INITIAL SUBMITTAL OF SCENARIOS

FOR THE PERRY INITIAL EXAMINATION - JANUARY 2001

LC 99-01
Crew and Simulator Scenario Assignments

This assignment sheet is to be used in conjunction with NUREG-1021 Forms ES 301-4, ES 301-5, ES 301-6, ES D-1, and ES D-2.

Crew A RO / RO / SROU Scenario 1a / 1b / 1c

- Scenarios 1a and 1b are designed for Crew A;
- Scenario 1c is designed for Crew B only

Crew B SROI / SROI / SROI Scenario 1a/ 1b / 1c

Crew C RO / RO / SROU Scenario 2a / 2b / 2c

- Scenarios 2a and 2b are designed for Crew C
- Scenario 2c is designed for Crew D only

Crew D SROI / SROI / SROI Scenario 2a/ 2b / 2c

- Scenario #3 is a spare which can be used for any crew
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Only used scenarios 1a, 1c, 2a and 2c.
Licensee requested other material be removed.

Facility: Perry Scenario No.: 1a Op-Test No.: 2001-01

Examiners: _____ Operators: _____

Objectives: Evaluate the applicants' ability to: replace feedpumps on Startup Level Controller (SULC) at high power; increase reactor power using recirc flow; evaluate tech specs for a failed HPCS water level instrument (Level 2); implement off-normal procedure for an unplanned change in reactor power due to a single control rod scram as a result of a failed APRM; implement off-normal procedure for an earthquake which results in a failure (closed) of the Main Turbine Lube Oil (MTLO) temperature control valve and a trip of a turbine building closed cooling (TBCC) pump; execute plant emergency instructions for a recirc pipe break in the drywell with a failure to scram (ATWS), including a failure of RHR Pump A; and execute plant emergency instructions that require emergency depressurization due to a loss of all RPV water level instrumentation and subsequent RPV flooding to restore adequate core cooling.

Initial Conditions: Plant is at 85% power per SCC direction. MOL pull sheets (Step 79). IOI-3, Section 4.6, Step 2. RFPT B is on the SULC in Auto and RFPT A is on its Manual Speed Dial due to I&C testing/calibration of the RFPT flow controllers. Testing of RFPT A flow controller is completed.

Turnover: 1. BOP operator replace feedpumps on Startup Reactor Level Control at high power per SOI-C34 with RFPT A on the SULC and RFPT B on its Manual Speed Dial to support I&C testing/calibration of RFPT B flow controller. 2. Increase reactor power to 90% (after the feedpump shift is completed).

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	Replace feedpumps on Startup Level Control at high power.
2		R (RO)	Increase reactor power from 85% to 90% using recirc flow
3	BS02: 1B21N067G	I (BOP)	HPCS water level 2 instrument trip unit 1B21N673G spurious trip (TS 3.3.5.1. and 3.3.6.1)
4	NM04H 100%	I (RO) C (RO)	Single control rod scram (26-35) due to APRM H failure upscale (TS 3.3.1.1 and ORM 6.2.1)
5	AV02: 1P41F0030 CP02: 1P44C001B	C (RO) C (BOP)	MTLO TCV positioner failure closed due to seismic event TBCC Pump B failure due to seismic event
6	TH02A 10%	C (All) M (All)	Recirc pipe break resulting in drywell pressurization and reactor scram
7	RD15-10% CP02: 1E12C0002A	C (RO) M (All) C (BOP)	Failure of RPS and ARI to automatically shutdown the reactor ATWS RHR Pump A shaft seizure
8	rmf losslevel	I (All) M (All)	Emergency Depressurization due to loss of all RPV water level indication and RPV Flooding to restore adequate core cooling

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

Scenario 1a
Simulator Setup and Cues

1. Simulator Setup

   a. Initial Conditions

      1) Reset to IC97
      2) Set N21-F220 potentiometer to '0519', if required
      3) Lower power to 85% using recirc flow (adjust AGAFs)
      4) Place RFPT B on the SULC and RFPT A on the Manual Speed Dial
      5) Perform annunciator test
      6) Update IOI-3 to Section 4.6, Step 2
      7) Update MOL pull sheets to Step 79
      8) Execute Batch File 'LNC9901-1a' (see attached list)
      9) Restore Infotag file (ror infotags)

   b. Special Procedures

      1) Special Maneuver Control Rod Movement Sheet for Rod 26-35

2. Batch File 'LNC9901-1a'

a.	RD08AR2635	Active	Rod 26-35 'A' solenoid fuse blown
b.	BS02:1B21N0673G	E1	HPCS L2 trip unit spurious trip
c.	NM04H	E2	APRM H failure upscale 100%
d.	RD15	E4	ATWS 1% severity
e.	CP02:1P44C0001B	E4	TBCC Pump B shaft seizure 3 min TD
f.	AN:1H13P6808A[9]	E4	Seismic Alarm – Override ON
g.	AN:1H13P6808A[15]	E4	Seismic Monitor Trbl Alarm – Override ON
h.	TH02A	E4	Recir loop A break 10% severity 15 min TD
i.	AN:1H13P6808A[16)	E4	Loose Parts Trbl Alarm – Override ON
j.	AV02:1P41F0030	E4	MTLO TCV positioner failure closed 30 sec TD
k.	CP02:1E12C0002A	E5	RHR Pump A shaft seizure 1 min TD

Commands: 1. E5 RH:1E12C0002A[3].GT.0.5 (RHRPMPA)

Assign Triggers: 1. E4 = ror seismic_1
2. E6 = rmf losslevel

3. Cues

a.	Event 1	None
b.	Event 2	As Rx Engineer, report (if necessary) that there are no thermal limit considerations and power can be increased using recirc flow
c.	Event 3	**Insert Trigger E1 when directed** As I&C, report that trip unit 1B21N673G has failed downscale
d.	Event 4	**Insert Trigger E2 when directed** As I&C, report that APRM H appears to have a failed averaging circuit As I&C/PPO, report that the Div. 1 SRI switch at HCU 26-35 is in the TEST position **If directed to place the Div 1 SRI switch back to NORMAL, then delete malfunction RD08AR2635** As Rx Engineer, report that thermal limits are within limits and that you are working on a recovery plan for rod 26-35 **Later provide crew with a Special Maneuver Sheet for Rod 26-35 (from 00 to 48) which will restore the rod to its full out position**
e.	Event 5	**Insert Trigger E4 when directed** As PPO, report that the valve positioner for 1P41F030 has failed and the valve is full closed As PPO, report that breaker F1F07 for TBCC Pump B has tripped on overcurrent (white button is sticking out)
f.	Event 6	None
g.	Event 7	**Trigger E5 will go active when LPCS/LPCI A Injection Prevention is performed** As PPO, report that RHR Pump A breaker EH1110 has overcurrent trips on all 3 phases
h.	Event 8	**Insert Trigger E6 when directed**

SPECIAL MANEUVER CONTROL ROD MOVEMENT SHEET

PNPP No. 9076 Rev. 8/10/95 **Page 1** FTI-B02

CYCLE 8 SEQUENCE A STARTUP NUMBER 078

MOVEMENT AUTHORIZATIONS		
STEP AND CONDITIONS	RXENG	DATE
Perform Step 1 to recover control rod 26-35		

STEP	ROD	FROM	TO	S.O. INITIAL	I.V. INITIAL	COMMENTS
1	26-35	00	48			Perform Coupling Check

RX ENG.: APPROVAL _____ / _____ DATE CONCURRENCE _____ / _____ DATE

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 1 Page 1 of 1

Event Description: Replace feedpumps on Startup Level Control at high power

Time	Position	Applicant's Actions or Behavior
	SRO/RO/BOP	Hold reactivity brief
	SRO	Directs BOP to replace RFPT B with RFPT A on the Startup Level Controller per SOI-C34, Section 7.5
		- Provides SRO oversight during feedwater pump shift
		- Directs RO to monitor reactor power and reactor pressure during feedwater pump shift
	RO	Monitors reactor power and reactor pressure
	BOP	Replaces RFPT B with RFPT A on the SULC
		- Verifies RFPT B is on SULC in Auto
		- Verifies RFPT A is on Manual Speed Control Dial
		- Nulls RFPT B Deviation Meter using Manual Speed Control Dial
		- Places RFPT B Governor Mode Control in Manual
		- Selects RFP A with the Startup Feedwater Pump Select Switch
		- Places SULC in Manual
		- Uses SULC Manual PBs to null the RFPT A Deviation Meter
		- Places RFPT A on the SULC by taking RFPT A Governor Mode Control to Auto
		- Nulls SULC deviation using the tape set and places controller in Auto
		- Adjusts SULC tape set, if required, to restore water level to normal control band (~196 inches)

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 2 Page 1 of 1

Event Description: Increase reactor power from 85% to 90% using recirc flow

Time	Position	Applicant's Actions or Behavior
	SRO/RO/BOP	Hold reactivity brief
	SRO	Directs RO to increase reactor power from 85% to 90% using Recirc flow
		- Provides SRO oversight for power increase
	RO/BOP	Notifies SCC, Chem and HP of intent to raise reactor power
	RO	Increases reactor power from 85% to 90% using Recirc Loop Flow Controller
		- Maintains Recirc loop flows matched within 5%

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 3 Page 1 of 2

Event Description: HPCS Water Level 2 instrument trip unit 1B21-N673G spurious trip

Time	Position	Applicant's Actions or Behavior
	BOP	Reports HPCS RX LEVEL LO L2 alarm
		- Consults ARI-H13-P601-16 (C5)
		- Verifies no HPCS automatic actions occurred
	RO	Monitors reactor power, reactor pressure and reactor water level
	SRO/RO	Acknowledges receipt of unexpected alarm
	SRO	Directs BOP to go to back panel H13-P625 to determine which
		HPCS Level 2 trip unit is tripped
		- Examiner informs BOP that trip unit 1B21-N673G indicates
		downscale (tripped) and the other 3 trip units indicate
		normal readings.
	BOP	Reports that trip unit 1B21-N673G indicates downscale
	SRO	References Tech Specs for a single, inoperable HPCS
		Water Level – Low Level 2 inst. channel
		- LCO 3.3.5.1 (ECCS Inst)
		- Enters Condition A
		- Enters Condition B
		- LCO 3.3.6.1 (Pri Cont Isol Inst)
		- Enters Condition A

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 3 Page 2 of 2

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Requests I&C assistance in the Control Room to support
		troubleshooting

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 4 Page 1 of 3

Event Description: Single control rod scram (26-35) due to Div 1 SRI Test Switch in TEST concurrent with an upscale failure of APRM H

Time	Position	Applicant's Actions or Behavior
	RO	Recognizes upscale failure of APRM H
		- Reports ½ scram on RPS B/D
		- Recognizes small decrease in reactor power
		- Reports rod drift and accumulator fault alarms
		- Determines control rod 26-35 is now fully inserted
	BOP	Assists RO with review of numerous ARIs due to single
		rod scram and APRM failure
	SRO	Enters ONI-C51 due to unplanned change in reactor power
		- Confirms no Immediate Operator Actions are required
		to be performed
		- Directs RO/BOP Supplemental Actions for a Nuclear
		Instrumentation failure
		- Verifies channel malfunction
		- Directs bypassing of the failed APRM channel
		- Directs resetting RPS ½ scram
		- References Tech Specs
	SRO	Notifies Reactor Engineering of ONI entry and single rod scram
		- Directs Reactor Engineer to confirm thermal limits are
		within limits
		* Reactor Engineering cannot develop a recovery plan
		until the exact cause of control rod 26-35 insertion is determined.

