

LaSalle County Station

DYNAMIC SIMULATOR SCENARIO GUIDE

ILT CLASS 02-01 NRC EXAM

ESG 1

Rev. 0

01/04/2003

DEVELOPED BY:

Facility Author

Date

APPROVED BY:

Facility Representative

Date

Scenario Outline

Facility: LaSalle Station

Scenario No.: ESG 1

Op Test No.: 1

Examiners: _____

Operators: _____

Initial Conditions:

- Unit 1 startup is in progress IAW LGP-1-1, step E.4.5, Heatup/Pressurization.
- TLO Temperature controller in manual.
- Online Safety level is green.
- Unit 2 is operating at 100% power.

Turnover:

- Control rods are being withdrawn to raise Rx power for mode change to OC1.
- 1A RHR system is running for surveillance, LOS-RH-Q1 and is ready to be secured.
- Turbine shell warming is in progress.

Event No.	Malf. No.	Event Type*		Event Description
1	N/A	R	RO SRO	Pull rods for reactor startup. LGP-1-1 in progress.
2	N/A	N	BOP SRO	Secure 1A RHR from surveillance LOS-RH-Q1.
3	CAEP	I	BOP SRO	1A RHR min flow valve 1E12-F064A fails to open.
4	MNI098	I	RO SRO	IRM C fails upscale. This results in half-scam on RPS bus A.
5	CAEP	C	RO SRO	Blown RPS fuse 1C71-F18C occurs during reset of half scram.
6	MCN002	C	BOP SRO	Lake Screen House Travelling Screen Trouble/CW Pump Trip.
7	MRD277 MRD278 MCF113	M	ALL	Manual Scram/ATWS/Hydraulic lock of Scram Discharge Volume. Loss of MDRFP
8	CAEP		BOP SRO	Small LOCA from 1B RR Pump seal failure.

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

Narrative Summary

Event(s)	Description
1.2.1	After the crew has taken the shift, the SRO should direct the RO to continue with control rod pulls to raise reactor power for mode change to OC1.
1.2.2, 3	The SRO should also direct the BOP to secure the 1A RHR system from its quarterly surveillance test. The BOP should shutdown the RHR loop in accordance with LOS-RH-Q1. While securing the RHR loop, the RHR minimum flow valve, 1E12-F064A, will fail to open because of a bad flow switch instrument. The operator will be able to open the valve manually, but the flow instrument must be considered inoperable and appropriate tech spec actions taken.
1.2.4, 5	Once the BOP operator has responded to the RHR min flow valve problem and the RO has withdrawn sufficient control rods to meet the reactivity change requirements, IRM C fails (inop trip). This results in a half-scam on RPS bus A. The crew should respond in accordance with the abnormal operating procedures and will have to bypass the failed IRM and reset the half scram. When the RO resets the half scram signal, RPS fuse 1C71-F18C will blow. The crew will follow the abnormal procedure, re-insert the half scram, replace the fuse, and reset the half scram. The SRO should refer to tech specs for required actions.
1.2.6	Once the crew has addressed the RPS problems, a Lake Screen House Travelling Screen Trouble alarm is received with a subsequent trip of a CW pump. The attempt to start an additional CW pump will be unsuccessful. The SRO should direct the RO to scram the reactor when he has determined vacuum will not be recovered.
1.2.7, 8	When the RO attempts to scram the reactor, he/she should recognize that all rods did not insert and report this to the SRO. The RO should also initiate the alternate rod insertion (ARI) system. The SRO should enter the emergency operating procedures for a failure to scram. The SRO should direct the RO to perform alternate rod insertion in accordance with LGA-NB-01. The SRO should direct the BOP to start suppression pool cooling in anticipation of a loss of the main condenser. The success path is to perform method 4 of LGA-NB-01 to insert the control rods. This step will allow drainage of the scram discharge volume to allow the rods to insert. Overall plant control will be further complicated by a small LOCA in the Drywell from a failed 1B RR Pump seal.

Critical Steps

1. Crew initiates a manual scram before reactor pressure reaches the auto scram setpoint (1038 psig).
2. With ATWS conditions, crew injects boron and/or performs alternate rod insertion in accordance with the emergency operating procedures to shutdown the reactor.
3. Crew initiates suppression chamber and drywell sprays as directed by the EOP's.

Shift Turnover Information

⇒ Day of week and shift

- ◆ Monday Day Shift

⇒ Weather conditions

- ◆ No adverse weather conditions expected in the next 24 hours

⇒ (Plant power levels)

- | | |
|---|-------------------------|
| ◆ Unit 1 – M/S in startup, on IRM ranges 8 & 9. | ◆ Unit 2 – 100% Power |
| ◆ 25 MWt | ◆ 3454 MWt |
| ◆ 0 MWe | ◆ 1149 MWe |
| ◆ 30 Mlbm/hr CORE FLOW | ◆ 107 Mlbm/hr CORE FLOW |

⇒ Thermal Limit Problems/Power Evolutions

- | | |
|--|--------|
| ◆ Unit 1 startup is in progress IAW LGP-1-1, (rev 69) step E.4.5, Heatup/Pressurization. | ◆ None |
| ◆ Control rods are being withdrawn to increase CTP for mode change to OC1. | ◆ |

⇒ Existing LCOs, date of next surveillance

- | | |
|--------|--------|
| ◆ None | ◆ None |
| ◆ | ◆ |

⇒ LOSs in progress or major maintenance

- | | |
|--|--------|
| ◆ 1A RHR has been running for greater than 30 minutes for LOS-RH-Q1 and is now ready to be shutdown. | ◆ None |
| ◆ TLO Temperature controller in manual. | ◆ |
| ◆ | ◆ |

⇒ Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment

- | | |
|---|--------|
| ◆ | ◆ None |
| ◆ | ◆ |

⇒ Comments, evolutions, problems, etc.

- | | |
|---|--|
| ◆ Online Safety is Green (RAW = 1.0) | ◆ Online Safety is Green (RAW = 1.0) |
| ◆ Unit 1 is in a Division 1 work week. | ◆ Unit 2 is in a Division 1 work week. |
| ◆ Turbine chest warming is in progress. Shell warming has been completed, but may have to be performed again. | |

Operator Actions

Event No.(s): 1.1		Page 1 of 1
Description: After the crew has taken the shift, the SRO should direct the RO to continue with control rod pulls to increase CTP for mode change to OC1.		
Initiation: Following shift turnover on the signal of lead examiner		
Cues: Directed by SRO		
Time	Position	Applicant's Actions or Behavior
	RO	<p>Per LGP-1-1</p> <ul style="list-style-type: none"> Continue to increase CTP with control rod withdrawal. Do NOT allow CTP to increase above 12% in Startup Mode. <ul style="list-style-type: none"> Monitor IRM and APRM recorders. Verify Main Turbine BPVs open as reactor power increases. <p>Per LOP-RM-01:</p> <ul style="list-style-type: none"> Verify Rod Select power available with rod position information correct on Four Rod Display. Verify withdraw block light de-energized when rod is selected. Press rod withdraw push-button, release and verify the following: <ul style="list-style-type: none"> Rod insert light is lit and a drive flow of ≈ 4 gpm is indicated. Rod withdraw light is lit and drive flow of ≈ 2 gpm is indicated. Rod position indication on Four Rod Display shows new rod position. Observe changes in nuclear instrumentation indications. Rod settle light is lit for ≈ 6 seconds.
	BOP	<ul style="list-style-type: none"> Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> Directs actions above. Enforces OPS expectations and standards Emphasizes need for caution and conservatism during the power change. Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. Ensures OPS activities are completed as scheduled.
Terminus: Clearly observable plant response from change in power level.		

NOTES:

Operator Actions

Event No.(s): 1.2, 1.3

Page 1 of 2

Description: The SRO directs the BOP to secure the 1A RHR pump which has been running for LOS-RH-Q1. An instrument failure will prevent the min flow valve, 1E12-F064A, from opening as the system flow decreases.

