPV pressure is <425 psig, throttles open 2E11-F015A (B). • Reports SULCV problem to the SRO.
		With Chief Examiners Permission, the Scenario will be terminated when reactor water is being controlled following the Emergency Depressurization, with reactor pressure below 50 psig or as directed by the Chief Examiner.

Appendix D **Scenario Outline** **Form ES-D-1**

NRC FINAL

Facility: E. I Hatch **Scenario No.:** 10-3 **Op-Test No.:** 2016-301

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions. Unit 2 is operating at 60% RTP. 2B21-F013D, SRV 2D, is inoperable for LLS, RAS written.

Turnover: Continue startup and place RFPT 2A in service, starting at step 7.1.11.2.8 of 34SO-N21-007-2. Once RFPT 2A is in service, notify Maintenance to perform walk down of RFPT 2A piping. Once Maintenance walk down is complete, increase Reactor power to 75% RTP using Recirc.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP)	Continue startup and place RFPT 2A in service, starting at step 7.1.11.2.8 of 34SO-N21-007-2.
2	mfP51_222C loP51-C001BGl loP51- C001BR2 diP51- C001B	C (BOP)	SSAC 2C Trips - 2B fails unloaded, 2A must be manually started.
3	mfE51_250 svoE51075	C (ATC) TS (SRO)	RCIC Steam Line breaks in the Rx bldg. RCIC isolation valves fail to auto close (**Critical Task**)
4	mf60131136 aoE21R600B	C (BOP) TS (SRO)	2B Loop of Core Spray experiences high discharge pressure (valve leakage). Perform ARP & restore.
5	svoB21036 mf60211154 mfC12_26_22-27	I (ATC) TS (SRO)	One (1) Reactor Pressure ATTS trip unit causes a half scram and Control Rod 22-27 scrams in due to a blown fuse. The control rod fuse is repaired (Time Compress) and the rod is withdrawn.
6	mf65702209 mf65702227 mf65321987	R (ATC)	Earthquake requiring scram prior to 98 inches in Torus with a loss of Unit 1 SAT 1D. Reduce reactor power to between 40% & 50% due to earthquake.
7	svoT48140(70/.75) svoT48142(50/10) svoT48143(50/10) svoT48147(50/10) svoT48148(50/10)	M (ALL)	Emergency Depress prior to Torus level reaches 98 inches. (**Critical Task**)
8	mfB21_129A mfB21_129E mfB21_129L mfB21_129M mfB21_129C mfB21_129K mfB21_129H	C (ATC)	ALL ADS valves fail to open when Emergency Depress is required, EOP-108. (**Critical Task**)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Appendix D **Scenario Outline** **Form ES-D-1**

NRC FINAL

Facility: **E. I Hatch** **Scenario No.:** **10-3** **Op-Test No.:** **2016-301**

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initiating Conditions:	Unit 2 is operating at 60% RTP. 2B21-F013D, SRV 2D, is inoperable for LLS, RAS written.
Turnover	Continue startup and place RFPT 2A in service, starting at step 7.1.11.2.8 of 34SO-N21-007-2. Once RFPT 2A is in service, notify Maintenance to perform walk down of RFPT 2A piping. Once Maintenance walk down is complete, increase Reactor power to 75% RTP using Recirc.

Summary:

- **Event 1:** Normal; The "2A" RFPT will be placed into service IAW 34SO-N21-007-2.
- **Event 2:** Component; SSAC 2C Trips - 2B fails unloaded, 2A manually started. The "2C" Station Service Air Compressor (SSAC) trips due to an equipment malfunction. "2B" SSAC auto starts but does not supply any air to the system because its loader system is malfunctioning. The crew will manually start "2A" SSAC, which does return the air system to normal pressures.
- **Event 3:** Component/TS; A RCIC steam line will break outside of Primary Containment. The outboard isolation valve is failed open and cannot be closed. Both isolation valves fail to automatically close on an automatic isolation signal and must be manually closed. (**Critical Task**) The SRO addresses Tech Specs for inoperable Primary Containment Isolation Valve.
- **Event 4:** Component/TS; 2B Loop of Core Spray experiences high discharge pressure (valve leakage). When ARP is performed, system pressure is restored.
- **Event 5:** Component; One (1) Reactor Pressure ATTS trip unit causes a half scram and a control rod to scram in due to a blown fuse. The control rod fuse is repaired (Time Compress) and the rod is withdrawn.
- **Event 6:** Major; Earthquake requiring scram prior to 98 inches in Torus with a loss of Unit 1 SAT 1D.
- **Event 7:** Reactivity; Reduce reactor power to between 40% & 50% due to earthquake.
- **Event 8:** Major; Emergency Depress prior to 98 inches in the Torus. (**Critical Task**)
- **Event 9:** Component; ALL ADS valves fail to open when Emergency Depress is required, 31EO-EOP-108. (**Critical Task**)

Critical Tasks

NRC FINAL

Facility: E. I Hatch **Scenario No.: 10-3** **Op-Test No.: 2016-301**

Critical Tasks

- Manually isolate the RCIC isolation valves within 5 minutes of receiving 602-302 and 602-313. **(Event 3)**
- Emergency Depress prior to Torus level reaches 98 inches. **(Event 8)**
- Reduce and maintain RPV pressure to <50 psig using SRVs and 31EO-EOP-108. **(Event 9)**

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	6	1. SSAC 2C Trips - 2B fails unloaded, 2A manually started **(Event 2)** 2. RCIC steam line will break **(Event 3)** 3. 2B Loop of CS high pressure **(Event 4)** 4. ATTS Scram with CR blown fuse **(Event 5)** 5. Earthquake with SAT 1D loss **(Event 6)** 6. All ADS valves fail **(Event 9)**
2.	Malfunctions After EOP Entry	1-2	1	1. All ADS valves fail **(Event 9)**
3.	Abnormal Events	2-4	4	1. SSAC 2C Trips - 2B fails unloaded, 2A manually started **(Event 2)** 2. RCIC steam line will break **(Event 3)** 3. ATTS Scram with CR blown fuse **(Event 5)** 4. Earthquake with SAT 1D loss **(Event 6)**
4.	Major Transients	1-2	2	1. Earthquake requiring scram prior to 98 inches in Torus **(Event 6)** 2. Emergency Depress prior to 98 inches in Torus **(Event 8)**
5.	EOPs entered, requiring substantive actions	1-2	2	1. RC **(Event 6)** 2. PC **(Event 7)**
6.	EOPs contingencies requiring substantive actions	0-2	1	1. Emergency Depress prior to 98 inches in Torus **(Event 7)**
7.	EOP Based Critical Tasks	2-3	3	1. RCIC steam line will break **(Event 3)** 2. Emergency Depress prior to 98 inches in Torus **(Event 8)** 3. ALL ADS valves fail to open when Emergency Depress is required, EOP-108. **(Event 9)**

ILT 10 NRC FINAL Scenario 3

SHIFT TURNOVER

target ZERO Every day, every job, safely.	**Safety Focus**
UNIT 1 STATUS	
Plant Conditions:	Unit 1 is operating at 100% RTP.
UNIT 2 STATUS	
Plant Conditions:	Unit 2 is operating at 60% RTP.
Protected Train: ☒ Division I ☐ Division II	**EOOS:** ☒ Green ☐ Yellow ☐ Orange ☐ Red
Scheduled evolutions:	☐ Place RFPT 2A in service, starting at step 7.1.11.2.8 of 34SO-N21-007-2 ☐ Once RFPT 2A is in service, Maintenance will perform walk down of RFPT 2A piping ☐ Once Maintenance walk down is complete, increase Reactor power to 75% RTP using Recirc
Surveillances due this shift:	☐ None
Inop Equipment:	☐ 2B21-F013D, SRV 2D, is inoperable for LLS, RAS written
Active tagouts:	☐ NONE
Rod Configuration:	☐ See RWM

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 1 Page 2 of 29

Event Description: Place the RFPT '2A' in service, starting at step 7.1.11.2.7 of 34SO-N21-007-2.

Time	Position	Applicant's Actions or Behavior
15 Mins	SRO	Orders Operator to place RFPT '2A' in service, starting at step 7.1.11.2.8 of 34SO-N21-007-2.
	BOP	• Enters 34SO-N21-007-2 at step 7.1.11.2.8.
		• Confirms M/A station is tracking actual Speed Setter (RFPT) speed. • Places the TMR Mode switch to M/A. • Confirms the M/A Station green light illuminates.
		NOTE: *Alarm RFP C005A DISCH FLOW LOW, (656-039), will clear when RFPT 2A is placed into service. MULTIPOINT TEMP RCDR 2T47-R611 TEMP HIGH, (657-072) may come in and clear. All are expected for this plant condition. If dispatched to RFPT area, SIMULATOR OPERATOR, wait 2 minutes, NOTIFY BOP there are no steam leaks in the RFPT area. This is a normal condition and the alarm will clear as the temperature decreases.*
		• Slowly changes the RFPT 2A M/A station to match RFP 2A AND the RFP 2B flow match. • Matches the input AND output of Pump A M/A Station by performing the following: • Depresses the PF key AND read the controller output (PF lamp lit). • Depresses the PF key so the input to the controller is displayed (PF lamp is off). • Adjusts the manual output lever until the input AND output are matched on P603 panel. • Monitors RWL, RFPT 2A discharge pressure and RFPT 2A & 2B speed.
		NOTE: *Alarm 656-039, "RFP C005A Disch Flow Low" will clear when RFPT 2A is placed into service. Alarm 650-135, "Heater Trouble" may come in and clear. This is expected for this plant condition.*
		• Places RFP A M/A station in AUTO • As required, adjusts RFP A Speed Control Bias Setting to maintain RFPT 2A and 2B speed within 100 RPM. • Alarm RFPT CONTROLLER TROUBLE, (656-039) clears.

Op-Test No.: 2016-301 Scenario No.: 10-3 Event No.: 1 Page 3 of 29

Event Description: Place the RFPT '2A' in service, starting at step 7.1.11.2.7 of 34SO-N21-007-2.

Time	Position	Applicant's Actions or Behavior
		• Informs SRO that the 2A RFPT is in service in Automatic control.
	SRO	• Informs ATC to increase power with Recirc to 75% power.
		Simulator operator proceeds to the next event at the Chief Examiner's direction

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 2 Page 4 of 29

Event Description: SSAC 2C Trips - 2B fails unloaded, 2A must be manually started.

Time	Position	Applicant's Actions or Behavior
7 Min		*SIMULATOR OPERATOR, at direction of the Chief Examiner, NOTIFY the ATC by phone and request Off-Gas flow reading, then ACTIVATES: (**RB-2**) malfunction mfP51_222C. ENSURE Event Trigger **EGP51-3** ACTIVATES the following when the "B" air compressor "red" light is on:* *loP51-C001BG1 to OFF,* *loP51-C001BR2 to ON,* *mfP51_222B,* ***EGP51-4**.* *ONCE "2B" SSAC is placed in PTL, ENSURE Event Trigger **EGP51-4** DELETES: loP51-COO1BG1, loP51-C001BR2, and mfP51_222B.*
	ALL	The following annunciators are received: • PANEL 2H11-P700 SYSTEM TROUBLE, (650-225). • AIR CMPSR 2C TRIPPED/SHUTDOWN, (700-233).
	BOP	• Acknowledges 2H11-P700 panel alarm on 2H11-P650. • Acknowledges AIR CMPSR 2C TRIPPED/SHUTDOWN, (700-233), on 2H11-P700 and notifies the SRO of the alarm. • Confirms/starts "2B" SSAC on P650 panel. • Determines air pressure is continuing to decrease. • Starts "2A" SSAC on P650 panel IAW (700-233) or 34AB-P51-001-2. • Dispatches SO/Maintenance locally to investigate "2C" SSAC tripping and "2B" SSAC not maintaining air pressure. • As time allows, contacts Health Physics after starting Standby SSACs. • May receive CONTROL BLG SERVICE AIR PRESS LOW, (700-222).
	SRO	May direct BOP into 34AB-P51-001-2, Loss of Instrument and Service Air System or Water Intrusion into the Service Air System.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 2 Page 5 of 29

Event Description: SSAC 2C Trips - 2B fails unloaded, 2A must be manually started.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator: 2 minutes after being dispatched to investigate SSAC 2C tripping and SSAC 2B not maintaining air pressure (unless SSAC 2A was started), and with Lead Examiners permission, *INFORM the BOP;* *SSAC 2C has a low oil pressure shutdown indication* *AND* *IF SSAC 2B IS STILL RUNNING that SSAC 2B is running unloaded and you cannot locally get it to "LOAD".* *OR* *IF SSAC 2B IS **NOT** RUNNING that SSAC 2B is off and NOT in automatic mode locally (auto light not lit).* *Simulator Operator: If requested to crosstie air, REPORT Unit 1 crosstie is not available.* *IF dispatched locally as Maintenance, if SSAC 2B IS RUNNING, as Maintenance, request SSAC 2B Shutdown for troubleshooting.*
	SRO	• Notifies SO/Maintenance (if BOP has not) to investigate SSAC 2C tripping and SSAC 2B not maintaining air pressure and initiates a condition report. • Directs the BOP to start the 2A SSAC IAW AIR CMPSR 2C TRIPPED/SHUTDOWN, (700-233). • Directs the BOP to start the SSAC 2B. • May request to crosstie air with Unit 1.
	BOP	• Places SSAC 2B switch to PTL on P650 panel. • As time allows, dispatches SO to perform step 7.5.1.6 of 34SO-P51-001-2.
		SIMULATOR OPERATOR proceeds to the next event at the Chief Examiner's direction.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 3 Page 6 of 29

Event Description: RCIC steam line break with failure to auto close, manual works.

Time	Position	Applicant's Actions or Behavior
15 Min.		*Simulator Operator: Call BOP and request 2C Main Fuel Oil Storage tank level, ENTER **RB-3** to starts the following RCIC steam leak:* • *mfE51_250 (RCIC Leak) 100/7* • *svoE51075 (F008 stuck open)* ***NOTE**: It takes approximately 3.0 minutes for the 601-321, "Leak Det Diff Temp High" to alarm.*
	BOP	• Determines 2T41-B009, Secondary Stm. Chase Cooler is NOT running • Monitors Steam Tunnel temps. • Enters 34AB-T22-001-2, 'Primary Coolant System Pipe Break – Rx Building. • Dispatches operator to ATTS for Steam Chase Temperatures.
	BOP	Acknowledges LEAK DET DIF TEMP HIGH, (601-321) and reports to SRO. Enters 601-321 and starts investigating.

		• Confirms which area is producing alarm using Temperature Recorder on 2H11-P614:
		  • R604, Pt. 115 is reading approximately 32°F delta-T.
		  • R608, Pt. 117 is reading approximately 32°F delta-T.
		• Enters 34AB-T22-003-2, Secondary Containment Control.

		***NOTE:** It will take about 30 minutes for a Group 1 isolation to occur. At direction of the Chief Examiner, if P603-2 "Group 1 System A Trip" alarms, IMMEDIATELY DELETE mfE51_250.*
	SRO	• Enters the 31EO-EOP-014-2, 'Secondary Containment' EOP Flowchart on Secondary Containment High Differential Temperature. • Has an operator monitor Sec Cont. Temps. • Has operators monitor systems for source of the leak.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 3 Page 7 of 29

Event Description: RCIC steam line break with failure to auto close, manual works.

Time	Position	Applicant's Actions or Behavior
	BOP	• Enters 34AB-T22-003-2, Secondary Containment Control.
		SIMULATOR OPERATOR: *If 2E51-F007 is **CLOSED** DO NOT ENTER (**RB-10**):* *SIMULATOR OPERATOR: When EOP SC flowchart is ENTERED and Chief Examiner concurs ENTER (**RB-10**) mfE51_113 (RCIC Auto Isolation E51-F008)*
	ATC	As time allows the crew will enter the following ARPs: • RCIC STEAM LINE DIFF PRESS HIGH, (602-302). • RCIC TURBINE TRIP, (602-301). • RCIC ISOLATION SIGNAL LOGIC A, (602-307). • RCIC ISOLATION SIGNAL LOGIC B, (602-313). **Time:**_____
	ATC	Responds to failure of RCIC Isolation: • Places 2E51- F008 control switch to CLOSE. • Places 2E51- F007 control switch to CLOSE. *(Critical Task is to position 2E51-F007 control switch to close within 5 minutes of receiving 602-302, 602-307 and 602-313 listed above OR may close before alarms are received).* **Time:**_____ • Informs SRO of failure of 2E51-F008 to close. • Dispatches operator/Maintenance to investigate the leak.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 3

Event Description: RCIC steam line break with failure to auto close, manual works.

Time	Position	Applicant's Actions or Behavior
	SRO	Reviews Tech Specs section 3.6.1.3, Primary Containment Isolation Valves' Condition A.1 and A.2 and determines: • 2E51-F008 Inop • 2E51-F007 must be closed and deactivated within 4 hours AND • 2E51-F007/F008 penetration must be verified ISOLATED every 31 days. • As time allows, contacts the Shift Support Supervisor to draft a Danger Tagout for 2E51-F007. Enters TS RAS for RCIC 3.5.3 Condition A, which requires verifying HPCI is operable within 1 hour and restoring RCIC in 14 days.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 4 Page 9 of 29

Event Description: 2B Loop of Core Spray experiences high discharge pressure (valve leakage). When ARP is performed, system pressure is restored.

Time	Position	Applicant's Actions or Behavior
10 Min		*At the Chief Examiner's direction, Simulator Operator enters (**RB-4**) malfunction mf60111061 Window 25 Core Spray B Disch Pipe Press High (ON) and aoE21-R600B to 465 psig.*

	BOP	• Enters ARP 34AR-601-125-2.
		• Confirm validity of alarm using Disch Press indicator, 2E21-R600B (~465 psig).
		• Confirm the following valves are CLOSED.
		  • 2E21-F037B, Testable Check Bypass Vlv.
		  • 2E21-F005B, Inbd Discharge Vlv.
		• Closes 2E21-F004B, Outbd Discharge Vlv.
		• Opens 2E21-F005B.
		• Closes 2E21-F005B, to reseat.
		• Opens 2E21-F004B to open.

	SRO	• Directs operator to enter 601-113 ARP. • Reviews TS 3.5.1, ECCS and Enters Condition A since 2E21-F004B is closed. • TS 3.5.1.A requires the ECCS pump to restored to operable status in 7 days. • Reviews TS 3.6.1.3, PCIV.
	SRO	• Enters TS 3.5.1, ECCS Operating, and determines that with Core Spray B Jockey Pump Sys Water Level Low, 601-114, received, declares CS 2B pump inop: • TS 3.5.1.A requires the ECCS pump to restored to operable status in 7 days.
		***NOTE**: If addressed, 2E21-F004B is NOT a PCIV and TS 3.6.1 for PCIVs is not applicable.*

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 4 Page 10 of 29

Event Description: 2B Loop of Core Spray experiences high discharge pressure (valve leakage). When ARP is performed, system pressure is restored.

Time	Position	Applicant's Actions or Behavior
		*Simulator Operator, ENSURE Event Trigger **EGE21-6** activates when 2E21-F015B is placed to open position. This will clear CS B Disch Press High alarm & return 2E21-R600B to normal.*
	BOP	• IAW ARP 601-125, may perform the following: • Slightly opens 2E21-F015B to lower CS Discharge pressure. • Confirms 601-125 clears. • When pressure is approximately 100 psig, closes 2E21-F015B. • If 601-114, Core Spray B Jockey Pump Sys Water Level Low, is received directs an SO to vent the "B" Loop of Core Spray IAW 34SV-SUV-017-2. • Monitors Core Spray B Loop pressure for subsequent increases.
		NOTE: *If pressure is NOT relieved, then a follow-up question on PCIV leakage TS 3.6.1.3.D may be appropriate.*
		NOTE: *If pressure IS relieved on Core Spray Loop B, and pressure is NOT monitored, then a follow-up question on a high pressure condition of the inner system piping may be appropriate.*
		Simulator Operator, at the Chief Examiner's request, proceeds to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 5

Event Description: One (1) Reactor Pressure ATTS trip unit causes a half scram and Control Rod 22-27 scrams in due to a blown fuse. The control rod fuse is repaired (Time Compress) and the rod is withdrawn.

Time	Position	Applicant's Actions or Behavior
20 min		*At the Chief Examiner's direction, Simulator operator, ENTER (**RB-5**) svoB21036 (final value of 1200 with ramp of 1000). **EGB21-26** will insert malfunctions mf60211154 and mfC12_26_22-27.*
	ALL	The following annunciators are received: REACTOR VESSEL HIGH PRESSURE TRIP, 603-105. REACTOR AUTO SCRAM SYSTEM A TRIP, 603-117. CRD ACCUMULATOR PRESS LOW OR LEVEL HIGH, 603-148. RMCS / RWM ROD BLOCK OR SYSTEM TROUBLE, 603-239 (when control rod 22-27 is selected). ROD DRIFT, 603-247. ECCS/RPS DIVISION I TROUBLE, 602-110.
	ATC	• Determines that reactor pressure has not changed. • Announces to SRO that a half-scram in the "A" channel has occurred due to an invalid high reactor pressure signal. • Informs the SRO that control rod 22-27 has scrammed in.
		*Simulator Operator: When dispatched to check the ATTS panel reactor pressure instruments, report **ONE MINUTE LATER** that 2B21-N678A has a red trip light and gross failure light illuminated.*
	SRO	• Dispatches personal to the ATTS panels to determine which reactor pressure instrument has tripped. • Contacts maintenance to repair ATTS card 2B21-N678A (2B21-N078A is transmitter). • Contacts maintenance to check and replace the fuse in the RPS "B" channel for control rod 22-27. • Notifies Rx Engineering or STA to check thermal limits if the SRO has not already contacted them.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 5

Event Description: One (1) Reactor Pressure ATTS trip unit causes a half scram and Control Rod 22-27 scrams in due to a blown fuse. The control rod fuse is repaired (Time Compress) and the rod is withdrawn.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator: When contacted as Reactor Engineering with the following question from 34AB-C11-004-2, "Contact Reactor Engineering to determine what thermal limits were exceeded during the event AND what recovery actions are necessary." Answer NO thermal limits have been exceeded.
	SRO	Refers to the following Tech Specs: LCO 3.3.1.1, Reactor Protection System (RPS) Instrumentation, and determines that 2B21-N678A requires entry into RAS 3.3.1.1.A to place the channel in trip or the "A" trip system in trip in 12 hours.
		*Simulator Operator: AFTER the TS call is made **DELETES** mfC12_26_22-27; this will cause the scram light for the rod to extinguish.* *AND* *REPORTS as Maintenance that control rod 22-27 had a fuse blown, which has been replaced.*
		Simulator Operator: After being dispatched to repair ATTS card 2B21-N678A AND AFTER the SRO has determined the Tech Spec RAS, *DELETE svoB21036 and mf60211154,* *THEN REPORT to the SRO that time compression has been used and that 2B21-N678A has been repaired and returned to service.*

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 5

Event Description: One (1) Reactor Pressure ATTS trip unit causes a half scram and Control Rod 22-27 scrams in due to a blown fuse. The control rod fuse is repaired (Time Compress) and the rod is withdrawn.

Time	Position	Applicant's Actions or Behavior
		NOTE: *The following annunciators and actions may not be taken in the same sequence as listed below.*

	ATC	• Addresses annunciator, Reactor Auto Scram System A Trip, 603-117.
		  • Confirm scram group A 1 2 3 4 lights for Trip System A on panel 2H11-P603 are extinguished.
		  • Determine the cause of the trip.
		  • Attempt to correct or bypass the cause of the trip.
		  • Using the Process Computer obtains an OD-7 and determines that control rod movement has occurred.
		  (May reset half scram before performing OD-7).

	ATC	• Resets RPS Channel A using 2C71-S5, Reactor Scram Reset switch, on panel 2H11-P603, per step 5.2.3 of 34AR-603-117-2. • Determines that section 4.7 of 34AB-C11-004-2 is required to be used to recover control rod 22-27.

	ATC	• Addresses annunciator ROD DRIFT, (603-247)
		  • At panel 2H11-P603, confirms that one or more Rod Drift lights are illuminated on the full core display.
		  • Selects the drifting rod and confirms that RPIS indicates the rod is not at an even reed switch position.
		  • Notifies the Shift Supervisor and the STA.
		  • Refers to 34AB-C11-004-2, Mis-positioned Control Rods, for recovery of drifting OR mis-positioned control rod.
		  • When directed by the Shift Supervisor, resets the rod drift using the Rod Drift Alarm reset switch on Panel 2H11-P603.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 5

Event Description: One (1) Reactor Pressure ATTS trip unit causes a half scram and Control Rod 22-27 scrams in due to a blown fuse. The control rod fuse is repaired (Time Compress) and the rod is withdrawn.

Time	Position	Applicant's Actions or Behavior
	ATC	• Refers to Attachment 1 of 34AB-C11-004-2 for the proper actions to take. • Are >4 rods mispositioned? NO • Is the reactor sub-critical? NO • Is reactor power < LPSP (21%)? NO • Are Thermal Limits acceptable? YES • Performs Action 1. • Refer to Attachment 2 for restoration steps.
		Simulator Operator: When Reactor Engineering is notified for a recovery plan, provide the SRO with the marked up copy of Attachment 2 of 34AB-C11-004-2.
	ATC	• Refers to Attachment 2 to recover the control rod. • Withdraws the control rod to position 48 using the Rod Movement switch and Rod Out Notch Override switch (RONOR). • Performs coupling check on control rod.
		Simulator operator proceeds to the next event at the Chief Examiner's direction.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 6

Event Description: Earthquake with a loss of Unit 1 SAT 1D requiring Reactor power to be reduced to between 40 – 50% RTP.

Time	Position	Applicant's Actions or Behavior
10 Min		*Simulator Operator, at Chief Examiners direction, ACTIVATE (**RB-6**)* *(Earthquake – malfunctions to (ON):* *mf65702209 Window 30 SEISMIC PEAK SHOCK RECORDER HIGH G LEVEL & mf65702227 Window 48 SEISMIC INSTRUMENTATION TRIGGERED* *&* *mf65321987 Window 18 230 KV BREAKER TRIP (ANNUNCIATOR ON)*
	ALL	The following annunciators are received: • 2H11-P657 SYSTEM TROUBLE, (650-224). • SEISMIC PEAK SHOCK RECORDER HIGH G LEVEL, (657-030). • SEISMIC INSTRUMENTATION TRIGGERED, (657-048). • 230 KV BREAKER TRIP, (653-218).
	BOP	• 2H11-P657 SYSTEM TROUBLE, (650-224), alarm on 2H11-P650 panel. • 230 KV BREAKER TRIP, (653-218) on 2H11-P653 panel. • Communicates both alarms to the SRO.
	SRO	Dispatches the BOP to Panel 2H11-P653 and 2H11-P657.
	BOP	• Enters 230 KV BREAKER TRIP, 653-218, on 2H11-P653 panel and informs the SRO that PCBs 179440 & 179450 supplying power to SAT 1D have tripped open. • As time permits, may notify GCC of tripped PCBs.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 6

Event Description: Earthquake with a loss of Unit 1 SAT 1D requiring Reactor power to be reduced to between 40 – 50% RTP.

Time	Position	Applicant's Actions or Behavior
	BOP	Informs the SRO of the Seismic alarms and enters ARPs: 34AR-657-030-2 and 34AR-657-048-2 to perform the following actions: ***NOTE:*** *Actions for both ARPs are the same, except for checking the power supply.*
		• Dispatches Unit 1 RO to panel 1H11-P701 to check for further indication of a seismic event by monitoring Peak Shock Annunciator, 1L51-R620, for 12.7 Hz amber lights (> 0.08g, OBE) and 12.7 Hz red lights (> 0.15g, DBE).
		Simulator Operator: After one minute, Notifies Unit 2 Control Room that you were in the Reactor Building and felt the floor vibrating.

	BOP	• May have the Unit 1 RO check the following:
		  • Peak Shock Annunciator, 1L51-VDC-R620, plugged in on panel 1H11-P701.
		  • BRKR 3 on 120/208V Essential AC Cab., 1R25-S065.
		• May have I & C refer to Seismic Instrumentation Earthquake Response Manual, SX-18271, for guidance in analyzing seismic data.
		• Enters 34AB-Y22-002-0, Naturally occurring Phenomenon.
		• May inform the Shift Manager to evaluate an Emergency Classification.

	SRO	Directs the BOP to enter 34AB-Y22-002-0, Naturally occurring Phenomenon, if not already entered.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 6 Page 17 of 29

Event Description: Earthquake with a loss of Unit 1 SAT 1D requiring Reactor power to be reduced to between 40 – 50% RTP.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator: ***Immediately after being dispatched to check the Shock recorder on 1H11-P701 panel, inform the team that the following lights are illuminated:*** • *12.7 Hz* ***Amber*** *lights (> 0.08g, OBE)* *AND* • *12.7 Hz* ***Red*** *lights (> 0.15g, DBE)* *AND* • *Unit 1 has scrammed* *AND* • *SAT 1D de-energized 1B EDG started.* *(Immediately is appropriate since this indicator is on Unit 1, but right next to the Unit 2 SRO desk. It is NOT simulated in the Simulator since it is a Unit 1 only instrument.)* ***NOTE:*** *With SAT 1D de-energized, 34GO-OPS-013-2, Normal Plant Shutdown, should NOT be entered.*

	SRO	• Determines that all electrical power is NOT available.
		• Directs the crew to reduce reactor power to between 40% and 50% RTP per 34GO-OPS-005-2, Power Changes.
		Contacts switchyard maintenance to assist in switchyard damage assessment .
		• Contacts Maintenance to inspect Independent Spent Fuel Storage Installation (ISFSI) for damage.
		• Within one hour , dispatches personnel to locally close or confirmed closed the following valves (if not performed by the BOP):
		  • 1P11-F167, CST Sump to Radwaste Drain.
		  • 1P11-F3002, Condensate Transfer Pumps and Sample Sink Drain Line to Yard.
		  • 2P11-F051, Retaining Wall Drain.
		  • 2P11-F100, Transfer Pump Wall Drain.
		• Dispatches personnel to inspect the plant for damage.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 6

Event Description: Earthquake with a loss of Unit 1 SAT 1D requiring Reactor power to be reduced to between 40 – 50% RTP.

Time	Position	Applicant's Actions or Behavior
		NOTE: *These actions are redundant to the SROs and either can perform.*

	BOP	• Enters 34AB-Y22-002-0 and performs the following actions:
		• Determines that all electrical power is available.
		• Informs SRO of the requirement to enter 34GO-OPS-005-2, Power Changes, and reduce reactor power to between 40% and 50% RTP per 34GO-OPS-005-2, Power Changes.
		Contacts switchyard maintenance to assist in switchyard damage assessment.
		• Contacts Maintenance to inspect Independent Spent Fuel Storage Installation (ISFSI) for damage.
		• Within one hour , dispatches personnel to locally close or confirmed closed the following valves (if not performed by the SRO):
		  • 1P11-F167, CST Sump to Radwaste Drain.
		  • 1P11-F3002, Condensate Transfer Pumps and Sample Sink Drain Line to Yard .
		  • 2P11-F051, Retaining Wall Drain.
		  • 2P11-F100, Transfer Pump Wall Drain.
		• Dispatches personnel to inspect the plant for damage.

	SRO	• Directs ATC to decrease reactor power to 40% to 50% by decreasing Recirc flow. Power decreases should be made as recommended by the STA/Reactor Engineering at a rate exceeding 10 MWe/min.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 6

Event Description: Earthquake with a loss of Unit 1 SAT 1D requiring Reactor power to be reduced to between 40 – 50% RTP.

Time	Position	Applicant's Actions or Behavior
		NOTE: *May get the RBM UPSCALE, (603-202) and ROD OUT BLOCK, (603-238) alarm, if a peripheral control rod is not selected. This is expected and the operator may select a peripheral rod at this time.* *May also get Alarm HEATER TROUBLE, 650-135 alarm. This is expected at this power level.*
	ATC	• IAW 34SO-B31-001-2 (step 7.1.5) & 34GO-OPS-005-2, the ATC decreases Recirc pump speed, exceeding 10 MWE per minute by depressing the LOWER SLOW, LOWER MEDIUM or LOWER FAST pushbuttons on the Master (P603 panel) or Individual controls (P602 panel) until reactor power is 40 – 50%. • If using Individual Controls, pump speed decreases will alternate between the "A" & "B" Recirc pumps to prevent excessive flow mismatches. • Monitors power decrease by observing APRM and generator output indications. • Notifies SRO of attaining 40% to 50% reactor power.
		Simulator Operator enters the next event after power has been decreased between 40% to 50% or at the Chief Examiner's request.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 7

Event Description: Emergency Depress prior to Torus level reaches 98".

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, after reactor power is reduced between 40-50% RTP and at Chief Examiners direction**, ACTIVATE (**RB-1**)* *Torus leak at (3/4") 0.75"/min)* *svoT48140 (70/.75), svoT48142 (50/10), svoT48143 (50/10), svoT48147 (50/10), svoT48148 (50/100)* ***LOOK ahead,** This leak will be modified at 142 inches in the Torus (**EGT48-1**) and ALL ADS SRVs fail closed.* *Simulator Operator: After one minute, **Notifies Unit 2 Control Room that you were in the Reactor Building and felt the floor vibrating.
	ALL	The following annunciators are received: • 650-224, PANEL 2H11-P657 SYSTEM TROUBLE. • 657-086, TORUS S-W AREA INSTR SUMP LVL HIGH. • 657-087, TORUS N-W AREA INSTR SUMP LVL HIGH. • 657-088, TORUS N-E AREA INSTR SUMP LVL HIGH. • 657-089, TORUS S-E AREA INSTR SUMP LVL HIGH. • 657-104, TORUS S-W AREA INSTR SUMP LVL HIGH-HIGH. • 657-105, TORUS N-W AREA INSTR SUMP LVL HIGH-HIGH. • 657-106, TORUS N-E AREA INSTR SUMP LVL HIGH-HIGH. • 657-107, TORUS S-E AREA INSTR SUMP LVL HIGH-HIGH. • 657-013, TORUS N-E AREA INSTR SUMP LVL HIGH-HIGH-HIGH. • 657-031, TORUS S-E AREA INSTR SUMP LVL HIGH-HIGH-HIGH. • 657-049, TORUS N-W AREA INSTR SUMP LVL HIGH-HIGH-HIGH. • 657-067, TORUS S-W AREA INSTR SUMP LVL HIGH-HIGH-HIGH.
	BOP	• Reports multiple alarms to SRO indicating a break in the Reactor Building. • Directs SO/Maintenance to investigate the leak.
	SRO	• Directs BOP to 2H11-P657 panel. • When above alarms are reported, directs operator to monitor Torus water level and then if lowering, enter 34AB-T23-004-2, Torus Water Level.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 7 Page 21 of 29

Event Description: Emergency Depress prior to Torus level reaches 98".

Time	Position	Applicant's Actions or Behavior
		Simulator Operator: ***Four minutes after being dispatched to check for leaks in the Torus section of the Reactor Building, report to the crew:*** *A leak has been identified on the "2A" Core Spray line between the Torus and the first Core Spray isolation valve.*
	ALL	• 602-235, TORUS WATER LEVEL HIGH/LOW, annunciates • Recognizes that Torus level is decreasing.
	SRO	• Dispatches personnel to determine the location of the Torus leak. • If not already directed, directs NPO to enter 34AB-T23-004-2, Torus Water Level, and to monitor Torus water level. • Enters the PC EOP Flowchart when Torus level decreases to 146 inches. • May determine that water will not be added to the Torus until the cause of the low Torus level is identified and controlled. • Enter SC EOP flowchart for SC area water levels being high.
	BOP	• If NOT already performed, dispatches personnel to the Torus area AND the Reactor Building diagonals to determine the source of the water loss (if the leak location has not already been reported).
		NOTE: *Once the leak has been identified on the "2A" Core Spray line, the operators may stop isolating other systems in an attempt to isolate valve.*

	ATC	• Enters 34AB-T23-004-2, Torus Water Level, and performs the following:
		  • Dispatches personnel to the Torus to determine source of leakage
		  • Notifies SRO of ECCS TS requirements when closing valves.
		  • Closes 2E21-F019B, Torus Suction Vlv.
		  • Closes 2E11-F065B, Torus Suction Vlv.
		  • Closes 2E11-F065D, Torus Suction Vlv.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 7

Event Description: Emergency Depress prior to Torus level reaches 98".

Time	Position	Applicant's Actions or Behavior
	ATC	• Checks Torus water level and determines the Torus level is continuing to decrease with the above valves closed • Closes 2E41-F051, HPCI Torus Suction Vlv. • Opens 2E21-F019B, Torus Suction Vlv. • Opens 2E11-F065B, Torus Suction Vlv. • Opens 2E11-F065D, Torus Suction Vlv.
	ATC	• Enters 34AB-T23-001-2, Loss of Primary Containment Integrity, AND 34AB-T22-003-2, Secondary Containment Control. • Checks Torus water level and determines the Torus level is continuing to decrease, and performs the following valves: • Opens 2E41-F051, HPCI Torus Suction Vlv. • Closes 2E51-F003, RCIC Torus Suction Vlv.
	ATC	• Checks Torus water level and determines the Torus level is continuing to decrease, and performs the following valves: • Opens 2E51-F003, RCIC Torus Suction Vlv. • Closes 2E21-F019A, Torus Suction Vlv. • Closes 2E11-F065A, Torus Suction Vlv. • Closes 2E11-F065C, Torus Suction Vlv.
	ATC	• Checks Torus water level and determines the Torus level is continuing to decrease, and opens the following valves: • 2E21-F019A, Torus Suction Vlv. • 2E11-F065A, Torus Suction Vlv. • 2E11-F065C, Torus Suction Vlv.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 7 Page 23 of 29

Event Description: Emergency Depress prior to Torus level reaches 98".

Time	Position	Applicant's Actions or Behavior
	SRO	• IAW the PC flowchart, prior to water level reaching 98 inches, determines that the reactor is required to be shutdown and enters the RC flowchart at point A. • Assigns the ATC to perform RC-1. • Assigns the BOP operator to perform RC-2 and RC-3. • Enters 31EO-EOP-010-2, RC EOP flow chart if RWL decreases below 3 inches. • Directs RWL Band of 3 to 50 inches.
	ATC	• Performs RC-1 consisting of: • Inserts a manual scram. • Places the mode switch to shutdown. • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display. • Notifies SRO of rod position check. • Places SDV isolation valve switch to "isolate" & confirms closed. • If not tripped, places the Recirc pumps at minimum speed. • Inserts SRMs and IRMs. • Shifts recorders to read IRMS, when required. • Ranges IRMS to bring reading on scale. • Notifies the SRO when the above actions are complete.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 7

Event Description: Emergency Depress prior to Torus level reaches 98".

Time	Position	Applicant's Actions or Behavior

	BOP	• Performs RC-2 actions consisting of:
		  • Confirms proper Level Control response:
		  • Checks ECCS Injection Systems.
		  • Ensures FW Master Controller setpoint reduces to 9 inches and output reduces to 25% of previous value (will not due to low power).
		  • Set down does not auto function (low power), manually reduces FW Master Controller setpoint to approximately 9 inches.
		  • When feed flow is less than the capacity of the S/U level control valve (≈ 1.5 mlbm/hr), then:
		  • Opens 2N21-F125.
		  • Places 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches.
		  • Closes 2N21-F110.
		  • Will control RWL and with SRO permission will raise RWL to 32 to 42 inches.

	BOP	• Performs RC-3 consisting of:
		  • Monitor RPV pressure.
		  • Confirm proper operation of pressure control system (TBV, LLS, etc.).
		  • If necessary, allow RPV pressure to exceed 1074 psig then cycle any SRV to initiate LLS.
		  • Maintain RPV pressure between 1074 and 800 psig.
		  • Notify SRO of pressure control system operation.

	SRO	If the need to Emergency Depressurize is recognized in time, then Anticipates Emergency Depressurization. • Assign an operator to fully open all Main Turbine Bypass Valves. • Directs ATC/BOP to place HPCI in Pull To Lock prior to 110 inches Torus level.

Op-Test No.: 2016-301 **Scenario No.:** 10-3 **Event No.:** 7 Page 25 of 29

Event Description: Emergency Depress prior to Torus level reaches 98".

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	• On the DEHC panel • Selects the Control > Bypass Valve screen. • Inserts a ramp rate of 100, then presses OK. • Inserts a bypass valve position of 100, then presses OK. • Checks that the Bypass Valve Jack status is active. • Recognizes that 3 Bypass Valves open. • Reports to the SRO 3 Bypass Valves are open. • Places HPCI Aux Oil pump in the Pull To Lock position on 2H11-P601 panel.
	ATC	• Provides periodic updates on Torus level to the SRO.
	SRO	• Transitions to CP-1 and orders 7 ADS valves open for Emergency Depress. (**GO TO EVENT 8**)

Op-Test No.: 2016-301 Scenario No.: 10-3 Event No.: 8 Page 26 of 29

Event Description: ALL ADS valves fail to open when Emergency Depress (ED) is required, EOP-108 used to ED.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, failure of ALL ADS SRVs to open, has been ACTIVE since the start of scenario.
	ATC/BOP	• Places the switches for 7 ADS valves in the open position. Determines that NONE of the ADS valves open. • Either informs SRO or continues opening other LLS SRVs. Only 4 SRVs (LLS) will open • Notifies SRO that 4 SRVs open and failure of ALL ADS SRVs fail to open. *(Critical Task – Critical task is met when 4 SRVs (LLS SRVs) have been opened and RPV pressure is <50 psig using SRVs and 31EO-EOP-108.* • The amber lights for the SRVs will NOT illuminate if pressure has been reduced to below approximately 300 psig. In this case the operator must use 2H11-P614 recorder indication to monitor tail pipe temperatures for the SRVs to verify the valves actually opened (Recorder 2B21-R614).
		NOTE: *If RPV pressure is below approximately 300psig, the SRV amber lights will not illuminate for SRV position confirmation. The operator can verify that the SRVs have opened by observing SRV tailpipe temperature increase.*
	SRO	• If the Operator notifies the SRO that 7 SRVs failed to open and that only 4 LLS valves are open, the SRO directs the operator to enter 31EO-EOP-108. • The amber lights for the SRVs will not illuminate if pressure has been reduced to below approximately 300 psig. In this case the operator must use 2H11-P614 recorder indication to monitor tail pipe temperatures for the SRVs to verify the valves actually opened (Recorder 2B21-R614).
	ATC/BOP	• Depending on Reactor Water Level prior to opening ADS valves, RWL may swell to above 60 inches, requiring the operator to enter 34AB-C32-001-2, Reactor Water Level Above 60 inches. Operator secures all injection other than CRD.
		With Chief Examiners Permission the Scenario will be terminated when Reactor pressure is within 50 psig of Torus pressure or as directed by the Chief Examiner.

Appendix D **Scenario Outline** **Form ES-D-1**

NRC FINAL

Facility: E. I Hatch **Scenario No.:** **10-04** **Op-Test No.:** **2016-301**

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions. Unit 2 is operating at 90% RTP. 2D11-K615B, Offgas Post Treatment Radiation Monitor, failed Downscale. RAS written.

Turnover: Hydrogen Seal Oil System is currently aligned with the Emergency Seal Oil pump in service. After turnover restore to Normal Hydrogen Seal Oil System Lineup starting at step 7.3.3.2.5 of 34SO-N42-001-2. Once Hydrogen Seal Oil is returned to Normal lineup, increase reactor power to 100% RTP using the Recirculation System and control rods.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP)	Restoration To Normal Hydrogen Seal Oil System Lineup starting at step 7.3.3.2.5 of 34SO-N42-001-2
2	mfB31_135B	R (ATC) TS (SRO)	Recirc '2B' ASD Cell Bypass; "2B" Recirc speed decreases resulting in a flow mismatch
3	mf65031541 mfN61_73	C (ATC)	RFPT loop seal failure requiring manual opening of bypass valve to prevent Main Turbine trip on low vacuum
4	mf70022407	C (BOP)	'2C' SSAC high temp condition '2A & 2B' SSACs are manually started by BOP
5	svoT48140 svoT48142 svoT48143 svoT48147 svoT48148	C (BOP) TS (SRO)	A leak develops from the HPCI Torus suction line downstream of 2E41-F051 and can be isolated by closing 2E41-F051 (Critical Task)
6	mfB31_39A mfB31_45A rfB31_29 mf60213160	C (ATC) TS (SRO)	Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated
7	mfS11_161	M (ALL)	Loss of Offsite Power
8	mfR43_239C mfR43_49B mfR43_62A	C (ATC)	2C EDG fails to auto tie, 1B EDG will NOT operate & 2A EDG will tie after resetting Shutdown (Critical Task to energize at least one emergency bus)
9	rfE51_234	C (BOP)	HPCI 2E41-F001 stuck closed, RCIC 2E51-F013 Fails to Auto Open requiring manual operation of 2E51-F013 to inject prior to RWL reaching -180 inches (Critical Task)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

NRC FINAL

Scenario Summary

Facility: E. I Hatch **Scenario No.: 10-04** **Op-Test No.: 2016-301**

Initiating Conditions:	Unit 2 is operating at 90% RTP. 2D11-K615B, Offgas Post Treatment Radiation Monitor, failed Downscale. RAS written.
Turnover	Hydrogen Seal Oil System is currently aligned with the Emergency Seal Oil pump in service. After turnover restore to Normal Hydrogen Seal Oil System Lineup starting at step 7.3.3.2.5 of 34SO-N42-001-2. Once Hydrogen Seal Oil is returned to Normal lineup, increase reactor power to 100% RTP using the Recirculation System.

Summary:

- **Event 1:** Normal; The BOP will return Hydrogen Seal Oil to a Normal lineup IAW the system operating procedure.

- **Event 2**: Reactivity/Component/TS; A "2B" Recirculation Pump ASD Cell will auto bypass. This will result in a flow and power reduction. The ASD Cell Bypass and Recirc flow mismatch will be addressed by annunciator response procedures and an abnormal procedure. The SRO will address TS for Recirc flow mismatch.

- **Event 3:** Component; The RFPT loop seal will experience a low level condition causing condenser vacuum to degrade. The ATC operator will isolate the loop seal drain which stops condenser vacuum decreasing. Once the loop seal level is restored, the operator returns the loop seal system to normal lineup.

- **Event 4:** Component; The "2C" Station Service Air Compressor (SSAC) will receive a high discharge air temp alarm. The operator will start the 2A & 2B SSAC's and shutdown 2C SSAC.

