Facility: Fermi 2 Scenario No. 1 Op-Test No: 2004-401

Examiners: _____ Operators: _____

Initial Conditions: IC-18, EOL, 100% Rx. Power.

Turnover: The plant has been operating for 364 days. Reactor Power is currently 100% of rated thermal power. All rods are full out. CRD Pump "B" is out of service due to high vibration on the motor bearings. It will be returned to service in two days. This shift will place D2 RHR in Torus Cooling in preparation of the next shift conducting a surveillance for RCIC Testing.

NOTE: The Pre-job Briefing for placing RHR in Torus Cooling is to be conducted by the crew prior to entering the simulator. (suggested time 30 minutes prior to beginning the scenario).

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP) N (SRO)	Place RHR in Torus Cooling
2	MF 1423	C (BOP) C (SRO)	RHRSW Pump "B" Trip
3	VO1402	I (BOP) I (SRO)	Hotwell Level Controller Primary Instrument Fails high
4	MF 3652	C (All)	Trip of "South" Reactor Feedpump
5	RF 2331 RF 2333	I (RO) I (SRO)	Recirc Flow Limiter "A" Logic Failure
6	N/A	R (RO) N (SRO)	Insert CRAM Array
7	MR 3571	M (All)	Leak in Torus (Value = 100%, ramped over 600 sec.)
8	MF 3595	C (RO)	RPS Fails to Cause a Scram
9	N/A	M (All)	Emergency Depressurization is required
10	MF 3385 MF 3387	C (BOP)	"E" Bypass Valve Fails Closed "W" Bypass Valve Fails Closed
11	MF 0020 MF 0023	C (BOP)	SRV "E" Fails to open SRV "H" Fails to open

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

Facility: Fermi 2 Scenario No. 2 Op-Test No: 2004-401

Examiners: _____ Operators: _____

Initial Conditions: IC-07, BOL, Rx. Press. 350 Psig

Turnover: The plant is in the process of a startup in accordance with 22.000.02. IRM Range on range 6, Rod sequence A002, RWM Step 17, Rod 18-27 at position 00-04, page 21 of 53 of the Rod Pull Sheets. The crew is to continue the startup and synchronize the generator to the grid. EDG 13 is Out of Service for a relay repair that was discovered after startup commenced. Repairs and testing will be complete prior to entering Mode 1.

NOTE: The Pre-job Briefing for placing Power Increase and Generator Synchronization is to be conducted by the crew prior to entering the simulator. (suggested time 30 minutes prior to beginning the scenario).

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R (RO) R (SRO) N (BOP)	Increase reactor power using control rods
2	MF 1200	I (RO) I (SRO)	IRM “D” Failure Upscale (value = 130)
3	MF 0069	C (BOP) C (SRO)	CRD FCV F002A fails closed
4	VO 0097	I (All)	Fuel Pool Radiation Monitor Fails Upscale (Value = 110 mr/hr)
5	RF 1424 RF 1425 RF1376	M (All)	Loss of Offsite Power
6	MF 3550	C (BOP)	EDG 12 Trips after starting
7	MF 0005	M (All)	Steam Leak in Drywell (HPCI Stm line) (Value: 5%, ramped over 120 sec., 5 Min. T.D. after LOOP)
8	MF 1418	C (RO)	RHR Pump “A” Fails to start (Trips)

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

Op-Test No.: 2004-401 Scenario No.: 1 Event No.: 1/2 Page 1 of 1

Event Description: Place RHR in Torus Cooling / RHR SW Pump "B" Trip
(Do not insert RHRSW pump trip until RHR is running in Torus Cooling)

Time	Position	Applicant's Actions or Behavior
0 min	SRO	(Short)Brief shift on placing RHR Loop in torus cooling per SOP 23.205, Sec 5.4. Direct BOP to place a loop of RHR in torus cooling using SOP 23.205, Sec 5.4. +7 min Respond to Annunciator 2D47 "Div.II RHR Serv/H2O Pump B/D Mtr. Tripped" Refer to TS 3.7.1 "RHR SW System". Declares RHRSW Pump B inoperable **NOTE:** SRO may elect to shutdown RHR **BOOTH OPERATOR ACTION:** *Insert V01402, Hotwell Level Controller Primary Instrument Fails high. This malfunction takes approximately 10 minutes to build in.*
	RO	NONE
	BOP	Place Div. II of RHR in torus cooling using SOP 23.205. Respond to Annunciator 2D47 "Div.II RHR Serv/H2O Pump B/D Mtr. Tripped" • Place CMC Switch to OFF • Send NO to D2 RHR EDG 13 Swgr. Room to check Bkr. Verify Flow (RHRSW) between 5250 to 6500 gpm with one pump running in a loop in accordance with 23.208. **BOOTH OPERATOR ACTION:** *When requested to check RHRSW Bkr., wait a 3 minutes and report that the Breaker for RHRSW Pump "B" is tripped. (51 relay – Overcurrent)*