Initiation: Following shift turnover on the signal of lead examiner

Cues: Annunciator 1H13-P601-C405, does not clear as system flow is reduced

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Per LOS-RH-Q1, Att. 1A:</p> <ul style="list-style-type: none"> • VERIFY B RHR Pump motor has ran a minimum of 30 minutes. • CLOSE 1E12-F024A, B RHR Test to SP Vlv. • VERIFY 1E12-F064A, B RHR Min Flow Vlv OPENS as flow decreases. <ul style="list-style-type: none"> • Operator recognizes failure of 1E12-F064A to open. • Reports problem to SRO. • Opens 1E12-F064A with C/S and/or continues with pump shutdown. (Operator may re-open the Full Flow Test, 1E12-F024A, per LOR 1H13-P601-C304 to put A RHR in a stable condition.) • STOP A RHR Pump 1E12-C002A. • OPEN 1E12-F048A, A RHR HX Bypass Valve. • If corner room temperature is less than 104 °F, VERIFY B/C RHR Pump Cubicle Cooler Fan 1VY01C has stopped. • If no longer required, SHUTDOWN DG Cooling Water Pump at 1PM01J. • On Panel 1H13-P601, verify RHR PMP dsch press LO alarm (C405) is clear. • 1E12-F031A, A RHR Pump Dsch Check Valve, check to close is satisfactory. If NOT satisfactory, REFER to ER-AA-321 for applicable actions. • At RB 673 inside A RHR Corner Room, after the RHR pump motor has cooled to ambient temperature, VERIFY RHR pump motor bearing oil reservoir levels are proper.

NOTES:

[illegible]

Operator Actions

Event No.(s): 1.2, 1.3		Page 2 of 2
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Per LOR-1H13-P601-C304, RHR Pump 1A Injection Flow High:</p> <ul style="list-style-type: none"> • VERIFY automatic action has occurred. • VERIFY RHR Pump flow is maintained above 1000 gpm per appropriate operating procedure to insure adequate flow for cooling. • If alarm does not function as required: <ul style="list-style-type: none"> • VERIFY sensor is properly valved in. • INITIATE appropriate corrective action. • Instrument setpoint is specified in Technical Specification Section 3.3.5.1 • NOTIFY Unit Supervisor.
	RO	<ul style="list-style-type: none"> • Monitors reactor to ensure operations remain within established bands. • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> • Authorizes and directs completion of scheduled surveillance. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Refers to Tech Specs for failed instrument: • Acceptable tech spec actions should include: <ol style="list-style-type: none"> 1. Declare Flow instrument inoperable /7days to restore timeclock (T/S 3.3.5.1 R.A.D.4) 2. Declare 1B LPCI inoperable and enter 7 day timeclock (T/S 3.5.1 R.A.A.1). • Enforces OPS expectations and standards.

Terminus: 1A RHR system shutdown. Applicable timeclocks started

NOTES:

[illegible]

Operator Actions

Event No.(s): 1.4, 1.5

Page 1 of 2

Description: IRM C fails (inop trip) resulting in a half-scam on RPS bus A. The crew will have to bypass the failed IRM and reset the half scam. When the RO resets the half scam signal, RPS fuse 1C71-F18C will blow.

Initiation: After RHR failure has been addressed, on the signal of lead examiner.

Cues: Annunciator 1H13-P603-B304, applicable scram light out on 1H13-P603 benchboard

Time	Position	Applicant's Actions or Behavior
	RO	<p>Per LOR-1H13-P603-B304, Channel A IRM HI-HI/INOP:</p> <ul style="list-style-type: none"> • VERIFY RPS Channel A DEENERGIZES and Control Rod Block INITIATES. • If RPS Channel B is NOT TRIPPED VERIFY IRM Range Switch is in correct position. • If one IRM in Channel A has failed High or is Inop, BYPASS that IRM and INITIATE corrective action to restore operability. RESET RPS Channel A. • REFER to Tech Spec 3.3.1. • NOTIFY Unit Supervisor. <p>Per LOA-NR-101,</p> <ul style="list-style-type: none"> • Stop all control rod motion/power changes. • Check reactor in STARTUP on IRM range 3 or greater • Check at least - one Indication available. • Check recorders - working: <ul style="list-style-type: none"> • Digital indication. • Pens tracking. • Check IRM indications on 1H13-P603 and 1H13-P635/636 -NORMAL. • If IRM inop, BYPASS the IRM. <ul style="list-style-type: none"> • Refer to Tech Spec 3.3.1.1 and TRM 3.3.c. • Contact QNE.

NOTES:

[illegible]

Operator Actions

Event No.(s): 1.4, 1.5		Page 2 of 2
Time	Position	Applicant's Actions or Behavior
	RO	Per LOA-RP-101 <ul style="list-style-type: none"> • Check only one RPS Bus -affected and Control Rods NOT moving. • Suspend any half scram testing in progress. • Check more than one RPS BUS LIVE light out on a single Channel. If not: <ul style="list-style-type: none"> • Replace affected bulb. • If light remains de-energized, immediately insert a half scram on the affected RPS Bus. • Direct BOP to replace any bad fuses • Reset half scram. • Verify proper rod position via process computer.
	BOP	<ul style="list-style-type: none"> • Check if affected 1C71-F18 fuse is blown at panels 1H13-P609 and P611. <ul style="list-style-type: none"> ◦ Replace blown fuse (1C71-F18C). • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> • Directs actions above • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Refers to Tech Specs for failed instrument: • Acceptable tech spec actions should include: <ol style="list-style-type: none"> 1. Declare 1C IRM inoperable. No T/S action required - LCO met. • Enforces OPS expectations and standards

Terminus: "C" IRM bypassed, RPS fuse replaced, half scram reset

NOTES:


[illegible]

Operator Actions

Event No.(s): 1.6		Page 1 of 2
Description: A Lake Screen House alarm will occur and subsequent report of High Screen Differential Level will cause a CW Pump trip. Condenser vacuum will decrease to a point requiring a manual scram.		
Initiation: On the signal of lead examiner.		
Cues: Annunciator LOR-1PM03J-B509, LSH Travelling Screen Panel Trouble, LOR-1PM03J-B406, CW Pp. Trip, LOR-1PM03J-B511, Condenser Vacuum Low		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Per LOR-1PM03J-B509, LSH Travelling Screen Trouble and LOR-1PM03J-B406, CW Pp. Trip:</p> <ul style="list-style-type: none"> • Dispatch operator to Lake Screen House. • If alarm due to high diff. level and approaching 12 inches, refer to LOP-CW-03 for S/U of a Sdbdy Pp. or reduce power per LGP 3-1. • Refer to LOA-CW-101. <p>Per LOR-1PM03J-B511, Condenser Vacuum Low:</p> <ul style="list-style-type: none"> • Monitor Condenser Vacuum Indication. • Do not operate Main Turbine with sustained Condenser Vacuum less than: <ul style="list-style-type: none"> • 25" HG (5" Backpressure) with Reactor Power less than 75%. • 23.5" HG (6.5" Backpressure) with Reactor Power greater than 75%. • Verify SJAE are operating properly per LOP-OG-07, Startup of Off Gas System. • Verify Circulating Water System is operating properly per LOP-CW-03, Startup of Circulating Water System. • If Condenser Vacuum decreases to turbine trip point (21.6"), refer to LOA-TG-101, Unit 1 Turbine Generator. • Initiate appropriate corrective action as required.
	RO	<p>Per LOR-1PM03J-B511, Condenser Vacuum Low:</p> <ul style="list-style-type: none"> • If Condenser Vacuum continues to decrease, reduce Reactor Power per LGP-3-1, as necessary, to a point at which Condenser Vacuum has stabilized. If vacuum cannot be stabilized and Turbine Trip is imminent, manually Scram reactor per LGP-3-2, Reactor Scram. <ul style="list-style-type: none"> • With the turbine off line, RO should initiate a manual reactor scram prior to receiving an automatic scram on high Rx pressure or power. <p>Per LGP-3-2 Attachment E (hardcard):</p> <ul style="list-style-type: none"> • Arm and Depress scram pushbuttons • Place mode switch in Shutdown • Insert IRMs and SRMs • Check rods in and power decreasing <ul style="list-style-type: none"> • Inform SRO that rods have failed to insert. • Operate FW to control level in band directed by SRO • Report level and pressure trends • Verified RR downshifted to slow speed • Stabilize pressure <1020 psig