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 4 Page 2 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Directs NLO to Containment to investigate HCU 26-35
	RO/BOP	Requests I & C assistance in the Control Room for APRM H troubleshooting
	RO/BOP	Bypasses APRM H using APRM Bypass joystick
	RO/BOP	Resets RPS B/D ½ scram by depressing RPS Channel D Manual Reset PB
	SRO	Notifies OPS Management of ONI-C51 entry, reason for entry
	RO/BOP	Coordinate with NLO in Containment to investigate HCU 26-35
	SRO	References Tech Specs for a single, inoperable APRM - LCO 3.3.1.1 (RPS Inst.) (This is PLCO) - ORM 6.2.1 (Control Rod Block) (This is PLCO)
	SRO/RO/BOP	Notified by NLO in Containment that the Div 1 SRI Switch for HCU 26-35 is in TEST position
	SRO	Develops recovery plan for control rod 26-35 with Rx Engineering - Directs NLO to place HCU 26-35 Div 1 SRI Switch to Normal position - References FTI-B02 for recovery actions for control rod 26-35

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 4 Page 3 of 3

Event Description:

Time	Position	Applicant's Actions or Behavior
	SRO (Cont)	(Section 5.10)
		- Obtains Special Maneuver Sheet from Reactor Engineering for recovery of control rod 26-35
		- Notifies OPS Management of reason for control rod 26-35 insertion and recovery plan intention
		- Holds reactivity brief for recovery of control rod 26-35
		- Directs RO and BOP to recover control rod 26-35 using Special Maneuver Sheet
	RO/BOP	Recovers control rod 26-35 using Special Maneuver Sheet
		* It is not required to recover control rod 26-35 before proceeding to Event # 5

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 5 Page 1 of 2

Event Description: Seismic event which results in the failure (closed) of the Main Turbine Lube Oil temp control valve and trip of TBCC Pump B

Time	Position	Applicant's Actions or Behavior
	RO	Reports 'SEISMIC EVENT P969' and 'SEISMIC MONITOR TRBL' alarms
	RO/BOP	Monitors for changes in reactor power, reactor pressure and water level and other major plant parameters.
	SRO	Enters ONI-D51 due to seismic event - Directs BOP to verify if OBE acceleration limits have been exceeded - Coordinate with RO/BOP to complete applicable Supplemental Actions - Notifies OPS management of ONI entry (when time permits)
	BOP	Verifies OBE acceleration limits have been exceeded by receipt of one or more red lights on H13-P969
	RO	Reports 'MAIN TURB OIL TEMP HI' alarm - Diagnoses high MLO temperature coincident with MLO temp controller output at 0% in Auto Mode - Throttles open Turbine Lube Oil TCV Bypass Valve P41-F350 to reduce MTLO temp to 110-120 °F
	BOP	Reports 'BUS F-1-F BREAKER TRIP' alarm - Diagnoses trip of TBCC Pump B

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 5 Page 2 of 2

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO	Enters ONI-P44 due to loss of TBCC Pump B
		- Directs BOP to start the standby TBCC Pump C per SOI-P44
	BOP	Coordinates with NLO to start TBCC Pump C per SOI-P44
		- Directs NLO to throttle TBCC Pump C discharge valves to 20% open
		- Takes TBCC Pump C control switch to START
		- Directs the NLO to fully open TBCC Pump C discharge valve

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 6 Page 1 of 2

Event Description: Recirc pipe break results in Drywell pressurization and subsequent reactor scram; execution of PEI-T23, Containment Control

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Reports increasing drywell pressure
		* Reactor automatically scrams at 1.68 psig (occurs concurrently with LOCA automatic actions)
	SRO	Directs RO to either perform a fast reactor shutdown or manually scram the reactor prior to drywell pressure reaching 1.68 psig.
	RO	Reduces core flow to 58 x 10^6 lbm/hr and arms and depresses RPS Manual Scram PBs or arms/depresses RPS Manual Scram PBs
	SRO	Enters PEI-T23, Containment Control, when Drywell pressure reaches 1.68 psig.
	SRO	Directs RO/BOP actions per PEI-T23
		-Drywell Temperature Control
		- Operates all available DW cooling
		- Restores NCC to the DW
		- Maintains DW average temperature less than 330°F
		- Drywell & Containment Pressure Control
		- Maintains Containment pressure below PSP
		- Containment Temperature Control
		- Operates all available Containment cooling
		- Restores CVCW System

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 6 Page 2 of 2

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO (cont)	- Maintains Cont. average temperature less than 185°F
		- Suppression Pool Level Control
		- Restores and maintains SP level between 17.8 and 18.5 ft
		- Suppression Pool Temperature Control
		- Maintains both SP average temperature and RPV pressure below HCL
	RO/BOP	Executes PEI-T23 actions per SRO direction

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 7 Page 1 of 3

Event Description: Failure of RPS and ARI to automatically shutdown the reactor (ATWS); execution of PEI-B13, RPV Control (Non-ATWS), and execution of PEI-B13, RPV Control (ATWS); RHR Pump A trip

Time	Position	Applicant's Actions or Behavior
	RO	Reports failure of RPS to fully insert all control rods with reactor power greater than 4%
		* DW pressure > 1.68 psig is also a PEI-B13 entry condition
	SRO	Enters PEI-B13, RPV Control (Non-ATWS)
	SRO	Directs RO/BOP actions per PEI-B13, RPV Control (Non-ATWS) - Arms and depresses all RPS Manual Scram PBs - Places the Reactor Mode Switch in SHUTDOWN - Starts Hydrogen Analyzers - Verifies ARI Initiated
	RO/BOP	Executes PEI-B13, RPV Control (Non-ATWS) actions per SRO direction
	SRO	Determines reactor is NOT shutdown under all conditions without boron
	SRO	Exits PEI-B13, RPV Control (Non-ATWS) and enters PEI-B13, RPV Control (ATWS)
	SRO	Directs RO/BOP actions per PEI-B13, RPV Control (ATWS) -Terminates boron injection when the reactor is shutdown under all conditions without boron

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 7 Page 2 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO (Cont)	- RPV Power Control
		- Shutsdown TG when load is less than 90 MWe
		- Inserts SRMs and IRMs when power less than 4%
		- Verifies Recirc FCVs are at min. position if TG is on-line
		- Verifies Recirc FCVs are at min. position if RCIC or RFPTs are operating
		- Trips Recirc Pumps if power is > 4%
		- Inserts Control Rods
		- Injects SLC if power is > 4%
		- Inhibits ADS
		- Verifies RWCU isolated
		* It is not expected that all control rods (except for one) will be fully inserted or boron concentration will be equal to or greater than 1020 ppm
		- RPV Level Control
		- Inhibits ADS
		- Terminates and prevent injection into the RPV
		- HPCS
		- LPCS and LPCI
		* RHR Pump A will trip off one minute after pump starts
		- Prepares 2 or more systems for injection
		- Maintains MSIVs open if any MSL is open

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 7 Page 3 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO (Cont)	- Maintains RPV level between – 25 inches and +100 Inches if power is > 4%
		- Maintains RPV level between –25 inches and + 215 inches if power is < 4%
		- Injects into the RPV using systems that inject outside the shroud
		* Crew will be able to maintain RPV level > -25 inches until RPV level cannot be determined.
		* Crew should maintain RPV level > Level 1 (+16.5 inches) to maintain MSIVs open
		- RPV Pressure Control
		- Prevents injection from LPCS and LPCI if not required for adequate core cooling
		- RPV pressure stabilized between 800 and 1000 psig
	RO/BOP	Executes PEI-B13, RPV Control (ATWS) actions per SRO direction
	RO/BOP	Reports trip of RHR Pump A
		- Dispatches NLO to investigate pump trip
		* LPCI A will not be required to maintain adequate core cooling; however, it is a system which injects outside the shroud during an ATWS

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 8 Page 1 of 3

Event Description: Loss of all RPV level indication resulting in RPV Flooding to restore adequate core cooling

Time	Position	Applicant's Actions or Behavior
	SRO/RO/BOP	Recognizes loss of all RPV water level indication
	SRO	Determines RPV level cannot be determined
		- Exits PEI-B13, RPV Control (ATWS) RPV Level Control and Pressure Control Legs
		- Enters PEI-B13, RPV Flooding
		- Determines reactor is not shutdown under all conditions without boron
		* At this point, it is not anticipated that all rods (except one) will be fully inserted in order to declare the reactor is shutdown without boron
	SRO	Directs RO/BOP actions per PEI-B13, RPV Flooding
		- Prepares one or more systems for injection (preferably outside the shroud injection systems)
		- Terminates and prevent injection into the RPV except for boron and CRD
		- Trips RCIC
		* Must hold here until all injection into the RPV has been terminated (except boron and CRD)
		- Confirms Suppression Pool level > 5.25 ft
		- Opens all ADS valves to rapidly depressurize the RPV
		- Closes MSIVs, MSL drains and RCIC steam isolations

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 8 Page 2 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
		*Must hold here until RPV pressure is less than MARFP (130 psig)
		- Injects into the RPV to establish & maintain RPV pressure above MARFP using outside the shroud injection systems
		* Loss of LPCI 'A' may prevent crew from being able to establish and maintain RPV pressure above MARFP using outside the shroud injection systems
		- Injects into the RPV to establish and maintain RPV pressure above MARFP using any system
		- Controls injection to maintain RPV pressure greater than MARFP and as low as practical
		* Must hold here until the reactor is shutdown under all conditions
	RO/BOP	Executes PEI-B13, RPV Flooding actions per SRO direction
	SRO	Enters PEI-M51/56, Hydrogen Control concurrently with PEI-B13, RPV Flooding
	SRO	Directs RO/BOP actions per PEI-M51/56
		- Energizes Hydrogen Igniters

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 8 Page 3 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Executes PEI-M51/56 actions per SRO direction
		Scenario Termination Criteria:
		1) Injection controlled to maintain RPV pressure greater than
		MARFP (130 psig) but as low as practical
		2) Control rods being inserted to shutdown the reactor under
		all conditions without boron.

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 7 Page 1 of 1

Event Description: Critical Task #1

Time	Position	Applicant's Actions or Behavior
		Critical Task #1 – With a reactor scram required and the reactor not shutdown, to prevent an uncontrolled RPV depressurization and subsequent power excursion, inhibit ADS
		1. Safety Significance:
		- Precludes core damage due to an uncontrolled reactivity addition
		2. Cues:
		- Procedural compliance
		3. Measured by:
		- ADS logic inhibited prior to an automatic initiation of the ADS System unless all required injection systems are terminated and prevented
		4. Feedback:
		- RPV pressure and level trends
		- ADS "Out of Service" annunciator status

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 7 Page 1 of 1

Event Description: Critical Task #2

Time	Position	Applicant's Actions or Behavior
		Critical Task #2 – With a reactor scram required and the reactor not shutdown, initiate action to reduce power by injecting boron and/or inserting control rods
		1. Safety Significance:
		- Shutting down the reactor can preclude failure of Containment or equipment necessary for the safe shutdown of the plant
		2. Cues:
		- Procedural compliance
		3. Measured by:
		- SLC Pump control switches taken to ON and control rod insertion before the end of the scenario
		4. Feedback:
		- Reactor power trend

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 8 Page 1 of 1

Event Description: Critical Task #3

Time	Position	Applicant's Actions or Behavior
		Critical Task #3 – When RPV water level cannot be determined and the reactor is at pressure, initiate Emergency Depressurization
		1. Safety Significance:
		- Maintain adequate core cooling
		2. Cues:
		- Procedural compliance
		- Loss of all level indication
		3. Measured by:
		- Observation – at least 5 SRVs open prior to re-establishing injection after terminate and prevent actions are completed
		4. Feedback:
		- Reactor pressure trend
		- Suppression pool temperature trend

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 8 Page 1 of 1

Event Description: Critical Task #4

Time	Position	Applicant's Actions or Behavior
		Critical Task #4 – During an ATWS with Emergency depressurization required, terminate and prevent injection, with the exception of SLC and CRD, into the RPV until reactor pressure is below MARFP
		1. Safety Significance:
		- Prevention of fuel damage due to uncontrolled feeding
		2. Cues:
		- Procedural compliance
		3. Measured by:
		- Observation – no injection into the RPV except for SLC and CRD prior to reaching the MARFP that causes a reactor short period alarm or power increase to APRM upscale alarms
		4. Feedback:
		- Reactor power trend, power spikes, reactor short period alarms

Op-Test No.: 2001-01 Scenario No.: 1a Event No.: 8 Page 1 of 1

Event Description: Critical Task #5

Time	Position	Applicant's Actions or Behavior
		Critical Task #5 – When RPV water level cannot be determined during an ATWS, with RPV pressure below the MARFP, slowly increase and control injection into the RPV to restore and maintain RPV pressure above the MARFP
		1. Safety Significance:
		- Establish adequate core cooling
		2. Cues:
		- RPV pressure trend
		- Procedural compliance
		3. Measured by:
		- RPV pressure is established and controlled above the MARFP
		4. Feedback:
		- Lack of level indication
		- Hydrogen generation
		- RPV pressure indications

Facility: Perry Scenario No.: 1c Op-Test No.: 2001-01

Examiners: _____ Operators: _____

_____ _____

_____ _____

Objectives: Evaluate the applicants' ability to: decrease reactor power using recirc flow; evaluate tech specs for a failed C85 pressure regulator channel; place RWCU F/D A in service; implement off-normal procedure for a pipe break outside of containment due to a RWCU pipe break in the Aux Bldg with a RWCU pump failure due to a shaft seizure and a failure of a RWCU containment isolation valve to automatically isolate; evaluate an ESW Pump B discharge pressure low alarm bistable card failure during ESW Pump B operation; evaluate tech specs for a trip of RHR Pump B during suppression pool cooling operations; implement off-normal procedures for a loss of a Class 1E divisional DC bus and an unplanned change in reactor power due to a trip of both recirc pumps which requires a manual reactor scram; execute plant emergency instructions to prevent exceeding Containment pressure suppression pressure limit due to a rupture of the scram discharge volume (SDV).

Initial Conditions: Plant is in operation with reactor power at 75%. BOL pull sheet (Step 89, gang 47 at 24). IOI-3, Section 4.6, Step 2. RHR Loop B is in the suppression pool cooling mode due to weeping SRV F047B. There are 6 days and 16 hours remaining on the ALCO for TS 3.5.1.

