

Scenario Summary

DRAFT**Facility:** E. I Hatch**Scenario No.:** 4-01 **Op-Test No.:** 2009-301

Initiating Conditions:	Unit 2 is at 60% performing a reactor start-up. All equipment is operable.
Turnover	Continue increasing reactor power using the reactivity plan.
<p>Summary:</p> <ul style="list-style-type: none"> • Event 1: Component/TS; As the team prepares to raise reactor power, the “2A” Reactor Recirculation pump seals will develop a failure that results in reactor coolant leaking into the Drywell (DW). The team will trip and isolate the “2A” Reactor Recirc pump. The Shift Supervisor (SS) will address TS for coolant leakage and single Recirc loop operation. • Event 2: Component/TS; The Recirc pump seal leak (Event 1) causes DW pressure to increase. The team will receive a P603 alarm that will direct DW venting to be placed in service. The BOP operator will attempt to start Standby Gas Treatment (SBGT). The SBGT suction dampers will not open for the first SBGT system the operator attempts to start. The opposite SBGT train will then be started and DW venting will be aligned. The SS will address TS for an inoperable train of SBGT. • Event 3: Reactivity; The tripped Recirc pump (Event 1) will result in operation inside the Region of Potential Instabilities of the Power-To-Flow map. The team will insert control rods to exit the region. • Event 4: Normal; The power reduction (Event 1) will result in Feedwater flow decreasing to the point that their minimum flow valves cycle open. The team will remove one RFPT from service. • Event 5: Component/TS; SRV “2G” will inadvertently open. The team will attempt to close the SRV IAW the abnormal procedure for a stuck open SRV. The SRV will go closed after the team directs the fuses to be pulled (Critical task). If Torus temperature exceeds 95°F, the team will place RHR in Suppression Pool Cooling. The SS will address TS for the failed SRV. • Event 6: Major/Component; The “2C” Station Service Air Compressor (SSAC) will trip. The “2B” SSAC will not auto start, and an operator will start the “2A” SSAC. • Event 7A: Major/Component; The running RFPT will trip, resulting in Reactor Water Level (RWL) decreasing below +3 inches. The reactor will scram/be scrambled. An ATWS condition will exist, requiring manual control rod insertion (Critical task). RCIC will start, but RPV level will decrease since makeup requirements exceed RCIC capacity. HPCI will NOT auto start. • Event 7B: Component; RCIC will trip. If the team has not started a RFPT (Event 7A) to control reactor water level, the trip of RCIC will leave the Feedwater system as the only high pressure source of injection. The team will start and use a RFPT that was previously shutdown (Event 4) to control RWL above -185 inches (Critical Task). 	

Critical Tasks and ES 304-4 Attributes

DRAFT**Facility:** E. I Hatch**Scenario No.:** 4-01 **Op-Test No.:** 2009-301**Critical Tasks**

- Remove fuse to close SRV "G" prior to entering the unsafe area of the Boron Injection Initiation Temperature curve (Event 5).
- Commence insertion of control rods before entering the unsafe region of the Heat Capacity Temperature Limit graph (Event 7A).
- Maintain RWL above -185 inches. This is the lowest level that corresponds to adequate core cooling with injection (Event 7B).

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	6	1. Recirc Pump Seal failure 2. SBGT suction dampers 3. SRV fails open 4. Failure of SSAC 5. Control Rods fail to insert 6. HPCI Fails to start 7. RCIC trip
2.	Malfunctions After EOP Entry	1-2	2	1. HPCI Fails to start 2. RCIC Trip
3.	Abnormal Events	2-4	3	1. SRV Fails Open 2. Recirc Pump Trip 3. Loss of Air
4.	Major Transients	1-2	1	1. Reactor scram/ATWS
5.	EOPs entered, requiring substantive actions	1-2	2	1. RCA EOP Flow Chart 2. RC EOP Flow Chart
6.	EOPs contingencies requiring substantive actions	0-2	1	1. CP-3 ATWS Level Control Flow Chart
7.	Critical Tasks	2-3	3	1. Pull fuses for SRV 2. Insert Rods during ATWS 3. Maintain RWL >-185 inches

Appendix D

Scenario Outline

Form ES-D-1

DRAFT

Facility: E. I Hatch **Scenario No.:** 4-01 **Op-Test No.:** 2009-301

Examiners: _____ **Operators:** _____ **SRO**
 _____ **RO**
 _____ **BOP**

Initial Conditions. : Plant is at 60% power.

Turnover: A plant startup is in progress. Increase reactor power IAW the reactivity plan.

Event No.	Malf. No.	Event Type*	Event Description
1	mfB31_39A mfB31_45A aoB31-603A	C (ATC) TS (SRO)	Recirc Pump "A" seal leakage causes DW leakage. Pump is secured and isolated.
2	ET-T46-01 ET-T46-02	C (BOP) TS (SRO)	Vent the Drywell. Suction valves for the first SBGT started will fail to open, examinee must use opposite train to vent the Drywell
3		R (ATC)	Decrease reactor power by inserting control rods to return to the acceptable region of the power to flow map.
4		N (BOP)	Remove one RFPT from service
5	mfB21_130G rfB21_306	C (ATC)	Stuck open SRV, 2B21-F013G, only a tracking RAS.
6	mfP51_222C mfP51_222A	C (BOP)	Loss of "2C" SSAC. "2B" SSAC does not start. Manually start "2A" SSAC.
7A	mfN21_87A mfN21_87B mfE41_107 mfC11_211	M (ALL) C (BOP)	The running RFPT trip, the reactor scrams/is scrammed and all rods do not insert (ATWS). HPCI fails to start (2E41-F001 failed closed). RCIC starts but RWL decreases since makeup requirements exceed RCIC capacity. RPV level will go below -185" if a RFPT is not used to control RPV level.
7B	mf2E51_110	C (BOP)	After RWL band has been lowered to below -60" AND the MSIVs have been over-ridden, RCIC will trip. RPV level will go below -185" if a RFPT is not used to control RPV level.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

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

Time	Position	Applicant's Actions or Behavior
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		<p><u>Simulator Operator</u></p> <p>With Chief Examiners Permission:</p> <p>Call control room BOP operator and request the following (this action will ensure the ATC operator responds to the Recirc Seal leak):</p> <ul style="list-style-type: none"> • As the Chemistry Lab, request a reading from the Pre-Treatment Radiation Monitor, 2D11-K601.
		<p><u>Simulator Operator</u></p> <p>When the candidate pulls 34GO-OPS-005 AND before power is increased; press (RB-1) to activate:</p> <ul style="list-style-type: none"> • mfB31_39A (30/30) • mfB31_45A (90/50) • aoB31-603A (50/10)
	ATC	<ul style="list-style-type: none"> • Receives Annunciator "Outer Seal A Leak Detection Flow High", 34AR-602-116-2 • 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 failed. • Notifies SS that the Outer Seal on Recirc A has 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 • 657 Panel Alarm – Multipoint Temperature RCDR 247-R626 Temperature High 657-025

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

Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> • Receives and Acknowledges the following Annunciators: <ul style="list-style-type: none"> ○ Recirc loop A Out of Service 602-127, ○ Speed Control A signal failure 602-132 ○ Fluid Drive A Scoop Tube Lock 602-126 ○ RBM Downscale 603-211 ○ Rod Out Block 603-238 ○ Heater Trouble Alarm 650-135 (may come in and clear) • Closes 2B31-F031A, Reactor Recirc A Pump Disch Vlv <ul style="list-style-type: none"> ○ Receive annunciator: Recirc Flow Limit 603-134 • 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." <ul style="list-style-type: none"> ○ Notify Plant Management and Load Dispatcher
		<p><u>Simulator Operator</u></p> <p>When requested to close 2B31-F008, press (RB-2) to activate:</p> <ul style="list-style-type: none"> • rfB31_29, Recirc mini purge B31-F016A closure (simulates B31-F008A being closed) <p>AND THEN</p> <ul style="list-style-type: none"> • MODIFY aoB31-603A to 10 @ 40
		<p><u>Simulator Operator</u></p> <p>If another DW leakage check is requested, report:</p> <ul style="list-style-type: none"> • Drywell floor drain leakage has decreased to 1.8 gpm.

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Event Description: Drywell venting, failed SBTG.

Time	Position	Applicant's Actions or Behavior
		Note; This event will begin when an operator is given direction to begin venting the Drywell due to the Recirc Pump seal leak in Event 1
	SS	<ul style="list-style-type: none"> When venting is required; Directs Operator to vent the drywell.
	BOP	<ul style="list-style-type: none"> 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 at the 2H11-P657 panel to start SBTG 2A or 2B. Determines that 2T46-F001 (A or B) and 2T46-F003 (A or B) for the selected train will not open Informs SS that SBTG (A or B) cannot be started due to suction valve failure. <p><i>Note: Event triggers will insert overrides to keep the first valves that are operated from opening and then remove the event trigger from the opposite SBTG train. The examinee will not be successful with the first SBTG train; however, the second SBTG train used will be successful.</i></p>
	SS	<ul style="list-style-type: none"> Enters Tech Specs 3.6.4.3 for the SBTG with the failed suction dampers (7 day RAS to operable status) Direct that maintenance be contacted to determine problem with failed SBTG suction dampers.

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Event Description: Insert control rods to return to safe area of Power to flow map

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> • IAW 34G0-OPS-005-2 Power Changes, • Within 15 minutes of entering the Immediate Exit Region of the Power to Flow map, directs operator to exit the region by inserting control rods. • Has a control rod movement brief per 34GO-OPS-065-0
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • If the Team calls for the STA or Reactor Engineering for rod movement recommendations, then recommend: <ul style="list-style-type: none"> ○ “Insert rods in reverse order, starting with the current rod group.”
	SS	<ul style="list-style-type: none"> • Directs the operator to insert the rods to the insert limit after consulting with the STA.
	ATC	<ul style="list-style-type: none"> • Inserts control rods per 34GO-OPS-065-0, starting with control rod GROUP 51. • During rod insertion, rod steps will be performed in reverse sequential order, starting at the highest numbered step. (** rod steps are not required to be performed sequentially, but must be positioned to their RWM insert limit prior to inserting lower numbered groups). <ul style="list-style-type: none"> • Selects Rod • Places Control Rod movement switch to the IN position • Verifies Rod moves using Rod display information and Rx and Generator power decreasing.

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Event Description: Remove one RFPT from service

Time	Position	Applicant's Actions or Behavior
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		<ul style="list-style-type: none"> • Reactor Feed Pump Shutdown <ul style="list-style-type: none"> ○ Confirm Feedwater Flow is less than 7 Mlbm/hr. ○ Confirm RFPT's are in Automatic control on 2C32-R600, Master Controller. ○ Place 2C32-R601A (B), RFP A (B) M/A Station, in Manual. ○ Decrease RFPT 2A (2B) speed with RFP A (B) M / A Station until the other RFP is controlling reactor vessel level. ○ Place the RFPT, 2A (2B) TMR Mode Switch to SS. Confirm Speed Setter (yellow) light illuminates. ○ Take 2N21-C005A (B), RFPT 2A (2B) Speed Setter, to lower, until turbine speed stops decreasing, panel 2H11-P650. ○ Dispatch SO to confirm open RFPT drain valves ○ Confirm HP Stop Valves (2N11-F012A or B) and LP Stop Valve (2N38-F009A or B) close (P650) <p>NOTE: The team can elect to trip the RPFT, if so;</p> <ul style="list-style-type: none"> ○ Receives alarm; RFPT 2A OR B Tripped 650-325 (A RFPT) 650-326 (B RFPT) ○ When RFPT 2A (2B) speed is zero (the RFPT may windmill if the suction valve and min flow are open and will not go on TG), confirm 2N39-C002A (B), RFPT 2A (2B) Turning Gear motor, STARTS and Turning Gear engages (subsection 7.1.7 has instructions for placing a RFPT on TG).

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Event Description: Stuck open SRV, 2B21-F013G.