NOTES:

Operator Actions

Event No.(s): 1.6		Page 2 of 2
Time	Position	Applicant's Actions or Behavior
	SRO	<p>Specific:</p> <ul style="list-style-type: none"> • SRO should anticipate a loss of pressure control as condenser vacuum decreases and should prepare the crew for a manual scram. • SRO directs a manual reactor scram prior to an automatic scram on high Rx pressure or power. • Upon failed reactor scram, SRO should monitor for EOP entry conditions and direct the crew accordingly. <p>General:</p> <ul style="list-style-type: none"> • Directs actions described above. • On transient, positions himself as command authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications IAW OP-AA-106-101.
	<p>Terminus: Scram signal initiated.</p>	

NOTES:

[illegible]

Operator Actions

Event No.(s): 1.7, 1.8

Page 1 **of** 3

Description: A scram discharge volume hydraulic lock will cause an ATWS on a manual or automatic scram. Overall plant control will be further complicated by a small LOCA in the Drywell from a failed 1B RR Pump seal.

Initiation: Will occur automatically on a manual or automatic scram.

Cues: Numerous rods remain out after auto/manual scram, rising containment pressure, ECCS and PCIS initiations.

Time	Position	Applicant's Actions or Behavior
<div style="border: 1px solid black; padding: 2px; display: inline-block; transform: rotate(-90deg); transform-origin: left top;">Critical Task</div>	RO	<p>Per LGA-NB-01, Alternate Rod Insertion:</p> <ul style="list-style-type: none"> • Initiate ARI • Insert rods using normal means • Checks scram lights on and scram group lights off • Check that more that 25 rods failed to insert • Performs/Coordinates Method 4 Scram Reset/Full Scram <ul style="list-style-type: none"> • As necessary, coordinates Attachment 1B to defeat scram trip relays. • As necessary, resets/defeats ARI per Att. 1E. • Reset the scram • When the SDV High Level Scram signals clear, then initiate a scram by removing jumpers and depress scram PBs in at least one trip channel. • Reports MDRFP trip to US. • Reports to the Unit Supervisor when all control rods are FULL-IN <p>Performs additional EOP actions as directed by SRO</p> <ul style="list-style-type: none"> • Monitors RPV level and coordinates with BOP to control in band specified using RCIC and CRD systems • Monitors RPV pressure and coordinates with BOP to control with SRVs.
	BOP	<p>Performs EOP actions as directed by SRO</p> <ul style="list-style-type: none"> • Inhibits ADS and prevents ECCS injection • Starts 2 loops of suppression pool cooling • Startup RHR Service Water as follows: <ul style="list-style-type: none"> ◆ Start first RHR Service Water Pump. ◆ Open 1A/1B RHR Hx Service Water Outlet Valve. ◆ When flow reaches 3000 gpm, START second RHRWS Pump. • Start 1A/1B RHR Pump. • Establish RHR flow of 1500 to 7450 gpm. <ul style="list-style-type: none"> ◆ Throttle 1E12-F024A/B open. ◆ Throttle 1E12-F048A/B closed.

NOTES:

Operator Actions

Event No.(s): 1.7, 1.8		Page 2 of 3
Time	Position	Applicant's Actions or Behavior
	BOP Critical Task	<p>Performs EOP actions as directed by SRO</p> <ul style="list-style-type: none"> • Initiates Suppression Chamber Spray • Initiates DW Spray • Coordinates with RO to control pressure with SRVs
	SRO Critical Task	<p>Directs entry into EOPs and EOP actions as entry conditions are met.</p> <p>Per LGA-10 as directed from LGA-001:</p> <ul style="list-style-type: none"> • Per the Power Leg directs the following: <ul style="list-style-type: none"> • Initiate ARI, Start SBLC (SBLC start is optional) • Run RR-FCVs to minimum • Insert Rods per LGA-NB-01 • Per the Level Leg directs the following: <ul style="list-style-type: none"> • Hold level between -150 and +59.5 inches • If/When can't hold level > (-150) inches, enters LGA-006 <p>Per LGA-003:</p> <ul style="list-style-type: none"> • Per Primary Containment Pressure Leg, directs the following: <ul style="list-style-type: none"> • Spray the Suppression Chamber before pressure reaches 12 psig • When SC pressure is 12 psig, then <ul style="list-style-type: none"> ◆ VERIFY within the limits of the DSL ◆ TRIP all RR pumps ◆ SPRAY the Drywell (per LGA-RH-103) • Per Drywell Temperature Leg, directs the following: <ul style="list-style-type: none"> • If determined can't stay below 135 F in DW, then start all available drywell cooling (per LGA-VP-01) • Per Pool Temperature Leg, directs the following: <ul style="list-style-type: none"> • Start two loops of pool cooling • If determined can't stay below 105 F in Suppression Pool, then start all available pool cooling per (LGA-RH-103) • Pool Level Leg <ul style="list-style-type: none"> • Monitor Suppression Pool Level (-4.5 to +3.0 inches) • Hydrogen Leg <ul style="list-style-type: none"> • Start Hydrogen and Oxygen Monitors (per LGA-CM-01)

NOTES:

Operator Actions

Event No.(s): 1.7, 1.8

Page 3 of 3

Time	Position	Applicant's Actions or Behavior
	SRO	<p>General:</p> <ul style="list-style-type: none">• Directs actions described above.• On transient, positions himself as command authority on the unit.• Acknowledges immediate operator actions and directs subsequent actions.• Enforces OPS expectations and standards. <p>GSEP Event Classification (if performed):</p> <ul style="list-style-type: none">• GSEP - "Site Emergency" per EAL MS3

Terminus:

- All rods fully inserted (or proper actions in progress).
- RPV level stable and under control in required band.
- Containment sprays initiated and pressure decreasing.
- Upon approval of lead examiner.

NOTES:

REFERENCES

<u>Procedure</u>	<u>Title</u>	<u>Revision</u>
LGA-001	RPV Control	03
LGA-010	Failure to Scram	03
LGA-NB-01	Alternate Rod Insertion	06
LGA-RH-103	Unit 1 RHR operations in the LGAs	04
LGP-1-1	Normal Unit Startup	68
LGP-3-2	Reactor Scram	47
LOA-NR-101	Neutron Monitoring Trouble	06
LOA-RP-101	Unit 1 Loss of RPS Power	05
LOP-RH-05	Operation of RHR Service Water System	23
LOP-RH-13	Suppression Pool Cooling Operation	24
LOP-RM-01	Reactor Manual Control Operation	21
LOR-1H13-P603-B304	Channel A IRM HI-HI/INOP	02
LOR-1PM03J-B511	Condenser Low Vacuum	02
LOR-1PM03J-B509	Lake Screen House Travelling Screen Panel Trouble	00
LOR-1PM03J-B406	Circ. Water Pp. Auto Trip	03