Op-Test No.: 2004-401 Scenario No.: 1 Event No.: 3 Page 1 of 1

Event Description: Event Description: Hotwell Level Controller Failure

Time	Position	Applicant's Actions or Behavior
+17 min	SRO	Upon receipt of annunciator 5D131 “South Hotwell Level High/Low”, direct the BOP to investigate and transfer Hotwell level control system in accordance with SOP 23.107..
	RO	Upon receipt of annunciator 5D131 “South Hotwell Level High/Low”, monitor plant parameters.
	BOP	Respond to annunciator 5D131 “South Hotwell Level High/Low • Determine the Primary Hotwell level control instrument has failed high by comparing with other hotwell level indications. • Observe Normal and Emergency Hotwell reliefs are open even though hotwell level is actually low. Selects course of action to transfer Hotwell level control system in accordance with 23.107, sec. 6.11 when directed by SRO. **Booth Operator:** *Reports: Setpoint at ~60” and normal air pressure to controller. (N61) RF1705 switches to B/U hotwell level instrument. (ON / ACCEPT / START)*

Op-Test No.: 2004-401 Scenario No.: 1 Event No.: 4/5/6 Page 1 of 1

Event Description: Event Description: Hotwell Level Controller Failure

Time	Position	Applicant's Actions or Behavior
+30 min	SRO	Enters AOP 20.107.01 “LOSS OF FEEDWATER”, • directs RO to **ensure RR Runback** • directs RO to insert CRAM Array • directs BOP to start Standby Feedwater. When reported that A RR MG failed to runback, direct manually running MG back to 40% IAW 20.107.01. When a loss of feedwater heating is detected, Direct BOP and RO to Reduce Recirculation Flow and Insert Control Rods using the CRAM Array, in accordance with AOP 20.107.02 “LOSS OF FEEDWATER HEATING”. Determines that FW Temperature is decreasing. Notify Chemistry that power changed greater than 15% in a one-hour period. After inserting the CRAM array, verify power <65% Direct shutdown of standby feedwater
	RO	**Ensure RR Runback** and Insert CRAM Array to < 65%RTP when RFP Trips at SRO direction in accordance with AOP 20.107.01. (When noticed that A RR MG did not runback, manually run back to 40%) After inserting the CRAM array, verify power <65%.
	BOP	Start Standby Feedwater and inject at 1200 gpm. When directed shutdown standby feedwater.

Op-Test No.: 2004-401 Scenario No.: 1 Event No.: 7/8/9/10/11 Page 1 of 2

Event Description: Event Description: Hotwell Level Controller Failure

Time	Position	Applicant's Actions or Behavior
+40 min	SRO	Upon receipt of Annunciator 2D82 “RB Torus Sump Level Hi-Hi/ Low-Low”, Enters EOP Sheet 5 on High Sump Level, Upon receipt of Annunciator 7D71 “Torus Water Level Trouble, enters EOP Sheet 2 for Low Torus Level. *As Torus level drops to –38”, enters EOP Sheet 1 for Reactor Scram and Emergency Depressurization. Enters EOP Sheet 1, RPV Control and order the Mode Switch placed in SHUTDOWN Upon communication of ATWS, enter EOP Sheet 1A, RPV Control – ATWS Directs ATWS actions until rods are inserted using ARI. Inhibit ADS Defeat MSIV isolations and bypass drywell pneumatics. Trip recirc pumps Confirm ARI Verifies Reactor shutdown and Enters EOP Sheet 1, RPV Control *Directs BOP to open 5 ADS SRVs and Emergency Depressurize the Reactor in accordance with EOP sheet 3, Emergency Depressurization, at or before Torus Level of –38 inches. Upon receiving report from BOP of “E & H” SRVs not opening, directs BOP to open two additional SRVs. Directs maintaining water level 173”-214”. May direct placing torus cooling in service based on high torus temperature.

