

PROPOSED NRC-DEVELOPED SCENARIOS

FOR THE FERMI INITIAL EXAMINATION - JUNE 2001

Facility: <u>FERMI 2</u>	Scenario No.: <u>A</u>	Op-Test No.: <u>2001</u>	
Examiners: _____ _____	Operators: _____ _____		
Initial Conditions: <u>Plant is at 25% power with a startup in progress in accordance with GOP 22.000.03, POWER OPERATION 25% TO 100% TO 25%</u>			
Turnover: <u>Continue plant Startup. Severe thunder storm warnings for area later in the day. HPCI is out of service for oil change, estimated return to service is 12 hours. Perform 24.402.01 Drywell and Suppression Chamber Vacuum Breaker Operability Test, beginning at step 5.1.26. TWMS in service in CLEANUP MODE.</u>			
Event No.	Malf. No.	Event Type*	Event Description
1		R (RO)	Increase power from 25% to approximately 30%
2	MF0100	C (RO)	Control Rod 02-35 uncoupled
3		N (BOP)	24.402.01, Drywell and Suppression Chamber Vacuum Breaker Operability Test
4	RF0736	C (BOP)	G5100-F611, TWMS Cond to Torus Makeup Vlv, fail closed.
5	MF3573	C (BOP)	CCHVAC, T4100C031, Return Air Fan trip.
6	Panel Override	I (RO)	Auto-Manual flow controller FH/A-R600 {fail flow indication high}
6	MF0069		Control Air Failure to C11-F002A
7		ALL	Thunder Storm/Tornado Watch - Lightening Strike
7	MF3385	C (RO)	Turbine Bypass Valve East N11-F059A Failure @ 100% Open on 60 second ramp.
7	MF3126	ALL	Cycle of 120 kV Breaker GM in 120kV Switchyard {Lightening Strike}
8	RF1711 RF1712 RF1709 RF1710	M(ALL)	Turbine Generator Load Rejection/ATWS Breaker CM Disconnect CO, Breaker CM Disconnect CK, Breaker CF Disconnect CD & Breaker CF Disconnect CH
8	MF3595 MF3671	M (ALL)	Total Scram Failure All Rods Stuck, variable density @ 5%
8	MF3604	C (RO)	SLC Pump A – TRIP
9	RF1424	M (ALL)	Loss of Div II Offsite Power/Partial Loss of Div II Onsite Power Brownstown #2 345kV Disconnects OPEN
9	MF3513	C (BOP)	EDG 14 Fails to Start
9	MF1419	C (BOP)	C002B, RHR Pump B Trip {Trigger for 1 minute after started}

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

**INITIAL CONDITIONS**

Initial Conditions: IC-11

At step 540 of the pull sheets, **withdraw rod 18-35 from 12-20.**

Core flow is approximately 48 x 10 E6/lbh.

Reactor power is approximately 25%.

The SRFP is idling at 1000 rpm.

Setup for single element feedwater level control.

The crew will be directed to pull group 5/1 from 12 to 48.

Upon completion of this rod pull the plant will be about 29% power with a core flow of 49.

For performance of Section 5.1, 24.402.01, Drywell and Suppression Chamber Vacuum Breaker Operability Test, verify or reduce Drywell pressure to less than or equal to Suppression Chamber pressure. Requirement is that this surveillance be completed within 12 hours of an SRV opening you can give them about 2 hours to complete the surveillance.

TWMS in service in CLEANUP MODE IAW SOP 23.144 Section 6.

**EQUIPMENT OUT OF SERVICE:**

HPCI is out of service for oil change, estimated return to service is 12 hours.

P4100-C002, GSW Pump #2 is out of service for breaker work.

P4300-C003, South TBCCW Pump is out of service for P4300-F024C, South TBCCW Pump Discharge Iso Vlv work.

**SIMULATOR SETUP and CUES**

Reset to IC-11

At step 540 of the pull sheets, **withdraw rod 18-35 from 12-20.**

Setup for single element feedwater level control with the SRFP idling at 1000 rpm.

Ensure East CRD Pump is in service.

Ensure Steam Tunnel Cooler A is in service.

Ensure HPCI is taken out of service.

Ensure P4100-C002, GSW Pump #2 is out of service.

Ensure P4300-C003, South TBCCW Pump is out of service.

Place TWMS in service in CLEANUP MODE IAW SOP 23.144 Section 6.

Obtain copy of GOP 22.000.03, POWER OPERATION 25% TO 100% TO 25% and markup complete through step 4.2.5

Obtain copy of 24.402.01, Drywell and Suppression Chamber Vacuum Breaker Operability Test and markup complete through step 5.1.26.

For performance of Section 5.1, 24.402.01, Drywell and Suppression Chamber Vacuum Breaker Operability Test, verify or reduce Drywell pressure to less than or equal to Suppression Chamber pressure.

Conduct Shift Turnover and allow crew to conduct briefings prior to coming into Simulator.

- 2 MF0100 Control Rod 02-35 uncoupled {set active from shift turnover}  
After crew re-inserts 02-35 to attempt re-coupling clear malfunction.
- 4 RF0736 G5100-F611, TWMS Cond to Torus Makeup Vlv, fail closed.
- 5 MF 3573 CCHVAC, T4100C031, Return Air Fan trip.
- Field Report** Return Air Fan tripped {due to mechanical binding} breaker [MCC 72F-5A Pos 1B, AB5-H17] on overload.)
- Field Report** Verified proper operation of CCHVAC Makeup Air Rad Monitors (RR H11-P883 and P884).
- Field Report** Perform local verifications at H21-P285B (AB5-G13) for Div 2 CCHVAC.
- Field Report** Report local instrument readings (RB5-G15) for Div 2 CCHVAC.
- T41-R046B, Div 2 CCHVAC Chiller Evaporator Press Ind, 23 to 27.5" vac.
  - T41-R047B, Div 2 CCHVAC Chiller Condenser Press Ind, 5 to 15" vac.
  - T41-R048B, Div 2 CCHVAC Chiller Purge Cndr Press Ind, 15" vac to 15 psig.
  - T41-RA06B, Div 2 CCHVAC Chiller Oil Sump Temp Ind, 130 to 140°F.
  - T41-RA05B, Div 2 CCHVAC Chiller Oil Cooler Temp Ind, 105 to 130°F
  - T41-R045B, Div 2 CCHVAC Chiller Oil Pressure Ind, 11 to 15 psig (22.4 to 30.5" Hg) above evaporator pressure.
- 6 Panel Override MF0069 Auto-Manual flow controller FH/A-R600 {fail flow indication high}  
Control Air Failure to C11-F002A  
When RO take flow controller FH/A-R600 to manual remove MF0069 and allow adjustment to required value
- 7 Thunder Storm/Tornado Watch - Lightening Strike  
**Initiate Malfunctions MF3385 and MF3126 at the same time.**
- 7 MF3385 Turbine Bypass Valve East N11-F059A Failure @ 100% Open {ITS}  
**Set to fail OPEN on a 60 second ramp**
- 7 MF3126 Security Shift Manager Cycle of 120 kV Breaker GM in 120kV Switchyard  
Report lightening and high winds, uprooting trees near the NOC.  
**REPORT TORNADO WATCH**

8 Turbine Generator Load Rejection/ATWS

**ATWS**

8 MF3595 Total Scram Failure  
MF3671 All Rods Stuck, variable density @ 5%  
MF3604 SLC Pump A – TRIP

**T/G Load Reject**

RF1711 Breaker CM Disconnect CO  
RF1712 Breaker CM Disconnect CK  
RF1709 Breaker CF Disconnect CD  
RF1710 Breaker CF Disconnect CH

**Set Malfunctions for EVENT 8 ATWS prior to EVENT 7 “Turbine Bypass Valve East N11-F059A Failure”**

9 Loss of Div II Offsite Power/Partial Loss of Div II Onsite Power

RF1424 Brownstown #2 345kV Breakers

MF3513 EDG 14 Fails to Start

**Insert EVENT #9 malfunctions MF1424 and MF3513 after initial Scram actions have been completed and failure of SLC has been reported, but before RO attempts to drive rod in IAW 29.ESP.03**

MF1419 C002B, RHR Pump B Trip  
{Trigger for 1 minute after started}

**If directed to defeat ARI {IAW EOPs}, perform the following : on page RF-EOP, place RF 2315 - RF 2318 in DEFEAT:**

**CRITICAL TASK:**

1. During an ATWS, INHIBIT ADS to prevent an uncontrolled RPV depressurization, to prevent causing a significant power excursion per FSL-1.
2. With a reactor scram required and the reactor not shutdown, TAKE ACTION TO REDUCE POWER BY INSERTING CONTROL RODS, to prevent exceeding the primary containment design limits per FSQ-11.
3. Recognize if the requirements of FSL-OR3 {Reactor power >3% and RPV level > 108 inches} are met; and if met, terminates and prevents injection to the RPV in order to lower RPV water level until conditions required by FSL-25 are established, and then maintains the level above -28".

**SHIFT TURNOVER**

Plant is in MODE 1 at approximately 25% power.

Core flow is about 48 E6 lb/h.

Feedwater level control is in single element with the S RFP idling at 1000 rpm.

Continue power ascension iaw GOP 22.000.03, POWER OPERATION 25% TO 100% TO 25%.

At step 540 of the pull sheets.

Continue rod withdrawal and pull group 5/1 from 12 to 48.

24.402.01, Drywell and Suppression Chamber Vacuum Breaker Operability Test is in progress at step 5.1.26 and must be completed within the next 2 hours.

TWMS in service in CLEANUP MODE IA

Severe thunder-storm warning for the area

**EQUIPMENT OUT OF SERVICE:**

HPCI is out of service for oil change, est

P4100-C002, GSW Pump #2 is out of service

P4300-C003, South TBCCW Pump is out of service for Discharge Iso Vlv work.

Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>1</u> Page <u>1</u> of <u>3</u>		
Event Description: Increase power from 25% to approximately 30% IAW GOP 22.000.03, POWER OPERATION 25% TO 100% TO 25%		
	SRO	Crew brief on power increase IAW GOP 22.000.03, POWER OPERATION 25% TO 100% TO 25% and 24.402.01 Drywell and Suppression Chamber Vacuum Breaker Operability Test conducted prior to crew taking shift.
	SRO	Direct RO to withdraw control rod group 5/1 rods from 12 to 48.
	SRO	Notify Central System Supervisor of power increase.
	RO	Withdraw control rod group 5/1 rods from 12 to 48.
	RO/Verifier	Per 23.623 step 6.1.1.2 - Before any planned rod movement, Attachment 1 has been read and signed.
	RO	Selects a control rod and states which one was selected,
	RO	When selecting a Control Rod, verify the LPRM's displayed, are the correct LPRM's for the selected Control Rod.
	Verifier	Confirms that the appropriate rod was selected. In confirming the appropriate selection the verifier shall:
		1. Read the Rod Pull Sheet (Verifier's Copy), 2. Verify the rod select light on the full core display, 3. Indicate agreement with the operator, and 4. Place a check mark in the Selection Check Column.
	RO	States the rod's position and the position it is to be moved to.
	Verifier	Confirms that the intended movement is appropriate. In confirming, the verifier shall:
		1. Verify the rod's current position as indicated on the 4 rod display or process computer CRT is as stated on the Rod Pull Sheet (Verifier's Copy), 2. Verify that the rod's intended final position is within the range for the current step, 3. Indicate agreement with the operator, and 4. Place a check mark in the Position Check Column.
	RO/Verifier	Shall confirm the Control Rod is moving in the correct direction.

Time	Position	Applicant's Actions or Behavior
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Event Description: Increase power from 25% to approximately 30% IAW GOP 22.000.03, POWER OPERATION 25% TO 100% TO 25%		
	RO/Verifier	Shall closely monitor both Reactor Power and Control Rod Position Indication.
	RO	Shall verify appropriate response on LPRM meters.
	RO	Before reaching the specified position, the operator shall release the Rod Movement Control switch for insertion, <b>or</b> the Rod Movement Control switch and the Rod Notch Override switch for withdrawal.
	RO/Verifier	Shall confirm the Control Rod has moved to the specified position.
	RO/Verifier	The operator and verifier place a check mark on their respective Rod Pull Sheets to indicate that the step has been completed and the rod has been moved to the specified position, <b>or</b> if the rod is left at the intermediate position, the rod position will be written in the Final Position Column.
		<b>CRD Coupling Integrity Test</b>
		<b>NOTE:</b> For Control Rods being pulled to FULL-OUT (Position 48), the Control Rod should not be driven into the backseat using continuous rod motion. As a goal, the Control Rod should be notched into Position 48.
	RO	Perform coupling test of all Control Rods as follows:
		1. Perform coupling test of all Control Rods as follows: a. Attempt to withdraw Control Rod from Position 48 by notching rod. b. Verify Control Rod is coupled as follows: 1) Rod settling back to Position 48. 2) Annunciator 3D76, CONTROL ROD OVERTRAVEL, does not alarm. c. Verify one of the following: 1) Position 48 is displayed on the Four Rod Display. 2) The Full-out light is lit on the Full Core Display. d. Enter Coupling Verification information on Attachment 3.







Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>3</u> Page <u>1</u> of <u>4</u>		
Event Description: Perform 24.402.01, Drywell and Suppression Chamber Vacuum Breaker Operability Test		
Time	Position	Applicant's Actions or Behavior
	SRO	Direct performance of 24.402.01, Drywell and Suppression Chamber Vacuum Breaker Operability Test beginning at step 5.1.26.
	BOP	Direct T48-F423, Nitrogen Supply Isolation Valve to Suppression Chamber – Drywell Vacuum Breaker at H21-P505 (RBB-G15) OPEN.
	BOP	Test T2300-F400H, Torus to DW Vacuum Breaker, as follows: 1. Depress and hold T2300-F400H open pushbutton. 2. Verify T2300-F400H indicates open at COP H11-P808. (CT-O) 3. Verify T2300-F400H indicates open (CLOSED light OFF) at COP H11-P817. (CT-O) 4. Release T2300-F400H OPEN pushbutton. 5. Verify T2300-F400H indicates closed at COP H11-P808. (CT-C) 6. Verify T2300-F400H indicates closed at COP H11-P817. (CT-C)
	BOP	Direct T48-F423, Nitrogen Supply Isolation Valve to Suppression Chamber – Drywell Vacuum Breaker at H21-P505 (RBB-G15) CLOSED.
	BOP	Direct T48-F424, Nitrogen Supply Isolation Valve to Suppression Chamber –Drywell Vacuum Breaker at H21-P505 (RBB-G15) OPEN.
	BOP	Test T2300-F400J, Torus to DW Vacuum Breaker, as follows: 1. Depress and hold T2300-F400J OPEN pushbutton. 2. Verify T2300-F400J indicates open at COP H11-P808. (CT-O) 3. Verify T2300-F400J indicates open (CLOSED light OFF) at COP H11-P817. (CT-O) 4. Release T2300-F400J OPEN pushbutton. 5. Verify T2300-F400J indicates closed at COP H11-P808. (CT-C) 6. Verify T2300-F400J indicates closed at COP H11-P817. (CT-C)
	BOP	Direct T48-F424, Nitrogen Supply Isolation Valve to Suppression Chamber –Drywell Vacuum Breaker at H21-P505 (RBB-G15) CLOSED.
	BOP	Direct T48-F425, Nitrogen Supply Isolation Valve to Suppression Chamber –Drywell Vacuum Breaker at H21-P505 (RBB-G15) OPEN.

Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>3</u> Page <u>2</u> of <u>4</u>		
Event Description: 24.402.01, Drywell and Suppression Chamber Vacuum Breaker Operability Test		
Time	Position	Applicant's Actions or Behavior
	BOP	Test T2300-F400K, Torus to DW Vacuum Breaker, as follows: 1. Depress and hold T2300-F400K OPEN pushbutton. 2. Verify T2300-F400K indicates open at COP H11-P808. (CT-O) 3. Verify T2300-F400K indicates open (CLOSED light OFF) at COP H11-P817. (CT-O) 4. Release T2300-F400K OPEN pushbutton. 5. Verify T2300-F400K indicates closed at COP H11-P808. (CT-C) 6. Verify T2300-F400K indicates closed at COP H11-P817. (CT-C)
	BOP	Direct T48-F425, Nitrogen Supply Isolation Valve to Suppression Chamber –Drywell Vacuum Breaker at H21-P505 (RBB-G15) CLOSED.
	BOP	Direct T48-F426, Nitrogen Supply Isolation Valve to Suppression Chamber –Drywell Vacuum Breaker at H21-P505 (RBB-G15) OPEN.
	BOP	Test T2300-F400L, Torus to DW Vacuum Breaker, as follows: 1. Depress and hold T2300-F400L OPEN pushbutton. 2. Verify T2300-F400L indicates open at COP H11-P808. (CT-O) 3. Verify T2300-F400L indicates open (CLOSED light OFF) at COP H11-P817. (CT-O) 4. Release T2300-F400L OPEN pushbutton. 5. Verify T2300-F400L indicates closed at COP H11-P808. (CT-C) 6. Verify T2300-F400L indicates closed at COP H11-P817. (CT-C)
	BOP	Direct T48-F426, Nitrogen Supply Isolation Valve to Suppression Chamber –Drywell Vacuum Breaker at H21-P505 (RBB-G15) CLOSED.
	BOP	Direct T48-F427, Nitrogen Supply Isolation Valve to Suppression Chamber –Drywell Vacuum Breaker at H21-P505 (RBB-G15) OPEN.
	BOP	Test T2300-F400M, Torus to DW Vacuum Breaker, as follows: 1. Depress and hold T2300-F400M OPEN pushbutton. 2. Verify T2300-F400M indicates open at COP H11-P808. (CT-O) 3. Verify T2300-F400M indicates open (CLOSED light OFF) at COP H11-P817. (CT-O) 4. Release T2300-F400M OPEN pushbutton. 5. Verify T2300-F400M indicates closed at COP H11-P808. (CT-C) 6. Verify T2300-F400M indicates closed at COP H11-P817. (CT-C)

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Event Description: 24.402.01, Drywell and Suppression Chamber Vacuum Breaker Operability Test		
Time	Position	Applicant's Actions or Behavior
	BOP	Direct T48-F427, Nitrogen Supply Isolation Valve to Suppression Chamber –Drywell Vacuum Breaker at H21-P505 (RBB-G15) CLOSED.
	BOP	Direct at H21-P556 (RBB-G15): 1. Place Circuit #5 (to H21-P548) in OFF. 2. Place Circuit #6 (to H21-P505) in OFF.
	BOP	Direct at Relay Room Panel H11-P913, 120VAC Balance of Plant Relay Cabinet, remove fuses FU-50 through FU-61.
	BOP	Verify, T23-F450A and T23-F450B, have position indication on COP H11-P808.
	RO	Independent Verifier verify the following valve lineup, at COP H11-P808, verify the following Vacuum Breakers indicate CLOSED: 1. T2300-F400A, Torus to DW Vacuum Breaker 2. T2300-F400B, Torus to DW Vacuum Breaker 3. T2300-F400C, Torus to DW Vacuum Breaker 4. T2300-F400D, Torus to DW Vacuum Breaker 5. T2300-F400E, Torus to DW Vacuum Breaker 6. T2300-F400F, Torus to DW Vacuum Breaker 7. T2300-F400G, Torus to DW Vacuum Breaker 8. T2300-F400H, Torus to DW Vacuum Breaker 9. T2300-F400J, Torus to DW Vacuum Breaker 10. T2300-F400K, Torus to DW Vacuum Breaker 11. T2300-F400L, Torus to DW Vacuum Breaker 12. T2300-F400M, Torus to DW Vacuum Breaker
	RO	At COP H11-P817, verify the following Vacuum Breakers indicate CLOSED: 1. T2300-F400A, Torus to DW Vacuum Breaker 2. T2300-F400B, Torus to DW Vacuum Breaker 3. T2300-F400C, Torus to DW Vacuum Breaker 4. T2300-F400D, Torus to DW Vacuum Breaker 5. T2300-F400E, Torus to DW Vacuum Breaker 6. T2300-F400F, Torus to DW Vacuum Breaker 7. T2300-F400G, Torus to DW Vacuum Breaker 8. T2300-F400H, Torus to DW Vacuum Breaker 9. T2300-F400J, Torus to DW Vacuum Breaker 10. T2300-F400K, Torus to DW Vacuum Breaker 11. T2300-F400L, Torus to DW Vacuum Breaker 12. T2300-F400M, Torus to DW Vacuum Breaker



Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>4</u> Page <u>1</u> of <u>2</u>		
Event Description: G5100-F611, TWMS Cond to Torus Makeup Vlv, fail closed		
Time	Position	Applicant's Actions or Behavior
	BOP	RESPOND to and REPORT, 7D71 - TORUS WATER LEVEL TROUBLE
		<b>NOTE:</b> Chart paper divisions represent 4 inches each on Level Recorders T50-R804A(B), Div 1(2) Torus Level Recorder.
	BOP	1. Verify the following: <ul style="list-style-type: none"> <li>• Torus water level on G51-R402, Narrow Range Torus Level Ind, is less than -1.5 inches.</li> <li>• Torus level on T50-R804A, Div 1 Torus Level Recorder (COP H11-P601), less than -1.5 inches</li> <li>• Torus level on T50-R804B, Div 2 Torus Level Recorder (COP H11-P602), is less than -1.5 inches</li> </ul>
	BOP	<b>IF</b> water level is between -2.0 inches and +2.0 inches, restore and maintain Torus Water Level between -1.5 inches and +1.5 inches in accordance with 23.144, "Torus Water Management System."
	BOP	RECOGNIZE and REPORT G5100-F611, TWMS Cond to Torus Makeup Vlv, fail closed
	SRO	Direct BOP to secure TWMS CLEANUP MODE IAW SOP 23.144
	BOP	Return to Bypass Mode from Cleanup Mode IAW 23.144 section 6.2.2 <ol style="list-style-type: none"> <li>1. Close G5100-F611, TWMS Cond to Torus Makeup Vlv.</li> <li>2. Open G5100-F609, TWMS Recirc Line Iso Vlv.</li> <li>3. When TWMS Pumps ammeters indicates approximately 95 amps, close G5100-F033, TWMS to Cndr Iso Vlv.</li> </ol>
		<b>NOTE:</b> If the Off Gas System is in service, a short duration increase in Off Gas Flow may occur approximately 10 to 15 minutes after TWMS Flow to the Condenser is stopped.

Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>4</u> Page <u>2</u> of <u>2</u>		
Event Description: G5100-F611, TWMS Cond to Torus Makeup Vlv, fail closed		
Time	Position	Applicant's Actions or Behavior
	BOP	<p><b>10.0 SHUTDOWN</b></p> <p>10.2.1 Stop Torus Water Management North Pump.</p> <p>10.2.2 Wait approximately five seconds before stopping Torus Water Management South Pump.</p> <p>10.2.3 Wait approximately five seconds before closing or verifying closed G5100-F609, TWMS Recirc Line Iso Vlv.</p> <p>10.2.4 Close or verify closed G5100-F606, TWMS Rtrn to CS Inbd Iso Vlv.</p> <p>10.2.5 Close or verify closed G5100-F604, TWMS Rtrn to RHR Inbd Iso Vlv.</p> <p>10.2.6 Close or verify closed G5100-F600, S TWMS Pump Inbd Suct Iso Vlv.</p> <p>10.2.7 Close or verify closed G5100-F602, N TWMS Pump Inbd Suct Iso Vlv.</p> <p>10.2.8 If Condensate System is supplying CRD Pump Suction Line, verify G5100-F613, TWMS Sec Cntm Otbd Iso Vlv, is open.</p> <p>10.2.9 If Condensate System is supplying CRD Pump Suction Line, verify G5100-F612, TWMS Sec Cntm Inbd Iso Vlv, is open</p> <p>10.2.10 Verify or place TWMS Drain Mode Selector Switch in LOCK.</p>
	SRO	Comply with Technical Specifications, Section 3.6.2.2, Suppression Pool Water Level.
	SRO	Direct investigation of G5100-F611, TWMS Cond to Torus Makeup Vlv, failure.
	BOP	Direct NLO to investigate G5100-F611
		<b>Event terminated when TWMS shutdown and any ITS LCOs entered or at the discretion of the Chief Examiner.</b>

Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>5</u> Page <u>1</u> of <u>3</u>		
Event Description: CCHVAC, T4100C031, Return Air Fan trip.		
Time	Position	Applicant's Actions or Behavior
	BOP	RESPOND to and REPORT - 8D72, MOTOR TRIPPED
		<ol style="list-style-type: none"> <li>Determine which component has tripped by verifying various motor indications.</li> <li>Monitor associated equipment and systems for changing parameters.</li> </ol>
	BOP	RECOGNIZE and REPORT T4100-C031, Div 1 CCHVAC Return Air Fan tripped.
	BOP	RESPOND to and REPORT - 8D5, DIV 1 CONTROL ROOM A/C TROUBLE
		<ol style="list-style-type: none"> <li>Verify one of the following for a tripped condition: <ul style="list-style-type: none"> <li>T4100-B007, Div 1 CCHVAC Supply Fan, and T4100-C031, Div 1 CCHVAC Return Air Fan.</li> <li>T4100-B009, Div 1 CCHVAC Chiller Compressor.</li> </ul> </li> <li>IF T4100-B007, Div 1 CCHVAC Supply Fan, and T4100-C031, Div 1 CCHVAC Return Air Fan, have tripped, ENTER 20.413.01, "Control Center HVAC System Failure."</li> </ol>
	BOP	Refer SRO to: ITS, Section 3.7.3, Control Room Emergency Filtration (CREF) ITS, Section 3.7.4, Control Center Air Conditioning (AC) TRM Section TR 3.7.2, Control Room Emergency Filtration (CREF) TRM Section TR 3.7.3, Control Center Air Conditioning (AC)
	SRO	<b>ENTER</b> 20.413.01, "Control Center HVAC System Failure."
		Direct BOP to Shift to standby Division of CCHVAC, IAW 23.413.
	SRO/BOP	Direct investigation of T4100C031, Return Air Fan trip
	Field Report	Return Air Fan tripped {due to mechanical binding} breaker [MCC 72F-5A Pos 1B, AB5-H17] on overload.)
	BOP	Perform/Direct operational checkout of D11-K813, Div 2 CCHVAC Makeup Air Radiation Monitor, in accordance with 23.625, "Process Gaseous Radiation Monitoring." Document action taken and completion of independent verification in the Fermi 2 Unit Log.

Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>5</u> Page <u>2</u> of <u>3</u>		
Event Description: CCHVAC, T4100C031, Return Air Fan trip.		
	Field Report	Verified proper operation of CCHVAC Makeup Air Rad Monitors (RR H11-P883 and P884).
	BOP	3. verify: <ol style="list-style-type: none"> <li>a. Div 2 Mode Select switch is selected to the same mode as the running division.</li> <li>b. Div 2 Emergency Air Intake Selector switch in AUTO.</li> </ol>
		4. Verify or place Division 2 switches for the following equipment in AUTO: <ul style="list-style-type: none"> <li>• T4100-B006, Div 2 CCHVAC Supply Fan.</li> <li>• T4100-C040, Div 2 CCHVAC Chilled Wtr Pump.</li> <li>• T4100-B027, Div 2 CCHVAC Equip Room Cooler.</li> <li>• T4100-C030, Div 2 CCHVAC Return Air Fan.</li> <li>• T4100-B008, Div 2 CCHVAC Chiller.</li> <li>• T4100-C048, Div 2 CCHVAC Emerg Makeup Fan.</li> </ul>
	BOP	5. Direct T4100-B008, Div 2 CCHVAC Chiller, to be manually loaded, place Div 2 Capacity Control Module AUTO-MANUAL switch in MANUAL (H21-P285B, AB5-G13).
	Field Report	Perform local verifications at H21-P285B (AB5-G13) for Div 2 CCHVAC.
	BOP	6. Place Control Center HVAC Div 1(2) Mode Select switch in ALL AUTO and verify: <ul style="list-style-type: none"> <li>• T4100-B006, Div 2 CCHVAC Supply Fan, starts.</li> <li>• T4100-C040, Div 2 CCHVAC Chilled Wtr Pump, starts.</li> </ul>
	BOP	7. Place Control Center Div 1 switch in ALL STOP. 8. Verify the following: <ol style="list-style-type: none"> <li>b. T4100-C030, Div 2 CCHVAC Return Air Fan, starts (after supply fan establishes flow).</li> <li>c. T4100-B008, Div 2 CCHVAC Chiller, starts and remains running</li> </ol>
	BOP	10. If T4100-B008, Div 2 CCHVAC Chiller, is being manually loaded; momentarily place LOAD-HOLD-UNLOAD-AUTO Switch in LOAD and then back in HOLD.

Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>5</u> Page <u>3</u> of <u>3</u>		
Event Description: CCHVAC, T4100C031, Return Air Fan trip.		
		<b>NOTE:</b> Normal operating band is 5 to 15" vacuum, but the unit trips at 1.5 psig.
	BOP	<ul style="list-style-type: none"> <li>c. Verify T41-R047B, Div 2 CCHVAC Chiller Condenser Press Ind, is maintaining approximately 8 to 15" vac (RB5-G15).</li> <li>d. Verify T41-R046B, Div 2 CCHVAC Chiller Evaporator Press Ind, does not exceed 27" (RB5-G15).</li> <li>e. Repeat momentary load increase until evaporator and condenser vacuum are within normal operating band and are not increasing.</li> </ul>
	BOP	11. When evaporator and condenser vacuum have stabilized, place Div 2 AUTO-MANUAL Switch in AUTO.
	BOP	12. Verify normal operation of T4100-B008, Div 2 CCHVAC Chiller, by observing the following local instrument readings (RB5-G15):
	Field Report	Report local instrument readings (RB5-G15) for Div 2 CCHVAC. <ul style="list-style-type: none"> <li>• T41-R046B, Div 2 CCHVAC Chiller Evaporator Press Ind, 23 to 27.5" vac.</li> <li>• T41-R047B, Div 2 CCHVAC Chiller Condenser Press Ind, 5 to 15" vac.</li> <li>• T41-R048B, Div 2 CCHVAC Chiller Purge Cndr Press Ind, 15" vac to 15 psig.</li> <li>• T41-RA06B, Div 2 CCHVAC Chiller Oil Sump Temp Ind, 130 to 140°F.</li> <li>• T41-RA05B, Div 2 CCHVAC Chiller Oil Cooler Temp Ind, 105 to 130°F</li> <li>• T41-R045B, Div 2 CCHVAC Chiller Oil Pressure Ind, 11 to 15 psig (22.4 to 30.5" Hg) above evaporator pressure.</li> </ul>
	BOP	14. Verify damper lineup for Division in service in accordance with: <ul style="list-style-type: none"> <li>• Enclosure A - Normal Mode.</li> </ul>
<b>Event terminated when Div 2 CCHVAC is in service and any ITS LCOs entered or at the discretion of the Chief Examiner.</b>		

Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>6</u> Page <u>1</u> of <u>1</u>		
Event Description: CRD Flow Controller FH/A – R600 Auto Failure		
Time	Position	Applicant's Actions or Behavior
	RO	RESPOND to and REPORT: <ul style="list-style-type: none"> <li>Abnormal flow and pressure associated with the CRD Hydraulic Flow Control Station (C11-F002A or B) as indicated on H11-P603</li> <li>Abnormal cooling water flow to Hydraulic Control Units as indicated on H11-P603</li> </ul>
	SRO	Enter AOP 20.106.03
	SRO	Direct RO to: Place CRD Flow Controller in MANUAL. Adjust CRD Flow Controller to establish 37-63 gpm on C11-R800.
	SRO	<b>CAUTIONS</b> , that attempting to adjust Drive Water to Reactor Differential Pressure too quickly may result in Control Rod drifts.
	RO	Places CRD Flow Controller in MANUAL and adjust CRD Flow Controller to establish 37-63 gpm on C11-R800.
	RO	Adjust CRD PCV, as necessary, to establish: Drive Water Diff Press (255-265 psid). Cooling Water Diff Press (6-30 psid).
		<b>Event terminated when CRD Flow Controller in MANUAL and CRD Flow adjusted to establish 37-63 gpm on C11-R800 or at the discretion of the Chief Examiner.</b>



Time	Position	Applicant's Actions or Behavior
	BOP	RESPOND to and REPORT, 11D27, 120KV BREAKER TRIP
	BOP	Refer to ARP and: 1. Determine which 120kV breaker has tripped by observing green backlighted OPEN indicator and Line Ammeter. 2. Direct an operator to Fermi I to perform the following: a. In Relay Room, on applicable panel, check the following, for indication of breaker trip: b. At 120kV MAT, inspect applicable breaker for the following signs of failure: 3. If 120kV breaker opened on automatic relaying, perform the following: a. Notify Central System Supervisor. b. If directed by Central System Supervisor, initiate a trouble request on a Request for Shut Down (OP-14).
	Security	Calls to report lightening and high winds, uprooting trees near the NOC.
	Shift Manager	Reports Tornado Watch to NSS/SRO
	SRO/Crew	ENTER AOP 20.000.01 ACTS OF NATURE
	SRO	Contact Systems Supervisor and check current and forecasted weather conditions for the following: ▪ Monroe County. ▪ Wayne County. ▪ Washtenaw County. ▪ Lenewee County. ▪ North Central Ohio.
	SRO	Directs the following actions
		Announce event over the Hi-Com.
		Make hourly announcements while the Tornado Watch is in effect.
		Verify RHRSW MDCT Fans Brakes are operable.



Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>8</u> Page <u>1</u> of <u>3</u>		
Event Description: Turbine Generator Load Rejection/ATWS		
Time	Position	Applicant's Actions or Behavior
	RO	RESPOND to and REPORT: 4D121, 345KV BKR POS CF OPEN 4D123, 345KV BKR POS CM OPEN
	RO	Verify 345KV Breaker: Position CF, is OPEN. Position CM, OPEN.
	RO	RESPOND to and REPORT: 4D46, MAIN TURBINE TRIP
	SRO	Enter AOP 20.109.01 TURBINE/GENERATOR TRIP
	SRO	Direct RO to stabilize Reactor Pressure < 1050 psig with Turbine Bypass Valves or SCRAM Reactor
	RO	Verify the following closed: <input type="checkbox"/> Turbine Stop Valves. <input type="checkbox"/> Turbine Control Valves. <input type="checkbox"/> Low Pressure Stop Valves. <input type="checkbox"/> Low Pressure Intercept Valves. <input type="checkbox"/> Live Steam to MSR Iso Valves.
	RO	Report RPV Pressure and Power increasing due to failed Turbine Bypass Valve and cold water injection due to loss of feedwater heating. <b>OR</b> Reactor Scram initiated due to reactor power or pressure high.
	SRO/Crew	Recognize main turbine trip, failure to scram, and that MSIVs and a Bypass Valve is open but RPV pressure is >1093.
	SRO	Enter EOP 29.100.01, RPV Control based on failure to scram with high RPV pressure. Transition to 29.100.01 sh1A Direct crew actions IAW 29.100.01 sh1A as follows:
	SRO	Direct FSQ 1-8

Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>8</u> Page <u>2</u> of <u>3</u>		
Event Description: Turbine Generator Load Rejection/ATWS		
Time	Position	Applicant's Actions or Behavior
	RO	<u>P603 operator:</u> <ul style="list-style-type: none"> <li>• place Mode Switch to Shutdown</li> <li>• depress manual scram pushbuttons</li> <li>• run Recirc to minimum</li> <li>• trip running Recirc pumps</li> <li>• initiate ARI</li> </ul>
	SRO	Direct FSL 1-5 {FSL-1, Critical Task #1} Direct FSP 1-3
	BOP	<u>CRNSO:</u> <ul style="list-style-type: none"> <li>• inhibit ADS {Critical Task #1}</li> <li>• control water level in band directed by NASS</li> <li>• control RPV pressure in band directed by NASS(900-1050#)</li> <li>• restores DW pneumatics &amp; ventilation systems as required</li> </ul>
	BOP	Restoration of ventilation will include: <ul style="list-style-type: none"> <li>• S/D one division of SGTS</li> <li>• S/D of second CCHVAC M/U fan</li> <li>• S/U or S/D of DW cooling fans as required for plant conditions</li> <li>• Verification of Secondary Containment pressures</li> </ul>
	SRO	Recognize entry for FSL-OR3 Power >3% and RPV level >108 inches. Direct Terminate and Prevent. {Critical Task #3}
	BOP	Performs actions for Terminate & Prevent per FSL-18 when directed {Critical Task #3}
	SRO	WHEN RPV level < 108 inches - RECORD level. {Critical Task #3}
	SRO	Direct, BOP to reestablish injection use available injection systems to MAINTAIN RPV WATER LEVEL between -28 inches and level RECORDED. {Critical Task #3}
	BOP	Commence and slowly inject to maintain RPV level within prescribed band using TABLE 9 Sources. {Critical Task #3}



Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>9</u> Page <u>1</u> of <u>4</u>		
Event Description: Loss of Div II Offsite Power/Partial Loss of Div II Onsite Power		
Time	Position	Applicant's Actions or Behavior
	SRO/Crew	Recognize Loss of Div II Offsite Power
	SRO	Enter AOP 20.300.345kV
	SRO/Crew	Recognize loss of all Condenser Circ. Water
		<b>NOTE:</b> The loss of Div 2 power causes the remaining bypass valve to close (loss of control power). This will cause the crew to transition to the SRV's for pressure control. There is now the need to control level and pressure otherwise power could get away from them. With the RO controlling power and the BOP controlling level, pressure, and containment parameters (open SRV's).
	SRO	Direct BOP to verify EDG 13 output breaker closes and the following closed: Bus 72E Pos 2A. Bus 72E Pos 5B. Bus 72EC Pos 2C.
	BOP	Report EDG 13 operating with the following breakers closed: Bus 72E Pos 2A. Bus 72E Pos 5B. Bus 72EC Pos 2C.
	SRO	Direct BOP to verify EDG 14 output breaker closes and the following closed: Bus 72ED Pos 2D. Bus 72F Pos 3A (H11-P817).
	BOP	Report EDG 14 failed to start
	SRO	Direct performance of: 20.307.01, Emergency Diesel Generator Failure {EDG14}.
	BOP	Direct field operator to perform actions required by 20.307.01, Emergency Diesel Generator Failure

Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>9</u> Page <u>2</u> of <u>4</u>		
Event Description: Loss of Div II Offsite Power/Partial Loss of Div II Onsite Power		
Time	Position	Applicant's Actions or Behavior
	SRO	DIRECT action to reduce power by boron injection.
		Order SLC injection before Torus temperature reaches BIT per FSQ-12.
	RO	Initiate SLC as directed by SRO. Verifies isolation of RWCU. Reports SLC failure.
	SRO	Direct injection of Alt Boron Injection IAW 29.ESP.02
	SRO	Direct RO action to reduce power by inserting control rods per FSQ-10. {Critical Task #2}
	RO	Insert control rods per FSQ-10 and 29.ESP.03. {Critical Task #2}
		Initially rods can not be inserted until the power is restored to MPU 3 and 72E-3A for the CRD PCV.
	SRO	Follow-up on performance of AOP 20.300.72E, Loss Of Bus 72E and AOP 20.300.345kV.
	SRO	Direct BOP to align MPU 3 to Alternate per AOP 20.300.345kV Subsequent Action S.1 MPU 3 de-energized <b>AND</b> Alternate available (Dist Cab 72E-4A-8). To align MPU 3 to Alternate: a. Close Bus 72E Pos 4A. b. Open Dist Cab 72F-4B-4. c. Close Bus 72F Pos 4B.
	BOP	Aligns MPU 3 to Alternate by performing the following steps: a. Close Bus 72E Pos 4A. b. Open Dist Cab 72F-4B-4. c. Close Bus 72F Pos 4B.
	RO	Reset ARI per FSQ-10 defeating logic trips if necessary.
	RO	Reset scram (ARI) and after SDV is drained, initiate a manual scram (ARI) per FSQ-11 and 29.ESP.03 (section 4). {Critical Task #2}

Op-Test No.: <u>2001</u> Scenario No.: <u>A</u> Event No.: <u>9</u> Page <u>3</u> of <u>4</u>		
Event Description: Loss of Div II Offsite Power/Partial Loss of Div II Onsite Power		
Time	Position	Applicant's Actions or Behavior
	RO/BOP	Report TW Temperature >95°F <b>OR</b> Report TW Level > 2 inches. <b>OR</b> Report DW Temp >145°F.
	SRO	Enter Primary Containment Control EOP on TWT.
	SRO	Direct CRNSO to operate all available Torus Cooling per TWT-3.
	BOP	Operate all available Torus Cooling as directed.
	BOP	RESPOND to and REPORT Alarm 2D45, DIV II RHR PUMP B/D MOTOR TRIPPED
	BOP	Recognize and report RHR pump B tripped and enter ARP 2D45
	BOP	Direct an operator to Bus 65E Pos B5 to determine cause of pump trip.
	BOP	Place tripped pumps E1102-C002B, Div 2 RHR Pumps B in OFF/RESET.
	BOP	Close Torus cooling valves.
	SRO	Re- Enter Primary Containment Control EOP on TWL.
	SRO	Re- Enter Primary Containment Control EOP on DWT
	SRO	Direct CRNSO to operate all available DW Cooling (29.ESP.08).
	BOP	Operate all available DW Cooling (29.ESP.08).
	RO	REPORTS Inserting control rods. {Critical Task #2}