Simulator Operator Instructions

Initial Setup

1. Recall **IC-18** (S/U in progress at 935 psig, ½ BPV, pulling rods for mode change to OC1).
2. Insert Step 31 rods. (7C – old rod list).
3. Secure 1D CD/CB pp.
4. Select 1C CD/CB pp. for STDBY.
5. Place “A” RHR in Full Flow Test (7450 gpm – no RHR WS on)for LOS-RH-Q1.
6. Verify computer point A800 (“A” RH flow) agrees with indication.
7. Isolate ES to 16 and 13 heaters (1ES006A,B and C. 1ES001A&B.)
8. Isolate RT blowdown flow.
9. Place simulator in RUN.
10. Verify RWM sequence loaded
11. Load and run the setup CAEP written for this scenario (**esg1r1.cae** on zip disc)

Event Triggers and Role Play

Event

1. Withdraw Rods To Raise Power for Mode Change to OC1
 - a. No triggers
2. Shutdown 1A RHR From LOS-RH-Q1
 - a. No triggers
3. 1E12-F064A Fails to Open Because of Bad Flow Switch
 - a. No triggers – Flow switch is failed on initial setup.
 - b. Failure is from setpoint drift. Can only be diagnosed by IMD cal or functional test.
 - c. As Field Supervisor or IM contacted to verify DPS 1E12-N010A/B, wait 5 minutes then report that switches were found to be valved in properly.
4. 1C IRM Fails (Inop Trip)
 - a. **Trigger 4** on request from lead evaluator.
 - b. IMD can diagnose failure from “module unplugged”.
5. RPS Fuse 1C71-F018C Blows When Half Scram Reset
 - a. **Trigger 5** automatic on reset of half scram.
 - b. Role play as required to support blown fuse 1C71-F18C (install fuse).
6. Lake Screen House Trouble/Loss of CW Pump
 - a. **Trigger 6** on request from lead evaluator
 - b. Role play as operators
 - (1) Perform actions as requested.
 - (2) If dispatched to LSH, inform RO that debris has built up on the screens for the “A” CW pp. and dp is approx. 12 inches.
 - (3) Status of “B” CW pp. – DP increasing, approx. 3 inches.
7. ATWS/Hydraulic Lock of SDV
 - a. No triggers – SDVs degraded on initial setup.
 - b. Role play for LGA-NB-01 as necessary.
 - c. Remove SDV malfunction before re-scram per method 4 is completed.
8. Loss of MDRFP/1B RR seal leak/MDRFP trip
 - a. **Triggers 8** 1 minute after reactor scram
 - b. Role Play – As requested for MDRFP trip.

LaSalle County Station

DYNAMIC SIMULATOR SCENARIO GUIDE

ILT CLASS 02-01 NRC EXAM

ESG 2

Rev. 0

01/05/2003

DEVELOPED BY:

Facility Author

Date

APPROVED BY:

Facility Representative

Date

Facility: LaSalle Station

Scenario No.: ESG 2

Op Test No.: 1

Examiners: _____

Operators: _____

Initial Conditions:

- Unit 1 startup is in progress IAW LGP-1-1.
- TLO Temperature controller in manual.
- 1A GC pump is OOS for alignment.
- 1B HD pump OOS for pump repair.
- HPCS is OOS to megger and inspect motor.
- Online Safety level is yellow.
- Unit 2 is operating at 100% power.

Turnover:

- Unit 1 is in a Division 3 work week.
- RR pump upshift IAW LOP-RR-05 is scheduled to be performed this shift.
- Ready to transfer HD Tank level control to pump forward.

Event No.	Malf. No.	Event Type*		Event Description
1	N/A	N	BOP SRO	Transfer HD Tank level control to pump forward.
2	N/A	R	RO SRO	Upshift RR pumps during startup.
3	CAEP	I	BOP SRO	HD Tank level controller fails.
4	MCF114	C	BOP SRO	1C HD Pump trips immediately after starting.
5	MRD080	C	RO SRO	Rod Drift.
6	MRC027	I	RO SRO	Reactor Recirc FCV drifts open.
7	MRC041	M	ALL	Reactor Recirculation line break.
8	MNB078		BOP SRO	1B/1C RHR fails to auto initiate.
9	CAEP		BOP SRO	The selected DW spray valve fails to open (breaker trips), the other loops valves will operate.

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

NARRATIVE SUMMARY

Event(s)	Description
2.1	Once the turnover is completed the SRO should direct the BOP operator to transfer heater drain tank level control to pump forward.
2.2	Once heater drains are on pump forward, the SRO should direct an upshift of the reactor recirc pumps to fast speed. The RO should perform the upshift IAW LOP-RR-05.
2.3, 4	After the RR pump upshift, the output signal for the HD Tank level controller will fail causing pump forward valves to close. The BOP operator will respond in accordance with the annunciator procedures and the abnormal procedure. He should attempt to start a standby HD pump. The first pump he starts will trip but the second pump will start and will help to reduce tank level. He may also take manual control of the controller to reopen the pump forward valves.
2.5	After heater drain system parameters have been stabilized, rod 30-4 will drift in. The RO will take actions IAW LOA-RD-101.
2.6	The major transient sequence will begin with a RR flow control valve spuriously ramping open. The crew should recognize the failure, immediately lockup the affected FCV and perform the actions of the abnormal operating procedure (LOA-RR-101). After these actions and some troubleshooting activities, the RR FCV problems lead to a RR system break in the drywell.
2.7, 8, 9	The break in the drywell will require actions in the RPV Level Control and Drywell Pressure control legs of the emergency operating procedures. After emergency operating procedure entry, additional failures will include a failure of 1B/1C RHR to auto start (can be started manually) and a failure of the drywell spray valves that are initially selected for use.

Critical Steps

4. The crew establishes drywell sprays prior to exceeding the limits of the PSP curve.
5. The crew establishes flow through the RHR Heat Exchanger within 30 minutes of exceeding 105°F in the suppression pool.

Shift Turnover Information

⇒ Day of week and shift

- ◆ Monday Day Shift

⇒ Weather conditions

- ◆ No adverse weather conditions expected in the next 24 hours

⇒ (Plant power levels)

- | | |
|------------------------------|-------------------------|
| ◆ Unit 1 - 30% Power/65% FCL | ◆ Unit 2 – 100% Power |
| ◆ 1000 MWt | ◆ 3454 MWt |
| ◆ 287 MWe | ◆ 1149 MWe |
| ◆ 36.7 Mlbm/hr CORE FLOW | ◆ 107 Mlbm/hr CORE FLOW |

⇒ Thermal Limit Problems/Power Evolutions

- | | |
|--|--------|
| ◆ Startup in progress. Ready to upshift RR pumps | ◆ None |
| ◆ Transfer HD tank level control to Pump Forward | ◆ |

⇒ Existing LCOs, date of next surveillance

- | | |
|-------------------------------|--------|
| ◆ T/S 3.5.1, 14 days for HPCS | ◆ None |
| ◆ | ◆ |

⇒ LOSs in progress or major maintenance

- | | |
|---|---|
| ◆ HPCS pump is OOS to megger and inspect motor. | ◆ |
| ◆ 1A GC pump is OOS for alignment. | ◆ |
| ◆ | ◆ |

⇒ Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment

- | | |
|--------|--------|
| ◆ None | ◆ None |
| ◆ | ◆ |

⇒ Comments, evolutions, problems, etc.