Turnover: 1. Reduce reactor power to 70% per SCC request. 2. Per Chemistry request, BOP operator place RWCU F/D A in service (currently in hold mode). 3. Secure suppression pool cooling when SP temperature has been reduced to 75 F.

Event No.	Malf. No.	Event Type*	Event Description
1		R (RO)	Decrease reactor power from 75% to 70% using core flow
2	PT01: 1C85N0001A 0%	I (RO)	Main steam pressure transmitter failure (downscale) for C85 pressure regulating channel A (TS 3.2.2)
3		N (BOP)	Place RWCU F/D A in service
4	CP02: 1G33C0001A CU04 5% MV04: 1G33F0001	C (RO) C (All) C (BOP)	RWCU Pump A failure due to shaft seizure RWCU pipe break in the Auxiliary Building Failure of RWCU containment isolation valve G33F001 to automatically isolate (TS 3.6.1.3)
5	AN:1H13 P60117A[42] ON	I (BOP)	ESW Pump B low discharge pressure alarm bistable card failure
6	CB01: 1E12C0002B	C (BOP)	Trip of RHR Pump B while in SP Cooling mode (TS 3.5.1; 3.6.1.7; 3.6.2.3)
7	ED09B	C (ALL) C (RO)	Loss of Class 1E divisional DC bus ED1B resulting in a trip of both recirc pumps requiring a manual reactor scram Failure of RPS to automatically shutdown the reactor (RO manually initiates ARI to shutdown the reactor)
8	RD16 40%	M (ALL)	Loss of coolant accident in Containment due to scram discharge volume rupture

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

Scenario 1c

Simulator Setup and Cues

1. Simulator Setup

   a. Initial Conditions

      1) Reset to IC17 (Power Uprate IC not required)
      2) Adjust AGAFs (if required)
      3) Place RWCU F/D A in Hold mode RF CU05 HOLD RF CU09 0 gpm
      4) Startup RHR loop B in the SP cooling mode
      5) Perform annunciator test
      6) Update IOI-3 to Section 4.6, Step 2
      7) Update BOL pull sheets to Step 89, gang 47 at position 24
      8) Execute Batch File 'LNC9901-1c' (see attached list)
      9) Restore Infotag file (ror infotags)
      10) Verify no Triggers went active

   b. Special Procedures

      1) None

2. Batch File 'LNC9901-1c'

a.	MV04:1G33F0001	Active	Failure of auto close logic for G33F001
b.	RV02:1B21F0047B	Active	SRV F047B leakage 3% severity
c.	RD16	Active	SDV rupture 40% severity
d.	RY02:1C71K14A	Active	RPS relay fails as is
e.	RY02:1C71K14C	Active	RPS relay fails as is
f.	RY02:1C71K14E	Active	RPS relay fails as is
g.	RY02:1C71K14G	Active	RPS relay fails as is
h.	PT01:1C85N0001A	E1	Main Steam pressure transmitter failure downscale
i.	AN:1H13P6801A[18]	E2	RWCU Pump A Gland Seal Temp Hi alarm – Override ON
j.	CP02:1G33C0001A	E2	RWCU Pump A shaft seizure 1 min TD
k.	CU04	E2	RWCU pipe break in Aux Bldg 5% severity 2 min TD
k.	AN:1H13P60117A[42]	E3	ESW Pump B Discharge Pressure Low alarm – Override ON
l.	CB01:1E12C0002B	E4	RHR Pump B spurious breaker trip
m.	ED09B	E5	Loss of 125 Vdc bus ED-1-B

3. Cues

a.	Event 1	As Rx Engineer, report (if necessary) that there are no thermal limit considerations and power can be decreased using recirc flow
b.	Event 2	**Insert Trigger E1 when directed during the power increase** As I&C, report that Main Steam pressure transmitter C85N001A for C85 pressure regulator channel A appears to have failed downscale
c.	Event 3	As PPO, coordinate with RO to place RWCU F/D A in service
d.	Event 4	**Insert Trigger E2 when directed** As PPO, report that there is steam in the Aux 599 hallway and you cannot approach the RWCU pump room area. Also report that the steam cloud appears to be dissipating.
e.	Event 5	**Insert Trigger E3 when directed** As PPO, report that ESW Pump B discharge pressure as read on PI-R101B at panel H51-P1136 in the ESW pumphouse indicates 88 psig As I&C, report that bistable card PB-N103B in panel H13-P864 has failed which is causing the alarm to be locked in.
f.	Event 6	**Insert Trigger E4 when directed** As PPO, report that RHR Pump B breaker EH1208 has no flags or tripped relays. Reason for breaker opening is unknown
g.	Event 7	**Insert Trigger E5 when directed** AS PPO, report that normal battery charger supply breaker ED1B07 and Bus ED-1B main breaker ED1B03 are tripped (reason unknown). Request Electrical Maintenance support
h.	Event 8	None

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 1 Page 1 of 1

Event Description: Decrease reactor power from 75% to 70% using recirculation flow

Time	Position	Applicant's Actions or Behavior
	SRO/RO/BOP	Hold reactivity brief
	SRO	Directs RO to reduce reactor power from 75% to 70% using Recirc flow
		- Verifies with Reactor Engineering that repositioning of control rods is not required to satisfy thermal limits
		- Provides SRO oversight for power decrease
	RO/BOP	Notifies SCC, Chem and HP of intent to lower reactor power
	RO	Decreases reactor power from 75% to 70% using Recirc Loop Flow Controller
		- Maintains Recirc loop flows matched within 10%
		* C85 pressure regulator channel failure will be inserted during power decrease. C85 will automatically switch over to the standby regulator. There are no alarms for this event.

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 2 Page 1 of 1

Event Description: Main Steam pressure transmitter failure (downscale) for C85 Pressure Regulator Channel A

Time	Position	Applicant's Actions or Behavior
	RO	Diagnoses C85 pressure regulator failure
		- Informs SRO
	SRO/RO	Requests I&C assistance in the Control Room to support troubleshooting
	SRO	References Tech Specs for a single out of service C85 pressure regulator channel
		- LCO 3.2.2 (MCPR)
		- Enters Condition A
	SRO	Notifies OPS Management of Tech Spec entry

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 3 Page 1 of 1

Event Description: Place RWCU F/D A in service

Time	Position	Applicant's Actions or Behavior
	SRO	Directs BOP to place RWCU F/D A in service per SOI-G33, Section 5.1
	BOP	Places RWCU F/D A in service
		- Contacts Chemistry to determine if a hold time is required
		- Establishes communications with NLO at RWCU F/D Control Panel
		* Majority of SOI steps are performed by the NLO
		- Throttles closed RWCU FILTER/DEMIN BYPASS VALVE while coordinating with NLO to establish a flow rate of 155 gpm
		- Contacts Chemistry to take a resin break through sample
		* Event # 4 can begin immediately after RWCU F/D A is in service

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 4 Page 1 of 3

Event Description: RWCU pump seal failure resulting in a steam leak/system isolation with a failure of RWCU containment isolation valve to close.

Time	Position	Applicant's Actions or Behavior
	RO	Reports RWCU PUMP A GLAND SEAL TEMP HI alarm
		- Consults ARI-H13-P680-1 (C6)
		- Dispatches NLO to RWCU Pump A
		* One minute after alarm RWCU Pump A trips
		- Reports trip of RWCU Pump A
	SRO/BOP	Acknowledges receipt of unexpected alarm and trip of RWCU
		Pump A
		* One minute after trip of RWCU Pump A the small RWCU pipe
		break occurs
	RO/BOP	Reports RWCU ISOL PUMP A/B RM TEMP HI alarm
		- Consults ARI H13-P680-1 (C5)
		* Other alarms will also occur which indicates some sort of
		pipe break
	BOP	Verifies RWCU isolation
		- Diagnoses failure of valve G33-F001 to automatically close
		- Informs SRO of failure of valve G33-F001 to close
	SRO	Acknowledges failure of G33-F001 to auto close

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 4 Page 2 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO (Cont)	- Directs BOP to manually close G33-F001
	BOP	Closes G33-F001 using control switch
		- Informs SRO that valve is closed
	SRO	Directs BOP to monitor area temperatures in order to confirm leak
		is isolated
	BOP	Monitors area temperatures
		- Informs SRO that temperatures are decreasing
	RO	Monitors reactor power, reactor pressure and reactor water level
	SRO	Enters ONI-N11 and ONI-D17 due to unknown pipe break
		- Evacuates the applicable plant area (Aux Bldg)
		- Directs NLO to inspect RWCU area
		- Isolates the leak by isolating the affected system
		- Directs Chem and HP to initiate actions per RPI-0506
		- Coordinates with RO/BOP to complete applicable Supplemental
		Actions
		- Notifies OPS management of entry into ONI-N11 and ONI-D17
	SRO	References Tech Specs for an inoperable PCIV (G33-F001)
		- LCO 3.6.1.3 (PCIV)
		- Enters Condition A

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 4 Page 3 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO (Cont)	- Requests tagout for G33-F001 to de-energize in closed position
	SRO	Exits ONI-N11 and ONI-D17 when leak is confirmed to be isolated
	SRO	Evaluates entry into PEI-N11, Containment Leakage Control
		* Entry into PEI-N11 is not expected

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 5 Page 1 of 1

Event Description: ESW Pump B low discharge pressure alarm bistable card failure

Time	Position	Applicant's Actions or Behavior
	BOP	Reports ESW PUMP B DISCHARGE PRESSURE LOW alarm
		- References ARI H13-P601-17 (G6)
	SRO/RO	Acknowledges receipt of unexpected alarm
	BOP	Dispatches NLO to investigate ESW Pump B
		- Verifies pump discharge indication is normal
		- Informs SRO of discrepancy between alarm and indicated pump discharge pressure
	SRO/RO/BOP	Requests I&C assistance in the Control Room to support troubleshooting
		* If BOP references P&ID, he/she can determine there is a local discharge pressure gage which can be used to confirm the Control Room indication
		* NLO will report that local indication is reading normal
	BOP	Informs SRO that local and Control Room indications are normal
		- He may theorize an alarm card problem
	SRO	Directs I&C to initiate troubleshooting
	SRO	Directs BOP to frequently monitor ESW pump discharge pressure due to failed annunciator

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 6 Page 1 of 2

Event Description: Trip of RHR Pump B while in SP Cooling mode

Time	Position	Applicant's Actions or Behavior
	BOP	Reports RHR PUMP B TRIP alarm
		- References ARI-H13-P601-17 (F4)
		- Dispatches NLO to investigate RHR Pump B and pump breaker
	SRO/RO	Acknowledges receipt of unexpected alarm
	SRO	Directs BOP to close RHR B TEST TO SUPP POOL VALVE E12-F024B
	SRO	References Tech Specs for an inoperable RHR Pump B
		- LCO 3.5.1 (ECCS)
		- Still in Condition A
		- LCO 3.6.1.7 (RHR Containment Spray)
		- Enters Condition A
		- LCO 3.6.2.3 (RHR SP Cooling)
		- Enters Condition A
	SRO	Informs OPS Management of RHR Pump B trip and Tech Spec LCO entries
	SRO	Requests Maintenance assistance to support troubleshooting
	SRO	Directs BOP to place RHR Loop B in Secured Status in preparation for fill and vent

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 6 Page 2 of 2

Event Description: _____

Time	Position	Applicant's Actions or Behavior
		* Placing RHR Loop B in Secured Status does not have to be
		completed before proceeding to Event #7

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 7 Page 1 of 3

Event Description: Loss of DC Bus ED-1-B results in a trip of both Reactor Recirculation Pumps which requires a manual reactor scram

Time	Position	Applicant's Actions or Behavior
	BOP	Reports DC BUS ED-1-B UNDERVOLTAGE alarm
		- Consults ARI-H13-P877-2 (H1)
	SRO/RO	Acknowledges receipt of unexpected alarm
	BOP	Dispatches NLO to investigate DC Bus ED-1-B
	SRO	Enters ONI-R42-2 due to loss of DC Bus ED-1-B
		* Bus ED-1-B will not be restored
	RO	Diagnoses trip of both Reactor Recirc Pumps
		- Observes decrease in reactor power and core flow
		* Numerous other alarms will occur
	SRO	Enters ONI-C51 due to unplanned change in reactor power
		- Directs RO to insert a manual reactor scram
	RO	Arms and depresses RPS Manual Scram PBs
		- Recognizes failure of RPS to scram the reactor
		- Informs SRO of failure to scram
	SRO/BOP	Acknowledges receipt of RPS failure to scram