- **Event 5:** Component/TS; A leak develops from the HPCI Torus suction line downstream of 2E41-F051 and can be isolated by closing 2E41-F051. Torus water level will continue to decrease until 2E41-F051 is isolated. (**Critical Task**)

- **Event 6**: Component/TS; The "2A" Reactor Recirculation pump seals will sequentially develop a failure that results in reactor coolant leaking into the Drywell (DW). Initially, only the Number 1 seal fails, followed a few minutes later by a Number 2 Seal failure. The ATC operator will trip and isolate the "2A" Reactor Recirc pump. The SRO will address TS for coolant leakage and single Recirc loop operation.

- **Event 7:** Major; The plant will experience a Loss of Offsite power.

- **Event 8:** Component; 2C EDG fails to auto tie to the emergency bus and must have its frequency lowered, then raised to force the 2C EDG output breaker to close. 2A EDG will tie after Shutdown is manually reset. (**Critical Task to energize at least one emergency bus**)

- **Event 9:** HPCI F001 stuck closed and RCIC 2E51-F013 Fails to Auto Open requiring manual operation of 2E51-F013 to inject prior to RWL reaching -180 inches. (**Critical Task**)

NRC FINAL

Critical Task List

Facility: E. I Hatch **Scenario No.: 10-04** **Op-Test No.: 2016-301**

Critical Tasks

- A leak develops from the HPCI Torus suction line downstream of 2E41-F051 and can be isolated by closing 2E41-F051. Torus water level will continue to decrease until 2E41-F051 is isolated.
- Starts/ties either 2A or 2C EDG after a LOSP
- Maintains RWL above TAF or opens 7 ADS valves prior to reaching -180 inches

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	8	1. ASD 2B Cell bypass (**Event 2**) 2. RFPT Loop Seal failure (**Event 3**) 3. SSAC 2C High temperature (**Event 4**) 4. Leak from HPCI Torus suction line (**Event 5**) 5. Recirc Seal leakage (**Event 6**) 6. LOSP (**Event 7**) 7. 2 EDG failures (**Event 8**) 8. HPCI F001 fail shut/ RCIC F013 manual open (**Event 9**)
2.	Malfunctions After EOP Entry	1-2	2	1. Loss of EDGs (**Event 8**) 2. HPCI F001 fail shut/ RCIC F013 manual open (**Event 9**)
3.	Abnormal Events	2-4	4	1. Diesel Generator Recovery (**Event 8**) 2. Reactor Recirculation Pump(S) Trip, Or Recirc Loops Flow Mismatch (**Event 5**) 3. Scram (**Event 7**) 4. Pipe Break in Sec. Containment(**Event 6**)
4.	Major Transients	1-2	1	1. Station Blackout (**Event 7**)
5.	EOPs entered, requiring substantive actions	1-2	2	1. RC (Non-ATWS) 2. Primary Containment
6.	EOPs contingencies requiring substantive actions	0-2	0	1. None
7.	EOP Based Critical Tasks	2-3	3	1. Leak from HPCI Torus suction line (**Event 5**) 2. Ties either 2A or 2C EDG after a LOSP (**Event 8**) 3. Maintains RWL above TAF or opens 7 ADS valves before -180 inches RWL (**Event 9**)

SHIFT TURNOVER

target ZERO Every day, every job, safely.	**Safety Focus**
UNIT 1 STATUS	
Plant Conditions:	Unit 1 is operating at 100% power Activities in progress: Maintaining Rated Thermal Power
UNIT 2 STATUS	
Plant Conditions:	Unit 2 is operating at 90% RTP.
Protected Train: ☒ Division I ☐ Division II	**EOOS:** ☒ Green ☐ Orange ☐ Yellow ☐ Red
Scheduled evolutions:	☐ Hydrogen Seal Oil System is currently aligned with the Emergency Seal Oil pump in service. After turnover restore to Normal Hydrogen Seal Oil System Lineup starting at step 7.3.3.2.5 of 34SO-N42-001-2. ☐ Once Hydrogen Seal Oil is returned to Normal lineup, increase reactor power to 100% RTP using the Recirculation System and control rods.
Surveillances due this shift:	☐ None
Inop Equipment:	☐ 2D11-K615B, Offgas Post Treatment Radiation monitor has failed Downscale. IAW TS/TRM, I&C has placed 2D11-K615B in the trip condition while maintaining the function of 602-405, Post Treatment O/G Radiation Hi-Hi-Hi/Inop. A Caution Tag is attached to 2D11-K615B switch.
Active tagouts:	☐ None
Rod Configuration:	☐ See RWM

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 1

Event Description: Restoration To Normal Hydrogen Seal Oil System Lineup starting at step 7.3.3.2.5 of 34SO-N42-001-2.

Time	Position	Applicant's Actions or Behavior
10 Mins		*Simulator Operator, IF contacted as SO, report the following:* • *Seal Oil Vacuum Pump Separator Tank oil level is between the High AND Low Oil Level on 2N42-LG-R306, Separator Tank Sight Glass* • *2N42-F042, Vacuum Tank Inlet Valve, open* • *Oil level in the Vacuum Tank is above the bottom of the lower observation window* • *Seal Oil Vacuum Pump shaft has been manually rotated.*

	BOP	• Enters Restoration To Normal Hydrogen Seal Oil System Lineup at step 7.3.3.2.5
		• Starts 2N42-C001, H_2 Seal Oil Vacuum Pump, (2H11-P651).
		
		Simulator Operator, WHEN contacted as SO, 2N42-R302, Vacuum Tank Pressure, is 26.5 in. Hg and steady.
		
		• Confirms 2N42-R302, Vacuum Tank Pressure, stabilizes above 26 in. Hg. by contacting SO locally.
		• Starts 2N42-C003, Recirc H_2 Seal Oil Pump.
		• Starts 2N42-C004, Main H_2 Seal Oil Pump.
		• Secure 2N42-C002, Emergency Seal Oil Pump, as follows:
		  • Holds control switch for ESOP in OFF Pull To Lock position until pump stops as indicated by its extinguished red AND green lights
		  • Alarm EMERG SEAL OIL PUMP RUNNING, (651-216) will clear after the SO resets the local panel.
		  • AFTER pump stops, releases control switch.
		  • Confirm its green light is illuminated.

		Simulator Operator, when contacted as SO, report the following: • *2N42-R300, Seal Oil Pump Disch Press, is 105 psig* • *2N42-R301, Seal Oil / Machine Gas dP, pressure, is 8 psig above generator gas pressure.* • *If asked, inform BOP the Emergency Seal Oil Pump shaft has stopped rotating.*

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 1

Event Description: Restoration To Normal Hydrogen Seal Oil System Lineup starting at step 7.3.3.2.5 of 34SO-N42-001-2.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, when contacted as SO, report the following: • ***DELETE*** *mf65121574, EMERGENCY SEAL OIL PUMP RUNNING (ANNUNCIATOR ON)* • *REPORT Local alarm, EMERG SEAL OIL PUMP RUNNING, (N43-105) has been reset*
	BOP	• Confirms the following by contacting SO locally: • 2N42-R300, Seal Oil Pump Disch Press, is 100 - 110 psig. • 2N42-R301, Seal Oil / Machine Gas dP, pressure, is being maintained 7 - 9 psig above generator gas pressure.
		Simulator Operator, at the Chief Examiner's request, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 2 Page 4 of 29

Event Description: "2B" Recirculation Pump ASD Cell will auto bypass.

Time	Position	Applicant's Actions or Behavior
10 min		*Simulator Operator, At Chief Examiner's direction, press (**RB-2**) to activate:* • *mfB31_135B, Recirc ASD B Cell Bypass*
	SRO	• Direct Maintenance to be contacted to determine cause of Recirc speed decrease. • Evaluates TS LCO/RAS Recirculation Loops Operating and enters TS 3.4.1 Condition A.1 to restore within limits within 24 hours.
		NOTE: *With the ASD 2B Cell Bypassed, the operator may enter 34AB-B31-001-2, Reactor Recirculation Pump(s) Trip, Recirc Loops Mismatch, OR ASD Cell Bypass", first due to Recirc flow mismatch.*

	ATC	• Respond to ASD B TROUBLE, (602-208), Annunciator
		• Diagnose Recirc pump speed mismatch.
		• Confirm that an ASD cell has failed and is bypassed using SPDS or by having it verified locally at the ASD cabinet.
		• Enter 34AB-B31-001-2, Reactor Recirculation Pump(s) Trip, Recirc Loops Mismatch, or ASD Cell Bypass.
		  • Confirm the "SPD HLD RESET" pushbutton is illuminated.
		  • Enter section III of 34AB-B31-001-2.
		  • If Recirc speed mismatch >5%, inform SRO of 1 hour limit to balance Recirc Pump flows.

		*If the SRO decides to increase Recirc flow to match flow, then the following (**increase**) actions will be taken, otherwise skip this part and go to the (decrease) actions.*
	SRO	If asked, Reactor Engineering guidance for **increasing** power is: • "Limit the rate of power change to 10 MWe/minute."

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 2 Page 5 of 29

Event Description: "2B" Recirculation Pump ASD Cell will auto bypass.

Time	Position	Applicant's Actions or Behavior
	ATC	• If directed by SRO to **increase**: • Depress the respective "B" SPD HLD RESET pushbutton indicating lamp. • Increase speed of the Recirc Pump 2B per 34SO-B31-001-2, Reactor Recirc System, by depressing SLOW Raise or MEDIUM Raise pushbutton on ASD 2B. • After 34AB-B31-001-2 has been addressed entered, the operator will depress the Fault Reset pushbutton to reset the ASD B TROUBLE, (602-108), alarm.
		*If the SRO decides to **decrease** Recirc flow to match flow, then the following actions will be taken, otherwise skip.*
	ATC	• If directed by SRO to decrease: • Depress the respective "B" SPD HLD RESET pushbutton indicating lamp. • Decrease speed of the Recirc Pump 2A per 34SO-B31-001-2, Reactor Recirc System, by depressing SLOW Lower or MEDIUM Lower pushbutton on ASD 2A. • After 34AB-B31-001-2 has been addressed entered, the operator will depress the Fault Reset pushbutton to reset the ASD B TROUBLE, (602-208), alarm.
		***NOTE** to Examiners: TS SR 3.4.1.1 requires Recirc flow mismatch be less than 5% if operating at greater than or equal to 70% rated core flow, and mismatch be less than 10% if operating at less than 70% rated core flow.*
		Simulator Operator, When the crew has diagnosed that possibly an ASD Cell is bypassed, then with Chief Examiner's concurrence: *Call the Control Room as I&C with the following message:* *The Recirculation Pump ASD 2B has automatically bypassed a cell, conditions at the ASD are normal.*
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 3 Page 6 of 29

Event Description: RFPT loop seal failure.

Time	Position	Applicant's Actions or Behavior
10 Min		*SIMULATOR OPERATOR: At the direction of the Chief Examiner, ACTIVATE (**RB-3**)* • *mf65031541 "RFP Loop Seal Level Low (Annunciator On)"* • *mfN61_73 "Main Condenser Air In-leakage"* ***NOTE:** It takes approximately 28 minutes for vacuum to decrease to 25.9 inches.*
	ATC	• Recognize RFP LOOP SEAL LEVEL LOW, (650-319), annunciator.

	ATC	• Respond to annunciator RFP LOOP SEAL LEVEL LOW, (650-319)
		  • Dispatches an SO to 2H21-P216 to confirm 2N22-F398, RFP Bracket Drain Loop Seal Fill Valve is open.
		  • Monitors vacuum at 2H11-P650, on 2N21-R602.
		• Dispatches an SO to confirm seal water lineup and pressures IAW 34SO-N21-007-2, Condensate and Feedwater System.
		
		SIMULATOR OPERATOR: When requested NOTIFY the ATC that "Seal water pressures are normal".

	ATC	Recognize PRETREATMENT O/G RADIATION DOWNSCALE/INOP, (601-428), annunciator.

	BOP	• Monitors Inlet Flow to Stack on 2N62-P600.
		  • Receives INLET FLOW TO STACK HIGH, (600-020).
		  • Monitors Inlet flow to Stack at 2N62-P600, on 2N21-R604.

	SRO	May direct entry into 34AB-N61-002-2, Main Condenser Vacuum Low, abnormal.

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 3

Event Description: RFPT loop seal failure.

Time	Position	Applicant's Actions or Behavior
	BOP	If directed, may REDUCE reactor power per 34GO-OPS-005-2, Power Changes, to establish and maintain vacuum greater than 25 in. Hg.
		SIMULATOR OPERATOR: ***ENSURE*** *Event Trigger* ***EGN21-2*** *deletes mfN61_73 when* • *2N21-F265 is closed* *Then 45 seconds later, DELETES mf65031541.*
	ATC	• With seal water pressures normal, will be required to close 2N21-F265, RFP Loop Seal Outlet Isol Vlv after 5 minutes of alarm RFP LOOP SEAL LEVEL LOW, (650-319), being received. • With vacuum degrading may close 2N21-F265 sooner to reverse degrading vacuum condition.
	ATC	• Opens 2N21-F265 when RFP LOOP SEAL LEVEL LOW, (650-319) clears.
	BOP	• Alarm INLET FLOW TO HOLDUP LINE HIGH, (600-020), clears when flow returns to normal.
		SIMULATOR OPERATOR; At Chief Examiners direction, proceed to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 4 Page 8 of 29

Event Description: '2C' SSAC high temp condition and secured. '2A & 2B' SSACs are manually started.

Time	Position	Applicant's Actions or Behavior
5 Min.		*SIMULATOR OPERATOR:* *At the direction of the Chief Examiner ACTIVATE (**RB-4**)* • *mf70022407 Control Bldg Aftclr B001C Disch Temp High (Alarm On)* • *aoP52-R600 "Service Air Pressure"* • *aoP51-R600 "Control Air Pressure"* ***NOTE:*** *SSAC 2B will fail to auto start on lowering pressure. Event Trigger (**EGP51-2**) will remove this failure when SSAC 2B is manually started.*
		SIMULATOR OPERATOR: *When the operator dispatches a SO locally , wait 2 minutes, then NOTIFY operator that local temp on 2P51-R312C is 125°F and 2P51-R302C is reading 385°F.* *If requested by operator, report standby SSAC oil levels are normal and Aftercooler/Intercooler drains have been cycled.*
	BOP	Responds to annunciator CONTROL BLDG AFTCLR B001C DISCH TEMP HIGH, (700-216): • Sends SO to locally confirm temperature is > 120 degrees F on 2P51-R312C and 2P51-R302C. • Starts the 2A and/or 2B Service Air Compressor. • Secures the 2C Service Air Compressor by placing its control switch in Pull-to-Lock when the local report is given or earlier as directed by the SRO. • Dispatches SO/Maintenance to investigate high temperature alarm.

Op-Test No.: 2016-301 Scenario No.: 10-04 Event No.: 4 Page 9 of 29

Event Description: '2C' SSAC high temp condition and secured. '2A & 2B' SSACs are manually started.

Time	Position	Applicant's Actions or Behavior
		*SIMULATOR OPERATOR: When the operator secures the 2C Service Air Compressor, ENSURE Event Trigger (**EGP51-1**) is ACTIVATED: DELETES the following:* • *aoP52-R600 'Service Air Pressure'* • *aoP51-R600 'Control Air Pressure'* *mf70022407 'Control Bldg Aftclr B001C Disch Temp High' (Annunciator On) 30 seconds later.*
	BOP	Annunciator CONTROL BLDG AFTCLR B001C DISCH TEMP HIGH, (700-216) clears.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 5 Page 10 of 29

Event Description: A leak develops from the HPCI Torus suction line downstream of 2E41-F051 and can be isolated by closing 2E41-F051.

Time	Position	Applicant's Actions or Behavior
12 Min		*Simulator Operator, at Chief Examiners direction, ACTIVATE (**RB-5**)* *Torus leak at (3/4 inch) 0.75 inch/min)* *svoT48140 (70/.75), svoT48142 (50/10), svoT48143 (50/10), svoT48147 (50/10), svoT48148 (50/100)*
	ALL	The following annunciators are received: • PANEL 2H11-P657 SYSTEM TROUBLE, (650-224). • TORUS S-W AREA INSTR SUMP LVL HIGH, (657-086). • TORUS N-W AREA INSTR SUMP LVL HIGH, (657-087). • TORUS N-E AREA INSTR SUMP LVL HIGH, (657-088). • TORUS S-E AREA INSTR SUMP LVL HIGH, (657-089). • TORUS S-W AREA INSTR SUMP LVL HIGH-HIGH, (657-104). • TORUS N-W AREA INSTR SUMP LVL HIGH-HIGH, (657-105). • TORUS N-E AREA INSTR SUMP LVL HIGH-HIGH, (657-106). • TORUS S-E AREA INSTR SUMP LVL HIGH-HIGH, (657-107). • TORUS N-E AREA INSTR SUMP LVL HIGH-HIGH-HIGH, (657-013). • TORUS S-E AREA INSTR SUMP LVL HIGH-HIGH-HIGH, (657-031). • TORUS N-W AREA INSTR SUMP LVL HIGH-HIGH-HIGH, (657-049). • TORUS S-W AREA INSTR SUMP LVL HIGH-HIGH-HIGH, (657-067).
	BOP	• Reports multiple alarms to SRO indicating a break in the Reactor Building. • Directs SO/Maintenance to investigate the leak.

Op-Test No.: 2016-301 Scenario No.: 10-04 Event No.: 5 Page 11 of 29

Event Description: A leak develops from the HPCI Torus suction line downstream of 2E41-F051 and can be isolated by closing 2E41-F051.

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs BOP to 2H11-P657 panel. • When above alarms are reported, directs operator to monitor Torus water level and then if lowering, enter 34AB-T23-004-2, Torus Water Level.
		Simulator Operator: ***Four minutes after being dispatched to check for leaks in the Torus section of the Reactor Building, report to the crew:*** *A leak has been identified on the HPCI suction line and I can't tell where the leak is exactly.*
	ALL	• TORUS WATER LEVEL HIGH/LOW, (602-235) annunciates • Recognizes that Torus level is decreasing.
	SRO	• Dispatches personnel to determine the location of the Torus leak. • If not already directed, directs NPO to enter 34AB-T23-004-2, Torus Water Level, and to monitor Torus water level. • Enters the PC EOP Flowchart when Torus level decreases to 146 inches. • May determine that water will NOT be added to the Torus until the cause of the low Torus level is identified and controlled. • Enter SC EOP flowchart for SC area water levels being high.
	BOP	If NOT already performed, dispatches personnel to the Torus area AND the Reactor Building diagonals to determine the source of the water loss (if the leak location has NOT already been reported).

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 5

Event Description: A leak develops from the HPCI Torus suction line downstream of 2E41-F051 and can be isolated by closing 2E41-F051.

Time	Position	Applicant's Actions or Behavior

	ATC	• Enters 34AB-T23-004-2, Torus Water Level, and performs the following:
		  • Dispatches personnel to the Torus AND SE Diagonal to determine source of leakage.
		  • Notifies SRO of ECCS TS requirements when closing valves.
		  • Closes 2E21-F019B, Torus Suction Vlv.
		  • Closes 2E11-F065B, Torus Suction Vlv.
		  • Closes 2E11-F065D, Torus Suction Vlv.

		Simulator Operator: ENSURE Event Trigger ***EGE41-4*** *MODIFIES the following when 2E41-F051 is closed:* *svoT48140 (r:0.0), svoT48142 (0/10), svoT48143 (0/10), svoT48147 (0/10), svoT48148 (0/10)*
	ATC	• Checks Torus water level and determines the Torus level is continuing to decrease with the above valves closed • Closes 2E41-F051, HPCI Torus Suction Vlv. • Opens 2E21-F019B, Torus Suction Vlv. • Opens 2E11-F065B, Torus Suction Vlv. • Opens 2E11-F065D, Torus Suction Vlv.
	ATC	• Checks Torus water level and determines the Torus level has stopped decreasing • Enters 34AB-T23-001-2, Loss of Primary Containment Integrity, AND 34AB-T22-003-2, Secondary Containment Control. • Notifies SRO that the Torus leak stopped after 2E41-F051 was closed.

Op-Test No.: 2016-301 Scenario No.: 10-04 Event No.: 5 Page 13 of 29

Event Description: A leak develops from the HPCI Torus suction line downstream of 2E41-F051 and can be isolated by closing 2E41-F051.

Time	Position	Applicant's Actions or Behavior

	SRO	• Reviews TS 3.6.2.2, Suppression Pool Water Level.
		• IAW TS 3.6.2.2 Condition A.
		  • Must restore within 2 hours
		
		• Reviews TS 3.5.1, ECCS/RCIC.
		• IAW TS 3.5.1 Condition C,
		  • Declares HPCI inoperable,
		  • Must verify within one hour that RCIC is operable by administrative means.
		  • Must restore HPCI to operable status within 14 days.

		NOTE: *This TS would be appropriate if the applicant elects to perform 31EO-EOP-100-2, Section 4.7 to override high Torus level suction*
	SRO	• Reviews TS 3.3.5.1, ECCS Instrumentation. • IAW TS 3.3.5.1 Condition D, • Only applicable if HPCI is not aligned to the Suppression Pool, Declares HPCI inop within one hour.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 6

Event Description: Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated

Time	Position	Applicant's Actions or Behavior
12 Min		*Simulator Operator, with Chief Examiners Permission:* • *Call control room BOP operator and tell them to stay on the phone until directed to hang up.* • *ACTIVATE: (**RB-6**) to start Recirc Pump 2A seal leakage, mfB31_39A Final 100, Ramp of 10*
	ATC	• Receives Annunciator, PUMP A SEAL STAGING FLOW HIGH/LOW, (602-122) in approximately 3 minutes. • Observes and compares 2B31-R603A, Seal A No. 1 pressure indicator, AND 2B31-R602A, Seal A No. 2 pressure indicator, to determine the Inner (#1) seal has failed (No. 1 pressure normal with No. 2 pressure > normal). • Notifies SRO that the Inner (#1) Seal on Recirc A has failed. • Directs a System Operator to confirm seal water flow to Pump A is between 1.6 to 2.2 gpm locally (this indication not available in the Control Room). • Assigns an extra operator to perform 34SV-SUV-019-2, Surveillance Checks, to determine the magnitude of leakage. • May monitor Drywell pressure.
		Simulator Operator, *After the ATC operator has started executing steps in the "Pump A Seal Staging Flow High/Low" ARP, THEN Instruct the BOP operator to hang up the phone.*

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 6

Event Description: Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated

Time	Position	Applicant's Actions or Behavior
		Simulator Operator; *After 3 minutes from 602-122, NOTIFY the Chief Examiner AND then press **(RB-1)** to ACTIVATE: mfB31_45A (10/20), Recirc A Outer Seal Failure.*
		(**IMPORTANT**) • *Ensure the **ATC responds** to the "Outer Seal A Leak Detection Flow High," (602-116) and performs the next set of actions (Trip and isolate the "2A" Recirc Pump). ENSURE the BOP operator is the person assigned to vent the Drywell.*

	ALL	• Receives Annunciators:
		  • OUTER SEAL A LEAK DETECTION FLOW HIGH, (602-116).
		  • DRYWELL/TORUS RCDR R627 TEMP HIGH, (650-204).
		  • PANEL 2H11-P654 SYSTEM TROUBLE, (650-214).
		  • PANEL 2H11-P657 SYSTEM TROUBLE, (650-224).
		  • DRYWELL FLOOR DRAINS SUMP LEAK HIGH-HIGH, (602-408).

	ATC	• Observes and compares 2B31-R603A, Seal A No. 1 pressure indicator AND 2B31-R602A, Seal A No. 2 pressure indicator, to determine the outer seal has now failed (No. 1 and No. 2 seal pressure decreases). • Notifies SRO that the Outer (#2) Seal on "2A" Recirc has also failed. • Has an extra operator perform 34SV-SUV-019-2, Surveillance Checks, to determine magnitude of leak. • Monitors 2D11-R630, Fission Products Monitor recorder, to determine IF primary system coolant is leaking from seals. • Monitors Drywell pressure. • PANEL 2H11-P657 SYSTEM TROUBLE, (650-224) • MULTIPOINT TEMPERATURE RCDR 2T47-R626 TEMPERATURE HIGH (657-025).

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 6

Event Description: Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated

Time	Position	Applicant's Actions or Behavior

	ALL	• Receives the following alarms
		  • PRIMARY CONTAINMENT PRESS HIGH, (603-115).
		  • DRYWELL FLOOR DRAINS SUMP LEAK HIGH, (602-408).

	SRO	• Directs Operator to Check DW Leakage. • Directs the BOP to vent the DW with SBGT, when DW pressure approaches 0.65 psig.

		Simulator Operator;
		
		As the operator checking DW leakage, report:
		  • *DW Equipment drain leakage is stable at 1.7 gpm*
		  • *Floor drain leakage has increased from 0.8 gpm to 12.1 gpm.*
		
		SIMULATOR OPERATOR;
		If the crew inserts a Reactor Scram during Event 5, PROCEED to Major Event 7.

Op-Test No.: 2016-301 Scenario No.: 10-04 Event No.: 6 Page 17 of 29

Event Description: Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs BOP to Vent the DW using both Loops of CAD.
		NOTE: *The operator may place DW Venting in service by using the Placard that's available or using the appropriate section of the procedure. These steps assume the Placard is used. The 2A or 2B CAD Loop valves will be used first.*

	BOP	IAW 34SO-T48-002-2, Placard, the BOP performs the following:
		• Opens 2T48-F334A and/or 2T48-F334B
		• The following alarms will be received:
		  • DRYWELL VENT EXHAUST BYPASS VALVES OPEN, (657-008).
		  • DRWL/TORUS N_2 M/U 2 INCH ISOL VALVES OPEN, (657-042).
		  • DRYWELL VENT EXHAUST BYPASS VALVES OPEN, (654-002).
		  • DRWL/TORUS N_2 M/U 2 INCH ISOL VALVES OPEN, (654-035).
		• Opens 2T48-F335A and/or 2T48-F335B.
		• Opens 2T48-F336A and/or 2T48-F336B using 2T48-R615A and/or R615B, Drywell Flow Controller for F336A and/or F336B.
		• Monitors DW pressure .
		• Confirms Drywell and Torus O_2 concentration is <4%, on 2P33-R603,Pri Cnmt Oxygen Recorder (P602) OR by lab sample.

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 6

Event Description: Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated

Time	Position	Applicant's Actions or Behavior
	ATC	• Per (602-116) and 34SO-B31-001-2, Recirc System, Performs one of the following to secure the Reactor Recirc Pump: • Either (actions for Immediate Shutdown) • Place the ASD "A" control switch in Pull to Lock (P602). • Depress the ASD "A" Shutdown pushbutton (P602). • OR (Actions for Shutdown in a Timely Manner) • Depress the ASD "A" Shutdown pushbutton (P602). • Confirm ASD A speed ramps to ~370 RPM (2B31-R660) or 22% (2B31-R661). • Confirm Recirc Pump A goes to 0 RPM (2B31-R660) or 22% (2B31-R661) and drive coasts to 0 gpm (2B31-R614 or R617). • Confirm ASD A Start pushbutton illuminates. • Place ASD "A" control switch 2B31-S002A to Pull-To-Lock (P602). • Closes 2B31-F031A, Reactor Recirc A Pump Disch Vlv . • Closes 2B31-F023A, Reactor Recirc A Pump Suction Vlv . • Dispatches SO to close Seal Injection To Pump A Header Isolation Valve, 2B31-F008A. • Enters 34AB-B31-001-2 "Reactor Recirculation Pump(s) TRIP, Recirc Loops Flow mismatch, Or ASD Cell Bypass." • Notify Plant Management and Load Dispatcher.
	ATC	• Receives and Acknowledges the following Annunciators: • RECIRC LOOP A OUT OF SERVICE, (602-127). • ASD "A" TRIP WARNING, (602-101). • ASD "A" TROUBLE, (602-108). • ASD "A" FATAL FAULT, (602-102). • RBM DOWNSCALE, (603-211). • ROD OUT BLOCK, (603-238). • HEATER TROUBLE ALARM, (650-135) (may come in and clear).

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 6

Event Description: Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated

Time	Position	Applicant's Actions or Behavior
		NOTE TO EXAMINER: *SRO may direct exiting the Region of Potential Instabilities and a follow-up question may be needed to address Tech Spec requirements.*
	SRO	• Directs operator to shutdown and isolate Recirc pump A • Enters Tech Specs: • 3.4 Reactor Coolant System. • 3.4.1 Recirculation Loops Operating • **Condition: 3.4.1.A,** Requirements of the LCO not met. (i.e. single loop operations). **Required Action:** Satisfy requirements of the LCO. **Completion time:** 24 hrs. • **Condition: 3.4.4.A,** Unidentified leakage not within limit OR total leakage not within limit. **Required Action:** Reduce leakage to within limits. **Completion time:** 4 hours. • **Condition 3.4.4.B**, Unidentified leakage increase not within limit. **Required Action:** Reduce leakage increase to within limits. **Completion time:** 4 hours. • Notifies STA or Reactor Engineering that new limits apply for APLHGR, MCPR, LHGR, and APRMs Simulated Thermal power - New Setpoints are required within 24 hours.

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 6

Event Description: Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated

Time	Position	Applicant's Actions or Behavior
		Simulator Operator; *AFTER the suction and discharge valves are closed for the "2A" Recirc pump, and you are requested to close 2B31-F008, THEN:* *AND THEN press (**RB-9**) to ACTIVATE:* • *rfB31_29, Recirc mini purge B31-F016A closure (simulates B31-F008A being closed)* • *mf60213160, "Outer Seal A Leak Detection Flow High – Annunciator Off (602-116)* *AND THEN REPORT that 2B31-F008A is closed.*
		Simulator Operator; *If another DW leakage check is requested, report:* • *Drywell floor drain leakage has decreased to 1.8 gpm.*
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 7

Event Description: Loss of Offsite Power with EDGs failures.

Time	Position	Applicant's Actions or Behavior
15 Mins		*SIMULATOR OPERATOR: At the direction of the Chief Examiner, ACTIVATE (**RB-7**), mfS11_161, Loss of Offsite Power.*
	ALL	Recognize a Loss Of Offsite Power.
		NOTE: *With a Loss of Offsite Power, the pertinent operator RC-2 actions are limited to checking ECCS.*
	SRO	• Calls for maintenance support in restoring all emergency 4160 VAC buses. • Enters the RC EOP flowchart and directs a RWL band of +3 - +50 inches.
	ATC	May enter 34AB-R22-003-2, Station Blackout, until the appropriate EDGs are supplying power to emergency buses.
		NOTE: *The SRO may assign one operator to perform Scram procedure placards RC-1, RC-2 and RC-3.*
	SRO	• Assigns the ATC to perform RC-1. • Assigns the BOP operator to perform RC-2 and RC-3. • If time allows assigns TC-1 to be performed. • Enters the RC EOP flow chart, 31EO-EOP-010-2, once reactor water level decreases to 3 inches or reactor pressure increases to 1074 psig. • Directs EOP RC level control band of +3 inches to +50 inches

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 7

Event Description: Loss of Offsite Power with EDGs failures.

Time	Position	Applicant's Actions or Behavior
	ATC	• Performs RC-1 consisting of: • Inserts a manual scram. • Places the mode switch to shutdown. • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display. • Notifies the SRO of rod position check. • Places SDV isolation valve switch to "isolate" & confirms closed. • Inserts SRMs and IRMs. • Shifts recorders to read IRMS, when required. • Ranges IRMS to bring reading on scale. • Notifies the SRO when the above actions are complete.
		NOTE: *With a Loss of Offsite Power, the pertinent operator RC-2 actions are limited to checking ECCS.*
	BOP	• Checks ECCS Injection Systems and verifies no initiation signal present.
		• Performs RC-3 consisting of: • Monitor RPV pressure. • Confirm proper operation of pressure control system (LLS and SRVs). • If necessary, allows RPV pressure to exceed 1074 psig then cycles any SRV to initiate LLS. • Maintain RPV pressure between 1074 and 800 psig. • Notify SRO that LLS is the pressure control system.
		Simulator Operator, PROCEEDS to the next event.

Op-Test No.: 2016-301 Scenario No.: 10-04 Event No.: 8 Page 23 of 29

Event Description: 2C EDG auto starts but fails to tie/must lower then raise frequency to energize bus (fails to auto tie), 1B EDG will NOT run & 2A EDG will start & tie after manipulating Start switch.

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs ATC to address the plant electrical systems and enter the following: • 34AB-R22-003-2, Station Blackout. • 34AB-R43-001-2, Diesel Generator Recovery.
		The ATC may start first with any of the Diesel Generators.
	ATC	Reviews EDG 2A annunciators and determines EDG 2A failed to Start.
		IAW 34AB-R43-001-2, Diesel Generator Recovery, for EDG 2A : • Determines the EDG is not running. • Determines the Auto Start System Operative Light is lit. • Places EDG 2A Start/Stop switch to START. • Confirms EDG 2A has started and tied. • Reports to SRO Bus 2E is now energized.
	ATC	Reviews EDG 1B annunciators and determines alarms 652-211, Lube Oil Press Low and 652-229, Emergency Engine Shutdown.
		SIMULATOR OPERATOR: When called as the SO to investigate the EDGs, wait two minutes and report: • *EDG 1B has a break on the oil pump discharge line*
	ATC	IAW 34AB-R43-001-2, Diesel Generator Recovery, for EDG 2C: • Determines the EDG is running. • Confirm Normal and alternate supply breakers OPEN. • Lowers EDG frequency to 57 Hz, then Raise to 60 Hz. (Critical Task) • Confirms EDG 2G output breaker closed. • Reports to SRO Bus 2G is now energized.

Op-Test No.: 2016-301 Scenario No.: 10-04 Event No.: 8 Page 24 of 29

Event Description: 2C EDG auto starts but fails to tie/must lower then raise frequency to energize bus (fails to auto tie), 1B EDG will NOT run & 2A EDG will start & tie after manipulating Start switch.

Time	Position	Applicant's Actions or Behavior
		The following can be performed in any order.
		• As time allows, directs the SSS to perform the following: • RPS MG Set 2A – restarted. • SSAC 2A local breaker - reclosed. • Division I Station Service Battery Chargers. (may have been previously performed). • Vital AC Alternate Power Supply returned to service.
		• As time allows, directs the SSS to perform the following: • RPS MG Set 2B – restarted. • RPS Alternate Supply from 2B Essential Cabinet – restarted. • SSAC 2B local breaker - reclosed. • Division II Station Service Battery Chargers. (may have been previously performed) • Vital AC Battery Charger returned to service.
	SRO	Once power is restored, may direct operator to place Torus Cooling in service.
	BOP (Placard)	• Enters 34SO-E11-010-2, Residual Heat Removal or uses placard on 2H11-P601. • Places RHRSW in service. • Prelubes RHRSW B pump. • Overrides 2E11-F068B Low Discharge Pressure Interlock. • Positions 2E11-F068B to 45% OPEN. - RHR HX B Diff Press Low (601-215) alarms. • Starts RHRSW pump B. • Places 2E11-F068B Low Discharge Pressure Interlock switch to normal position. • Positions 2E11-F068B to obtain < 4400 GPM AND < 450 PSIG. • RHR HX B Diff Press Low (601-215) alarm clears.

Op-Test No.: 2016-301 **Scenario No.:** 10-04 **Event No.:** 8

Event Description: 2C EDG auto starts but fails to tie/must lower then raise frequency to energize bus (fails to auto tie), 1B EDG will NOT run & 2A EDG will start & tie after manipulating Start switch.

Time	Position	Applicant's Actions or Behavior
	BOP (Placard)	• Place RHR loop B in Suppression Pool Cooling. • Does NOT position the 2/3 Core Height Permissive switch. (RWL will NOT be lowered to below 2/3 core height). • Does NOT place the Containment Spray valve Control switch in the manual position. (LOCA signal is not present). • Confirm open 2E11-F048B, HX Bypass Vlv. • Close 2E11-F047B, Hx Inlet Vlv. • Confirm open 2E11-F003A, HX Outlet Vlv. • Start RHR pump 2B. - SEC System Auto Initiation Signal Present (650-234) alarms. - Auto Blow Down CS or RHR Press Permissive (602-312) alarms. - RHR Flow Low (601-215) alarms.
		• Open 2E11-F028B, Torus Spray or Test Vlv. • Throttle open 2E11-F024B, Full Flow Test Line Vlv. and establish RHR flow of less than or equal to 7700 gpm (R603B). - RHR Flow Low (601-215) alarm clears. • Open 2E11-F047B, Hx Inlet Vlv. • Close 2E11-F048B, Hx Bypass Vlv. • Reports to SRO that RHR has been placed in Suppression Pool Cooling mode.
		Simulator Operator, PROCEEDS to the next event.

Op-Test No.: 2016-301 Scenario No.: 10-04 Event No.: 9 Page 26 of 29

Event Description: HPCI 2E41-F001 stuck closed, RCIC 2E51-F013 Fails to Auto Open requiring manual operation of 2E51-F013 to inject prior to RWL reaching -180"

Time	Position	Applicant's Actions or Behavior
		The malfunction for this event was in at the beginning of the scenario (rfE51_234 Final Value of BYPASS). The operator may start RCIC OR HPCI first; either is acceptable, however 2E41-F001 is stuck closed, making HPCI unavailable.
	BOP	• Starts RCIC for level control by performing the following at 2H11-P602 panel:
		• Depresses RCIC Manual Initiation P/B. • Confirms/Opens 2E51-F046. • Confirms/Starts Barom Cndsr Vac Pump. • Confirms/Opens 2E51-F045. • Confirms/Opens 2E51-F019. • Confirms/Closes 2E51-F019 at flow > 79.3 gpm. • Realizes 2E51-F013 did not auto open. • Opens 2E51-F013 (Critical Task to maintain RWL >-180 inches). • Adjusts controller for desired flow and with SRO permission will raise RWL to 32 to 42 inches.
	BOP	• Starts HPCI for level control by performing the following at 2H11-P602 panel: • Opens 2E41-F059, Lube Oil Cooling Wtr Vlv. • Starts 2E41-C002-2, Barometric Condenser Vacuum Pump. • Realizes 2E41-F001, Turbine Steam Supply Vlv, will not open. • Takes 2E41-C002-3, Aux Oil Pump, control switch to the START position. (May place switch in Pull To Lock Off) • As time allows, notifies Maintenance of 2E41-F001 failure. • Informs SRO of 2E41-F001 failure.
		With Chief Examiners Permission, the Scenario will be terminated when Reactor water level is controlled in band and One Emergency bus is energized or as directed by the Chief Examiner.

Appendix D **Scenario Outline** **Form ES-D-1**

NRC FINAL

Facility: E. I Hatch **Scenario No.:** 10-05 **Op-Test No.:** 2016-301

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions. Unit 2 is operating at approximately 5% RTP preparing to swap Steam Packing Exhausters IAW step 7.3.1 of 34SO-N33-001-2. 2B21-F013M is inop for its mechanical lift setpoint, RAS written.

Turnover: Continue with the Startup IAW 34GO-OPS-001-2 at step 7.4.1.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP)	Swap operating Steam Packing Exhausters IAW step 7.3.1 of 34SO-N33-001-2.
2	N/A	R (ATC)	Withdraw Control Rods to increase power.
3	mfT41_147	C (BOP)	Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start. Standby Exhaust fan manually started or SBGT fan started to re-establish Rx. Bldg. dP. (Critical Task)
4	mfC11_299	C (ATC)	CRD Flow Controller fails in Auto requiring manual operation to re-establish CRD flow.
5	loE21-C001AG1 loE21-C001AR2 diE21-C001A loE21-C001A_SIW1	TS (SRO)	CS pump 2A DC breaker tripped and cannot be reclosed.
6	N/A	C (BOP) TS (SRO)	HPCI Room fire
7	mfN21_88B	I (ATC)	Feedwater pump 2B cooling water controller failure.
8	rfC11_141	TS (SRO)	The Backup SDV valves will close due to a small air leak on 2C11-F040 requiring the SRO declare a TS Required Action Statement.
9	N71_70	M(ALL)	Circ Water Leak Causing Con Bay Flooding/Loss of Vacuum/Loss of CRD pumps
10	loB21-F022BG1 loB21-F022BR2 loB21-F022BMG1 loB21-F022BMR2 loB21-F028BG1 loB21-F028BR2 loB21-F028BMG1 loB21-F028BMR2 loB21-F022B_AC1 loB21-F022B_DC1 loB21-F028B_AC1 loB21-F028B_DC1	C (BOP)	BPV #3 Main Turbine Bypass Valve fails 25% open, 'B' MSL fails to isolate automatically on low vacuum, manual isolation required. (Critical Task)
*	(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor		

NRC FINAL

Scenario Summary

Facility: E. I Hatch **Scenario No.: 10-05** **Op-Test No.: 2016-301**

Initiating Conditions:	Unit 2 is operating at approximately 5% preparing to swap Steam Packing Exhausters per step 7.3.1 of 34SO-N33-001-2. 2B21-F013M is inop for its mechanical lift setpoint, RAS written.
Turnover	Continue with the Startup IAW 34GO-OPS-001-2 at step 7.4.1.

Summary:

- **Event 1**: Normal; Swap Steam Packing Exhausters IAW 34SO-N33-001-2, Seal Steam System.
- **Event 2**: Pull control rods to continue Startup to ~ 9% power, raise pressure set to 920.
- **Event 3**: Component; Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start. The operator takes manual control to place the Standby Exhaust fan or SBGT in service to re-establish the required Reactor Building dP. **(Critical Task)**
- **Event 4:** Component; CRD Flow Controller fails closed causing a loss of normal CRD flow. The ATC will place the controller in manual and restore CRD flow.
- **Event 5:** TS; CS pump 2A DC breaker tripped and cannot be reclosed.
- **Event 6:** Component; HPCI Room Fire.
- **Event 7**: Instrument; Feedwater pump 2B cooling water controller will fail requiring the ATC to maintain cooling water manually.
- **Event 8:** TS; The Backup SDV valves will close due to a small air leak on 2C11-F040 requiring the SRO declare a TS Required Action Statement.
- **Event 9:** Major; Condenser Bay Flooding is received which de-energizes 4160V 2A & 2B, requiring the operator to insert a manual scram. 'B' MSL fails to automatically close; manual works.
- **Event 10:** 'B' MSL fails to isolate automatically on low vacuum, manual isolation required. **(Critical Task)**

NRC FINAL

Critical Task List

Facility: E. I Hatch **Scenario No.: 10-05** **Op-Test No.: 2016-301**

Critical Tasks

- Standby Exhaust fan manually started or SBGT fan started to re-establish Rx Bldg dp. **(Event 3)**
- 'B' MSL fails to isolate automatically on low vacuum, manual isolation required to prevent release to Turbine Building. **(Event 10)**

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	6	1. Reactor Building Exhaust fan failure **(Event 3)** 2. CRD Flow Controller fails closed **(Event 4)** 3. HPCI room fire **(Event 6)** 4. RFP 2B cooling water failure **(Event 7)** 5. Condenser Bay flooding **(Event 9)** 6. MSIV line fails to isolate **(Event 10)**
2.	Malfunctions After EOP Entry	1-2	1	1. MSIV line fails to isolate **(Event 10)**
3.	Abnormal Events	2-4	3	1. 34AB-T22-002-2, Loss of Sec Cont Integrity **(Event 3)** 2. 34AB-X43-001-2, Fire Procedure, **(Event 6)** 3. 34AB-C71-001-2, Scram Procedure **(Event 9)**
4.	Major Transients	1-2	1	1. Condenser Bay Flooding-Scram **(Event 9)**
5.	EOPs entered, requiring substantive actions	1-2	1	1. RC (Non-ATWS) **(Event 9)**
6.	EOPs contingencies requiring substantive actions	0-2	0	1. None
7.	EOP Based Critical Tasks	2-3	2	1. Stby Exh fan manually started or SBGT fan started to re-establish Rx Bldg dp. **(Event 3)** 2. 'B' MSL fails to isolate automatically on low vacuum, manual isolation required to prevent release to Turbine Building. **(Event 10)**

SHIFT TURNOVER

target ZERO Every day, every job, safely.	**Safety Focus**
UNIT 1 STATUS	
Plant Conditions:	☐ Unit 1 is operating at 100% power ☐ Activities in progress: Maintaining Rated Thermal Power
UNIT 2 STATUS	
Plant Conditions:	☐ Unit 2 is operating at approximately 5% preparing to swap Steam Packing Exhausters per step 7.3.1 of 34SO-N33-001-2. ☐ FWLC System is operating in Single element Mode. ☐ 2B21-F013M is inop for its mechanical lift setpoint, RAS written.
Protected Train: ☒ Division I ☐ Division II	**EOOS:** ☒ Green ☐ Orange ☐ Yellow ☐ Red
Scheduled evolutions:	☐ Continue with the Startup IAW 34GO-OPS-001-2 at step 7.4.1. ☐ Continue with control rod withdrawal at Step 31 (06-23). When Step 31 rods are at position 24, Continuous Rod withdrawal is allowed.
Surveillances due this shift:	☐ None
Inop Equipment:	☐ 2B21-F013M is inop for its mechanical lift setpoint.
Active tagouts:	☐ Normal Supply Breakers to 4160V 2A, 2B, 2C & 2D
Rod Configuration:	☐ See RWM

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 1

Event Description: Swap Steam Packing Exhausters IAW 34SO-N33-001-2, Seal Steam System.