- | | |
|--|--|
| ◆ Online Safety is Yellow. | ◆ Online Safety is Green. |
| ◆ The Unit 1 is in a Division 3 work week. | ◆ The Unit 2 is in a Division 3 work week. |
| ◆ TLO Temperature controller in manual. | |

Operator Actions

Event No.(s): 2.2		Page 1 of 2
Description: Once the turnover is completed, the SRO should direct an upshift of the reactor recirc pumps to fast speed. The RO should perform the upshift IAW LOP-RR-05.		
Initiation: Following shift turnover.		
Cues: Directed by SRO		
Time	Position	Applicant's Actions or Behavior
	RO	<p>Per LOP-RR-05, Check the following:</p> <ul style="list-style-type: none"> • Both RR PPs. In slow speed and FCV's full open. • Reactor Power is between 25% and 35% with FCL < 66.7%. • Both 1B33-P611A and B, Flow Controller M/A Stations A and B in Manual. • Both RR Mptpr Breakers 4A and 4B are closed. • Feedwater flow >2.83 million pounds per hour (>20% of rated flow). Refer to the discussion in LOA-RR-101. • Differential temperature between RR Pp. Suction and Steam Dome is >10.1°F for the loop to be upshifted. • Reactor Level between high and low level alarm. • AT the 1DS001 Operator Station RRFCV Interlock Screen, BYPASS both A and B RR Interlocks as follows: <ul style="list-style-type: none"> • Select "Low Flow Bypass" for Loop A and then Press the "Activate button • Select "Low Flow Bypass" for Loop B and then Press the "Activate button • Select "Low Power Bypass" for Loop A and then Press the "Activate button • Select "Low Power Bypass" for Loop B and then Press the "Activate button • Depress Lower pushbutton on RR Loop A/B M/A Station for loop in which pp. speed will be changed until 1B33-F060A/B, FCV is at Min. (<20% indicated). • At the 1DS001 Operator Station Interlocks screen, Verify the following Interlocks are reset: <ul style="list-style-type: none"> • A RR Loop "Feedwater Flow Low". • B RR Loop "Feedwater Flow Low". • A RR Loop "Suction Delta Temp Low" • B RR Loop "Suction Delta Temp Low" • Verify Hi Speed Start Permissive indicating light 1B33-Ds02A/B is ON. • Initiate TADS datalogger to collect data. • PLACE selected Breaker RR Motor Bkr 3A/B Control Switch to START position and Release. • OBSERVE the following in the selected loop: <ul style="list-style-type: none"> ◦ 1A/B and 2A/B breakers OPEN. ◦ 3A/B breaker CLOSES after pump speed DECREASES to 350 RPM. ◦ Pump speed INCREASES to approximately 1750 RPM. ◦ Reactor level DROPS then RETURNS to level controller setpoint. ◦ Reactor Power initially INCREASES then STABILIZES.

NOTES:

Operator Actions

Event No.(s): 2.2		Page 2 of 2
Time	Position	Applicant's Actions or Behavior
	RO	<ul style="list-style-type: none"> • Second RR Pp. Transfer from slow to fast speed. • Perform actions as performed for first pp. Upshift.. • Verify Loop A flow approximately the same as B loop. • Observe Feedwater Flow from CR recorder at the 1H13-P603 panel to ensure FW flow is >20% of rated (>2.83 million pounds per hour). • At the 1DS001 Operator Station Interlocks screen, Verify the following Interlocks are reset: <ul style="list-style-type: none"> • A RR Loop "Feedwater Flow Low". • B RR Loop "Feedwater Flow Low". • A RR Loop "Suction Delta Temp Low" • B RR Loop "Suction Delta Temp Low" • AT the 1DS001 Operator Station RRFCV Interlock Screen Place both A and B RR Interlocks in NORMAL as follows: <ul style="list-style-type: none"> • Select "Low Flow Bypass" for Loop A and then Press the "Deactivate button • Select "Low Flow Bypass" for Loop B and then Press the "Deactivate button • Select "Low Power Bypass" for Loop A and then Press the "Deactivate button • Select "Low Power Bypass" for Loop B and then Press the "Deactivate button • Throttle 1(2)G33-F102, RWCU Suct Header Stop Valve until flow indicator 1(2)G33-R610 indicates >25 gpm. • CONTROL Reactor Recirc Flow using Reactor Recirc Loop Flow Controller M/A Station(s) per LOP-RR-07. • Increase Reactor Power per LGP 1-1, Normal Unit Startup.
	BOP	<ul style="list-style-type: none"> • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> • Directs actions above. • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Ensures OPS activities are completed as scheduled.
Terminus: Both RR pumps in fast speed		

NOTES:

Operator Actions

Event No.(s): 2.3, 2.4		Page 2 of 2
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Per LOP-HD-02, for Heater Drn Pmp Forward Controller in Manual Mode</p> <ul style="list-style-type: none"> TRANSFER to Manual by DEPRESSING the Man Push-button on 1(2)HK-HD066. DEPRESS the Output Increase (up arrow) Push-button to increase flow (lower tank level). DEPRESS the Output Decrease (down arrow) Push-button to decrease flow (raise tank level). <p>Per LOR-1PM03J-B504:</p> <ul style="list-style-type: none"> DETERMINE which Heater Drain Pump TRIPPED. START Standby Heater Drain Pump. SEE LOA-HD-101, Heater Drain System Trouble INITIATE action to determine why pump(s) tripped and INITIATE Action Request if applicable.
	RO	<ul style="list-style-type: none"> Monitors reactor to ensure operations remain within established bands Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> On transient, positions himself as command authority on the unit. Directs actions above. Acknowledges immediate operator actions and directs subsequent actions. Enforces OPS expectations and standards. Contacts Shift Manager and recommends notifications IAW OP-AA-101-501.
Terminus: Plant conditions stable and HD tank level under control		

NOTES:

[illegible]

Operator Actions

Event No.(s): 2.6		Page 1 of 1	
Description: 1A RR flow control valve spuriously drifts open.			
Initiation: After addressing rod 30-43 drift, on the signal of lead examiner.			
Cues: Increasing power, core flow, MWe, w/o operator action/control			
Time	Position	Applicant's Actions or Behavior	
	RO	<p>When RO/BOP recognize drifting FCV:</p> <ul style="list-style-type: none"> • Immediately lockup the drifting FCV from the 1H13-P602 panel • Inform the SRO • Refer to LOA-RR-101 <p>Per LOA-RR-101, for Recirculation FCV Failing Open:</p> <ul style="list-style-type: none"> • If FCV position is not stable, Lock up FCV by pressing 1A/1B HPU TRIP pushbuttons. • Check core flow and loop flows - less than T.S. mismatch. <ul style="list-style-type: none"> ◦ Within 5.425Mlbm/hr as read from 1B21-R611A/B if core flow is greater than or equal to 75.95 Mlbm/hr. ◦ Within 10.85 Mlbm/hr as read from 1B21-R611 A/B if core flow is less than 75.95 Mlbm/hr. • Check instrumentation for signs of fuel damage. • Notify QNE to evaluate core performance. • Go to Subsection B.10, Loop flow mismatch, if pp. Flows not within T.S. limits. 	
	BOP	<ul style="list-style-type: none"> • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. 	
	SRO	<ul style="list-style-type: none"> • On transient, positions himself as command authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. <ul style="list-style-type: none"> ◦ If RR loop flows exceed T.S. limits, enters 2 hour timeclock per 3.4.1R.A.F-1. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications IAW OP-AA-106-101. 	
Terminus: Drifting RR FCV locked up, SRO has addressed loop flow mismatch T.S.			

NOTES:

Operator Actions

Event No.(s): 2.7, 2.8, 2.9

Page 1 of 4

Description: RR Line break occurs in the drywell. Additional failures will include a failure of 1B/1C RHR to auto start (can be started manually) and a failure of the drywell spray valves that are initially selected for use.