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 7 Page 2 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO	Enters PEI-B13, RPV Control (Non-ATWS) due to reactor scram required and power > 4% or RPV level < 178 inches
	SRO	Directs RO/BOP actions per PEI-B13, RPV Control (Non-ATWS) - Places the Reactor Mode Switch in SHUTDOWN - Starts Hydrogen Analyzers - Initiates ARI - Inserts SRMs and IRMs
	RO/BOP	Executes PEI-B13, RPV Control (Non-ATWS) actions per SRO directions
	RO	Verifies all control rods are fully inserted when ARI is initiated - Informs SRO all control rods are fully inserted
		* LOCA in Containment due to SDV rupture (Event #8) will commence when RPS scram valves open
	SRO	Directs RO/BOP actions per PEI-B13, RPV Control (Non-ATWS)
		- RPV Level Control - Restores and maintains RPV level between 185 and 215"
		- RPV Pressure Control - Verifies no SRVs are cycling

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 7 Page 3 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO (Cont)	- Stabilizes pressure to less than 1000 psig with Bypass Valves
		- Performs a controlled depressurization of the RPV
		* PEI-B13 will continue to be executed concurrently with
		PEI-T23 in Event #8
	RO/BOP	Executes PEI-B13, RPV Control (Non-ATWS) actions per SRO
		direction

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 8 Page 1 of 2

Event Description: Loss of Coolant Accident in Containment due to SDV rupture

Time	Position	Applicant's Actions or Behavior
		* There will be numerous alarms and indications that will occur
		indicating that a LOCA is occurring in the Containment
	BOP	Reports CNTMT UNIDENTIFIED LEAK RATE HIGH Alarm
		- References ARI-H13-P601-18 (B2)
	SRO/RO	Acknowledges receipt of unexpected alarm
	SRO/RO/BOP	Monitors Containment and Drywell parameters
	SRO	Enters PEI-T23, Containment Control, when SP level > 18.5 ft
	SRO	Directs RO/BOP actions per PEI-T23, Containment Control
		- Containment Temperature Control
		- Operates all available Containment cooling
		- Restores CVCW
		- Maintains Containment average temperature < 185 °F
		- DW and Containment Pressure Control
		- Spray Containment when pressure is > 2.25 psig
		- Maintains Containment pressure below PSP
		* RHR B is not available for Containment Spray

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 8 Page 2 of 2

Event Description: _____

Time	Position	Applicant's Actions or Behavior
		* PSP will not be exceeded if Containment Spray is initiated in a timely manner
	SRO (Cont)	- Drywell Temperature Control - Operates all available DW cooling - Restores NCC to the DW - Maintains DW average temperature less than 330 °F
		- Suppression Pool Temperature Control - Maintains both SP ave. temp. and RPV pressure below HCL
		- Suppression Pool Level Control - Restores and maintains SP level between 17.8 and 18.5 ft.
	RO/BOP	Executes PEI-T23 actions per SRO direction
		Scenario Termination Criteria
		1) RPV level maintained 185 to 215 inches
		2) Controlled depressurization of the RPV is in progress in order to reduce the driving head for the LOCA in Containment
		3) Containment Spray 'A' in operation to maintain Containment pressure below PSP

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 7 Page 1 of 1

Event Description: Critical Task #1

Time	Position	Applicant's Actions or Behavior
		Critical Task #1 – During operation in the Manual Scram Required Region of the Two Loop Power to Flow Map, manually scram the reactor
		1. Safety Significance:
		- Reduce the probability of power oscillations that could exceed MCPR limits without causing a scram
		2. Cues:
		- SPDS Power to Flow Map
		- Procedural compliance
		3. Measured by:
		- Manual scram inserted
		4. Feedback:
		- Reactor scram indications
		- Reactor power trends

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 7 Page 1 of 1

Event Description: Critical Task #2

Time	Position	Applicant's Actions or Behavior
		Critical Task #2 – With a reactor scram required and the reactor not shutdown, take action to reduce power by initiating ARI or pulling scram fuses to cause control rod insertion
		1. Safety Significance:
		- Shutting down the reactor can preclude failure of Containment or equipment necessary for the safe shutdown of the plant
		2. Cues:
		- Reactor power indication
		- Procedural compliance
		3. Measured by:
		- Observation – All control rods inserted by arming and depressing ARI Manual Initiation push buttons or RPS fuses removed
		4. Feedback:
		- Reactor power trend

Op-Test No.: 2001-01 Scenario No.: 1c Event No.: 8 Page 1 of 1

Event Description: Critical Task #3

Time	Position	Applicant's Actions or Behavior
		Critical Task #3 – With Containment pressure exceeding 2.25 psig, and prior to exceeding the Pressure Suppression Pressure, initiate Containment Spray
		1. Safety Significance:
		- Precludes an unrequired Emergency Depressurization
		2. Cues:
		- Containment pressure increase
		- Procedural compliance
		3. Measured by:
		- Observation – With Containment pressure at least 2.25 psig, Containment Spray is manually initiated prior to exceeding the Pressure Suppression Pressure
		4. Feedback:
		- Containment pressure indication (trend)
		- "Containment Spray Start Signal Received" alarm status

Facility: Perry Scenario No.: 2a Op-Test No.: 2001-01

Examiners: _____ Operators: _____

_____ _____

_____ _____

Objectives: Evaluate the applicants' ability to: reset Recirc flow control cavitation runback; evaluate tech specs for a malfunctioning Division 1 DG governor (oscillations) and perform unload and shutdown of DG; perform alarm response instructions for a failure of the Generator hydrogen cooler temperature controller in the Auto mode; evaluate tech specs for a failure of an LPRM detector (upscale) including bypassing an LPRM; implement off-normal procedure for a loss of feedwater heating due to a malfunction of the fdw heater 6A level control valves; decrease reactor power using recirc flow in preparation for motor feed pump (MFP) shutdown from operating to secured status due to vibration problems; implement integrated operating instruction for a fast unload and trip of the main turbine due to an EHC hydraulic oil leak at CIV #5 (Main Turbine trip will cause a reactor scram); execute plant emergency instructions due to a low RPV water level, including a trip of the remaining feedwater pump and failure of the HPCS injection valve to auto open; execute plant emergency instructions for a RPV bottom head pipe break in the drywell and a rupture of the scram discharge volume (SDV) which results in Containment pressurization, including failure of an RHR containment spray valve to open and degradation of the remaining RHR pump; and execute plant emergency instructions that require emergency depressurization prior to exceeding pressure suppression pressure including failure of an ADS SRV to open.

Initial Conditions: Plant is at 68% power due to a trip of RFPT A. EOL pull sheets (Step 82). IOI-3, Section 4.6, Step 4. RFPT B and the MFP are on the MLC due to an unexplained trip of RFPT A at the end of last shift. ONI-N27, Supplemental Action #4 (reset recirc FCV runback) still needs to be completed before ONI-N27 can be exited. ONI-C51 was entered and exited. Division 1 DG is paralleled to the grid at 3000 kW. Previous shift had just completed the transfer of Bus EH11 to its preferred source (per the POD).

Turnover: 1. Reset the recirc flow control cavitation runback per SOI-B33. 2. Unload and shutdown Division 1 DG per SOI-R43. 3. Increase reactor power when directed by SCC.

Event No.	Malf. No.	Event Type*	Event Description
1		N (RO)	Reset recirc flow control cavitation runback.
2	DG04A 75%	I (BOP) N (BOP)	Div 1 DG governor oscillations (TS 3.8.1) Unload and shutdown Div 1 DG
3	CN02: 1P44R0436 0%	I (BOP)	Generator hydrogen cooler temperature controller failure in AUTO mode
4	NM03 100%	I (RO)	LPRM 08-17 (5C) failure upscale (TS 3.3.1.1) Bypass LPRM 08-17 (5C)
5	AV02: 1N25F0280A AV02: 1N25F0290A	C (BOP)	Loss of fdw heating due to malfunction of fdw heater 6A level control valves

Facility: Perry Scenario No.: 2a Op-Test No.: 2001-01

6	ZA1N27R0330 4.2 ZA1N27R0329 3.9	C (RO) R (RO)	Motor Feed Pump high vibration Decrease reactor power from 68% to 63% using recirc flow Shutdown MFP from operating to secured status
7	TC03E 0% TC05 20%	C (RO) C (ALL)	CIV #5 failure closed Fast unload and trip of main turbine due to an EHC hydraulic oil leak
8	 CP01: 1N27C0002B RY02: 1E22K9	M (All) C (RO) C (BOP)	Main turbine and reactor scram, low RPV level due to no high pressure fdw pumps RFPT B shaft breakage HPCS injection valve (F004) auto open circuit failure
9	TH02C 100% RD16 2% MV01: 1E12F0537A CP03: 1E12C0002B 75%	M (All) C (BOP) C (BOP)	RPV bottom head drain pipe break resulting in drywell pressurization Loss of coolant accident in Containment due to scram discharge volume rupture Containment spray valve fails as-is (blown control power fuse) RHR Pump B degradation
10	 RV04: 1B21F0041E	M (All) C (BOP)	Emergency Depressurization prior to exceeding Containment pressure suppression pressure ADS SRV failure closed

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

Scenario 2a
Simulator Setup and Cues

1. Simulator Setup

   a. Initial Conditions

      1) Reset to IC99
      2) Trip RFPT A and perform ONI-N27 supplemental actions except for reset of recirc flow control cavitation runback (adjust AGAFs) RF FW72 CLOSE
      3) Shutdown RFPT A from 1100 rpm per SOI-N27 RF FW73 OPEN
      4) Start and load Division 1 DG to 3000 kW per SOI-R43
      5) Set N21-F220 potentiometer to '0519', if required
      6) Perform annunciator test
      7) Update IOI-3 to Section 4.6, Step 4
      8) Update EOL pull sheets to Step 82
      9) Execute Batch File 'LNC9901-2a' (see attached list)
      10) Restore Infotag file (ror infotags)
      11) Verify no Triggers went active

   b. Special Procedures

      1) IOI-14, Fast Unload and Trip of Main Turbine

2. Batch File 'LNC9901-2a'

a.	RD16	Active	SDV rupture 15% severity
b.	RY02:1E22K9	Active	HPCS initiation relay K9 fails as-is
c.	MV06:1E12F0537A	Active	Containment spray valve F537A fails as-is (blown control power fuse)
d.	RV04:1B21F0041E	Active	SRV F041E failure closed
e.	DG04A	E1	Div 1 DG governor oscillations 75% severity
f.	CN02:1P44R0436	E2	Generator hydrogen cooler temperature controller failure (auto mode) 0% severity
g.	NM03L0817C	E3	LPRM 0817(5C) failure upscale 100% severity
h.	AV02:1N25F0280A	E4	Htr 6A drain to cndr (F280A) failure closed
i.	AV02:1N25F0290A	E4	Htr 6A drain to Htr 5A (F290A) failure closed
j.	CP02:1N27C0004	E7	MFP shaft seizure
k.	TC05	E8	EHC fluid leak 20% severity 3 min ramp
l.	TC03E	E8	CIV #5 failure closed 0% severity 2 min ramp
m.	CP01:1N27C0002B	E10	RFPT B shaft breaks
n.	TH02C	E11	RPV bottom head drain pipe break 50% severity
o.	CP03:1E12C0002B	E12	RHR Pump B degradation 75% severity 1 min TD 1 min ramp
p.	PC01A	Active	DW/CNTMT Bypass Leakage Train A 50% severity

Commands:
1. E1 DG:BKREH1102[3].EQ.0 (DGBKREH1102)
2. E5 AN:1H13P8705A[17].GT.0 (HTR6LVL)
3. E7 ZD1N27C0004.GT.0 (MFPOFF)
4. E9 TCLEHCTANK.LE.67 (EHCLEVEL)
5. E10 RDLSDV[1].GE..60 (SDVLEVEL)
6. E10 ZD1C71S1[1].NE.0 (MODESWITCH)
7. E12 ZL1E12F0537B(2).GT.0 (E12F537B)

Assign Triggers:
1. E5 = dmf AV02:1N25F0280A
2. E5 = dmf AV02:1N25F0290A
3. E6 = ior ZA1N27R0330 4.2
4. E6 = ior ZA1N27R0329 3.9
5. E7 = dor ZA1N27R0330
6. E7 = dor ZA1N27R0329
7. E9 = mmf TC05 50

3. Cues

a. Event 1 — None

b. Event 2 — **Trigger E1 will activate after the DG Output Breaker is open**

As PPO, report that Div 1 DG speed is oscillating.