Time	Position	Applicant's Actions or Behavior
		With Chief Examiners Permission: Simulator Operator enters mfB21_130G, SRV G fails open. (RB-3)
	All	<ul style="list-style-type: none"> Receives "Safety Blowdown Pressure High," 34AR-602-311-2 and "Safety Blowdown Valves Leaking," 34AR-603-122-2 alarms
	SS	<ul style="list-style-type: none"> Directs operator to enter 34AB-B21-003-2, Failure of Safety/Relief valves, and dispatch an operator to pull the fuses for SRV "G."
	ATC	<ul style="list-style-type: none"> Enters 34AB-B21-003-2, Failure of Safety/Relief valves
	ATC	<ul style="list-style-type: none"> Determines that SRV "G" is open Manually cycles SRV "G" Attempts to reset ADS as follows: <ul style="list-style-type: none"> Depresses the ADS Logic A Timer Reset pushbutton Depresses the ADS Logic B Timer Reset pushbutton Attempts to reset LLS as follows: <ul style="list-style-type: none"> Depresses the LLS Channel A/C Reset pushbutton. Depresses the LLS Channel B/D Reset pushbutton. Informs SS that the "G" SRV is open and the fuses will have to be pulled for the valve Notifies SSS to pull the Fuses for SRV "G." <p>(Critical Task – Remove fuse to close SRV "G" prior to entering the unsafe area of the Boron Injection Initiation Temperature curve)</p>
		Simulator Operator, 2 Minutes after the request was made to pull fuses for the SRV "G", enters rfB21_306 to simulate pulling the fuses for SRV "G." Then, Notify the crew that the fuses have been pulled for SRV "G." Intent is for Torus Temperature to remain below 95°F. (RB-4)

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Event Description: Stuck open SRV, 2B21-F013G.

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> • Initiates a Tracking RAS for TS LCO 3.6.1.6 • Directs operators to verify that the "G" SRV is closed, after the fuses are pulled.
	ATC	<ul style="list-style-type: none"> • Confirms that SRV "G" is closed by monitoring: <ul style="list-style-type: none"> ○ SRV tailpipe temperature decrease ○ Torus level stabilizing ○ Torus Temp stabilizing ○ Rx and Generator power returns to the pre-event level
	ATC	<ul style="list-style-type: none"> • Resets the SRV leak detection by placing the Leak Detection Logic A Reset key lock switch to Reset position and back to Normal position and confirm that the Amber SRV indicating lights have Extinguished. • Informs the SS that SRV "G" is closed.
	SS	<ul style="list-style-type: none"> • 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.

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Event Description: Loss of "2C" SSAC, "2B" SSAC does not start, manually start "2A" SSAC

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, as directed by the Chief Examiner, Insert mfP51_222C, Air Compressor trip. (RB-5)
	BOP	<ul style="list-style-type: none"> • Responds to "PANEL 2H11-P700 SYSTEM TROUBLE" annunciator on 2H11-P650 panel. • Responds to annunciator "AIR CMPSR 2C Tripped/ Shutdown."34AR-700-233-2 • Addresses the abnormal procedure 34AB-P51-001-2, "Loss Of Instrument and Service Air System or Water Intrusion Into The Service Air System." <ul style="list-style-type: none"> ○ Places the control switch for "B" compressor to start at 2H11-P650. ○ Recognizes "B" air compressor will not start. ○ Places the switch for "A" air compressor to start, the air compressor does start. ○ Places the control switch 2P51-S3, on Panel 2H11-P650 for Air Comp 2P51-C001C to Off Pull-To-Lock ○ Contacts Health Physics. ○ Has the SSS to locally check Air Compressor 2P51-C001C Microprocessor for cause of Trip. ○ Investigate cause of 2P51-C001B fail to run. ○ Notifies the SS of the status of the air system.
	SS	Notifies maintenance to begin investigating the trip condition on C Air Compressor and failure on the "B" SSAC.
		<p>Simulator operator: If called as Unit One SS or ATC with request to cross-tie air systems report the Unit One is operating on only the "A" compressor and it will not supply both units, therefore; cannot cross-tie.</p>

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Event Description: RFPT Trip / ATWS actions / HPCI Failure to Start

Time	Position	Applicant's Actions or Behavior
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		<p>Simulator Operator: When directed by the Chief Examiner;</p> <p><u>Only activate ONE</u> of the following malfunctions:</p> <ul style="list-style-type: none"> • If the "A" RFPT is in service, Insert mfN21_87A (RB-6) • If the "B" RFPT is in service, Insert mfN21_87B (RB-7)
	All	<ul style="list-style-type: none"> • Diagnose trip of Feedwater pump / Loss of all High Pressure Feedwater Injection
	SS	<ul style="list-style-type: none"> • Direct NPO to scram the reactor <ul style="list-style-type: none"> ○ Enters RC or RC-A EOP Flowchart. ○ Directs CBO to perform RC-1 placard. ○ Directs BOP to perform RC-2 and RC-3 placards.
	SS	Enters RC-A Flowchart (ATWS) and CP3 (ATWS Level Control).
		<ul style="list-style-type: none"> • Directs ATC to: <ul style="list-style-type: none"> ○ Confirm the reactor Mode Switch in Shutdown. ○ Confirm ARI Initiation. ○ Confirm Recirc runback to minimum.

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Event Description: RFPT Trip / ATWS actions / HPCI Failure to Start

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> • Directs BOP operator or SSS to contact maintenance and have HPCI failure investigated.
	BOP	<ul style="list-style-type: none"> • Manually starts a Reactor Feedwater Pump (P650): <ul style="list-style-type: none"> ○ Confirm the Condensate system is available. ○ Take the A or B RFPT Reset-Trip control switch to reset. ○ Confirm the RFPT HP stop valve red light illuminates. ○ Confirm the RFPT LP stop valve red light illuminates. ○ Confirm the RFPT trip annunciator clears 650-325 (or 326). ○ Raise RFPT speed using the Speed Setter switch until speed is at 2100 RPM ± 100 RPM and confirm M/A Station Permissive white light illuminates. ○ Place the RFPT TMR Mode Switch to M/A and confirm the M/A station green light illuminates. ○ Raise RFPT speed with the M/A station until RFP discharge pressure (R635A/B) > reactor pressure (R605A).

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Event Description: RFPT Trip / ATWS actions / HPCI Failure to Start

Time	Position	Applicant's Actions or Behavior
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	BOP	<ul style="list-style-type: none"> • Inject to the RPV and control reactor water level in the band assigned by the SS by performing one of the following: <ul style="list-style-type: none"> ○ Throttling 2N21-F110 (Bypass Valve) as necessary to raise or lower injection flow rate. OR ○ Confirm open or open 2N21-F125 (SULCV isolation valve) and then throttling 2N21-F111 (2C32-R629 S/U Lvl Control Valve) as necessary to raise or lower injection flow rate. <p>Note: Until the SS assigns a reactor water level band, the level band is IAW 34AB-C71-001-2, RC-2 placard.</p>
	BOP	<ul style="list-style-type: none"> • Monitors RPV pressure. • Confirms proper operation of pressure control system LLS. • If necessary, allows RPV pressure to exceed 1074 psig then cycles any SRV to initiate Low Low Set. • Maintains RPV pressure between 1074 and 800 psig. • As time permits notifies SS of pressure control system operation.

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Event Description: RFPT Trip / ATWS actions / HPCI Failure to Start

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • Inhibits ADS by placing both Keylock inhibit switches to "Inhibit." • If directed to do so by the SS, calls the SSS to have MSIV closure override performed. • Places override switches for 2P41-F316 in the override switches to "Override."
	SS	<ul style="list-style-type: none"> • As a conservative action, the SS may direct injection of boron using SBLC.
	ATC	<ul style="list-style-type: none"> • If directed by the SS to inject SBLC: <ul style="list-style-type: none"> ○ Places the SBLC switch to either position "A" or "B". • Confirm the following <ul style="list-style-type: none"> ○ Squib Vlv Ready indicating lights extinguish. ○ SBLC Loss of Continuity to Squib Valve annunciator alarms ○ Selected SBLC pump has started ○ 2G31-F004, Rx Water Cleanup Vlv is closed ○ SBLC tank level is decreasing ○ SBLC discharge pressure > reactor pressure ○ Reactor power is decreasing

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Event Description: RFPT Trip / ATWS actions / HPCI Failure to Start

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> If water level is above -60" and power above 5% when the SS addresses CP-3, he will Direct the BOP to lower water level to below -60" using 31EO-EOP-113-2.
	BOP	<ul style="list-style-type: none"> Reduces injection to lower RWL to < -60 inches using 31EO-EOP-100-2: <ul style="list-style-type: none"> Recognizes HPCI failure to start, and informs SS. Lowers Feedwater flow as necessary to achieve a lowering RWL trend.
	SS	<ul style="list-style-type: none"> When RPV level is below -60 inches, Directs the BOP operator to control RPV level within a level band. Any band between -60 inches and -185 inches is acceptable. (Typically -60" to -100" to maintain RPV level above -101") If RWL is subsequently allowed to increase to >-60 inches and Rx power is >5%, the override will be re-addressed to once again, lower level to < -60.

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Event Description: RCIC Trip

Time	Position	Applicant's Actions or Behavior
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		<p><u>Simulator operator:</u></p> <p>AFTER the MSIV low level closure HAS BEEN BYPASSED:</p> <p>THEN</p> <ul style="list-style-type: none"> • Insert mf2E51_110, "RCIC Turbine Trip" (RB-8)
	BOP	<ul style="list-style-type: none"> • Use Feedwater system to control RPV water level in the assigned band (Critical Task – Maintain RWL above -185 inches) • Verify/Place RFPT controllers in Manual • Raise RFPT speed to increase pressure to above RPV pressure • Do one of the following to provide injection to the RPV: <ul style="list-style-type: none"> ○ Verify/Place the Startup Level Control Valve in Manual ○ Open/Verify open 2N21-F125 ○ Throttle open 2N21-F111 (SULCV) OR <ul style="list-style-type: none"> ○ Throttle open 2N21-F110
	SS	<p>IF the following conditions exist:</p> <ul style="list-style-type: none"> • Reactor power >5%. • RWL above TAF. • Torus temperature is in the safe region of the BIIT curve. • SRVs are open. <p>Then Addresses the override located at coordinate C2 on EOP Flowchart CP-3 to Terminate and Prevent injection to the RPV.</p>

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Event Description: RCIC Trip

Time	Position	Applicant's Actions or Behavior
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		<p><u>AFTER</u> the following conditions EXIST:</p> <ul style="list-style-type: none"> • Control Rods are Inserting. • RWL is being maintained in the established level band. • <u>The SCRAM has been reset.</u> • The SDV Vent & Drains are open. <p>THEN, with Chief Examiner's permission:</p> <ul style="list-style-type: none"> • Delete MF2C11-211 and • Enter mf60313289, Scram Discharge Volume High Level Trip alarm OFF, and mf60313307, Scram Discharge Volume Not Drained Alarm OFF (RB-9)
	ATC	<ul style="list-style-type: none"> • SCRAMS Reactor • All rods insert • Notifies SS that all rods are full in.
	SS	<ul style="list-style-type: none"> • Transitions to RC – Point B • Orders Operator to slowly increase RWL to 3 to 50 inches.

Scenario Summary

DRAFT**Facility:** E. I Hatch**Scenario No.:** 4-02 **Op-Test No.:** 2009-301

Initiating Conditions:	Unit 2 is at 60% performing a reactor start-up. "2A" Core Spray pump is tagged out.
Turnover	The HPCI surveillance is to be performed in 3 hours. RHR "2B" is in Torus Cooling in preparation for the HPCI surveillance. Lower Torus level to 147.5 inches for HPCI Surveillance.

Summary:

- **Event 1:** Normal; The BOP operator will lower Torus level.
- **Event 2:** Instrument; The cooling water controller for the "2B" RFPT will fail. This results in high temperatures on the RFPT oil system and RFPT bearings. The BOP operator will place the controller in manual and adjust cooling water flow to reduce the temperatures. If manual control is not taken within 3 minutes, RFPT vibrations will occur and continue to increase until either the temperature is reduced or 6 mils is reached. RFPT trip is required at 6 mils.
- **Event 3:** Component/TS; The "2B" RHRSW pump trips. The team is directed by an ARP, to place the "2D" RHRSW in service IAW the RHR System procedure.
- **Event 4:** Reactivity/Component; A Recirculation Pump ASD Cell will auto bypass on the "2A" Recirc pump. 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 SS will address TS for Recirc flow mismatch.
- **Event 5:** Reactivity; The plant will be operating in the Immediate Exit Region of the Power-to-Flow map (Event 4). The team will exit the region of the P/F map by either inserting control rods or increasing Recirc Pump speed.
- **Event 6:** Component/TS; The RCIC turbine receives an inadvertent trip while in standby due to accidental bumping of the trip lever. The SS addresses TS for RCIC being inoperable. RCIC will be returned to standby by the BOP operator.
- **Event 7:** Component; 600VAC Bus 2A is inadvertently tripped. A report will inform the team that the cause of the trip is known and the bus may be re-energized. The BOP operator will restore the bus IAW abnormal and system operating procedures.
- **Event 8A:** Major; A loss of all high pressure injection/reactor scram occurs as a result of the following:
"2D" 4160VAC bus trips, "2C" Condensate Booster pump trips, HPCI cannot be started, "B" Feedwater line breaks inside the Drywell (LOCA and a loss of an injection line for RCIC) and both CRD pumps trip.
- **Event 8B:** Component; ECCS LOCA logic fails so operators are required to manually start ECCS equipment (RHR, CS, EDGs) (**Critical Task**). Operators will align RHR to spray the Suppression Chamber. Containment sprays will be secured prior to reaching TAF.
- **Event 8C:** Major/Component; Reactor water level will decrease to TAF, requiring the team to Emergency Depressurize the RPV (**Critical Task**). Only 3 ADS valves will open. The team will manually open 4 additional SRVs. Operators must manually open the RHR and CS discharge valves after reactor pressure decreases below the 500 psig permissive signal (**Critical Task**). Reactor pressure will decrease to below the shut-off head of the low pressure ECCS pumps and RWL will be restored to above TAF using all available injection systems. After RWL is determined to be above TAF, injection valves will be throttled to control injection and raise RWL to the normal EOP band.