Initiation: After conditions stable following RR FCV drift, on the signal of lead examiner

Cues: Multiple annunciators for High DW pressure and Low RPV level

Time	Position	Applicant's Actions or Behavior
	RO	<p>When RO/BOP recognize indications of LOCA:</p> <p>Per LGP-3-2 Attachment E (hardcard):</p> <ul style="list-style-type: none"> • Arm and Depress scram pushbuttons • Place mode switch in Shutdown • Insert IRMs and SRMs • Check rods in and power decreasing • Inform Unit Supervisor rods are in • Operate FW to control level 32" to 45" or as specified by US. • Report level and pressure trends • Verified RR downshifted to slow speed • Verify turbine and generator are tripped • Stabilize pressure <1020 psig <p>Performs additional EOP actions as directed by SRO</p> <ul style="list-style-type: none"> • Coordinates with BOP to maintain/restore RPV level in band specified using preferred injection systems • Monitors RPV parameters <ul style="list-style-type: none"> ◦ Report lowering RPV level (value, rate, trend) ◦ Report indications of RR line break

NOTES:

[illegible]

Operator Actions

Event No.(s): 2.7, 2.8, 2.9		Page 2 of 4
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Makes plant announcement for reactor scram</p> <p>Verifies needed auto actions (PCIS, ECCS)</p> <ul style="list-style-type: none"> Report failure of 1B/1C RHR to initiate on LOCA condition Manually starts and aligns 1B/1C RHR. <p>Performs additional EOP actions as directed by SRO</p> <ul style="list-style-type: none"> Starts 2 loops of suppression pool cooling <ul style="list-style-type: none"> Startup RHR Service Water as follows: <ul style="list-style-type: none"> Start first RHR Service Water Pump. Open 1A/1B RHR Hx Service Water Outlet Valve. When indicated flow reaches 3000 gpm, START second RHR Service Water Pump. Start 1A/1B RHR Pump. Establish RHR flow of 1500 to 7450 gpm. <ul style="list-style-type: none"> Throttle 1E12-F024A/B open. Throttle 1E12-F048A/B closed. Initiates Suppression Chamber Spray Initiates DW Spray Coordinates with RO to maintain/restore RPV level in band specified using preferred injection systems Restarts VR IAW LGA-VR-01 (as time permits)

NOTES:

[illegible]

Operator Actions

Event No.(s): 2.7, 2.8, 2.9		Page 4 of 4
Time	Position	Applicant's Actions or Behavior
	SRO	<p>Directs entry into EOPs and EOP actions as entry conditions are met.</p> <p>Per LGA-04 directs the following (if RPV blowdown required)</p> <ul style="list-style-type: none"> • Verify SP level >-18 feet • Initiate ADS • Verify 7 SRVs open • Wait until Shutdown Cooling interlocks clear <p>General:</p> <ul style="list-style-type: none"> • On transient, positions himself as command authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications IAW OP-AA-106-101.
<p>Terminus:</p> <ul style="list-style-type: none"> • RPV level stable and under control above TAF and in required band • DW Spray initiated and DW pressure lowering • Upon approval of lead examiner 		

NOTES:

[illegible]

REFERENCES

Procedure	<u>Title</u>	<u>Revision</u>
LGA-001	RPV Control	04
LGA-002	Secondary Containment Control	01
LGA-003	Primary Containment Control	04
LGA-CM-01	Emergency Operation of Post LOCA H2/O2 Monitors	06
LGA-RH-103	Unit 1 RHR operations in the LGAs	04
LGA-VR-01	Primary Containment Temperature Reduction	08
LGP-1-1	Normal Unit Startup	68
LGP-3-2	Reactor Scram	47
LOA-RD-101	Control Rod Drive Abnormal	06
LOA-HD-101	Heater Drain System Trouble	07
LOA-RR-101	Unit 1 RR System Abnormal	11
LOP-HD-02	Normal Startup and Operation of the HD System	29
LOP-RM-01	Reactor Manual Control Operation	21
LOP-RR-05	Changing RR Pump Speed From Slow to Fast	32
LOP-RR-07	Operation of RR Flow Control System	25
LOR 1H13-P603-A504	CRD Drift	03
LOR-1PM03J-B503	Heater Drain Tank Level Hi/Lo	01
LOR-1PM03J-B504	Heater Drain Pump Auto Trip	00

Simulator Operator Instructions

Initial Setup

1. Recall IC- 25 (Ready to upshift RR pumps)
2. Place simulator in RUN.
3. Load and run the setup CAEP written for this scenario (**esg2r1**.cae on floppy disc)
4. Latch 16 heaters.
5. Hang OOS cards for HPCS
6. Start 1B GC Pump. Hang OOS on 1A GC Pump. Clear GC local panel alarm.
7. Hang OOS on 1B HD Pump.
8. Write T/S 3.5.1, 14 days, for HPCS being OOS
9. Verify ESF light for HPCS on.
10. Verify ESF light for Div II off.

Event Triggers and Role Play

Event

9. Upshift RR Pumps
 - a. No triggers
 - b. Role play for EO actions in RB
10. Transfer HD Tank Level Control To Pump Forward
 - a. No triggers
 - b. Role play for operator actions at HD racks
11. HD Tank Level Controller Fails Causing Level To Rise
 - a. **Trigger 3** on request from lead evaluator
 - b. Role play for operator actions at HD racks
12. First Standby HD Pump Started Will Trip
 - a. **Trigger 4** is automatic on start of HD pump
 - b. Role play as operators at breaker and pump.
 - (1) No visible signs of damage.
13. Rod 30-43 drift
 - a. **Trigger 5** to insert drift for 30-43.
 - b. Role play as rounds operator.
14. RR FCV Drifts Open
 - a. **Trigger 6** on request from lead evaluator
 - b. Role play as necessary
15. RR Line Break In DW
 - a. **Trigger 7** on request from lead evaluator
 - b. Role play as necessary
16. 1B RHR fails to auto initiate
 - a. No triggers. Signal is defeated on initial setup.
 - b. If dispatched to EHC skid, report loss of fluid but don't know where (leak is in HB).
17. First Selected DW Spray Valves Will Fail To Operate
 - a. **Trigger 9** is automatic on operation of DW spray valves.
 - b. Role play at valves and breakers as requested. Failed valve(s) cannot be operated.

LaSalle County Station

DYNAMIC SIMULATOR SCENARIO GUIDE

ILT CLASS 02-01 NRC EXAM

ESG 3

Rev. 0

1/07/2003

DEVELOPED BY:

Facility Author

Date

APPROVED BY:

Facility Representative

Date

Facility: LaSalle Station

Scenario No.: ESG 3

Op Test No.: 1

Examiners: _____

Operators: _____

Initial Conditions:

- Unit 1 is operating at 85% reactor power with flow control line at 107%.
- TLO Temperature controller in manual..
- 1C RHR Pump is OOS for breaker repair.
- 1B IN Compressor is OOS for lube oil change.
- Online Safety level is green.
- Unit 2 is operating at 100% power.

Turnover:

- Unit 1 is in a Division 2 work week.
- LOS-RP-W1 is scheduled to be performed this shift.
- A power ascension for load following is also scheduled for this shift.

Event No.	Malf. No.	Event Type*		Event Description
1	N/A	R	RO SRO	Power ascension to 100% power at 300 MWE/hour.
2	N/A	N	BOP SRO	Complete LOS-RP-W1, Manual Scram Instrumentation.
3	R0563P	I	BOP SRO	RCIC Drain Pot Alarm.
4	MAI003	C	BOP SRO	Trip of the running Instrument Nitrogen (IN) compressor.
5	CAEP	C	RO SRO	Trip of running TDRFP seal injection pump with failure of standby pump auto start.
6	MCF072	I	RO SRO	Output signal from the TDRFP A flow transmitter fails .
7	MCA005	M	ALL	Broken Division 1 containment monitoring instrument line.
8	MNB104		ALL	Major steam leak propagates inside the primary containment.