As PPO, report that Div 1 DG governor has an oil leak and oil level is out of sight low

c. Event 3 — **Trigger E2 after the Div 1 DG has been shutdown**

As I&C, report that Generator hydrogen cooler temperature controller requires troubleshooting to determine reason for failure in the AUTO mode

d. Event 4 — **Insert Trigger E3 when directed**

As I&C, report that LPRM 08-17 (5C) has failed upscale

e. Event 5 — **Insert Trigger E4 when directed**

Both malfunctions will automatically delete themselves

As I&C, report that the controller for HTR 6A DRAIN TO HTR 5A drain valve N25F0290A appears to be operating normally and maybe there was a momentary level fluctuation

As I&C, report that HTR 6A DRAIN TO CNDR drain valve N25F0280A appears to have stuck in the closed position

As Rx Engineer, report that thermal limits are within limits for the current power level

f. Event 6

Insert Trigger E6 when directed

As PPO/RSE, report that the MFP has a cracked seal water line on the outboard pump end, is making abnormal noises, has increased vibration levels, and should be removed from service as soon as possible

g. Event 7

Insert Trigger E8 when directed

Takes approximately 3 minutes for the first alarm to occur

As PPO, actions to locate EHC oil leak will be unsuccessful

As Rx Engineer, if asked, inform crew to insert control rods in reverse per the pull sheets

Trigger E9 will automatically activate when EHC tank level decreases to .67 to increase the leak rate which causes the Main Turbine to trip and the reactor to scram

EHC tank level can be monitored on the Monitored Parameter Summary as follows:

1. Select 'List MP Files'
2. Select 'ehclvl'
3. Select Option to restore parameter to MPS

h. Event 8

Trigger E10 will activate when the Rx Mode Switch is in Shutdown or the SDV is 60% full

As PPO, report that RFPT B shaft has broken

i. Event 9

Insert Trigger E11 when directed

Modify PC01A to 100% and RD16 to 25% when Containment pressure is 1.0 psig to drive crew towards emergency depressurization

Modify RD16 to 50% (or as necessary) when crew has initiated Containment Sprays to drive the crew towards emergency Depressurization

E12-F537A will blow its control power fuse when it begins to stroke

Trigger E12 will activate when E12-F537B is open

As PPO, report that MCC EF1B07-JJ for valve E12F537A has a blown control power fuse

Do not replace fuse until crew has commenced emergency depressurization

As PPO, report there is no visible cause for RHR Pump B degradation

j. Event 10

None

Op-Test No.: 2001-01 Scenario No.: _2a_ Event No.: _1__ Page _1_ of _1_

Event Description: _Reset Recirc Flow Control Cavitation Runback_____

Time	Position	Applicant's Actions or Behavior
	SRO/RO/BOP	Hold reactivity brief
	SRO	Directs RO to reset the Recirc Flow Control Cavitation Runback
		per SOI-B33, Section 7.8
		- Provides SRO oversight during runback reset
	RO	Resets Recirc flow control cavitation runback
		- Operates recirc Flow Control to obtain 0% LIMITER ERROR on
		Recirc Loop A and B Flow Control
		- Operates Recirc Flux Control to obtain 0% M/A ERROR on Recirc
		Loop A and B Flow Control
		- Takes CAVITATION/FCV LIMIT RCIRC RESET switch to A and
		Then to B
		* RO should confirm that the Recirc FCVs do not move when the
		Runback has been reset
	SRO	Exits ONI-N27
	SRO	Notifies OPS Management of ONI-N27 exit

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 2 Page 1 of 3

Event Description: Unload and shutdown the Division 1 DG; DG governor oscillations cause the Div 1 DG to be inoperable

Time	Position	Applicant's Actions or Behavior
	SRO	Directs BOP to unload and shutdown the Division 1 DG per SOI-R43, Sections 5.3 and 6.1
	BOP	Terminates parallel operations with the grid - Adjusts DG VOLTAGE RGLTR to achieve 100 KVAR - Adjusts DG GOVERNOR to achieve 100 KW - Lowers generator load to 2500 KW at a rate of 150-200 KW per minute - Lowers generator load to 100 KW
		* DG should be shutdown within 5 minutes after reaching 2500 KW
		- Takes DIESEL GEN BRKR to TRIP
		*DG governor oscillations commence when the DG bkr is opened
		* BOP will not be able to complete all of the steps required to shutdown the Div 1 DG because of the governor problem
	BOP	Diagnoses DG governor problem - Informs SRO - Contacts NLO to investigate DG governor oscillations
	SRO	Directs BOP to continue the shutdown of the Div 1 DG

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 2 Page 2 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	BOP	Shutsdown the Div 1 DG to standby
		- Verifies DIESEL GENERATOR in AUTO
		- Verifies DIESEL GENERATOR CONTROL TRANSFER in CONT RM
		- Verifies DIESEL GEN OUT OF SERVICE in NORM
		- Confirms DIESEL GEN BRKR is open
		- Places SYNC SEL SWITCH in the TH1 position
		* BOP will not be able to complete the next step due to the governor oscillations
		- Adjusts DIESEL GEN GOVERNOR such that the synchroscope is moving slowly in the fast direction
		- Places SYNC SEL SWITCH in the OFF position
		- Adjusts DG VOLTAGE RGLTR to achieve 4100-4200 volts
		- Contacts NLO to confirm DG FIELD BREAKER Closed amber light is OFF
		- Takes DIESEL GENERATOR to STOP
		- Contacts NLO to confirm DG FIELD BREAKER CLOSED amber light is OFF
		- Contacts NLO to verify Lock Out Relay 86G and 86G/1 are reset
		* Division 1 DG Turbo Prelube Valve was not required to be opened since this was a normal DG shutdown

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 2 Page 3 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
		* Remainder of DG shutdown is not required to be completed prior to commencing Event #3
	SRO	Directs BOP to place the Div 1 DG in Secured Status per SOI-R43, Section 6.3
	BOP	Shutsdown Div 1 DG to Secured Status - Places DG OUT OF SERVICE to INOP - Places DIESEL GENERATOR in PULL TO LOCK - Contacts NLO to place INOP/NORMAL/START switch in INOP - Contacts NLO to verify the HORN switch is in DE-ACT
	BOP	Informs SRO and RO that Div 1 DG is in secured status
	SRO	References Tech Specs for an inoperable Div 1 DG - LCO 3.8.1 (AC Sources-Operating) - Enters Condition B
	SRO	Notifies OPS Management of LCO entry
	SRO	Requests RSE and Mechanical Maintenance assistance to support troubleshooting

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 3 Page 1 of 1

Event Description: Failure of the Generator Hydrogen Cooler Temperature Controller in the AUTO mode

Time	Position	Applicant's Actions or Behavior
	BOP	Reports GENERATOR HYDROGEN TEMP HIGH alarm
		- Consults ARI-H13-P870-9 (D3)
		* Several other alarms may also occur
	SRO/RO	Acknowledges receipt of unexpected alarm
	RO	Monitors generator temperatures using ICS
	BOP	Diagnoses failure of the Generator Hydrogen Cooler Temperature
		Controller in the Auto Mode
		- Informs SRO
		- Places controller in the Manual mode and restores
		Generator hydrogen cooler temperature to normal
	SRO/RO	Requests I&C assistance in the Control Room to support
		troubleshooting

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 4 Page 1 of 2

Event Description: LPRM 08-17 (5C) failure upscale; bypass of LPRM 08-17(5C)

Time	Position	Applicant's Actions or Behavior
	RO	Reports LPRM UPSCALE alarm
		- Diagnoses upscale indication for LPRM 08-17 (5C)
		- Monitors reactor power to determine actual reactor power has not changed
		- Consults ARI-H13-P680-6 (C6)
	SRO/BOP	Acknowledges receipt of unexpected alarm
	SRO	Determines ONI-C51 entry is not required
	RO/BOP	Requests I&C assistance in the Control Room to support troubleshooting
	SRO	Directs BOP to go to back panel H13-P672 to determine LPRM 08-17 (5C) indication as confirmation for the alarm
	BOP	Reports that LPRM 08-17 (5C) indication is 125% (upscale)
	SRO	Determines LPRM 08-17 (5C) has failed
	SRO	References Tech Specs for a single, inoperable LPRM - LCO 3.3.1.1 (RPS) -PLCO
	SRO	Directs BOP to Bypass LPRM 08-17 (5C) per SOI-C51(APRM), Section 7.3

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 4 Page 2 of 2

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	BOP	Bypasses LPRM 08-17 (5C)
		- Determines LPRM is associated with APRM D
		- Determines (with SRO) if APRM D will be operable after the LPRM is bypassed
		- Notifies Reactor Engineering of intent to bypass the LPRM
		- Bypasses APRM D using Neutron Monitor Bypass-APRM joystick
		- Places LPRM 08-17 (5C) Card Mode Switch in BY position
		- Confirms white Bypass light is ON
		- Compares APRM Channel D indication with rated thermal power
		- Must be within + 2%
		Unbypasses APRM Channel D

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 5 Page 1 of 2

Event Description: Loss of FDW Heater 6A extraction steam due to malfunction of FDW Heater 6A level control valves

Time	Position	Applicant's Actions or Behavior
	BOP	Reports HTR 6A EXST & INLET DRNS ISOL LEVEL HIGH alarm
		- Consults ARI-H13-P870-5 (E1)
		- Verifies ARI automatic actions occurred
		* FDW Heater 6A level control valve malfunctions will automatically
		delete themselves when the high level alarm activates
	SRO/RO	Acknowledges receipt of unexpected alarm
	RO	Monitors reactor power due to decreasing fdw temperature
	SRO	Enters ONI-N36, Loss of Feedwater Heating due to loss of
		Extraction steam to FDW Heater 6A
		- Directs RO to reduce reactor power using recirc flow to ≤ the
		power level prior to the loss of fdw heating (68%)
		- Directs RO/BOP Supplemental Actions
		* ARI directs entry into ONI-N36; however, the SRO may initially
		enter ONI-C51 due to an unplanned change in reactor power or
		reactivity. ONI-C51 Supplemental Actions will direct the SRO to
		ONI-N36
	SRO/RO/BOP	Requests I&C assistance in the Control Room to support
		troubleshooting

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 5 Page 2 of 2

Event Description: _____

Time	Position	Applicant's Actions or Behavior
		* Recovery of extraction steam flow to FDW Heater 6A is not required prior to proceeding with Event #6
	SRO	Notifies OPS Management of ONI-N36 entry and reason for entry

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 6 Page 1 of 2

Event Description: Motor Feed Pump (MFP) high vibration; decrease reactor power using recirc flow from 68% to 63%; shutdown of MFP

Time	Position	Applicant's Actions or Behavior
		* There is no high vibration alarm for the MFP in the Control Room
	RO/BOP	Receives report from NLO about MFP high vibration and cracked seal water line with recommendation to shutdown the MFP
		- Informs SRO
	RO	Confirms MFP high vibration indication on H13-P680
	SRO	Determines MFP must be removed from service
		- Determines reactor power limit is 63% with one RFPT in service
	SRO/RO/BOP	Requests RSE and Mechanical Maintenance assistance to support troubleshooting
	SRO/RO/BOP	Hold reactivity brief
	SRO	Directs RO to decrease reactor power from 68% to 63% using recirc flow
		- Provides SRO oversight for power decrease
	RO/BOP	Notifies SCC, Chem and HP of intent to lower reactor power
	RO	Decreases reactor power from 68% to 63% using Recirc Loop Flow Controller
		- Maintains Recirc loop flows matched within 10%

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 6 Page 2 of 2

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO/RO/BOP	Hold reactivity brief
	SRO	Directs BOP to shutdown the MFP from Operating to Secured
		Status per SOI-N27, Section 6.3
		- Provides SRO oversight during fdw evolution
	RO	Monitors reactor power and reactor pressure during fdw evolution
	BOP	Shutsdown the MFP from operating to secured status
		- Verifies MFP FLOW CONTROL is in Manual
		- Verifies FEEDWATER RCIRC FLOW CONTROL MFP tapeset
		at 0%
		- Closes MFP FCVs
		- Verifies MFP RCIRC CONTROL VALVE opens
		- Places MFP control switch in OFF
		- Closes MFP RCIRC CONTROL VALVE
		- Closes MFP DISCHARGE VALVE
		- Directs NLO to close the MFP casing warmup valves
		- Closes MFP SUCTION VALVE, if directed by SRO

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 7 Page 1 of 2

Event Description: EHC leak at CIV #5; fast unload and trip of the Main Turbine due to EHC oil leak

Time	Position	Applicant's Actions or Behavior
	BOP	Reports EHC STBY PUMP START-HEADER PRESSURE LOW Alarm
		- Consults ARI-H13-P870-9 (G2)
		- Verifies standby EHC pump auto-started
	SRO/RO	Acknowledges receipt of unexpected alarm
	RO/BOP	Dispatches NLO to investigate EHC System
		* EHC SYSTEM RESERVOIR LEVEL HI/LO alarm will also occur as the EHC leak progresses
	SRO	Enters IOI-14, Fast Unload and Trip of Main Turbine due to EHC leak
	SRO	Directs RO/BOP actions per IOI-14
	RO/BOP	Executes IOI-14 actions per SRO direction
	SRO/RO/BOP	Notifies SCC, Chem and HP of intent to remove Main Generator from the grid
		* Crew will not be able to shutdown the Main Turbine per IOI-14 before it trips on low EHC pressure (1100 psig)

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 7 Page 2 of 2

Event Description: _____

Time	Position	Applicant's Actions or Behavior
		* When EHC reservoir level decreases to 67%, the EHC leak rate will increase and the Main Turbine will trip shortly thereafter
	SRO	Evaluates insertion of manual reactor scram before the Main Turbine trips
		* SRO may decide to manually scram the reactor if he decides that the crew will not be able to progress quickly enough to the Main Turbine per IOI-14
	SRO	Directs RO to arm and depress all RPS Manual Scram PBs
	RO	Arms and depresses all RPS Manual Scram PBs