Time	Position	Applicant's Actions or Behavior
3 Min	BOP	• Places 2N33-C001 Stm Pkg Exh Blower 2A Control Switch to the OFF position. • Opens 2N33-F025B, SPE Blower Disch Vlv, UNTIL Red OPEN indicating light ILLUMINATES. • Places 2N33-C001 Stm Pkg Exh Blower 2B the Control Switch to the RUN.
		• Throttles OPEN 2N33-F025B, SPE Blower Disch. Vlv, UNTIL Steam Packing Exhauster Vacuum indicates between 10-20 inches of water vacuum as read on 2N33-R601B. • Closes 2N33-F025A, SPE Blower Disch Vlv. • Places the control switches in STOP for 2N33-F025A & B.
		Simulator Operator enters the next event after surveillance is complete OR at the Chief Examiner's request.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 2

Event Description: Withdraw control rods to ~9% power and transfer the Reactor Mode Switch to Run

Time	Position	Applicant's Actions or Behavior
12 Min	SRO	Directs ATC to continue rod withdrawal (06-23) to approximately 9% power
		NOTE: *IAW Turnover sheet, Notch withdrawal is used to position 24 and then continuous notch withdrawal is allowed.*
	ATC	• Starting at Step 31, withdraws all control rods within a step to the withdraw limit. • Initials for control rod withdrawal. • Dates for control rod withdrawal. • Notifies SRO that reactor power is approximately 9%.
	SRO	Directs: • ATC confirm all APRMs indicate between 7% AND 10%. • BOP confirm operable APRM DOWNSCALE trips are clear .
	ATC	Reports all APRMs indicate between 7% AND 10%.
	BOP	Confirms operable APRM DOWNSCALE trips are clear by performing the following at the APRM ODAs at 2H11-P608: • Depress the "ETC" key. • UNTIL "TRIP STATUS" option ILLUMINATES. • Depress "TRIP STATUS" key, THEN confirm "APRM FLUX DOWNSCALE ALARM" is NOT active.
	SRO	Directs BOP or ATC to confirm all IRMs are NOT Upscale.
	BOP/ATC	Confirms no IRMs are UPSCALE by observing: • 2H11-P606 upscale lights not illuminated **OR** • 2H11-P603 upscale lights not illuminated **OR** • 2H11-P603 annunciator 603-221, "IRM Upscale" not illuminated.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 2

Event Description: Withdraw control rods to ~9% power and transfer the Reactor Mode Switch to Run

Time	Position	Applicant's Actions or Behavior
	SRO	Confirms APRM/OPRM Operability: • at least three APRM channels per RPS Trip System are OPERABLE. **AND** • at least 2 "APRM TWO-OUT-OF-FOUR-VOTER-CHANNELS" per RPS Trip System are OPERABLE. **AND** • at least 3 OPRM channels per RPS Trip System are OPERABLE. Confirms surveillances are current: • 57SV-C51-001-0, APRM Functional Test. • 57SV-C51-005-0, APRM Calibration. • 57SV-C51-003-0, APRM Two Out of Four Logic Module FT.
		NOTE: *APRM status can be confirmed by the turnover sheet or by directing STA to confirm operability.* *Simulator Operator: If contacted for APRM status, inform the SS all APRMs are operable and all surveillances are current.*
	SRO	Directs the ATC (or observes) the following annunciators are CLEAR: • 603-232, MAIN STEAM LINE PRESS A LOW. • 603-233, MAIN STEAM LINE PRESS B LOW.
	ATC	If directed, reports annunciators 603-232 and 603-233 are clear.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 3 Page 5 of 27

Event Description: Reactor Building Exhaust fan (2T41-C007A) failure, broken coupling.

Time	Position	Applicant's Actions or Behavior
15 Min		*At Lead Evaluators direction the Simulator Operator ENTERS **(RB-3)** mfT41_147, Rx Bldg Exhaust Fan A fails & standby does not auto start*
		On the 2H11-P650 panel alarms 650-214, Panel 2H11-P654 Panel System Trouble and 650-224, Panel 2H11-P657 Panel System Trouble are received.
	BOP	• Announces the alarm to the SRO.
	SRO	• The SRO repeats the alarm and dispatches the BOP operator to the 2H11-P654 & P657 panels.
		NOTE: *This failure will require entry into the SC EOP Flow Chart as well as two Abnormal procedures. The success path is to restore Rx. Bldg Ventilation or place SBGT in service.*
		When the operator enters 657-081, then the following actions will be addressed to place Rx Bldg Exhaust Fan back in service.
	BOP	• Acknowledges 657-081, RB Exhaust Fan 2T41-C007A/B Flow Low' alarm and enters 657-081.
		• Confirms the Standby Rx Bldg Vent Exhaust Fan has not automatically started the operator will place the control switch for 2T41-C007A to OFF AND 2T41-C007B to Run. • Confirm the following dampers are OPEN: • 2T41-F044A, R/B Inboard Isol Dampers Inacc. Areas Exhaust Fans Disch on 2H11-P657. • 2T41-F044B, R/B Outboard Isol Dampers Inacc Areas Exhaust Fans Dish on 2H11-P654. • 2T41-F028, Rx Bldg Vent Filter D005 Inlet Damper on 2H11-P657. • Confirm RB Exhaust flow on 2T41-R618 point 2 is indicating approximately 6.5 KCFM.
		• Once RB Exhaust and Supply flows have stabilized, confirms 654-001, RB Inside To Outside Air Diff Press Low, clears and notifies SS.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 3

Event Description: Reactor Building Exhaust fan (2T41-C007A) failure, broken coupling.

Time	Position	Applicant's Actions or Behavior
		NOTE: *If 657-081 actions are not performed, crew would enter 34AB-T22-003-2 and 31EO-EOP-014-2, SC flowchart. Operators would secure Rx Bldg Ventilation IAW 34SO-T41-005-2 and place SBGT in service IAW 34SO-T46-001-2 (Placard).*
	BOP	• Enters 34AB-T22-003-2, Secondary Containment Control. • Monitors secondary containment parameters. • Notifies the SS to enter 31EO-EOP-014-2, EOP Secondary Containment flowchart due to low RB dp. • Dispatches a SO/Maint to investigate the low RB dp. • Enters 34AB-T22-002-2, Loss of Secondary Containment Integrity.
		Simulator Operator, at Chief Examiner's direction, move on to the next Event

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 4 Page 7 of 27

Event Description: CRD Flow Controller fails in Auto requiring manual operation to re-establish CRD flow.

Time	Position	Applicant's Actions or Behavior
10 Min		*At the Chief Examiner's direction, Simulator Operator ENTERS (**RB-4**), mfC11_299.*
	ATC	• Receives CRD HYD TEMP HIGH, (603-140) alarm. • Determines that the CRD Flow Control Valve A has closed. • Determines 2C11-R600, CRD Flow Controller, output is at minimum and has failed downscale. • Notifies SRO that the CRD Flow Controller has failed downscale. • Notifies I & C (if SRO does NOT) to investigate 2C11-R600.
		***NOTE**: The ATC may immediately place the controller in manual IAW 31GO-OPS-021-0, Manipulation and Control of Equipment OR NMP-OS-007-001, Conduct of Operations Standards and Expectations, responding to a failed controller.*

	ATC	• Enters:
		  • CRD HYD TEMP HIGH, (603-140).
		  • 34AB-C11-001-2, Loss Of CRD System.
		• IAW 31GO-OPS-021-0,
		Places 2C11-R600 controller in Manual.
		• Increases output of controller until CRD flow is approximately 50 gpm.

	SRO	• Dispatches I & C to investigate 2C11-R600. • Dispatches a SO to monitor CRD drive temperatures. • Directs operator to perform actions of the ARP and 34AB-C11-001-2.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 5 Page 8 of 27

Event Description: CS pump 2A DC breaker tripped and cannot be reclosed.

Time	Position	Applicant's Actions or Behavior
11 min		*SIMULATOR OPERATOR, with Chief Examiner's direction, DEPRESSES* ***RB-11*** *(turns green light off to CS 2A & places pump switch to off), then NOTIFIES the Shift Supervisor, as the SO on Outside rounds, that the DC Control power breaker for Core Spray pump 2A is tripped.*
	SRO	• Directs BOP/ATC to confirm CS 2A light status on 2H11-P601 panel. • Notifies Maintenance to investigate tripped breaker.
	SRO	• Refers to TS for CS 2A being INOP. • 3.5 ECCS and RCIC System. • 3.5.1 ECCS Operating. Enters a 7 day RAS per TS 3.5.1.A.1 to restore low pressure ECCS injection/spray subsystem to OPERABLE status.
		SIMULATOR OPERATOR, if directed to reclose DC Control Power breaker for CS 2A, REPORT the DC Control Power breaker will not stay closed.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 6 Page 9 of 27

Event Description: HPCI Room Fire.

Time	Position	Applicant's Actions or Behavior
11 min		*Simulator Operator;* *Prior to placing the Mode Switch to the Run position AND with Chief Examiner's direction, NOTIFY the Shift Supervisor, as the SO on rounds, that heavy smoke is coming from the Unit 2 HPCI room and you cannot see what is actually burning. You are leaving the area.*
	SRO	• Directs BOP to enter 34AB-X43-001-2, Fire Procedure, and make the announcement.
		NOTE: *Operator performing Section 4.0 will be making appropriate notifications below.*

	BOP	• Enters 34AB-X43-001-2, Fire Procedure, and performs the following:
		  • Sounds the fire alarm (SIREN) over the plant PA system, (repeats 2 times – may get U1 operator to handle repeats).
		  • Notifies Rad Waste Control room that Reactor Building floor drain sump pumps are in Automatic.
		  • Notifies Radiation Protection to respond to the fire area.
		  • Notifies Security to merge the Plant PA system.

		• Transitions to section 8.0 for Fire in 'Reactor Bldg.'
		  • Stops the following equipment at Panels 2H11-P654 & P657:
		  • 2T41-C001A, Rx Bldg Supply Fan.
		  • 2T41-C001B, Rx Bldg Supply Fan.
		  • 2T41-C007A, Rx Bldg Exhaust Fan.
		  • 2T41-C007B, Rx Bldg Exhaust Fan.
		  • 2T41-C002A, Refuel Flr Vent Supply Fan.
		  • 2T41-C002B, Refuel Flr Vent Supply Fan.
		  • 2T41-C005A, Refuel Flr Vent Exh Fan.
		  • 2T41-C005B, Refuel Flr Vent Exh Fan.
		  • Acknowledges annunciators at Panels 2H11-P654 & P657:
		  • Refueling Floor Outside Air Diff Press Low (657-001).
		  • RB Inside to Outside Air Diff Press Low (654-001).

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 6 Page 10 of 27

Event Description: HPCI Room Fire.

Time	Position	Applicant's Actions or Behavior
	BOP	• Transitions to section 8.5 for Fire in 'South Half of Reactor Bldg.' • Transitions to section 8.5.6 for Fire in 'HPCI Room.' • Places 2T41-B005A HPCI Pump Rm Cooler in Off, P657. • Places 2T41-B005B HPCI Pump Rm Cooler in Off, P654. • Places HPCI Aux Oil pump in PTL Off, P601. • Dispatches a SO to open Brkr 6 in 2R25-S002.
		Simulator Operator *When directed to open Brkr 6 in 2R25-S002, insert malfunctions mfE41_235A and mfE41_235B (**RB-5**).*
		• Closes the following HPCI Valves on P601. • 2E41-F002, HPCI Isolation Valve. • 2E41-F003, HPCI Isolation Valve. • 2E41-F041, HPCI Torus Suction Valve. • 2E41-F042, HPCI Torus Suction Valve.
		Simulator Operator, Once the above HPCI valves are closed, NOTIFY the Shift Supervisor that the fire in the HPCI room is OUT. A storage locker under the stairwell was on fire. We put out the fire without spraying water on any HPCI components. Ventilation and HPCI can be restored to normal.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 6 Page 11 of 27

Event Description: HPCI Room Fire.

Time	Position	Applicant's Actions or Behavior

	SRO	• Announces to the crew the fire is out.
		• As time allows, directs the operator to leave the HPCI Aux oil pump in PTL Off.
		• Refers to TS for HPCI INOP.
		  • 3.5 ECCS and RCIC System.
		  • 3.5.1 ECCS Operating.
		
		Enters a 1 hour RAS per TS 3.5.1.C.1 to verify by admin means RCIC is operable and per TS 3.5.1.C.2 to restore HPCI to operable status within 14 days.
		
		Enters a 72 hour RAS per TS 3.5.1.D.1 to restore HPCI to operable status OR D.2 to restore low pressure ECCS injection/spray subsystem to OPERABLE status.
		
		• As time allows, Refer to TRM 3.7.2.D.1, ECCS and RCIC Room Coolers and immediately declares HPCI INOP.

	SRO	• Orders the Rx Bldg Ventilation system re-started IAW 34SO-T41-005-2.
	BOP	• Enters 34SO-T41-005-2 and performs the following actions: • Momentarily depresses Rx Bldg Supply Fans Reset. • Momentarily depresses Rx Bldg Recirc Fan 2T41-B017 Reset.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 6 Page 12 of 27

Event Description: HPCI Room Fire.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, when requested to perform the following, inform the operator that the Unit 1 pushbuttons have been depressed.
	BOP	• Requests U1 to depress 1T41/2T41, Rx Bldg/Rf Flr ISOL DMPR RESET A pushbutton, panel 1H11-P657. • Requests U1 to depress 1T41/2T41, Rx Bldg/Rf Flr ISOL DMPR Reset B pushbutton, panel 1H11-P654. • Momentarily depresses 2T41-D005, Reactor Building Filter, Deluge reset. • Opens 2T41-F028, Rx Bldg Vent Filter D005 Inlet Damper. • Confirms Open/Opens 2T41-F044A, Rx Bldg Inboard Isol Dampers Inaccessible Areas Exhaust Fans Disch.
	BOP	• Confirms Open/Opens 2T41-F044B, Rx Bldg Outboard Isol Dampers Inaccessible Areas Exhaust Fans Disch, panel 2H11-P654. • Places in RUN 2T41-C007B, Rx Bldg Vent Exhaust Fan. • Places in STBY 2T41-C007A, Rx Bldg Vent Exhaust Fan. (Fan Broke may be left in off). • Confirms Open/Opens 2T41-F011A, Rx Bldg Inboard Isol Dampers Supply Fans Disch.
	BOP	• Confirms Open/Opens 2T41-F011B, Rx Bldg Outboard Isol Dampers Supply Fans Disch, panel 2H11-P654. • Places in RUN 2T41-C001A or 2T41-C001B, Rx Bldg Supply Fan. • Places in STBY 2T41-C001B or 2T41-C001A, Rx Bldg Supply Fan.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 6 Page 13 of 27

Event Description: HPCI Room Fire.

Time	Position	Applicant's Actions or Behavior
	BOP	• Dispatches a SO to perform the following:
		• ADJUST 2T41-FC-R027 to maintain Rx Bldg Vent Exhaust Flow approximately 6.5 KCFM as indicated by the green pen on 2T41-R618, flow recorder, located on 2H11-P657. • ADJUST 2T41-FC-R022 to maintain Rx Bldg Vent Supply Flow approximately 5.3 KCFM as indicated by the red pen on 2T41-R618, flow recorder, located on 2H11-P657. • While maintaining approximately 6.5 KCFM for Rx Bldg Vent Exhaust Flow and 5.3 KCFM Bldg Vent Flow respectively, • ADJUSTS Flow Controllers 2T41-FC-R027 and 2T41-FC-R022 to obtain 0.25 inches water pressure on 2T46-DPR-R604A&B.
	BOP	• Informs the SRO that the Rx Bldg dp has returned to normal.
	SRO	• Orders the RF Floor Ventilation system re-started IAW 34SO-T41-006-2.
		Simulator Operator, when requested to perform the following, inform the operator that the Unit 1 pushbuttons have been depressed.
	BOP	• Requests U1 to depress 1T41/2T41, Rx Bldg/Rf Flr ISOL DMPR RESET A pushbutton, panel 1H11-P657. • Requests U1 to depress 1T41/2T41, Rx Bldg/Rf Flr ISOL DMPR Reset B pushbutton, panel 1H11-P654. • Momentarily depresses Refuel Floor Vent Fans Reset, 2T41-SR2. • Momentarily depress 2T41-PB2, Refueling Floor Exh Fil Train 2T41-D007, Deluge reset. • Momentarily depress 2T41-PB3, Refueling Floor Exh Fil Train 2T41-D008, Deluge reset.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 6 Page 14 of 27

Event Description: HPCI Room Fire.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, when requested to perform Refueling Floor Unit Heater Fan positioning and Temperature Indicating Controller setup, INFORM the operator that the Refueling Floor Unit Heater Fan positioning and Temperature Indicating Controller setup has been performed..
	BOP	• Opens 2T41-F004A, Spent Fuel Pool Area Damper. • Opens 2T41-F004C, Refuel Floor Area Damper. • Confirms 2T41-F023A, Refuel Flr Isol Dmprs Exhaust Fans Suction, is OPEN. • At panel 2H11-P654, confirms 2T41-F023B, Refuel Flr Exh Fans Suction Outboard Isol Damper, is OPEN. • Confirms 2T41-F003A, Refuel Flr Isol Dmprs Supply Fans Disch, is OPEN. • At panel 2H11-P654, confirms 2T41-F003B, Refuel Flr Supply Fans Disch Outboard Isol Damper, is OPEN.
	BOP	• Places 2T41-C005A or 2T41-C005B, Refuel Flr Vent Exh Fan, control switch, in RUN. • Places 2T41-C002A or 2T41-C002B, Refuel Flr Vent Supply Fan, control switch, in RUN. • Places 2T41-C005B or 2T41-C005A, Refuel Flr Vent Exh Fan, control switch, in STBY. • Places 2T41-C002B or 2T41-C002A, Refuel Flr Vent Supply Fan, control switch, in STBY.
	BOP	Dispatches SO to perform the following:
		• Adjust 2T41-R032 and 2T41-R037, Flow Controllers, to obtain approximately 30 KCFM through 2T41-C002A or 2T41-C002B, Refueling Floor Supply Fan, and 2T41-C005A or 2T41-C005B, Refueling Floor Exhaust Fan. • Adjust 2T41-R032 or 2T41-R037, Flow Controllers, to obtain 0.25 inches water negative pressure on the Refueling Floor as indicated on 2T46 DPR R604A and 2T46-DPR-R604B.
	BOP	• Informs the SRO that the RF Ventilation dp has returned to normal.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 7 Page 15 of 27

Event Description: 2B RFPT Cooling water controller failure. TC repair & return to Automatic.

Time	Position	Applicant's Actions or Behavior
8 Min		*At the Chief Examiner's direction, Simulator Operator, INSTRUCT the BOP operator by phone to stay on the line until told to hang up, THEN ENTER: (**RB-6**) mfN21_88B, Feedwater Pump Lube Oil Cooling System Failure.*
	ALL	The following alarms will annunciate: • RFPT 2B BRG OIL TEMP HIGH, (650-315). • RFPT 2B BRG TEMP HIGH, (650-333). • RFP/COND BRG METAL TEMP HIGH, (650-112), (approximately 1 minute later if 2B RFPT PSW TCV is NOT opened in a timely manner).
		***NOTE**: The ATC may immediately place the controller in manual IAW 31GO-OPS-021-0, Manipulation and Control of Equipment OR NMP-OS-007-001, Conduct of Operations Standards and Expectations, responding to a failed controller.*
	ATC	• Addresses the high temp annunciator, pulling the ARP and confirms temperatures: • Dispatches BOP to panel 2H11-P655, checks all temperature indicators on 2N32-R616 to determine actual oil temperatures. • Confirms that RFPT 2B Oil Temp controller, 2P41-R606, on panel 2H11-P650 is adjusted for 110 to 130°F.
	ATC	• Recognizes the automatic function of the controller has failed, closing the cooling water valve. • Places the controller in manual, depresses the open/increase pushbutton, opening the valve. Oil temperatures begin decreasing and the alarm extinguishes.
	SRO	Notifies maintenance of the 2P41-R606, RFPT temperature controller, problem.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 8

Event Description: The Backup SDV valves will close due to a small air leak on 2C11-F040 requiring the SRO declare a TS Required Action Statement.

Time	Position	Applicant's Actions or Behavior
10 Min		*Simulator Operator, at the Chief Examiner's direction, ENTERS (**RB-9**) rfC11_141, SDV Outboard Valves close* *AND* *3 minutes later ENSURES Event Trigger **EGC11-4** ACTIVATES mf60311307, SDV Not Drained, alarm.*
	ALL	• When the SDV NOT DRAINED, (603-119), alarm is received, recognizes that the SDV Outboard Valves have closed. (May recognize prior to alarm by scanning the control boards).

	ATC	• Enters 603-119 and performs the following:
		  • Determines that 2C11-F035A, 2C11-F035B and 2C11-F037 have closed.
		  • Determines status of all Scram Valves (blue lights are not lit) on P603 display.
		  • Determines status of SCRAM VLV PILOT AIR HDR PRESS HIGH/LOW, (603-131), (NOT LIT)
		  • Determines if any Rod Drift lights on P603 (None).
		  • Confirms Scram Disch Vol Isol Test Switch in Normal.
		  • Dispatches SO to the CRD drives to check for leaking Scram Outlet Valves.
		  • Dispatches SO/Maintenance to determine if an air leak exists on the SDV valve piping.

	SRO	• Enters Tech spec 3.1.8 Condition A which requires the SDV line to be isolated within 7 days. • May inform Maintenance to correct the associated air leak.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 9 Page 17 of 27

Event Description: Circ Water Leak Causing Con Bay Flooding/Loss of Vacuum/Loss of CRD pumps

Time	Position	Applicant's Actions or Behavior
15 min		*Simulator Operator: At Lead Evaluator's direction, press **(RB-7)** to ACTIVATE: mfN71_70, Circulation Water System Leak (0 – 100,000 gpm), Final 100, Ramp 1000.*
	All	• Recognizes that Condenser Water Box A R602A dP is approaching 0.
	SRO	• As time allows, dispatches a SO to locally investigate the reduced Circ Water dP and for a possible leak.
	SRO	• When 650-164, Condenser Room Flooding, alarm is received, directs the ATC enter 34AB-C71-001-2, Scram Procedure, and scram the reactor. • Assigns the ATC to perform RC-1. • Assigns the BOP operator to perform RC-2 and RC-3. • Enters 31EO-EOP-010-2, RC EOP flow chart. • Assigns a RWL band between 3 inches and 50 inches.
		Simulator Operator: *Ensure **EGC71-1** INSERTS mfN61-73 when mode switch is taken to Shutdown, (Final of 100, Ramp 1000) and svoN37227 BPV#3 to25% open AND **EGC71-14** INSERTS overrides both CRD pumps (diC11B-S3A & S3B to STOP).*

	ATC	• Performs RC-1 consisting of:
		  • Inserts a manual scram.
		  • Places the mode switch to shutdown.
		  • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display.
		  • Notifies SRO of rod position check.
		  • Places SDV isolation valve switch to "isolate" & confirms closed.
		  • If not tripped, places the Recirc pumps at minimum speed.
		  • Inserts SRMs and IRMs.
		  • Ranges IRMS to bring reading on scale.
		  • Notifies the SRO when the above actions are complete.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 9 Page 18 of 27

Event Description: Circ Water Leak Causing Con Bay Flooding/Loss of Vacuum/Loss of CRD pumps

Time	Position	Applicant's Actions or Behavior

	BOP	• Performs RC-2 actions consisting of:
		• Confirms proper Level Control response:
		  • Checks ECCS Injection Systems and secure as necessary.
		  • Ensures FW Master Controller setpoint reduces to 9 inches and output reduces to 25% of previous value.
		  • IF set down does not auto function, then manually reduces FW Master Controller setpoint to approximately 9 inches.

	BOP	• When feed flow is less than the capacity of the S/U level control valve (≈ 1.5 mlbm/hr), then:
		  • Opens 2N21-F125.
		  • Places 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches.
		  • Confirms closed 2N21-F110.

	BOP	At 2H11-P603 maximizes CRD flow by:
		  • May Reset the LOCA pushbuttons for the pump being started.
		  • Places 2C11-R600, CRD Flow Control, in manual at zero output.
		  • Starts CRD pump 2C11-C001A(B).
		  • Realizes the selected CRD pump will not start.
		  • As time allows, notifies SRO that Both CRD pumps will not start.
		  • As time allows, dispatches SO/Maintenance to investigate Reset the LOCA pushbutton for the Standby CRD Pump.

		EXAMINER NOTE: SRVs actuate in LLS at 1120 psig and then control pressure between 850 - 990 psig.

	BOP	• Performs RC-3 consisting of:
		  • Monitor RPV pressure.
		  • If necessary, allow RPV pressure to exceed 1074 psig then cycles any SRV to initiate LLS.
		  • If necessary, verifies LLS actuates at 1120 psig.
		  • Maintain RPV pressure between 1074 and 800 psig.
		  • Notify SRO of pressure control system operation.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 9

Event Description: Circ Water Leak Causing Con Bay Flooding/Loss of Vacuum/Loss of CRD pumps

Time	Position	Applicant's Actions or Behavior
	SRO	• Enters 31EO-EOP-010-2, RC EOP flow chart. • If time permits, directs the ATC to reset the scram.
	ATC	• If directed, resets the scram IAW 34SO-C71-001, "Scram Procedure."

	BOP	• Starts RCIC for level control by performing the following:
		  • Depresses RCIC Manual Initiation P/B.
		  • Confirms Open 2E51-F046.
		  • Confirms Start of Barom Cndsr Vac Pmp.
		  • Confirms Open 2E51-F045.
		  • Confirms Open 2E51-F013.
		  • Adjusts RCIC flow controller to maintain RWL.

	SRO	May direct BOP to unisolate HPCI and place in-service IAW 34SO-E41-001-2, HPCI System.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 9 Page 20 of 27

Event Description: Circ Water Leak Causing Con Bay Flooding/Loss of Vacuum/Loss of CRD pumps

Time	Position	Applicant's Actions or Behavior
		NOTE: *The BOP will perform the following at 2H11-P601 panel.*

	BOP	IAW 34SO-E41-001-2 Section 7.1.4, HPCI System Standby;
		• Places the Auto Isolation Signal A keylock switch to the RESET position AND returns to NORMAL. (Verifies Auto Isolation Signal white light is EXTINGUISHED).
		• Places the Auto Isolation Signal B keylock switch to the RESET position AND returns to NORMAL. (Verifies Auto Isolation Signal white light is EXTINGUISHED).
		• Confirms the following alarms are cleared:
		  • HPCI ISOLATION TRIP LOGIC A INITIATED (601-115).
		  • HPCI ISOLATION TRIP LOGIC B INITIATED (601-121).
		• Determines which HPCI valve to use:
		  • IF necessary, warm AND pressurize the HPCI Steam Line by performing either:
		  step 7.1.40.1 (Pressurizing HPCI steam supply with 2E41-F002).
		  OR
		  step 7.1.40.2 (Pressurizing HPCI steam supply with 2E41-F003).
		
		(Step 7.1.40.1)
		• Confirms closed 2E41-F002, Inbd Steam Isol Valve.
		• Opens 2E41-F003, Outbd Steam Isol Valve.
		• Opens 2E41-F054, Drain Pot Trap Byp Valve.
		• Slowly throttles open 2E41-F002.
		• Fully Opens 2E41-F002 when turbine steam inlet pressure (2E41-R602) is within 50 psig of reactor pressure on 2B21-R623A or B (P601 panel), then places control switch to stop position.
		• HPCI ISOLATION VLV F002/F003 NOT FULLY OPEN, 601-217, will clear.
		• Closes 2E41-F054, Steam Line Drain Valve when annunciator 601-110, HPCI Turbine Inlet Drain Pot Level High is clear (not expected to be received).
		
		NOTE: *601-110 may not alarm.*

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 9 Page 21 of 27

Event Description: Circ Water Leak Causing Con Bay Flooding/Loss of Vacuum/Loss of CRD pumps

Time	Position	Applicant's Actions or Behavior
		(Step 7.1.40.2) • Confirms closed 2E41-F003, Outbd Steam Isol Valve. • Opens 2E41-F002, Inbd Steam Isol Valve. • Opens 2E41-F054, Drain Pot Trap Byp Valve. • Slowly throttles open 2E41-F003. • Fully Opens 2E41-F003 when turbine steam inlet pressure (2E41-R602) is within 50 psig of reactor pressure on 2B21-R623A or B (P601 panel), then places control switch to stop position. • HPCI ISOLATION VLV F002/F003 NOT FULLY OPEN, 601-217, will clear. • Closes 2E41-F054, Steam Line Drain Valve when annunciator 601-110, HPCI Turbine Inlet Drain Pot Level High is clear (not expected to be received). ***NOTE:*** *601-110 may not alarm.*
	SRO	• Per CP-1: • Order BOP to Inhibit ADS (if not previously done). • Orders BOP to start ALL RHR & Core Spray pumps. • Orders emergency depressurization once RWL decreases below –155 inches and prior to –180 inches. • Orders all available Table L-1 systems injecting until RWL raises above –155 inches. • As time permits, directs Torus Cooling to be placed in service.
	BOP	• Starts ALL RHR & Core Spray pumps (P601) by placing switches to start IAW placard.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 9 Page 22 of 27

Event Description: Circ Water Leak Causing Con Bay Flooding/Loss of Vacuum/Loss of CRD pumps

Time	Position	Applicant's Actions or Behavior

	ATC	• Opens 7 ADS valves prior to RWL reaching -180 inches by:
		  • Placing switches for the ADS valves to OPEN.
		  • Confirms ALL ADS valve red lights illuminate.
		  • Confirms ALL ADS valve yellow lights illuminate.
		  • Confirms Reactor pressure is decreasing.
		  • Notifies the SRO that ALL ADS valves are open.

	BOP	• Opens RHR and Core Spray injection valves open once the Reactor Pressure Low 500 psig alarm illuminates. • Verifies injection from Core Spray and RHR pumps begins as soon as reactor pressure decreases below the shut off head of the pumps. • When RWL is restored above Top OF Active Fuel throttles flow for C/S and RHR per the SRO directions.
	ATC	***NOTE:*** *The operator may place torus cooling in service by using the Placard that's available or using the appropriate section of the procedure. These steps assume the Placard is used. The A and/or B loop of RHR may be used depending on Torus temperature. The following steps are written assuming "B" loop and "B" pump is used. If/When "A" loop is used, substitute "A" for "B" for valves and if "B" pump is not used substitute "A", "C", or "D" for "B" pump.*

	ATC	• Enters 34SO-E11-010-2, Residual Heat Removal
		  • Places RHRSW in service.
		  • Prelube RHRSW pump.
		  • Overrides 2E11-F068B (A) Low Discharge Pressure Interlock.
		  • Positions 2E11-F068B (A) to 45% OPEN.
		  • Starts RHRSW pump B (A).
		  • Places 2E11-F068B (A) Low Discharge Pressure Interlock switch to normal position.
		  • Positions 2E11-F068B (A) to obtain < 4400 gpm AND < 450 psig.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 9

Event Description: Circ Water Leak Causing Con Bay Flooding/Loss of Vacuum/Loss of CRD pumps

Time	Position	Applicant's Actions or Behavior
	ATC	• IF desired to start a SECOND RHRSW pump, • Throttles 2E11-F068B (A) to achieve max flow rate (not to exceed 4400 GPM). • Opens 2E11-F068B (A) an additional 5%. • Starts second RHRSW Pump. • Positions 2E11-F068B (A) to obtain < 8800 gpm AND < 450 psig.
	ATC	• Places RHR B (A) Loop in Torus cooling per the placard by performing the following steps: • Opens 2E11-F048B (A). • Closes 2E11-F047B (A). • Opens 2E11-F003B (A). • Starts RHR Loop B (A) pump. • Opens 2E11-F028B (A). • Receives annunciator Auto Blowdown CS OR RHR Press. • Receives annunciator "SEC System Auto Initiation Signal Present." • Throttles OPEN 2E11-F024B (A). • Opens 2E11-F047B (A). • Ensures RHR flow is < 11,500 GPM, THEN Closes 2E11-F048B. • Notifies the SRO that RHR "B" (A) loop is in service. • May place the second pump in service.
		Simulator Operator, PROCEEDS to the next event.

Op-Test No.: 2016-301 **Scenario No.:** 10-05 **Event No.:** 10

Event Description: BPV #3 Main Turbine Bypass Valve fails open, 'B' MSL fails to isolate automatically on low vacuum, manual isolation required.

Time	Position	Applicant's Actions or Behavior
		*SIMULATOR OPERATOR ENSURES **EGB21-1 & EGB21-2** for deleting overrides for MSIV lights is ACTIVATED when the 2B21-F022B AND F028B is positioned to close.*
	ALL	• Recognizes the B MSL failed to isolate on low condenser vacuum and places both control switches for 2B21-F022B and F028B to close.
	SRO	• Directs operator to place B MSL control switches, 2B21-F022B and F028B, to close and confirm valves indicate close.
	BOP	• Places B MSL control switches, 2B21-F022B and F028B, to close and confirms valves indicate closed. (Critical Task)
	SRO	As time allows, directs entry into 34AB-N71-001-2, Circulating Water System Failure
	BOP	• Confirms Closed MSIVs. • Confirms Closed MSL Drains. • Confirms close 2N11-F004A and 2N11-F004B, RSSV's.
		With Chief Examiners Permission, the Scenario will be terminated when reactor water is being controlled using RCIC/HPCI or RHR/CS following an Emergency Depressurization, with reactor pressure below 50 psig or as directed by the Chief Examiner.

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
CR-SIM 1 (RO & SRO-I)

Title **MOVE CONTROL RODS USING SINGLE NOTCH (STUCK ROD)** **Pen and Ink Changes incorporated. Revision conforms to as-administered version of JPM.**		
Author: **Anthony Ball**	**Media Number:** CR-SIM 1 2016-301	**Time** 20 Minutes
Reviewed By: **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee **N/A**		**Date:** **N/A**
Approved By **Ed Jones**		**Date** **05/30/2016**

SOUTHERN COMPANY

Course Number	Program Name	Media Number
	OPERATIONS TRAINING	CR-SIM 1 2016-301

Rev. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
00	03/10/97	Initial development	RAB	RSG
01	09/26/97	Revised based on feedback from the 1997 Requal annual exam.	SCB	DHG
02	09/16/98	Added amplifying instructions for the simulator Operator.	SCB	DHG
03	01/18/99	Revised malfunction numbers for the new simulator computer.	SCB	DHG
04	03/21/00	Format modification, change time allowance based on running average, procedure change, correct simulator setup	RAB	DHG
05	06/01/00	Incorporate instructor comment, change the "Group" to "Step" through out the JPM	RAB	DHG
06	11/03/00	Include objective number	RAB	DHG
07	03/19/02	Include initial Operator statement	RAB	RAB
08	01/17/03	Update to current pull sheets & sim model	DNM	DHG
09	06/27/05	Revised Initial License statement for successful completion	RAB	RAB
10	06/23/06	Remove Response Cues	RAB	RAB
11	10/13/08	Step 19 was changed to require "double clutch" mode of rod movement.	JWP	RAB
12	10/27/08	Modified setup to match current rod pull sequence. Added type of rod movement "double clutch", added clarification of critical task.	ADY	RAB
12.1	10/17/11	Reviewed JPM against current procedure. Added pass / fail criteria. Added Fundamental question to new Attachment 1. Modified JPM to pull the last two rods in step 25 prior to transferring the Mode Switch to RUN.	MMG	ALS
12.2		Modified JPM against current procedure. Removed fundamental question and changed Media # to CR-SIM 1 2016-301 & use on the 2016-301 NRC Exam.	ARB	ELJ

Line Contributors

The following individuals contributed to the development of this lesson plan.

Rev. No.	List of Contributors
12.1	MMG

UNIT 1 ( ) UNIT 2 (X)

TASK TITLE:	Move Control Rods Using Single Notch (Stuck Rod)
JPM NUMBER:	CR-SIM 1 2016-301
TASK STANDARD:	The task shall be completed when controls rods in the specified sequence have been withdrawn to the required position per 34GO-OPS-065-0.
TASK NUMBER:	001.010
OBJECTIVE NUMBER:	001.010.A

PLANT HATCH JTA IMPORTANCE RATING:

RO 3.57

SRO 3.52

K/A CATALOG NUMBER: 201003A201

K/A CATALOG JTA IMPORTANCE RATING:

RO 3.40

SRO 3.60

OPERATOR APPLICABILITY: Nuclear Plant Operator (NPO)

GENERAL REFERENCES:	**Unit 2**
	34GO-OPS-065-0 (current version) 34AB-C11-003-2 (current version)

REQUIRED MATERIALS:	**Unit 2**
	34GO-OPS-065-0 (current version) 34AB-C11-003-2 (current version) Control Rod Movement Sequence Sheet

APPROXIMATE COMPLETION TIME: 20 Minutes

SIMULATOR SETUP: REFER TO SIMULATOR SETUP SHEET ON THE FOLLOWING PAGE

SIMULATOR SETUP

Simulator Initial Conditions:

1. **RESET** the Simulator to **7%, Xfer to RUN** or **SNAP 2016-301 JPM CR 1** and leave in **FREEZE**.

2. **INSERT the following MALFUNCTION & EVENT TRIGGER:**

MALF #	TITLE	FINAL VALUE	RAMP RATE	ACT. TIME
mfC12_22_~~30_47~~ 22_07	Stuck Rod			00000
EGC11-10	Deletes Stuck Rod			

3. Take the Simulator **OUT OF FREEZE** and **PERFORM** the following **MANIPULATIONS:**

   A. Ensure that drive water dP is ~260 psid and stable

   B. Mark up the Pull Sheet in Step 31 (Student will be pulling the last six rods in this step).

4. **PLACE** the Simulator in **FREEZE** until the INITIATING CUE is given.

5. **ESTIMATED** Simulator **SETUP TIME**: **15 Minutes**

NOTE: The simulator Operator will act as **second verifier** for rod movement and read the pre-job brief to the Operator.

EVALUATOR COPY

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. A normal plant startup is in progress per 34GO-OPS-001-2, "Plant Startup, and is currently at Step 7.4.3.
2. Rod withdrawal to achieve 6-7% on the APRMs is in progress.
3. There are 6 rods left to withdraw in Step 31 of the Pull Sequence to complete that step.
4. Rod Worth Minimizer is operable and has been loaded with the correct movement sequence, which has been approved by the Reactor Engineering Supervisor.
5. Permission has been granted to use Notch Override in this group of rods.

INITIATING CUES:

Perform Control Rod manipulations IAW Step 31 of Control Rod Movement Sheets.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	Human performance tools, safety, PPE met (1), **AND** For initial trg **all** steps completed correctly OR For continuing trg, **critical** steps (if used) completed correctly	Mark the JPM as a **PASS**
FAIL	Above standards not met	Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences. (AG-TRN-01-0685 Section 6.5.3 provides examples)

START TIME:_____

1.	Operator identifies the procedure needed to perform the task.	Operator has identified the correct procedure as 34GO-OPS-065-0.	
2.	Operator reviews the procedure's precautions and limitations.	Operator has reviewed the precautions and limitations.	
3.	Operator identifies the materials that are required.	Operator has identified the required materials and where to obtain them.	

PROMPT: **WHEN** the Operator addresses an approved copy of the Control Rod Movement Sequence Sheet, **GIVE** the Operator the Control Rod Movement Sequence Sheet.

****4.**	Select the next control rod 06-31 in Rod Step 31.	At panel 2H11-P603, the push-button is DEPRESSED on CONTROL ROD SELECT Matrix for selected control rod 06-31 in Rod Step 31.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**5.	Withdraw the control rod 06-31 to the withdrawal limit.	At panel 2H11-P603, ROD MOVEMENT CONTROL switch is used to withdraw the rod 06-31 and then performs a rod coupling check.	
6.	Confirm the proper control rod 06-31 movement.	At panel 2H11-P603, the Operator VERIFIES that the rod 06-31 withdraws.	
7.	Complete the line, for the selected rod, on the Control Rod Movement Sequence sheet.	On the Control Rod Movement Sequence sheet, on the line for the selected rod (Withdrawn side of sheet), the Operator has: Filled in INIT block. Filled in DATE block.	
**8.	Select the next control rod 22-07 in Rod Step 31.	At panel 2H11-P603, the push-button is DEPRESSED on CONTROL ROD SELECT Matrix for selected control rod 22-07 in Rod Step 31.	
	~~Withdraw the control rod 22-07 to the withdrawal limit.~~	~~At panel 2H11-P603, ROD MOVEMENT CONTROL switch is used to withdraw the rod 22-07 and then performs a rod coupling check.~~	Pen and Ink Change
	~~Confirm the proper control rod 22-07 movement.~~	~~At panel 2H11-P603, the Operator VERIFIES that the rod 22-07 withdraws.~~	Pen and Ink Change
	~~Complete the line, for the selected rod, on the Control Rod Movement Sequence sheet.~~	~~On the Control Rod Movement Sequence sheet, on the line for the selected rod (Withdrawn side of sheet), the Operator has:~~ ~~Filled in INIT block.~~ ~~Filled in DATE block.~~	Pen and Ink Change

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
	~~Select the next control rod 30-47 in Rod Step 31.~~	~~At panel 2H11-P603, the push-button is DEPRESSED on CONTROL ROD SELECT Matrix for selected control rod 30-47 in Rod Step 31.~~	Pen and Ink Change

ALTERNATE PATH STARTS HERE
(Step 13)

**9.	Operator attempts to withdraw control rod ~~30-47~~ **22-07** to it's withdraw limit and recognizes that control rod ~~30-47~~ **22-07** has not moved.	At panel 2H11-P603, ROD MOVEMENT CONTROL switch is used to withdraw the rod and the operator has RECOGNIZED that rod position indicator for rod ~~30-47~~ **22-07** indicates "12" on the Four- Rod Display and/or RWM.	Pen and Ink Change
10.	Operator enters the abnormal procedure for inability to move a control rod.	Operator OBTAINS 34AB-C11-003-2, "Inability to Move a Control Rod."	
11.	Operator confirms that the inability to move the rod is NOT caused by a rod block.	At panel 2H11-P603, the Operator VERIFIES: White select light for the affected rod is illuminated. White ROD OUT permissive light is illuminated. Annunciator RMCS/RWM ROD BLOCK OR SYS TROUBLE (603-239) is clear.	
12.	Operator confirms the proper operation of the CRD Hydraulic System	At panel 2H11-P603, the Operator VERIFIES proper indication for: CLG WTR FLOW 2C11-R605 CHG WTR PRESS 2C11-R601 CLG WTR dP 2C11-R603 DR WTR dP 2C11-R602	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

NOTE: The Operator may attempt to move the control rod again to verify the proper RMCS and CRD Drive flow indications. However the Operator may accomplish this step by having observed rod motion on the previous rod movements.

13.	Operator confirms that the RMCS timer is operating properly.	At panel 2H11-P603, the Operator VERIFIES the proper indications on the ROD IN, ROD OUT, and ROD SETTLE lights.	
14.	Operator confirms drive water insert and withdraw flows.	At panel 2H11-P603, the Operator VERIFIES: Drive water insert flow is approximately 4 gpm. Drive water withdraw flow is approximately 2 gpm.	

NOTE: If operator momentarily causes Event Trigger to fire early, SIMULATOR OPERATOR **RE-INSERT (EVENT TRIGGER EGC11-10)** AND **mfC12_22_~~30-47~~ 22-07 f:1 d:0,** into the scenario. This will allow the operator to move the rod at 350 psid.

15.	Operator increases CRD drive water pressure to 300 psid.	At panel 2H11-P603, the Operator ADJUSTS DRIVE PRESS CNTL VLV 2C11-F003 to obtain 300 psid as indicated on DR WTR dP 2C11-R602.	
16.	Withdraw the control rod to position 48 using the Rod Movement Control switch.	At panel 2H11-P603, ROD MOVEMENT CONTROL switch is used to withdraw the rod ~~30-47~~ **22-07**. Operator RECOGNIZES that rod position indicator still indicates "12".	Pen and Ink Change

NOTE: **(EVENT TRIGGER EGC11-10),** when Drive Water dP is increased to 350 psig, **mfC12_22_~~30_47~~ 22-07** will be **DELETED**. This will allow the operator to move the rod at 260 psid.

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**17.	Operator increases CRD drive water pressure to 350 psid.	At panel 2H11-P603, the Operator ADJUSTS DRIVE PRESS CNTL VLV 2C11-F003 to obtain 350 psid as indicated on DR WTR dP 2C11-R602.	
**18.	Withdraw the control rod to position 14 using the Rod Movement Control switch.	At panel 2H11-P603, the ROD MOVEMENT CONTROL switch is used for rod withdrawal to position 14. Critical task is withdrawing the Rod.	
19.	Operator reduces Drive Water pressure to 260 psid.	At panel 2H11-P603, the Operator ADJUSTS DRIVE PRESS CNTL VLV 2C11-F003 to obtain 260 psid as indicated on DR WTR dP 2C11-R602.	
20.	Operator acknowledges procedure exited and CR initiated.	Operator acknowledges procedure exited and CR initiated.	

PROMPT: **WHEN** the Operator addresses resuming control rod movement, **INFORM** the Operator that another Operator will continue with Control Rod Movement.

END TIME: _____

NOTE: The terminating cue shall be given to the Operator when:

- Operator completes step ~~24~~ **20** of this JPM.

  Pen and Ink Change

- With NO reasonable progress, the Operator exceeds double the allotted time.
- The Operator has withdrawn rod ~~30-47~~ **22-07** to its withdrawal limit and completed the initial and date blocks.

  Pen and Ink Change

(Indicates critical step)**

Summary of JPM Attributes

JPM CR-SIM 2 2016-301:

SUMMARY OF JPM QUANTITATIVE ATTRIBUTES

CATEGORY	Minimum NRC Attributes	JPM CONTENT
Total Critical Steps	At least 2	8
Step 4 Selects 06-31	Proper rod in withdraw sequence.	
Step 5 Withdraws 06-31	Proper rod in withdraw sequence.	
Step 8 Selects 22-07	Proper rod in withdraw sequence.	
~~Step 9 Withdraws 22-07~~	~~Proper rod in withdraw sequence.~~	
~~Step 12 Selects 30-47~~	~~Proper rod in withdraw sequence.~~	
Step ~~13~~ 9 Recognizes ~~30-47~~ 22-07 fail	Proper rod operation.	
Step ~~21~~ 17 Adjust dP to 350 psig	Required to move control rod.	
Step ~~22~~ 18 Withdraws 30-47	Proper rod in withdraw sequence.	
Number of JPM Steps	<30	25
Time to Perform JPM	<45 min	20 min
Normal / Faulted / Alternate Path		
Alternate Path	Control rod ~~30-47~~ 22-07 is stuck and will require entering 34AB-C11-003-2 to increase dP to 350 psig to move the control rod.	
Setting (administered)		
Simulator		
Is LOD "1" or "5"	NO	NO

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. A normal plant startup is in progress per 34GO-OPS-001-2, "Plant Startup, and is currently at Step 7.4.3.
2. Rod withdrawal to achieve 6-7% on the APRMs is in progress.
3. There are 6 rods left to withdraw in Step 31 of the Pull Sequence to complete that step.
4. Rod Worth Minimizer is operable and has been loaded with the correct movement sequence, which has been approved by the Reactor Engineering Supervisor.
5. Permission has been granted to use Notch Override in this group of rods.

INITIATING CUES:

Perform Control Rod manipulations IAW Step 31 of Control Rod Movement Sheets.

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
CR-SIM 2 (ALL)

Title: **Perform RC-2, HPCI Injection (Alternate Path)**		
Author: **Anthony Ball**	**Media Number:** CR-SIM 2 2016-301	**Time:** 15 Minutes
Line Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee (N/A for minor revisions) **N/A**		**Date:** **N/A**
Approved By (Training Program Manager or Lead Instructor) **Ed Jones**		**Date:** **05/30/2016**

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Course Number	Program Name	Media Number
N/A	OPERATIONS TRAINING	CR-SIM 2 2016-301

Rev. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
3.0	05/30/16	Revised LR-JP-00505 to be an Alternate Path JPM for use on 2016-301 NRC Exam. Reviewed JPM against current procedure. Changed "Media Number" to CR-SIM 2 2016-301. After NRC Exam, Media Number will be changed to new LR-JP-00505D (Alt Path).	ARB	ELJ

Line Contributors

The following individuals contributed to the development of this lesson plan.