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

NARRATIVE SUMMARY

Event(s)	Description
3.1	Once the crew has accepted the unit, the SRO should direct the RO to commence the power ascension to 100% power at 300 MWE/hour in accordance with LGP 3-1 and LOP-RR-07.
3.2	The SRO should also direct the BOP to complete LOS-RP-W1.
3.3	After LOS-RP-W1 is performed, the RCIC drain pot alarm will annunciate. The RO should take the required actions per LOR 1H13-P601-D502 and isolate the 1E51-F360 after two minutes.
3.4	When the crew has addressed the RCIC problem, a trip of the running Instrument Nitrogen (IN) compressor will occur. The BOP should acknowledge/announce the control room alarms and refer to the applicable alarm and abnormal procedures. The BOP should cross-tie IN with the Instrument Air (IA) system. An operator should be dispatched locally to investigate and restore IN.
3.5	After the IN system has been restored, the operating TDRFP seal injection pump will trip and the standby pump will fail to auto start. The crew will be able to start the standby pump manually.
3.6	Once the crew has restored seal injection, the A TDRFP flow transmitter will fail, causing the A TDRFP min flow valve to open. The RO should verify the A TDRFP min flow M/A station is in manual and position the feed pump min flow as required for plant conditions.
3.7	A malfunction was initially inserted to simulate a broken containment monitoring instrument line. This break will have the following effects: - Fail Division 1 drywell pressure indication - Fail Division 1 ECCS and EDG automatic initiation - Prevent remote operation of Division 1 drywell spray The diagnosis of the exact cause of these failures is not the immediate concern while performing the actions of the symptom-based LGAs. More important is that the operators recognize the impact of these failures in performing the EOPs (e.g., using redundant instrumentation, manually initiating affected systems if needed).
3.8	Once the reactor is manually scrammed or reactor water level is stabilized, a major steam leak propagates inside the primary containment which requires entry into the LGAs. Actions will include initiating suppression chamber sprays and drywell sprays. As previously mentioned, the operators will need to recognize the impact of the containment line instrument break and take appropriate compensatory actions.

Critical Steps

6. Crew recognizes failure of Division 1 ECCS to initiate and take action to manually initiate Division 1 logic and systems as required.
7. Crew initiates Drywell Sprays before drywell pressure exceeds the limits of the Pressure Suppression Pressure curve in the emergency operating procedures.

Shift Turnover Information

⇒ Day of week and shift

- ◆ Monday Day Shift

⇒ Weather conditions

- ◆ No adverse weather conditions expected in the next 24 hours

⇒ (Plant power levels)

- | | |
|-------------------------------|-------------------------|
| ◆ Unit 1 - 85% Power/101% FCL | ◆ Unit 2 – 100% Power |
| ◆ 3001 MWt | ◆ 3489 MWt |
| ◆ 964 MWe | ◆ 1149 MWe |
| ◆ 73 Mlbm/hr CORE FLOW | ◆ 107 Mlbm/hr CORE FLOW |

⇒ Thermal Limit Problems/Power Evolutions

- | | |
|---|-----------------------|
| ◆ Power ascension for load following is scheduled this shift (300 MWe/hr) | ◆ None |
| ◆ | ◆ Unit 2 – 100% Power |

⇒ Existing LCOs, date of next surveillance

- | | |
|--------------------------------|--------|
| ◆ T/S 3.5.1, 7 days for 1C RHR | ◆ None |
| ◆ | ◆ |

⇒ LOSs in progress or major maintenance

- | | |
|--|--------|
| ◆ LOS-RP-W1 needs completed following thermography on scram solenoids. | ◆ None |
| ◆ 1C RHR Pump OOS for breaker repair. | ◆ |
| ◆ 1B IN Compressor is OOS for lube oil change. | ◆ |

⇒ Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment

- | | |
|--------|--------|
| ◆ None | ◆ None |
| ◆ | ◆ |

⇒ Comments, evolutions, problems, etc.

- | | |
|--|--------------------------------------|
| ◆ Online Safety is Green (RAW = 1.0) | ◆ Online Safety is Green (RAW = 1.0) |
| ◆ The Unit 1 is in a Division 2 work week. | ◆ The Unit 2 is in a RCIC work week. |
| ◆ TLO Temperature controller in manual. | |

Operator Actions

Event No.(s):	3.1	Page	1	of	1
Description: After the crew has taken the shift, the SRO should direct the RO to continue to raise reactor power to 100% at 300 MWe/hr.					
Initiation: Following shift turnover on the signal of lead examiner					
Cues: Directed by SRO					
Time	Position	Applicant's Actions or Behavior			
	RO	<p>Per LGP-3-1:</p> <ul style="list-style-type: none"> Place additional condensate polishers into service as necessary, per LOP-CP-02. Increase power at the rate recommended by a QNE, or applicable Attachment from LGP-3-1, or computer generated equivalent. Recirculation flow changes shall be made per LOP-RR-07. <p>Per LOP-RR-07:</p> <ul style="list-style-type: none"> Verify AUTO light on recirculation loop flow controller M/A station A/B is ON. To adjust A and B Recirculation Loop Flow Controller Setpoint, DEPRESS the Ganged Flow Setpoint Station RAISE/LOWER pushbutton(s) as required. 			
	BOP	<ul style="list-style-type: none"> Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. 			
	SRO	<ul style="list-style-type: none"> Directs actions above. Enforces OPS expectations and standards Ensures RO monitors critical parameters carefully. Stresses awareness of where operation is on the power to flow map. Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. Ensures OPS activities are completed as scheduled. 			
Terminus: Clearly observable plant response from change in power level.					

NOTES:

[illegible]

Operator Actions

Event No.(s): 3.2

Page 1 **of** 1

Description: The SRO should also direct the BOP to complete LOS-RP-W1.

Initiation: Following shift turnover on the signal of lead examiner

Cues: Directed by SRO

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Per LOS-RP-W1:</p> <ul style="list-style-type: none"> • Verify relays 1C71A-K15A/B/C/D energized. • Alarms 1H13-P603-B510/B504/B203/B303/B211/B311 cleared. • Run OD-7 and check rod positions. • TRIP SYSTEM A1 <ul style="list-style-type: none"> • Arm Reactor Manual Scram Pushbutton for system A1 and VERIFY the CHAN A MANUAL SCRAM SWITCH ARMED alarm illuminates. • Momentarily Press the Reactor Manual Scram Pushbutton for Trip System A1 and CHECK the following: <ul style="list-style-type: none"> • CHAN A1 REACTOR AUTO SCRAM alarm illuminates. • SCRAM GROUP A solenoid lights de-energize. • RESET the tripped channel and CHECK the following: <ul style="list-style-type: none"> • SCRAM GROUP A solenoid lights re-energize. • CHAN A1 REACTOR AUTO SCRAM alarm can be reset • Disarm the Reactor Manual Scram Pushbutton for trip system A1 and VERIFY the alarm for CHAN A MANUAL SCRAM SWITCH ARMED alarm can be reset. • TRIP SYSTEM A2, B1 and B2 <ul style="list-style-type: none"> • Perform actions as performed for trip system A1 for appropriate trip system. • RUN OD-7 and check rod positions.
	RO	<ul style="list-style-type: none"> • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> • Directs actions above. • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Ensures OPS activities are completed as scheduled.

Terminus: LOS-RP-W1 complete,

NOTES:

Operator Actions

Event No.(s): 3.3

Page 1 of 2

Description: After LOS-RP-W1 has been performed, the RCIC Drain Pot alarm will annunciate.

Initiation: After LOS-RP-W1 is complete, on the signal of lead examiner.

Cues: Annunciator LOR-1H13-P601-D502, RCIC Drain Pot Level High

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Per LOR-1H13-P601-D502:</p> <ul style="list-style-type: none"> • VERIFY automatic actions (OPENS AO 1E51-F054, RCIC Turbine Inlet Steam Line Water Drain Pot Trap Bypass) occurs. • VERIFY AO 1E51-F025 and AO 1E51-F026 open, and MO 1E51-F045 closed. • If RCIC is in standby, and the alarm does NOT clear and the 1E51-F054 does NOT close within two minutes, CLOSE 1E51-F360 and declare RCIC INOP. • Dispatch operator locally. • Enters information in Unit Log.
	RO	<ul style="list-style-type: none"> • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> • Directs actions above. • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Declares RCIC INOP and enters T.S. 3.5.3 R.A. A.1 and A.2. Verify HPCS operable and restore RCIC in 14 days.