DRAFT**Facility:** E. I Hatch**Scenario No.:** 4-02 **Op-Test No.:** 2009-301**Critical Tasks**

- Start ECCS pumps prior to opening ADS valves (Event 8B)
- Open ADS valves before RWL reaches -185 inches (Event 8C)
- Begin opening ECCS discharge valves after reactor pressure decreases below the 500 psig permissive and before reactor pressure decreases to below ECCS pump shutoff head. (Event 8C)

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	8	1. RFPT Temperature Controller failure. 2. RHRSW pump trip. 3. Recirc ASD Cell Bypass. 4. RCIC trip. 5. Loss of "2A" 600 VAC bus. 6. LOCA Logic failure. 7. Failure of ADS valves to open.
2.	Malfunctions After EOP Entry	1-2	2	1. LOCA Logic failure. 2. Failure of ADS valves to open.
3.	Abnormal Events	2-4	2	1. Recirc ASD Cell Bypass. 2. Loss of "2A" 600 VAC bus.
4.	Major Transients	1-2	2	1. Scram, Loss of high pressure injection. 2. Emergency Depressurize at TAF.
5.	EOPs entered, requiring substantive actions	1-2	1	1. RC
6.	EOPs contingencies requiring substantive actions	0-2	2	1. CP-1 Alternate RPV Level Control 2. CP-1 Emergency Depressurization
7.	Critical Tasks	2-3	3	1. Start ECCS Pumps 2. Open SRVs to Emergency Depressurize. 3. Open ECCS Discharge Valves

Appendix D

Scenario Outline

Form ES-D-1

DRAFT

Facility: E. I Hatch **Scenario No.:** 4-02 **Op-Test No.:** 2009-301

Examiners: _____ **Operators:** _____ **SRO**
 _____ **RO**
 _____ **BOP**

Initial Conditions. Unit 2 is operating at 100% power. Core Spray pump “2A” is tagged out for maintenance due to the supply breaker tripping during a Surveillance test.

Turnover: The HPCI surveillance is to be performed in 3 hours. RHR “2B” is in Torus Cooling in preparation for the HPCI surveillance. Lower Torus level to 147.5 inches for HPCI Surveillance

Event No.	Malf. No.	Event Type*	Event Description		
1		N (BOP)	Lower Torus level to 147.5 inches using RHR Loop “2B.”		
2	mfN21_88B	I (ATC)	Feedwater pump 2B cooling water controller failure. TC repair and return to auto.		
3	mfE11_120B	TS (SRO) C (BOP)	“2B” RHRSW pump trips, team places the other RHRSW pump in service.		
4	mfB31_135A	R (ATC) C (ATC)	A Reactor Recirc ASD cell is auto bypassed. “2A” Recirc speed decreases resulting in a flow mismatch.		
5		R (ATC)	Insert control rods or raise Reactor Recirc pump speed to return to safe area of Power to flow map.		
6	mfE51_61	TS (SRO) C (BOP)	RCIC Trip & Throttle valve tripped locally, must be reset and re-latched.		
7	mfR23_174	C (BOP)	Loss of 600 VAC Bus 2A. Main Transformer temperatures increase. Restoration of power to the bus.		
8A	mfR22_181 mfB21_229B mfE41_104 diC11B-S4A diC11B-S4B mfC11A_30A mfC11B_30B	M (All)	4160 VAC “D” trips causing a loss of 2 Condensate and Condensate booster pumps, then Feedwater line B breaks, causing a LOCA, HPCI trips on start and will not be returned to service.		
8B	mfE11_202B mfE21_202A	C (BOP)	ECCS fails to start on LOCA signal.		
8C	mfB21_129A mfB21_129C mfB21_129E mfB21_129H	M (ALL) C (ATC)	Emergency depressurization is required due to low RWL During emergency depress ADS valves A, C, E, and H don’t operate.		
*	(N)ormal,	(R)eactivity,	(I)nstrument,	(C)omponent,	(M)ajor

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 1

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Event Description: Lower Torus level to 147.5 inches using RHR Loop "2B."

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> Directs the operator to lower torus water level to 147.5" using "B" loop of RHR.
	BOP	<ul style="list-style-type: none"> Enters 34SO-E11-010-2, Section 7.4.5, Residual Heat Removal System. Confirms Radwaste is capable of receiving the water to be transferred. Confirms the RHR discharge water temperature is < 200°F, 2T47-R627, point 3. Opens 2E11-F049, RHR to Radwaste Valve. Monitors torus level on 2T48-R607A (B), 2H11-P602 (2H11-P654). Throttles OPEN, 2E11-F040, RHR to Radwaste Valve.
	BOP	<ul style="list-style-type: none"> Monitors torus water level and once level has been lowered to approximately 147.5" secures the flow path. Closes 2E11-F040, RHR to Radwaste Valve. Closes 2E11-F049, RHR to Radwaste Valve. Reports to the SS that torus water level has been lowered to 147.5"

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 2

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Event Description: Feedwater pump 2B cooling water controller failure.

Time	Position	Applicant's Actions or Behavior
		<p><u>Simulator Operator</u></p> <p>At Chief Examiner's direction:</p> <ul style="list-style-type: none"> • While the BOP operator is lowering torus water level, press (RB-1) to activate: <ul style="list-style-type: none"> ○ mfN21_88B, Feedwater Pump Lube Oil Cooling System Failure
	ALL	<p>The following alarms will annunciate:</p> <ul style="list-style-type: none"> • 34AR-650-315-2, "RFPT 2B Brg Oil Temp High" • 34AR-650-112-2, "RFP/COND BRG Metal Temp High" • 34AR-650-333-2, "RFPT 2B BRG Temp High"
	ATC	<p>Note: the operator may immediately place the controller in manual in accordance with 31GO-OPS-021-0, Manipulation and Control of Equipment, responding to a failed controller.</p> <ul style="list-style-type: none"> • Addresses the high temp annunciator, pulling the ARP • At panel 2H11-P655, check all temperature indicators on 2N32-R616 to determine actual oil temperatures. • Confirm that RFPT 2B Oil Temp controller, 2P41-R606, on panel 2H11-P650 is adjusted for 110 to 130°F
	ATC	<ul style="list-style-type: none"> • 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.

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 2

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Event Description: Feedwater pump 2B cooling water controller failure.

Time	Position	Applicant's Actions or Behavior
	All	<ul style="list-style-type: none"> If this condition exists for over 3 minutes alarm 34AR-650-332-2, "RFPT 2B EXCESSIVE VIBRATION," will illuminate.
	BOP	<ul style="list-style-type: none"> Confirm excessive vibration by observing 2N32-R600, Turbine Vibration and Eccentricity Recorder, points 13 and 14, on panel 2H11-P650 (DEPENDENT) OR 2H21-P536, TMR Workstation Mark V Control Panel. IF the RFPT vibration INCREASES to 6 mils, TRIP 2B RFPT.
	SS	<ul style="list-style-type: none"> Notifies maintenance of the RFPT temperature controller problem.
		<p><u>Simulator Operator</u></p> <p>After the team has taken manual control of the temperature controller <u>AND</u> has notified Maintenance of the problem:</p> <ul style="list-style-type: none"> THEN Delete malfunction mfN21_88B <p>AND</p> <ul style="list-style-type: none"> Call the control room and report the following: <ul style="list-style-type: none"> "Time compression is being used; the problem with 2P41-R606 was a wiring harness on the temperature sensor. The automatic function of the temperature controller has been repaired and may be returned to service."

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 4

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Event Description: Recirc ASD cell is auto-bypassed, reduced Recirc pump speed.

Time	Position	Applicant's Actions or Behavior
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		<p><u>Simulator Operator</u></p> <p>At Chief Examiner's direction, press (RB-3) to activate:</p> <ul style="list-style-type: none"> • mfB31_135A, Recirc ASD A Cell Bypass
	SS TS	<ul style="list-style-type: none"> • Direct ATC to respond to Recirc Loop Out Of Service Annunciator • Direct maintenance be contacted to determine cause of Recirc speed decrease • TS LCO/RAS Recirculating Loops Operating (TS 3.4.1 – 24 hours to satisfy the LCO).
	C (ATC) R (ATC)	<ul style="list-style-type: none"> • Respond to Recirc Loop Out Of Service Annunciator • Diagnose Recirc pump speed mismatch • Enter 34AB-B31-001-2, "Reactor Recirculation Pump(s) Trip, Recirc Loops Mismatch, OR ASD Cell Bypass" <ul style="list-style-type: none"> ○ Confirm the "SPD HLD RESET" pushbutton is illuminated <p>Note: If the SS directs rods to be inserted to exit the Immediate Exit Region, go to Event 5, otherwise continue here:</p> <ul style="list-style-type: none"> ○ Enter section III of 34AB-B31-001-2 <ul style="list-style-type: none"> ▪ If Recirc speed mismatch >35%, inform SS of 1 hour limit to balance Recirc Pump flows ○ When directed by SS with STA guidance: <ul style="list-style-type: none"> ▪ Depress the respective SPD HLD RESET pushbutton indicating lamp ▪ Increase speed of the "2A" Recirc Pump per 34SO-B31-001-2, Reactor Recirc System"

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 5

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Event Description: Insert control rods to return to safe area of Power to flow map.

Time	Position	Applicant's Actions or Behavior
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	SS	<ul style="list-style-type: none"> • Within 15 minutes of entering the Immediate Exit Region of the Power to Flow map, directs operator to exit the region by inserting control rods. • Has a control rod movement brief per 34GO-OPS-065-0
		<p><u>Simulator Operator</u></p> <p>If the Team calls for the STA or Reactor Engineering, for rod movement recommendations:</p> <ul style="list-style-type: none"> • Respond as follows: <ul style="list-style-type: none"> ○ "I am 10 minutes away and to use the Reactivity Manipulations Turnover."
	ATC	<ul style="list-style-type: none"> • Inserts control rods per 34GO-OPS-065-0, starting with control rod GROUP 54. • During rod insertion, rod steps will be performed in reverse sequential order, starting at the highest numbered step. (** rod steps are not required to be performed sequentially, but must be positioned to their RWM insert limit prior to inserting lower numbered groups). <ul style="list-style-type: none"> • Selects Rod • Places Control Rod movement switch to the IN position • Verifies Rod moves using Rod display information and Rx and Generator power decreasing.
	ATC	<ul style="list-style-type: none"> • If required, adjust 2C11-F003 to get 220 – 280psid drive water dp.

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 6

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Event Description: RCIC Turbine Trip and Throttle Valve tripped locally

Time	Position	Applicant's Actions or Behavior
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		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • At Chief Examiner's direction, press (RB-4) to activate: <ul style="list-style-type: none"> ○ mfE51_61, RCIC Overspeed Trip
	ALL	<ul style="list-style-type: none"> • Annunciator 34AR-602-301-2, "RCIC TURBINE TRIP" is received.
	BOP	<ul style="list-style-type: none"> • Confirms RCIC Turbine has tripped per the following indications: <ul style="list-style-type: none"> • 2E51-F524, Trip & Throttle Valve, indicates closed. • 2E51-F013, Pump Discharge Valve, indicates closed. • 2E51-F019, Min Flow Valve, indicates closed.
	SS	<ul style="list-style-type: none"> • Notifies the SSS to have the RCIC trip investigated.