Rev. No.	List of Contributors

UNIT 1 () UNIT 2 (X)

TASK TITLE:	**Perform RC-2, HPCI Injection (Alternate Path)**
JPM NUMBER:	CR-SIM 2 2016-301
TASK STANDARD:	The task shall be completed when the operator has manually started HPCI with a flow controller failure to restore RWL to > +3 inches.

TASK NUMBER: 005.005

OBJECTIVE NUMBER: H-OP005.005

PLANT HATCH JTA IMPORTANCE RATING:

RO X.XX

SRO X.XX

K/A CATALOG NUMBER: 295031EA1.08

K/A CATALOG JTA IMPORTANCE RATING:

RO 3.8

SRO 3.9

OPERATOR APPLICABILITY: Nuclear Plant Operator (NPO)

GENERAL REFERENCES:	**Unit 1**	**Unit 2**
	NA	34AB-C71-001-2, Ver 12.5 34SO-E41-001-2, Ver 30

REQUIRED MATERIALS:	**Unit 1**	**Unit 2**
	NA	34AB-C71-001-2, Ver 12.5 34SO-E41-001-2, Ver 30

APPROXIMATE COMPLETION TIME: 15 Minutes

SIMULATOR SETUP: Refer to simulator setup sheet on the following page.

SIMULATOR SETUP

Simulator Initial Conditions:

1. **RESET** the Simulator to **90% power or SNAP 612** and leave in **FREEZE**.

2. **ACTIVATE THE FOLLOWING EVENT TRIGGERS:**

Trigger #	DESCRIPTION	CONDITIONS
EGE41-1	Inserts E41_106 - HPCI flow controller output fails low	aoE41-R610.aivToPanel >.65

3. **INSERT** the following **MALFUNCTIONS:**

Activator	MALF #	TITLE	FINAL VALUE	RAMP RATE
EGE41-1	mfE41_106	HPCI flow controller output fails low		
ST 0	mfC11-299	CRD Flow Control Fails Low		
ST-0	mfE42_235A	HPCI Fails to start on RWLs		
ST 0	rfE41_152	HPCI High RWL Bypassed	BYPASS	
ST 0	mfN21_87A	A Feedwater Pump trip	TRIP	
ST 0	mfN21_87B	B Feedwater Pump trip	TRIP	
ST 0	mfE51_110	RCIC Turbine Trip	TRIP	
ST 0	mfB21_132	ADS Fails To Initiate		

4. **PLACE** the Simulator in **FREEZE** until the INITIATING CUE is given.

5. **PLACE DANGER TAGS** on the following equipment:

MPL #	COMPONENT	TAGGED POSITION
	NONE	

6. **ESTIMATED** Simulator **SETUP TIME**: **7 Minutes**

EVALUATOR COPY

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Unit 2 has Scrammed.
2. RFPT's are unavailable.
3. RCIC is unavailable.
4. Pre-Job Brief is NOT required.

INITIATING CUES:

Maintain RWL in a band of +3 to +50 inches using HPCI.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences. (AG-TRN-01-0685 Section 6.5.3 provides examples)

Start Time:_____

NOTE: The following JPM steps are written assuming the Operator starts HPCI using the HPCI Placard.

1.	IF required, depress the High Water Level Reset Pushbutton (Placard Step 1)	Operator DETERMINES that a High RWL condition has not occurred (no white light). It is permitted to depress the pushbutton but is not required.	
2.	OPEN 2E41-F059 (Placard Step 2)	At 2H11-P601, the Operator OPENS LUBE OIL CLG WTR VLV, 2E41-F059, red light illuminated.	
3.	START Barom Cndsr Vac Pump (Placard Step 3)	At 2H11-P601, the Operator STARTS HPCI BAROM CNDSR VACUUM PUMP, 2E41-C002-2, red light illuminated.	

PROMPT: **IF** the operator addresses posting High Radiation Areas, as the Shift Supervisor, **ACKNOWLEDGE** the report to post the areas.

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**4.	Perform the following in rapid succession: Place 2E41-F001 CS in OPEN, AND …….. AND ……. (Placard Step 4)	At 2H11-P601, the Operator PLACES CS for the TURB STEAM SUPPLY VLV, 2E41-F001 in the OPEN position.	
5.	Perform the following in rapid succession: ……, AND VERIFY red light illuminates, AND ……. (Placard Step 4)	At 2H11-P601, the Operator VERIFIES 2E41-F001 red light is illuminated.	
**6.	Perform the following in rapid succession: ……, AND …….. AND START Aux Oil Pump (Placard Step 4)	At 2H11-P601, the Operator STARTS the AUX OIL PUMP, 2E41-C002-3, red light illuminated.	
**7.	OPEN 2E41-F006 (Placard Step 5)	At 2H11-P601, the Operator OPENS PUMP DISCHARGE VLV, 2E41-F006, red light illuminated.	
8.	CONFIRM TCV and TSV OPEN (Placard Step 6)	At 2H11-P601, the Operator CONFIRMS that the: TURBINE CONTROL VLV and TURBINE STOP VLV are OPEN, red light illuminated.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

ALTERNATE PATH STARTS HERE
(Step 9).

9.	Confirm the HPCI Turbine comes up to speed as directed by the Turbine Flow Controller, 2E41-R612.	At panel 2H11-P601, the operator RECOGNIZES HPCI turbine has NOT increased to rated speed and that the HPCI FLOW CONTROL 2E41-R612 has failed LOW.	

NOTE: The following step is NOT sequence sensitive and may be performed at any point during the performance of this JPM.

****10.**	Operator takes manual control of the HPCI Flow Controller.	At panel 2H11-P601, HPCI FLOW CONTROL 2E41-R612 Manual (M) pushbutton has been DEPRESSED, Manual (M) amber light illuminated.	
****11.**	Operator increases HPCI Turbine speed.	At panel 2H11-P601, HPCI FLOW CONTROL 2E41-R612 level is TAKEN to the Open (O) direction until: PUMP DISCH PRESS 2E41-R601 is greater than Reactor pressure and the desired flow is obtained.	
12.	CONFIRMS 2E41-F012 CLOSES at flow > 790 gpm (Placard Step 7)	At 2H11-P601, the Operator CONFIRMS MIN FLOW VLV, 2E41-F012 is CLOSED when HPCI pump flow is > 790 gpm, green light illuminated.	
****13.**	ADJUST controller for desired flow (Placard Step 8)	At 2H11-P601, the Operator ADJUSTS HPCI FLOW CONTROL, 2E41-R612 to control rate of RWL level increase to maintain >+3 and <+111 inches.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
14.	ADJUST controller for desired flow (Placard Step 8)	At 2H11-P601, the Operator ADJUSTS HPCI FLOW CONTROL, 2E41-R612 to control rate of RWL level increase to maintain >+3 and <+50 inches.	
15.	Confirm 2E41-F001 is full OPEN (Placard Step 9)	At 2H11-P601, the Operator CONFIRMS 2E41-F001 is fully OPEN.	

PROMPT: **IF** the operator addresses Maintenance investigating the failed HPCI Flow controller, as the Shift Supervisor, **INFORM** the operator that Maintenance will be notified.

PROMPT: **IF** the operator addresses maintain RWL, as the Shift Supervisor, **INFORM** the operator that another operator will maintain the appropriate RWL band.

End Time:_____

NOTE: The terminating cue shall be given to the operator when:

- Operator completes step 15 of this JPM.
- With NO reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: We will stop here.

(Indicates critical step)**

Summary of JPM Attributes

JPM CR-SIM 2 2016-301:

SUMMARY OF JPM QUANTITATIVE ATTRIBUTES

CATEGORY	Minimum NRC Attributes	JPM CONTENT
Total Critical Steps	At least 2	5
Step 4 Open 2E41-F001	Opening the steam supply valve is required to provide motive force.	
Step 6 Start Aux Oil Pump	Required to provide oil pressure to open the TCV and TSV.	
Step 7 Open 2E41-F006	Opening the discharge valve is required to allow for injection.	
Step 10 Controller in Manual	Allows manual control of output	
Step 11 Increase output	Required to obtain injection	
Step 13 Adjust for >+3 inches	Required to reset Scram	
Number of JPM Steps	<30	15
Time to Perform JPM	<45 min	15 min
Normal / Faulted / Alternate Path		
Alternate Path	Manual start of HPCI with a Flow controller failure requiring the operator to manually adjust controller to inject into the RPV. HPCI will NOT auto start on low RWL or high DW pressure.	
Setting (administered)		
Simulator		
Is LOD "1" or "5"	NO	NO

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Unit 2 has Scrammed.
2. RFPT's are unavailable.
3. RCIC is unavailable.
4. Pre-Job Brief is NOT required.

INITIATING CUES:

Maintain RWL in a band of +3 to +50 inches using HPCI.

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
CR-SIM 3 (RO & SRO-I)

Title: **OVERRIDE THE MSIVS IN AN EMERGENCY**		
Author: **Anthony Ball**	**Media Number:** CR-SIM 3 2016-301	**Time:** 30.0 Minutes
Line Technical Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee: **N/A**		**Date:** **N/A**
Approved By (Training Program Supervisor, Lead Instructor or Line Supervisor) **Ed Jones**		**Date:** **05/30/16**

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Course Number	Program Name	Media Number
N/A	OPERATIONS TRAINING	CR-SIM 3 2016-301

Rev. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
01	08/24/92	General revision and format change	WMM	SCB
02	08/16/93	General revision, word processor change	RAB	RSG
03	08/19/94	Modify simulator setup, adjust format	RAB	SMC
04	03/28/96	Format change	RAB	DHG
05	04/10/97	Revised based on feedback from the 1996 Requal annual exam.	SCB	RSG
06	02/07/00	Format modification, change time allowance based on running average, upgrade to the new simulator operating system	RAB	DHG
07	11/02/00	Include objective number	RAB	DHG
08	03/11/02	Include initial operator statement	RAB	RAB
09	03/17/05	Deleted "S" from procedure numbers, changed Revision and Rev. numbers to "Current Version". Changed to Nuclear Plant Operator. Updated Simulator IC# and MSIV position.	ARB	DHG
10	06/13/05	Revised Initial License statement for successful completion	RAB	RAB
11	04/18/06	Remove Response Cues	RAB	RAB
12	11/06/06	Correct MPLs and Switch labels on Unit 1	BKW	RAB
13	06/07/12	Revision for use on 2012-301 CR-SIM 3 and updated procedure changes. After NRC Exam, Media Number will be changed to LR-JP-14.14.	ARB	CME
14	05/30/16	Reviewed JPM against current procedure for use on 2016-301 NRC Exam. Changed "Media Number" to CR-SIM 3 2016-301. After NRC Exam, Media Number will be changed to the next revision of LR-JP-14.14 and U1 material will be added back.	ARB	ELJ

UNIT 1 (X) UNIT 2 (X)

TASK TITLE:	**OVERRIDE THE MSIVS IN AN EMERGENCY**
JPM NUMBER:	CR-SIM 3 2016-301
TASK STANDARD:	The task shall be completed when the MSIVs have been opened per 31EO-EOP-111-1/2.
TASK NUMBER:	014.014
OBJECTIVE NUMBER:	014.014.A

PLANT HATCH JTA IMPORTANCE RATING:

RO 3.85

SRO 3.16

K/A CATALOG NUMBER: 239001A4.01

K/A CATALOG JTA IMPORTANCE RATING:

RO 4.20

SRO 4.00

OPERATOR APPLICABILITY: Nuclear Plant Operator (NPO)

GENERAL REFERENCES:	**Unit 1**	**Unit 2**
	31EO-EOP-111-1 31EO-EOP-011-1 (current versions)	31EO-EOP-111-2 31EO-EOP-011-2 (current versions)

REQUIRED MATERIALS:	**Unit 1**	**Unit 2**
	31EO-EOP-111-1 (current version)	31EO-EOP-111-2 (current version)

APPROXIMATE COMPLETION TIME: **30.0** Minutes

SIMULATOR SETUP: REFER TO SIMULATOR SETUP SHEET ON THE FOLLOWING PAGE

SIMULATOR SETUP

Simulator Initial Conditions:

1. **RESET** the Simulator to **IC #113 or Snap 613** and leave in **FREEZE**.

2. **ACTIVATE THE FOLLOWING EVENT TRIGGERS:**

Trigger #	DESCRIPTION	CONDITIONS
EGB21-17	Delete mf60321350 Group I System A Trip	diA71B-S32.aivToPanel<1
EGB21-18	Delete mf60321351 Group I System B Trip	diA71B-S33.aivToPanel<1

3. **INSERT** the following **MALFUNCTIONS:**

MALF #	TITLE	FINAL VALUE	RAMP RATE	ACT. TIME
mfC11_211	Scram Discharge Volume ATWS (Var)	20	100	00000
mfE41_235A	HPCI Fails to Auto Start on Low Level			00000
mfE41_235B	HPCI Fails to Auto Start on Hi Drywell Press			00000
mf60321383	Spur Ann -- LOW CONDENSER VACUUM A BYPASS			00000
mf60321384	Spur Ann -- LOW CONDENSER VACUUM B BYPASS			00000
mf60321350	Group I System A Trip			00000
mf60321351	Group I System B Trip			00000

4. **INSERT** the following **SIMULATOR VALUE OVERRIDES (SVO):**

SVO #	DESCRIPTION	FINAL VALUE	RAMP RATE	ACT. TIME
svoB21005	LT-N081A Group I/II Isolation	-110	100	00000
svoB21006	LT-N081B Group I/II Isolation	-110	100	00000

5. **INSERT** the following **REMOTE FUNCTIONS:**

REM #	DESCRIPTION	STATUS
rfN11045	SJAE A Steam	CLOSE
rfB21148	Grp 1 Low Rx Water Level Bypass	ORIDE
rfC71279	Group 1 Isolation Oride Jumpers	ORIDE

6. Take the Simulator **OUT OF FREEZE** and **PERFORM** the following **MANIPULATIONS:**

A. Take simulator out of FREEZE and perform RC-1, RC-2 and TC-1.
B. Place 2N11-F004A & F004B control switches in CLOSED & ENSURE they are CLOSED.
C. Place 2N33-F003 control switch in CLOSED & ENSURE it is CLOSED
D. Place the MSIV control switches in CLOSED.
E. Enter Remote Functions WHEN Torus temperature reaches 109°F or greater.
F. Inhibit ADS and inject SBLC.
G. Acknowledge annunciators.

7. **PLACE** the Simulator in **FREEZE** until the INITIATING CUE is given.

8. **ESTIMATED** Simulator **SETUP TIME**: **15 Minutes**

EVALUATOR COPY

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. The Condenser Low Vacuum and Low RWL isolations have been bypassed.
2. Main Condenser is in operation with Circ Water and Condensate Systems in operation.
3. An ATWS condition exists and 31EO-EOP-011-2 (RCA) is in progress.
4. EHC is in operation.

INITIATING CUES:

Open the MSIVs to re-establish Main Condenser as the heat sink using 31EO-EOP-111-2.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences. (AG-TRN-01-0685 Section 6.5.3 provides examples)

START TIME:_____

1.	Place MSIV Control Switches to CLOSED.	At panel 2H11-P601, confirms the following OUTBOARD MSIV switches are in CLOSED: MSIV 2B21-F028A MSIV 2B21-F028B MSIV 2B21-F028C MSIV 2B21-F028D	
2.	Place MSIV Control Switches to CLOSED.	At panel 2H11-P602, confirms the following INBOARD MSIV switches are in CLOSED: MSIV 2B21-F022A MSIV 2B21-F022B MSIV 2B21-F022C MSIV 2B21-F022D	
3.	Confirm A & B RFPTs are tripped.	At panel 2H11-P650, Operator has determined BOTH RFPTs are TRIPPED by: Checking annunciators(650-325 & 326) are ILLUMINATED	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
	PROMPT: **IF** the operator addresses isolation bypasses, as the Shift Supervisor, **INFORM** the operator that the Condenser Low Vacuum and Low Water Level isolations are bypassed.		
**4.	Reset Group I Isolation.	The GR ISOL RESET switch has been taken to GR I RESET position at panels 2H11-P601 and 2H11-P602.	
5.	Bypass the High Flow isolation on 2P70-F004 and F005, if necessary.	Operator has determined it is NOT necessary to bypass the High Flow Isolation by: Checking annunciators OR Checking INBD INLET ISOL 2P70-F004 and F005 red lights illuminated on panel 2H11-P700.	
	NOTE: It is acceptable for operator to have the High Flow Isolation bypassed. **IF** operator decides to bypass the High Flow Isolation, as the Shift Support Supervisor, **INFORM** the operator that it has been bypassed.		
6.	Confirm closed Inboard MSIVs.	At panel 2H11-P602, the following INBOARD MSIVs are CLOSED, green light illuminated: MSIV 2B21-F022A MSIV 2B21-F022B MSIV 2B21-F022C MSIV 2B21-F022D.	
**7.	Open Outboard MSIVs.	At panel 2H11-P601, the following switches are in OPEN SLO TEST, red light illuminated: MSIV 2B21-F028A MSIV 2B21-F028B MSIV 2B21-F028C MSIV 2B21-F028D.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
8.	Check differential pressure across Inboard MSIVs.	Operator has determined differential pressure is greater than 200 psid using: REACTOR PRESSURE indicator A(B,C) 2C32-R605A(B,C) on panel 2H11-P603 AND MAIN STEAM PRESS "A"("B") 2N32-R654A(B) indicator on Turbine EHC Panel or recorder PRESS TO STOP VLVS 1 & 4 2N11-R601 OR ***Monitor*** → ***steam pressure*** 2N32-K4001A OR 2N32-K4001B.	

NOTE: Any valid indication of Reactor Pressure and Steam Line Pressure can be used for Step 7.

9.	Confirm/Close valves 2N11-F001A & B.	The operator has ADDRESSED contacting a SO to verify/close SJAE 2A(2B) MAIN STEAM ISOL VALVE at panel 2H21-P216.	

PROMPT: **WHEN** the operator addresses valves 2N11-F001A and B, as the SO, **INFORM** the operator that the valves 2N11-F001A & B are closed.

10.	Confirm the following valves are closed: 2N11-F004A 2N11-F004B 2N33-F003	At panel 2H11-P650, the following valves are CLOSED, green light illuminated: 2ND STG A & B MSR RHTR STM SPLY VLV 2N11-F004A 2ND STG C & D MSR RHTR STM SPLY VLV 2N11-F004B MAIN STM FEED VLV 2N33-F003.	

(** Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**11.	Open the following valves: 2B21-F016 2B21-F019	The following valves are OPEN, red lights illuminated: MSL DRAIN VLV, 2B21-F016, at panel 2H11-P602 MSL DRAIN VLV, 2B21-F019, at panel 2H11-P601	
12.	Open the following valve: 2B21-F020	The following valve is OPEN, red lights illuminated: DRAIN VLV, 2B21-F020, at panel 2H11-P602	
13.	Verify differential pressure across MSIVs is less than 200 psid.	Operator has determined differential pressure is less than 200 psid using: REACTOR PRESSURE indicator A(B,C) 2C32-R605A(B,C) on panel 2H11-P603 AND MAIN STEAM PRESS "A"("B") 2N32-R654A(B) indicator on Turbine EHC Panel or recorder PRESS TO STOP VLVS 1 & 4 2N11-R601 OR *Monitor* → *steam pressure* 2N32-K4001A OR 2N32-K4001B.	

NOTE: Any valid indication of Reactor Pressure and Steam Line Pressure can be used for Step 11.

**14.	Open Inboard MSIVs.	At panel 2H11-P602, the following switches are in OPEN SLO TEST, red light illuminated: MSIV 2B21-F022A MSIV 2B21-F022B MSIV 2B21-F022C MSIV 2B21-F022D.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

NOTE: It is acceptable if the operator uses the Open Fast Test switch position.

PROMPT: **WHEN** the operator addresses the Main Condenser Vacuum System, as the Shift Supervisor, **INFORM** the operator that another operator will place it in service and monitor vacuum.

PROMPT: **IF** the operator addresses system restoration, as the Shift Supervisor, **INFORM** the operator that restoration is not required at this time.

END TIME:_____

NOTE: The terminating cue shall be given to the operator when any one of the following is met:

- After JPM step #13 is complete.
- With NO reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: We will stop here.

EVALUATOR – **PICK UP** the Initiating Cue sheet.

Summary of JPM Attributes

JPM CR-SIM 3 2016-301:

SUMMARY OF JPM QUANTITATIVE ATTRIBUTES

CATEGORY	Minimum NRC Attributes	JPM CONTENT
Total Critical Steps	At least 2	4
Step 4 Reset Group I Isolation	The Group I Isolation is required to be reset to re-open the MSIVs	
Step 7 Open the Outboard MSIVs	Opening the Outboard MSIVs is required to re-establish the Main Condenser as the heat sink, and to reduce differential pressure across the Inboard MSIVs less than 200 psid.	
Step 11 Open 2B21-F016 & F019	The MSL Drain valves are opened to reduce differential pressure across the Inboard MSIVs less than 200 psid.	
Step 14 Open the Inboard MSIVs	Opening the Inboard MSIVs is required to re-establish the Main Condenser as the heat sink.	
Number of JPM Steps	<30	14
Time to Perform JPM	<45 min	30.0 min
Normal / Faulted / Alternate Path		
Normal	Open the MSIVs using 31EO-EOP-11-2.	
Setting (administered)		
Simulator		
Is LOD "1" or "5"	NO	NO

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. The Condenser Low Vacuum and Low RWL isolations have been bypassed.
2. Main Condenser is in operation with Circ Water and Condensate Systems in operation.
3. An ATWS condition exists and 31EO-EOP-011-2 (RCA) is in progress.
4. EHC is in operation.

INITIATING CUES:

Open the MSIVs to re-establish Main Condenser as the heat sink using 31EO-EOP-111-2.

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
CR-SIM 4 (RO & SRO-I)

Title: **REACTOR PRESSURE CONTROL WITHIN BAND WITH BPVs & SRVs**		
Author: **Anthony Ball**	**Media Number:** CR-SIM 4 2016-301	**Time:** 20.0 Minutes
Line Technical Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee: **N/A**		**Date:** **N/A**
Approved By (Training Program Supervisor, Lead Instructor or Line Supervisor) **Ed Jones**		**Date:** **05/30/16**

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Course Number	Program Name	Media Number
N/A	OPERATIONS TRAINING	CR-SIM 4 2016-301

Rev. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
00	5/26/11	Initial development for use on 2011-301 NRC Exam.	ARB	CME
0.1	05/30/16	Reviewed JPM against current procedure for use on 2016-301 NRC Exam. Changed "Media Number" to CR-SIM 4 2016-301. After NRC Exam, Media Number will be changed to a new LR-JPM.	ARB	ELJ

UNIT 1 ( ) UNIT 2 (X)

TASK TITLE:	**REACTOR PRESSURE CONTROL WITHIN BAND WITH BPVs & SRVs**
JPM NUMBER:	CR-SIM 4 2016-301
TASK STANDARD:	The task will be completed when the operator is controlling Reactor pressure in a band using SRVs per 34SO-B21-001-2.
TASK NUMBER:	200.034
OBJECTIVE NUMBER:	200.034.C

PLANT HATCH JTA IMPORTANCE RATING:

RO

SRO

K/A CATALOG NUMBER: 239001A2.01

K/A CATALOG JTA IMPORTANCE RATING:

RO 3.8

SRO 3.9

OPERATOR APPLICABILITY: Nuclear Plant Operator (NPO)

GENERAL REFERENCES:	**Unit 2**
	34SO-N30-001-2 (current version) 34SO-B21-001-2 (current version)

REQUIRED MATERIALS:	**Unit 2**
	34SO-N30-001-2 (current version) 34SO-B21-001-2 (current version)

APPROXIMATE COMPLETION TIME: 20.0 Minutes

SIMULATOR SETUP: REFER TO SIMULATOR SETUP SHEET ON THE FOLLOWING PAGE

SIMULATOR SETUP

Simulator Initial Conditions:

1. **RESET** the Simulator to **IC #113 or Snap 614** and leave in **FREEZE**.

2. **INSERT** the following **MALFUNCTIONS and EVENT TRIGGERS:**

KEY	MALF #	DESCRIPTION	FINAL	RAMP	DELAY
ST-0	mfB21_129A	SRV A Fails Stuck			0000
ST-0	mfB21_129B	SRV B Fails Stuck			0000
ST-0	mfB21_129C	SRV C Fails Stuck			0000
ST-0	mfB21_129D	SRV D Fails Stuck			0000
ST-0	mfB21_129E	SRV E Fails Stuck			0000
ST-0	mfB21_129F	SRV F Fails Stuck			0000
ST-0	mfB21_129G	SRV G Fails Stuck			0000
ST-0	mfB21_129H	SRV H Fails Stuck			0000
ST-0	mfB21_129K	SRV K Fails Stuck			0000
ST-0	mfB21_129L	SRV L Fails Stuck			0000
ST-0	mfB21_129M	SRV M Fails Stuck			0000
ST-0	mfE41_104	HPCI Turbine Trip			0000
ST-0	mfE51_110	RCIC Turbine Trip			0000
ST-0	mfN21_87A	Feedwater Pump A Trip			0000
ST-0	svoB21053	PT-N127A SRV Electrical open	1000	1000	0000
ST-0	svoB21054	PT-N127B SRV Electrical open	1000	1000	0000
ST-0	svoB21055	PT-N127C SRV Electrical open	1000	1000	0000
ST-0	svoB21056	PT-N127D SRV Electrical open	1000	1000	0000
ST-0	mfB21_226A	Low-Low Set A Fails Inop			0000
ST-0	mfB21_226B	Low-Low Set B Fails Inop			0000
ST-0	mf60131129	Leak Det Diff Temp Hi			0000
ST-0	mf60131135	Leak Ambient Temp Hi			0000

RB-1	mfN37_134	ALL Bypass Valves Fail CLOSED			9999
RB-1	diN32-C001A	EHC Pump 2A Switch	Trip		9999
RB-1	diN32-C001B	EHC Pump 2B Switch	Trip		9999

ACTIVATE THE FOLLOWING EVENT TRIGGERS:

Trigger #	DESCRIPTION	CONDITIONS
EGB21-21	SRV B Stuck, opens when control switch is in OPEN	diB21-F013B.iivPanel=1
EGB21-22	SRV G Stuck, opens when control switch is in OPEN	diB21-F013G.iivPanel=1
EGB21-23	SRV F Stuck, opens when control switch is in OPEN	diB21-F013F.iivPanel=1
EGB21-24	SRV D Stuck, opens when control switch is in OPEN	diB21-F013D.iivPanel=1
EGN37-1	RPV pressure <800 psig closes BPVs & trips off EHC pumps	aoC32-R605B.anvToPanel<.667

3. Take the Simulator **OUT OF FREEZE** and **PERFORM** the following **MANIPULATIONS OR RUN SCENARIO FILE** and **EVENT TRIGGER** (current rev) **CR-SIM 4 2016-301:**

A. Perform RC-1 and RC-2 actions such that the 2N21-F110 is closed and the SULCV is in auto and set at +20".
B. Perform TC-1; ensuring 2N11-F004A and B are closed.
C. Lower Pressure Set to 825 psig.
D. Ensure Reactor pressure stabilizes at ~825 psig.
E. Ensure BYPASS VALVE screen and SPEED screen is called up.
F. Place **RPV Pressure** (B025) in the P603 plasma display.

4. **PLACE** the Simulator in **FREEZE** until the INITIATING CUE is given.

5. **ESTIMATED** Simulator **SETUP TIME**: **15 minutes**

EVALUATOR COPY

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Unit 2 Reactor has been scrammed.
2. Other operators are performing scram actions.
3. A Reactor pressure reduction is required due to an unisolable steam leak in the Reactor Building.
4. You have the sole responsibility for Reactor Pressure Control.

INITIATING CUES:

LOWER AND THEN MAINTAIN Reactor pressure between 700 and 800 psig using the Bypass Valves.

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences.

START TIME:_____

1.	Operator identifies the procedure needed to perform the task.	Operator has obtained procedure 34GO-OPS-013-2, step 7.5.5 or uses Placard at Turbine Panel.	

NOTE: For Steps 2 through 8 all indication will be on panel 2H11-P650 using HMI Screens 2N32-K4001A or B.

2.	**Selects** ***Control*** / ***psi-load*** screen	The operator has SELECTED the ***Control*** screen and also has SELECTED the ***psi-load*** button on 2N32-K4001A or B.	

3.	**Selects** ***Ramp Rate*** button	The operator has SELECTED the ***Ramp Rate*** button on 2N32-K4001A or B.	

NOTE: An acceptable Ramp Rate results in a cooldown rate NOT exceeding 100ºF/hr OR RWL exceeding +100 inches.

****4.**	**Enters** a ramp rate	The operator has ENTERED a ramp rate >0 and <100 displayed on 2N32-K4001A or B.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**5.	**Selects** ***Pressure*** button	The operator has SELECTED the ***Pressure*** button on 2N32-K4001A or B.	
**6.	**Enters** desired target pressure	The operator has ENTERED a target pressure between 700 and 800 psig on 2N32-K4001A or B.	
**7.	**Adjusts** ***Ramp Rate*** AND/OR the ***Pressure*** setpoints to maintain pressure/cooldown rate.	The operator has VARIED the ramp rate/pressure to maintain a cooldown rate ≤100° F/Hr OR RWL exceeding 100 inches change on 2N32-K4001A or B.	

ALTERNATE PATH STARTS HERE

NOTE: **SIMULATOR OPERATOR**, **WHEN** the operator has successfully opened Bypass Valves (BPVs) and reactor pressure is being reduced to <800 psig **ENSURE** Event Trigger **EGN37-1** FULLY CLOSES ALL Bypass Valves AND TRIPS BOTH EHC Pumps.

8.	The failure of ALL BPVs is recognized.	Operator identifies all BPVs closed on 2N32-K4001A or B.	

PROMPT: **IF** the operator reports the failure of the BPVs and EHC pumps, **INFORM** the operator that you will get Maintenance to investigate, and to control Reactor pressure between 700 – 800 psig.

PROMPT: **IF** alarm 650-124, Max Combined Flow Limit Limiting, is received, **INFORM** the operator that another operator will address the ARP.

PROMPT: **IF** the operator addresses using other systems to control Reactor pressure, **INFORM** the operator to control Reactor pressure between 700 – 800 psig.

NOTE: The operator can use any of the following procedures to control reactor pressure:

- Placard on 2H11-P602 panel
- 34SO-B21-001-2, Automatic Depressurization (ADS) And Low-Low Set (LLS) Systems

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
9.	Operator identifies applicable procedures to perform the task.	Operator has IDENTIFIED the correct procedure as: Placard on 2H11-P602 panel 34SO-B21-001-2, step 7.4.1.	

NOTE: ALL SRVs, EXCEPT LLS SRVs, fail to open with the switch.

10.	Attempts to OPEN SRV 2B21-F013M.	At Panel 2H11-P602, the operator has PLACED the control switch for 2B21-F013M into the OPEN position, red light ILLUMINATES.	

11.	The failure of the 2B21-F013M to open is recognized.	At 2H11-P602, the operator has RECOGNIZED the failure of the 2B31-F013M to OPEN, amber light remains EXTINGUISHED.	

PROMPT: **IF** the operator reports the failure of the 2B21-F013M to open, **INFORM** the operator that you will get Maintenance to investigate, and to control Reactor pressure between 700 – 800 psig.

NOTE: Due to failures, LLS will NOT automatically ARM with Reactor pressure >1074 psig.

NOTE: EVENT TRIGGER **EGB21-21, 22, 23 & 24** will allow 2B21-F013B, G, F, & D LLS valve to be used to control RPV pressure.

NOTE: Any of the LLS valves (2B21-F013B, D, F, or G) will be used to control RPV pressure and will successfully meet the intent of Critical Step **__12__. 34SO-B21-001-2 allows opening of any of the LLS valves to control RPV pressure.

__12.	OPEN SRV 2B21-F013B, D, F, or G.	At Panel 2H11-P602, the operator has PLACED the control switch for 2B21-F013B, D, F, or G into the OPEN position prior to 1250 psig, red light ILLUMINATED.	

PROMPT: **IF** the operator addresses checking SRV tailpipe temperature on recorder 2B21-R614, at Panel 2H11-P614, **INFORM** the operator that another operator will check the recorder for proper SRV operation.

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**13.	Reactor pressure in band: 700 to 800 psig	The operator CONTROLS pressure in band: 700 to 800 psig (± 50 psig)	
**14.	Before Reactor decreases below 700 psig, CLOSE SRV 2B21-F013B, D, F, or G.	At panel 2H11-P602 the operator has PLACED the control switch for 2B21-F013B, D, F, or G into the CLOSE position PRIOR to Reactor pressure lowering below its band (-50 psig), green light ILLUMINATED.	

NOTE: **AFTER** the operator has demonstrated proper control of Reactor pressure, **INFORM** the operator that another operator will continue maintaining Reactor pressure in band.

END TIME:_____

NOTE: The terminating cue shall be given to the operator when any one of the following is met:

- After JPM step #14 is complete.
- With NO reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: Another operator will continue from here.

EVALUATOR – **PICK UP** the Initiating Cue sheet.

(Indicates critical step)**

Summary of JPM Attributes

JPM CR-SIM 4 2016-301:

SUMMARY OF JPM QUANTITATIVE ATTRIBUTES

CATEGORY	Minimum NRC Attributes	JPM CONTENT
Total Critical Steps	At least 2	7
Step 4 Enters ramp rate	Entering a ramp rate is required to lower the pressure reference signal.	
Step 5 Selects Pressure	Selecting the Pressure button allows the operator to reduce the desired pressure value.	
Step 6 Enters target Pressure	Entering the target pressure allows the operator to start the pressure reduction to this desired pressure value.	
Step 7 Adjusts ramp/rate	Adjusts as needed to maintain a cooldown rate ≤100° F/Hr OR RWL exceeding 100 inches.	
Step 12 Opens SRV 2B	Terminates the pressure increase.	
Step 13 Reactor pressure in band	Controls pressure in band	
Step 14 Closes SRV 2B	Prior to exceeding pressure band on lower band	
Time to Perform JPM	<45 min	20.0 min
Normal / Faulted / Alternate Path		
Alternate Path	When the Bypass valves fail, the Operator is required to control pressure via an alternate method and use SRVs.	
Setting (administered)		
Simulator		
Is LOD "1" or "5"	NO	NO

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Unit 2 Reactor has been scrammed.
2. Other operators are performing scram actions.
3. A Reactor pressure reduction is required due to an Unisolable steam leak in the Reactor Building.
4. You have the sole responsibility for Reactor Pressure Control.

INITIATING CUES:

LOWER AND THEN MAINTAIN Reactor pressure between 700 and 800 psig using the Bypass Valves.

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
CR-SIM 5 (ALL)

Title: **Perform a Manual Initiation of Drywell Sprays (Alternate Path)**		
Author: **Anthony Ball**	**Media Number:** CR-SIM 5 2016-301	**Time:** 15.0 Minutes
Line Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee (N/A for minor revisions) **N/A**		**Date:** **N/A**
Approved By (Training Program Manager or Lead Instructor) **Ed Jones**		**Date:** **05/30/16**

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Course Number	Program Name	Media Number
N/A	OPERATIONS TRAINING	CR-SIM 5 2016-301

Ver. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
00.0	30Nov15	Initial Development for Simulator only.	MCK	ALS
0.1	05/30/16	Reviewed JPM against current procedure for use on 2016-301 NRC Exam. Changed "Media Number" to CR-SIM 5 2016-301. After NRC Exam, Media Number will be changed to LR-JP-00701A (Alt Path).	ARB	ELJ
		.		

Line Contributors

The following individuals contributed to the development of this lesson plan.

Ver. No.	List of Contributors

UNIT 1 ( ) UNIT 2 (X)

TASK TITLE:	**Perform a Manual Initiation of Drywell Sprays (Alternate Path)**
JPM NUMBER:	CR-SIM 5 2016-301
TASK STANDARD:	The task shall be completed when the RHR System has been initiated in the Drywell spray mode, per 34SO-E11-010-2 with total RHR flow > 5000gpm but <17,000gpm. Operator is to take action based on Overload protection alarm for the 2A RHR pump by securing the pump.

TASK NUMBER: 007.001

OBJECTIVE NUMBER: 007.001.O

PLANT HATCH JTA IMPORTANCE RATING:

RO 4.71

SRO 4.05

K/A CATALOG NUMBER: 226001A4.03

K/A CATALOG JTA IMPORTANCE RATING:

RO 3.50

SRO 3.50

OPERATOR APPLICABILITY: Nuclear Plant Operator (NPO)

GENERAL REFERENCES:	Unit 1	Unit 2
	N/A	34SO-E11-010-2 Ver. 42.0 31EO-EOP-012-2 Ver. 6

REQUIRED MATERIALS:	Unit 1	Unit 2
	N/A	34SO-E11-010-2 Ver. 42.0

APPROXIMATE COMPLETION TIME: 15.0 Minutes

SIMULATOR SETUP: Refer to Simulator setup sheet on the following page.

SIMULATOR SETUP

Simulator Initial Conditions:

1. **RESET** the Simulator to **IC # 113 (100%)** or **SNAP 615** and leave in **FREEZE**.

2. **ACTIVATE THE FOLLOWING EVENT TRIGGERS:**

Trigger #	DESCRIPTION	CONDITIONS
EGE11-31	Inserts 2A RHR Pump Overload Alarm	loE11-F021AR2.algToPanel = 1

3. **INSERT** the following **MALFUNCTIONS:**

Activator	MALF #	TITLE	FINAL VALUE	RAMP RATE
ST 0	mfE41_107	HPCI Failure to Start (F001 Stuck)		
ST 0	mfE51_110	RCIC Turbine Trip		
ST 0	mfB21_229B	FW Line B Break Inside Containment (Var)	10	100
ST 0	mfR22_183	4KV Buss 2F Fault	1	
ST 0	mfR43_167B	Diesel Gen Failure to Start 1B	1	

4. **INSERT** the following **REMOTE FUNCTIONS:**

Activator	REM #	Description	Status
ST 0	rfE11_167	2E11-F017A & B Override 5 Min Timer	ORIDE

5. **INSERT** the following **OVERRIDES:**

Activator	TAG #	S/M/L	DESCRIPTION	Final Value	Ramp Rate	Delay
ST-0	diE11-F028B	S	Torus Spray OR Test Vlv	CLOSE		0
ST-0	diE11-F027A	S	Torus Spray Vlv	CLOSE		0

6. Take the Simulator **OUT OF FREEZE** and **PERFORM** the following **MANIPULATIONS:**

A. Perform first five (5) Steps of RC-1.
B. Close 2N21-F006B. Allow the valve to go FULL CLOSE.
C. Perform actions of RC-2 to stabilize RWL around 9 inches.
D. Place RHR pump 2B in OFF.
E. Trip Recirculation Pumps 2A and 2B place in PTL.
F. Secure all Drywell cooling fans.
G. Allow Simulator to run approximately 10 min to stabilize conditions.
H. Acknowledge all Annunciators.

7. **PLACE DANGER TAGS** on the following equipment:

MPL #	COMPONENT	TAGGED POSITION
	NONE	

8. **PLACE** Protected Equipment tags on the following: **NONE**

9. **PLACE** the Simulator in **FREEZE** until the INITIATING CUE is given.

10. **ESTIMATED** Simulator **SETUP TIME**: 30 **Minutes**

EVALUATOR COPY

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Torus pressure is greater than 11 psig.

   31EO-EOP-012-2, PC Primary Containment Control is in progress.
2. 2E11-F027A, Torus Spray Valve, is bound closed and cannot be opened.
3. Drywell pressure and temperature are within the SAFE region of the Drywell Spray Initiation Limit Curve. (GRAPH 8).
4. Pre-Job Brief is NOT required.

INITIATING CUES:

Initiate Drywell sprays using the RHR Loop 2A per 34SO-E11-010-2.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences.

START TIME:_____

NOTE: This JPM is set up for the Operator to use the CONTAINMENT SPRAY INITIATION PLACARD.

1.	IF RWL <2/3 core height, (-193 inches), PLACE the Cnmt Spray Vlv Cntl 2/3 Core Ht Permis keylock in MANUAL OVERRD. Step 1	Operator VERIFIES that RWL is >-193" and this step is not applicable.	
****2.**	IF required by EOPs AND LOCA signal present, PLACE Cnmt Spray Vlv Cntl switch in the MANUAL position. Step 2	At panel 2H11-P601, the Operator PLACES the CONTAINMENT SPRAY VALVE CONTROL switch to MANUAL, white light illuminated for 2A Loop RHR.	
3.	Confirm CLOSED 2E11-F015A and/or 2E11-F017A, unless required for core cooling. Step 3	At panel 2H11-P601, CONFIRM Closed 2E11-F015A and/or 2E11-F017A.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
4.	IF power is being provided by EDG, CHECK EDG loading prior to start of RHR pump(s). Step 4	Operator VERIFIES that EDGs are not providing power to emergency buses.	
5.	START RHR pump(s) in loop A. Step 5	At panel 2H11-P601, Operator VERIFIES the 2A RHR pump is RUNNING, red light illuminated.	
6.	IF TORUS Spray is desired, PERFORM the following: Step 6	Operator DETERMINES that Torus Sprays are in service on 2B Loop of RHR remainder of step 6 is NOT required.	
****7.**	IF DRYWELL Spray is desired, PERFORM the following: OPEN Containment Spray Valve 2E11-F021A. Step 7.1	At panel 2H11-P601, the Operator OPENS 2E11-F021A CNMT SPRAY INBD VLV.	

ALTERNATE PATH STARTS HERE
(When 2E11-F021A goes intermediate (>50% Open),
2A RHR pump indicates an overload condition but the pump fails to trip).

8.	Operator identifies annunciator RHR Pump A OVLD/LOCKOUT Relay Trip is alarming.	Operator IDENTIFIES annunciator, RHR Pump A OVLD/LOCKOUT Relay Trip (601-212), is alarming.	

NOTE: The Operator may refer to the Annunciator Response Procedure (ARP) 34AR-601-212-2 “RHR PUMP A OVLD/LOCKOUT RELAY TRIP” only step 5.1 is required action.

****9.**	IF 2E11-C002A, RHR Pump A has NOT tripped, TRIP 2E11-C002A, panel 2H11-P601, ARP – Step 5.1	Operator TRIPS 2A RHR pump (2E11-C002A) at Panel 2H11-P601.	

PROMPT: **IF** Operator asks, **INFORM** the Operator that Maintenance will investigate the problem with 2A RHR Pump.

PROMPT: **IF** Operator asks, **INFORM** the Operator to Spray the Drywell.

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
10.	IF RWL <2/3 core height, (-193 inches), PLACE the Cnmt Spray Vlv Cntl 2/3 Core Ht Permis keylock in MANUAL OVERRD. Step 1	Operator VERIFIES that RWL is >-193" and this step is not applicable.	
**11.	IF required by EOPs AND LOCA signal present, PLACE Cnmt Spray Vlv Cntl switch in the MANUAL position. Step 2	At panel 2H11-P601, the Operator PLACES the CONTAINMENT SPRAY VALVE CONTROL switch to MANUAL, white light illuminated for 2B Loop RHR.	
12.	Confirm CLOSED 2E11-F015B and/or 2E11-F017B, unless required for core cooling. Step 3	At panel 2H11-P601, the Operator CONFIRMS Closed 2E11-F015B and/or 2E11-F017B.	
13.	IF power is being provided by EDG, CHECK EDG loading prior to start of RHR pump(s). Step 4	Operator VERIFIES that EDGs are not providing power to emergency buses.	
14.	START RHR pump(s) in Loop B. Step 5	At panel 2H11-P601, Operator VERIFIES the 2B RHR pump is RUNNING, red light illuminated	
15.	IF TORUS Spray is desired, PERFORM the following: Step 6	Operator DETERMINES that Torus Sprays cannot be placed in service on 2B Loop of RHR so remainder of Step 6 is not required.	
**16.	IF DRYWELL Spray is desired, PERFORM the following: OPEN 2E11-F021B Step 7.1	At panel 2H11-P601, the Operator OPENS 2E11-F021B CNMT SPRAY INBD VLV.	

NOTE: To achieve the proper spray pattern from the nozzles, a Minimum Drywell Spray flow of at least **5,000** gpm is required.

**17.	THROTTLE OPEN 2E11-F016B Step 7.2	The Operator THROTTLES OPEN 2E11-F016B, CNMT SPRAY OUTBD VLV.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**18.	Operator establishes RHR Total flow to provide adequate drywell spray flow.	The Operator ESTABLISHES Total RHR Flow of >5000 gpm.	
19.	Operator verifies proper response.	The Operator OBSERVES drop in Drywell pressure.	
20.	Refer to 34SO-E11-010-2, AND place RHR Hx into service. Step 8	Operator REFERS to 34SO-E11-010-2	

PROMPT: **IF** Operator proceeds to place RHR HX into service, **INFORM** the Operator another Operator will perform those actions.

END TIME:_____

NOTE: The terminating cue shall be given to the operator when any of the following conditions are met:

- Operator completes step 20 of this JPM.
- With no reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: We will stop here.

(Indicates critical step)**

Summary of JPM Attributes

JPM CR-SIM 5 2016-301**:**

SUMMARY OF JPM QUANTITATIVE ATTRIBUTES

CATEGORY	Minimum NRC Attributes	JPM CONTENT
Total Critical Steps	At least 2	5
Step 9 Operator TRIPS 2A RHR pump		Action required protecting equipment from potential fire.
Step 11 PLACES switch to MANUAL		Action required for opening drywell spray valves
Step 16 OPENS 2E11-F021B		Required to initiate drywell sprays.
Step 17 THROTTLES OPEN 2E11-F016B		Required to establish drywell sprays.
Step 18 ESTABLISHES Total RHR Flow		Minimum flow is >5000gpm for drywell sprays.
Number of JPM Steps	<30	20
Time to Perform JPM	<45 min	10 min
Normal / Faulted / Alternate Path		
Alternate		While drywell sprays are being aligned in the 2A Loop of RHR the 2A RHR pump receives an overload condition but does not trip. This requires the operator to trip the 2A RHR pump and establish drywell sprays in the 2B Loop of RHR.
Setting (administered)		
Simulator		
Is LOD "1" or "5"	NO	NO

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Torus pressure is greater than 11 psig.

   31EO-EOP-012-2, PC Primary Containment Control is in progress.
2. 2E11-F027A, Torus Spray Valve, is bound closed and cannot be opened.
3. Drywell pressure and temperature are within the SAFE region of the Drywell Spray Initiation Limit Curve. (GRAPH 8).
4. Pre-Job Brief is NOT required.

INITIATING CUES:

Initiate Drywell sprays using the RHR Loop 2A per 34SO-E11-010-2.