Facility: <u>FERMI 2</u>	Scenario No.: <u>B spare</u>	Op-Test No.: <u>2001</u>	
Examiners: _____ _____	Operators: _____ _____		
Initial Conditions: <u>Plant is at 88% power following 24.110.05, RPS-TURBINE CONTROL AND STOP VALVE FUNCTIONAL TEST</u>			
Turnover: <u>Return to full power in accordance with GOP 22.000.03, POWER OPERATION 25% TO 100% TO 25%. HPCI is out of service for oil change, estimated return to service is 12 hours.</u>			
Event No.	Malf. No.	Event Type*	Event Description
1		R (RO)	Report from field that North Reactor Feed Pump outboard pump bearing has oil leak. <b>Perform Rapid Power Reduction</b> (23.623) to <65% power. {Insert Cram Array to reduce power (prevent Recirc Manual Runback)}
2		N (BOP)	<b>Shutdown North Reactor Feed Pump IAW 23.107</b>
3	MF1181	C (RO)	<b>A CRD Hydraulic Pump Trip</b>
4	MF0025	C (BOP)	<b>Failed Safety Relief Valve B21-F013K</b>
5	MF0065 MF0066 RF0048 MF0251 MF0341 MF0533	C (RO)	<b>RR Seal Failure / ATWS</b> Recirc Seal Failure Pump B Lower Recirc Seal Failure Pump B Upper ATWS with ARI Insertion Control Rod 14-19 STUCK Control Rod 18-23 STUCK Control Rod 26-31 STUCK
5	RF0036	C (RO)	MOV B3105-F023B Breaker OPEN {fail after dual indication during isolation of B RR Pump}
6	MF0068	M (ALL)	<b>Small Break LOCA with reduced mitigation capabilities.</b> B Recirculation Loop Rupture
6	RF0571	C (BOP)	MOV E1150-F048A Breaker fail open
6	MF1425	C (BOP)	RHR SW Pump D Trip
6	VO0177	C (BOP)	RHR CNMT Spray Otbd Isol Vlv Fail as Is E11-F016B {Fail Full OPEN}

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

**INITIAL CONDITIONS****Initial Conditions:**

Core flow is approximately .

Reactor power is approximately 88%.

**EQUIPMENT OUT OF SERVICE:**

HPCI is out of service for oil change, estimated return to service is 12 hours.

P4100-C002, GSW Pump #2 is out of service for breaker work.

P4300-C003, South TBCCW Pump is out of service for P4300-F024C, South TBCCW Pump Discharge Iso Vlv work.

**SIMULATOR SETUP and CUES**

Reset to IC-11

Ensure A CRD Hydraulic Pump is in service.

Ensure HPCI is taken out of service.

Ensure P4100-C002, GSW Pump #2 is out of service.

Ensure P4300-C003, South TBCCW Pump is out of service.

Conduct Shift Turnover and allow crew to conduct briefings prior to coming into Simulator.

- |   |                       |   |
|---|-----------------------|---|
| 1 |                       | North RFP oil leak, Rapid Power Reduction to <65% power.  |
|   | <b>Panel Override</b> | <b>Prevent initiation of amber Recirc Manual RUNBACK covered pushbutton on COP H11-P603</b>   |
|   | Field Report          | Turbine Building Rounds Operator reports North Turbine Driven Reactor Feed Pump, pump outboard bearing oil leak.<br><br><b>Emphasize that RFP has to be removed from service, not sever enough to immediately trip the pump. Leak can not be stopped, but can be contained with no exceptional fire hazard.</b> |
| 2 | N (BOP)               | Shutdown North Reactor Feed Pump IAW 23.107   |
| 3 | MF 1181 C (RO)        | CRD Hydraulic Pump Trips Pump A   |
|   | <b>Field Report</b>   | CRD Hydraulic High Temperatures   |
|   | <b>Field Report</b>   | Investigate trip of CRD Pump A (Bus 64B Pos B11, AB2 Swgr Rm). Trip is due to a breaker fault ("flag" for 51 device, overcurrent, showing on switch gear, and there is a haze of smoke in the area).  |

4	MF0025	C (BOP)	Failed Safety Relief Valve B21-F013K
	<b>Field Report</b>		Safety Relief Valve B21-F013K tailpipe temperature is greater than 220° F.
	<b>Field Report</b>		Fuses for Safety Relief Valve B21-F013K removed.
	<b>Field Report</b>		Safety Relief Valve B21-F013K tailpipe temperature is trending down.
5		M (ALL)	RR Seal Failure with Non-Power ATWS
			<b>DO NOT</b> activate RF0048, MF0251, MF0341 and MF0533 until after SORV is closed and sure crew is not going to scram plant, but insert prior to RR seal failures.
			<b>ACTIVATE</b> MF0065, Recirc Seal Failure Pump B Lower (@ 100% severity ramped over 30 seconds and MF0066, Recirc Seal Failure Pump B Upper, (@ 100% severity ramped over 45 seconds after a 1.5 minute delay. <b>{Adjust ramp rates to allow crew the opportunity to diagnose the seal failure and to take action to Scram prior to auto scram on high Drywell pressure.}</b>
	MF0065	C (RO)	Recirc Seal Failure Pump B Lower
	MF0066	C (RO)	Recirc Seal Failure Pump B Upper
		<b>Field Report</b>	Recirculation Pump B Water to Seal Cavity Flow Indicator shows 1.6 to 2.25 gpm on B31-R004B.
		<b>Field Report</b>	Report leakage rate to DW Equip Drains Sump
	RF0048	C (RO)	ATWS with ARI Insertion
	MF0251	C (RO)	Control Rod 14-19 STUCK
	MF0341		Control Rod 18-23 STUCK
	MF0533		Control Rod 26-31 STUCK
	RF0036	C (RO)	<b>MOV B3105-F023B Breaker OPEN {fail after dual indication If RO attempts to close during isolation of B RR Pump}</b>
			<b>After RO recognizes 3 rods still withdrawn, allow insertion of all but one (1) rod via either normal drive or re-scram.</b>

- 6
- |        |         |  |
|--------|---------|--|
| MF0068 | M (ALL) | Small Break LOCA with reduced mitigation capabilities.<br>Recirculation Loop Rupture B<br><b>{Initiate 2 minutes after ARI, Ramp to 9% over 6 minutes}</b> |
| RF0571 |         | MOV E1150-F048A Breaker fail open<br><br><b>Activate after full open following high drywell pressure LOCA initiation.</b>                                  |
| MF1425 | C (BOP) | RHR SW Pump D Trip<br><br><b>Activate after SRO directs Torus Spray initiated per PCP-5 to prevent exceeding 9 psig in Torus.</b>                          |
| VO0177 | C (BOP) | RHR CNMT Spray Otbd Isol Vlv Fail as Is E11-F016B {Fail Full OPEN}<br><br><b>Activate when operator attempts to close to secure Drywell Sprays.</b>        |

**CRITICAL TASK:**

When Reactor Power is > 3% initiate Alternate Rod Insertion functions to depressurize the scram air header and open the scram valves to initiate control rod insertion.

When drywell pressure exceeds the suppression chamber spray initiation pressure, **INITIATE** drywell sprays, while in the safe region of the drywell spray initiation limit (DWSIL).

**TERMINATE** drywell sprays before a negative drywell pressure is sustained.

**SHIFT TURNOVER**

Plant is in MODE 1 at approximately 88% power.

Return to full power in accordance with GOP 22.000.03, POWER OPERATION 25% TO 100% TO 25%.

**EQUIPMENT OUT OF SERVICE:**

HPCI is out of service for oil change, estimated return to service is 12 hours.

P4100-C002, GSW Pump #2 is out of service for breaker work.

P4300-C003, South TBCCW Pump is out of service for P4300-F024C, South TBCCW Pump Discharge Iso Vlv work.

Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>B spare</u> Event No.: <u>1</u> Page <u>1</u> of <u>1</u>		
Event Description: North RFP oil leak, Rapid Power Reduction (23.623) to <65% power.		
		Crew brief for return to full power IAW GOP 22.000.03, POWER OPERATION 25% TO 100% TO 25% conducted prior to coming into the simulator.
	SRO	Directs power increased to 100% IAW GOP 22.000.03
	SRO	Notify Central System Supervisor of power increase.
	RO	Initiates power increase with Reactor Recirc Flow Control
	Field Report	Turbine Building Rounds Operator reports North Turbine Driven Reactor Feed Pump, pump outboard bearing oil leak.
	RO	Relay Field Report to SRO
	SRO	DIRECT Rapid Power Reduction IAW SOP 23.623, Reactor Manual Control System
	SRO	ORDER: Reduce Core Flow to not less than 55% of rated Core Flow by lowering Reactor Recirc Pump speed. Then insert the Cram Array to achieve approximately 65% reactor power.
	RO	Reduce Core Flow by reducing RRMG A (B) Speed controller outputs.
		NOTE:
		If SRO orders or RO attempts to reduce core flow by initiating a Manual Runback by depressing and releasing the RECIRC MANUAL RUNBACK pushbutton, will report unsuccessful.
	RO	Insert the Red Cram Array, rods are directed to be fully inserted.
	RO	Continue fully inserting Cram Array control rods using the Cram Array book until the desired power level is achieved.
	SRO	Notify the Station Nuclear Engineer.
		<b>Event terminated when reactor power has been reduced to the capacity of one RFP.</b>

Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>B spare</u> Event No.: <u>2</u> Page <u>1</u> of <u>3</u>		
Event Description: Shutdown North Reactor Feed Pump IAW 23.107		
	SRO	DIRECT BOP Operator to secure the North Reactor Feed Pump IAW 23.107.
	BOP	Removes the North Reactor Feed Pump from service:
	BOP	Verify Reactor Feed Pump Turbine North vibration is less than 4 mils and monitor throughout the entire evolution.
		<b>NOTE:</b> C32-R618, Master Feedwater Level Controller, output and C32-R616A(B), N(S) Reactor Feed Pump Controller, process variable (PV) generally will not be equal. C32-R618, Master Feedwater Level Controller, output is characterized by function generators in DCS logic.
	BOP	Verify C32-R616A(B), N(S) Reactor Feed Pump Controller and C32-R618, Master Feedwater Level Controller, in AUTO.
		<b>NOTE:</b> When adjusting bias on Reactor Feed Pump Controller, DCS logic limits the rate bias actually changes preventing rapid Reactor Feed Pump Turbine speed changes.
	BOP	Add negative (-) bias to off-going C32-R616A, Controller, until Reactor Feed Pump Turbine speed stops lowering.
	BOP	Place off-going in MANUAL when Turbine speed is at approximately 1600 to 1800 rpm.
	BOP	Open or verify open, the following valves (COP H11-P805): P9500-F408 N RFPT MS Line Drain Valve P9500-F615 NRFPT LP Above Seat Drain Valve P9500-F658 N RFPT Exh Duct Drain Valve P9500-F406 NRFPT Gland Stm Sply Drn Vlv P9500-F607 N RFPT MS Line Drain Iso Valve P9500-F655 N RFPT Rhtr Stm Line Drn Vlv P9500-F609 N RFPT HP Stop Vlv Drain Valve P9500-F403 NRFPT Reheat Stm Sply Drn Vlv P9500-F601 N RFPT Header Drain Valve P9500-F603 N RFPT First Stage Drain Valve P9500-F605 N RFPT Exhaust Casing Drain Valve P9500-F611 N RFPT Rhtr Stm Line Drn Vlv

Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>B spare</u> Event No.: <u>2</u> Page <u>2</u> of <u>3</u>		
Event Description: Shutdown North Reactor Feed Pump IAW 23.107		
		<b>NOTE:</b> Annunciator 5D40, N RFPT TRIP PUSHBUTTON ARMED, will alarm when performing the following step.
	BOP	Place Reactor Feed Pump Turbine North TRIP pushbutton collar in ARMED.
		<b>NOTE (1):</b> When the Reactor Feed Pump Turbine North is tripped and the associated suction flow is less than 10%, DCS logic will automatically adjust the output of C32-R616A, Controller, to 0% and place controller in MANUAL.
		<b>NOTE (2):</b> When the Turbine steam stop valves, N1100-F001A, N RFPT HP Stop Valve, and N3000-F033A, N RFPT LP Stop Valve, are closed, N2100-F614, North RFP Min Flow Line Iso Vlv, and N21-F400A, N RFP Min Flow Line FCV, have close signals. Closure of N21-F400A, N RFP Min Flow Line FCV, is time-delayed approximately 37 seconds after both Reactor Feed Pump Turbine North steam stop valves are closed.
	BOP	Push North Turbine red TRIP pushbutton, and verify the following valves close:
		N1100-F001A N RFPT HP Stop Valve N3000-F033A N RFPT LP Stop Valve N2100-F614 N RFP Min Flow Line Iso Vlv N21-F400A N RFP Min Flow Line FCV
	BOP	Approx 10 sec's after Ann 5D72, N/S RFPT SPEED LOW TURNING GEAR DISENGAGED, alarms, verify North Turbine turning gear engages and turning gear motor starts.
	BOP	Verify Ann 5D72, N/S RFPT SPEED LOW TURNING GEAR DISENGAGED, clears.
	BOP	Place North Turbine TRIP pushbutton collar in DISARMED.
	BOP	Push North Turbine green SPEED DECREASE pushbutton until backlight is ON and speed demand is 0%.