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 6

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Event Description: RCIC Turbine Trip and Throttle Valve tripped locally

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> • Addresses tech specs 3.5.3.A for RCIC being inop. <ul style="list-style-type: none"> • Determines a one hour RAS exist to verify by administrative means that HPCI is operable. • Determines a 14 day RAS exist to restore RCIC to operable status.
		<p><u>Simulator Operator</u></p> <p>After TSs have been addressed:</p> <ul style="list-style-type: none"> • As a SO in training, call the Control Room and report: <ul style="list-style-type: none"> ○ “While I was in the RCIC room I accidentally bumped a lever on the RCIC pedestal. It changed position along with a long rod attached to the lever.”
	SS	<ul style="list-style-type: none"> • Notifies the SSS to have the RCIC mechanical overspeed reset. • Directs the operator to return RCIC to standby. May use generic guidance of 31GO-OPS-021-0 to open the trip and throttle valve.

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 6

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Event Description: RCIC Turbine Trip and Throttle Valve tripped locally

Time	Position	Applicant's Actions or Behavior
		<p><u>Simulator Operator</u></p> <p>AFTER the operator has identified the problem as a trip AND RCIC is directed to be reset locally:</p> <ul style="list-style-type: none"> • Delete malfunction mfE51_61 <p>THEN</p> <ul style="list-style-type: none"> • Call the control room and report: <ul style="list-style-type: none"> ○ “The RCIC mechanical over-speed mechanism has been reset.”
	BOP	<ul style="list-style-type: none"> • Enters 34SO-E51-001-2, Reactor Core Isolation Cooling (RCIC) System section for resetting the mechanical overspeed.
		<ul style="list-style-type: none"> • At panel 2H11-P602, takes 2E51-F524, Turbine Trip & Throttle Valve control switch to close and holds until valve operator is fully closed. • At panel 2H11-P602, takes 2E51-F524, Turbine Trip & Throttle Valve (T&T), control switch to open and holds until the valve is operator is fully open, verifying the valve indication reflects the valve is opening along with the valve operator. • Verifies “RCIC Turbine Trip” annunciator clears

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 7

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Event Description: Loss and Restoration of Power to 600VAC Bus 2A

Time	Position	Applicant's Actions or Behavior
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		<p><u>Simulator Operator</u></p> <p>At Chief Examiner's direction, press (RB-5) to activate::</p> <ul style="list-style-type: none"> • Activate mfR23_174, 600 VAC Bus 2A Fault.
		<p><u>Simulator Operator</u></p> <p>After the 600 VAC bus supply breaker trips:</p> <ul style="list-style-type: none"> • Delete malfunction mfR23_174, 600 VAC Bus 2A Fault.
	All	<ul style="list-style-type: none"> • Diagnose loss of "2A" 600VAC bus
	SS	<ul style="list-style-type: none"> • Direct BOP operator to respond to alarms associated with the loss of 600V Bus 2A: <ul style="list-style-type: none"> ○ 600V Bus 2A Undervoltage alarm (P651) ○ Air Cmpsr 2C Tripped/SD (P700) ○ Standby EHC Pump Running (P650) ○ Offgas Panel alarms (P600) ○ Main Transformer Misc Alarm ○ STA SVC Supply Breaker Trip • Direct BOP operator to enter 34AB-R23-002-2, "Loss of 600V Bus 2A, 2AA, 2BB, or 2B" • Direct that maintenance investigate problem with 600VAC Bus 2A

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 7

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Event Description: Loss and Restoration of Power to 600VAC Bus 2A

Time	Position	Applicant's Actions or Behavior
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		<p><u>Simulator Operator</u></p> <p>At Chief Examiner's direction:</p> <p>After the team has called for Maintenance support;</p> <ul style="list-style-type: none"> • Call the control room as Electrical Maintenance and report: <ul style="list-style-type: none"> ○ "The normal supply breaker to 2R23-S001 was tripped accidentally, and there is no problem with the bus. No lockout relays have tripped."
	SS	<ul style="list-style-type: none"> • Direct the BOP operator to energize "2A" 600 VAC Bus
	C (BOP)	<ul style="list-style-type: none"> • Perform Enter 34AB-R23-002-2, "Loss of 600V Bus 2A, 2AA, 2BB, or 2B" actions to prepare for energizing the bus. • Strip all loads from "2A" 600VAC Bus <ul style="list-style-type: none"> ○ Supply to 2R24-S035 Turb Bldg MCC 2D-B ○ Supply to 2R24-S036 WGTB MCC ○ FDR to Bldg Xfmr • Place pump switches to "PTL" or "OFF" <ul style="list-style-type: none"> ○ "2A" Stator Cooling Water pump ○ "2A" EHC Pump

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 7

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Event Description: Loss and Restoration of Power to 600VAC Bus 2A

Time	Position	Applicant's Actions or Behavior
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	C (BOP)	<ul style="list-style-type: none"> • Re-Energize “2A” 600 VAC Bus IAW with 34SO-R23-001-2, “600V / 480V AC System <ul style="list-style-type: none"> ○ Confirm that power is available from 4160V Bus 2C as indicated by the potential lights. ○ Confirm that 4160V Bus 2C voltage is normal. ○ On panel 2H11-P676, confirm that 87S2AX (87S2BX), Sta Serv Transf 2A (2B) Diff Aux Relay is reset. ○ TAKE ACB 135632, Alt Supply To 2R23-S001, AND ACB 135634, Norm Supply to 2R23-S001, control switches to TRIP AND confirm that the green flags are visible. ○ CLOSE ACB 135436, Feeder To SST 2A. ○ Strip all loads off 600V AC Bus 2A by tripping all feeder breakers. ○ CLOSE ACB 135634, Norm Supply To 2R23-S001 (2R23-S002), to energize the bus AND confirm that 600V AC Bus 2A voltage is normal. • Restore all “2A” 600 VAC Bus feeder breakers <ul style="list-style-type: none"> ○ Supply to 2R24-S035 Turb Bldg MCC 2D-B ○ Supply to 2R24-S036 WGTB MCC ○ FDR to Bldg Xfmr
		<p>NOTE: All parts of this section are not required to be completed before Event 8A is initiated (Chief Examiners discretion). The intent of this event is for the BOP operator to demonstrate to properly strip and energize the bus.</p>

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 8A

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Event Description: Loss of Condensate System and Feedwater line Break.

Time	Position	Applicant's Actions or Behavior
		<p><u>Simulator Operator</u></p> <p>With Chief Examiners Permission, press (RB-6) to activate:</p> <ul style="list-style-type: none"> • mfR22_181, 4KV Bus 2D Fault • mfN21_80C, Condensate Booster Pump C Trip • mfB21_229B, FW LINE "B" BREAK INSIDE CONTAINMENT • mfE41_104, HPCI Turbine Trip • mfC11_30A, CRD A Pump Trip • mfC11_30B, CRD B Pump Trip
	ALL	<ul style="list-style-type: none"> • Recognizes a loss of "D" 4160 VAC station service electrical bus and a trip of 2C Condensate Booster Pump has occurred resulting in a loss of Condensate and Condensate Booster pumps A, B, and C. • An automatic scram due to decreasing reactor water level or high drywell pressure will occur. • Identifies drywell pressure is rapidly increasing.
	SS	<ul style="list-style-type: none"> • Assigns the ATC to perform RC-1. • Assigns the BOP operator to perform RC-2 and RC-3. • Enters the RC EOP flow chart 31EO-EOP-010-2 • As time allows, • Enters 31EO-EOP-012-2, PC-1 flow chart. • As time allows: <ul style="list-style-type: none"> ○ Directs an operator to perform TC-1 ○ Notifies maintenance to repair 4160 VAC D and CBP 2C. ○ Dispatches personnel to the EDGs to check for proper operation. ○ Directs 2P41-F316A-D to be opened

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 8B

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Event Description: ECCS fails to start on LOCA signal.

Time	Position	Applicant's Actions or Behavior
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	BOP	<ul style="list-style-type: none"> Identifies the ECCS pumps have not started when RPV water level decreased below -101" or with D/W pressure >1.85psig. Places the control switch for RHR "A" to start. Places the control switch for RHR "C" to start.
		(Critical task - start ECCS pumps prior to opening ADS valves).
	BOP	<ul style="list-style-type: none"> Places the control switch for RHR "B" to start. Places the control switch for RHR "D" to start. Places the control switch for Core Spray "B" to start
		NOTE: If D/W conditions are present for a long enough period of time (dependent on closure of 2N21-F006B) Torus and D/W sprays will be initiated.
	SS	<ul style="list-style-type: none"> Orders initiation of Suppression Pool Sprays

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 8B

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Event Description: ECCS fails to start on LOCA signal.

Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> • Initiates drywell sprays in the "A" or "B" loop of RHR by: <ul style="list-style-type: none"> • Opens 2E11-F021A(B) on 2H11-P601 panel. • Throttles open 2E11-F016A(B) to establish at least 5000 gpm to the drywell.
	SS	<ul style="list-style-type: none"> • Directs that drywell and suppression pool sprays be secured before the respective area decreases below 0 psi or if reactor water level decreases to TAF.
	ATC	<ul style="list-style-type: none"> • Secure D/W sprays prior to D/W pressure <0psig or if RWL decreases to TAF. • Secure Torus sprays prior to <0psig. • Secure Torus cooling and Torus sprays if RWL decreases to TAF.

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 8C

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Event Description: Failure of ADS valves to operate.

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • Monitors RPV water level as it trends down. • Informs the SS of water level reaching -155.”
	SS	<ul style="list-style-type: none"> • Per CP-1 <ul style="list-style-type: none"> ○ Orders emergency depressurization once water level decreases below -155” and prior to -185.” ○ Orders all available table 8 systems injecting until water level raises above -155.”
	ATC	<ul style="list-style-type: none"> • Opens 7 ADS valves, (Critical Task- Open ADS valves before RWL reaches -185 inches)
	ATC	<ul style="list-style-type: none"> • Places switches for the ADS valves to OPEN. • Recognizes valves A, C, E, and H, do not receive an amber light. • Notifies the SS
	SS	<ul style="list-style-type: none"> • DIRECTs the ATC to open 4 LLS valves.

Op-Test No.: 2009-301 Scenario No.: 4-02 Event No.: 8C

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Event Description: Failure of ADS valves to operate.

Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> • Verifies the following are closed: <ul style="list-style-type: none"> • MSIVs • RPV head vents • MSL drains • RCIC isolation valves • HPCI isolation valves.
	SS	<ul style="list-style-type: none"> • Sets a pressure band for the operator to achieve, must be greater than 50 psid above torus pressure.
	SS	Starts the flooding interval time limit.
		With Chief Examiners Permission: <ul style="list-style-type: none"> • The scenario should be terminated when the crew has Emergency depressurized the reactor AND: <ul style="list-style-type: none"> ○ Re-established adequate core cooling with water level above TAF OR ○ Reactor pressure more than 50 psid above torus pressure.

Scenario Summary

DRAFT**Facility:** E. I Hatch**Scenario No.:** 4-03 **Op-Test No.:** 2009-301

Initiating Conditions:	Unit 2 is at 1% power, performing a reactor start-up.
Turnover	Raise pressure set to 420 psig. Withdraw Control Rods to until one Main Turbine Bypass Valve 80% open in preparation for the start of "2A" RFPT.