Op-Test No.: 2004-401 Scenario No.: 1 Event No.: 7/8/9/10/11 Page 2 of 2

Event Description: Event Description: Hotwell Level Controller Failure

Time	Position	Applicant's Actions or Behavior
	RO	*At or before a Torus Water Level of –38", Scrams the reactor as directed *Informs SRO that Mode Switch did not cause a Scram. Performs actions of EOP SH. 1A, RPV Control – ATWS, and: Confirms RR Pumps runback Trips the Recirc Pumps Initiates ARI Reports all rods full in when ARI scrams the rods.
	BOP	Upon receipt of Annunciator 2D82 "RB Torus Sump Level Hi-Hi/ Low-Low", investigates cause of alarm. Upon receipt of Annunciator 7D71 "Torus Water Level Trouble", investigates the cause for the alarm Upon direction performs the actions of EOP SH.1, RPV Control: Inhibits ADS Confirms isolations occur (29.ESP.01) Bypasses pneumatic interlocks and restores PC Pneumatics Orders bypassing MSIV L1 logic and high rad interlocks. Upon receipt of Annunciator 7D71 "Torus Water Level Trouble, investigates the cause for the alarm *Opens 5 ADS SRVs and Emergency Depressurize the Reactor When directed. Reports that 2 SRVs will not open "E & H" Opens 2 additional SRVs to complete Emergency Depressurization. Maintains RPV level as directed. Places torus cooling in service in accordance with SOP 23.205 as directed

Op-Test No.: 2004-401 Scenario No.: 2 Event No.: 1 Page 1 of 1

Event Description: Increase Reactor Power using Control Rods.

Time	Position	Applicant's Actions or Behavior
0 min	SRO	(Short)Brief shift on (Review SOP 23.623 Sec 7.0), in preparation for Control Rod Withdrawal. ***NOTE:*** *SURROGATE STA will fill out heatup data sheets.*
	RO	Review SOP 23.623 Sec 7.0,, in preparation for Control Rod Withdrawal. Begin to withdraw control rods to increase power in accordance with SOP 23.623.
	BOP	Monitor plant parameters during power increase.

Op-Test No.: 2004-401 Scenario No.: 2 Event No.: 2 Page 1 of 1

Event Description: IRM “D” Failure Upscale

Time	Position	Applicant’s Actions or Behavior
+10 min	SRO	Upon receipt of Annunciator 3D60 “IRM CH B/F/D/H Upscale Trip/Inop” & 3D63 “IRM UPSCALE”, direct the RO to Stop Rod Movement. When IRM cannot be reset, instruct the RO to bypass the IRM in accordance with 23.603 “Intermediate Range Monitoring System”. Refer to Tech Spec 3.3.1.1, Reactor Protection System Instrumentation and TRM 3.3.2.1, Control Rod Block Instrumentation. Upon receipt of Annunciator 3D74 “Trip Actuators B1/B2 Tripped”, direct the RO to reset the half scram in accordance with 23.610 “Reactor Protection System (RPS), after bypassing IRM “D”. Continue Startup upon reset of half scram.
	RO	Upon receipt of Annunciator 3D63 “IRM UPSCALE”, Stop Rod Movement and investigate the cause. When IRM cannot be reset, request to bypass the IRM in accordance with 23.603 “Intermediate Range Monitoring System”. Upon receipt of Annunciator 3D74 “Trip Actuators B1/B2 Tripped”, reset the half scram in accordance with 23.610 “Reactor Protection System (RPS), after bypassing IRM “D”. Continue startup upon direction from SRO.
	BOP	Assist in determining cause of IRM “D” upscale. **BOOTH OPERATOR ACTION** *When requested, wait approximately 3 minutes and report IRM D is upscale in relay room and no other IRMs indicate a problem*

Op-Test No.: 2004-401 Scenario No.: 2 Event No.: 3 Page 1 of 1

Event Description: CRD Flow Control Valve Failure (Closed)

Time	Position	Applicant's Actions or Behavior
+20 min	SRO	Upon notification of CRD FCV A Failure, enters AOP 20.106.03 "CRD FCV Failure", directs RO to perform actions associated with the procedure.
	RO	RO Notices no rod movement when withdrawing control rods and verifies CRD System Indicators on H11-P603 are below their normal ranges. Notifies SRO of conditions Performs the actions of AOP 20.106.03 1. Places FCV to manual and tries to restore system flow. 2. Contacts an NO and coordinates placing the standby CRD FCV in service. **BOOTH OPERATOR ACTION**: When requested to place the standby CRD FCV in service, insert the following: • RF0051 CRD FCVA Mode – Manual • RF0053 CRD FCVB Mode – Auto • RF0058 CRD FCVA Isol. Vlv. – 0% • RF0059 CRD FDVB Isol. Vlv. – 100% (900 sec Ramp)
	BOP	Monitors plant parameters.