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
CR-SIM 6 (RO & SRO-I)

Title: **Transfer an Emergency 4160 VAC Bus from the Emergency to the Normal Power Supply**		
Author: **Anthony Ball**	**Media Number:** CR-SIM 6 2016-301	**Time:** 20 Minutes
Line Technical Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee: **N/A**		**Date:** **N/A**
Approved By (Training Program Supervisor, Lead Instructor or Line Supervisor) **Ed Jones**		**Date:** N/A

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Course Number	Program Name	Media Number
N/A	OPERATIONS TRAINING	CR-SIM 6 2016-301

Rev. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
01	06/09/89	General revision and format change	WGW	RSG
02	08/24/89	Revise questions & add LR lesson plans	JEM	DHG
03	07/01/92	General revision and format change	WMM	DHG
04	09/23/93	General revision, word processor change	RAB	RSG
05	07/18/94	Correct for D/G loading, adjust format	RAB	SMC
06	02/23/95	Correct simulator setup and prompts to include directions for the simulator Operator to place speed drop and voltage regulator to the correct positions, adjust format, include phonetics in the initiating cue	RAB	DHG
07	08/17/95	Format change, incorporate student comment about Unit 1 section	RAB	SMC
08	07/05/96	Format change	RAB	SMC
09	10/01/97	Revised based on comments from the 1997 annual exam.	SCB	DHG
10	03/05/99	Revised to make steps for direction of synchscope rotation, step 8 (U1) and Step 9 (U2) noncritical. Revised for new simulator malfunction numbers.	SCB	DHG
11	02/11/00	Format modification, change time allowance based on running average, update to new simulator operating system	RAB	DHG
12	03/29/00	TLB comment; change step 10 of U2 for voltage requirement of the diesel	RAB	SMC
13	11/02/00	Include objective number, TLB comment, correct Step 9 of Unit 1 section to agree with procedure change	RAB	DHG
14	03/11/02	Incorporate instructor comment on goal for power decrease of Step 12 for Unit 2, include initial Operator statement	RAB	RAB
15	03/08/05	Documentum revision	DNM	RAB
16	06/13/05	Revised Initial License statement for successful completion	RAB	RAB
17	04/18/06	Remove Response Cues	RAB	RAB
18	09/17/08	Changed note before step 8 from "lightly loaded" to > 500 KW" to correspond to procedure guidance.	JWP	RAB
18.1	10/17/11	Reviewed JPM against current procedure. Added Fundamental question to Attachment 1. Added pass / fail criteria. Added 30AC-OPS-003 for resetting LOSP Lockout Relay. Added the following prompt," **WHEN** the Operator addresses Manual Start Permissive lights, **INFORM** the Operator that U-1 light is illuminated and U-2 light is extinguished."	MMG	ALS
18.2	08/24/15	Added "Summary of JPM Attributes" and changed wording to match procedure including procedure step numbers. Deleted Unit 1 section, will perform in Simulator for Unit 2. Deleted fundamental question.	MMG	ALS
18.3	05/30/16	Reviewed JPM against current procedure. Changed "Media Number" to CR-SIM 6 2016-301. After NRC Exam, Media Number will be changed back to LR-JP-02711.	ARB	ELJ

Line Contributors

The following individuals contributed to the development of this lesson plan.

Rev. No.	List of Contributors

UNIT 1 ( ) UNIT 2 (X)

TASK TITLE:	**Transfer an Emergency 4160 VAC Bus from the Emergency to the Normal Power Supply**
JPM NUMBER:	CR-SIM 6 2016-301
TASK STANDARD:	The task shall be completed when the Operator has transferred the "2F" 4160 VAC Emergency Bus power supply from the associated Emergency Diesel to the "D" Startup Transformer, per 34SO-R43-001, with exception of placing the selected Diesel Generator in Standby.

TASK NUMBER: 027.011

OBJECTIVE NUMBER: 027.011.O

PLANT HATCH JTA IMPORTANCE RATING:

RO 3.07

SRO 3.07

K/A CATALOG NUMBER: 262001A404

K/A CATALOG JTA IMPORTANCE RATING:

RO 3.60

SRO 3.60

OPERATOR APPLICABILITY: Nuclear Plant Operator (NPO)

GENERAL REFERENCES:	Unit 1	Unit 2
	NA	34SO-R43-001-2, Ver 28.2

REQUIRED MATERIALS:	Unit 1	Unit 2
	NA	34SO-R43-001-2, Ver 28.2

APPROXIMATE COMPLETION TIME: 20 Minutes

SIMULATOR SETUP: N/A

SIMULATOR SETUP

Simulator Initial Conditions:

1. **RESET** the Simulator to **IC # for 100% power** or **SNAP 616** and leave in **FREEZE**.

2. **INSERT** the following **REMOTE FUNCTIONS:**

Activator	REM #	Description	Status
RB 1	rfR43_241	Diesel Gen 1B Engine Control Switch	UNIT 2
RB 2	rfR43_295	Diesel Gen 1B Engine Remote Speed Droop (0 to 100)	50
RB-3	rfR43_188	Diesel Gen 1B Unit 1 Voltage Reg Transfer	MAN

3. Take the Simulator **OUT OF FREEZE** and **PERFORM** the following **MANIPULATIONS:**

   A. Open the Normal and Alternate supply breakers to Bus "2F."
   B. Verify the "1B" D/G output breaker closes and match flags on the breaker switch.
   C. Place Diesel Generator "B" Volt Select switch in OFF position.
   D. Ensure Diesel Generator load is greater than 500 kW.
   E. Start another PSW pump on that bus.

4. **PLACE** the Simulator in **FREEZE** until the INITIATING CUE is given.

5. **ESTIMATED** Simulator **SETUP TIME**: 15 **Minutes**

EVALUATOR COPY

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. 4160 VAC Emergency Bus 2F is being supplied from Emergency Diesel Generator 1B.
2. The condition that caused Bus 2F to de-energize has been corrected.
3. 4160 VAC Emergency Bus 2F is ready to be transferred to its normal power supply.
4. All procedure requirements have been met for the reset of the 4160V Bus 2F LOSP Lockout Relay.
5. A Systems Operator is stationed in the Emergency Diesel Generator 1B Room.
6. Pre-Job Brief is NOT required.

INITIATING CUES:

Transfer the 4160 VAC Bus “2F” to the normal power supply.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences.

START TIME:_____

1.	Operator determines the correct procedure.	The Operator DETERMINES that procedure 34SO-R43-001-2, section 7.2.2.3 should be used.	
2.	**Confirm** power has been restored to Startup Transformers 2C OR 2D. (potential lights for Startup Aux Xfmr 2C OR 2D ILLUMINATED, panel 2H11-P651) (Step 7.2.2.3.1)	At panel 2H11-P651, the Operator has VERIFIED that SUT "2D" potential lights are illuminated.	
****3.**	**Reset** 4160V Bus 2F LOSP Lockout Relay in accordance with NMP-OS-007-001, Conduct of Operations Standards and Expectations, and 31GO-OPS-021-0, Manipulation of Controls and Equipment, AND ********** (Step 7.2.2.3.2)	At panel 2H11-P652, the Operator RESETS BUS "2F" LOSP LOCKOUT RELAY. (Switch TURNED clockwise and HELD until its white light illuminates).	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
4.	********** ********** **********, AND, **confirm** annunciator 652-202, LOSS OF OFF SITE POWER, is clear. (Step 7.2.2.3.2)	At panel 2H11-P652, the Operator CONFIRMS annunciator 652-202, LOSS OF OFFSITE POWER, is clear.	
**5.	**Place** Diesel Gen 1B Mode Select Switch in TEST. (step 7.2.2.3.3)	At panel 2H11-P652, the Operator PLACES Diesel Gen 1B Mode Select Switch in TEST.	

NOTE: SIMULATOR OPERATOR, **WHEN** the Operator addresses adjusting speed droop, the Simulator Operator will **TOGGLE REMOTE FUNCTION rfR43241, (RB 1)** "Diesel Gen 1B Engine Control Switch" to **UNIT 2**. As the SO, **INFORM** the Operator that Diesel Gen 1B Engine Control Switch has been placed to **UNIT 2**, (step 7.2.2.3.4).

6.	**Confirm** Manual Start Permissive light is illuminated on 2H11-P652. (Step 7.2.2.3.4.1)	At panel 2H11-P652, the Operator CONFIRMS Manual Start Permissive light is illuminated on 2H11-P652.	

NOTE: SIMULATOR OPERATOR, **WHEN** the Operator addresses the Manual Start Permissive light on Unit 1, as the Unit 1 Operator, **INFORMS** the Operator that the Unit 1 Manual Start Permissive light is extinguished. (Step 7.2.2.3.4.2)

NOTE: SIMULATOR OPERATOR, **WHEN** the Operator addresses adjusting speed droop, the Simulator Operator will **TOGGLE REMOTE FUNCTION rfR43295, (RB 2)** "D/G 1B Engine Remote Speed Droop (0 to 100)," to **50**. As the SO, **INFORM** the Operator that speed droop has been adjusted to 50. (Step 7.2.2.3.5)

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
	NOTE: SIMULATOR OPERATOR, **WHEN** the Operator addresses the position of the Unit 1 Voltage Regulator Transfer switch, the Simulator Operator will **TOGGLE REMOTE FUNCTION rfR43188**, **(RB 3)** "Diesel Gen 1B Unit 1 Voltage Reg Transfer," to **MAN**. As the Unit 1 Control Room Operator, **INFORM** the Operator that the Unit 1 Voltage Regulator Transfer switch is in manual. (Step 7.2.2.3.6)		
**7.	**Place** OR **confirm** Diesel Gen 1B Voltage Reg Transfer switch to MANUAL, panel 2H11-P652. (Step 7.2.2.3.7)	At panel 2H11-P652, the Operator PLACES VOLTAGE REG TRANSFER switch in MANUAL, green light illuminated.	
**8.	**Place** Synch Switch (SSW) in ON for: ACB 135574, 4160V Bus 2F Normal Supply, OR ACB 135564, 4160V Bus 2F Alternate Supply. (Step 7.2.2.3.8)	At panel 2H11-P652, the Operator PLACES SSW ACB 135574, in the ON position.	
	NOTE: **Diesel Generator B Volt Select switch must be turned on to check DG voltage.**		
9.	**Adjust** the Diesel Gen 1B Voltage Adjust switch UNTIL diesel output voltage is equal to 4160V. (Step 7.2.2.3.9)	At panel 2H11-P652, the Operator ADJUSTS the "1B" DIESEL GEN B VOLTAGE ADJUST switch as necessary to indicate approximately 4160 volts on VOLTMETER for 4KV BUS "2F".	
	NOTE: For performance of this JPM, the Diesel Generator is Heavly loaded (> 500 KW).		
**10.	Using Diesel Gen 1 B Speed Adjust switch, **adjust** diesel speed to attain a slow synchroscope rotation in the desired direction (1 to 3 rpm). (Step 7.2.2.3.10)	At panel 2H11-P652, the Operator ADJUSTS the DIESEL GEN B SPEED ADJUST switch as needed until the Synchroscope rotation is in the CLOCKWISE direction at 1 to 3 rpm.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**11.	Using Diesel Gen 1B Voltage Adjust, **adjust** Diesel Gen 1B output voltage to match the highest phase of the incoming source (Startup Transformer 2D (normal) OR 2C (alternate)). (Step 7.2.2.3.11)	At panel 2H11-P652, the Operator ADJUSTS Diesel output voltage using DIESEL GEN B, VOLTAGE ADJUST to match the highest phase of SUT "2D" Winding 2. Operator does not exceed 4400 volts on any phase.	

NOTE: For the purpose of this JPM, ±100 volts is considered matched.

**12.	WHEN the sychroscope indicates 2 minutes to 12 AND WHEN the synchroscope lights approach the dimmest point, **take**: ACB 135574, 4160V 2F Normal Supply, OR ACB 135564, Alternate Suppy, To CLOSE. (Step 7.2.2.3.12)	At panel 2H11-P652, the Operator TAKES 4160 "2F," NORMAL SUPPLY ACB 135574 control switch to CLOSE, (when synchroscope is 2 minutes to 12:00 position and when the synchroscope lights approach the dimmest point, then released to the midposition, red light illuminated.)	

NOTE: If the synchroscope for ACB 135574 was not energized the breaker remains OPEN, green light on.

13.	Using the Diesel Gen 1B Speed Adjust switch, **decrease** the load on diesel to between 400 AND 500 KW WHILE maintaining diesel reactive load between 400 AND 500 KVAR, using Diesel Gen 1B Voltage Adjust switch. (Step 7.2.2.3.13)	At panel 2H11-P652, the Operator ADJUSTS the DIESEL GEN B, VOLT ADJUST and SPEED ADJUST switches as necessary to reduce load on Diesel to 400-500 KW while maintaining 400-500 KVAR.	
**14.	**Take** ACB 135570, Diesel Gen 1B Emergency Supply, control switch to TRIP. (Step 7.2.2.3.14)	At panel 2H11-P652, the Operator TAKES DIESEL GEN B, EMERGENCY SUPPLY ACB 135570 control switch to TRIP and released to midposition, green light illuminated.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
15.	Confirm ACB 135570, Diesel Gen 1B Emergency Supply, green (OPEN) light is ILLUMINATED. (Step 7.2.2.3.15)	At panel 2H11-P652, the Operator IDENTIFIES that the DIESEL GEN B, EMERGENCY SUPPLY ACB 135570 green light is illuminated.	
16.	Place Synch Switch (SSW) in OFF for: ACB 135574, 4160V Bus Normal Supply OR ACB 135564, Alternate Supply. (Step 7.2.2.3.16)	At panel 2H11-P652, the Operator PLACES SSW ACB 135574 in OFF.	

PROMPT: **WHEN** the Operator addresses securing of the Diesel Generator, as the Shift Supervisor, **INFORM** the Operator that another Operator will shutdown the Diesel Generator.

END TIME:_____

NOTE: The terminating cue shall be given to the operator when any of the following conditions are met:

- Operator completes Step 16 of this JPM.
- With NO reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: We will stop here.

(Indicates critical step)**

Summary of JPM Attributes

JPM CR-SIM 6 2016-301:

SUMMARY OF JPM QUANTITATIVE ATTRIBUTES

CATEGORY	Minimum NRC Attributes	JPM CONTENT
Total Critical Steps	At least 2	8
Step 3 Reset Lockout Relay	Operator must reset Lockout Relay to be able to close the normal supply breaker.	
Step 5 EDG in Test	Operator must place Mode Select Switch to TEST to be able to parallel sources.	
Step 7 Volt Reg to Manual	Voltage Reg is transferred to manual to allow voltage to be adjusted.	
Step 8 Synch Switch ON	Operator must place synch switch for normal breaker to ON to defeat interlock so breaker can be closed.	
Step 10 Adjust Speed	Operator must adjust speed to obtain proper rotation.	
Step 11 Adjust Voltage	Operator must adjust voltage to limit the initial VARS	
Step 12 Close Norm Bkr	To supply power from normal supply, the breaker must be closed.	
Step 14 Open EDG Bkr	To un-parallel electrical sources, must open EDG output breaker.	
Number of JPM Steps	<30	16
Time to Perform JPM	<45 min	20 min
Normal / Faulted / Alternate Path		
Normal	Operator is told to transfer power from the 1B EDG to the normal supply.	
Setting (administered)		
Simulator		
Is LOD "1" or "5"	NO	NO

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. 4160 VAC Emergency Bus 2F is being supplied from Emergency Diesel Generator 1B.
2. The condition that caused Bus 2F to de-energize has been corrected.
3. 4160 VAC Emergency Bus 2F is ready to be transferred to its normal power supply.
4. All procedure requirements have been met for the reset of the 4160V Bus 2F LOSP Lockout Relay.
5. A Systems Operator is stationed in the Emergency Diesel Generator 1B Room.
6. Pre-Job Brief is NOT required.

INITIATING CUES:

Transfer the 4160 VAC Bus “2F” to the normal power supply.

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
CR-SIM 7 (RO Only)

Title: **Conduct a Rod Worth Minimizer (RWM) Functional Test (Failure)**		
Author: **Anthony Ball**	**Media Number:** CR-SIM 7 2016-301	**Time:** 10.0 Minutes
Line Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee (N/A for minor revisions) **N/A**		**Date:** **N/A**
Approved By (Training Program Supervisor or Lead Instructor) **Ed Jones**		**Date:** **05/30/16**

Course Number	Program Name	Media Number
N/A	OPERATIONS TRAINING	CR-SIM 7 2016-301

Ver. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
00	11/15/99	Initial development	RAB	DHG
01	11/06/00	Include objective number	RAB	DHG
02	03/19/02	Include initial operator statement	RAB	RAB
03	03/17/05	Deleted "S" from procedure numbers, changed Revision and Rev. numbers to "Current Version". Changed to Nuclear Plant Operator. Updated Simulator IC# and added "Prompt" for sequence control mode.	ARB	DHG
04	06/27/05	Revised Initial License statement for successful completion	RAB	RAB
05	06/30/05	Remove Response Cues	RAB	RAB
05.1	10/17/11	Reviewed JPM against current procedure. Added pass / fail criteria. Added Fundamental question to new Attachment 1. Corrected JPM to reflect what a Rod Group 3 and 4 rod is. Added prompt to tell student what Step a Rod Group 3 & 4 is.	MMG	ALS
05.2	05/30/16	Reviewed JPM against current procedure for use on 2016-301 NRC Exam. Changed the Media Number to CR-SIM 7 2016-301. Deleted Attachment 1 (Fundamental Question).	ARB	ELJ

Line Contributors

The following individuals contributed to the development of this lesson plan.

Ver. No.	List of Contributors
05.1	MMG

UNIT 1 ( ) UNIT 2 (X)

TASK TITLE:	**Conduct a Rod Worth Minimizer (RWM) Functional Test (Failure)**
JPM NUMBER:	**CR-SIM 7 2016-301**
TASK STANDARD:	The task shall be completed when the operator has successfully conducted the Rod Worth Minimizer Functional Test per 34GO-OPS-001.
TASK NUMBER:	001.014
OBJECTIVE NUMBER:	001.014.A

PLANT HATCH JTA IMPORTANCE RATING:

RO 3.40

SRO 2.85

K/A CATALOG NUMBER: 201006A302

K/A CATALOG JTA IMPORTANCE RATING:

RO 3.40

SRO 3.50

OPERATOR APPLICABILITY: Nuclear Plant Operator (NPO)

GENERAL REFERENCES:	**Unit 1**	**Unit 2**
	N/A	34GO-OPS-001-2, Att 5, Ver 47.1 34GO-OPS-065-0, Ver 12.6 34AB-C11-004-2, Ver 4.1 Control Rod Movement Sequence

REQUIRED MATERIALS:	**Unit 1**	**Unit 2**
	N/A	34GO-OPS-001-2, Att 5, Ver 47.1 Control Rod Movement Sequence

APPROXIMATE COMPLETION TIME: 10.0 Minutes

SIMULATOR SETUP: Refer to Simulator Setup sheet on the following page.

SIMULATOR SETUP

Simulator Initial Conditions:

1. **RESET** the Simulator to **All Rods IN** and leave in **FREEZE**.

2. **ACTIVATE** the following Event Trigger:

Trigger #	DESCRIPTION	CONDITIONS
EGC91-01	Inserts Override C91-J001 f2	loC51-RS-10-43B1.algToPanel=1
EGC91-02	Inserts Override C91-J001 f2	loC51-RS-42-11B1.algToPanel=1
EGC91-03	Inserts Override C91-J001 f2	loC51-RS-10-11B1.algToPanel=1
EGC91-04	Inserts Override C91-J001 f2	loC51-RS-42-43B1.algToPanel=1

3. **INSERT** the following **REMOTE FUNCTIONS:**

REM #	DESCRIPTION	STATUS
rfC51_190	RWM Sequence Control	ON

4. Take the Simulator **OUT OF FREEZE** and **PERFORM** the following **MANIPULATIONS:**

   A. **RESET** all annunciators.

   B. **SELECT** a Control Rod from **Step 1** and initialize the RWM by pushing the ETC button on the operator display.

   C. **VERIFY** that all RWM rod blocks are clear
   D. **VERIFY** the Rod Sequence Selector Switch is in A12 (B12).
   E. **VERIFY** RWM Sequence Control is in the ON position.

4. **PLACE** the Simulator in **FREEZE** until the crew assumes the shift.

5. **ESTIMATED** Simulator **SETUP TIME**: **10 Minutes**

EVALUATOR COPY

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. The Reactor is shutdown; the manual scram has been reset.
2. The Unit 2 Refueling Bridge has been confirmed to have power.
3. 34GO-OPS-001-2, Plant Startup, is in progress.
4. The RWM Instrument Console's keylock switch at panel 2H11-P616 is in the OPERATE position.
5. Reactor Engineering has confirmed the following:
   - Steps 1.3.1, 1.3.2 & 1.3.3 of Attachment 5 are complete
   - Rod Group 3 Step16
   - Rod Group 4 Step 34

INITIATING CUES:

Perform the Rod Worth Minimizer Functional Test using Attachment 5 of 34GO-OPS-001-2.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences. (AG-TRN-01-0685 Section 6.5.3 provides examples)

START TIME:_____

1.	Confirm RMCS/RWM ROD BLOCK OR SYS TROUBLE annunciator is clear.	At panel 2H11-P603, the operator VERIFIES that the annunciator 603-239, RMCS/RWM ROD BLOCK OR SYS TROUBLE, is extinguished.	

2.	Confirm RWM keylock switches are in OPERATE.	At panel 2H11-P603, the Operator's Display keylock switch is in OPERATE. Initial Conditions states that the keylock switch at panel 2H11-P616 is in OPERATE.	

(** Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
3.	Confirm Step 01 is displayed on RWM Operator's Display.	At panel 2H11-P603, the operator has VERIFIED that 01 is displayed on the RWM Operator's Display.	
4.	Confirm the Reactor Mode switch is in START & HOT STBY.	At panel 2H11-P603, the operator places or CONFIRMS the Reactor Mode switch is in START & HOT STBY.	
5.	Select a rod from Step 2 of the Rod Worth Minimizer Sequence and verify system response.	At panel 2H11-P603, using the CONTROL ROD SELECT matrix pushbuttons, a rod is SELECTED from Step 2 of the RWM Sequence AND At the RWM operator's display, the operator has CONFIRMED "SE" appears on the RWM Operator's Display and the Message Section confirms a Withdrawal Block exists due to a Select Error.	.

NOTE: If the operator selects any rod NOT in Step 1 of the RWM Sequence, they will still receive the same indications as a Step 2 rod.

6.	Attempt to withdraw the selected rod.	At panel 2H11-P603, the operator VERIFIES no rod motion occurred.	

PROMPT: **WHEN** the operator asks the STA/RE for a Rod Group 3 rod, **INFORM** the operator to refer to the Initial Conditions.

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
7.	Select a rod from Rod Group 3 of the Rod Worth Minimizer Sequence and verify system response.	At panel 1H11-P603, using the CONTROL ROD SELECT matrix pushbuttons, a rod is SELECTED from Group 3 Step 16 of the RWM Sequence AND At the RWM operator's display, the operator has CONFIRMED "SE" appears on the RWM Operator's Display and the Message Section confirms a Withdrawal Block exists due to a Select Error.	
8.	Attempt to withdraw the selected rod.	At panel 2H11-P603, the operator VERIFIES no rod motion occurred.	

NOTE: When the operator selects a Step 34 Group 4 rod, an **Event Trigger will ACTIVATE OVERRIDE C91_J001DI to BYPASS.**

PROMPT: **WHEN** the operator asks the STA/RE for a Rod Group 4 rod, **INFORM** the operator to refer to the Initial Conditions.

****9.**	Select a rod from Rod Group 4 of the Rod Worth Minimizer Sequence and verify system response.	At panel 2H11-P603, using the CONTROL ROD SELECT matrix pushbuttons, a rod is SELECTED from Group 4 Step 34 of the RWM Sequence AND At the RWM operator's display, the operator has CONFIRMED "SE" appears on the RWM Operator's Display and the Message Section confirms a Withdrawal Block exists due to a Select Error.	
****10.**	Attempt to withdraw the selected rod.	At panel 2H11-P603, the operator RECOGNIZES that the control rod moved.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**11.	Insert the control rod and notify the SS that the RWM failed its operability check.	At panel 2H11-P603, the operator INSERTS the control rod to the full in position; AND, Notifies the SS that the RWM has failed its operability check.	

PROMPT: **IF** addressed by the operator, **INFORM** the operator that the STA has confirmed the RWM Scram Buffers are clear and ready to accept data.

END TIME:_____

NOTE: The terminating cue shall be given to the operator when any of the following conditions are met:

- Operator completes step 11 of this JPM.
- With NO reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: Another operator will continue from here.

(Indicates critical step)**

Summary of JPM Attributes

JPM CR-SIM 2 2016-301:

SUMMARY OF JPM QUANTITATIVE ATTRIBUTES

CATEGORY	Minimum NRC Attributes	JPM CONTENT
Total Critical Steps	At least 2	3
Step 9 Selects Group 4 rod	Proper rod to confirm RWM operation.	
Step 10 Attempts to move Gr 4	Recognizes rod moved.	
Step 11 Inserts Gr. 4 rod/notifies SS	Proper procedure response for failed RWM.	
Number of JPM Steps	<30	25
Time to Perform JPM	<45 min	10 min
Normal / Faulted / Alternate Path		
Alternate Path	RWM has failed the operability test by allowing a control rod to be moved when it should not have.	
Setting (administered)		
Simulator		
Is LOD "1" or "5"	NO	NO

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. The Reactor is shutdown; the manual scram has been reset.
2. The Unit 2 Refueling Bridge has been confirmed to have power.
3. 34GO-OPS-001-2, Plant Startup, is in progress.
4. The RWM Instrument Console's keylock switch at panel 2H11-P616 is in the OPERATE position.
5. Reactor Engineering has confirmed the following:
   - Steps 1.3.1, 1.3.2 & 1.3.3 of Attachment 5 are complete
   - Rod Group 3 Step16
   - Rod Group 4 Step 34

INITIATING CUES:

Perform the Rod Worth Minimizer Functional Test using Attachment 5 of 34GO-OPS-001-2.

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
CR-SIM 8 (ALL)

Title: **Perform 34IT-T45-001-2, Reactor Building Instrument Sumps Isolation Valve Exercise**		
Author: **Richard A. Greenhouse**	**Media Number:** CR-SIM 8 2016-301	**Time:** 15 Minutes
Line Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee (N/A for minor revisions) **N/A**		**Date:** **N/A**
Approved By (Training Program Supervisor or Lead Instructor) **Ed Jones**		**Date:** **05/30/16**

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Course Number	Program Name	Media Number
N/A	OPERATIONS TRAINING	CR-SIM 8 2016-301

Ver. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
00	05/30/16	Initial development for use on 2016-301 NRC Exam.	RAG	ELJ

Line Contributors

The following individuals contributed to the development of this lesson plan.

Ver. No.	List of Contributors

UNIT 1 () UNIT 2 (X)

TASK TITLE:	**Perform 34IT-T45-001-2, Reactor Building Instrument Sumps Isolation Valve Exercise**
JPM NUMBER:	CR-SIM 8 2016-301
TASK STANDARD:	This task shall be successfully completed when all of the JPM Critical Steps corresponding to 34IT-T45-001-2, Sections 7.2, 7.3 and 7.4, have been correctly performed to complete the Instrument Sump Isolation Valve exercise.

K/A CATALOG NUMBER: 268000K1.04

K/A CATALOG JTA IMPORTANCE RATING:

RO 2.7

SRO 2.9

OPERATOR APPLICABILITY: Nuclear Plant Operator (NPO)

GENERAL REFERENCES:	**Unit 1**	**Unit 2**
	NA	34IT-T45-001-2, Ver 0.9

REQUIRED MATERIALS:	**Unit 1**	**Unit 2**
	NA	34IT-T45-001-2, Ver 0.9

APPROXIMATE COMPLETION TIME: 15 Minutes

SIMULATOR SETUP: Refer to Simulator Setup sheet on the following page.

SIMULATOR SETUP

Simulator Initial Conditions:

1. **RESET** the Simulator to **IC for 100% RTP** and leave in **FREEZE**.
2. Take the Simulator **OUT OF FREEZE** and **PERFORM** the following **MANIPULATIONS:**

   A. None

3. **PLACE** the Simulator in **FREEZE** until the INITIATING CUE is given.
4. **ESTIMATED** Simulator **SETUP TIME**: **5 Minutes**

EVALUATOR COPY

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Unit 2 is operating at 100% RTP.
2. 34IT-T45-001-2, Reactor Building Instrument Sumps Isolation Valve Exercise, is in progress. Section 7.1 of 34IT-T45-001-2 is complete.
3. A designated operator is stationed as required to support valve manipulations.

INITIATING CUES:

Perform 34IT-T45-001-2, Reactor Building Instrument Sumps Isolation Valve Exercise, sections 7.2, 7.3 and 7.4.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences.

START TIME:_____

NOTE To Evaluator: Perform the turn-over for this JPM prior to entering the simulator when possible (i.e allow the student to review the procedure in the Virtual Simulator or Simulator Assessment Room, etc.) Doing this will minimize the time the simulator is not being actively used.

PROMPT: **WHEN** the operator addresses obtaining permission from the Shift Supervisor, **INFORM** the operator that permission has been granted.

1.	Confirm the Sump Isol switch for 2T45-F005, 2T45-F003, and 2T45-F001 is in CLOSED, panel 2H11-P654. (Step 7.2.1)	At panel 2H11-P654, the operator confirms the control switch for 2T45-F005, 2T45-F003 and 2T45-F001 is in the CLOSE position.	

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
2.	Confirm the following valves are CLOSED: • 2T45-F005, RHR N-E Inbd Sump Isol • 2T45-F003, Torus N-E & S-E Inbd Sump Isol • 2T45-F001, HPCI Sump Isol (Step 7.2.2)	At panel 2H11-P654, the operator confirms the following: 2T45-F005 is CLOSED, green light illuminated. 2T45-F003 is CLOSED, green light illuminated. 2T45-F001 is CLOSED, green light illuminated.	
****3.**	Place the Sump Isol switch for 2T45-F005, 2T45-F003, and 2T45-F001, in AUTO: • 2T45-F005 • 2T45-F003 • 2T54-F001 (Step 7.2.3)	At panel 2H11-P654, the operator places the control switch for 2T45-F005, 2T45-F003 and 2T45-F001 in the AUTO position.	
4.	Confirm the following valves OPEN: • 2T45-F005 • 2T45-F003 • 2T45-F001 (Step 7.2.4)	At panel 2H11-P654, the operator confirms the following: 2T45-F005 is OPEN, red light illuminated. 2T45-F003 is OPEN, red light illuminated. 2T45-F001 is OPEN, red light illuminated.	
****5.**	Place the Sump Isol switch for 2T45-F005, 2T45-F003, and 2T45-F001 in CLOSE: • 2T45-F005, RHR N-E Inbd Sump Isol • 2T45-F003, Torus N-E & S-E Inbd Sump Isol • 2T45-F001, HPCI Sump Isol (Step 7.2.5)	At panel 2H11-P654, the operator places the control switch for 2T45-F005, 2T45-F003 and 2T45-F001 in the CLOSE position.	

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
6.	Confirm the following valves CLOSE: • 2T45-F005, RHR N-E Inbd Sump Isol • 2T45-F003, Torus N-E & S-E Inbd Sump Isol • 2T45-F001, HPCI Sump Isol (Step 7.2.6)	At panel 2H11-P654, the operator confirms the following: 2T45-F005 is CLOSED, green light illuminated. 2T45-F003 is CLOSED, green light illuminated. 2T45-F001 is CLOSED, green light illuminated.	
7.	Confirm the Sump Isol switch for 2T45-F007 and 2T45-F006 is in CLOSED, panel 2H11-P654. (Step 7.3.1)	At panel 2H11-P654, the operator confirms the control switch for 2T45-F007 and 2T45-F006 is in the CLOSE position.	
8.	Confirm the following valves are CLOSED: • 2T45-F007, Torus N-W & S-W Inbd Sump Isol • 2T45-F006, RCIC Sump Isol (Step 7.3.2)	At panel 2H11-P654, the operator confirms the following: 2T45-F007 is CLOSED, green light illuminated. 2T45-F006 is CLOSED, green light illuminated.	
****9.**	Place the Sump Isol switch for 2T45-F007 and 2T45-F006 in AUTO: • 2T45-F007 • 2T45-F006 (Step 7.3.3)	At panel 2H11-P654, the operator places the control switch for 2T45-F007 and 2T45-F006 in the AUTO position.	
10.	Confirm the following valves OPEN: • 2T45-F007 • 2T45-F006 (Step 7.3.4)	At panel 2H11-P654, the operator confirms the following: 2T45-F007 is OPEN, red light illuminated. 2T45-F006 is OPEN, red light illuminated.	
****11.**	Place the Sump Isol switch for 2T45-F007 and 2T45-F006 in CLOSE: • 2T45-F007, Torus N-W & S-W Inbd Sump Isol • 2T45-F006, RCIC Sump Isol (Step 7.3.5)	At panel 2H11-P654, the operator places the control switch for 2T45-F007 and 2T45-F006 in the CLOSE position.	

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
12.	Confirm the following valves CLOSE: • 2T45-F007, Torus N-W & S-W Inbd Sump Isol • 2T45-F006, RCIC Sump Isol (Step 7.3.6)	At panel 2H11-P654, the operator confirms the following: 2T45-F007 is CLOSED, green light illuminated. 2T45-F006 is CLOSED, green light illuminated.	
13.	Confirm the Sump Isol switch for 2T45-F004 and 2T45-F002 is in CLOSED, panel 2H11-P654. (Step 7.4.1)	At panel 2H11-P654, the operator observes the control switch for 2T45-F004 and 2T45-F002 is in the CLOSE position.	
14.	Confirm the following valves are CLOSED: • 2T45-F004, RHR N-E Outbd Sump Isol • 2T45-F002, Torus N-E & S-E Outbd Sump Isol (Step 7.4.2)	At panel 2H11-P654, the operator confirms the following: 2T45-F004 is CLOSED, green light illuminated. 2T45-F002 is CLOSED, green light illuminated.	
****15.**	Place the Sump Isol switch for 2T45-F004 and 2T45-F002 in AUTO: • 2T45-F004 • 2T45-F002 (Step 7.4.3)	At panel 2H11-P654, the operator places the control switch for 2T45-F004 and 2T45-F002 in the AUTO position.	
16.	Confirm the following valves OPEN: • 2T45-F004 • 2T45-F002 (Step 7.4.4)	At panel 2H11-P654, the operator confirms the following: 2T45-F004 is OPEN, red light illuminated. 2T45-F002 is OPEN, red light illuminated.	
****17.**	Place the Sump Isol switch for 2T45-F004 and 2T45-F002 in CLOSE: • 2T45-F004, RHR N-E Outbd Sump Isol • 2T45-F002, Torus N-E & S-E Sump Isol (Step 7.4.5)	At panel 2H11-P654, the operator places the control switch for 2T45-F004 and 2T45-F002 in the CLOSE position.	

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
18.	Confirm the following valves CLOSE: • 2T45-F004, RHR N-E Outbd Sump Isol • 2T45-F002, Torus N-E & S-E Sump Isol (Step 7.4.6)	At panel 2H11-P654, the operator confirms the following: 2T45-F004 is CLOSED, green light illuminated. 2T45-F002 is CLOSED, green light illuminated.	

PROMPT: **ONCE** the operator has completed Step 7.4.6, **INFORM** the operator that another operator will complete the restoration section of the procedure.

END TIME:_____

NOTE: The terminating cue shall be given to the operator when any of the following conditions are met:

- Operator completes step 18 of this JPM.
- With NO reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: We will stop here.

Summary of JPM Attributes

JPM CR-SIM 8 2016-301:

SUMMARY OF JPM QUANTITATIVE ATTRIBUTES

CATEGORY	Minimum NRC Attributes	JPM CONTENT
Total Critical Steps	At least 2	6
Step 3	Place the switch for 2T45-F005, F003 and F001 in AUTO	Confirm operability of isolation valves in the OPEN position
Step 5	Place the switch for 2T45-F005, F003 and F001 in CLOSE	Confirm operability of isolation valves in the CLOSE position
Step 9	Place the switch for 2T45-F006 and F007 in AUTO	Confirm operability of isolation valves in the OPEN position
Step 11	Place the switch for 2T45-F006 and F007 in CLOSE	Confirm operability of isolation valves in the CLOSE position
Step 15	Place the switch for 2T45-F002 and F004 in AUTO	Confirm operability of isolation valves in the OPEN position
Step 17	Place the switch for 2T45-F002 and F004 in CLOSE	Confirm operability of isolation valves in the CLOSE position
Number of JPM Steps	<30	18
Time to Perform JPM	<45 min	15 min
Normal / Faulted / Alternate Path		
Normal	Complete sections 7.2, 7.3 and 7.4 of 34IT-T45-001-2.	
Setting (administered)		
Simulator		
Is LOD "1" or "5"	NO	NO

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Unit 2 is operating at 100% RTP
2. 34IT-T45-001-2, Reactor Building Instrument Sumps Isolation Valve Exercise, is in progress. Section 7.1 of 34IT-T45-001-2 is complete.

INITIATING CUES:

Perform 34IT-T45-001-2, Reactor Building Instrument Sumps Isolation Valve Exercise, sections 7.2, 7.3 and 7.4.

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
PLANT 1 (ALL)

Title: **From Outside the MCR, Insert a Manual Reactor Scram (Alternate Path)**		
Author: **Anthony Ball**	**Media Number:** PLANT 1 2016-301	**Time:** 14 Minutes
Line Technical Review By (N/A for minor revisions) **N/A**		**Date:**
Reviewed by Instructional Technologist or designee: **N/A**		**Date:**
Approved By (Training Program Supervisor, Lead Instructor or Line Supervisor) **Ed Jones**		**Date:** **05/30/16**

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Course Number	Program Name	Media Number
N/A	OPERATIONS TRAINING	PLANT 1 2016-301

Rev. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
0.0	08/06/15	Initial development. A manual scram by opening RPS breakers will not work forcing the Operator to use the SDV Level Switches in the Reactor Building. Added "Summary of JPM Attributes" and changed wording to match procedure including procedure step numbers.	MMG	ALS
0.1	05/30/16	Reviewed JPM against current procedure for use on 2016-301 NRC Exam. Changed Media number to PLANT 1 2016-301 and will be returned to LR-JP-01018A after 2016-301 NRC Exam.	ARB	ELJ

Line Contributors

The following individuals contributed to the development of this lesson plan.

Rev. No.	List of Contributors

UNIT 1 (X) UNIT 2 (X)

TASK TITLE:	**From Outside the MCR, Insert a Manual Reactor Scram (Alternate Path)**
JPM NUMBER:	PLANT 1 2016-301
TASK STANDARD:	The task shall be completed when the operator has successfully inserted a reactor scram using the SDV Level Switches per 31RS-OPS-001 by tripping magnetrol switches 1C11-N013A & B OR 1C11-N013C & D.

TASK NUMBER: 010.018

OBJECTIVE NUMBER: 010.018.A

PLANT HATCH JTA IMPORTANCE RATING:

RO 4.20

SRO 4.67

K/A CATALOG NUMBER: 201001A221

K/A CATALOG JTA IMPORTANCE RATING:

RO 3.6

SRO 3.9

OPERATOR APPLICABILITY: Nuclear Plant Operator (NPO)

GENERAL REFERENCES:	**Unit 1**	**Unit 2**
	31RS-OPS-001-1, Ver 5.24	31RS-OPS-001-2, Ver 6.23

REQUIRED MATERIALS:	**Unit 1**	**Unit 2**
	31RS-OPS-001-1, Ver 5.24	31RS-OPS-001-2, Ver 6.23

APPROXIMATE COMPLETION TIME: 14 Minutes

SIMULATOR SETUP: N/A

EVALUATOR COPY

UNIT 1

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. A condition has occurred which required the Control Room to be evacuated.
2. The Reactor is NOT shutdown.
3. 31RS-OPS-001-1, Shutdown From Outside the Control Room, is in progress.
4. Pre-Job Brief is NOT required.

INITIATING CUES:

Insert a Manual Scram by de-energizing RPS per 31RS-OPS-001-1.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences.

START TIME:_____

1.	Operator identifies the procedure needed to perform the task.	The Operator has IDENTIFIED the correct procedure as 31RS-OPS-001-1, step 4.4.	
2.	De-energize RPS. OPEN the following breakers at RPS distribution panel 1C71-P001: • 1C71-CB3A • ********** (Step 4.4.1.1)	At panel 1C71-P001, the Operator OPENS breaker 1C71-CB3A.	
3.	De-energize RPS. OPEN the following breakers at RPS distribution panel 1C71-P001: • ********** • 1C71-CB3B (Step 4.4.1.1)	At panel 1C71-P001, the Operator ATTEMPTS to open breaker 1C71-CB3B. The Operator RECOGNIZES that the breaker will not reposition.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

PROMPT: **WHEN** the Operator attempts to open breaker 1C71-CB3B, **INFORM** the Operator that the breaker did NOT reposition and can not be moved.

PROMPT: **IF** the Operator requests direction from the Shift Supervisor, **INFORM** the Operator to Insert a Manual Scram per 31RS-OPS-001-1.

NOTE: The Operator may elect to reclose breaker 1C71-CB3A prior to addressing the SDV Level Switches.

ALTERNATE PATH STARTS HERE
(Step 4)

NOTE: The critical steps will be either steps 4, 5, 8, and 9 OR steps 6, 7, 10, and 11. Both switches on one side of the Reactor Building will insert a Full Reactor Scram. To receive credit, the Operator ONLY has to trip both magnetrol switches on one side of the Reactor Building.

**4.	Scram Discharge Volume Level Switches. At the Scram Discharge Volume, remove the covers to one of the following sets of level switches: 1C11-N013A and ********* OR ********** (Step 4.4.2.1)	At location 139RER11, the Operator REMOVES the cover from magnetrol switch 1C11-N013A.	
**5.	Scram Discharge Volume Level Switches. At the Scram Discharge Volume, remove the covers to one of the following sets of level switches: ********** and 1C11-N013B, OR ********** (Step 4.4.2.1)	At location 139RER11, the Operator REMOVES the cover from magnetrol switch 1C11-N013B.	

NOTE: The Operator may remove the covers for 1C11-N013A and B, then trip their magnetrol switches and replace their covers. The Operator may stop there or proceed to performing the same actions for 1C11-N013C and D.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**6.	Scram Discharge Volume Level Switches. At the Scram Discharge Volume, remove the covers to one of the following sets of level switches: ********** OR 1C11-N013C and ********** (Step 4.4.2.1)	At location 139RER03, the Operator REMOVES the cover from magnetrol switch 1C11-N013C.	
**7.	Scram Discharge Volume Level Switches. At the Scram Discharge Volume, remove the covers to one of the following sets of level switches: ********** OR ********** and 1C11-N013D (Step 4.4.2.1)	At location 139RER03, the Operator REMOVES the cover from magnetrol switch 1C11-N013D.	
**8.	Trip magnetrol switches for the switches with removed covers: 1C11-N013A and **********, OR ********** (Step 4.4.2.2)	At location 139RER11, the Operator TRIPS magnetrol switch 1C11-N013A.	
**9.	Trip magnetrol switches for the switches with removed covers: ********** and 1C11-N013B, OR ********** (Step 4.4.2.2)	At location 139RER11, the Operator TRIPS magnetrol switche 1C11-N013B.	
**10.	Trip magnetrol switches for the switches with removed covers: **********, OR 1C11-N013C and ********** (Step 4.4.2.2)	At location 139RER03, the Operator TRIPS magnetrol switche 1C11-N013C.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**11.	Trip magnetrol switches for the switches with removed covers: **********, OR ********** AND 1C11-N013D (Step 4.4.2.2)	At location 139RER03, the Operator TRIPS magnetrol switche 1C11-N013D.	
12.	Replace the covers to the magnetrol switches. (Step 4.4.2.3)	Operator REPLACES all removed magnetrol switch covers.	

END TIME:_____

NOTE: The terminating cue shall be given to the operator when any of the following conditions are met:

- Operator completes step 12 of this JPM.
- With no reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: Another operator will continue from here.

(Indicates critical step)**

EVALUATOR COPY

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. A condition has occurred which required the Control Room to be evacuated.
2. The Reactor is NOT shutdown.
3. 31RS-OPS-001-2, Shutdown From Outside the Control Room, is in progress.
4. Pre-Job Brief is NOT required.

INITIATING CUES:

Insert a Manual Scram by de-energizing RPS per 31RS-OPS-001-2.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences.

Start Time:_____

1.	Operator identifies the procedure needed to perform the task.	Operator has IDENTIFIED the correct procedure as 31RS-OPS-001-2 step 4.4	
2.	De-energize RPS. OPEN the following breakers at RPS distribution panel 2C71-P001, at 130TGT12. • 2C71-CB3A • ********** (Step 4.4.1.1)	At panel 2C71-P001, the Operator OPENS breaker 2C71-CB3A.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
3.	De-energize RPS. OPEN the following breakers at RPS distribution panel 2C71-P001, at 130TGT12. • ********** • 2C71-CB3B (Step 4.4.1.1)	At panel 2C71-P001, the Operator ATTEMPTS to open breaker 2C71-CB3B. The Operator RECOGNIZES that the breaker will not reposition.	

PROMPT: **WHEN** the Operator attempts to open breaker 2C71-CB3B, **INFORM** the Operator that the breaker did NOT reposition and can not be moved.

PROMPT: **IF** the Operator requests direction from the Shift Supervisor, **INFORM** the Operator to Insert a Manual Scram per 31RS-OPS-001-2.

NOTE: The Operator may elect to reclose breaker 2C71-CB3A prior to addressing the SDV Level Switches.

ALTERNATE PATH STARTS HERE
(Step 4)

NOTE: **The critical steps will be either steps 4, 5, 8, and 9 OR steps 6, 7, 10, and 11**. Both switches on one side of the Reactor Building will insert a Full Reactor Scram. To receive credit, the Operator ONLY has to trip both magnetrol switches on one side of the Reactor Building.

****4.**	Scram Discharge Volume Level Switches. Remove the covers to 2C11-N013A & **********, Magnetrol Switches, at 130RBR15 ********** (Step 4.4.2.1)	At location 130RBR15, the Operator REMOVES the cover from magnetrol switch 2C11-N013A.	
****5.**	Scram Discharge Volume Level Switches. Remove the covers to ********* & 2C11-N013B, Magnetrol Switches, at 130RBR15 ********** (Step 4.4.2.1)	At location 130RBR15, the Operator REMOVES the cover from magnetrol switch 2C11-N013B.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

NOTE: The Operator may remove the covers for 2C11-N013A and B, then trip their magnetrol switches and replace their covers. The Operator may stop there or proceed to performing the same actions for 2C11-N013C and D.