Summary:

- **Event 1:** Normal evolution; RPV pressure will be raised to 420 psig using the DEHC system.
- **Event 2:** Reactivity control; Following the pressure increase, control rods will be withdrawn to open the #1 Main Turbine Bypass Valve to 80% open.
- **Event 3:** Component; While withdrawing control rods to open the #1 Bypass Valve, control rod 26-23 sticks. It will not move at normal CRD drive water pressure. CRD drive water pressure will be raised IAW the Inability to Move a Control Rod abnormal procedure. When drive water pressure (dp) is >350 psig, the rod will move. Rod withdrawal will then continue normally.
- **Event 4:** Component; The Control Room will receive a report that the "2C" Condensate Booster Pump (CBP) has an oil leak. The message will be worded such that there is time to start another pump and secure the running CBP. It will be recommended that the pump be shut down. The team will start a standby CBP ("2A" or "2B") and secure the "2C" CBP.
- **Event 5:** Instrument/TS; After the standby CBP has been placed in service, 2E41-F002 (HPCI Inboard Steam Isolation Valve) will close as the result of an instrument failure (High Steam Flow dp). Time compression will be used to repair the condition and the team will restore HPCI to standby. SS addresses Tech Specs for HPCI operability and HPCI instrumentation.
- **Event 6:** Component; "2A" CRD pump will trip. "2B" CRD pump will be started IAW the Loss of CRD abnormal procedure. The pump trip will be investigated. The "2B" CRD pump will trip, resulting in a condition requiring a manual reactor scram. When the scram is inserted, several control rods will not fully insert due to the combination of low RPV pressure and both CRD pumps being off. Power is <5%, so control rod insertion will be addressed using the abnormal procedure for control rods insertion. The SS will enter the RC-A EOP flow chart if RWL decreases < 3 inches. The "2A" CRD pump will be repaired and started, causing the remaining control rods to fully insert as charging water pressure increases with the scram inserted. SS addresses TS requirement for loss of CRD.
- **Event 7A;** Major/Component; Torus water level will begin increasing at 3 inches/minute due to an outage valving error. The team will attempt to isolate the flow path; however, the Core Spray AOV and MOV suction valves will fail to work. The SS enters the PCC EOP flowchart.
- **Event 7B:** The SS uses EOP Contingency Procedure 1 (CP-1) and directs an operator to Emergency Depressurize the RPV. An operator opens 7 ADS valves prior to Torus water level exceeding 193 inches. **(Critical Task)**
- **Event 8:** Component; The Startup Level Control Valve (SULCV) fails closed requiring operators to control RWL with the SULCV Bypass Valve, or by using Core Spray, or Residual Heat Removal systems. **(Critical Task)**

Critical Task List

Facility: E. I Hatch
Scenario No.: 4-03 **Op-Test No.:** 2009-301

Critical Tasks

- Fully insert all control rods by restarting a CRD pump. (Event 6)
- Open 7 SRVs prior to Torus Water Level exceeding 193 Inches. (Event 7A)
 - NOTE: The critical task is met when 5 SRVs have been opened. This is the minimum number of SRVs required by the EOPs to Emergency Depressurize the RPV.
- Align available systems for vessel injection to maintain RWL greater than -185 inches. (Event 8)

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	5	1. Stuck control rod. 2. HPCI isolation. 3. CRD Pump Trip. 4. Torus water level increases. 5. SULCV fails closed.
2.	Malfunctions After EOP Entry	1-2	1	1. 2 Main Turbine Bypass Valves fail closed. 2. SULCV fails closed.
3.	Abnormal Events	2-4	3	1. Inability to move a control rod. 2. Loss of CRD. 3. Control rod insertion.
4.	Major Transients	1-2	1	1. Torus water level increasing.
5.	EOPs entered, requiring substantive actions	1-2	1	1. PCC EOP Flowchart.
6.	EOPs contingencies requiring substantive actions	0-2	1	1. CP-1 Emergency Depress.
7.	Critical Tasks	2-3	2	1. Open SRVs to Emergency Depressurize 2. Insert control rods 3. Maintain RWL >-185 inches

DRAFT

Facility: E. I Hatch **Scenario No.:** 4-3 **Op-Test No.:** 2009-301

Examiners: _____ **Operators:** _____ **SRO**
 _____ **RO**
 _____ **BOP**

Initial Conditions. The unit is starting up Rx Pressure at 380 psig. Power is to be increased to the point of starting the first feed pump.

Turnover: Increase pressure set to 420 psig reactor pressure and continue power increase using control rods until approximately one bypass valve is open 80%. At that time place the first reactor feed pump in service. Heat up data is being taken by a third operator.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP)	Increase Reactor Pressure to 420 psig prior to preparation for RFPT '2A' Startup.
2	N/A	R (ATC)	Pull rods and to achieve one bypass valve 80% open in preparation for RFPT Startup.
3	mfC11_280 mfC12_22 26-23	C (ATC)	Control rod 26-23 at "00" is stuck, must increase drive water d/p and double clutch to get rod to move from position "00".
4	none	C (BOP)	System Operator reports Condensate Booster Pump (CBP) "C" has an oil leak, "A" or "B" CBP must be started, "A" shutdown.
5	mfE41_108	I (BOP) TS (SRO)	HPCI Instrument malfunction results in an isolation of 2E41-F002, compressed repair realign.
6	mfC11_30A mfC11_30B	C ATC TS (SRO)	CRD A Trip / Start CRD B/ several minutes later CRD B trips/ Manual SCRAM
7A	svoT48140 svoN37226 svoN37227 aoP11-R601 diE21-F019A	M (ALL)	Torus level begins to increase due to Core Spray CST and Torus suction valves being open at the same time. Valve failures will prevent closing the CS suction valves. Torus level continues to increase, challenging EOP limits (Heat Capacity Temperature Limit, Pressure Suppression Pressure and SRV Tail Pipe Level Limit graphs).
7B			Emergency depress due to high Torus water level
8	mfN21_99	C (BOP)	SULCV fails closed. RPV level will be controlled either by throttling open 2N21-F110, or by using a low pressure ECCS pump system.
*	(N)ormal,	(R)eactivity,	(I)nstrument, (C)omponent, (M)ajor

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 4

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Event Description: System Operator reports Condensate Booster pump "A" has an oil leak, "B" must be started, "A" shutdown.

Time	Position	Applicant's Actions or Behavior
		<p><u>Simulator Operator</u></p> <p>When directed by the chief examiner:</p> <ul style="list-style-type: none"> • Call the Control Room as a System Operator (SO), and REPORT: <ul style="list-style-type: none"> ○ I am performing rounds. The "2C" Condensate Booster pump has an oil leak. • When questioned about the size of the oil leak, REPORT: <ul style="list-style-type: none"> ○ The CBP is low on oil and a slow steady stream of oil is leaking, I recommend shutting it down as soon as possible. • IF asked if there is enough oil to allow the pump to run without damage to the pump, THEN REPORT: <ul style="list-style-type: none"> ○ I recommend that it be shut down as soon as possible.
	SS	<ul style="list-style-type: none"> • Directs Operator to place 2A or 2B Condensate Booster pump (CBP) in service and shutdown the 2C Condensate Booster pump.
	BOP	<ul style="list-style-type: none"> • Enters 34SO-N21-007-2 and performs the following actions: • Directs an SO to: <ul style="list-style-type: none"> • Verify that 2A or 2B CBP Oil Reservoir and motor bearing oil levels are WITHIN normal level marks. • Throttle 2P41-F364A or B, outlet valve as necessary to maintain the oil temperature between 50°F and 115°F. • Confirm / Place CBP 2A or 2B Oil Pump control switch in Auto and Confirm pump is running. • Confirm Closed/Close 2N21-F020A or B, Standby CBP Discharge Valve.

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 4

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Event Description: System Operator reports Condensate Booster pump "A" has an oil leak, "B" must be started, "A" shutdown.

Time	Position	Applicant's Actions or Behavior
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • Call the Control Room as a SO and REPORT: <ul style="list-style-type: none"> ○ The oil level for CBP 2A (or 2B) oil levels is normal. ○ Oil temperature is at 95°F. ○ The oil pump is running in Auto. ○ 2N21-F020A or B is closed. <p>Note: You do NOT have to enter the remote function for closing the discharge valve for the CBP. The procedure requires it to be throttled prior to pump start; however, we do not have throttle capability.</p>
	BOP	<ul style="list-style-type: none"> • Directs SO to: <ul style="list-style-type: none"> • Throttle Open 2N21-F020A or B, CBP Discharge Valve, for 15 seconds • Observe for indication of a stuck open / leaking discharge check valve as evidenced by increasing pressure on the pump side of the discharge check valve.
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • VERIFY that rfN21_60A (or 60B) is in Open. • Call the Control Room as a SO and REPORT:

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 4

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Event Description: System Operator reports Condensate Booster pump "A" has an oil leak, "B" must be started, "A" shutdown.

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> ○ 2N21-F020A (or F020B) has been opened 15 seconds ○ The discharge check valve does NOT indicate leakage.
	BOP	<ul style="list-style-type: none"> • Starts Condensate Booster Pump 2A or 2B, by placing the control switch to Start. • Has SO throttle open the Discharge valve and maintain oil temp by throttling PSW to the oil cooler.
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • Call the Control Room as a SO and REPORT: <ul style="list-style-type: none"> ○ "The discharge valve is full open for CBP 2A (or 2B)." ○ "Oil temp is being maintained at 95°F."
	BOP	<ul style="list-style-type: none"> • When condensate and Feedwater flows and pressures have stabilized, directs the SO to close 2N21-F020C
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • ENTER rfN21_62 (CBP "C" Disch valve close) <p>THEN</p>

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 4

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Event Description: System Operator reports Condensate Booster pump "A" has an oil leak, "B" must be started, "A" shutdown.

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> • Call the Control Room as a SO and REPORT: <ul style="list-style-type: none"> ○ "The 2C CBP discharge valve has started closing."
	BOP	<ul style="list-style-type: none"> • Places CBP 2C control switch to stop within 90 secs of being told the discharge valve has started closing. • Reports to SS that 2A or 2B CBP is operating and that the 2C CBP has been secured. May ask SS if it is desired to place the 2C CBP in standby. If so the CBP 2C control switch will be placed in Auto.
	SS	<ul style="list-style-type: none"> • May direct the operator to place CBP 2C in PTL Off or Standby and leave oil pump in off.
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • IF requested to re-open the discharge valve: <ul style="list-style-type: none"> ○ ENTER rfN21_62 (CBP "C" Disch valve Open) • Call the Control Room as a SO and report: <ul style="list-style-type: none"> ○ "The "2C" CBP discharge valve is Open."

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 4

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Event Description: System Operator reports Condensate Booster pump “A” has an oil leak, “B” must be started, “A” shutdown.

Time	Position	Applicant's Actions or Behavior

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 5

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Event Description: HPCI instrument malfunction, causing an isolation of 2E41-F002

Time	Position	Applicant's Actions or Behavior
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • As an I&C Technician, call the Control Room and REPORT: <ul style="list-style-type: none"> ○ “The cause of the isolation is 2E41-N657A. ○ “It has failed upscale.” ○ “We are repairing the problem at this time.”
	SS	<ul style="list-style-type: none"> • Addresses Tech Specs 3.3.6.1 and determines a RAS requires the channel to be placed in trip in 24 hours <p>AND</p> <ul style="list-style-type: none"> • Tech Specs 3.5.1 on HPCI operability, that HPCI is inop with a 14 day RAS
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • DELETE mfE41_108, HPCI instrument malfunction. • As an I&C Tech, call the Control Room and REPORT: <ul style="list-style-type: none"> ○ “I am using Time Compression and it has been 1 hour since we talked. HPCI instrument 2E41-N657A has been repaired.”
	SS	Directs the ATC operator to realign HPCI to standby status.

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 6

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Event Description: CRD A Trip / Start CRD B/ CRD B trips/ Manual SCRAM

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> • Orders the ATC operator to insert control rods IAW 34AB-C11-005-2, Control Insertion Methods. • If RWL decreases to less than 3 inches, will enter the RC EOP flowchart; however, RWL is not expected to go below 3 inches.
	ATC	<ul style="list-style-type: none"> • Enters 34AB-C11-005-2 • Bypasses the Scram Discharge Volume high level trip • Resets the Scram • Places the Scram Discharge Volume Isolation Test switch to NORMAL
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • 2 minutes after the scram has been inserted: <ul style="list-style-type: none"> ○ DELETE mfC11_30A • Call the ATC that a <u>Time Compression</u> is being used and it is 10 minutes later, and REPORT: <ul style="list-style-type: none"> ○ “2A CRD pump has been repaired.”

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 6

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Event Description: CRD A Trip / Start CRD B/ CRD B trips/ Manual SCRAM

Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> • Starts 2A CRD Pump and establishes drive water DP. • Places the Reactor Mode Switch to REFUEL. • Places the RWM Bypass switch to BYPASS. • Obtain recommendations from the STA as to which rods have the highest worth (Black and white spiral pattern.) • Inserts control rods.” <p>Critical Task: Take actions to fully insert all control rods by restarting a CRD pump.</p>
	BOP	<p>Performs actions of RC-2 and RC-3 after Reactor SCRAM.</p> <ul style="list-style-type: none"> • Confirms proper Level Control response: <ul style="list-style-type: none"> • Checks ECCS Injection Systems and secures 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	<ul style="list-style-type: none"> • With feed flow is less than the capacity of the S/U level control valve (≈ 1.5 mlbm/hr), verifies: <ul style="list-style-type: none"> • 2N21-F125 is open. • Places 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches. • Ensures 2N21-F110 is closed.