Time	Position	Applicant's Actions or Behavior
	RO	RESPOND to and REPORT: 3D96, MOTOR TRIPPED
	RO	Report CRD Pump A tripped. Place CMC switch to OFF-RESET.
	SRO	Enter AOP 20.106.01, CRD Hydraulic System Failure.  Comply with Technical Specifications, Section 3.1.5, Control Rod Scram Accumulators.  IF Reactor Pressure $\geq$ 900 psig AND more than one accumulator trouble light received (at least one on a withdrawn control rod) AND no CRD pump running  THEN Within 20 minutes place Mode switch in SHUTDOWN.
	SRO	Direct P603 to perform SA of AOP 20.106.01.
	RO	Place C11-R600, CRD Flow Controller, in MANUAL and close.
	RO	Close C1152-F003, CRD Drive/Clg Water PCV.
	RO	Start standby CRD Pump.
	BOP	Dispatch operator to investigate CRD Hydraulic High Temperatures.
	BOP	Dispatch operator(s) to investigate cause of the CRD Pump trip.
	Field Report	Investigate trip of CRD Pump A (Bus 64B Pos B11, AB2 Swgr Rm). Trip is due to a breaker fault ("flag" for 51 device, overcurrent, showing on switch gear, and there is a haze of smoke in the area).
	RO	Adjust CRD Flow Control Valve to establish normal system flow (37-63 gpm).
	RO	Null CRD Flow Controller and place in AUTO.



Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>B spare</u> Event No.: <u>4</u> Page <u>1</u> of <u>2</u>		
Event Description: Failed Safety Relief Valve B21-F013K		
	BOP	RESPOND to and REPORT: 1D61 SRV OPEN.
	BOP	Verify SRV open by: Red OPEN light (COP H11-P601) RECOGNIZE and REPORT; Safety Relief Valve B21-F013K has Failed.
	BOP	Dispatch operator to Relay Room to verify SRV open by: B21-R614, SRV Tailpipe Temperature Recorder (RR H11-P614), is greater than 220° F.
	Field Report	Safety Relief Valve B21-F013K tailpipe temperature is greater than 220° F.
	SRO	ENTER AOP 20.000.25, Failed Safety Relief Valve and DIRECT Crew Actions.
	BOP	Take Immediate Actions per AOP 20.000.25. Depress Open then Close PB for the SORV.
	BOP	ANNOUNCE that SRV will not close from H11-P601
	SRO	Direct Rapid Power Reduction IAW 23.623. {Power previously reduced to remove RFP from service, action limited to insertion of additional Cram Array Rods}
	RO	Commence Rapid Power Reduction (23.623). {Limited to insertion of additional Cram Array Rods}
	SRO	DIRECT monitoring of Torus Temperature IAW 24.000.01, Att 17.
	SRO	BRIEF/DIRECT Crew: Place Reactor Mode switch in SHUTDOWN if Torus Water Average Temperature $\geq 110^{\circ}\text{F}$ .
	SRO	DIRECT all available RHR in placed in Torus Cooling.
	BOP/RO	PLACE all available RHR in Torus Cooling.

Op-Test No.: 2001 Scenario No.: B spare Event No.: 4 Page 2 of 2

Event Description: Failed Safety Relief Valve B21-F013K

Time	Position	Applicant's Actions or Behavior
	SRO	DIRECT SRV fuses pulled.
	BOP	DIRECT SRV closure by pulling appropriate fuse(s) (Enclosure A).
		When SRV fuses are pulled, SRV valve position indication is lost, alternate methods of determining the SRV is close must be used.
	RO	After fuses pulled determine SRV closed by: <ul style="list-style-type: none"> <li>▪ Steam Flow/Feed Flow mismatch returns to original value.</li> <li>▪ Lowering tailpipe temperature on B21-R614, SRV Tail Pipe Temperature Recorder.</li> </ul>
	RO	REPORT SRV CLOSED
	Field Report	Fuses for Safety Relief Valve B21-F013K removed.
	SRO	Comply with the following Technical Specifications: <ul style="list-style-type: none"> <li>• Section 3.3.6.3, Low-Low Set (LLS) Instrumentation.</li> <li>• Section 3.4.3, Safety Relief Valves (SRVs).</li> <li>• Section 3.5.1, ECCS - Operating.</li> <li>• Section 3.6.2.1, Suppression Pool Average Temperature.</li> <li>• Section 3.6.1.8, Suppression Chamber-to-Drywell Vacuum Bkrs.</li> <li>• TRM Section TR 3.3.3, Accident Monitoring Instrumentation.</li> <li>• TRM Section TR 3.3.6.3, Low-Low Set (LLS) Instrumentation.</li> </ul>
	SRO	After SRV operation with the Suppression Chamber average water temperature greater than or equal to 160° F and Reactor Pressure greater than 200 psig, perform an external visual examination of the Suppression Chamber IAW 43.000.019, "Primary Containment Inspection," to comply with SR 3.6.1.1.3.
	SRO	Within 12 hours after any discharge of steam to the Suppression Pool, the Drywell-Suppression Chamber Vacuum Breakers must be demonstrated operable by performing 24.402.01, "Drywell Suppression Chamber Vacuum Breaker Operability Test."
		<b>Event terminated when Safety Relief Valve B21-F013K closed or at the discretion of the Chief Examiner.</b>

Op-Test No.: <u>2001</u> Scenario No.: <u>B spare</u> Event No.: <u>5</u> Page <u>1</u> of <u>5</u>		
Event Description: RR Seal Failure / ATWS		
Time	Position	Applicant's Actions or Behavior
	RO	RESPOND to and REPORT: 3D145, RECIRC PMP B OUTER SEAL LEAKAGE HIGH
		NOTE: Lower than normal or decreasing pressure on Seal 2 indicates failure (or failing) of Seal 2 or blockage of Seal 1 staging labyrinths. Lower than normal or decreasing pressure on both Seal 1 and Seal 2 indicates failure (or failing) of both Seals.
	RO	ENTER ARP and Verify: B31-R629B, RR Pump B Seal Cavity Press Ind (P603): • Seal 1, Red Indicator: 1000 psig (approximate) • Seal 2, Green Indicator: 500 psig (approximate)
	RO	Direct an operator to perform the following: • Verify 1.6 to 2.25 gpm on B31-R004B, Recirculation Pump B Water to Seal Cavity Flow Indicator (RB1-D15). • Verify approximately 1000 psig on B31-R001B, RR-Recirc Pmp B #1 Seal Cavity Press Ind (H21-P022, RBB-B15). • Verify approximately 500 psig on B31-R002B, RR-Recirc Pmp B #2 Seal Cavity Press Ind (H21-P006, RBB-B15).
	Field Report	Recirculation Pump B Water to Seal Cavity Flow Indicator shows 1.6 to 2.25 gpm on B31-R004B.
	SRO/RO	Determine leakage rate to DW Equip Drains Sump as follows: • DIRECT an operator to monitor the following and determine rate of change (1% increase equals 8.925 gallons) (RB1-B11): - G11-N157A, DW Equip Drn Sump G1101-D071 LS. - G11-N157B, DW Equip Drn Sump G1100-D071 LS. • Compare data taken from previous readings to recent readings for DWEDS Identified Leakage in accordance with 24.000.02, "Shiftly, Daily, Weekly and Situation Required Surveillances," Attachment 1.
	Field Report	Report leakage rate to DW Equip Drains Sump

Op-Test No.: 2001 Scenario No.: B spare Event No.: 5 Page 2 of 5

Event Description: RR Seal Failure / ATWS

Time	Position	Applicant's Actions or Behavior
	SRO	When increasing leakage rate to Drywell Equipment Drains Sump is determined to be HIGH greater than 0.9 gpm.
	SRO	DIRECT RO/BOP to Monitor Drywell and Torus Pressure, T50-R802A(B), Div 1(2) PC Pressure Recorder (COP H11-P601/602) for increasing pressure. Monitor B31-R601, Recirc System Coolant Temps, Points 6, 7, and 8 for increasing temperature.
	SRO	IF either of the following occur, shutdown and isolate RR Pump B in accordance with 23.138.01. Leakage exceeds Technical Specification limits. <b>OR</b> Seal Temperature exceeds 200°F.
	RO	RESPOND to and REPORT: 3D147, RECIRC PMP B STAGING SEAL FLOW HIGH/LOW
	RO/BOP	REPORT Drywell pressure increasing.
	SRO	DIRECT: <b>EITHER</b> RECIRC PMP B shutdown and isolation <b>OR</b> Reactor Scram followed by RR PMP B shutdown and isolation
		NOTE: When the South RR MG Set, Generator B Field Breaker is open, the DCS logic automatically sets the B31-R621B, South RR MG Set Gen Speed Controller output to 12% and the setpoint to 28% for startup of the respective RR MG Set. The speed controller setpoint and output are not adjustable in AUTO or MANUAL when the field breaker is open.
	RO	PERFORM Recirc Pump B shutdown and isolation.
	RO	Stop South RR MG Set.
	RO	Verify South Field Breaker opens after a time delay, as indicated by Trip Coil #1 and Trip Coil #2 white TRIPPED lights on.
	RO	Verify DCS Logic adjusts B31-R621B, Speed Controller output to 12% and the setpoint to 28%.

Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>B spare</u> Event No.: <u>5</u> Page <u>3</u> of <u>5</u>		
Event Description: RR Seal Failure / ATWS		
	RO	Verify 3D129, RECIRC A & B FLOW LIMITER 2/3 DEFEATED, is in alarm.
		If required, perform Section 10.9, RR Pump Isolation, concurrently.
		CAUTION - Seal Purge Water Supply for RR Pump Seals must be isolated by closing B3100-F008B, N(S RR Pump Seal Wtr Iso Vlv, prior to isolating a RR Pump to avoid pressurizing the pump casing with CRD Flow and lifting Relief Valve, B3100-F015B, CRD Supply Water to Loop B Seal Cavity Relief Valve.
		CAUTION - If it is necessary to isolate a RR Pump in a hot loop, the isolation valves should be opened or throttled open, if possible, to prevent excessive closed seating forces on the RR pump isolation valves as the loop cools down.
		NOTE: If performing this section due to excessive RR Pump Seal leakage, Step 10.9.2.1 may be performed at anytime to allow timely RR Pump isolation.
	RO	Direct Field Operator to close B3100-F008B, S RR Pump Seat Wtr Iso Vlv (RB1-E11, 12' up).
	RO	Close B3105-F031B, S RR Pump Discharge Vlv. Close G3352-F106, RWCU RR Loop B Suct Iso Vlv. Close B3105-F023B, S RR Pump Suction Vlv.
	RO	REPORT: B3105-F023B, S RR Pump Suction Vlv tripped during close travel and is in intermediate position with no power.
	SRO	ENTER 20.000.21 REACTOR SCRAM and DIRECT Reactor Scram if not previously done.
	RO	Place Reactor Mode switch in SHUTDOWN.
	RO	REPORT failure of all control rods to fully inserted.
	SRO	ENTER EOP 29.100.01, RPV Control based on failure to scram with high RPV pressure. Transition to 29.100.01 sh1A. DIRECT crew actions IAW 29.100.01 sh1A as follows:

Op-Test No.: <u>2001</u> Scenario No.: <u>B spare</u> Event No.: <u>5</u> Page <u>4</u> of <u>5</u>		
Event Description: RR Seal Failure / ATWS		
Time	Position	Applicant's Actions or Behavior
	SRO	Direct FSQ 1-8
	RO	depress manual scram pushbuttons run Recirc to minimum trip running Recirc pumps initiate ARI
	RO	REPORT: All but 3 control rods fully inserted. Reactor Power decreasing and is less than 3% on APRMs.
	SRO	Direct FSL 1-5 Direct FSP 1-3
	BOP	inhibit ADS control water level in band directed by NASS control RPV pressure in band directed by NASS(900-1050#) restores DW pneumatics & ventilation systems as required
	BOP	Restoration of ventilation will include: <ul style="list-style-type: none"> <li>• S/D one division of SGTs</li> <li>• S/D of second CCHVAC M/U fan</li> <li>• S/U or S/D of DW cooling fans as required for plant conditions</li> <li>• Verification of Secondary Containment pressures</li> </ul>
	SRO	Direct BOP to confirm Isolations/Actuation's (29.ESP.01) per L-1.
	BOP	Confirm Isolations and Actuations.
	SRO	Recognize Power <3% and RPV level >108 inches. Direct level band between -28 inches and 214 inches using Table 9 systems outside shroud.
	RO	Maintains RPV level in prescribed band.
	SRO	Direct RO action to reduce power by inserting control rods per FSQ-10.



Op-Test No.: <u>2001</u> Scenario No.: <u>B spare</u> Event No.: <u>6</u> Page <u>1</u> of <u>2</u>		
Event Description: Small Break LOCA with reduced mitigation capabilities.		
Time	Position	Applicant's Actions or Behavior
	RO/BOP	Report increasing drywell pressure.
	SRO	Enter 29.100.01 SH 1, RPV Control, and SH 2, Primary Containment Control, on high Drywell pressure.
	RO/BOP	Report High Drywell Temperature
	SRO	Re-enter 29.100.01 SH 2, Primary Containment Control, on high drywell temperature.
	SRO	Direct BOP to operate all available Torus Water Cooling (23.205) per TWT-2.
	BOP	Operate all available Torus Water Cooling as directed.
	BOP	REPORT:    MOV E1150-F048A, RHR Heat Exchanger A Bypass Valve, Breaker tripped with valve OPEN
	SRO/BOP	Evaluate effectiveness of Div 1 RHR for Torus Spray and Drywell Spray based upon Torus bulk temperature.
	BOP	Use Div 1 RHR as directed by SRO.
	SRO	Direct CRNSO to operate all available Drywell Cooling (29.ESP.08) per DWT-3.
	BOP	Operate all available Drywell Cooling as directed.
	SRO	Direct/verify EECW initiation/isolation per PCP-3.
	BOP	Confirm initiation of EECW and isolation of EECW to the DW per PCP-3.
	SRO	Direct BOP to prevent injection from low pressure ECCS pumps not needed for adequate core cooling per PCP-3.
	BOP	Prevent injection from low pressure ECCS pumps not needed for adequate core cooling.

Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>B spare</u> Event No.: <u>6</u> Page <u>2</u> of <u>2</u>		
Event Description: Small Break LOCA with reduced mitigation capabilities.		
	SRO	Before Torus pressure reaches 9 psig, direct initiation of Torus Sprays (23.205) per PCP-5.
	BOP	Initiate Torus Sprays.
	BOP	RESPOND to and REPORT: 2D47, DIV II RHR Serv H <sub>2</sub> O Pump B/D Mtr Tripped.
	BOP	Direct field operator to investigate trip of B RHR Service Water Pump.
	SRO	Direct Torus Sprays terminated when Torus pressure drops <1.68 psig.
		When drywell pressure exceeds the suppression chamber spray initiation pressure, <b>INITIATE</b> drywell sprays, while in the safe region of the drywell spray initiation limit (DWSIL).
	SRO	Direct CRNSO to shutdown DW Cooling Fans per PCP-9.
	BOP	Shutdown Drywell Cooling Fans.
	SRO	Direct BOP to initiate Drywell Sprays per PCP-9.
	BOP	Initiation DW Sprays.
		<b>TERMINATE</b> drywell sprays before a negative drywell pressure is sustained.
	SRO	Direct Drywell Sprays terminated when Drywell pressure drops <1.68 psig.
	BOP	Attempt to terminate Drywell Sprays and report RHR CNMT Spray Otbd Isol Vlv E11-F016B breaker tripped when attempted to close valve to secure Drywell Sprays.
	SRO	DIRECT BOP to SECURE Div 2 RHR Drywell Sprays by either: CLOSE E11-F021B <b>OR</b> SECURE Div 2 RHR pumps BEFORE a negative drywell pressure is sustained.



Facility: <u>FERMI 2</u>	Scenario No.: <u>C</u>	Op-Test No.: _____
Examiners: _____	Operators: _____	
_____	_____	
_____	_____	
<p>Initial Conditions: <u>At approximately 75% power following an emergency power reduction due to a loss of feedwater heating.</u></p>		
<p>Turnover: <u>Withdraw Cram Array and return to full power. HPCI oil change complete and system fill and vent is complete, return to standby mode in accordance with SOP 23.202 High Pressure Coolant Injection. Set up HPCI for PMT run.</u></p>		

Event No.	Malf. No.	Event Type*	Event Description
1		R (RO)	Withdraw Cram Array
2	MF0803	C (RO)	Control Rod difficult to withdraw
3	MF3662		Fuel Cladding Failure
4		N (BOP)	Return HPCI to Standby Mode IAW 23.202
5	MF1428 RF0647 MF1435 Panel Override MF1708	I (BOP)	HPCI Spurious Isolation with failure to isolate HPCI Logic B Spurious Isolation. MOV E4150-F003 Breaker - OPEN. HPCI Turbine Trip – TRIPPED. E4100-F028, HPCI Stm Sply Drn Pot Inbd Iso – OPEN. E4100-F029, HPCI Stm Sply Drn Pot Otbd Iso - OPEN. H30-2D77, HPCI Turbine Inlet Drain Pot Level High – In Alarm
6	MF1451	C (RO)	RWCU Non-Regenerative Heat Exchanger Tube Leak {5% over 5 minutes}
7	VO1309	C (SRO)	Trip of 72B-3A MCC Main Feed Breaker Trip
8	MF2469 MF3338	M (ALL)	06D069 Seismic System Event/Trouble with Feedwater Line Rupture Outside Containment {0-15% break ramped in over 5 minutes}
9	MF2469 MF3571	M (ALL)	06D069 Seismic Event with RHR Suction Line Break Downstream of F004A, {0-100% ramp}
9	MF0020 MF0024	C (BOP)	Failure of ADS SRVs during emergency Depressurization MAIN STEAM SRV FAILURE B21-F013E 0% MAIN STEAM SRV FAILURE B21-F013J 0%

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

**INITIAL CONDITIONS**

IC-??

At approximately 75% power

Cram Array inserted

HPCI ready to return to Standby Mode

**EQUIPMENT OUT OF SERVICE:**

P4100-C002, GSW Pump #2 is out of service for breaker work.

P4300-C003, South TBCCW Pump is out of service for P4300-F024C, South TBCCW Pump Discharge Iso Vlv work.

**SIMULATOR SETUP and CUES**

Have HPCI tag out removed and ready to complete line-up to Standby Mode IAW 23.202

- 2 **MF0803** Difficult to withdraw Control Rod {rod 38-31 – third rod withdrawn}
  - **Rod fails to move from 00**
  - Enter SOP 23.106, Control Rod Drive Hydraulic System Section - 6.12 Difficult Rod Movement
  - **Allow rod to move after drive pressure increased to 350#**
- 3 **MF3662** Fuel Cladding Failure
  - **small 0.1%, start during withdraw of last group of cram array rods**

- Field Report**
1. **Operator** at D11-K814 and D11-K815, Two Min Holdup Pipe Exh Radiation Monitors, at RR H21-P883 and RR H21-P884 to perform the following:
    - a. Check the following:
      - Greater than  $1 \times 10^7$  cpm (full upscale)
      - Red TRIP 2 light ON
    - b. Attempt to reset alarm by depressing red TRIP 2 pushbutton.
    - c. Report condition found to Control Room.

**Chemistry** Report Off Gas Two Min Holdup Pipe Exh sample. Ensure report, when converted to mCi/sec per the "Off Gas Log Radiation Monitors Conversion Factors" sheet (posted on the rear of the H11-P601), indicates a slight increase well below the Technical Specification limit of  $\leq 340$  mCi/sec, TS 3.7.5.

**RP** Respond to SRO/MCR queries.

**PM/OM** Respond as Plant/Operations Management/Supervision. Listen to status, direct to follow procedures, concur that trend is minor, return HPCI to standby and continue startup.

**Due to the time interval required to warm-up the HPCI inlet steam line, Event # 6 may be initiated while Event #4 is in-progress.**

- 4 Return HPCI to Standby Mode IAW 23.202 {In ITS 3.5.1 E}
  - Warn HPCI Steam Line and return to standby – Surveillance to be performed later?

- 5 MF1428 HPCI Spurious Isolation with failure to isolate  
 RF0647 HPCI Logic B Spurious Isolation.  
 MOV E4150-F003 Breaker - OPEN.  
 MF1435 HPCI Turbine Trip – TRIPPED  
 Panel E4100-F028, HPCI Stm Sply Drn Pot Inbd Iso – OPEN  
 Override E4100-F029, HPCI Stm Sply Drn Pot Otbd Iso - OPEN.  
 MF1708 H30-2D77, HPCI Turbine Inlet Drain Pot Level High – In Alarm

**Activate Panel Overrides and MF1708, after approximately 1 minute activate MF1428 & MF1435. Allow E4150-F003 to partially close before activating RF0647.**

- 6 MF1451 RWCU Non-Regenerative Heat Exchanger Tube Leak  
**Small leak 5%, ramped over 5 minutes**

**Field Report** As operator at D11-K606, Radiation Monitor RBCCW, at RR H11-P604 to perform the following:  
 a. Check the following:  
 • Greater than 300 cps  
 • Amber UPSCALE light ON  
 b. Attempt to reset D11-K606, Radiation Monitor RBCCW.  
 c. Report condition found to Control Room.

- 7 VO1309 Trip of 72B-3A MCC Main Feed Breaker Trip

- 8 MF2469 06D069 Seismic System Event/Trouble with Feedwater Line Rupture Outside  
 MF3338 Containment

**0-15% break ramped in over 5 minutes**

**Field Report** As the Patrol NSO investigating seismic event, report:  
 A magnitude of 0.02g.  
 Red Error LED on D30-K800 is OFF.  
 D30-R800 has printed.

**Clear MF2469 after Field Report**

- 8 MF2469 06D069 Seismic Event with RHR Suction Line Break Downstream of F004A  
 MF3571  
 RF0546 MOV E1150-F004A Breaker

**If crew attempts to close F004A activate RF0546**

MF0020 MAIN STEAM SRV FAILURE B21-F013E 0%  
 MF0024 MAIN STEAM SRV FAILURE B21-F013J 0%

**CRITICAL TASK:**

When suppression pool water cannot be maintained in the safe region of the HCL or (-38"), **INITIATE emergency depressurization.**

Recognize less than the Minimum Number of SRVs Required for Emergency Depressurization open and take action to open other SRVs to effect the desired RPV depressurization until the total number of open SRVs equals the number of SRVs dedicated to ADS function. {ED-4 and ED-6}

**SHIFT TURNOVER**

Plant is in MODE 1 at approximately 75% power.

Core flow is about ?? E6 lb/h.

Cram Array inserted

HPCI ready to return to Standby Mode

HPCI System is filled and vented in accordance with Section 5.1, Initial Fill and Vent.

**EQUIPMENT OUT OF SERVICE:**

P4100-C002, GSW Pump #2 is out of service for breaker work.

P4300-C003, South TBCCW Pump is out of service for P4300-F024C, South TBCCW Pump Discharge Iso Vlv work.



Op-Test No.: <u>2001</u> Scenario No.: <u>C</u> Event No.: <u>2</u> Page <u>1</u> of <u>2</u>		
Event Description: Control Rod difficult to withdraw		
Time	Position	Applicant's Actions or Behavior
	RO	REPORT Control Rod 38-31 failed to move from 00 position.
	SRO/RO	Enter SOP 23.106, Control Rod Drive Hydraulic System Section - 6.12 Difficult Rod Movement
		<b>NOTE:</b> No drive flow, or a high sustained insert or withdraw drive flow rate may indicate that C11-F138, Cooling Water Line Check Valve, is not seated, or that there is a problem with C11-F120 (F121), Directional Control Valve. Section 6.12.3, Detailed Procedure - Problem in HCU, should be consulted.
	RO	Verify Control Rod 38-31 is not "Problem HCU" per <b>NOTE</b> .
	RO	<ol style="list-style-type: none"> <li>1. Increase Drive Water Pressure 15 to 25 psid.</li> <li>2. Provide a continuous withdraw signal for one to two minutes to displace air from the operating cylinder of the HCU.</li> <li>3. Insert the Control Rod one or two notches.</li> <li>4. Repeat steps as necessary until satisfactory rod motion is observed.</li> <li>5. Reduce Drive Water pressure to 260 psid.</li> </ol>
		<b>NOTE:</b> Crew may go directly to this step.
		<b>NOTE:</b> Crew may repeat this step 2 or 3 times.
	RO	<ol style="list-style-type: none"> <li>6. If Control Rod is stuck at Position 00, perform double clutch method of withdrawal as follows: <ol style="list-style-type: none"> <li>a. Hold Rod Out Notch Override switch to EMER ROD IN for several seconds.</li> <li>b. Verify full-in light is ON.</li> <li>c. Simultaneously place Rod Out Notch Override switch to OVERRIDE and Rod Movement Control switch to OUT NOTCH for several seconds.</li> <li>d. If Control Rod does not move out, repeat steps a through c as required.</li> </ol> </li> </ol>



Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>C</u> Event No.: <u>3</u> Page <u>1</u> of <u>2</u>		
Event Description: Fuel Cladding Failure		
	BOP	RESPOND to and REPORT: 3D24, 2 MINUTE HOLDUP PIPE RADN MONITOR UPSCALE TRIP
		<b>NOTE:</b> there is no flow through this section of pipe but it is acting as an area rad monitor for the off-gas system and is the first monitor to see the change in rad levels.
	BOP	Refer to ARP and perform/direct: 1. Direct an operator to D11-K814 and D11-K815, Two Min Holdup Pipe Exh Radiation Monitors, at RR H21-P883 and RR H21-P884 to perform the following: a. Check the following: <ul style="list-style-type: none"> <li>• Greater than <math>1 \times 10^7</math> cpm (full upscale)</li> <li>• Red TRIP 2 light ON</li> </ul> b. Attempt to reset alarm by depressing red TRIP 2 pushbutton. c. Report condition found to Control Room. 2. If Mechanical Vacuum Pumps have tripped, and Startup in progress, perform one of following in accordance with NSS and on call Station Nuclear Engineering direction: <ul style="list-style-type: none"> <li>• Place Off Gas in service in accordance with 23.712, "Off Gas System."</li> <li>• Discontinue Reactor Startup.</li> </ul> 3. Request Chemistry sample Off Gas Two Min Holdup Pipe Exh to determine source and magnitude of activity.
	SRO/BOP	Request Chemistry sample Off Gas Two Min Holdup Pipe Exh to determine source and magnitude of activity.
	SRO	Should contact/inform Radiation Protection.
	BOP	<b>Should</b> check the following for adverse trends: Process Gaseous Radiation Monitoring System recorder located in the Control Room plus the following instruments: RRE-R601 - Off Gas Log Scale - H11P601 RRE-R602 - Off Gas Linear Scale - H11P601 RR-R603 - Main Steam Line - H11P601 RRE-R605 - Fuel Pool Vent Exh East Duct - H11P601 CT-2B - Eberline Control Terminal {HVAC Exhaust Monitors} - H11P812



Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>C</u> Event No.: <u>4</u> Page <u>1</u> of <u>4</u>		
Event Description: Return HPCI to Standby Mode IAW 23.202		
	SRO	Direct HPCI returned to Standby Mode IAW 23.202
	BOP	1. Verify or place, E4100-M001, HPCI Test Line Iso/PCV E41-F011 Selector Switch, in ISOLATE. • Verify E41-F011, HPCI/RCIC Test Iso/PCV, closes or is closed.
	BOP	2. If HPCI Isolation is present and condition has cleared, reset isolation as follows: a. Verify or place HPCI Logic B Manual Isolation pushbutton collar in DISARMED. b. Turn keylock E4100-M127, HPCI Logic A Iso Trip Reset Sw, to RESET, and then back to NORMAL. • Verify white sealed in light is OFF. c. Turn keylock E4100-M126, HPCI Logic B Iso Trip Reset Sw, to RESET, and then back to NORMAL. • Verify white sealed in light is OFF.
	BOP	3. If HPCI steam supply line is isolated, perform the following to warm up steam line: a. Open E4100-F028, HPCI Stm Sply Drn Pot Inbd Iso. b. Open E4100-F029, HPCI Stm Sply Drn Pot Otbd Iso. c. Open E4100-F054, HPCI Stm Sply Drain Pot Trap Byp.
		<b>NOTE:</b> E4150-F600, HPCI Stm Sply Otbd Iso Byp Vlv, is a Throttle Valve in the open direction only.
	BOP	d. Remove water between E4150-F002, HPCI Stm Sply Inbd Iso Vlv, and E4150-F003, HPCI Stm Sply Otbd Iso Vlv, as follows: 1) Place E4150-F600, HPCI Stm Sply Otbd Iso Byp Vlv, keylock switch in NORM OPER. 2) Open E4150-F600, HPCI Stm Sply Otbd Iso Byp Vlv. 3) Open E4150-F003, HPCI Stm Sply Otbd Iso Vlv. 4) After approximately 5 minutes, close E4150-F003, HPCI Stm Sply Otbd Iso Vlv. 5) Close E4150-F600, HPCI Stm Sply Otbd Iso Byp Vlv. 6) Place E4150-F600, HPCI Stm Sply Otbd Iso Byp Vlv, keylock switch in LOCK.
		e. Place E4150-F002, HPCI Stm Sply Inbd Iso Vlv, keylock switch in NORM OPER.