****6.**	Scram Discharge Volume Level Switches. Remove the covers ********** ********** ******* OR 2C11-N013C & **********, Magnetrol Switches, at 130RBR23. (Step 4.4.2.1)	At location 130RBR23, the Operator REMOVES the cover from magnetrol switch 2C11-N013C.	
****7.**	Scram Discharge Volume Level Switches. Remove the covers ********** ********** ******* OR ********** & 2C11-N013D, Magnetrol Switches, at 130RBR23. (Step 4.4.2.1)	At location 130RBR23, the Operator REMOVES the cover from magnetrol switch 2C11-N013D.	

****8.**	Trip the magnetrol switches. (Step 4.4.2.2)	At location 130RBR15, the Operator TRIPS magnetrol switche 2C11-N013A.	
****9.**	Trip the magnetrol switches. (Step 4.4.2.2)	At location 130RBR15, the Operator TRIPS magnetrol switche 2C11-N013B.	
****10.**	Trip the magnetrol switches. (Step 4.4.2.2)	At location 130RBR23, the Operator TRIPS magnetrol switche 2C11-N013C.	
****11.**	Trip the magnetrol switches. (Step 4.4.2.2)	At location 130RBR23, the Operator TRIPS magnetrol switche 2C11-N013D.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
12.	Replace the covers to the magnetrol switches. (Step 4.4.2.3)	Operator REPLACES all removed magnetrol switch covers.	

END TIME:_____

NOTE: The terminating cue shall be given to the operator when any of the following conditions are met:

- Operator completes step 12 of this JPM.
- With NO reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

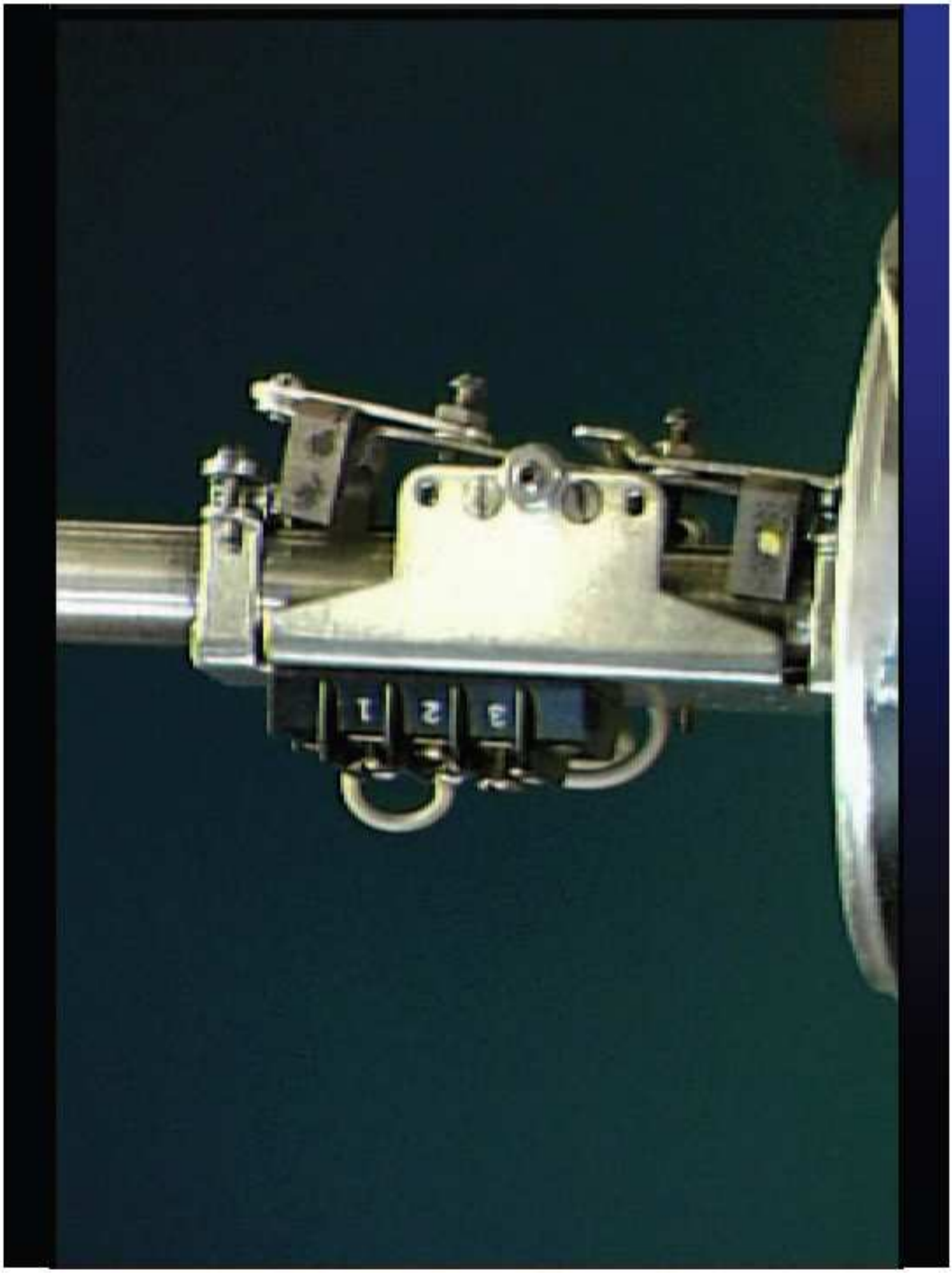
TERMINATING CUE: Another operator will continue from here.

(Indicates critical step)**


LINE
037
CB1
C718—
CB1
LOAD
CB2A
CB3A
810
810
CB4A
CB5A
CB6A
15


832
ON
OFF
CB6B
832
ON
OFF
CB5B
832
ON
OFF
CB4B
019
ON
OFF
CB3B
ON
OFF
CB2B


MAGNETROL
INDUSTRIAL
EQUIPMENT
CAT. NO.
MIN SP GR
RESISTIVE
AMPS
VOLTS


1
2
3

Summary of JPM Attributes

JPM PLANT 1 2016-301:

SUMMARY OF JPM QUANTITATIVE ATTRIBUTES

CATEGORY	Minimum NRC Attributes	JPM CONTENT
Total Critical Steps	At least 2	4
Step 4/6 Remove SDV Level Switch Cover		Operator removes 1/2C11-N013A(C) magnetrol switch cover to gain access to switch.
Step 5/7 Remove SDV Level Switch Cover		Operator removes 1/2C11-N013B(D) magnetrol switch cover to gain access to switch.
Step 8/10 Trip SDV Level Switch		Operator Trips 1/2C11-N013A(C) magnetrol switch to de-energize RPS A.
Step 9/11 Trip SDV Level Switch		Operator Trips 1/2C11-N013B(D) magnetrol switch to de-energize RPS B.
Number of JPM Steps	<30	12
Time to Perform JPM	<45 min	14 min
Normal / Faulted / Alternate Path		
Alternate Path	When the Operator attempts to insert a Reactor Scram by de-energizing RPS, one of the breakers will not open. The Operator must decide to continue with the procedure and insert a Reactor Scram with the SDV Level Switches in the Reactor Building.	
Setting (administered)		
Plant		
Is LOD "1" or "5"	NO	NO

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. A condition has occurred which required the Control Room to be evacuated.
2. The Reactor is NOT shutdown.
3. 31RS-OPS-001-2, Shutdown From Outside the Control Room, is in progress.
4. Pre-Job Brief is NOT required.

INITIATING CUES:

Insert a Manual Scram by de-energizing RPS per 31RS-OPS-001-2.

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
PLANT 2 (RO & SRO-I)

Title: **From the Remote Shutdown Panel, Start RHR and Inject into the Reactor**		
Author: **Richard A. Greenhouse**	**Media Number:** PLANT 2 2016-301	**Time** 13 Minutes
Line Technical Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee: **N/A**		**Date** **N/A**
Approved By (Training Program Supervisor, Lead Instructor or Line Supervisor) **Ed Jones**		**Date:** **05/30/16**

Course Number	Program Name	Media Number
N/A	OPERATIONS TRAINING	PLANT 2 2016-301

Ver. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
11	02/04/00	Format modification, modify title, upgrade to the new simulator operating system	RAB	DHG
12	10/31/00	Include objective number	RAB	DHG
13	02/26/02	Include initial operaotr statement	RAB	RAB
14	03/17/05	Deleted "S" from procedure numbers, changed Revision and Rev. numbers to "Current Version," changed "Reactor Operator" to "Nuclear Plant Operator," and changed IC #104 for Simulator Setup.	BEB	DHG
15	05/31/05	Revised Initial License statement for successful completion	RAB	RAB
16	04/06/06	Remove Response Cues	RAB	RAB
17	09/21/09	Added HU steps.	CLN	ALD
17.1	8/11/11	Reviewed JPM against current procedure. Added pass / fail criteria. Added to ensure Reactor pressure is < 200 psig and RWL is -120" in the simulator setup. Added "Confirms Reactor pressure is less than 449 (500) psig" prior to opening injection valves.	MMG	DNM
17.2	5/30/16	Reviewed JPM against current procedure. Changed media number to PLANT 2 2016-301. Removed U1 material and will be replaced once NRC exam is complete.	RAG	ELJ

Line Contributors

The following individuals contributed to the development of this lesson plan.

Ver. No.	List of Contributors

UNIT 1 ( ) UNIT 2 (X)

TASK TITLE:	**From the Remote Shutdown Panel, Start RHR and Inject into the Reactor**
JPM NUMBER:	PLANT 2 2016-301
TASK STANDARD:	The task shall be completed when the operator has successfully started RHR Loop B in the LPCI mode and injected into the Reactor from the Remote Shutdown Panel per 31RS-OPS-001.
TASK NUMBER:	007.019
OBJECTIVE NUMBER:	007.019.O

PLANT HATCH JTA IMPORTANCE RATING:

RO 4.20

SRO 3.60

K/A CATALOG NUMBER: 203000A1.01

K/A CATALOG JTA IMPORTANCE RATING:

RO 4.20

SRO 4.30

OPERATOR APPLICABILITY: Nuclear Plant Operator (NPO)

GENERAL REFERENCES:	**Unit 1**	**Unit 2**
	N/A	31RS-OPS-001-2, Ver. 6.24

REQUIRED MATERIALS:	**Unit 1**	**Unit 2**
	N/A	31RS-OPS-001-2, Ver. 6.24

Key for Remote Shutdown Panel (if performed in plant)

APPROXIMATE COMPLETION TIME: 13.0 Minutes

SIMULATOR SETUP: REFER TO SIMULATOR SETUP SHEET ON THE FOLLOWING PAGE

EVALUATOR COPY

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. An event has occurred which resulted in the evacuation of the Control Room.
2. Normal power supplies are available.
3. A failure of the RHR LOCA logic has occurred.
4. RHR Loop B is in Standby.
5. RWL is -120 inches.
6. RPV Pressure is <200 psig.
7. 31RS-OPS-001-2 is in progress.
8. All RHRSW Pumps are tripped
9. Both Recirc Pumps are tripped

INITIATING CUES:

From the Remote Shutdown Panel, place LPCI in operation using RHR Loop B in accordance with 31RS-OPS-001-2, Attachment 5.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences. (AG-TRN-01-0685 Section 6.5.3 provides examples)

Start Time:_____

1.	Operator identifies the procedure needed to perform the task.	The Operator has IDENTIFIED the correct procedure as 31RS-OPS-001-2, Attachment 5.	

NOTE: **Indicates Transfer Switches that MUST be positioned to satisfactorily complete the critical step.

2.	Place the following Transfer Switches in EMERG position: 2C82-S53 Step1.0	At Panel 2C82-P001, the Operator has placed 2C82-S53 Transfer Switch in the EMERG position.	
3.	Place the following Transfer Switches in EMERG position: 2C82-S52 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S52 Transfer Switch in the EMERG position.	
4.	Place the following Transfer Switches in EMERG position: 2C82-S5 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S5 Transfer Switch in the EMERG position.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
5.	Place the following Transfer Switches in EMERG position: 2C82-S18 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S18 Transfer Switch in the EMERG position.	
6.	Place the following Transfer Switches in EMERG position: 2C82-S8 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S8 Transfer Switch in the EMERG position.	
****7.**	Place the following Transfer Switch in EMERG position: 2C82-S80 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S80 Transfer Switch in the EMERG position.	
****8.**	Place the following Transfer Switch in EMERG position: 2C82-S9 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S9 Transfer Switch in the EMERG position.	
****9.**	Place the following Transfer Switch in EMERG position: 2C82-S13 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S13 Transfer Switch in the EMERG position.	
10.	Place the following Transfer Switches in EMERG position: 2C82-S10 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S10 Transfer Switch in the EMERG position.	
11.	Place the following Transfer Switches in EMERG position: 2C82-S1 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S1 Transfer Switch in the EMERG position.	
12.	Place the following Transfer Switches in EMERG position: 2C82-S12 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S12 Transfer Switch in the EMERG position.	
13.	Place the following Transfer Switches in EMERG position: 2C82-S17 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S17 Transfer Switch in the EMERG position.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
14.	Place the following Transfer Switches in EMERG position: 2C82-S14 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S14 Transfer Switch in the EMERG position.	
15.	Place the following Transfer Switches in EMERG position: 2C82-S11 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S11 Transfer Switch in the EMERG position.	
****16.**	Place the following Transfer Switches in EMERG position: 2C82-S16 Step 1.0	At Panel 2C82-P001, the Operator has placed 2C82-S16 Transfer Switch in the EMERG position.	
17.	Confirm Minimum Flow Bypass Valve, 2E11-F007B is open. Step 4.0	At panel 2C82-P001 the operator VERIFIES that the MIN FLOW BYP VLV, 2E11-F007B, is OPEN, red light is illuminated.	
****18.**	Start RHR Pump 2E11-C002B. Step 5.0	At panel 2C82-P001, RHR PUMP, 2E11-C002B, is RUNNING, red light illuminated.	

PROMPT: **WHEN** the operator addresses starting RHR Pump "2D," **INFORM** the operator a System Operator has started it locally.

19.	Confirm or open Heat Exchanger Shell Side Bypass Valve, 2E11-F048B. Step 7.0	At panel 2C82-P001, BYPASS VLV, 2E11-F048B, is OPEN, red light illuminated.	
20.	Confirm or close the following valve: 2E11-F028B Step 8.0	At panel 2C82-P001, the Operator has confirmed 2E11-F028B is CLOSED, green light illuminated.	
****21.**	Confirm or close the following valve: 2B31-F023B Step 8.0	At panel 2C82-P001, the Operator has CLOSED 2EB31-F023B, green light illuminated.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
22.	Confirm or close the following valve: 2E11-F011B Step 8.0	At panel 2C82-P001, the Operator has confirmed 2E11-F011B is CLOSED, green light illuminated.	
23.	Confirm or close the following valve: 2E11-F016B Step 8.0	At panel 2C82-P001, the Operator has confirmed 2E11-F016B is CLOSED, green light illuminated.	
24.	Confirm or close the following valve: 2E11-F006A Step 8.0	At panel 2C82-P001, the Operator has confirmed 2E11-F006A is CLOSED, green light illuminated.	
25.	Confirm or close the following valve: 2E11-F006B Step 8.0	At panel 2C82-P001, the Operator has confirmed 2E11-F006B is CLOSED, green light illuminated.	
26.	Confirm or close the following valve: 2E11-F006C Step 8.0	At panel 2C82-P001, the Operator has confirmed 2E11-F006C is CLOSED, green light illuminated.	
27.	Confirm or close the following valve: 2E11-F006D Step 8.0	At panel 2C82-P001, the Operator has confirmed 2E11-F006D is CLOSED, green light illuminated.	
28.	Confirm or close the following valve: 2E11-F073B Step 8.0	At panel 2C82-P001, the Operator has confirmed 2E11-F073B is CLOSED, green light illuminated.	
29.	Confirms Reactor pressure is less than 500 psig Step 9.0	Confirms Reactor pressure is less than 500 psig	

PROMPT: **IF** addressed, **INFORM** the operator Reactor pressure is less than 500 psig.

****30.**	Open the RHR Inboard Injection Valve, 2E11-F015B. Step 9.0	At panel 2C82-P001, RHR INBD INJ VLV, 2E11-F015B, OPEN, red light illuminated.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
31.	Confirm or open the RHR Outboard Injection Valve, 2E11-F017B. Step 9.0	At panel 2C82-P001 operator VERIFIES RHR OUTBD INJ VLV, 2E11-F017B, is OPEN, red light illuminated.	

PROMPT: Another operator will continue from here.

END TIME:_____

NOTE: The terminating cue shall be given to the operator when:

- Operator completes step 31 of this JPM.
- With no reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: We will stop here.

Summary of JPM Attributes

JPM PLANT 2 2016-301**:**

SUMMARY OF JPM QUANTITATIVE ATTRIBUTES

CATEGORY	Minimum NRC Attributes	JPM CONTENT
Total Critical Steps	At least 2	6
Step 7 PLACES switch 2C82-S80 to EMERG		Allows control of 2E11-F007B.
Step 8 PLACES switch 2C82-S9 to EMERG		Allows control of 2E11-C002B.
Step 9 PLACES switch 2C82-S13 to EMERG		Allows control of 2E11-F017B, F015B & C001B.
Step 16 PLACES switch 2C82-S16to EMERG		Allows control of 2B31-F023B.
Step 18 STARTS RHR pump 2B		Required to initiate LPCI injection.
Step 30 OPENS 2E11-F015B		Required to initiate LPCI injection.
Number of JPM Steps	<30	31
Time to Perform JPM	<45 min	13 min
Normal / Faulted / Alternate Path		
Normal		
Setting (administered)		
Plant or Simulator		
Is LOD “1” or “5”	NO	NO

UNIT 2

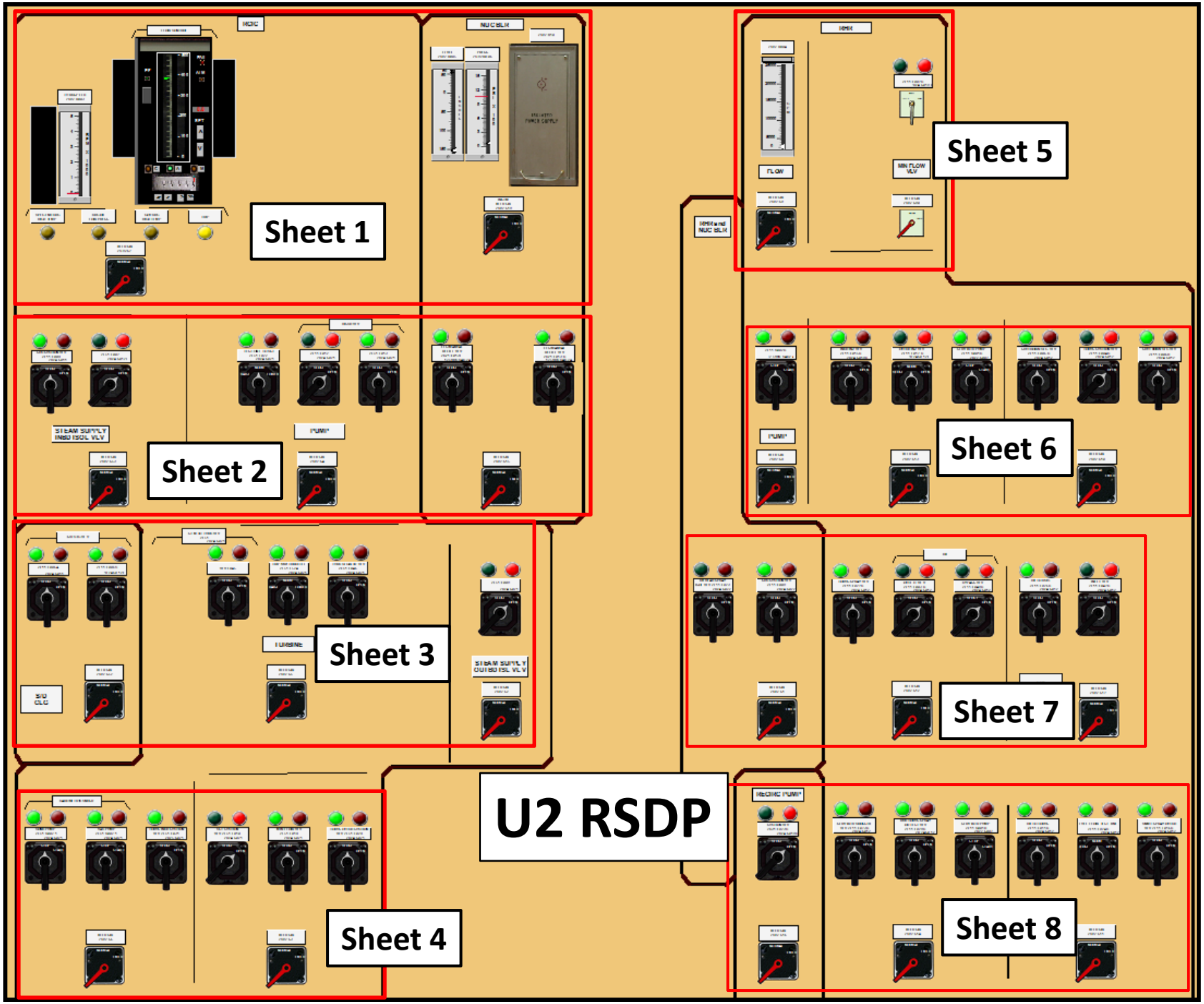
READ TO THE OPERATOR

INITIAL CONDITIONS:

1. An event has occurred which resulted in the evacuation of the Control Room.
2. Normal power supplies are available.
3. A failure of the RHR LOCA logic has occurred.
4. RHR Loop B is in Standby.
5. RWL is -120 inches.
6. RPV Pressure is <200 psig.
7. 31RS-OPS-001-2 is in progress.
8. All RHRSW Pumps are tripped
9. Both Recirc Pumps are tripped

INITIATING CUES:

From the Remote Shutdown Panel, place LPCI in operation using RHR Loop B in accordance with 31RS-OPS-001-2, Attachment 5.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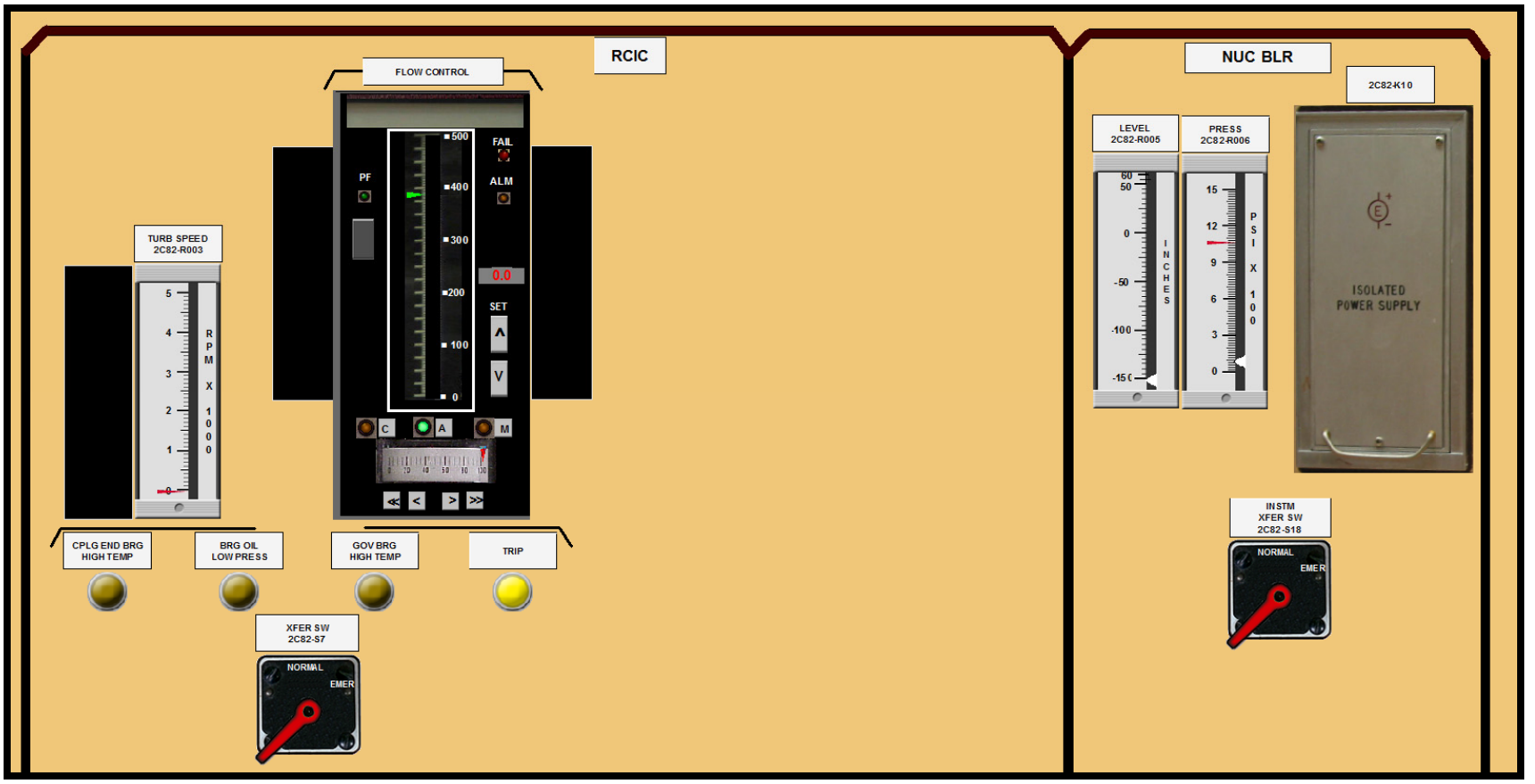
Sheet 7
Sheet 8
U2 RSDP

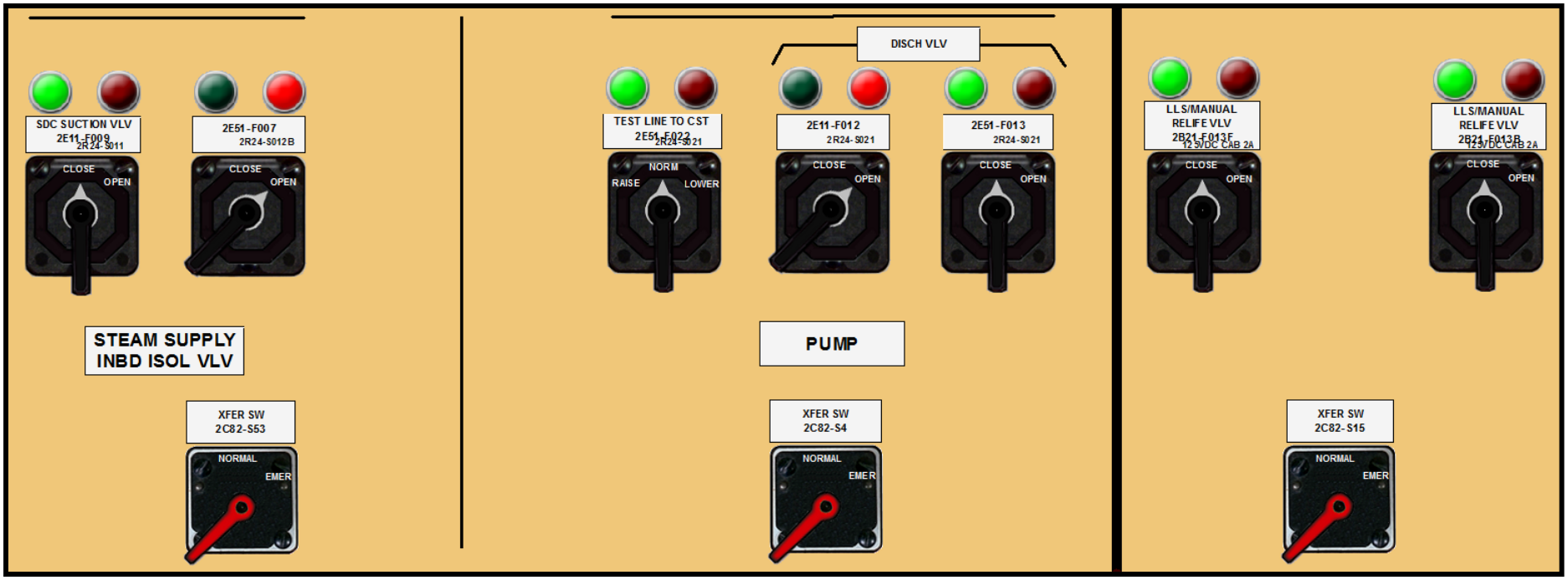
Sheet 1



2C82-S7

2C82-S18

Sheet 2



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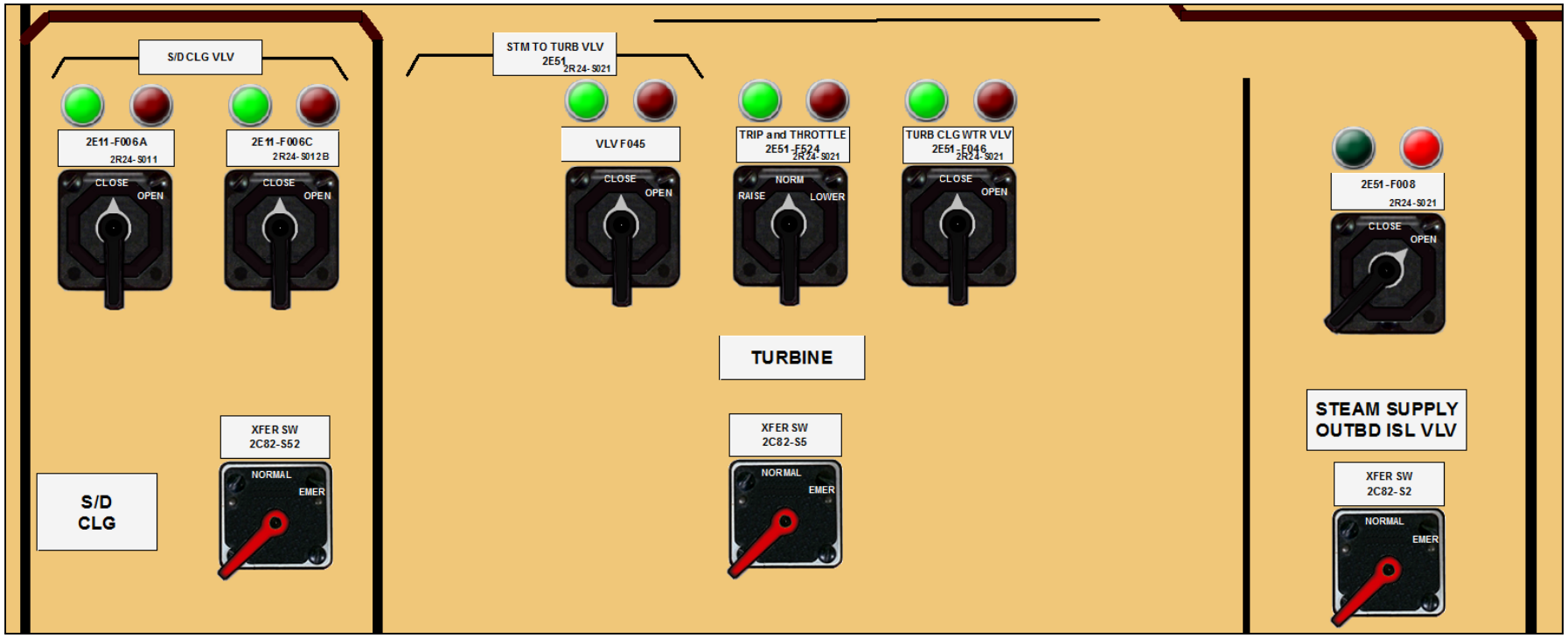
Sheet 3



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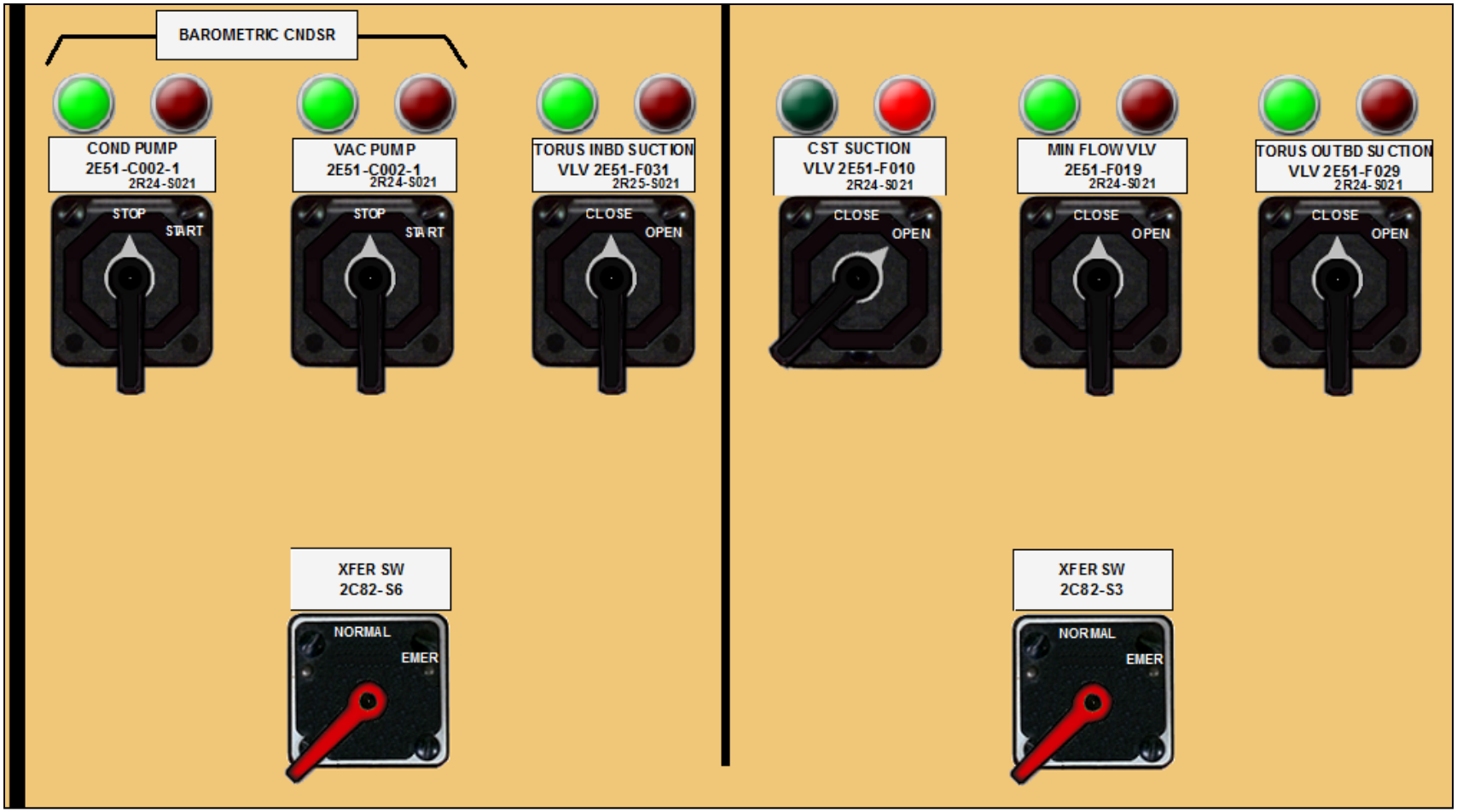
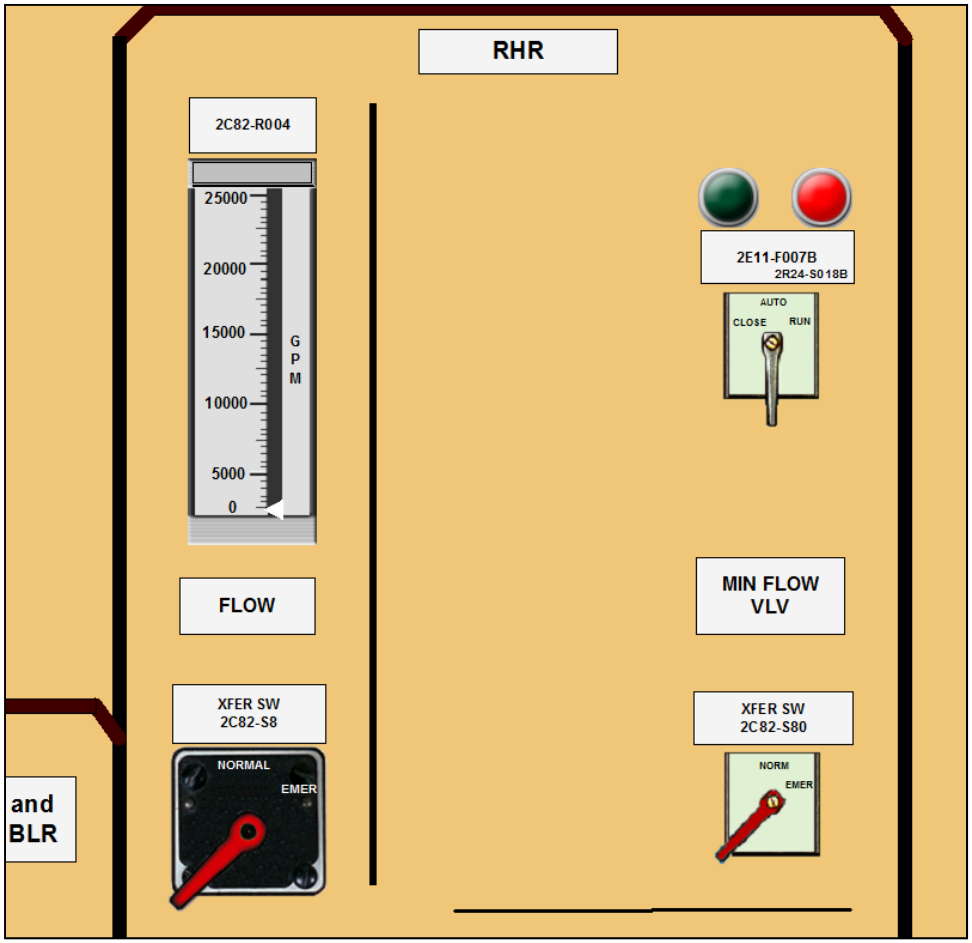
Sheet 4



2C82-S6

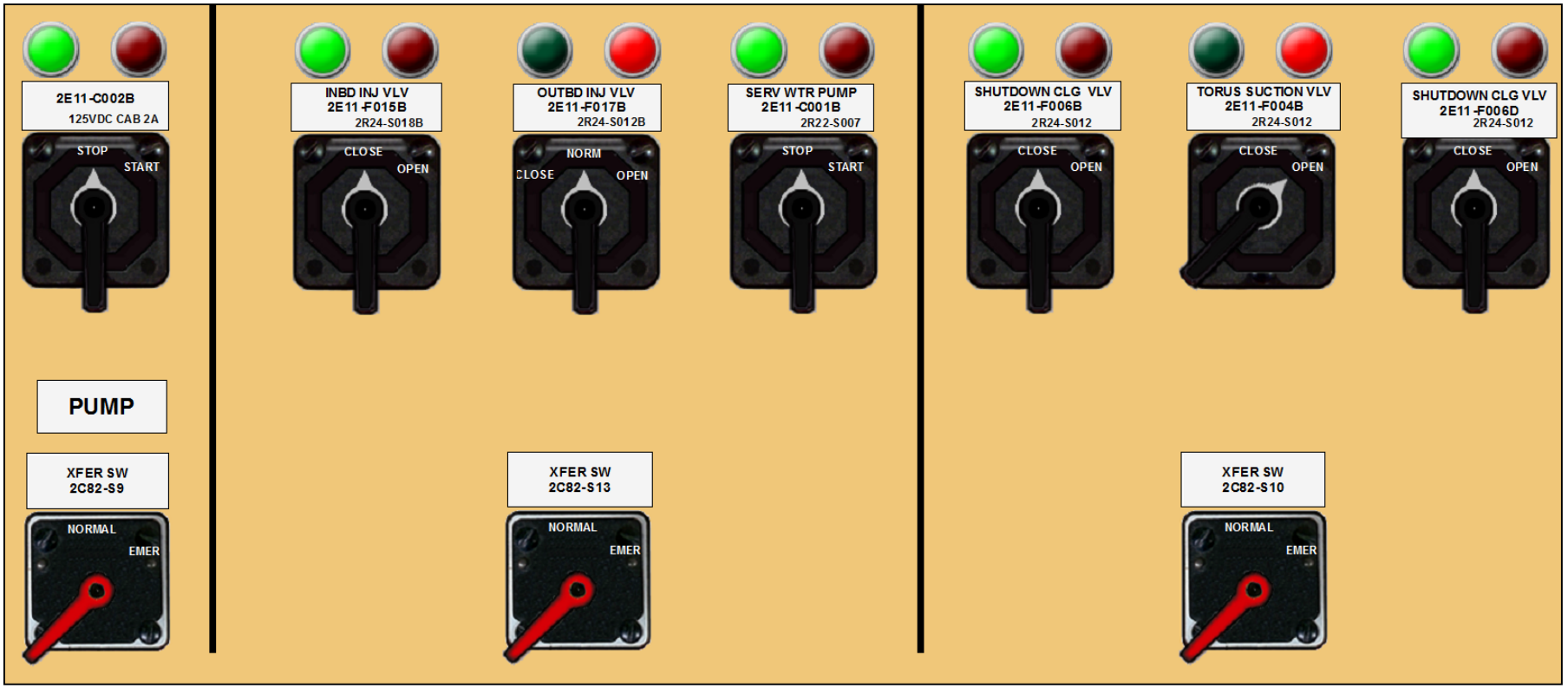
2C82-S3

Sheet 5



2C82-S8 **2C82-S80**

Sheet 6



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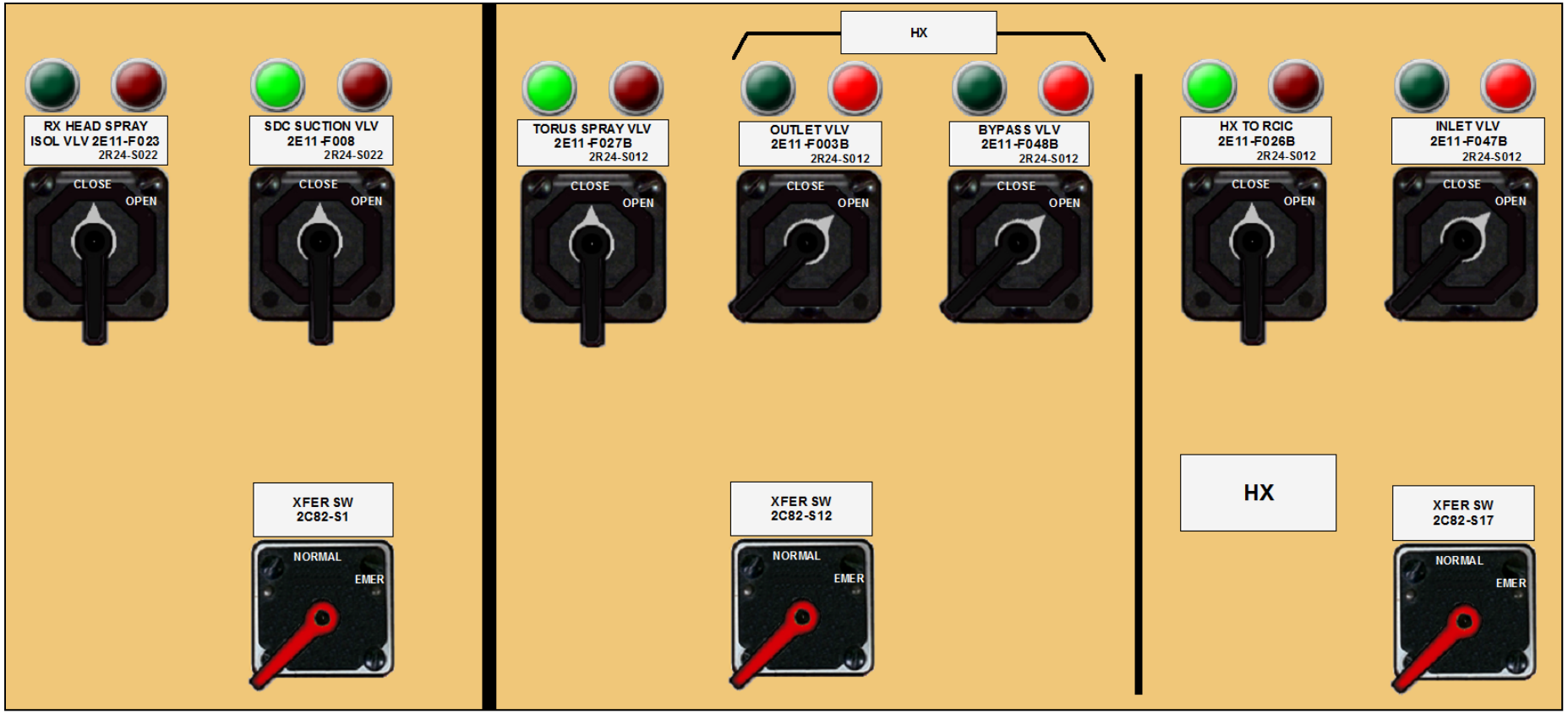
2C82-S13

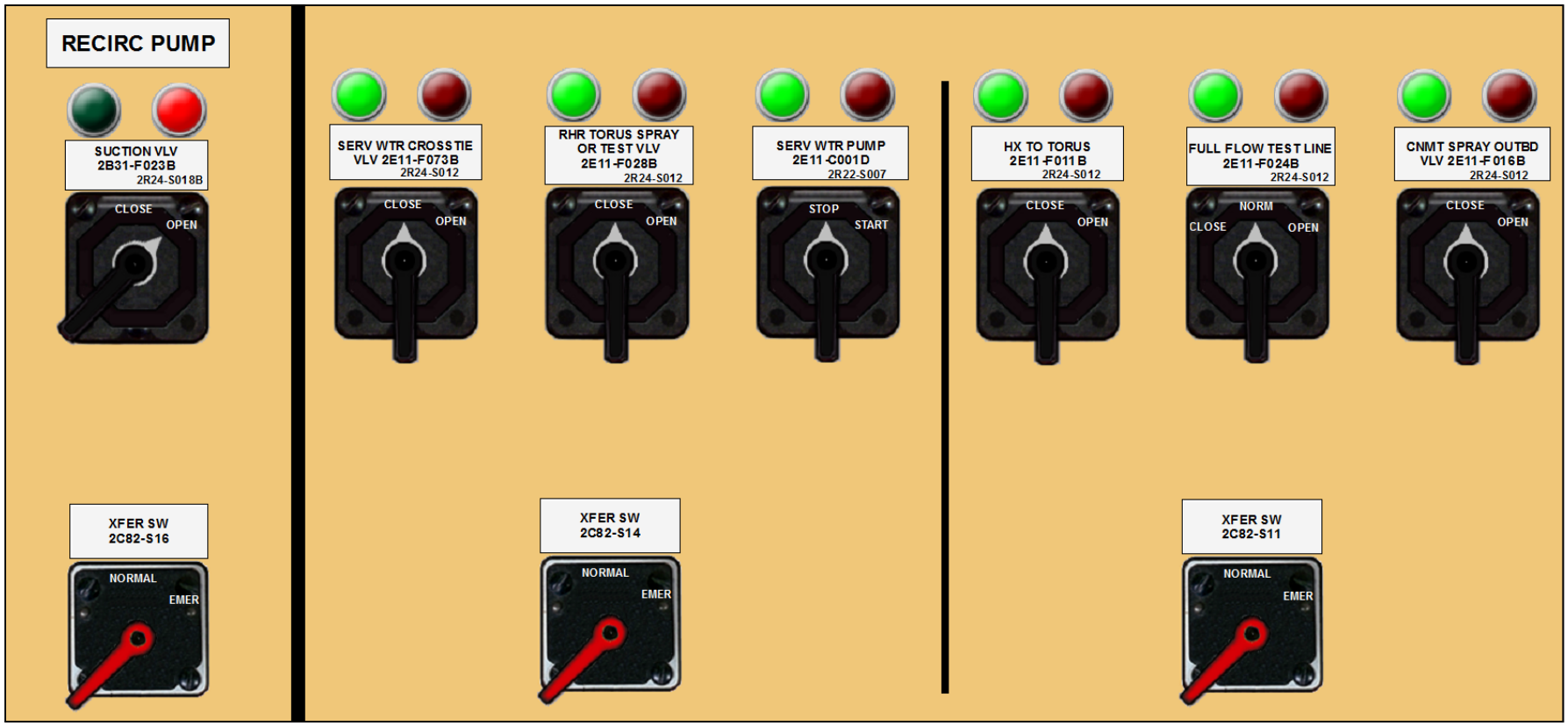
2C82-S10

Sheet 7



2C82-S1 **2C82-S12** **2C82-S17**

Sheet 8



2C82-S16

2C82-S14

2C82-S11

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
PLANT 3 (ALL)

Title: **Transfer the Vital AC System from Alternate Power to the Inverter**		
Author: **Anthony Ball**	**Media Number:** PLANT 3 2016-301	**Time:** 15 Minutes
Line Technical Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee: **N/A**		**Date:** **N/A**
Approved By (Training Program Supervisor, Lead Instructor or Line Supervisor) **Ed Jones**		**Date:** **05/30/16**

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Course Number	Program Name	Media Number
N/A	OPERATIONS TRAINING	PLANT 3 2016-301

Rev. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
01	07/01/92	General revision and format change	WMM	RSG
02	08/13/93	General revision, incorporate instructor comments, word processor change	RAB	RSG
03	11/15/93	Correct standard in step 10, both units	RAB	SMC
04	07/05/96	Format change, modify time allowance, made steps 5, 7, and 9 critical	RAB	SMC
05	09/14/98	Revised based on annual exam comments.	SCB	DHG
06	02/21/00	Format modification, change title to better reflect task, update K/As	RAB	DHG
07	11/02/00	Include objective number, change operator applicability to System Operator	RAB	DHG
08	03/11/02	Include initial operator statement	RAB	RAB
09	03/08/05	Documentum Revision	DNM	RAB
10	06/13/05	Revised Initial License statement for successful completion	RAB	RAB
11	04/11/06	Removed Response Cues	RAB	RAB
12	09/25/09	Added HU tools	ADY	ALD
12.1	10/17/11	Reviewed JPM against current procedure. Added Fundamental question to new Attachment 1.	MMG	ALS
12.2	01/22/14	Removed fundamental questions and added JPM attribute page. Added procedure step numbers to JPM staps.	JSC	ELJ
13	08/06/15	Updated "Summary of JPM Attributes" and changed wording to match procedure including procedure step numbers.	MMG	ALS
13.1	05/30/16	Reviewed JPM against current procedure to be used on ILT-10 NRC Exam. Changed Media Number to Plant 3 2016-301. Removed U1 information and once exam is complete will be added back and update the JPM Database.	ARB	ELJ

Line Contributors

The following individuals contributed to the development of this lesson plan.