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 7A

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Event Description: Core Spray Suction Valves Opened Result In Increasing Torus Water Level

Time	Position	Applicant's Actions or Behavior
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		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • When directed by the Chief Examiner, PRESS (RB-4) to activate: <ul style="list-style-type: none"> ○ svoT48140; Suppression Pool Water Level ○ aoP11-R601; Condensate Storage Tank Level • Note: The following overrides were entered at the beginning of the scenario: <ul style="list-style-type: none"> ○ diE21-F001A; Core Spray Suction Valve ○ diE21-F019A; Core Spray Torus Suction Valve ○ svoN37226; Turbine Bypass Valve #2 Position ○ svoN37227; Turbine Bypass Valve #3 Position ○ Event trigger E21-01; 2E21-F001A lights go out and valve fails open when the green light illuminates.
	All	<ul style="list-style-type: none"> • Recognize Torus water level is increasing.
	SS	<ul style="list-style-type: none"> • Direct operators to look for the source of water entering the Suppression Chamber. • May dispatch SO's to the Reactor Building Diagonals to check for valve lineup issues. • Enters Primary Containment Control (PCC) EOP flowchart when Suppression Pool level exceeds 150 inches.

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 7A

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Event Description: Core Spray Suction Valves Opened Result In Increasing Torus Water Level

Time	Position	Applicant's Actions or Behavior
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	BOP	<ul style="list-style-type: none"> • Monitor panels looking for sources of in-leakage to the Suppression chamber. • Determines Condensate Storage Tank level is decreasing. • Enters the following ARP's. <ul style="list-style-type: none"> ○ Torus Level High, 601-127 ○ Torus Level (RCIC) High, 602-230
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • When torus level reaches 160 inches, call the control room as the Operations Control Center (OCC) supervisor and REPORT: <ul style="list-style-type: none"> ○ “I sent a team to align the Unit 1 Core Spray suction to the CST in preparation for Reactor Cavity Flood up.” ○ “They went to Unit 2 and began to open 2E21-F002A before they noticed they were on the incorrect unit.” ○ “When they attempted to close the valve, the valve hand wheel would not turn and we could not get the valve to close. Maintenance is on their way to the valve.”
	SS	<ul style="list-style-type: none"> • Direct the BOP operator to close the “2A” Core Spray suction valves.

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 7A

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Event Description: Core Spray Suction Valves Opened Result In Increasing Torus Water Level

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • Place the 2E21-F001A valve switch in the close position <ul style="list-style-type: none"> ○ Recognizes that the lights for 2E21-F001A de-energize. ○ Reports to the SS that the lights for 2E21-F001A de-energized. • Place the 2E21-F019A valve switch in the close position. <ul style="list-style-type: none"> ○ Recognizes that 2E21-F019A did not close. ○ Reports to the SS that 2E21-F019A did not close. • Checks Torus level and determines that Torus level is still increasing.
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • If directed to close 2P11-F029, WAIT for <u>5 minutes</u> and THEN REPORT: <ul style="list-style-type: none"> ○ “The valve hand wheel for 2P11-F029 broke off of the valve stem and we are sending someone to get us a wrench.”
	SS	<ul style="list-style-type: none"> • Direct operators to maintain Torus Water Level below 193 inches to remain in the safe region of the Heat Capacity Temperature Limit (HCTL) EOP graph and the SRV Tailpipe Level Limit graph using 34SO-E11-010-2 or 34GO-OPS-087-2. • Directs that maintenance investigate the failure of the “2A” Core Spray suction valves to close.

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 7A

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Event Description: Core Spray Suction Valves Opened Result In Increasing Torus Water Level

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • If time allows, use 34SO-E11-010-2 "RHR System" to align RHR for draining the Torus to Radwaste: <ul style="list-style-type: none"> ○ Confirm Radwaste is capable of receiving water ○ Open 2E11-F049 ○ Close 2E11-F003B ○ Close 2E11-F047B ○ Confirm Open 2E11-F048B ○ Start a "B" loop RHR pump ○ Confirm discharge water is less than 200F (2T47-R627 pt. 3) ○ Throttle Open 2E11-F040
	SS	<ul style="list-style-type: none"> • Directs operators to terminate any external sources of water except for sources necessary to ensure adequate core cooling, boron injection, or CRD. • If the need to Emergency Depressurize is recognized in time, then Anticipates Emergency Depressurization. <ul style="list-style-type: none"> ○ Assign an operator to fully open all Main Turbine Bypass Valves.

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 7B

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Event Description: Emergency Depressurization of the RPV

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> • Prior to exceeding 193 inches in the Torus. <ul style="list-style-type: none"> ○ Orders 7 ADS valves open for Emergency Depress. <p>(Critical Task – Open 7 SRVs prior to Torus Water Level exceeding 193 Inches. Critical task is met when 5 SRVs have been opened.)</p>
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • When torus level reaches 205 inches, call the control room as the Operations Control Center (OCC) supervisor and REPORT: <ul style="list-style-type: none"> ○ “Maintenance has closed 2E21-F002A.”
	BOP	<ul style="list-style-type: none"> • Places the switches for 7 ADS valves in the open position. <ul style="list-style-type: none"> ○ If Anticipate Emergency Depressurization was performed, 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. <ul style="list-style-type: none"> • Operator secures all injection other than CRD

Op-Test No.: 2009-301 Scenario No.: 4-3 Event No.: 8

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Event Description: SULC Fails Closed, Will Use 2N21-F110 or Low Pressure ECCS System(s) to Maintain RWL.

Time	Position	Applicant's Actions or Behavior
		<p>Note: If the operator controlling RPV level has difficulty determining why injection with the Condensate System is not occurring (failed Startup Level Control Valve failed closed), the candidate may then elect or be directed to use low pressure ECCS maintain RWL.</p>
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • AFTER the ADS valves have been opened, PRESS (RB-5) to activate: <ul style="list-style-type: none"> ○ mfN21_99, SULCV fails closed (See Event 8A)
	BOP	<ul style="list-style-type: none"> • The BOP recognizes the SULCV has failed closed. • Performs one or more of the following to inject water into the reactor. <ul style="list-style-type: none"> ○ Throttles open 2N21-F110, and inject water into the reactor. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> ○ Starts a CS Pump. ○ 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). <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> ○ Starts a RHR pump. ○ When RPV pressure is <425 psig, throttles open 2E11-F015A(B). <ul style="list-style-type: none"> • Reports SULCV problem to the SS.
		<p><u>Critical Task</u> – Align available systems for vessel injection to maintain RWL greater than -185 inches. <u>NOTE:</u> The critical task is met when 5 SRVs have been opened (EOP minimum number of SRVs required to Emergency Depressurize the RPV).</p>

Scenario Summary

Facility: E. I Hatch

Scenario No.: 4-04 **Op-Test No.:** 2009-301

DRAFT

Initiating Conditions:	Unit 2 is at 90%. RCIC - RCIC is isolated following repair of the outboard isolation valve breaker. System restoration to standby per 34SO-E51-001-2, RCIC System, is in progress at step 7.1.1.33. The functional test for the Valve has been performed.
Turnover	Continue 34SO-E51-001-2, RCIC System, to return RCIC to Standby, at step 7.1.1.33.
<p>Summary:</p> <ul style="list-style-type: none"> • Event 1: Normal; The BOP operator will un-isolate RCIC. • Event 2: Component/TS; After RCIC has been un-isolated, a half scram will occur due to a PRNM 2 out of 4 logic trip. A control rod will scram due to a blown fuse. The control rod will be withdrawn after having the fuse replaced IAW abnormal procedure guidance. The SS will address Tech Specs for inoperable PRNM 2 out of 4 logic module. • Event 3/4: Component/Reactivity; After the control rod has been fully withdrawn, the “2A” Recirc Pump will begin to vibrate. A high vibration alarm will be received. Recirc pump speed will be reduced and the vibration alarm will clear. Any attempt to raise Recirc speed will cause the alarm to be received again. • Event 5: Component/TS; A RWCU line will break outside of Primary Containment. The outboard isolation valve is failed open and cannot be closed. The inboard valve fails to automatically close on an automatic isolation signal and must be manually closed (Critical Task). The SS addresses Tech Specs for inoperable Primary Containment Isolation Valves. • Event 6: Component/TS; “2B” Instrument Bus will be lost due blown fuse. The bus will be restored after the fuse is replaced. Impacted systems will be restored back to their normal alignment as time permits. The SS will address TS for loss of the Instrument Bus. • Event 7A: (Major) A loss of all Startup Transformer “2D” will occur. The reactor will scram and MSIVs will close. All control rods fully insert. The only Unit 2 4160V bus that will be energized without operator action is “2F”. There is a hard phase-to-phase short on “2E” 4160VAC bus which causes the alternate breaker to trip after it closes in. The “2A” EDG output breaker will not close. “2G” 4160 VAC bus fails to auto transfer and the associated EDG cannot be started. RCIC trips when it attempts to start. HPCI fails to auto start but can be manually started. Drywell pressure will increase to above 1.85 psig. The SS will direct the EOP actions IAW with the RC and PCC EOP flowcharts. • Event 7B: Component; “2G” 4160 VAC bus will be energized from SAT “2C. • Event 7C: Component; Start HPCI and inject to maintain RWL above top of active fuel. (Critical Task) 	

Critical Task List

Facility: E. I Hatch**Scenario No.:** 4-04 **Op-Test No.:** 2009-301Critical Tasks

- Manually isolate RWCU before exceeding maximum safe Secondary Containment Control EOP parameters (Temperatures, Radiation levels or SC water levels) (Event 5).
- Maintain RWL above -185 inches. This is the lowest level that corresponds to adequate core cooling with injection (Event 7C).

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	6	1. Control Rod fully inserts. 2. Recirc Pump Vibration. 3. RWCU Pipe Break. 4. Instrument Bus Loss. 5. Loss of SAT "2D" 6. HPCI fails to auto start.
2.	Malfunctions After EOP Entry	1-2	2	1. "2C" EDG cannot be started. 2. HPCI fails to auto start.
3.	Abnormal Events	2-4	3	1. RWCU pipe break inside the Reactor Bldg. 2. Instrument Bus Loss. 3. Mispositioned Control Rod
4.	Major Transients	1-2	1	1. Loss of SAT "2D"
5.	EOPs entered, requiring substantive actions	1-2	2	1. RC EOP Flowchart 2. PCC EOP Flowchart
6.	EOPs contingencies requiring substantive actions	0-2	0	
7.	Critical Tasks	2-3	2	1. Isolate RWCU line break. 2. Maintain RWL above -185 inches using HPCI.

Appendix D

Scenario Outline

Form ES-D-1

DRAFT**Facility:** E. I Hatch**Scenario No.:** 4-04**Op-Test No.:** 2009-301

Examiners: _____ **Operators:** _____ **SRO**
 _____ **RO**
 _____ **BOP**

Initial Conditions. Unit 2 is at 90% RTP following Turbine Control Valve testing. RCIC is isolated following repair of the outboard isolation valve breaker. System restoration to standby per 34SO-E51-001-2, RCIC System, is in progress at step 7.1.1.33. The functional test for the Valve has been performed.

Turnover: Continue 34SO-E51-001-2, RCIC System, to return RCIC to Standby, at step 7.1.1.33.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	Un-isolate RCIC and return to standby.
2	diC51-K617A-S2 diC51-K617A-S1 mfC12_26 14-39	C (ATC) TS (SRO)	PRNM 2 out of 4 logic module trips causing a half scram and a control rod to scram in due to a blown fuse.
3 4	mfB31_41A	C (ATC) R (ATC)	Recirc Pump "A" high vibration, power increase will be stopped and decrease started. Decreasing to about 62% power will correct condition.
5	mfG31_207A svoG31071, mfG31_52	C(BOP) TS (SRO)	RWCU line break outside of Secondary Containment. Must be manually isolated (Critical Task), with failure of outboard isolation valve to close.
6	mfR25_186 rfT41-299	C (BOP) TS (SRO)	Loss of "2B" Instrument Bus. Restoration of "2B" Instrument Bus.
7A	mfS11_227B mfP64_193B mfR22-182 mfR43_168A diR22_135584C mfC11_30B mfR43_167C mfN30_122 mfE51_110 mfE41_235A mfE41_235B	M (ALL)	Loss of all Startup Transformer "2D". "B" DW Chiller fault Fault on "2E" 4160VAC bus. "2A" EDG output breaker will not close. "2G" 4160 VAC bus fails to auto transfer. "B" CRD pump trips "2C" EDG cannot be started. Main turbine trip RCIC trips after auto starting. HPCI fails to auto start.
7B		C (ATC)	Energize "2G" 4160 VAC bus from SAT "2C.
7C		C (BOP)	Start HPCI to control RWL (Critical Task).
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

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Event Description: Un-isolate RCIC and return to standby.