Op-Test No.: 2004-401 Scenario No.: 2 Event No.: 4 Page 1 of 1

Event Description: Description: Fuel Pool Rad Monitor Failure (Upscale)

Time	Position	Applicant's Actions or Behavior
+30 min	SRO	Upon receipt of annunciators 3D31 "DIV I/II FP Vent Exh. Radn Monitor Upscale" & 3D35 "DIV I/II FP Vent Exh. Radn Monitor Upscale Trip", direct RO and BOP to perform associated actions Refer to TS 3.3.6.2 Isolation Instrumentation 3.3.7.1 Control Room Emergency Filtration System TRM 3.3.6.2 Isolation Instrumentation 3.3.7.1 Control Room Emergency Filtration System **NOTE:** SRO may enter AOP 20.000.11 "Loss of Secondary Containment Integrity" and EOP sheet 5 "Secondary Containment" prior to discovering the failed instrument caused the transient.
	RO	Responds to 3D31 "DIV I/II FP Vent Exh. Radn Monitor Upscale" & 3D35 "DIV I/II FP Vent Exh. Radn Monitor Upscale Trip".
	BOP	Checks (D11-K609 A) Fuel Pool East Radiation monitor and discovers it is pegged high. Monitors Plant Parameters 1. Verifies CCHVAC shifts to RECIRC. Mode 2. RB HVAC Trips 3. SGTS initiates

Op-Test No.: 2004-401 Scenario No.: 2 Event No.: 5/6/7/8 Page 1 of 2

Event Description: Loss of Offsite Power; Steamleak in Drywell; Trip of EDG 12 during startup; RHR Pump "A" Failure to Start.

Time	Position	Applicant's Actions or Behavior
+40 min	SRO	Enters AOP 20.300.03 "Loss of Off-Site Power", and directs implementation/actions. Enters EOP sheet 1 directs actions for level and pressure of RPV. 1. Direct BOP to Restore and keep RPV Level 173" to 214" 2. Directs maintaining Reactor Pressure less than 1093 using bypass valves and SRVs. 3. Direct RO to Confirm Reactor Scram Enter EOP 2 due to high drywell pressure when discovered. 1. Direct BOP to verify ECCS Actuations and isolations using 29.ESP.01 2. Direct RO to place RHR in Torus Cooling in accordance with 23.205. 3. Direct RO to Trip RR Pumps 4. Direct RO to place RHR in Torus Spray prior to Drywell pressure reaching 9 psig in accordance with 23.205.
	BOP	Performs actions of AOP 20.300.03 "Loss of Off-Site Power" • Assess status of EDG's (12 not running) • Starts CTG 11-1 • Restore AC Buses as directed by SRO or using 20.300.03. Reports EDG 12 has tripped, (Annunciator 9D60) Dispatches an operator to investigate EDG fail to start at RHR complex. Identify High Drywell Pressure. May assist in stabilizing level and pressure or addressing containment parameters.

Op-Test No.: 2004-401 Scenario No.: 2 Event No.: 5/6/7/8 Page 1 of 2 Event Description: Loss of Offsite Power; Steamleak in Drywell; Trip of EDG 12 during startup; RHR Pump "A" Failure to Start.		
	RO	Enters EOP 20.000.21 "Reactor SCRAM"/EOP Sh.1 RPV Control 1. Places the mode switch to shutdown, and reports all rods full in. 2. Verifies reactor power decreasing 3. Verifies RR Pumps Runback to minimum. 4. Verify Post Scram Feedwater logic has occurred. 5. Maintains RPV level L3 – L8 with SBFW, RCIC, HPCI,Cond./FW. 6. Stabilize reactor pressure, if possible. 7. Insert SRM/IRM Detectors (If power available) 8. Verify Isolations have occurred. Performs actions of EOP Sh.2 "Primary Containment Control" as directed. 1. Perform verification of initiation of EECW. 2. Perform verification of isolation of EECW to Drywell. 3. Restore Cooling to CRD in accordance with 23.127. 4. Shutdown RR Pumps in accordance with 23.138.01. 5. Verify ECCS Actuations and Isolations using 29ESP.01 6. Start RHR Loop in Torus Cooling in accordance with 23.205. Identify that RHR Pump "A" did not and will not start. (Annunciator 1D23) *Spray Drywell with "D" RHR Pump and terminate before pressure drops to 0 psig.