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 8 Page 1 of 3

Event Description: Main Turbine trip and reactor scram; loss of RFPT B; execution of PEI-B13, RPV Control (Non-ATWS) due to low RPV level; HPCS injection valve auto open circuit failure

Time	Position	Applicant's Actions or Behavior
	SRO	Enters ONI-C71-1, Reactor Scram
		- Directs RO to observe reactor power decreasing
		- Directs RO to trip the Main Turbine when load is < 90 MWe
		* Main Turbine may have auto tripped on low EHC pressure
		- Directs RO to verify reactor pressure being maintained with the Bypass Valves
		- Directs RO to stabilize reactor water level near 200 inches
		* RFPT B shaft will break resulting in a loss of the Fdw System
	RO	- Places Reactor Mode Switch in SHUTDOWN
		- Reports reactor power is decreasing
		- Verifies all control rods are in
		- Confirms Main Turbine is tripped
		- Verifies reactor pressure is being maintained with the Bypass Valves
		- Attempts to stabilize reactor water level near 200 inches
	RO	Diagnoses inability of RFPT B to maintain reactor water level
		- Informs SRO
	RO/BOP	Informs SRO when RPV water level has reached Level 3 (178")

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 8 Page 2 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO	Enters PEI-B13, RPV Control (Non-ATWS)
	BOP	Monitors all other panels to confirm proper system operation and alarms
	SRO	Enters PEI-B13, RPV Control (Non-ATWS)
	SRO	Directs RO/BOP actions per PEI-B13, RPV Control (Non-ATWS) - Verifies reactor is scrammed - Confirms Reactor mode Switch in SHUTDOWN - Starts Hydrogen Analyzers - Inserts SRMs and IRMs
		RPV Level Control
		- Restores and maintains RPV level between 185 215 inches
		* Feedwater – already diagnosed as not available * CRD - available * RCIC – available * HPCS – injection valve fails to auto open
		* RPV level will decrease to RPV Level 2 (130") and RCIC and HPCS will automatically initiate

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 8 Page 3 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO	RPV Pressure Control
		- Confirms no SRVs are cycling
		- Stabilizes RPV pressure to less than 1000 psig using C85 Bypass valves
	BOP	Monitors the automatic start of the RCIC System
		- Informs SRO/RO that RCIC is injecting to the RPV
	BOP	Monitors the automatic start of the HPCS System
		- Informs SRO that HPCS is not injecting
	BOP	Diagnoses failure of HPCS injection valve to automatically open
		- Opens HPCS injection valve by taking control switch to OPEN
		- Informs SRO/RO that HPCS is injecting to the RPV
		* RCIC and HPCS will restore RPV level to 185 to 215"
	RO/BOP	Executes PEI-B13, RPV Control (Non-ATWS) actions per SRO direction
		* At this point, RPV bottom head drain pipe break will be inserted (Event #9)

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 9 Page 1 of 4

Event Description: RPV bottom head drain pipe break resulting in Drywell pressurization; execution of PEI-T23, Containment Control; LOCA in Containment due to SDV rupture; failure of Containment Spray valve (RHR Loop A); Degradation of RHR Pump B in Containment Spray mode

Time	Position	Applicant's Actions or Behavior
		* There will be numerous alarms and indications that will occur Indicating that a LOCA is occurring in the Drywell and Containment
	SRO/RO/BOP	Acknowledges receipt of unexpected alarms
	SRO/RO/BOP	Monitors Containment and Drywell parameters
	RO/BOP	Reports increasing Drywell temperature and pressure
		* Increase in Containment temperature and pressure will lag the Drywell parameters
	SRO	Enters PEI-T23, Containment Control when Drywell pressure > 1.68 psig or Drywell average temperature > 145 °F
	SRO	Directs RO/BOP actions per PEI-T23, Containment Control - Drywell Temperature Control - Operates all available DW cooling - Restores NCC to DW - Maintains DW average temperature less than 330 °F - Suppression Pool Temperature Control - Maintains both SP ave. temp. and RPV pressure below HCL

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 9 Page 2 of 4

Event Description: _____

Time	Position	Applicant's Actions or Behavior
		- Suppression Pool Level Control
		- Restores and maintains SP level between 17.8 and 18.5 ft
		- Containment Temperature Control
		- Operates all available Containment cooling
		- Restores CVCW
		- Maintains Containment average temperature < 185 °F
		- DW and Containment Pressure Control
		- Maintains Containment pressure below PSP
	RO/BOP	Execute PEI-T23 actions per SRO direction
	RO/BOP	Report increasing Containment temperature and pressure
		* SDV rupture will be modified as necessary to force the crew to Emergency Depressurize
	SRO	Continues to direct RO/BOP actions per PEI-T23
		- DW and Containment Pressure Control
		- Spray Containment when pressure is > 2.25 psig
	RO/BOP	Initiates Containment Spray Loop A

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 9 Page 3 of 4

Event Description: _____

Time	Position	Applicant's Actions or Behavior
		* Containment Spray Valve E12-F537A will not open due to a blown control power fuse; thereby rendering Containment Spray Loop A inoperable
		* Control power fuse will not be replaced before Emergency Depressurization is required
	RO/BOP	Diagnoses failure of E12-F537A to open - Informs SRO that valve lost position indication and did not open - Dispatches NLO to MCC compartment to check fuses
	SRO	Upon receiving report that E12-F537A has a blown control power fuse, directs RO/BOP to have fuse replaced
	RO/BOP	Initiates Containment Spray Loop B
		* RHR Pump B flow will degrade when Containment Spray Valve E12-F537B opens
		* Containment pressure will continue to increase towards PSP
	RO/BOP	Diagnoses degradation of RHR Pump B flow - Informs SRO that RHR Pump B cannot attain proper spray flow - Dispatches NLO to investigate RHR Pump B

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 9 Page 4 of 4

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO	Determines Containment pressure cannot be maintained below PSP and Emergency Depressurization is required
		* Containment pressure will not exceed 15 psig

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 10 Page 1 of 2

Event Description: Emergency Depressurization prior to exceeding PSP; failure of ADS valve to open

Time	Position	Applicant's Actions or Behavior
	SRO	Executes PEI-B13, RPV Control (Non-ATWS), RPV Level Control Leg concurrently with PEI-B13, Emergency Depressurization
	SRO	Exits PEI-B13, RPV Control (Non-ATWS), RPV Pressure Leg and enters PEI-B13, Emergency Depressurization
	SRO	Directs RO/BOP actions per PEI-B13, Emergency Depressurization - Confirms that the reactor is shutdown under all conditions without boron - Verifies Drywell pressure is > 1.68 psig - Verifies no low pressure ECCS are required for adequate core cooling - Prevents injection from LPCS and LPCI - Verifies eight or more SRVs are not open - Verifies Suppression Pool level is > 5.25 ft - Opens all ADS valves to rapidly depressurize the RPV
		* ADS SRV F041E will not open
		* Crew should continue to restore and maintain RPV level 185-215" using available injection systems during Emergency Depressurization
	RO/BOP	Executes PEI-B13, Emergency Depressurization actions per SRO direction

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 10 Page 2 of 2

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Diagnoses failure of ADS SRV F041E to open
		- Informs SRO
	SRO	Directs RO/BOP to open one additional SRV
	RO/BOP	Opens one additional SRV
		- Informs SRO
	SRO	Verifies five or more SRVs are open
		* Remainder of PEI-B13, Emergency Depressurization actions will
		not be discussed
		* Entry into PEI-M51/56, Hydrogen Control, should not be required
		assuming the crew can maintain RPV level above Level 1 (16.5")
		during Emergency Depressurization
		Scenario Termination Criteria
		1) RPV level maintained 185 to 215 inches
		2) Emergency Depressurization in progress

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 9 Page 1 of 1

Event Description: Critical Task #1

Time	Position	Applicant's Actions or Behavior
		Critical Task #1 – With Containment pressure exceeding 2.25 psig, and prior to exceeding the Pressure Suppression Pressure, initiate Containment Spray
		1. Safety Significance:
		- Precludes an unrequired Emergency Depressurization
		2. Cues:
		- Containment pressure increase
		- Procedural compliance
		3. Measured by:
		- Observation – With Containment pressure at least 2.25 psig, Containment Spray is manually initiated Prior to exceeding the Pressure Suppression
		4. Feedback:
		- Containment pressure indication (trend)
		- "Containment Spray Start Signal Received" alarm status

Op-Test No.: 2001-01 Scenario No.: 2a Event No.: 10 Page 1 of 1

Event Description: Critical Task #2

Time	Position	Applicant's Actions or Behavior
		Critical Task #2 – When Containment pressure cannot be maintained below the Pressure Suppression Pressure, initiate Emergency depressurization of the RPV prior to exceeding PSP
		1. Safety Significance:
		- Precludes degradation of a fission product barrier
		2. Cues:
		- Increasing Containment pressure
		- Procedural compliance
		3. Measured by:
		- Observation – At least 5 SRVs must be open prior to exceeding the Pressure Suppression Pressure
		4. Feedback:
		- RPV pressure decreasing
		- SRV status indications

Facility: Perry Scenario No.: 2c Op-Test No.: 2001-01

Examiners: _____ Operators: _____

_____ _____

_____ _____

Objectives: Evaluate the applicants' ability to: shift service water pumps; implement off-normal procedure for tornado or high winds due to verbal notification of a severe thunderstorm warning and a lightning strike on a 345 kV transmission line; implement off-normal procedure for an SRV inadvertent opening/stuck open due to a leaking SRV including reducing reactor power using recirc flow and placing an RHR loop in suppression pool cooling mode; implement off-normal procedure for high radiation levels within the plant due to a failure (upscale) of a plant underdrain process radiation monitor; implement off-normal procedure for a feedwater flow control malfunction due to a failure (downscale) of a steam flow process transmitter; implement off-normal procedure for a loss of AC power due to a loss of off-site power including a failure of the Division 2 DG to auto start; execute plant emergency instructions due to loss of high pressure injection systems; execute plant emergency instructions due to heatup of the suppression pool due to leaking SRVs; and execute plant emergency instructions that require emergency depressurization due to low RPV water level in order to restore adequate core cooling.

Initial Conditions: Plant is at 98% power. MOL pull sheets (Step 77). IOI-3, Section 4.6, Step 35. The HPCS System is tagged out for coupling alignment with 13 days remaining on the ALCO for TS 3.5.1. The Unit 1 Startup Transformer was removed from service per SOI-S11 at the end of last shift due to low oil level. There is a PLCO for TS 3.8.1 for the Unit 1 Startup Transformer. The In-Field Unit Supervisor is currently searching for the misplaced tagout for the Unit 1 Startup Transformer. New fuel inspections are being performed in the FHB in preparation for RF08.

Turnover: 1. Shift Service Water (start SW Pump C, then secure SW Pump A) in preparation for quarterly schedule work. 2. Hang the clearance for the Unit 1 Startup Transformer.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	Shift Service Water pumps
2	CB01: S610PYTIE MRF ED01 OUT MRF ED10 OUT	C (RO)	Generator breaker S610PYTIE trips open (loss of Eastlake line)
		C (BOP)	Switchyard breaker S612PYTIE trips open (loss of Eastlake line)
3	RV02: 1B21F0051A 5%	C (BOP)	SRV F051A leakage (TS 3.4.4 and 3.6.1.6)
		R (RO)	Decrease reactor power from 98% to 90% using recirc flow
	TH23A as is	I (RO)	Recirc FCV A servo failure (FCV does not move) (TS 3.4.1 and 3.4.2)
			Startup RHR in suppression pool cooling mode (TS 3.5.1)
4	PT01: 0D17N0933 100%	I (BOP)	Plant Underdrain process radiation monitor spike upscale
5	PT01: 1C34N0003A 0%	I (RO)	Steam flow transmitter failure downscale
		N (RO)	Transfer RFPT from the manual speed dial to Startup Rx Level Control

Facility: Perry Scenario No.: 2c Op-Test No.: 2001-01

6	TF01: 2S11S0002 RY01: 1R43RSDG2	M (All) C (BOP)	Loss of Off-Site Power due to loss of Unit 2 Startup Transformer (TS 3.8.1) Division 2 DG failure to start (TS 3.8.1)
7	BS02: 1E51N0655A BS02: 1E51N0655E	M (All) I (BOP)	Reactor scram with subsequent loss of all high pressure injection systems RCIC System isolation due to failure (upscale) of exhaust rupture diaphragm trip units
8	RV02: 1B21F0051C 100%	C (All)	SRV F051C leakage resulting in heatup of the suppression pool and loss of reactor coolant inventory
9		M (All)	Emergency depressurization when RPV water level cannot be maintained above –25 inches