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> • Directs the operator to continue with RCIC "Return to Standby" per the Initial Condition sheet.
	BOP	<ul style="list-style-type: none"> • Un-isolates RCIC per 34SO-E51-001-2, RCIC System, starting at step 7.1.1.36 to return RCIC to standby.
		<ul style="list-style-type: none"> • Warms and Pressurizes the RCIC Steam Line by performing the following steps: <ul style="list-style-type: none"> ○ Confirms Closed 2E51-F008, Steam Supply Line Isol Vlv. ○ Confirms Closed 2E51-F007, Steam Supply Isol Vlv. ○ Confirms Open/Opens 2E51-F054, Steam Line Drain Vlv.
	BOP	<ul style="list-style-type: none"> • Opens 2E51-F008, Steam Supply Line Isol Vlv. • Slowly Throttles Open 2E51-F007, Steam Supply Isol Vlv. • When turbine steam inlet pressure is WITHIN 50 PSIG of reactor pressure as monitored on 2B21-R623A(B), Rx Water Level/Rx Press, on panel 2H11-P601, fully open 2E51-F007, Steam Supply Isol Vlv, is FULLY OPEN. • When RCIC Turbine Inlet Drain Pot Level High (602-308), clears, confirm Closed/Close 2E51-F054, Steam Line Drain Vlv. (Alarm may not come in.) • Has other operator perform independent verification for RCIC Standby lineup. • Notifies SS when RCIC is returned to Standby.
	SS	<ul style="list-style-type: none"> • Declares RCIC Operable

Op-Test No.: 2009-301 Scenario No.: 4-04 Event No.: 2

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Event Description: PRNM 2 out of 4 logic module trips causing a half scram and a control rod to scram in due to a blown fuse.

Time	Position	Applicant's Actions or Behavior
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		<p><u>Simulator operator</u></p> <ul style="list-style-type: none"> • As directed by the Chief Examiner, press the following: (THESE IO's ARE SEQUENCE SENSITIVE): <ul style="list-style-type: none"> ○ First, press (RB-1) to activate diC51-K617A-S2 THEN ○ Press (RB-2) to activate diC51-K617A-S1 and mfC12_26 14-39
	ALL	<ul style="list-style-type: none"> • Address the following alarms: <ul style="list-style-type: none"> ○ Recognizes a half scram occurs on RPS "A" ○ Reactor Neutron Monitoring Sys Trip, 34AR-603-109-2 ○ Reactor Auto Scram System "A" trip, 34AR-603-126-2 ○ Rod Drift, 34AR-603-247-2 ○ Identifies control rod 14-39 has scrambled full in.
		NOTE: The team may immediately address the abnormal procedure 34AB-C11-004-2, Mis-positioned Control Rods, since the control rod is mis-positioned.
	CBO	<ul style="list-style-type: none"> • Addresses annunciator "Rod Drift," 34AR-603-247-2 <ul style="list-style-type: none"> ○ 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.: 2009-301 Scenario No.: 4-04 Event No.: 2

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Event Description: PRNM 2 out of 4 logic module trips causing a half scram and a control rod to scram in due to a blown fuse.

Time	Position	Applicant's Actions or Behavior
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	SS	<ul style="list-style-type: none"> • Notifies maintenance to begin repairs on the “Two Out Of Four Logic” module A. • Notifies maintenance to investigate the cause of the control rod scrambling in (possible blown fuse). • Addresses tech specs for the logic module 3.3.1.1-1 2.e <ul style="list-style-type: none"> ○ Determines a RAS exist per 3.3.1.1-1 A requiring the channel or trip system be placed in trip within 12 hours.
		<p><u>Simulator Operator</u></p> <p>AFTER being directed to investigate the problem with control rod 14-39, then:</p> <ul style="list-style-type: none"> • Delete malfunction: mfC12_26 14-39 • Call the control room, as electrical maintenance. Inform the team that <u>Time Compression Is Being Used</u>, and REPORT: <ul style="list-style-type: none"> ○ “The fuse for control rod 14-39 (RPS B side) was blown and it has been replaced.”

Op-Test No.: 2009-301 Scenario No.: 4-04 Event No.: 2

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Event Description: PRNM 2 out of 4 logic module trips causing a half scram and a control rod to scram in due to a blown fuse.

Time	Position	Applicant's Actions or Behavior
		<p><u>Simulator Operator</u></p> <p>After being called to investigate the problem with the 2 out of 4 voter module:</p> <ul style="list-style-type: none"> • DELETE override: diC51-K617A-S2 • DELETE override: diC51-K617A-S1 • Call the control room, as I&C. Inform the team that <u>Time Compression Is Being Used</u>, and REPORT: <ul style="list-style-type: none"> ○ “The 2 out of 4 voters module was a shorted contact on a switch. The problem has been corrected.”
	CBO	<ul style="list-style-type: none"> • Resets the half Scram <ul style="list-style-type: none"> ○ Rotates the Reactor Scram Reset Switch in both directions ○ Scram Group A lights illuminate
	SS	<ul style="list-style-type: none"> • Direct the STA to confirm compliance Power Distribution Limits per with TS 3.2.

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Event Description: PRNM 2 out of 4 logic module trips causing a half scram and a control rod to scram in due to a blown fuse.

Time	Position	Applicant's Actions or Behavior
	SS, CBO	Performs a Control Rod Movement Brief, using Attachment 2 of 34GO-OPS-065-0. Control Rod Movement.
	CBO (R)	<ul style="list-style-type: none"> • Refers to Attachment 2 of 34AB-C11-004-2, "Mis-positioned Control Rods," to recover the control rod. • Withdraws the control rod using both the rod Movement switch and the Rod Out Notch Override switch.
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • After the CBO has referred to attachment 2 of 34AB-C11-004-2, "Mis-positioned Control Rods" <ul style="list-style-type: none"> ○ Provide marked up copy of attachment 2 (2 pages) of 34AB-C11-004-2.
	CBO	<ul style="list-style-type: none"> • Respond to the following annunciators when received during control rod withdrawal (will be received several times): <ul style="list-style-type: none"> ○ RBM Upscale or Inop 603-202 ○ Rod Out Block 602-238 • De-Select and Re-Select control rod 14-39 to clear the alarm.

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Event Description: Recirc Pump "A" high vibration, power increase will be stopped and decrease started. Decreasing by 5% power will correct condition.

Time	Position	Applicant's Actions or Behavior
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		<u>Simulator Operator</u>
		<ul style="list-style-type: none"> • At Chief Examiner's direction press (RB-3) to activate: <ul style="list-style-type: none"> ○ mFB31_41A, "A" Recirc Pump high vibration
	All	<ul style="list-style-type: none"> • Receives Recirc Pump A High Vibration alarm (602-104)
	SS	<ul style="list-style-type: none"> • Directs operator to enter 34AR-602-104-2.
	CBO	<ul style="list-style-type: none"> • Enters 34AR-602-104-2 <ul style="list-style-type: none"> ○ Depresses the Hi vibration reset pushbutton and determines that the alarm does not clear. ○ Notifies the SS that the vibration alarm did not clear. ○ Notifies the SS that the ARP requires reducing Recirc flow and attempting to reset the alarm again.
	SS	<ul style="list-style-type: none"> • Directs the operator to reduce Rx power with Recirc per 34GO-OPS-005 and 34SO-B31-001-2, exceeding 10 MWE/minute if necessary. • Reminds the operator that entry into the immediate exit region of the Power to Flow map is allowed. • Notifies Plant Management, Load Dispatcher, and Engineering that the power increase has been halted pending investigation of Recirc Pump "2A" high vibration condition.

Op-Test No.: 2009-301 Scenario No.: 4-04 Event No.: 3&4

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Event Description: Recirc Pump "A" high vibration, power increase will be stopped and decrease started. Decreasing by 5% power will correct condition.

Time	Position	Applicant's Actions or Behavior
	CBO	<ul style="list-style-type: none"> • Enters the following procedures <ul style="list-style-type: none"> ○ 34GO-OPS-005-2S, "Power Changes" ○ 34SO-B31-001-2S, "Recirculation System" ○ Decreases reactor power with Recirc flow decrease per 34SO-B31-001-2S by pressing the Master Recirc Flow Control Decrease push-buttons (may use any of the 3 decrease pushbuttons). ○ Monitors power decrease by observing APRM and generator output indications. ○ RBM Downscale (603-211) alarm will be received unless an edge rod is selected
	CBO	<ul style="list-style-type: none"> • Stops power reduction periodically and depresses the high vibration reset pushbutton. <ul style="list-style-type: none"> ○ The alarm will not clear until after power is reduced by at least 5%.
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • After power has been reduced by 5% <ul style="list-style-type: none"> ○ Delete mfB31_41A, "A" Recirc Pump high vibration."

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Event Description: Recirc Pump "A" high vibration, power increase will be stopped and decrease started. Decreasing by 5% power will correct condition.

Time	Position	Applicant's Actions or Behavior
	CBO	<ul style="list-style-type: none"> • Depresses the Hi vibration reset pushbutton and determines that the alarm DOES clear. • Notifies the SS that the vibration alarm is clear after reducing Recirc pump speed.
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • If Recirc Pump speed is increased to raise power: <ul style="list-style-type: none"> ○ Enter mfB31_41A, "A" Recirc Pump high vibration • THEN, if Recirc pump speed is subsequently reduced: <ul style="list-style-type: none"> ○ Delete mfB31_41A, "A" Recirc Pump high vibration
	SS	<ul style="list-style-type: none"> • Direct the operator to determine whether the plant is in the safe region of the Power to Flow map.
	CBO	<ul style="list-style-type: none"> • Determines that the plant is in the safe area of the Power to Flow map.
		<p><u>Simulator Operator</u></p> <p>Enter the next event now or at the Chief Examiner's direction.</p>

Op-Test No.: 2009-301 Scenario No.: 4-04 Event No.: 5

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Event Description: RWCU line break outside containment. Must be manually isolated, with failure of outboard isolation valve to close.

Time	Position	Applicant's Actions or Behavior
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • At Chief Examiner's direction, press (RB-4) to activate: <ul style="list-style-type: none"> ○ mfG31_207A, G31-F001 Fails to isolate on Group 5 ○ mfG31_52, RWCU System Leak <p>Note: svoG31071, G31-F004 Valve position was activated at ST=0</p>
	All	<ul style="list-style-type: none"> • "RWCU System Leak" Alarm, (602-421), is received.
	SS	<ul style="list-style-type: none"> • Request SSS to send a RO to Control Room back panel to determine leakage.
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • If asked to determine leakage, then report: <ul style="list-style-type: none"> ○ 2G31-N615 RWCU differential flow indicates 78 gpm.
	BOP	<ul style="list-style-type: none"> • Enters 34AR-602-421-2, "RWCU Sys Leak" • Enters 34AB-G31-001-2, "RWCU Isolation" <ul style="list-style-type: none"> ○ Determines that RWCU should have tripped and isolated. ○ Trips RWCU Pump "2B" ○ Places the control switches for 2G31-F001 and 2G31-F004 to the CLOSE position. ○ Determines that the RWCU System 2G31-F001 DID close. (Critical Task) ○ Determines that the RWCU System 2G31-F004 DID NOT close. ○ Notifies SS that 2G31- F004 will not close.

Op-Test No.: 2009-301 Scenario No.: 4-04 Event No.: 6

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Event Description: Loss of Instrument Bus "B" followed by Restoration of Instrument Bus "B"

Time	Position	Applicant's Actions or Behavior
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		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • At chief examiners direction press (RB-5) to activate: <ul style="list-style-type: none"> ○ mfR25_186, 120/208 VAC Inst Bus 2B Fault.
	C (ALL)	<ul style="list-style-type: none"> • Diagnose loss of Instrument Bus "B" <ul style="list-style-type: none"> ○ Loss of top green lights on each Drywell/Torus Vacuum Breaker (P602) ○ Loss of "D" steam flow indication (P603) <ul style="list-style-type: none"> • RLW decreases to below 32" and then recovers to normal. ○ RWLC automatically transfers to single element ○ Loss of ASD RPM indication 2B31-R660A and B ○ Loss of 2B Recirc Speed indicator (2B31-R661A-1) ○ Loss of 2B Recirc Speed Demand indicator (R661A-2) • The following annunciators will be received: <ul style="list-style-type: none"> ○ Torus Vacuum Relief Valve F311 Open, 603-251 ○ Feedwater Control System Trouble, 603-132 ○ Additional annunciators listed in attachment 3 of 34AB-R25-002-2.
	SS (TS)	<ul style="list-style-type: none"> • Direct BOP operator to pull and enter 34AB-R25-002-2, Loss of Instrument Buses. • Direct that a System Operator and Maintenance investigate the loss of 2B Instrument Bus. • Determines TS 3.8.7.C applies with a requirement of 8 hrs to restore.