Rev. No.	List of Contributors

UNIT 1 ( ) UNIT 2 (X)

TASK TITLE:	**Transfer the Vital AC System from Alternate Power to the Inverter**
JPM NUMBER:	PLANT 3 2016-301
TASK STANDARD:	The task shall be completed when Vital AC Power has been transferred from the alternate source to the inverter per 34SO-R25-002.

TASK NUMBER: 027.031

OBJECTIVE NUMBER: 027.031.O

PLANT HATCH JTA IMPORTANCE RATING:

RO 2.86

SRO 2.96

K/A CATALOG NUMBER: 2620012130

K/A CATALOG JTA IMPORTANCE RATING:

RO 3.90

SRO 3.40

OPERATOR APPLICABILITY: Nuclear Plant Operator (NPO)

GENERAL REFERENCES:	**Unit 1**	**Unit 2**
	N/A	34SO-R25-002-2, Ver. 5.3

REQUIRED MATERIALS:	**Unit 1**	**Unit 2**
	N/A	34SO-R25-002-2, Ver. 5.3

APPROXIMATE COMPLETION TIME: 15 Minutes

SIMULATOR SETUP: N/A

EVALUATOR COPY

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Vital AC room cooler is in operation.
2. The Vital AC rectifier and inverter have been started.
3. Pre-Job Brief is NOT required.

INITIATING CUES:

Transfer Unit 2 Vital AC from the Alternate Source to the Inverter in accordance with 34SO-R25-002-2, Section 7.1.4.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences.

Start Time:_____

1.	**Confirm** SYNC-MONITOR light is ILLUMINATED. (Step 7.1.4.1)	At the Vital AC Panel, location 112TET12, the Operator CONFIRMS the SYNC - MONITOR clear light is illuminated.	
2.	**Confirm in** OR **place** RETURN MODE Switch in AUTO position. (Step 7.1.4.2)	At Vital AC Panel, 112TET12, the Operator CONFIRMS the RETURN MODE switch is in AUTO.	
****3.**	**Place** MANUAL BYPASS switch in BYP-SYNC position. (Step 7.1.4.3)	At Vital AC Panel, 112TET12, the Operator PLACES the MANUAL BYPASS switch from BYPASS to the BYP-SYNC position.	
4.	**Confirm** SYNC-MONITOR light is EXTINGUISHED. (Step 7.1.4.4)	At Vital AC Panel, 112TET12, the Operator CONFIRMS the clear SYNC-MONITOR light is extinguished.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**5.	**Place** MANUAL BYPASS switch in BYP-TEST position. (Step 7.1.4.5)	At Vital AC Panel, 112TET12, the Operator PLACES the MANUAL BYPASS switch in BYP-TEST.	

PROMPT: **IF** the operator asked for the status of the red INVERTER static switch position light, **INFORM** the operator that light is ILLUMINATED (Step 7.1.4.6).

6.	**Confirm** the following: red INVERTER static switch position light is ILLUMINATED; AND ********** ********** (Step 7.1.4.7)	At Vital AC Panel, 112TET12, the Operator has IDENTIFIED the following indications: INVERTER red light illuminated. ********** **********	
7.	**Confirm** the following: ********** the white ALT LINE static switch position light is EXTINGUISHED; ********** (Step 7.1.4.7)	At Vital AC Panel, 112TET12, the Operator has IDENTIFIED the following indications: **********. ALT LINE white light extinguished. **********	
8.	**Confirm** the following: ********** ********** SYNC MONITOR light is EXTINGUISHED. (Step 7.1.4.7)	At Vital AC Panel, 112TET12, the Operator has IDENTIFIED the following indications: **********. **********. SYNC MONITOR clear light extinguished.	

NOTE: Step 7.1.4.8 is not applicable.

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**9.	**Place** TEST toggle switch in ALT LINE position. (Step 7.1.4.9)	At Vital AC Panel, 112TET12, the Operator PLACES the TEST toggle switch from CENTER to the ALT LINE (down) position.	
10.	**Confirm** the following: white ALT LINE static switch position light is ILLUMINATED; AND ********** ********** (Step 7.1.4.10)	At Vital AC Panel, 112TET12, the Operator has IDENTIFIED the following indications: ALT LINE white light illuminated. ********** **********	
11.	**Confirm** the following: ********** red INVERTER static switch position light is EXTINGUISHED; AND ********** (Step 7.1.4.10)	At Vital AC Panel, 112TET12, the Operator has IDENTIFIED the following indications: ********** INVERTER red light extinguished. **********	
12.	**Confirm** the following: ********** ********** SYNC MONITOR light is EXTINGUISHED (Step 7.1.4.10)	At Vital AC Panel, 112TET12, the Operator has IDENTIFIED the following indications: ********** ********** SYNC MONITOR clear light extinguished.	
**13.	**Place** MANUAL BYPASS switch in NORMAL position. (Step 7.1.4.11)	At Vital AC Panel, 112TET12, the Operator PLACES the MANUAL BYPASS Switch in NORMAL.	
**14.	**Place** TEST toggle switch in CENTER position. (Step 7.1.4.12)	At Vital AC Panel, 112TET12, the Operator PLACES the TEST toggle switch in CENTER position.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

PROMPT: **IF** the operator asked for the status of the red INVERTER static switch position light, **INFORM** the operator that light is ILLUMINATED (Step 7.1.4.13).

15.	**Confirm** the following: red INVERTER static switch position light is ILLUMINATED; AND ********** ********** (Step 7.1.4.14)	At Vital AC Panel, 112TET12, the Operator has IDENTIFIED the following indications: INVERTER red light illuminated. ********** **********	
16.	**Confirm** the following: ********** white ALT LINE static switch position light is EXTINGUISHED; AND ********** (Step 7.1.4.14)	At Vital AC Panel, 112TET12, the Operator has IDENTIFIED the following indications: ********** ALT LINE White light extinguished. **********	
17.	**Confirm** the following: ********** ********** SYNC MONITOR light is EXTINGUISHED. (Step 7.1.4.14)	At Vital AC Panel, 112TET12, the Operator has IDENTIFIED the following indications: ********** ********** SYNC MONITOR clear light extinguished.	

NOTE: Step 7.1.4.15 is not applicable.

PROMPT: **WHEN** addressed by the operator, as the Shift Supervisor, **INFORM** the operator that it is desired to place the Return Mode Switch to MANUAL.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
18.	IF desired, place RETURN MODE SWITCH in MANUAL position. (Step 7.1.4.16)	At Vital AC Panel, 112TET12, the Operator PLACES the RETURN MODE switch in MAN.	

END TIME:_____

NOTE: The terminating cue shall be given to the operator when any of the following conditions are met:

- Operator completes step 18 of this JPM.
- With NO reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: We will stop here.

Summary of JPM Attributes

JPM JP02731-13:

SUMMARY OF JPM QUANTITATIVE ATTRIBUTES

CATEGORY	Minimum NRC Attributes	JPM CONTENT
Total Critical Steps	At least 2	5
Step 3 BYP-SYNC position	Energizes synch circuit to compare inverter output voltage to bypass voltage (checks for out of phase between sources).	
Step 5 BYP-TEST position	Aligns Alternate power to Static Switch.	
Step 9 Toggle Switch to Alt Line	Allows Static Switch to supply Alternate power to bus.	
Step 13 BYP-Switch to Normal	Opens B1 contact so Alternate Power and Inverter power are controlled by the Static Switch (needed for Static Switch to have automatic control).	
Step 14 Toggle Switch to Center	Places Static Switch in control with power being supplied by the Inverter as long as sufficient voltage is present.	
Number of JPM Steps	<30	18
Time to Perform JPM	<45 min	15 min
Normal / Faulted / Alternate Path		
Normal	Operator is told to transfer power from Alternate to the Inverter.	
Setting (administered)		
Plant		
Is LOD "1" or "5"	NO	NO

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Vital AC room cooler is in operation.
2. The Vital AC rectifier and inverter have been started.
3. Pre-Job Brief is NOT required.

INITIATING CUES:

Transfer Unit 2 Vital AC from the Alternate Source to the Inverter in accordance with 34SO-R25-002-2, Section 7.1.4.

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
ADMIN 1 (ALL)

Title: **Determine if plant conditions allow a "Quick Restart" of a Recirc Pump**		
Author: **Richard A. Greenhouse**	**Media Number:** 2016-301 ADMIN 1	**Time:** 15.0 Minutes
Line Technical Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee (N/A for minor revisions) **N/A**		**Date:** **N/A**
Approved By (Training Program Manager or Lead Instructor) **Ed Jones**		**Date:** **05/30/16**

Course Number	Program Name	Media Number
N/A	OPERATIONS TRAINING	2016-301 ADMIN 1

Ver. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
0.0	06/07/12	Modified from LR-JP-25050 & will become new LR-JP-25053 after NRC Exam.	ARB	CME
1.0	05/30/16	Minor revision to match procedure and use on ILT-10 NRC Exam. Reviewed JPM against current procedure. Changed "Media Number" to 2016-301 ADMIN 6. This JPM will become LR-JP-25061 after NRC Exam.	RAG	ELJ

Line Contributors

The following individuals contributed to the development of this lesson plan.

Rev. No.	List of Contributors

UNIT 1 (X) UNIT 2 ( )

TASK TITLE:	**Determine if plant conditions allow a "Quick Restart" of a Recirc Pump**
JPM NUMBER:	2016-301 ADMIN 1
TASK STANDARD:	The task shall be complete when Attachment 6 of 34SO-B31-001-1, Reactor Recirculation System, has been performed through Step 5.2, and it has been determined that the requirements have NOT been met to start Recirc pump 1B.
TASK NUMBER:	004.002
OBJECTIVE NUMBER:	004.002.C

K/A CATALOG NUMBER: Generic 2.1.20

K/A CATALOG JTA IMPORTANCE RATING:

RO 4.6

SRO 4.6

OPERATOR APPLICABILITY: NPO and SRO

GENERAL REFERENCES:	**Unit 1**
	34SO-B31-001-1, Ver 46.2

REQUIRED MATERIALS:	**Unit 1**
	34SO-B31-001-1, Ver 46.2

APPROXIMATE COMPLETION TIME: 15.0 Minutes

SIMULATOR SETUP: N/A

EVALUATOR COPY

UNIT 1

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. 10 minutes ago, the Unit 1 reactor scrammed from 100% power.
2. Both Recirc Pumps tripped during the scram transient.
3. RWL went as low as -10 inches, and has been restored to +37 inches using Reactor Feedwater Pumps.
4. An operator has entered 34SO-B31-001-1, Reactor Recirculation System, and completed steps 7.1.4.2.1 through 7.1.4.2.5 (Recirc Pump B Quick Re-Start).
5. Data has been collected for use on step 7.1.4.2.6 of 34SO-B31-001-1.
6. Per the STA, the Power/flow condition is acceptable for restart of Recirc Pump 1B.

INITIATING CUES:

Perform step 7.1.4.2.6 of 34SO-B31-001-1, Reactor Recirculation System, AND,
Determine if plant conditions meet the procedural requirements for the Quick Re-Start of Recirc Pump 1B.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences. Reference: NMP-TR-111, "On-The-Job Training and Task Performance Evaluation".

START TIME:_____

NOTE: **34SO-B31-001-1, Attachment 6** serves as an answer key for this JPM. It is NOT to be provided to the student.

NOTE: At this time, PROVIDE the operator with **Attachment 1** (Plant Data page) and a copy of 34SO-B31-001-1.

1.	Operator refers to step 7.1.4.2.6 and is directed to Attachment 6 of 34SO-B31-001-1.	The operator enters Attachment 6 of 34SO-B31-001-1.	
2.	Recirc Loop and RPV Limit Checks: (Step 1.0 of Attachment 6)	The operator places a check mark next to "B" Recirc.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
3.	Confirm the reactor is at least 13% below the 78% load line of Attachment 1 of 34GO-OPS-005-1, AND The Power/flow condition is acceptable for restart per the STA/Rx Engineering OR If the OPRM System is inoperable, the reactor is at least 10% below the 61% load line of Attachment 1 of 34AB-C51-001-1. (Step 2.0 of Attachment 6)	The operator determines the reactor is SHUTDOWN and Initials Step 2.0 (1) and marks Step 2.0 (2) as "N/A".	
4.	Record the following data: Time (Step 3.0 of Attachment 6)	The operator records the CURRENT TIME. The operator initials the step.	

NOTE: Data is NOT required to be entered for Recirc Pump 1A in the following step.

****5.**	Record the following data: RPV Saturation Temp. (Step 3.0 (A) of Attachment 6)	The operator determines the RPV Saturation Temp for 820 psia (805 psig + 15 psi) is **521°F**, by using Attachment 1 of 34SO-B31-001-1	
6.	Record the following data: "A" Recirc Suction Temp (Step 3.0 (B) of Attachment 6)	The operator records "A" Recirc Suction Temp as **470°F** (Plant Data Sheet)	
7.	Record the following data: "B" Recirc Suction Temp (Step 3.0 (C) of Attachment 6)	The operator records "B" Recirc Suction Temp as **475°F** (Plant Data Sheet)	
8.	Record the following data: Vessel Bottom Head Drain (Step 3.0 (D) of Attachment 6)	The operator records Vessel Bottom Head Drain temperature as "N/A" or "Not Available"	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**9.	Confirm the ΔT between reactor coolant temp in the loop AND the RPV coolant temp is ≤ 50° F: Loop "B" ΔT = |(A)-(C)| (Step 4.1 of Attachment 6)	The operator records Loop "B" ΔT as **46°F (± 2°F)** The operator initials the step.	
**10.	Confirm the ΔT between the bottom head coolant temp AND the RPV coolant temp by performing step 5.1 OR 5.2. (Step 5.0 of Attachment 6)	The operator determines the step 5.2 must be used because Vessel Bottom Head Drain temp is NOT available. The operator records Step 5.1 as "N/A"	
**11.	Confirm ALL of the following: One OR more loop drive flows were >40% of rated flow prior to the RPT (Step 5.2 (a) of Attachment 6)	The operator determines loop drive flows were > 40% prior to the RPT (Unit 1 was at 100% RTP prior to the scram and RPT). The operator initials the step.	
**12.	Confirm ALL of the following: HPCI and RCIC have not injected since the RPT (Step 5.2 (b) of Attachment 6)	The operator determines HPCI and RCIC have not injected since the RPT (RWL decreased to -10" and was restored using RFPTs). The operator initials the step.	
**13.	Confirm ALL of the following: Feedwater temp has remained > 300°F since the RPT. (Step 5.2 (c) of Attachment 6)	The operator determines Feedwater temp has NOT remained > 300°F since the RPT (Plant Data sheet lists current Feedwater temp as **295°F**).	
14.	Confirm ALL of the following: Time between the RPT and restart is < 30 minutes. (Step 5.2 (d) of Attachment 6)	The operator records the RPT time (T1) and time Recirc start is required.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
15.	IF only ONE Recirc pump is idle, THEN confirm the operating pump loop flow is < 22,500 gpm. (Step 6.0 of Attachment 6)	The operator determines BOTH Recirc pumps are tripped and marks Step 6.0 as "N/A".	
16.	Verify the operating pump loop flow is ≤ 22,500 gpm. (Step 6.3 of Attachment 6)	The operator determines BOTH Recirc pumps are tripped and marks Step 6.3 as "N/A".	
17.	Independently verify the data recorded above is ACCEPTABLE prior to proceeding with the recirc pump start. (Step 7.0 of Attachment 6)		
****18.**	The operator reports to the Shift Supervisor.	The operator reports that plant conditions do NOT meet the procedural requirements for the Quick Re-Start of Recirc Pump 1B.	

PROMPT: **IF** addressed by the operator, as the Shift Supervisor, **INFORM** the operator that another operator will perform Step 7.0 of Attachment 6.

END TIME:_____

NOTE: The terminating cue shall be given to the operator when:

- After JPM step #18 is complete.
- With NO reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: We will stop here.

EVALUATOR – **PICK UP** the Initiating Cue sheet.

(Indicates critical step)**

CONTINUOUS

NOTE:	This attachment may be performed in Modes 1, 2, AND 3.

1.0 **Recirc** Loop and RPV Limit Checks:

Pre-startup checks for (√): _____ "A" recirc

_____√_____ "B" recirc

CAUTION:	LOAD LINE INCREASES OF UP TO 10% HAVE BEEN OBSERVED WHEN A RECIRC PUMP IS STARTED.

Critical

2.0 **Confirm** the:

(1) The reactor is at least 13% below the 78% load line of Attachment 1, Power vs. flow map in 34GO-OPS-005-1, INITIALS

AND

The Power/flow condition is acceptable for restart per the STA/Rx Engineering. INITIALS

OR

(2) IF the OPRM System is inoperable,
the reactor is at least 10% below the 61% Load Line of Attachment 1, OPRM System INOP Power vs. Flow map in 34AB-C51-001-1,
in order to avoid inadvertent entry into the RPI. N/A

3.0 **Record** the following data: Time CURRENT TIME INITIALS

	Parameter	Location	Value	
(A)	RPV Saturation Temp.	SPDS MISC RPV Heatup/ Cooldown OR Steam Tables	521°F (±2°F)	(A)
(B)	"A" Recirc Suction Temp	1B31-R650 OR Equivalent, average of process computer points B034, B035	470°F	(B)
(C)	"B" Recirc Suction Temp	1B31-R650 OR Equivalent, average of process computer points B036, B037	475°F	(C)
(D)	*Vessel Bottom Head Drain	*1B21-R606 Pt 3 OR 1G31-N601 Pt 5	Not Available	(D)

* The Bottom Head Drain temperature (D) may still be used even IF RWCU is NOT in service. (See Limitation 5.2.14). IF Bottom Head Drain temperature is NOT available, (i.e., inoperable), THEN use the alternate method of confirming the Bottom Head to Coolant ΔT in step 5.0.

Critical

4.0 FOR the Recirc loop to be started,
confirm the ΔT between the reactor coolant temperature in the loop AND the RPV coolant temperature is ≤ 50°F by performing step3.1 OR 3.2 below:

4.1 IF both recirc loops are idle;
Loop "A" ΔT = |(A) - (B)| = _____ (acceptable ≤ 50°F) N/A
OR
Loop "B" ΔT = |(A) - (C)| = 46°F (±2°F) (acceptable ≤ 50°F) INITIALS

•••••••••••••••••••••••••••••••••••• **OR** ••

4.2 IF only one recirc loop is idle,
THEN **loop** ΔT = |(B) - (C)| = _____ (acceptable ≤ 50°F) N/A

NOTE:	IF a direct indication is NOT available for Vessel Bottom Head Drain temp (D), THEN within 30 minutes of an RPT, the bottom head to coolant ΔT (≤ 145°F) may be confirmed per the alternate method in step 5.2.

Critical

5.0 **Confirm** the ΔT between the bottom head coolant temperature AND the reactor pressure vessel (RPV) coolant temperature is ≤ 145°F by performing step 4.1 OR 4.2 below:

5.1 ΔT = |(A) - (D)| = _____ (acceptable ≤ 145°F) N/A

•••••••••••••••••••••••••••••••••••• **OR** ••

5.2 Per Tech Spec BASES B.3.4.9,
confirm ALL of the following:

(a) One OR more loop drive flows were > 40% (18,000 gpm) of rated flow prior to the RPT, AND INITIALS

(b) HPCI and RCIC Systems have NOT injected since the RPT, AND INITIALS

(c) Feedwater temperature has remained > 300°F since the RPT, AND NOT MET

(d) Time between the RPT AND restart is < 30 minutes.

Record Recirc RPT trip time: RPT time (T1)

Recirc start is required prior to:

(T1) + 30 minutes = RPT time + 30 min INITIALS

ANSWER KEY

Critical

6.0 IF only ONE Recirc pump is idle,
THEN **confirm** the operating pump loop flow is < 22,500 gpm. N/A

6.3 **Verify** the operating pump loop flow is < 22,500 gpm. _____ N/A

7.0 **Independently verify** the data recorded above is ACCEPTABLE prior to proceeding with the recirc pump start. (VERIFIED) _____

Critical

8.0 **Confirm** the steps 1.0 thru 7.0 above, was performed within the last 15 minutes. _____

9.0 **Record** Recirc pump start time: _____ _____

UNIT 1

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. 10 minutes ago, the Unit 1 reactor scrammed from 100% power.
2. Both Recirc Pumps tripped during the scram transient.
3. RWL went as low as -10 inches, and has been restored to +37 inches using Reactor Feedwater Pumps.
4. An operator has entered 34SO-B31-001-1, Reactor Recirculation System, and completed steps 7.1.4.2.1 through 7.1.4.2.5 (Recirc Pump B Quick Re-Start).
5. Data has been collected for use on step 7.1.4.2.6 of 34SO-B31-001-1.
6. Per the STA, the Power/flow condition is acceptable for restart of Recirc Pump 1B.

INITIATING CUES:

Perform step 7.1.4.2.6 of 34SO-B31-001-1, Reactor Recirculation System, AND,
Determine if plant conditions meet the procedural requirements for the Quick Re-Start of Recirc Pump 1B.

PROVIDE TO APPLICANT

Plant Data

- **Reactor pressure:** 805 psig
- **"A" Recirc Suction Temp** (1B31-R650): 470° F
- **"B" Recirc Suction Temp** (1B31-R650): 475° F
- **Vessel Bottom Head Drain:** NOT AVAILABLE
- **Reactor Feedwater temperature:** 295° F

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
ADMIN 2 – (ALL)

Title: **USE A SYSTEM LOGIC DIAGRAM**		
Author: **A. B. Genereux**	**Media Number:** 2016-301 ADMIN 2	**Time:** 20.0 Minutes
Line Technical Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee: **N/A**		**Date:** **N/A**
Approved By (Training Program Manager or Lead Instructor) **Ed Jones**		**Date** **05/30/16**

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Course Number	Program Name	Media Number
N/A	OPERATIONS TRAINING	2016-301 ADMIN 2

Rev. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
0.0	05/30/16	Initial Development.	ABG	ELJ

Line Contributors

The following individuals contributed to the development of this lesson plan.

Rev. No.	List of Contributors

UNIT 1 ( ) UNIT 2 (X)

TASK TITLE:	**USE A SYSTEM LOGIC DIAGRAM**
JPM NUMBER:	2016-301 ADMIN 2
TASK STANDARD:	The task shall be complete when the operator has determined the failure condition of a relay using Plant Hatch logic drawings.

PLANT HATCH JTA IMPORTANCE RATING:

RO 3.08

SRO 2.67

K/A CATALOG NUMBER: G2.2.41

K/A CATALOG JTA IMPORTANCE RATING:

RO 3.5

SRO 3.9

OPERATOR APPLICABILITY: Nuclear Plant Operator (NPO)

GENERAL REFERENCES:	Unit 1	Unit 2
		H-27664, H-27671, H-27667, H-27665, H-51689

REQUIRED MATERIALS:	Unit 1	Unit 2
		H-27664, H-27671, H-27667, H-27665, H-51689

APPROXIMATE COMPLETION TIME: 20.0 Minutes

SETUP: This JPM may be performed in the Simulator Library, Control Room, Simulator, or Document Control.

EVALUATOR COPY

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Unit 2 is at operating at 100% rated power.
2. HPCI is operating at rated flow per 34SV-E41-002-2, HPCI Pump Operability.
3. Relay 2E41-K20 fails in the **ENERGIZED** condition.

INITIATING CUES:

5 minutes after the initial conditions above and using the applicable plant logic drawings, circle the position of the following HPCI valves:

2E41-F004, CST Suction	OPEN	CLOSED
2E41-F011, Test To CST Valve	OPEN	CLOSED
2E41-F008, Test To CST Valve	OPEN	CLOSED

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences.

START TIME:_____

Provide the Applicant with drawings H-27664, H-27671, H-27667, H-27665 and H-51689

1.	Operator locates relay 2E41-K20.	Using the relay tabulation table on H-27664 the operator locates 2E41-K20 on drawing H-27667, coordinate F-10.	

****2.**	Operator determines that 2E41-F004, HPCI CST Suction valve, DOES NOT receive a close signal.	Using the relay tabulation table on H-27664 the operator locates 2E41-F004 on drawing H-27671, coordinates E-1 and E-2. The operator DETERMINES that 2E41-F004 DOES NOT receive a close signal (remains OPEN).	

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**3.	Operator determines that 2E41-F011, HPCI Test to CST valve DOES receive a close signal.	Using the relay tabulation table on H-27664 the operator locates 2E41-F011 on drawing H-27671, coordinate J-2, the operator DETERMINES that 2E41-F011 DOES receive a close signal. (travels CLOSE)	
**4.	Operator determines that 2E41-F008, HPCI Test to CST valve DOES receive a close signal.	Using the relay tabulation table on H-27664 the operator locates 2E41-F008 on drawing H-51689, coordinate D-6, the operator DETERMINES that 2E41-F008 DOES receive a close signal. (travels CLOSE)	

END TIME:_____

NOTE: The terminating cue shall be given to the Operator when:

- After JPM step #4 is complete.
- With NO reasonable progress, the Operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: We will stop here.

EVALUATOR – PICK UP the Initiating Cue sheet **AND DRAWINGS H-27664, H-27671, H-27667, H-27665 and H-51689**.

ANSWER KEY

2E41-F004, CST Suction	OPEN	CLOSED
2E41-F011, Test To CST Valve	OPEN	CLOSED
2E41-F008, Test To CST Valve	OPEN	CLOSED

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Unit 2 is at operating at 100% rated power.
2. HPCI is operating at rated flow per 34SV-E41-002-2, HPCI Pump Operability.
3. Relay 2E41-K20 fails in the **ENERGIZED** condition.

INITIATING CUES:

5 minutes after the initial conditions above and using the applicable plant logic drawings, circle the position of the following HPCI valves:

2E41-F004, CST Suction	OPEN	CLOSED
2E41-F011, Test To CST Valve	OPEN	CLOSED
2E41-F008, Test To CST Valve	OPEN	CLOSED

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
ADMIN 3 – SRO ONLY

Title: **VERIFY FUEL MOVEMENT SHEET**		
Author: **Anthony Ball**	**Media Number:** 2016-301 ADMIN 3	**Time:** 30.0 Minutes
Line Technical Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee: **N/A**		**Date:** **N/A**
Approved By (Training Program Manager or Lead Instructor) **Ed Jones**		**Date** **05/30/16**

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FORM TITLE: TRAINING MATERIAL REVISION SHEET

Program/Course Code: **OPERATIONS TRAINING** Media Number: **2016-301 ADMIN 3**

Rev. No.	Date	Reason for Revision	Author's Initials	Supv's Initials
00	03/17/09	Initial development	FNF	CME
01	06/07/12	Revision for use on 2012-301 NRC Exam. After NRC Exam, Media Number will be changed to LR-JP-45.33A.	ARB	CME
1.1	05/30/16	Minor revision for use on 2016-301 NRC Exam. Reviewed JPM against current procedure. Changed "Media Number" to 2016-301 ADMIN 3. Incorporated JPM into a Fuel Movement Sheet Verification. After NRC Exam, Media Number will be changed to LR-JP-45.33B.	ARB	ELJ

UNIT 1 (X) UNIT 2 (X)

TASK TITLE:	**VERIFY FUEL MOVEMENT SHEET**
JPM NUMBER:	**2016-301 ADMIN 3**
TASK STANDARD:	The task will be complete when the operator has identified all in-core placement errors of all components listed on Page 1 of the attached Fuel Movement Sheet.
TASK NUMBER:	045.033
OBJECTIVE NUMBER:	045.033.O

PLANT HATCH JTA IMPORTANCE RATING:

RO Not Available

SRO Not Available

K/A CATALOG NUMBER: G2.1.35

K/A CATALOG JTA IMPORTANCE RATING:

RO 2.2

SRO 3.9

OPERATOR APPLICABILITY: Senior Reactor Operator

GENERAL REFERENCES:	**Refuel Floor**
	34FH-OPS-001-0 (current version) 42FH-ERP-014-0 (current version)

REQUIRED MATERIALS:	**Refuel Floor**
	Fuel Movement Sheets 34FH-OPS-001-0 (current version) 42FH-ERP-014-0 (current version)

APPROXIMATE COMPLETION TIME: 30 Minutes

SIMULATOR SETUP: N/A

EVALUATOR COPY

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Unit 2 is in a refueling outage.
2. You are the oncoming Refuel Floor SRO.
3. You are performing a turnover with the off-going Refuel Floor SRO.
4. You are asked to verify the attached Fuel Movement Sheet which was completed last shift.
5. The fuel movement sheet, Core Map and pictures of the associated core cells are available.

INITIATING CUES:

IAW 34FH-OPS-001-0, Fuel Movement Operation,

1. VERIFY fuel movement on the attached Fuel Movement Sheet.
2. If verification results in any discovered errors, identify the error(s) and corrective action(s) required.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences. Reference: NMP-TR-111, "On-The-Job Training and Task Performance Evaluation".

START TIME:_____

PROMPT: Hand the operator the fuel movement sheets, pictures of the core cells and 34FH-OPS-001-2 & 42FH-ERP-014-0.

PROMPT: **IF** the operator has problems reading the bundle serial numbers, **THEN** provide the serial numbers to the operator.

PROMPT: **IF** the operator asks about Spent Fuel Pool verification, **THEN** tell the operator he is only responsible for in-core verifications.

1.	Obtains the correct procedures.	Obtains and reviews 42FH-ERP-014-0, "Fuel Movement" and 34FH-OPS-001-0, "Fuel Movement Operation."	
2.	Verify Step #1 of Fuel Movement Sheet is correct.	Operator determines Fuel Bundle (JLV675) has been loaded in its proper location and Step #1 of Fuel Movement Sheet is correct.	
3.	Verify Step #2 of Fuel Movement Sheet is correct.	Operator determines Fuel Bundle (JLV682) has been loaded in its proper location and Step #2 of Fuel Movement Sheet is correct.	

(** **Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
	NOTE: Step #3 of Fuel Movement Sheet is a Double Blade Guide and is located in the Fuel Pool.		
4.	Verify Step #4 of Fuel Movement Sheet is correct.	Operator determines Fuel Bundle (JLK804) has been loaded in its proper location and Step #4 of Fuel Movement Sheet is correct.	
5.	Verify Step #5 of Fuel Movement Sheet is correct.	Operator determines Fuel Bundle (JLK817) has been loaded in its proper location and Step #5 of Fuel Movement Sheet is correct.	
	NOTE: Control Cell 38-37 is correct.		
****6.**	Verify Step #6 of Fuel Movement Sheet is correct.	Operator determines Fuel Bundle (JLV698) has NOT been loaded in its proper location and Step #6 of Fuel Movement Sheet is INCORRECT. (JLV678 should be loaded in this location)	
	NOTE: The applicant may report the findings to the Shift Supervisor at this time or wait until all of the Fuel Movement Sheet has been verified, either is acceptable.		
7.	Verify Step #7 of Fuel Movement Sheet is correct.	Operator determines Fuel Bundle (JLV670) has been loaded in its proper location and Step #7 of Fuel Movement Sheet is correct.	
	NOTE: Step #8 of Fuel Movement Sheet is a Double Blade Guide and is located in the Fuel Pool.		
8.	Verify Step #9 of Fuel Movement Sheet is correct.	Operator determines Fuel Bundle (JLK805) has been loaded in its proper location and Step #9 of Fuel Movement Sheet is correct.	
9.	Verify Step #10 of Fuel Movement Sheet is correct.	Operator determines Fuel Bundle (JLK812) has been loaded in its proper location and Step #10 of Fuel Movement Sheet is correct.	

(Indicates critical step)**

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

NOTE: Control Cell 14-37 is NOT correct.

****10.**	Verify Step #11 of Fuel Movement Sheet is correct.	Operator determines Fuel Bundle (JLV968) has NOT been loaded in its proper location and Step #11 of Fuel Movement Sheet is INCORRECT. (JLV698 should be loaded in this location)	

NOTE: The applicant may report the findings to the Shift Supervisor at this time or wait until all of the Fuel Movement Sheet has been verified, either is acceptable.

11.	Verify Step #12 of Fuel Movement Sheet is correct.	Operator determines Fuel Bundle (JLV708) has been loaded in its proper location and Step #12 of Fuel Movement Sheet is correct.	

NOTE: Step #13 of Fuel Movement Sheet is a Double Blade Guide and is located in the Fuel Pool.

12.	Verify Step #14 of Fuel Movement Sheet is correct.	Operator determines Fuel Bundle (JLK802) has been loaded in its proper location and Step #14 of Fuel Movement Sheet is correct.	
****13.**	Verify Step #15 of Fuel Movement Sheet is correct.	Operator determines Fuel Bundle (JLK802) has NOT been loaded in its proper location and Step #15 of Fuel Movement Sheet is INCORRECT. (JLK820 should be loaded in this location)	

NOTE: Control Cell 38-17 is NOT correct.

NOTE: The applicant may report the findings to the Shift Supervisor at this time or wait until all of the Fuel Movement Sheet has been verified, either is acceptable.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**14.	Perform 34FH-OPS-001-0 Section 7.1 FUEL MOVEMENT ERRORS.	Operator reports to Shift Supervisor the following Steps are INCORRECT: Step#6 Step#11 Step#15	
**15.	Perform 34FH-OPS-001-0, Step 7.1.1.4.	Operator reports to Shift Supervisor to NOTIFY Reactor Engineering of the fuel movement errors.	
**16.	Perform 34FH-OPS-001-0, Step 7.1.1.5.	Operator reports to Shift Supervisor to INITIATE a CR documenting the fuel movement error	
**17.	Perform 34FH-OPS-001-0, Step 7.1.1.6.	Operator reports to Shift Supervisor to NOT make any further fuel movements, until directed by Plant Management AND Reactor Engineering has provided a Reactivity Plan for recovery from the fuel movement error.	

END TIME:_____

NOTE: The terminating cue shall be given to the Operator when:

- After JPM step #17 is complete.
- With NO reasonable progress, the Operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: We will stop here.

EVALUATOR – **PICK UP** the Initiating Cue sheet.

(Indicates critical step)**

UNIT 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. Unit 2 is in a refueling outage.
2. You are the oncoming Refuel Floor SRO.
3. You are performing a turnover with the off-going Refuel Floor SRO.
4. You are asked to verify the attached Fuel Movement Sheet which was completed last shift.
5. The fuel movement sheet, Core Map and pictures of the associated core cells are available.

INITIATING CUES:

IAW 34FH-OPS-001-0, Fuel Movement Operation,

3. VERIFY fuel movement on the attached Fuel Movement Sheet.

4. If verification results in any discovered errors, identify the error(s) and corrective action(s) required.

FORM TITLE:
FUEL MOVEMENT SHEETS

TYPE OF FUEL MOVEMENT:
(check the type of fuel sheets)

Core Off-Load:	____	Partial Offload:	_____
Core Reload:	_X_	Upfront Shuffle:	_____
Shuffle:	____	Backend Shuffle:	_____
General Moves:	____	Other (Specify):	_____
Special Activity:	____		

Brief description of moves: ____Control Cells 38-37, 14-37 and 38-17 to be loaded with fuel and blade guides removed. Control Cell 14-17 to have blade guide installed for insertion of control rod.

Verify the following for all core reload move sheets:

The first 4 steps in the movement sequence will place bundles around the SRM which will first be in the fueled region.

N/A / _____
Date

N/A / _____
Date

Verify the following for all core shuffle move sheets:

At least 2 irradiated fuel assemblies will remain around each SRM unless approved by the Reactor Engineering Supervisor or designated alternate.

Samuel Johnson / *06/18/16*
Date

* *Michael Best* / *06/18/16*
Date

Prepared by: *Ben Williams* / *06/18/16*
Reactor Engineering — Date

Verified by: *Mike Watson* / *06/18/16*
Reactor Engineering — Date

* Verified by: *Kenneth Fairson* / *06/18/16*
Reactor Engineering — Date

** Approved by: *William Jefferson* / *06/18/16*
Reactor Engineering Supervisor — Date

* Additional verification IF required by the Reactor Engineering Supervisor for certain evolutions or marked N/A, initialed and dated by the RE Supervisor.

** The "Approved" space on the actual sheets is to be signed by the Reactor Engineering Supervisor or designated alternate.