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

Scenario 2c

Simulator Setup and Cues

1. Simulator Setup

   a. Initial Conditions

      1) Reset to IC97
      2) Set N21-F220 potentiometer to '0519', if required
      3) Place HPCS System in secured status. RF HP03 OUT RF HP08 OPEN Place red tag on the HPCS Pump and HPCS Injection Valve F004. Place HPCS Out of Service switch in Out of Service position
      4) Transfer Bus L10 to the Unit 2 Startup Transformer per SOI-R10 (13KV). RF ED17 OPEN (S180) Do not rack out L1001 or L1003
      5) Perform annunciator test
      6) Update IOI-3 to Section 4.6, Step 35
      7) Update MOL pull sheets to Step 77
      8) Execute Batch File 'LNC9901-2c' (see attached list)
      9) Restore Infotag file (ror infotags)
      10) Verify no Triggers went active

   b. Special Procedures

      1) None

2. Batch File 'LNC9901-2c'

a.	RY01:1R43RADG2	Active	Div 2 DG Start relay failure de-energized
b.	TH23A	Active	B33 FCV A failure as is (*use current value)
c.	CB01:S610PYTIE	E1	Gen breaker S610 breaker trip
d.	AN:1H13P6808A[7]	E1	Oscillograph P910 alarm – Override ON
e.	RV02:1B21F0051A	E2	SRV F051A leakage 5% severity
f.	PT01:0D17N0933	E3	Underdrain Manhole 20 West PRM detector failure 100% severity
g.	PT01:1C34N0003A	E4	Steam flow transmitter failure 0% severity 2 min ramp
h.	TF01:2S11S0002	E5	Loss of Unit 2 Startup Transformer
k.	BS02:1E51N0655A	E5	RCIC Turbine Exhaust Diaphragm Pressure trip unit failure 30 sec TD
i.	BS02:1E51N0655E	E5	RCIC Turbine Exhaust Diaphragm Pressure trip unit failure 45 sec TD
j.	ZL1E51DS12	E5	RCIC Gross Failure amber status light – Override ON 30 sec TD
k.	RV02:1B21F0051C	E5	SRV F051C leakage 100% severity 5 sec TD

Assign Triggers: 1. TRG E1 = mrf ED10 OUT
2. TRG E1 = mrf ED01 OUT
3. TRG E6 = dmf PT01:0D17N0933

3. Cues

a. Event 1

As PPO, report that bearing water flow is 4.5 gpm and is within limits of 4 +/- 1 gpm

b. Event 2

Insert Trigger E1 when directed after the following two verbal **reports have been made and the crew has entered ONI-ZZZ-1**

1. As SCC Dispatcher, inform the operators that the National Weather Service has issued a severe thunderstorm warning for Lake County

2. As Security, inform the operators that a squall line is approaching the plant from the northwest

As SCC Dispatcher, report that the S-8-PY-EL 345 kV line is out of service due to a lightning strike. You will inform Perry when the line is restored

If requested, inform the operator that cause of the Oscillograph P910 alarm is Point #6 PY Transmission Station Oscillograph Startup

c. Event 3

Insert Trigger E2 when directed

As Rx Engineer, report that thermal limits are within limits for the current power level

As B33 RSE, report that cause of the FCV A failure to move is unknown and will require troubleshooting

As B21 RSE, report that cause of SRV F051A leakage is unknown

d. Event 4

Insert Trigger E3 when directed

When operator is at panel H13-P906, then Trigger E6 to delete malfunction PT01:0D17N0933 to allow detector reading to return to normal

As I&C, report that the process radiation monitor detector appears to have spiked but is now reading normal

e. Event 5

Insert Trigger E4 when directed

As I&C/RSE, report that steam flow transmitter C34N003A has failed and the Master Level Controller should not be used until repairs are completed

f.	Event 6	**Insert Trigger E5 when directed after the following report has been made:** 1. As Security, report that a severe thunderstorm with high winds and lightning is passing through Painseville and is expected to arrive at the plant shortly As PPO, report that the Unit 2 Startup transformer took a lightning strike and has visible damage As PPO, report that the cause for Division 2 DG failure to start is unknown and that you require RSE support
g.	Event 7	**RCIC isolation will automatically occur when Trigger E5 has been inserted in Event 6 above** As I&C/RSE, report that reason for failure of RCIC turbine exhaust rupture diaphragm trip unit failure is unknown
h.	Event 8	**SRV F051C leakage will automatically occur when Trigger E5 has been inserted in Event 6 above**
i.	Event 9	None

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Event Description: Shift Service Water Pumps

Time	Position	Applicant's Actions or Behavior
	SRO	Directs BOP to Shift Service Water Pumps per SOI-P40/41,
		Section 5.1 by starting SW Pump C and securing SW Pump A
	RO	Monitors reactor power, reactor pressure and reactor water level
	BOP	Shifts Service Water Pumps
		- Stations NLO at SW Pumps
		- Takes SW PUMP C DISCH VLV control switch to OPEN. Pushes
		the STOP button when the blue light comes on
		- Takes SW PUMP C control switch to START
		- When SW PUMP C AMPS stabilize, takes SW PUMP C DISCH
		VLV control switch to OPEN
		- Takes SW PUMP A DISCH VLV control switch to CLOSE.
		Presses the STOP button when the blue light comes on
		- Takes SW PUMP A control switch to STOP
		- Takes SW PUMP A DISCH VLV control switch to CLOSE
		- Throttles NCC HX SW BYP VLV as necessary to maintain
		discharge pressure of all operating SW Pumps at 55-60 psig
		- Notifies Chem to place SW Chlorination System in Operation per
		SOI-P48

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Event Description: Entry into ONI-ZZZ-1; trip of Generator Brkr S-610-PY-TIE; and trip of Switchyard Brkr S-612-PY-TIE

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Receive report from SCC that the National Weather Service has
		issued a severe thunderstorm warning for Lake County
		- Informs SRO
	RO/BOP	Receives report from Security that a squall line is approaching the
		plant from the northwest
	SRO	Enters ONI-ZZZ-1 due to severe thunderstorm warning
		- Stops unnecessary activities such as fuel handling and transport
		of radioactive materials
		* Inspection and handling of new fuel is in progress in the FHB
		- Coordinates with RO/BOP to complete applicable Supplemental
		Actions
	SRO	Notifies OPS Management of ONI entry and reason for entry
	RO	Reports OSCILLOGRAPH alarm
		- Consults ARI-H13-P680-8 (B1)
	SRO/BOP	Acknowledges receipt of unexpected alarm
	RO	Diagnoses trip of Generator Brkr S-610-PY-TIE
		- Informs SRO

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Event Description: _____

Time	Position	Applicant's Actions or Behavior
		* Main Generator does not trip because Generator Brkr S-611-PY-TIE is still closed
	BOP	Diagnoses trip of Switchyard Brkr S-612-PY-TIE - Informs SRO
	SRO	Dispatches BOP to the Oscillograph Panel in the Unit 2 Control Room to investigate the alarm
	BOP	Reports Point #6, PY Transmission Station Oscillograph, is tripped
	RO/BOP	Notifies SCC of Oscillograph alarm
	SRO	Determines that the 345 kV Eastlake transmission line is lost

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Event Description: SRV F051A leakage; decrease reactor power from 98% to 90%; and Recirc FCV A failure (no movement)

Time	Position	Applicant's Actions or Behavior
	BOP	Reports SRV OPEN alarm
		- Consults ARI-H13-P601-19 (A7)
	SRO/RO	Acknowledges receipt of unexpected alarm
	RO	Monitors reactor power, reactor pressure and reactor water level
	BOP	Informs SRO/RO that SRV F051A is open
		* SRV solenoids are not energized. The SRV is leaking by causing
		the discharge tailpipe pressure switch to pick up (indicates
		the tailpipe pressure has exceeded 30 psig)
	SRO	Enters ONI-B21-1 due to an open/leaking SRV
		- Directs RO/BOP initiate evacuation of the Containment
		- Directs RO to reduce reactor power using recirc flow to ≤ 90%
		- Directs BOP to attempt to close the SRV by placing both of its
		control switches from AUTO to OFF
		- Directs BOP to de-energize the SRV solenoids by removing the
		applicable control power fuses
		- Coordinates with RO/BOP to complete applicable Supplemental
		Actions
	RO/BOP	Notifies SCC, Chem and HP of intent to lower reactor power

Op-Test No.: 2001-01 Scenario No.: 2c Event No.: 3 Page 2 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
		* This notification may occur after the power reduction is completed
	SRO	Provides SRO oversight for power decrease
	RO	Decreases reactor power from 98% to 90% using Recirc Loop Flow Control
		* Recirc FCV will not move, thereby causing a recirc flow mismatch
	RO	Informs SRO that Recirc FCV A will not move
	SRO	Directs RO to decrease reactor power to 90% using Recirc FCV B
	RO	Informs SRO that there is a >5% loop flow mismatch
	SRO	References Tech Specs for a single, inoperable Recirc loop due to A flow mismatch and also for a single, inoperable Recirc FCV - LCO 3.4.1 (Recirc Loops Operating) - Enters Condition A - LCO 3.4.2 (FCVs) - Enters Condition A
		*Reactor Engineering should be notified of the loop flow mismatch
		*Attempts to close the leaking SRV will be unsuccessful

Op-Test No.: 2001-01 Scenario No.: 2c Event No.: 3 Page 3 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	BOP	Attempts to close SRV by placing both control switches in OFF
		- Informs SRO/RO that SRV is still open
	BOP	Attempts to close SRV by removing its control power fuses
		- Informs SRO/RO that SRV is still open
		* The SRV becomes inoperable once the solenoid control power
		fuses are removed
	SRO	References Tech Specs for a single, inoperable LLS SRV (F051A)
		- LCO 3.4.4 (S/RVs) - PLCO
		- LCO 3.6.1.6 (LLS Valves)
		- Enters Condition A
	SRO/RO/BOP	Monitors Suppression Pool temperature heatup due to leaking SRV
	SRO	Evaluates SP temperature heatup trend
		* May direct the BOP to place an RHR Loop in SP Cooling mode
	SRO	Notifies OPS Management of ONI entry and reason for entry, also
		the various Tech Spec entries
	SRO/RO/BOP	Requests RSE and I&C assistance in the Control Room to support
		troubleshooting

Op-Test No.: 2001-01 Scenario No.: 2c Event No.: 4 Page 1 of 2

Event Description: Plant Underdrain Manhole #20 West Process Radiation Monitor Spike upscale

Time	Position	Applicant's Actions or Behavior
		* The PRM will spike upscale and then return to a normal reading
	RO	Reports COM AREA & PRCS MON P906 alarm
		- Consults ARI-H13-P680-8 (A4)
	SRO/BOP	Acknowledges receipt of unexpected alarm
	SRO	Directs BOP to back panel P906 to determine cause of alarm
	BOP	Informs SRO/RO that Plant Underdrain Manhole #20 West PRM indication spiked to cause a HIGH alarm; however, the indication appears to have returned to a normal reading
		* A HIGH alarm will cause all Plant Underdrain Pumps to trip off
	RO/BOP	Requests I&C assistance in the Control Room to support troubleshooting
	SRO	Enters ONI-D17 due to a HIGH alarm on Plant Underdrain Manhole #20 West PRM
		- Directs Chem and HP to initiate actions per RPI-0506
		- Coordinates with RO/BOP to complete applicable Supp Actions
		* It is not necessary to evacuate the affected area because the Plant Underdrain System is underground

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Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO	Notifies OPS Management of ONI-D17 entry and reason for entry
		* It is not necessary to wait for Chem results of Plant Underdrain samples and subsequent exit of ONI-D17 before proceeding to Event #5

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Event Description: Steam flow transmitter failure (downscale); transfer RFPT from Manual Speed Control Dial to the Startup Level Control

Time	Position	Applicant's Actions or Behavior
		The reactor will not scram on low RPV level during this Event
	RO	Reports FEED FLOW STEAM FLOW MISMATCH alarm
	RO	Reports RX LEVEL HI/LO L7/L4 alarm - Informs SRO that it is a L4 alarm and reactor water level is decreasing
	BOP	Consults ARI-H13-P680-3 (B7) and (A9) * RO will not have time to consult the ARIs since he will have to direct his attention to maintaining reactor water level
	SRO/BOP	Acknowledges receipt of unexpected alarms
	SRO	Enters ONI-C34 due to malfunction of fdw level control - Directs RO to transfer control of both RFPTs to the Manual Speed Control Dial and maintain reactor water level 192 to 200 inches - Directs RO to place RFP A & B FLOW CONTROL for both RFPTs to Manual - Coordinates with RO/BOP to complete applicable Supplemental Actions
	RO/BOP	Requests I&C assistance in the Control Room to support troubleshooting