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Event Description: Loss of Instrument Bus "B" followed by Restoration of Instrument Bus "B"

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • Pull and enter 34AB-R25-002-2, Loss of Instrument Buses. <ul style="list-style-type: none"> ○ Call SSS to send an SO and maintenance to investigate the bus loss. ○ Check supply breaker #28 closed on R25-S037. ○ Direct the electrician to check fuses in 2R20N-P002.
		<p>Simulator Operator</p> <ul style="list-style-type: none"> • As electrical maintenance, call the control room and report: <ul style="list-style-type: none"> ○ The fuses in 2R20N-P002 are blown
	BOP	<ul style="list-style-type: none"> • Direct the electrician to replace the blown fuses in 2R20N-P002
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • AFTER an electrician is directed to replace the blown fuses in 2R20N-P002, then: <ul style="list-style-type: none"> ○ Delete mfR25_186, 120/208 VAC Inst Bus 2B Fault. <p>THEN</p> <ul style="list-style-type: none"> • Call the control room as electrical maintenance and REPORT: <ul style="list-style-type: none"> ○ "The fuses have been replaced in 2R20N-P002.

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Event Description: Loss of Instrument Bus "B" followed by Restoration of Instrument Bus "B"

Time	Position	Applicant's Actions or Behavior
		<p>Completing all of the tasks listed in 34AB-R25-002-2 will require a large amount time.</p> <p>It is not expected that all of these tasks will be completed during this scenario, and at the chief examiners direction, proceed to the next event.</p> <p>Note: the next event is the major event (LOSP).</p>
	SS	<ul style="list-style-type: none"> • Direct the BOP operator to restore loads IAW 34AB-R25-002-2.
	BOP (C)	<ul style="list-style-type: none"> • Restore loads and plant alignment following power restoration to "2B" Instrument bus. <p><i>No</i> ○ Reset group isolation signals using Group Isolation Reset switches</p> <p><i>No</i> ○ Open Fission Product Monitoring isolation valves (P700)</p> <ul style="list-style-type: none"> • 2D11-F052 • 2D11-F053 • 2D11-F072 <p><i>No</i> ○ Reset and return RB ventilation to normal.</p> <p><i>No</i> ○ Reset and return RF ventilation to normal.</p> <p><i>?</i> ○ Confirm Recirc System has returned to normal.</p> <p><i>Yes</i> ○ Secure SBTG and place it in standby.</p> <p><i>Yes</i> ○ Restore DW Equipment and Floor Drain sumps.</p> <p><i>Yes</i> ○ Return the Steam Packing Exhauster to service.</p> <p><i>Yes</i> ○ Restore Control Building ventilation to normal alignment.</p> <p><i>Yes</i> ○ Return RWLC to 3 element control.</p>

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Event Description: Loss of Startup Transformer “2D”.

Time	Position	Applicant's Actions or Behavior
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		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • At Chief Examiner’s Direction press (RB-7) to activate: <ul style="list-style-type: none"> ○ mfC11_30B; Control Rod Drive Pump B Trip ○ mfP64_193B; Drywell Chiller Compressor B FAIL ○ mfR22-182; 4KV Bus 2E Fault ○ mfS11_227B; SAT 2D Failure ○ diR22-135574C; Contr SW ACB 135574 (4KV 2F Norm Brkr) ○ mfR43_168A; Diesel Gen Tie Brk Fails Auto Close 2A <p>Note: mfR43_167C, Diesel Gen Fail to Start 2C was active since the beginning of the scenario.</p>
	SS	<p>Enters the RC flowchart due to low reactor water level (RWL) and assigns the following tasks</p> <p>Note: the SS may assign one operator to perform Scram procedure placards RC-1, RC-2 and RC-3.</p> <ul style="list-style-type: none"> • Assigns the CBO to perform RC-1. • Assigns the BOP operator to perform RC-2 and RC-3. • If time allows assigns TC-1 to be performed.
	CBO	<ul style="list-style-type: none"> • Performs RC-1 consisting of:

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Event Description: Loss of Startup Transformer "2D".

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • Recognizes the MSIVs have closed. • Recognizes RCIC trip. • Recognizes that HPCI did not START. <p><u>See event 7C</u></p>
	BOP	<ul style="list-style-type: none"> • Performs RC-3 consisting of: <ul style="list-style-type: none"> ○ Monitor RPV pressure. ○ Confirm proper operation of pressure control system (TBV, LLS, etc.). No power ○ 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 SS of pressure control system operation.
	SS	<ul style="list-style-type: none"> • Directs the CBO to address the plant electrical systems and enter: <ul style="list-style-type: none"> ○ 34AB-R22-003-2, "Station Blackout" ○ 34AB-R43-001-2, "Diesel Generator Recovery" • Calls for maintenance support in restoring emergency 4160 VAC buses.

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Event Description: 4160 VAC 2G Manually Energized from Startup Transformer "2C".

Time	Position	Applicant's Actions or Behavior
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	CBO	<ul style="list-style-type: none"> • Enters 34AB-R22-003-2, "Station Blackout." • Enters 34AB-R43-001-2, "Diesel Generator Recovery."
	CBO	<p>May attempt to close the "2A" EDG output breaker using 34AB-R43-001-2, Diesel Generator Recovery, Attachment 2 (or placard).</p> <ul style="list-style-type: none"> • Ask is the diesel running unloaded? Yes • Confirms the normal and alternate supply breakers are open. • Lowers EDG frequency to 57 hz, then raise to 60 Hz. • Recognizes the EDG breaker closed and tripped open. • Did the Emergency Bus energize? NO • Refers to 34AB-R43-001-2. • Calls for Maintenance assistance. Time: _____
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • After 10 minutes has elapsed from the time of the call for assistance with the "2E" 4160 VAC Bus, call the control room as Electrical Maintenance in the EDG bldg and REPORT: <ul style="list-style-type: none"> ○ "The "2E" bus appears to have a hard short between two main bus bars. Length of time necessary to resolve the problem is unknown at this time."

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Event Description: 4160 VAC 2G Manually Energized from Startup Transformer “2C”.

Time	Position	Applicant's Actions or Behavior
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • <u>AFTER</u> the 86 lockout has tripped for the “2G” 4160 VAC bus, THEN: <ul style="list-style-type: none"> ○ DELETE diR22-135584C; Contr SW ACB 135574
	CBO	<p>In addressing “G” 4160 VAC bus the operator may use Attachment 2 (or placard) of 34AB-R43-001-2, Diesel Generator Recovery which directs the operator to determine and perform the following steps:</p> <ul style="list-style-type: none"> • Is the diesel running unloaded? NO • Is the Auto Start System operative light lit: NO • Confirms the normal and alternate supply breakers are open. • Depresses the EDG Shutdown Relay logic push-button (normally auto start occurs in 110 seconds, in this case the EDG will not start) • Did the EDG start? NO • Is the Auto Start System Operative light lit? NO • Direct operator at the EDG building to locally start the “2C” EDG Time: _____
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • After 4 minutes has elapsed from the call concerning the “2C” EDG, call the control room as the SO in the EDG bldg and REPORT: <ul style="list-style-type: none"> ○ “The “2C” EDG will cannot be started locally.”

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Event Description: 4160 VAC 2G Manually Energized from Startup Transformer "2C".

Time	Position	Applicant's Actions or Behavior
	CBO	<ul style="list-style-type: none"> • Addresses 34AB-R22-002-2, Loss of Emergency Bus <ul style="list-style-type: none"> ○ Direction is provided to energize "2G" 4160 bus from SAT "2C" using 34SO-R22-001-2, "4160 VAC System." • Addresses 34SO-R22-001-2, "4160 VAC System" for Restoration of power to 4160 VAC Emergency Bus (2E, 2F, 2G) from Alternate power Supply (2C). <ul style="list-style-type: none"> ○ Confirms power available to SAT 2C. ○ Confirms requirements are met to reset SAT 2C lockout relay. (see the next Simulator Operator direction) ○ Direct reset of SAT 2C lockout relay at Bus 2R22-S005. ○ Confirms requirements are met to reset LOSP lockout relay. ○ Requests permission from the SS to reset the LOSP relay for "2G" 4160 VAC bus ○ Hold 4160 VAC Bus 2G LOSP lockout relay in RESET. ○ Confirm the 4160 VAC bus 2G Alternate Supply breaker closes. ○ Place the Alternate Supply breaker to the close position.
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • If directed to reset the lock out relay for SAT 2C, REPORT: <ul style="list-style-type: none"> ○ "The lockout relay for SAT 2C is NOT tripped"

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Event Description: 4160 VAC 2G Manually Energized from Startup Transformer "2C".

Time	Position	Applicant's Actions or Behavior
	CBO	<ul style="list-style-type: none"> • Confirms "2B" PSW Pump starts • Confirms 2P41-F316 B and D automatically close
	CBO	<ul style="list-style-type: none"> • Addresses 34AB-R23-001-2, Loss Of 600 Volt Emergency Bus, for "C" and "D" 600VAC buses. • Resets the non-essential load lock-outs on 2H11-P652 • Directs the SSS close breakers fed from 600 VAC systems such as: <ul style="list-style-type: none"> ○ 125/250 VDC battery chargers. ○ Reactor Protection System power supply. ○ Station Service Air Compressors. ○ Reactor Building Closed Cooling Water pump.
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • When requested to perform remote actions to send operators out to help in restoration of 600 VAC bus loads, THEN perform the remote functions to restore (<u>ONLY</u> perform the actions for those systems specifically requested): <ul style="list-style-type: none"> ○ Station Service Battery Chargers ○ Vital AC Battery Charger ○ RPS power restoration ○ Station Service Air Compressor

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Event Description: 4160 VAC 2G Manually Energized from Startup Transformer "2C".

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> • Enters the PC EOP Flowchart due to high Drywell pressure (1.85 psig) An assigns the following actions: • Directs the operator to restore drywell chillers and coolers per 31EO-EOP-100-2, Miscellaneous Emergency Overrides.
		<p><u>Simulator Operator</u></p> <ul style="list-style-type: none"> • AFTER being directed to restore DW chillers AND AFTER DW pressure has exceeded 1.85 psig: <ul style="list-style-type: none"> ○ DELETE mfp64_193B, "Drywell Chiller Compressor B FAIL"
	CBO	<ul style="list-style-type: none"> • Restores drywell chillers per 31EO-EOP-100-2 section 3.7 by: <ul style="list-style-type: none"> ○ Verifies drywell temperature is below 250 °F using SPDS and/or recognizes there is not a leak in primary containment. ○ Place 2P64-S3, LOCA Override Switch, to BYPASS on panel 2H11-P700 ○ Has the SSS open links: <ul style="list-style-type: none"> ▪ Upper TB1-11, 2R22-S007 Fr.7,2P64-B006B ○ Directs the SSS reset 86 lockout relays on drywell chiller breaker

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Event Description: HPCI must be manually started.

Time	Position	Applicant's Actions or Behavior
		NOTE: <ul style="list-style-type: none"> • The following 2 malfunctions were entered at ST-0: <ul style="list-style-type: none"> ○ mfE41_235A (HPCI Fails To Auto Start On Low Level) ○ mfE41-_235B (HPCI Fails To Auto Start On Hi Drywell Press)
	BOP	<ul style="list-style-type: none"> • Recognizes that HPCI failed to Auto Start and Starts HPCI <p>(CRITICAL TASK) HPCI is the only high pressure injection system, perform this action prior to emergency depressurization being required due to lowing level.</p>
	BOP	<ul style="list-style-type: none"> • Recognizes HPCI fails to auto start at -35" or 1.85 psig DW pressure and manually starts per 34SO-E41-001-2, prior to emergency depressurization. <ul style="list-style-type: none"> ○ Opens 2E41-F059, Lube Oil Cooling Wtr Vlv. ○ Starts 2E41-C002-2, Barometric Condenser Vacuum Pump. ○ Opens 2E41-F001, Turbine Steam Supply Vlv ○ Takes 2E41-C002-3, Aux Oil Pump, control switch to the START position. ○ Opens 2E41-F006, Pump Discharge Valve.
	BOP	<ul style="list-style-type: none"> • Confirm the following valves OPENED: <ul style="list-style-type: none"> ○ Turbine Control Vlv ○ Turbine Stop Vlv • Recognizes that the flow controller has failed low • Places flow controller in manual and adjust as required to achieve the following • Confirm the turbine comes up to speed • Confirms 2E41-F012, Min Flow Vlv, closed. • Adjust flow with 2E41-R612, Flow Control to maintain water level.