Op-Test No.: <u>2001</u> Scenario No.: <u>C</u> Event No.: <u>4</u> Page <u>2</u> of <u>4</u>		
Event Description: Return HPCI to Standby Mode IAW 23.202		
Time	Position	Applicant's Actions or Behavior
	BOP	f. Open E4150-F002, HPCI Stm Sply Inbd Iso Vlv. g. Place E4150-F002, HPCI Stm Sply Inbd Iso Vlv, keylock switch in LOCK. h. Place E4150-F600, HPCI Stm Sply Otbd Iso Byp Vlv, keylock switch in NORM OPER.
	BOP	i. Monitor E41-R608, HPCI Turbine Steam Pressure Indicator, for an increase in inlet pressure.
	BOP	j. Slowly throttle open E4150-F600, HPCI Stm Sply Otbd Iso Byp Vlv. k. Allow HPCI steam line to warm slowly and pressure to stabilize as indicated on E41-R608, HPCI Turbine Steam Pressure Indicator.
	BOP	l. Place E4150-F600, HPCI Stm Sply Otbd Iso Byp Vlv, keylock switch in LOCK.
		m. Verify 2D85, HPCI STM LINE ISO VALVE NOT FULLY OPEN, is clear. n. Verify 2D77, HPCI TURBINE INLET DRAIN POT LEVEL HIGH, is clear.
		o. Close E4100-F054, HPCI Stm Sply Drain Pot Trap Byp.
		4. Reset HPCI Turbine as follows: a. Verify the following Turbine trip conditions DO NOT exist: b. If Reactor level is greater than Level 2: • Depress HPCI System Initiate Signal reset pushbutton, <b>and</b> verify white SEALED IN light is OFF. c. When Reactor level is less than Level 8: • Depress HPCI System Reac High H2O Level Signal reset pushbutton, and verify white SEALED IN light is OFF. d. Verify HPCI Turbine Trip, green De-energized light is ON.

Op-Test No.: <u>2001</u> Scenario No.: <u>C</u> Event No.: <u>4</u> Page <u>3</u> of <u>4</u>		
Event Description: Return HPCI to Standby Mode IAW 23.202		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>5. Verify or place the following HPCI steam line valves are in the specified position:</p> <ul style="list-style-type: none"> <li>• E4150-F001, HPCI Turb Stm Sply Iso Vlv, closed.</li> <li>• E4150-F002, HPCI Stm Sply Inbd Iso Vlv, open.</li> <li>• E4150-F003, HPCI Stm Sply Otbd Iso Vlv, closed.</li> <li>• E4150-F600, HPCI Stm Sply Otbd Iso Byp Vlv, open.</li> <li>• E4100-F067, HPCI Turb Stm Stop Vlv, closed.</li> <li>• E4100-F068, HPCI Turb Stm Control Vlv, closed.</li> <li>• E4100-F028, HPCI Stm Sply Drn Pot Inbd Iso, open.</li> <li>• E4100-F029, HPCI Stm Sply Drn Pot Otbd Iso, open.</li> <li>• E4100-F054, HPCI Stm Sply Drain Pot Trap Byp, closed.</li> <li>• E4150-F021, HPCI Turb Exh Stop Ck Valve, open.</li> <li>• E4150-F022, HPCI Turb Exh Pot Drain Stop Check Vlv, open.</li> <li>• E4150-F075, HPCI Exh Vac Bkr Otbd Iso Vlv, open.</li> <li>• E4150-F079, HPCI Exh Vac Bkr Inbd Iso Vlv, open.</li> </ul>
	BOP	<p>6. Verify or place the following HPCI valves are in the specified position:</p> <ul style="list-style-type: none"> <li>• E4150-F041, HPCI Torus Suct Otbd Iso Vlv, closed.</li> <li>• E4150-F042, HPCI Torus Suct Inbd Iso Vlv, closed.</li> <li>• E4150-F004, HPCI CST Suct Iso Vlv, open.</li> <li>• E4150-F012, HPCI Pump Min Flow Vlv, closed.</li> <li>• E4150-F007, HPCI Pump Disch Otbd Iso Vlv, open.</li> <li>• E4150-F008, HPCI Test Line Iso Vlv, closed.</li> <li>• E4150-F006, HPCI Pump Disch Inbd Iso Vlv, closed.</li> <li>• E4150-F059, HPCI Oil Clr Clg Water Iso Vlv, closed.</li> <li>• E4100-F026, HPCI Cond to DRW Inbd Iso Vlv, closed.</li> <li>• E4100-F025, HPCI Cond to DRW Otbd Iso Valve, open.</li> </ul>
	BOP	<p>7. Verify or place HPCI Turbine Trip pushbutton collar in DISARMED:</p> <ul style="list-style-type: none"> <li>• Verify 2D57, HPCI ISO TURBINE TRIP PUSHBUTTON ARMED POS, is clear.</li> </ul>
	BOP	<p>8. Verify or place E4101-C005, HPCI Turbine Aux Oil Pump, keylock switch in NORMAL.</p>
	BOP	<p>9. Verify or place E4101-C003, HPCI Baro Cndr Vacuum Pump, keylock switch in NORMAL.</p> <ul style="list-style-type: none"> <li>• Verify 2D67, HPCI AUX OIL/CNDR PUMP SEL SW DEFEATED, is clear.</li> </ul>



Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>C</u> Event No.: <u>5</u> Page <u>1</u> of <u>1</u>		
Event Description: HPCI SPURIOUS ISOLATION with failure to ISOLATE		
	BOP	RESPOND to and REPORT: 2D77, HPCI TURBINE INLET DRAIN POT LEVEL HIGH
	BOP	1. Open E4100-F054, HPCI Stm Sply Drain Pot Trap Byp. 2. Verify open, or open the following: E4100-F028, HPCI Stm Sply Drn Pot Inbd Iso. E4100-F029, HPCI Stm Sply Drn Pot Otbd Iso.
	BOP	RESPOND to and REPORT: 2D53, HPCI LOGIC B ISOLATION TRIP SIGNAL INITIATED 2D89, HPCI TURBINE TRIP SOLENOID ENERGIZED 2D93, HPCI TURBINE TRIPPED
	BOP	VERIFY: <ul style="list-style-type: none"> <li>• E41-F067, HPCI Turbine Stop Valve, closes.</li> <li>• E41-F012, HPCI Pump Minimum Flow Bypass Valve, closes.</li> <li>• E41-F006, HPCI Pump Discharge Inboard Isolation Valve, closes.</li> <li>• E41-F003, HPCI Steam Supply Outboard Isolation Valve, closes.</li> <li>• E41-F041, HPCI Supp Pool Outboard Isolation Valve, closes.</li> </ul>
	BOP	Report, E41-F003, HPCI Steam Supply Outboard Isolation Valve, Lost power unknown whether fully closed.
	SRO	Direct HPCI Isolated.
	BOP	Closing/verifying closed the following valves: E4150-F002, HPCI Stm Sply Inbd Iso Vlv, E4150-F600, HPCI Stm Sply Otbd Iso Byp Vlv {may be closed}.
	SRO	<b>Review ITS:</b> <ul style="list-style-type: none"> <li>• Section 3.3.2, Instrumentation - Isolation Actuation Inst.</li> <li>• Section 3.3.6.1, Primary Containment Isolation Instrumentation</li> <li>• Section 3.3.5.1, ECCS Instrumentation</li> <li>• Section 3.5.1, ECCS-Operating.</li> <li>• Section 3.6.3, Cnmt Systems - Primary Cnmt Isolation Valves.</li> <li>• TRM Section TR 3.3.6.1, Isolation Actuation Instrumentation.</li> </ul>
	SRO	Direct Maintenance to investigate HPCI Isolation
		<b>Event terminated when HPCI isolated or at the discretion of the Chief Examiner.</b>

Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>C</u> Event No.: <u>6</u> Page <u>1</u> of <u>2</u>		
Event Description: RWCU Non-Regenerative Heat Exchanger Tube Leak		
	RO	RESPOND to and REPORT: 3D54, RBCCW RADN MONITOR UPSCALE
	RO	Have D11-R604, RBCCW and GSW PRMS Recorder, verified greater than 300 cps (back of COP H11-P601).
	RO	1. Direct an operator to D11-K606, Radiation Monitor RBCCW, at RR H11-P604 2. If alarm will not clear, request Chemistry to sample RBCCW System to determine source of in-leakage. 3. Isolate source or shift to alternate components in accordance with the applicable System Operating Procedures.
	Field Report	As operator at D11-K606, Radiation Monitor RBCCW, at RR H11-P604 to perform the following: a. Check the following: • Greater than 300 cps • Amber UPSCALE light ON b. Attempt to reset D11-K606, Radiation Monitor RBCCW. c. Report condition found to Control Room.
	RO	Report findings to SRO
	SRO	Enter AOP 20.000.02, ABNORMAL RELEASE OF RADIOACTIVE MATERIAL
	SRO	Perform or direct performance of the following: Sound Plant Area alarm. Announce event over Hi-Com. Direct Radiation Protection to perform surveys. Direct Security to control access. Direct Chemistry to perform sampling.
	RO	REPORT: RWCU delta flow to increase.
	SRO	Directs RWCU Isolation
	SRO	May enter AOP, 20.707.01 LOSS OF RWCU to direct Isolation



Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>C</u> Event No.: <u>7</u> Page <u>1</u> of <u>2</u>		
Event Description: Trip of 72B-3A MCC Main Feed Breaker Trip		
	BOP	RESPOND to and REPORT: 9D11, DIV I 480V ESS BUS 72B BKR TRIPPED
	BOP	REPORT the loss of the following equipment:
		P5002-D001, Div 1 Control Air Compressor E1150-F028A, Div 1 RHR Torus Iso Vlv T4100-B029, Div 1 CAC Room Cooler T4100-B021, Div 1 CS Pumps Room Cooler E2150-F015A, Div 1 CS Test Line Iso Vlv
		E2150-F031A, Div 1 CS Pmps Min Flow Vlv E2150-F036A, Div 1 CS Pmps Torus Suct Vlv T4804-F601A, Div 1 TRS Return Inbd Iso Vlv T4804-F602A, Div 1 TRS Torus Suct Inbd Iso Vlv T4804-F604A, Div 1 TRS Return Otbd Iso Vlv
		E1150-F024A, Div 1 RHR Torus Clg Iso G3352-F001, RWCU Supply Inbd Iso Vlv T4804-F606A, Div 1 TRS Torus Suct Otbd Iso Vlv T4700-C001, Div 1 Dw 2 Spd Cooling Fan #1 T4100-F601, RBHVAC Steam Sply Inbd Iso Vlv
		G5100-F602, N TWMS Pump Inbd Suct Iso Vlv G5100-F600, S TWMS Pump Inbd Suct Iso Vlv G5100-F604, TWMS Rtrn To RHR Inbd Iso Vlv G5100-F606, TWMS Rtrn To CS Inbd Iso Vlv E1150-F004A, Div 1 RHR Pump A Torus Suct Iso
		E1150-F006A, Div 1 RHR Pump A SDC Suct Iso Vlv E1150-F007A, Div 1 RHR Pmps Min Flow Vlv E1150-F027A, Div 1 RHR Torus Spray Iso T4901-F601, Div 1 Dw Pneumatics Sply Inbd Iso Vlv T4803-F601, Dw Inlet Iso Vlv
		T4803-F602, Dw Exh Iso Vlv E1150-F611A, Div 1 RHR LPCI Bypass Vlv
	BOP	RESPOND to and REPORT: 8D41, DIV I DRYWELL TEMPERATURE HIGH 17D41, DIV II DRYWELL TEMPERATURE HIGH



Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>C</u> Event No.: <u>8</u> Page <u>1</u> of <u>3</u>		
Event Description: Seismic Event with Feedwater Line Rupture Outside Containment		
	BOP	RESPOND to and REPORT: 6D69, SEISMIC SYSTEM EVENT/TROUBLE
	BOP	Direct an operator to D30-K800, Active Seismic Central Recorder, to PERFORM 23.612, "Seismic Monitoring" (RR H11-P831).
	ALL	Verify plant parameters are stable.
	SRO/BOP	ENTER and PERFORM: 23.612, "Seismic Monitoring"
	Field Report	As the Patrol NSO investigating seismic event, report: A magnitude of 0.02g. Red Error LED on D30-K800 is OFF. D30-R800 has printed.
	BOP	Report 0.02g to SRO
	SRO/BOP	ENTER and PERFORM AOP 20.000.01, "Acts of Nature." Announce event over Hi-Com.
	SRO	Contact System Engineer and I&C per 23.612.
	SRO	Obtain verification of event magnitude by contacting U of M & Davis-Besse per 20.000.01.
	BOP	RESPOND to and REPORT: 5D126, NORMAL HOTWELL SUPPLY PUMP AUTO START
	BOP	ENTER ARP and VERIFY: P1100-C001A, Norm Hotwell Supply Pump, starts. Low level by observing the N61-R805, S HW Level Primary / Backup. Verify the following: • N2000-F620, Cndr HW Rlf Station Byp Valve, closed • N20-F401, Cndr Hotwell Norm Relief LCV, closed (0% indicated) • N20-F407, Cndr HW Norm Makeup LCV, open (90% indicated)
	BOP	REPORT Hotwell level low and continuing to trend down.

Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>C</u> Event No.: <u>8</u> Page <u>2</u> of <u>3</u>		
Event Description: Seismic Event with Feedwater Line Rupture Outside Containment		
	BOP	RESPOND to and REPORT: 5D135, CONDS DEMIN SYSTEM TROUBLE
	BOP	ENTER ARP: Immediate action should be taken to ensure that N20-F400, Cond F/D Bypass Valve, does <b>not</b> open. Direct an operator to H21-P250, Cond Filter Demins A-G Control Panel, to respond in accordance with appropriate H21-P250 ARP (TB1-R11). Verify Filter Demin Flows at Panel H21-P250, Cond Filter Demins A-G Control Panel.
	BOP	RESPOND to and REPORT: 5D116, CONDENSATE POLISH DEMIN DIFF PRESS HIGH 5D137, DEMINERALIZER STORAGE WATER LEVEL HIGH/LOW Verify P11-R801, DST, CRT & CST Level Recorder, greater than 20.8 feet or less than 3.0 feet.
	RO	RESPOND to and REPORT: 1D66, STEAM LEAK DETECTION AMBIENT TEMP HIGH Direct an operator to RR H11-P614, NSSS Temperature Recording and Leak Detection Cabinet, to perform the following: Determine which module has alarmed by verifying red alarm light ON. Place selector switch on alarmed module to READ and note temperature on bottom scale of meter. Report alarmed module and temperature to Control Room.
	RO	Report Feedwater Flow to Steam Flow mismatch
	SRO	Recognize this event as a loss of all feedwater and direct the P603 NSO to place the Mode Switch in Shutdown. Request scram reports.
	RO	Place the Mode Switch in Shutdown. Give scram report when NASS is ready.
	SRO	Enter EOP 29.100.01 Sh 5 Sec Cnmt due to Main Steam Tunnel Temperatures.



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Op-Test No.: <u>2001</u>	Scenario No.: <u>C</u>	Event No.: <u>9</u>	Page <u>1</u> of <u>2</u>
Event Description: Seismic after shock with Torus leak and 2 ADS valves fail to open			
Time	Position	Applicant's Actions or Behavior	
	BOP	RESPOND to and REPORT: 6D69, SEISMIC SYSTEM EVENT/TROUBLE	
	BOP	Direct an operator to D30-K800, Active Seismic Central Recorder, to PERFORM 23.612, "Seismic Monitoring" (RR H11-P831).	
	Field Report	As the Patrol NSO investigating seismic event, report: A magnitude of 0.05g. Red Error LED on D30-K800 is OFF. D30-R800 has printed.	
	BOP	Report 0.05g to SRO	
	BOP	RESPOND to and REPORT: 7D71, TORUS WATER LEVEL TROUBLE 2D76, REACTOR BLDG NE LEAKAGE TO FLR DRN SUMP HIGH	
	BOP	Verify Torus Level on: G51-R402, Narrow Range Torus Level Ind T50-R804A, Div 1 Torus Level Recorder T50-R804B, Div 2 Torus Level Recorder	
	BOP	CONFIRM and REPORT: G1101-D075, RB NE Flr Drn Sump, Pumps G1101-C002A(B), is running. G1101-D075, RB NE Flr Drn Sump, Level G11-R653, is increasing. Torus Water Level is less than -2 inches,	
	SRO	Direct entry into 23.702.01, "Plant System Leak Check Procedure" to determine source of and attempt control inleakage.	
	SRO	<b>ENTER</b> 29.100.01, Sheet 2, "Primary Containment Control."	
	SRO	At TWL-1 DIRECT: Raise Torus water level using 23.144, "TWMS" and 29.ESP.21 as necessary	

Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2001</u> Scenario No.: <u>C</u> Event No.: <u>9</u> Page <u>2</u> of <u>2</u>		
Event Description: Seismic after shock with Torus leak and 2 ADS valves fail to open		
	BOP	Perform one of the following: 1) RHR Test Line, open G5100-F604, TWMS Rtrn to RHR Inbd Iso Vlv. 2)CS Test Line, open G5100-F606, TWMS Rtrn to CS Inbd Iso Vlv. To prevent the CRD pump from tripping on low suction pressure, slowly open G5100-F611, TWMS Cond to Torus Makeup Vlv, until desired influent flow is achieved.
	BOP	RESPOND to and REPORT: 2D83, REAC BLDG LEAKAGE TO TORUS SUMP HIGH 2D82, REAC. BLDG. TORUS SUMP LEVEL HI-HI/LO-LO
	BOP	Verify and report sump level is Hi-Hi
	SRO	<b>ENTER</b> 29.100.01 Sh 5 "Secondary Containment And Radioactivity Release."
	RO/BOP	REPORT Torus level trending down and can not hold > -38 inches.
	SRO	Recognize TWL-4 and requirement to ED
	SRO	<b>ENTER</b> 29.100.01 Sh 3 "Emerg. Depress." and DIRECT ED
	SRO	Direct the BOP to open the 5 ADS valves per ED-4.
	BOP	Push the open pushbuttons for the 5 ADS Valves.
	BOP	Recognize 2 ADS SRVs failed to OPEN and OPEN 2 additional SRVs and REPORT to SRO
	SRO	Per ED-2 prevent injection from CS and LPCI pumps NOT required for adequate core cooling.
	SRO	Direct RPV level maintained 173 to 214 in.
	RO/BOP	Raise RPV water level to 173 to 214 in. using low pressure systems.
		<b>Event terminated when RPV Emergency Depressurized and RPV level maintained with Low Pressure ECCS Systems or at the discretion of the Chief Examiner.</b>



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**Scenario changes from Prep week**

**Scenario A**

Event #2 changed to Control Rod 58-35, 02-35 was incorrect

Revised initial conditions to reflect in GOP 20.000.02 {at step 7.2.27} vs 20.000.03

Event #4 Changed from RF0736 to panel override, RF tripped breaker for valve instead of closing valve. Added PO to prevent OPEN PB from reopening valve. Changed sequence of events 5 & 6 to spread action between candidates.

Event #5 CRD Controller failure, developed and implemented BATCH file to simulate flow signal failure. This also eliminated need for MF0069.

Event #8 added trip of B SLC pump to ensure Power Level control and drive crew to insert control rods.

Event #9 added RF1425 for other Brownstown disconnect, should not have been needed but simulator forced to achieve desired results.

Added South Steam Tunnel Cooler OOS, required in other scenario added here for consistency on OOS equipment.

Added requirement for Coupling Verification sheet to Simulator Setup

Added details of current Feedwater Level Control setup to Shift Turnover.

Event #2 in body of scenario corrected typo on AOP number and added cue for SNE if crew has trouble determine if acceptable amount of power reduction achieved.

Event #5 in body of scenario added clarifying information, for examiners, if RO over operates controller.

Event #9 in body of scenario added actions for recovery of SBFW for RPV Level Control.

Event #9 in body of scenario added actions for recovery of Station Air to allow control rod insertion.

**Scenario C**

Rearranged sequence of events to spread action between candidates.

Due to information obtained during validation changed rod difficult to withdraw to rod 06-31.

Changed event #4 from HPCI Spurious Isolation to Spurious Initiation. Setup for the Isolation was not realistic, given the abilities of the Fermi simulator.

Event #6 changed the severity to make event more realistic. Also added failure of RWCU to isolate to ensure positive operator action.

Event #7 corrected malfunction number

Event #8 added Spurious Group 1 Isolation - contingent, activate if crew scrams and shuts down feedwater before Steam Tunnel temperature results in a group 1 isolation.

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**Scenario B**

Event #6 changed malfunctions MF1425, RHRSW Pump D Trip and VO0177, RHR CNMT Spray Otbd Isol Fail As Is E11-F016B {Fail Full OPEN} to the following:

EVENT 6a -

VO0178, Failure of E1150-F016B (Div 2 DW Spray Isol Vlv)

VO0171, Failure of E1150-F028A (Div 1 Torus Spray/Cool Isol Vlv)

OR

EVENT 6b

VO0177, Failure of E1150-F016A (Div 1 DW Spray Isol Vlv)

VO0172, Failure of E1150-F028B (Div 2 Torus Spray/Cool Isol Vlv)

Either event 6a or 6b would be initiated depending on which loop of RHR was initially selected to use to spray.

This changed provided more operator control board actions and the consequences of improper operation would result in an unnecessary Emergency Depressurization.

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**Admin JPM changes from Prep week**

5/22 RO/SRO Admin JPM A.1.a  
Incorporated validation time  
Clarified requirements to obtain new edit  
Incorporated information on A&B TOT CU FLW failed sensor identification from edit

RO/SRO Admin JPM A.1.b  
Complete re-write, original used RHR shutdown cooling relay A71BK28 which is difficult to find a starting point in Fermi 2 electrical prints. Final JPM requires same skills and knowledge but uses relay G33A-K3B. Less time consuming to find a starting point. Relay EIN narrows scope to RWCU prints

RO/SRO Admin JPM A.2  
Incorporated validation time

RO Admin JPM A.3  
Incorporated validation time  
Incorp comment on exact location of equipment to be installed, clarify exposure.

RO Admin JPM A.4  
Incorporated validation time

SRO Admin JPM A.3  
Incorporated validation time  
Original had three operators to chose from based on Rad exposure, validation determined that no clear admin guidelines exist to chose between Operator #1 and #3. Therefore original Operator #1 choice deleted.

SRO Admin JPM A.4  
Incorporated validation time  
In step 7 added cues for STA feedback on % Gap Release and STA feedback on dose rate at site boundary.

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**Operating Exam JPM changes from Prep week**

**B.1.a**

Incorporated validation time

Reworded Initial Conditions with first 2 sentences from Initiating Cue.

Replaced MF0061 with BATCH FILE, malfunction did not accomplish task of providing high temperature required to force RR pump shutdown.

Revised Simulator Setup initial conditions to reflect actual simulator/plant conditions versus assumed conditions from procedures.

Removed performance of Enclosure D from JPM, this did not add to the task objectives but added considerable time to task performance.

Added Simulator Setup note to prepare completed Enclosure D for Applicant.

Added CUEs to steps requiring interface with Motor Bearing and Winding Temperature Monitor due to lack of simulation of this device.

Revised to terminate after tripping the RR pump. Task is complete at this time.

**B.1.b**

Validation of original JPM not possible on simulator, licensee reviewing procedure & simulator model under CARD program.

Replacement JPM on Transfer from 1 Element Level Control to Startup Level Control Mode validated on site.

**B.1.c**

Completely new task, revision to Scenario C during validation week invalidated the use of HPCI for JPM.

Validated JPM using RCIC as replacement.

**B.1.d**

Incorporated validation time

Revised initiating CUE to enhance transition to alternate injection source when RHR fails.

Added cues to inform applicant another operator would complete the following items:

Record Suppression Pool Temperature on Attachment 1

Record SRV tail pipe temperature for open SRVs on Attachment 3.

Record RHR inlet/outlet temperatures on Attachment 4.

Added missing step 4.2.1.15

**B.1.e**

Incorporated validation time

Step 2.1 added enhancement on specific valves verified.

Step 2.5.1 added enhancement - use of wide range press indication.

Step 2.10 changed b part of standard to non critical applicant "verifies."

Step 2.11 identified which dampers are specifically operated, therefore critical task.

Step 2.16.2 corrected typo in standard.

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B.1.f

Incorporated validation time

Revised Fermi2 Operations department position titles

Revise AOP title

Clarified task standard to specify the bus must remain energized during task.

Clarified step 7.2.9, reverse power trip of edg = failure of critical task.

B.1.g

Incorporated validation time

Added enhancement to initiating cue, added procedure section number.

Revised Fermi2 Operations department position titles

B.2.a

Incorporated validation time

Deleted part of CUE on last step, information not required for task completion.

B.2.b

Incorporated validation time

Added Examiner info to initiating CUE to give Applicant a copy of entire procedure 23.316.

Step 4.2.8, 4.2.10, 4.2.15 & 4.2.17 deleted standard to reset EPA breaker, should have been turned off originally vs tripped.

Step 4.2.11, added option that if Applicant trips MG immediately due to erratic voltage to go to Terminating Cue.

B.2.c

Incorporated validation time

P44-F400A is an EECW temp control valve vs an RBCCW temp control valve.

Modified Initial Conditions, Task Standard and Initiating Cue to reflect this.