Op-Test No.: 2001-01 Scenario No.: 2c Event No.: 5 Page 2 of 3

Event Description: _____

Time	Position	Applicant's Actions or Behavior
		* The Master Level Controller will not be available but the Startup Level Controller is operable
	SRO	Notifies OPS management of ONI-C34 entry and reason for entry
	SRO	Evaluates fdw level control options
	SRO	Directs RO to transfer RFPT A(B) from the Manual Speed Control Dial to the Startup Level Control per SOI-C34, Section 4.6 - Provides SRO oversight during fdw level control shift
		* One RFPT will be on the SULC and the other RFPT will be base loaded
	SRO	Directs BOP to monitor reactor power and reactor pressure during the fdw level control shift
	BOP	Monitors reactor power and reactor pressure
	RO	Transfers RFPT A(B) from the Manual Speed Control Dial to the Startup Level Control - Verifies RFPT A(B) is being controlled in manual by RFPT A(B) Manual Speed Control Dial - Verifies RFPT B(A) and MFP are shutdown or being operated under manual control

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Event Description: _____

Time	Position	Applicant's Actions or Behavior
	RO (Cont)	- Verifies SULC is in Manual
		- Verifies RFP A (B) FLOW CONTROL is in Manual
		- Verifies RFPT A(B) selected on STARTUP FDW PUMP SELECT
		- Uses the SULC Manual PBs to null RFP DEV METER A(B)
		- Places RFPT A(B) on SULC by taking RFPT A(B) GOV MODE CONTROL to Auto
		- Uses the SULC tapeset to null the controller deviation
		- Shifts SULC to Auto and adjusts the SULC tapeset to the desired water level
	SRO	Exits ONI-C34; notifies OPS Management of ONI exit

Op-Test No.: 2001-01 Scenario No.: 2c Event No.: 6 Page 1 of 2

Event Description: Loss of Off-Site Power due to loss of Unit 2 Startup Transformer

Time	Position	Applicant's Actions or Behavior
		* Unit 1 Startup Transformer is only removed from service. It has not been tagged out yet. It can be restored to service, if desired
	SRO/RO/BOP	Receives report from Security that a severe thunderstorm with high winds and lightning is expected to pass over the plant
	SRO/RO/BOP	Recognizes loss of off-site power
		* PEI-B13, RPV Control (Non-ATWS) will be discussed in Event #7
		* ONI-R10 and PEI-B13, RPV Control (Non-ATWS) will be executed concurrently
	SRO	Enters ONI-R10 due to loss of off-site power - Directs RO/BOP to evacuate the Containment - Directs BOP/RO to manually initiate RCIC - Directs BOP/RO to observe operation of all Diesel Generators
		* RCIC System malfunction is discussed in Event #7
	BOP/RO	Informs SRO that Division 1 and 3 DGs have started and closed onto their respective busses
		* Remember HPCS is not available (tagged out for maintenance)

Op-Test No.: 2001-01 Scenario No.: 2c Event No.: 6 Page 2 of 2

Event Description: _____

Time	Position	Applicant's Actions or Behavior
	BOP/RO	Recognizes failure of Div 2 DG to start
		- Informs SRO
		- Dispatches NLO to investigate failure of Div 2 DG to start
		* Div 2 DG will not be recovered
		* Due to loss of Bus XH12, the Gaitronics Five Channel and Plant
		PA are unavailable. Crew members must communicate with NLOs
		using the Plant Radios
	RO/BOP	Receives report that Unit 2 Startup Transformer was struck by
		lightning and has been damaged (will not be available)
		- Informs SRO
	SRO	Directs ONI-R10 Supplemental Actions for a Loss of Off-Site Power
		- Directs RO/BOP to perform Off-Site Power Restoration per
		Attachment 10, including restoration of the Unit 1 Startup
		Transformer
		* Div 2 DG restoration per ONI-R10, Attachment 9 may be pursued
		but it may not be a priority since Div 1 DG is operating and the
		crew is having reactor water level control problems
	RO/BOP	Performs Off-Site Power Restoration per ONI-R10, Attachment 10
	SRO	Notifies OPS Management of ONI-R10 entry when time permits

Op-Test No.: 2001-01 Scenario No.: 2c Event No.: 7 Page 1 of 4

Event Description: Reactor scram; RCIC System isolation due to instrument failure; execution of PEI-B13, RPV Control (Non-ATWS)

Time	Position	Applicant's Actions or Behavior
		* Reactor scram is due to loss of off-site power
		* It is not anticipated that the crew will enter ONI-C71-1 for a reactor scram before entering PEI-B13, RPV Control (Non-ATWS) due to the loss of off-site power
	RO	Informs SRO/BOP of reactor scram
	RO/BOP	Informs SRO of decreasing water level trend
		* Fdw System is not available due to loss of off-site power * HPCS is not available because it is tagged out
		* In Event #6, the BOP/RO was directed to initiate RCIC as part of the ONI-R10 Immediate Actions
	BOP/RO	Manually initiates RCIC
		* RCIC will isolate due to a rupture diaphragm failure
	BOP/RO	Reports RCIC ISOL DIAPHRAGM RUPTURED alarm - Consults ARI-H13-P601-21 (B1) - Verifies RCIC has automatically isolated - Informs SRO that RCIC has isolated and cannot inject to the RPV

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Event Description: _____

Time	Position	Applicant's Actions or Behavior
		* At this point the only high pressure injection system available is Division 1 CRDH which would have tripped off during the loss of off-site power
	RO/BOP	Inform SRO that RPV water level is less than Level 3 (177")
	SRO	Enters PEI-B13, RPV Control (Non-ATWS) due to RPV level < L3 - Verifies reactor is scrammed - Confirms Reactor Mode Switch is in SHUTDOWN - Starts Hydrogen Analyzer A (Analyzer B is unavailable) - Verifies the reactor is shutdown under all conditions without boron
		* SRMs and IRMs cannot be inserted due to the loss of off-site power
		- RPV Level Control - Determines RPV level cannot be restored and maintained between 185 and 215 inches
		* LPCS and LPCI A injection systems should not be used to restore RPV level until fill and vent can be verified due to the loss of off-site power

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Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO (Cont)	- Determines RPV level cannot be maintained greater than 0 inches
		* RPV level will reach Level 1 (16.5")
		- Executes PEI-M51/56, Hydrogen Control, due to RPV L1 - Inhibits ADS - Lines up alternate injection subsystems - Starts pumps in alternate injection subsystems that are lined up for injection
		* Crew is not expected to enter steam cooling.
		- When RPV level reaches 0 inches, confirms that any injection subsystem is lined up with the pump running - When RPV level decreases to –25 inches, PEI-B13, Emergency Depressurization is entered
		* PEI-B13, Emergency Depressurization is executed concurrently with PEI-B13, RPV Control (Non-ATWS)
		* PEI-B13, Emergency Depressurization is discussed in Event #9
		* RPV pressure may be slowly decreasing due to the two open SRVs (dependent on decay heat level)

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Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO (Cont)	- RPV Pressure Control
		- Verifies no SRVs are cycling
		- Attempts to stabilize pressure to less than 1000 psig
		* C85 Bypass Valves are not available due to loss of off-site power
		* Controlled depressurization of the RPV should not occur until an injection system(s) is available to maintain RPV level
		* RPV Pressure Control Leg will be exited when PEI-B13, Emergency Depressurization is entered
	RO/BOP	Executes PEI-B13, RPV Control (Non-ATWS) actions per SRO direction
	SRO	Enters PEI-M51/56, Hydrogen Control, concurrently with PEI-B13, RPV Control (Non-ATWS) when RPV level decreases to 16.5
	SRO	Directs RO/BOP actions per PEI-M51/56
		- Energizes Hydrogen Igniter A (Igniter B is unavailable)
	RO/BOP	Executes PEI-M51/56 actions per SRO direction

Op-Test No.: 2001-01 Scenario No.: 2c Event No.: 8 Page 1 of 3

Event Description: SRV F051C leakage resulting in a slow loss of reactor coolant inventory; execution of PEI-T23, Containment Control

Time	Position	Applicant's Actions or Behavior
		* SRV F051C will also fail open when the loss of off-site power occurs in order to cause RPV level to slowly decrease
	BOP/RO	Recognizes that SRV F051C is open - Informs SRO
		*Now have two SRVs open
		* Other priorities may dictate that ONI-B21-1 actions to close SRV F051C will not be performed
	SRO	Re-enters ONI-B21-1 due to a second open SRV (F051C) - Directs BOP/RO to attempt to close the SRV by placing both of its control switches from AUTO to OFF - Directs BOP/RO to de-energize the SRV solenoids by removing the applicable control power fuses
		* SRV solenoids are not energized; SRV is leaking by causing discharge tailpipe pressure to exceed 30 psig
		* Attempts to close SRV F051C will be unsuccessful
	BOP/RO	Attempts to close SRV F051C - Informs SRO that SRV will not close

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Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO/RO/BOP	Continues to monitor Suppression Pool temperature heatup rate due to two leaking SRVs
	SRO	Enters PEI-T23, Containment Control, when either Suppression Pool temperature exceeds 95 °F or Suppression Pool level exceeds 18.5 ft
		* Division 2 components are not available due to the loss of off-site power
		- Suppression Temperature Control - Operates all available Suppression Pool cooling - Maintains both Suppression Pool average temperature and RPV pressure below HCL
		* HCL will not be challenged during this scenario
		* Suppression Pool cooling may not be available because RHR Pump B tripped off during the loss of off-site power and RHR Loop A fill and vent needs to be verified
		- Suppression Pool Level Control - Restores and maintains Suppression Pool level between 17.8 and 18.5 ft

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Event Description: _____

Time	Position	Applicant's Actions or Behavior
	SRO (Cont)	- Drywell Temperature Control
		- Operates all available DW cooling
		- Restores NCC to DW
		- Maintains DW average temperature less than 330 °F
		- Drywell and Containment Pressure Control
		- Maintains Containment pressure below PSP
		- Containment Temperature Control
		- Operates all available Containment cooling
		- Restores CVCW System
		- Maintains Cont. average temperature less than 185 °F
	RO/BOP	Executes PEI-T23 actions per SRO direction

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Event Description: Execute PEI-B13, Emergency Depressurization when RPV level cannot be maintained greater than –25 inches; restore and maintain RPV level

Time	Position	Applicant's Actions or Behavior
	SRO/RO/BOP	Continues to monitor decreasing RPV water level trend
	RO/BOP	Continues to lineup alternate injection subsystems with the pump running
	SRO	Executes PEI-B13, RPV Control (Non-ATWS), RPV Level Control Leg, concurrently with PEI-B13, Emergency Depressurization
	SRO	Exits PEI-B13, RPV Control (Non-ATWS), RPV Pressure Control Leg, and enters PEI-B13, Emergency Depressurization
	SRO	Directs RO/BOP actions per PEI-B13, Emergency Depressurization - Confirms that the reactor is shutdown under all conditions without boron - Verifies Drywell pressure is < 1.68 psig - Verifies eight or more SRVs are not open - Verifies Suppression Pool level is > 5.25 ft - Opens all ADS valves to rapidly depressurize the RPV
		* There will be 8 ADS SRVs and the two leaking SRVs open
		- Confirms five or more SRVs are open
		* Remaining actions of PEI-B13, Emergency Depressurization will not be discussed

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Event Description: _____

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Executes PEI-B13, Emergency Depressurization actions per SRO direction
	SRO	Continues to execute PEI-B13, RPV Control (Non-ATWS), RPV Level Control Leg actions
		- Increases injection flow to the maximum
		- Uses all alternate injection subsystems
		* LPCS and LPCI A may be available at this point for injection
		- Restores and maintains RPV level greater than –25 inches
		- Restores and maintains RPV level between 185 and 215"
	RO/BOP	Executes PEI-B13, RPV Control, RPV Level Control Leg, actions per SRO direction
		Scenario Termination Criteria
		1) RPV water level being maintained 185 – 215 inches using available injection systems
		2) Off-Site power restoration in progress or completed

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Event Description: Critical Task #1

Time	Position	Applicant's Actions or Behavior
		Critical Task #1 – With RPV pressure below the shutoff head of the available low pressure system(s), operate available low pressure System(s) to restore RPV water level above T.A.F. (0 inches)
		1. Safety Significance: - Maintaining adequate core cooling 2. Cues: - Procedural compliance - Pressure below low pressure ECCS system shutoff head 3. Measured by: - Operator manually starts or initiates low pressure ECCS system(s) and injects into the RPV to restore RPV water level above 0 inches 4. Feedback: - RPV water level trend

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Event Description: Critical Task #2

Time	Position	Applicant's Actions or Behavior
		Critical Task #2 – With an injection system(s) operating and the reactor shutdown at pressure, when RPV water level drops to –25 inches (MSCRWL), initiate Emergency Depressurization before level reaches the MZIRWL (-42.5 inches)
		1. Safety Significance:
		- Maintain adequate core cooling, prevent degradation of fission product barrier
		2. Cues:
		- Procedural compliance
		- Reactor water level trend
		3. Measured by:
		- Observation – At least 5 SRVs must be open prior to RPV level decreasing to –42.5 inches on SPDS