Spent Fuel Pool Inventory Database Updated By: *Kenneth Fairson* / *06/18/16*
Date

Verified By: *William Jefferson* / *06/18/16*
Dat

UNIT _2_	X	Performs these moves in sequence		These may be performed non-sequentially	Approved *William Jefferson*	Date *6/18/16*

Step #	Move From:					Comments:	Move To:				Double Verif.	
	Location	Init	OR	Init	Serial Number		Location	Init	OR	Init	Init	Date
1	23K11	JH	SW	JH	JLV675		37-36	JH	SE	JH	AC	06/18/16
2	23K10	JH	SW	JH	JLV682		39-38	JH	NW	JH	AC	06/18/16
3	37-38 / 39-36	JH	N/A	JH	DBL B/G		17F11 / 17G10	JH	N/A	JH	AC	06/18/16
4	23H12	JH	SW	JH	JLK804		37-38	JH	SW	JH	AC	06/18/16
5	23H11	JH	SW	JH	JLK817		39-36	JH	NE	JH	AC	06/18/16
6	23H10	JH	SW	JH	JLV678		13-36	JH	SE	JH	AC	06/18/16
7	23H09	JH	SW	JH	JLV670		15-38	JH	NW	JH	AC	06/18/16
8	13-38 / 15-36	JH	N/A	JH	DBL B/G		17F10 / 17G09	JH	N/A	JH	AC	06/18/16
9	23K09	JH	SW	JH	JLK805		13-38	JH	SW	JH	AC	06/18/16
10	23K08	JH	SW	JH	JLK812		15-36	JH	NE	JH	AC	06/18/16
11	23G11	JH	SW	JH	JLV698		37-16	JH	SE	JH	AC	06/18/16
12	23G10	JH	SW	JH	JLV708		39-18	JH	NW	JH	AC	06/18/16
13	37-18 / 39-16	JH	N/A	JH	DBL B/G		17F09 / 17G08	JH	N/A	JH	AC	06/18/16
14	23F10	JH	SW	JH	JLK807		37-18	JH	SW	JH	AC	06/18/16
15	23F09	JH	SW	JH	JLK820		39-16	JH	NE	JH	AC	06/18/16
16	17J13 / 17J12	JH	N/A	JH	DBL B/G		13-18 / 15-16	JH	N/A	JH	AC	06/18/16

Movements Performed/Verified By:

John Hart	JH	6/18/16			
Print	Init	Date	Print	Init	Date
Alan Carter	AC	6/18/16			
Print	Init	Date	Print	Init	Date
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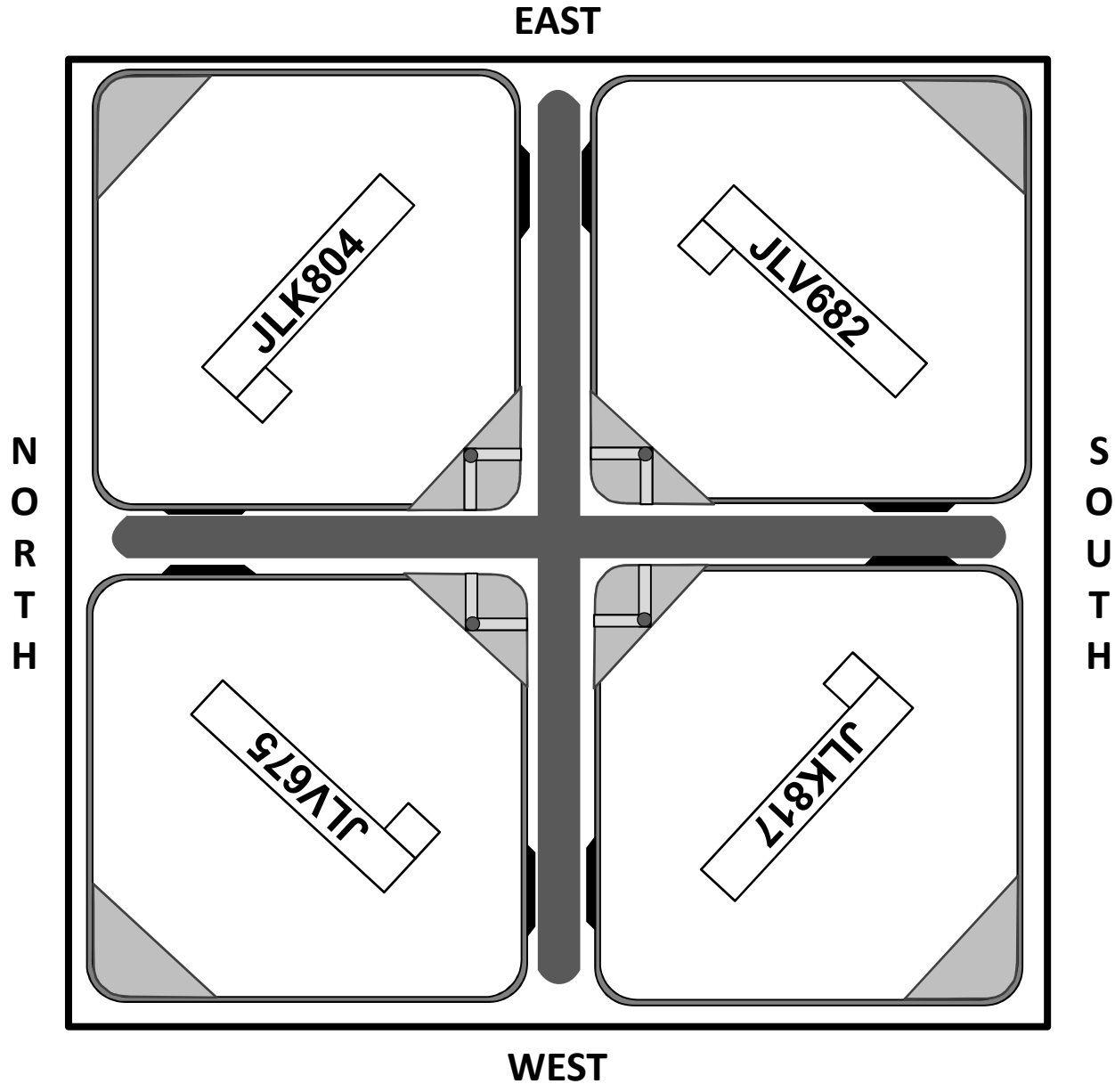
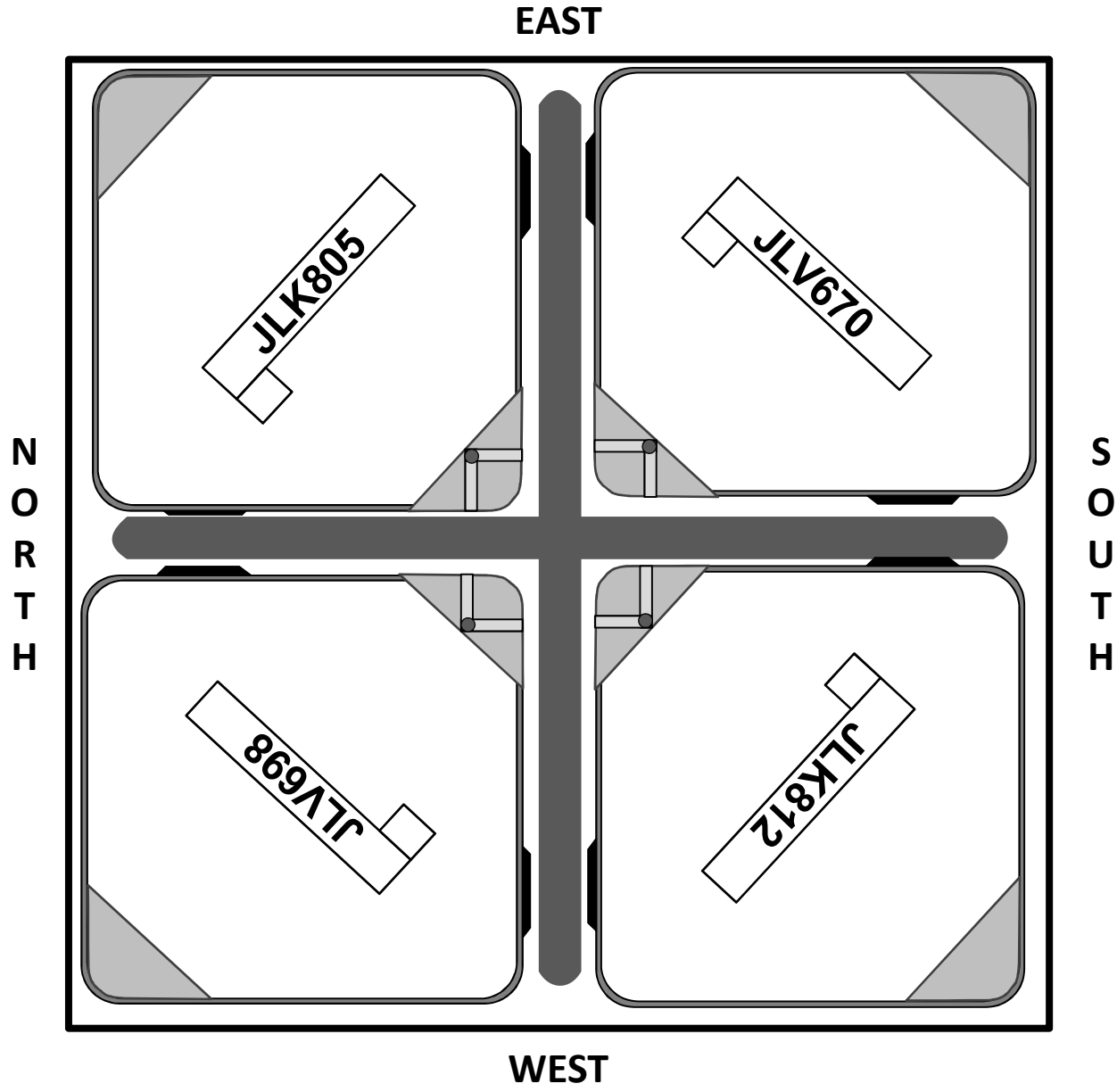
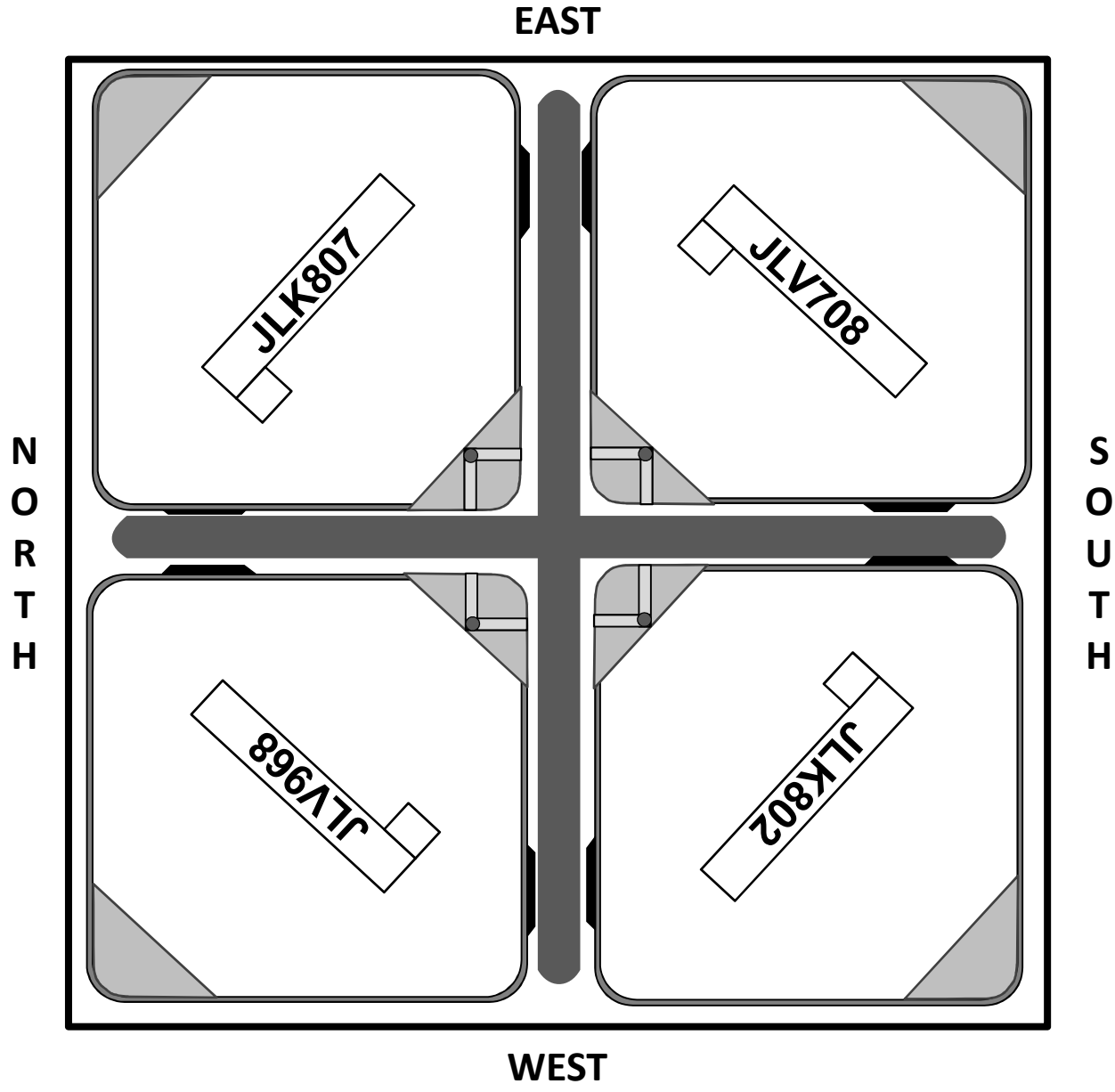


Control Cell 38-37



Control Cell 14-37



Control Cell 38-17

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
ADMIN 4 (RO ONLY)

Title: **CONDUCT OF OPERATIONS, 34SV-SUV-019-1 SURVEILLANCE**		
Author: **Anthony Ball**	**Media Number:** 2016-301 ADMIN 4	**Time:** 15.0 Minutes
Line Technical Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee: **N/A**		**Date:** **N/A**
Approved By (Training Program Manager or Lead Instructor) **Ed Jones**		**Date** **05/30/16**

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FORM TITLE: TRAINING MATERIAL REVISION SHEET

Program/Course Code: **OPERATIONS TRAINING** Media Number: **2016-301 ADMIN-4**

Rev. No.	Date	Reason for Revision	Author's Initials	Supv's Initials
1	5/26/11	Made editorial changes from LR-JP-10022 to use on 2011-301 NRC Exam. Changed K/A to G2.1.7.	ELJ	CME
1.1	05/30/16	Minor revision to match procedure and use on ILT-10 NRC Exam. Reviewed JPM against current procedure. Changed "Media Number" to 2016-301 ADMIN 4. This JPM will become LR-JP-10022 after NRC Exam.	ARB	ELJ

UNIT 1 (X) UNIT 2 ()

TASK TITLE:	**CONDUCT OF OPERATIONS, 34SV-SUV-019-1 SURVEILLANCE**
JPM NUMBER:	2016-301 ADMIN 4
TASK STANDARD:	This task will be satisfactorily met when the student has completeted section 7.5 of 34SV-SUV-019-1, SURVEILLANCE CHECKS, and informed the evaluator that Unit 1 drywell cooling system should be placed in "Additional Cooling Operating Mode."
TASK NUMBER:	
OBJECTIVE NUMBER:	

JTA IMPORTANCE RATING:

K/A CATALOG NUMBER: G2.1.7

RO 4.40

SRO 4.70

OPERATOR APPLICABILITY: Reactor Operator (RO)

GENERAL REFERENCES:	**Unit 1**
	34SV-SUV-019-1

REQUIRED MATERIALS:	**Unit 1**
	34SV-SUV-019-1. Complete previous shift data in step 7.5.4 (149 and 148) Calculators

APPROXIMATE COMPLETION TIME: 15.0 Minutes

SIMULATOR SETUP: NOT applicable

EVALUATOR COPY

UNIT 1

READ TO THE CANDIDATE

INITIAL CONDITIONS:

1. Unit 1 is operating at 100 % power.
2. 1T47-R611 is out of service.
3. 1T47-R612 is out of service.
4. The SS has directed this surveillance be completed as a paper version.
5. 1T47-R611 PT 14 and 1T47-R612 PT 10 Previous readings:
   - 1T47-R611 PT 14 (1T47-N009) was 149ºF
   - 1T47-R612 PT 10 (1T47-N003) was 148ºF

INITIATING CUES:

Complete section 7.5 of 34SV-SUV-019-1, SURVEILLANCE CHECKS, which evaluates drywell temperatures,

AND

Inform the evaluator of any actions (if any) that need to be taken as a result of the readings or results obtained from this surveillance.

SHOW ALL WORK.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

PROMPT: **GIVE** the operator an entire copy of 34SV-SUV-019-1.

START TIME:_____

NOTE: When the candidate addresses the need for SPDS readings provide Attachment 1.

1.	Determine method for obtaining temperature readings.	Per NOTE "S" of 34SV-SUV-019-1, the candidate determines temperature readings can be obtained from SPDS.	
****2.**	Performs step 7.5.1 of 34SV-SUV-019-1.	From the SPDS screen shot, the candidate has listed the following temperature readings on the surveillance sheet for; 1T47-N001L 120 N004 109 N008, 114 N001M, 114 N005 114	
3.	Performs step 7.5.2 of 34SV-SUV-019-1.	The candidate evaluates the temperatures from step 7.5.1 and determines the maximum temperatute minus the minimum temperature is less than 40ºF.	
4.	Performs step 7.5.3 of 34SV-SUV-019-1.	The candidate evaluates the readings in step 7.5.1. and concludes the highest is less than 275ºF and the lowest temperature is greater than 50ºF.	

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**5.	Performs step 7.5.4 of 34SV-SUV-019-1.	From the SPDS screen shot, the candidate has listed the following temperature readings on the surveillance sheet for; 1T47-N009 176 1T47-N003 175 AND Has listed the temperatures from the previous readings provided in the Initial Conditions.	
**6.	Performs step 7.5.5 of 34SV-SUV-019-1.	The candidate compares the current temperature readings in step 7.5.4 to those from the previous reading and concludes the temperatures DO differ by more than 10°F AND that a CR must be written	
7.	Performs step 7.5.6 of 34SV-SUV-019-1.	The candidate confirms the maximum reading in step 7.5.4 is less than 275°F and the minimum is greater than 50°F AND the maximum temperature minus the minimum temperature of step 7.5.4 is less than 50°F.	
**8.	Performs step 7.5.7 of 34SV-SUV-019-1.	From the SPDS screen shot, the candidate has listed the following temperature readings on the surveillance sheet for; 1T47-N001J, 199 N001K, 164 N002, 157 N001A, 182 N001B, 187 N010. 154	

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
9.	Performs step 7.5.8 of 34SV-SUV-019-1.	The candidate determines the maximum temperature from step 7.5.7 minus the lowest temperature from step 7.5.7 is less than 100°F.	
10.	Performs step 7.5.9 of 34SV-SUV-019-1.	The candidate confirms the maximum reading in step 7.5.7 is less than 275°F and the minimum is greater than 50°F.	
****11.**	Performs step 7.5.10 of 34SV-SUV-019-1.	Using the formula at the bottom of the surveillance page, the candidate calculates the average drywell temperature to be 136.7°F. (Accept ±1°F due to rounding errors)	
****12.**	Addresses any additional actions that are required as a result of the average drywell temperature reading.	The candidate informs the evaluator that since average drywell temperature exceeds 135°F, per note "L" of the surveillance the shift is to place the Drywell Cooling System in "Additional Cooling Operating mode" per 34SO-T47-001-1.	

END TIME:_____

NOTE: The terminating cue shall be given to the operator when:

- Operator completes step 12 of this JPM
- With NO reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: That completes this JPM.

Answer Key

7.5	PANEL - INSTRUMENT / TECH SPEC.	NOTE	REAC MODE	FREQ	T/S OR OPER LIM	N	D
7.5.1	1H11-P657: - 1T47-R611, Pt 9 (1T47-N001L) Pt 11 (1T47-N004) Pt 13 (1T47-N008) 1H11-P654: - 1T47-R612, Pt 9 (1T47-N001M) Pt 11 (1T47-N005)	R,S,C (spec only)	1,2,3	C	NA	120 109 114 114 114	
7.5.2	Confirm max minus min in 7.5.1 ≤ 40°F	B	1,2,3	C		SAT	
7.5.3	Confirm max < 275°F and min > 50°F in 7.5.1	B,C	1,2,3	C	NA	SAT	
7.5.4	1H11-P657: - 1T47-R611, PT 14 (1T47-N009) Previous shift reading Present reading 1H11-P654: - 1T47-R612, PT 10 (1T47-N003) Previous shift reading Present reading	R,S	1,2,3	C	NA	 149 176 148 175	
7.5.5	IF the previous reading differs from the present reading by greater than 10°F OR IF erratic instrument behavior is observed THEN submit a CR to evaluate the Operability of the instruments in step 7.5.4. (SR 3.3.3.1.1 for 3.3.3.1-1(10))	N/A	1,2,3	C	YES IF CR submitted. NR IF NOT required	**YES**	
7.5.6	Confirm max < 275°F and min > 50°F AND max minus min ≤ 50°F in 7.5.4 (SR 3.3.3.1.1 for 3.3.3.1-1(10))	B	1,2,3	C	NA	SAT	
7.5.7	1H11-P657: - 1T47-R611, Pt 7, (1T47-N001J) Pt 8, (1T47-N001K) Pt 10, (1T47-N002) 1H11-P654: - 1T47-R612, Pt 7, (1T47-N001A) Pt 8, (1T47-N001B) Pt 13, (1T47-N010)	R,S	1,2,3	C	NA	199 164 157 182 187 154	
7.5.8	Confirm max minus min in 7.5.7 ≤ 100°F (SR 3.3.3.1.1 for 3.3.3.1.1(10))	B	1,2,3	C		SAT	
7.5.9	Confirm max < 275°F and min > 50°F in 7.5.7	B,C	1,2,3	C	NA	SAT	
7.5.10	Average Drywell Temperature (SR 3.6.1.5.1)	L	1,2,3	C	≤ 150°F	**136.7**	
						INITIALS	
Calculations verified _____					DATE _____	TIME	

(1) DW Temp = $\frac{(7.5.1\ TE's)}{5}(0.63) + \frac{(7.5.4\ TE's)}{2}(0.22) + \frac{(7.5.7\ TE's)}{6}(0.15)$

UNIT 1

READ TO THE CANDIDATE

INITIAL CONDITIONS:

1. Unit 1 is operating at 100 % power.
2. 1T47-R611 is out of service.
3. 1T47-R612 is out of service.
4. The SS has directed this surveillance be completed as a paper version.
5. 1T47-R611 PT 14 and 1T47-R612 PT 10 Previous readings:
   - 1T47-R611 PT 14 (1T47-N009) was 149ºF
   - 1T47-R612 PT 10 (1T47-N003) was 148ºF

INITIATING CUES:

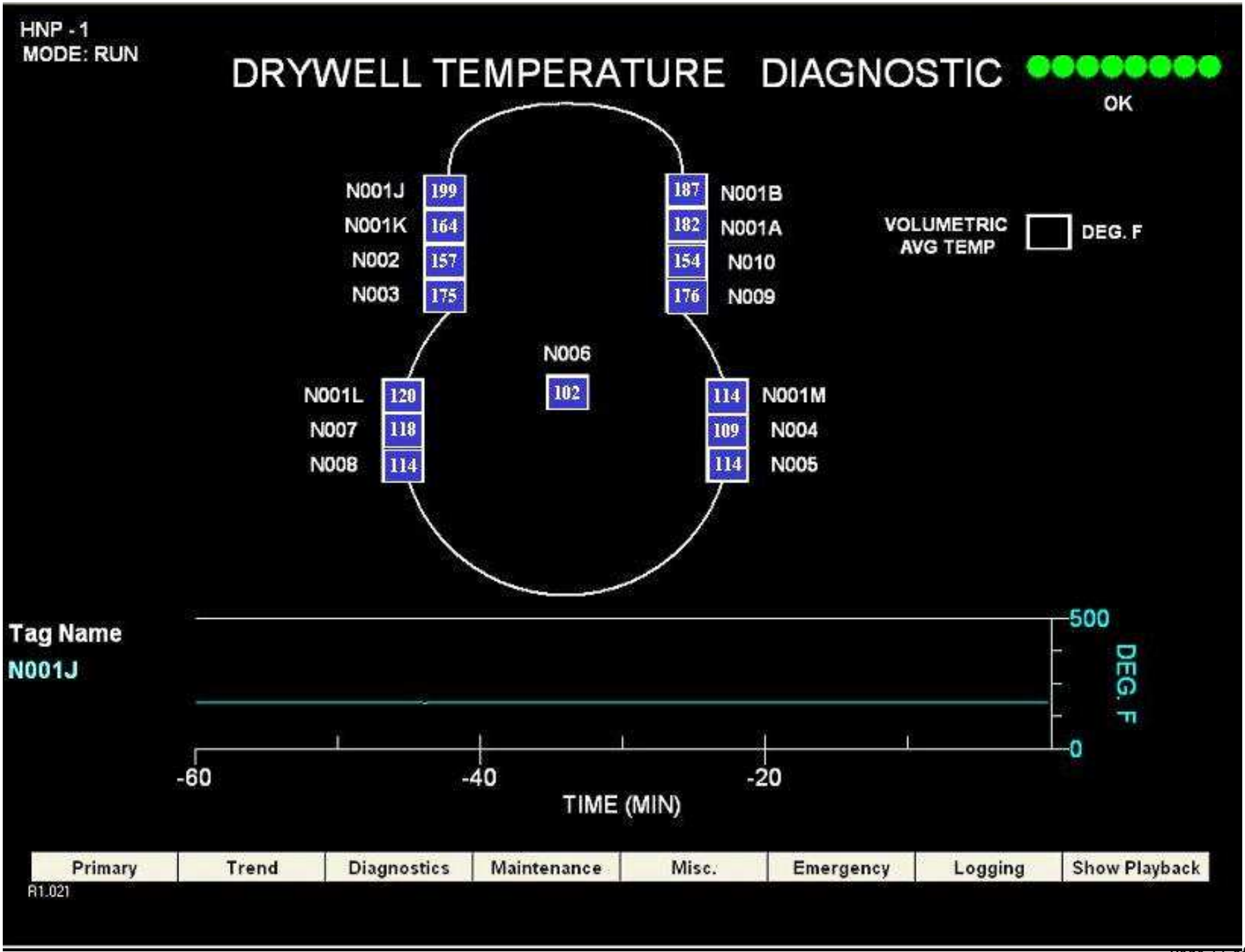
Complete section 7.5 of 34SV-SUV-019-1, SURVEILLANCE CHECKS, which evaluates drywell temperatures,

AND

Inform the evaluator of any actions (if any) that need to be taken as a result of the readings or results obtained from this surveillance.

SHOW ALL WORK.

Attachment 1



Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
ADMIN 5 (ALL)

Title: **EVALUATE AN RWP AND SURVEY MAP**		
Author: **Art Genereux**	**Media Number:** 2016-301 ADMIN 5	**Time:** 10.0 Minutes
Line Technical Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee: **N/A**		**Date:** **N/A**
Approved By (Training Program Manager or Lead Instructor) **Ed Jones**		**Date** **05/30/16**

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FORM TITLE: TRAINING MATERIAL REVISION SHEET

Program/Course Code: **OPERATIONS TRAINING** Media Number: **2016-301 ADMIN 5**

Rev. No.	Date	Reason for Revision	Author's Initials	Supv's Initials
00	08/16/13	Modified 2009-302 NRC Exam & renumbered for ILT-8 NRC Exam. After exam will be renumbered and placed into the LOCT & ILT bank.	ARB	CME
0.1	05/30/16	Modified 2013-301 NRC Exam to select RWP and determine if task can completed without exceeding any limits. After exam will be renumbered and placed into the LOCT & ILT bank as a New JPM.	ABG	ELJ

UNIT 1 (x) UNIT 2 ( )

TASK TITLE:	Comply with radiation work permit requirements during normal or abnormal conditions.
JPM NUMBER:	2016-301 ADMIN 5
TASK STANDARD:	The task shall be completed when the operator has determined: the correct RWP, Estimated Dose, and whether or not the predicted task could be completed without exceeding any limits and why.
TASK NUMBER:	N/A
OBJECTIVE NUMBER:	N/A
TYPE	N/A

PLANT HATCH JTA IMPORTANCE RATING:

RO N/A
SRO N/A

K/A CATALOG NUMBER: G2.3.7

K/A CATALOG JTA IMPORTANCE RATING:

RO 3.5
SRO 3.6

OPERATOR APPLICABILITY: Nuclear Plant Operator (NPO)

GENERAL REFERENCES:	**Unit 1**
	RWP 16-0004 RWP 16-0164 RP surveys Condenser Bay NMP-HP-001, Radiation Protection Standards 60AC-HPX-004-0, Radiation & Contamination Control
REQUIRED MATERIALS:	**Unit 1**
	RWP 16-0004 RWP 16-0164 RP surveys Condenser Bay

APPROXIMATE COMPLETION TIME: 10 Minutes
SIMULATOR SETUP: N/A

EVALUATOR COPY

UNIT 1

READ AND GIVE A COPY TO THE OPERATOR

INITIAL CONDITIONS:

1. Unit 1 is operating at 20% RTP.
2. You will be performing clearance activities in the vicinity of the Main Turbine Control valves.
3. The clearance activities will be performed on the 147 ft elevation in the Condenser Bay.
4. Total estimated round-trip TRANSIT dose is 5 mrem
5. Total estimated time at the job site is 80 minutes

INITIATING CUES:

Use the above conditions and the provided survey map to determine the following:

- The correct RWP for the task
- The projected dose
- If the clearance activity can or cannot be performed. If applicable, identify any limits that are exceeded.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **Initial** Operator Programs:
For OJT/OJE; All procedure steps must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg all steps completed correctly OR ❑ For continuing trg, critical steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences. (AG-TRN-01-0685 Section 6.5.3 provides examples)

START TIME: _____

PROMPT: **AT** this time, give the operator the RWPs and RP Survey Map.

****1.**	Determine the appropriate RWP.	Operator determines that RWP 16-0164 is the correct RWP.	

NOTE: RWP 16-004 can be used to enter High Rad Areas but not Locked High Rad or Very High Rad areas.

****2.**	Determines the estimated dose.	Operator determines the estimated dose, using at location dose rate of 105 mR/hr, for the task is: 80 minutes * 105 mrem /60 min = 140 mrem. Add transit dose of 5 mrem combine dose = 145 mrem (± 1.0 mrem).	

NOTE: The student may say that current plant policy is to leave the area at 80% of the allowable dose (80 mrem).

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**3.	Determine the task can be completed without exceeding limits.	Operator determines that the task cannot be completed without exceeding the task dose alarm of 100 mrem.	

END TIME:_____

NOTE: The terminating cue shall be given to the Applicant when:

- After JPM step #3 is complete.
- With NO reasonable progress, the Applicant exceeds double the allotted time.
- Applicant states the task is complete.

TERMINATING CUE: That completes this JPM.

UNIT 1

READ AND GIVE A COPY TO THE OPERATOR

INITIAL CONDITIONS:

1. Unit 1 is operating at 20% RTP.
2. You will be performing clearance activities in the vicinity of the Main Turbine Control valves.
3. The clearance activities will be performed on the 147 ft elevation in the Condenser Bay.
4. Total estimated round-trip TRANSIT dose is 5 mrem
5. Total estimated time at the job site is 80 minutes

INITIATING CUES:

Use the above conditions and the provided survey map to determine the following:

- The correct RWP for the task
- The projected dose
- If the clearance activity can or cannot be performed.
  If applicable, identify any limits that are exceeded.

SOUTHERN NUCLEAR

Radiation Work Permit

16-0164

UNIT 1

PLANT HATCH

		ACTIVE	REV: 0		Status Color: RED
Job Description	Unit 1 Turbine Building and ConBay Locked High Radiation Area Work. THIS RWP IS NOT TO BE USED FOR GENERAL AREA DOSE RATES GREATER THAN 2 REM.				
Location	U1 TURBINE BUILDING ALL ELEVATIONS				
HP Coverage	Authorization	Briefing	**START DATE** 1/1/2016 12:00 AM	**END DATE**	12/31/2016 11:59 PM
CONTINUOUS	SINGLE USE	SINGLE USE	Job Supv. MSOS Ext. 2954		

Radiological Conditions

> 0.3 DAC PART or > 1 DAC NOBLE GAS

> 100 mrad/hr/100cm2 or Alpha Level 3 or lower

> 1000 mrem/hr or >/= 200 mrem/individual/entry

Dosimetry

DIGITAL ALARMING DOSIMETER (DAD)

TELEMETRY (SEE INSTRUCTIONS)

WHOLE BODY OSLD

Protective Clothing Requirements

REFER TO WORKER/SPECIAL INSTRUCTIONS

Respirators

RESP

Usage is Conditional per RP

Tasks

Description	DAD Alarms	
	Dose (mr)	Rate (mr/h)
Mechanical Pump/Valve Repair	130	1000
Surveillance/Calibration	130	1000
Inspection, Walkdown	75	1000
Decon/ Pull Laundry/ Trash	20	1000
Scaffold/Insulation Install/Remove	130	1000
Shielding-Install/ Remove	75	1000
Miscellaneous Maintenance	150	1500
Leakage Repair	150	1500
In-Leakage Detection	75	1000
Brush Insp/Enclosure	15	1000
Mechanical Pump/Valve PM	80	1000
Electrical Pump/Valve Repair	130	1000
Electrical Pump/Valve PM	80	1000
RP Surveys/Constant Coverage	150	1800
OPs Clearances; Venting / Filling	100	1400

Instructions

Telemetry dosimetry is required for all LHRA entires (within range) except for entries where exposure is expected to be < or = 15 mrem/person/entry and R.P. Supervisor approvalRP Foreman approves.

Fire retardant PC's required for welding/torching per job supervisor or Health & Safety.

Lab Coat & Latex gloves are minimum dress requirements for outside person pulling drums.

Change gloves after handling highly contaminated equipment.

Water resistant suit &/or high top boots may be required for wet or highly contaminated environments.

If H2 Injection flow is reduced manually, RP Supervisor is to verify flow rate with the control room prior to Conbay entry. See NMP-HP-204 Attachment 1 for guidance.

This RWP is not to be used for general area dose rates greater than 2 Rem/hr.

Heat stress potential is elevated with Conbay entries. Ensure heat stress stay times are established prior to entry per NMP-FLS-002.

High noise level at power; DAD alarms are difficult if not impossible to hear. Read dosimeter frequently.

Prepared	Group Name	Approved	Suspended	Terminated
Prepared	Health Physics Staff	01/15/2016 01-15-2016 by DDGRIFFI		

Radiation Work Permit
16-0004

UNIT
0

PLANT HATCH

		ACTIVE	REV: 0		Status Color: GOLD		
Job Description	Operations Inspection, Surveillance and Fire Watch - This RWP not for entries into Locked High Rad or Very High Rad Areas						
Location	GENERAL PLANT LOCATION						
HP Coverage	Authorization	Briefing	START DATE	12/31/2015 3:00 PM	END DATE	12/31/2016 11:59 PM	
INTERMITTENT	INDIVIDUAL	INDIVIDUAL	Job Supv. SOS Ext. 5959				

Radiological Conditions

Airborne Radioactivity >0.3 DAC

Contamination <100Mrad/100cm2

Dose Rate <1000 mrem/hr. Refer to current survey of work area.

Dosimetry

DIGITAL ALARMING DOSIMETER (DAD)

WHOLE BODY OSLD

Protective Clothing Requirements

REFER TO RP FOR INSTRUCTIONS

Respirators

Usage is Conditional per RP

Tasks

Description	DAD Alarms	
	Dose (mr)	Rate (mr/h)
OPS Rounds, Clearances, Surveil.	25	250
OPS Control Room Activities	10	50
Supervision / Observation	20	100
JPMs /Training Activities	10	75
Ops (Non Rounds) High Rad Activities	20	300

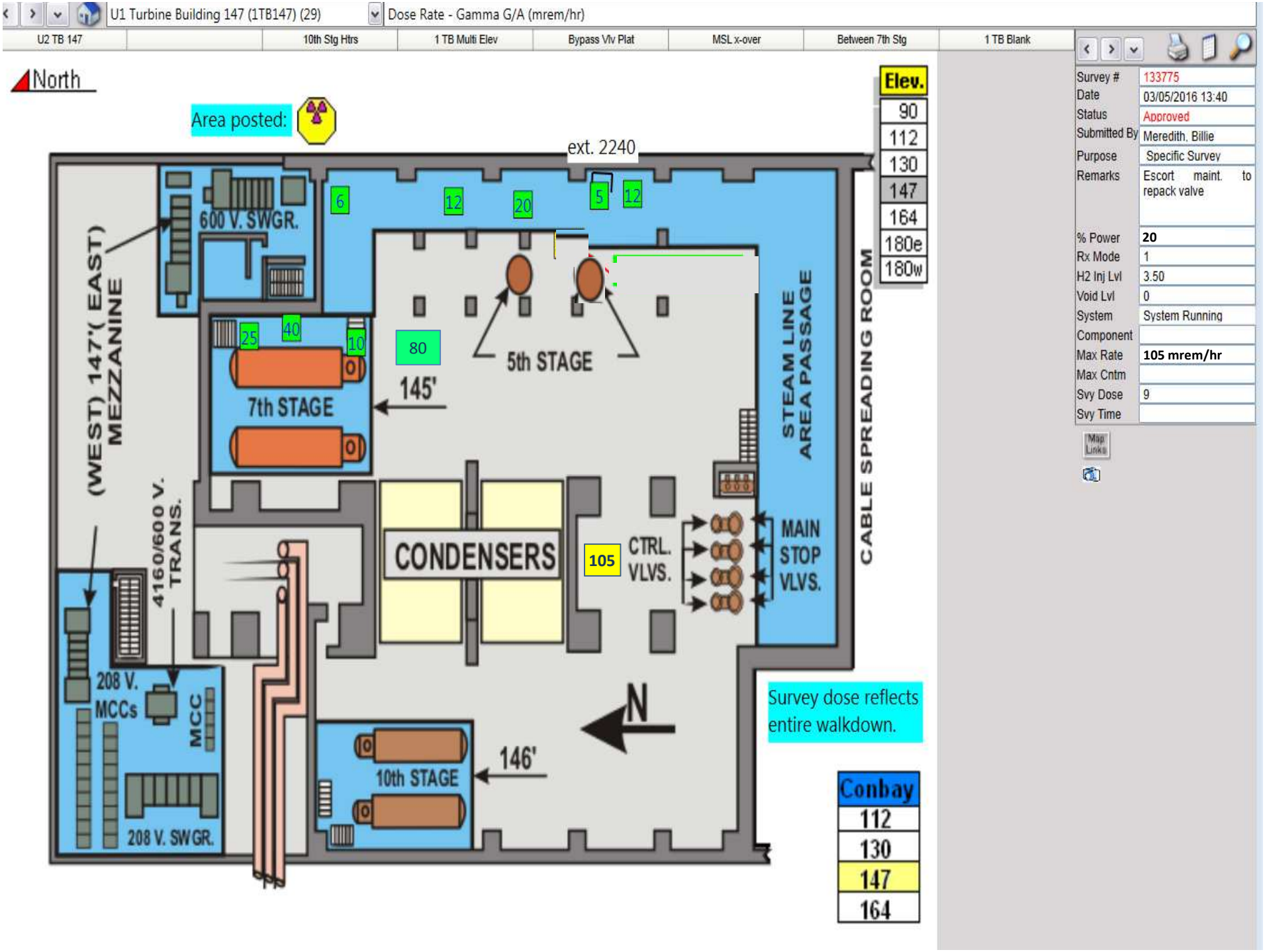
Instructions

Use Cameras in lieu of entry, when possible, to reduce exposure.

Entries into Locked High Rad or Very High Rad areas are not permitted on this RWP.

Briefing required prior to entering a High Radiation Area

Prepared	Group Name	Approved	Suspended	Terminated
Prepared	Health Physics Staff	12/30/2015 12-30-2015 by THMARION		


U1 Turbine Building 147 (1TB147) (29)
Dose Rate - Gamma G/A (mrem/hr)
U2 TB 147
10th Stg Htrs
1 TB Multi Elev
Bypass Vlv Plat
MSL x-over
Between 7th Stg
1 TB Blank
North
Area posted:
ext. 2240
Elev.
90
112
130
147
164
180e
180w
600 V. SWGR.
(WEST) 147'(EAST) MEZZANINE
4160/600 V. TRANS.
208 V. MCCs
MCC
208 V. SWGR.
7th STAGE
5th STAGE
10th STAGE
145'
146'
80
105
CONDENSERS
CTRL. VLVS.
MAIN STOP VLVS.
STEAM LINE AREA PASSAGE
CABLE SPREADING ROOM
N
Survey dose reflects entire walkdown.
Conbay
112
130
147
164
Survey # 133775
Date 03/05/2016 13:40
Status Approved
Submitted By Meredith, Billie
Purpose Specific Survey
Remarks Escort maint. to repack valve
% Power 20
Rx Mode 1
H2 Inj Lvl 3.50
Void Lvl 0
System System Running
Component
Max Rate 105 mrem/hr
Max Cntm
Svy Dose 9
Svy Time
Map Links

Southern Nuclear Company

Operations Training
Job Performance Measure (JPM)

FINAL
ADMIN 6 SRO ONLY

Title: **Emergency Classification - Complete NMP-EP-110 Checklist 1**		
Author: **Anthony Ball**	**Media Number:** 2016-301 ADMIN 6	**Time Critical:** 15.0 Minutes
Line Technical Review By (N/A for minor revisions) **N/A**		**Date:** **N/A**
Reviewed by Instructional Technologist or designee (N/A for minor revisions) **N/A**		**Date:** **N/A**
Approved By (Training Program Manager or Lead Instructor) **Ed Jones**		**Date** **05/30/16**

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Course Number	Program Name	Media Number
N/A	OPERATIONS TRAINING	2016-301 ADMIN 6

Ver. No.	Date	Reason for Revisions	Author's Initials	Sup's Initials
0.0	04/30/07	Initial development	CME	RAB
1.0	11/04/10	Added Task and HU Pass/Fail criteria. Updated Southern Company logo.	ELJ	CME
2.0	01/12/11	Updated references to NMP-EP-110 and NMP-EP-111	MCK	DNM
3.0	06/07/12	General revision for use on NRC Exam 2012-301. After NRC Exam, Media Number will be changed to LR-JP-25061-03.	ARB	CME
3.1	03/30/16	Minor revision to match procedure and use on ILT-10 NRC Exam. Reviewed JPM against current procedure. Changed "Media Number" to 2016-301 ADMIN 6. This JPM will become LR-JP-25061 after NRC Exam.	ARB	ELJ

Line Contributors

The following individuals contributed to the development of this lesson plan.

Ver. No.	List of Contributors

UNIT 1 (X) UNIT 2 (X)

TASK TITLE:	**Emergency Classification - Complete NMP-EP-110 Checklist 1**
JPM NUMBER:	2016-301 ADMIN 6
TASK STANDARD:	This task shall be successfully completed when the event has been classified and NMP-EP-110 Checklist 1, step 1 through step 6, has been correctly completed.

TASK NUMBER: 200.052

OBJECTIVE NUMBER: 200.052.A

PLANT HATCH JTA IMPORTANCE RATING:

RO 4.67

SRO 4.04

K/A CATALOG NUMBER: Generic 2.4.41

K/A CATALOG JTA IMPORTANCE RATING:

RO 2.30

SRO 4.1

OPERATOR APPLICABILITY: Senior Reactor Operator

GENERAL REFERENCES:	**Unit 1 & 2**
	NMP-EP-110, Ver 8.1 NMP-EP-111, Ver 11.0

REQUIRED MATERIALS:	**Unit 1 & 2**
	NMP-EP-110, Ver 8.1 NMP-EP-111, Ver 11.0

APPROXIMATE COMPLETION TIME: 15.0 Minutes

SIMULATOR SETUP: NA

EVALUATOR COPY

UNIT 1 & 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. You are the On-Shift Shift Manager.
2. Both Units were operating a 100% RTP when they both experienced a Loss of Station Power (LOSP).
3. The following Unit 1 conditions exist:
   - EDG 1A, 1B, and 1C start attempts have been unsuccessful from the Main Control Room
   - Other plant systems operated as expected
4. The following Unit 2 conditions exist:
   - EDG 2A successfully started and operated as expected
   - EDG 2C start attempts have been unsuccessful
   - Other plant systems operated as expected
5. Maintenance and System Operators have been dispatched to locally start the remaining EDGs.
   - Maintenance informs the Main Control Room that EDG 1A will be ready to be started in 30 minutes.
   - Maintenance informs the Main Control Room that EDG 1B & EDG 1C will be ready to be started in 3 hours.

INITIATING CUES:

DECLARE the event using NMP-EP-110, Checklist 1.

THIS IS TIME CRITICAL.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)

For **INITIAL** Operator Programs:
For OJT/OJE; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.
For License Examinations; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

	IF	THEN
PASS	❑ Human performance tools, safety, PPE met (1), **AND** ❑ For initial trg **all** steps completed correctly OR ❑ For continuing trg, **critical** steps (if used) completed correctly	❑ Mark the JPM as a **PASS**
FAIL	❑ Above standards not met	❑ Mark the JPM as a **FAIL**

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences. (AG-TRN-01-0685 Section 6.5.3 provides examples)

NOTE: The **CLASSIFICATION** must be made within 15 minutes of the initial prompt and the Student states they understand the initial conditions.

NOTE: Provide a copy of Checklist 1of NMP-EP-110 and Attachment 1 of JPM.

START TIME:_____

1.	Operator identifies the procedure needed to perform the task.	The operator has OBTAINED Check List 1, which is contained in NMP-EP-110.	
2.	**Determine** the appropriate Initiating Condition Matrix for classification of the event based on the current operating mode: HOT IC/EAL Matrix Eval Chart COLD IC/EAL Matrix Eval Chart Both HOT & COLD IC/EAL Matrix (Checklist 1, Step 1)	On Checklist 1, Step 1, The operator has selected **HOT IC/EAL** Matrix Evaluation Chart	

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
3.	**Evaluate** the status of the fission product barrier using Figure 1, Fission Product Barrier Evaluation. **Select** the condition of each fission product barrier: Fuel Cladding Integrity ********** ********** (Checklist 1, Step 2)	On Checklist 1, Step 2.a, The operator has selected **INTACT** for Fuel Cladding Integrity.	
4.	**Evaluate** the status of the fission product barrier using Figure 1, Fission Product Barrier Evaluation. **Select** the condition of each fission product barrier: ********** Reactor Coolant System ********** (Checklist 1, Step 2)	On Checklist 1, Step 2.a, The operator has selected **INTACT** for Reactor Cooling System.	
5.	**Evaluate** the status of the fission product barrier using Figure 1, Fission Product Barrier Evaluation. **Select** the condition of each fission product barrier: ********** ********** Containment Integrity (Checklist 1, Step 2)	On Checklist 1, Step 2.a, The operator has selected **INTACT** for Containment Integrity.	
6.	**Determine** the highest applicable fission product barrier Initiating Condition (IC). (Checklist 1, Step 2.b.)	On Checklist 1, Step 2.b, The operator has selected **NONE**	

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
7.	**Evaluate** AND **determine** the highest applicable IC/EAL using the Matrix Evaluation Chart(s) identified in step 1 THEN **Go To** step **4**. (Checklist 1, Step 3)	On Checklist 1, Step 3. The operator has identified **SS1**	
8.	**Check** the highest emergency classification level identified from either step 2b or 3: **Classification** ********** (Checklist 1, Step 4)	On Checklist 1, Step 4. The operator has selected **Site-Area** as the Classification.	
**9.	**Check** the highest emergency classification level identified from either step 2b or 3: ********** **Based on IC #** (Checklist 1, Step 4)	On Checklist 1, Step 4. The operator has selected **SS1** for the Based on IC#. SS1 is highest and current EAL for Unit 1. Current EAL for Unit 2 is SA5	

NOTE: It is expected that the IC# be filled in on Checklist 1 (in the above step).

10.	Remarks (**Identify** the specific EAL, as needed). (Checklist 1, Step 4)	On Checklist 1, Step 4. The operator has written **Loss of both SATs and failure of EDGs to power Emerg Buses and at least 1 Emerg Bus not restored within 15 minutes** in the space provided.	

NOTE: If follow-up questioning reveals that a classification was declared and based on another IC #, the classification should be evaluated for validity.

STEP #	PERFORMANCE STEP	STANDARD	SAT/UNSAT (COMMENTS)
**11.	**Declare** the event by approving the Emergency Classification. (Checklist 1, Step 5)	On Checklist 1, Step 5. The operator has **signed their name** as the Emergency Director in the space provided.	
**12.	Fill in the Date in the space provided. (Checklist 1, Step 5)	On Checklist 1, Step 5. The operator has entered the **current Date** in the space provided.	
**13.	Fill in the Time in the space provided. (Checklist 1, Step 5)	On Checklist 1, Step 5. The operator has entered the **current Time** in the space provided. **Time Critical Stop Time:** _____. **NOTE:** For this step to be completed considered SAT, the time entered must be within 15 minutes of the time recorded on the Initial Conditions sheet provided to the operator.	

END TIME:_____

NOTE: The terminating cue shall be given to the operator when:

- Operator completes step 13 of this JPM.
- With NO reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

TERMINATING CUE: We will stop here.

***** INSTRUCTOR ANSWER KEY *****

Checklist 1 - Classification Determination

NOTE

Key Parameters should be allowed to stabilize to accurately represent plant conditions prior to classifying an event

Initial Actions

Completed by

1. **Determine** the appropriate Initiating Condition Matrix for classification of the event based on the current operating mode: — Student
   - ☑ HOT IC/EAL Matrix Evaluation Chart (**Go To** Step **2)** to evaluate the Barriers)
   - ☐ COLD IC/EAL Matrix Evaluation Chart (**Go To** Step **3**)
   - ☐ Both HOT & COLD IC/EAL Matrix Evaluation Chart apply (**Go To** Step **2)**
2. **Evaluate** the status of the fission product barrier using Figure 1, Fission Product Barrier Evaluation.
   a. **Select** the condition of each fission product barrier: — Student

	LOSS	POTENTIAL LOSS	INTACT
Fuel Cladding Integrity	☐	☐	☑
Reactor Coolant System	☐	☐	☑
Containment Integrity	☐	☐	☑

   b. **Determine** the highest applicable fission product barrier Initiating Condition (IC): — Student

(select one) ☐ FG1 ☐ FS1 ☐ FA1 ☐ FU1 ☑None

3. **Evaluate** AND **determine** the highest applicable IC/EAL using the Matrix Evaluation Chart(s) identified in step 1 THEN **Go To** step **4**. — Student

Hot IC# **SS1** Unit **1** and/or Cold IC# _____ Unit___ or ☐ None

4. **Check** the highest emergency classification level identified from either step 2b or 3: — Student

Classification	Based on IC#	Classification	Based on IC#
☐ General		☐ Alert	
☑ Site-Area	SS1	☐ NOUE	
		☐ None	N/A

Remarks (**Identify** the specific EAL, as needed): **A loss of both SATs and failure of EDGs to power Emerg Buses and at least 1 Emerg Bus not restored within 15 minutes.**

5. **Declare** the event by approving the Emergency Classification.

Student Date: ***** / ***** / **** Time: ****** — Student

Emergency Director

6. **Obtain** Meteorological Data (not required prior to event declaration):

Wind Direction (from) **130** Wind Speed **5** Stability Class **D** Precipitation **0** — Student

7. **Initiate Attachment 2, Checklist 2 - Emergency Plan Initiation.** _____

UNIT 1 & 2

READ TO THE OPERATOR

INITIAL CONDITIONS:

1. You are the On-Shift Shift Manager.
2. Both Units were operating a 100% RTP when they both experienced a Loss of Station Power (LOSP).
3. The following Unit 1 conditions exist:
   - EDG 1A, 1B, and 1C start attempts have been unsuccessful from the Main Control Room
   - Other plant systems operated as expected
4. The following Unit 2 conditions exist:
   - EDG 2A successfully started and operated as expected
   - EDG 2C start attempts have been unsuccessful
   - Other plant systems operated as expected
5. Maintenance and System Operators have been dispatched to locally start the remaining EDGs.
   - Maintenance informs the Main Control Room that EDG 1A will be ready to be started in 30 minutes.
   - Maintenance informs the Main Control Room that EDG 1B & EDG 1C will be ready to be started in 3 hours.

INITIATING CUES:

DECLARE the event using NMP-EP-110, Checklist 1.

THIS IS TIME CRITICAL.

ATTACHMENT 1
METEOROLOGICAL DATA

Wind Direction (from)	130
Wind Speed	5
Stability Class	D
Precipitation	0