Terminus: SRO has declared RCIC inop and entered appropriate timeclocks.

NOTES:

[illegible]

Operator Actions

Event No.(s):	3.4	Page	1	of	2
Description: When the crew has addressed the RCIC problem, a trip of the running Instrument Nitrogen (IN) compressor will occur.					
Initiation: After crew has addressed RCIC, on the signal of lead examiner.					
Cues: Annunciator LOR-1PM13J-A404 alarming					
Time	Position	Applicant's Actions or Behavior			
	BOP	<p>Per LOR-1PM13J-A404, Instrument Nitrogen System Trouble:</p> <ul style="list-style-type: none"> • If alarm is due to R0103 1A Instr N2 Comp O/L Trip <ul style="list-style-type: none"> ◦ Dispatch an operator to MCC 133-2, Compt D-3 to investigate. ◦ Dispatch an operator to 1IN01CA and B, A and B Drywell Pneumatic Compressors to perform following: <ul style="list-style-type: none"> ▪ If available, 1B Drywell Pneumatic compressor in HAND (<i>not available due to OOS</i>) ▪ Place 1IN01CA, A Drywell Pneumatic compressor in OFF. ▪ Reset 1IN01CA, A Drywell Pneumatic compressor. ▪ Place 1IN01CA, A Drywell Pneumatic compressor in AUTO. ▪ If 1IN01CA and B, A and B Drywell Pneumatic Compressors are not running, place 1IN01CA, A Drywell Pneumatic compressor in hand. ▪ If 1A and 1B Drywell Pneumatic Compressors will not stay running, refer to LOA-IN-101 Loss of Drywell Pneumatic Air Supply. <p>Per LOA-IN-101 (operator may use hardcard):</p> <ul style="list-style-type: none"> • CHECK a Group 10 Primary Containment Isolation -NORMAL. • OPEN 1IN059 and 1IN060 at 1PM13J. (One control switch for both valves). • CHECK Southside and Northside N2 Bank - NORMAL. • CHECK 1IN061A and B, Air Receiver Relief Valves -CLOSED. • CHECK Power to the Drywell Pneumatic Air Compressors -AVAILABLE. • CHECK IN Compressor –RUNNING <ul style="list-style-type: none"> ◦ RESTART system per LOP-IN-01. 			

NOTES:

[illegible]

Operator Actions

Event No.(s): 3.4		Page 2 of 2
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Per LOA-IN-101 (continued)</p> <ul style="list-style-type: none"> • CHECK IN Compressors A/B Discharge Relief Valves - CLOSED. • CHECK Outboard and Inboard (if possible) system - INTACT. (No leaks) • CHECK IN Dryer –OPERATING PROPERLY. • VERIFY all compressor drain trap bypass valves closed. • MONITOR Primary Containment O2 levels at 1PM13J. • When IN System restored to normal operation, CLOSE 1IN059 and 1IN060.
	RO	<ul style="list-style-type: none"> • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<p>Specific:</p> <ul style="list-style-type: none"> • Directs actions listed above • Should consider contacting Work Control to expedite work on 1B IN compressor. • Considers tech spec implications of rising O2 levels in containment <ul style="list-style-type: none"> ◦ Refers to T/S 3.6.6.2, Drywell and Suppression Chamber Oxygen Concentration <p>General:</p> <ul style="list-style-type: none"> • On transient, positions himself as command authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications IAW OP-AA-101-501.
Terminus: Actions of LOA-IN-101 complete,		

NOTES:

[illegible]

Operator Actions

Event No.(s): 3.5		Page 1 of 1
Description: After the IN system has been restored, the operating TDRFP seal injection pump will trip and the standby pump will fail to auto start.		
Initiation: After crew has restored IN pressure, on the signal of lead examiner.		
Cues: Annunciator LOR-1PM03J-A307 alarming		
Time	Position	Applicant's Actions or Behavior
	RO	Per LOR-1PM03J-A307, <ul style="list-style-type: none"> • VERIFY a Seal Injection Pump is operating (Second Seal Injection Pump should start at 40 PSID) • At Panel 1FW01JA (768' outside feedpump room) VERIFY pressure at 1PS-FW187/188/189 is greater than 50 PSID. <ul style="list-style-type: none"> ◦ 1AP84E-E1-27 (136Y-3, Compt E-1, Bkr 21) provides Control Power for both the 1A TDRFP and 1B TDRFP Seal Injection Temperature Controls. • CHECK indication for 1A TDRFP Turning Gear on panel 1PM03J. <ul style="list-style-type: none"> ◦ If indication is NOT present, DISPATCH an operator to reset the breaker at 1AP84E-E1-21 (136Y-3, Compt E-1, Bkr 21). • At panel 1PL03JA, CHECK TDRFP Seal Injection Temperature Control System for proper operation. <ul style="list-style-type: none"> ◦ If local indication is de-energized, VERIFY the Seal Injection Temperature Control Valves have failed open. ◦ If TDRFP Seal Injection Temperature Controller is NOT working in AUTO, take manual control locally at the controllers. • If the problem cannot be corrected, the TDRFP must be shutdown and isolated before leakoff drain temperature exceeds 200°F.
	BOP	<ul style="list-style-type: none"> • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> • Directs actions above. • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Contacts Work Control to investigate problem and initiate repairs.
Terminus: TDRFP Seal Injection Pump running and hi temperature alarms clear		

NOTES:

Operator Actions

Event No.(s): 3.6

Page 1 of 1

Description: Once the crew has restored seal injection, the 1A TDRFP flow instrument will fail low.

Initiation: After crew has restored TDRFP Seal Injection, on the signal of lead examiner.

Cues: Annunciator LOR-1H13-P603-A511 alarming, RWLCS TROUBLE

Time	Position	Applicant's Actions or Behavior
	RO	<p>Per LOR-1H13-P603-A511:</p> <ul style="list-style-type: none"> At the 1DS001 Operation Station Event List, CHECK alarm message. If alarm message is "Dev Header/Pump Flow" then CHECK for failing reactor feed pump discharge flow signal. If a Reactor feed pump discharge flow signal has failed, <ul style="list-style-type: none"> VERIFY the corresponding reactor feed pump min. flow M/A station is in MANUAL. POSITION the corresponding reactor feedpump min flow as required for plant conditions. REFER to LOP-FW-16 to determine cause of alarm and required actions.
	BOP	<ul style="list-style-type: none"> Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> On transient, positions himself as command authority on the unit. Acknowledges immediate operator actions and directs subsequent actions. Requests an additional NSO to the control room for manual FW control. Enforces OPS expectations and standards.

Terminus: RPV level stable in the green band, actions taken per LOR 1H13-P603-A511.

NOTES:

Operator Actions

Event No.(s): 3.7, 3.8		Page 1 of 4
Description After failure of the A TDRFP flow instrument, a major steam leak (steam line “D”) propagates inside the primary containment. A broken containment monitoring instrument line will have the following effects: - Fail Division 1 drywell pressure indication - Fail Division 1 ECCS and EDG automatic initiation - Prevent remote operation of Division 1 containment spray – Fail SPDS DW Pressure Indication.		
Initiation: Conditions stable following RWLC failure.		
Cues: Multiple annunciators for High DW pressure		
Time	Position	Applicant’s Actions or Behavior
	RO	<p>When RO/BOP recognize indications of LOCA: Per LGP-3-2 Attachment E (hardcard):</p> <ul style="list-style-type: none"> • Arm and Depress scram pushbuttons • Place mode switch in Shutdown • Insert IRMs and SRMs • Check rods in and power decreasing • Inform Unit Supervisor rods are in • Operate FW to control level 12.5 to 55.5 inches • Report level and pressure trends • Verified RR downshifted to slow speed • Verify turbine and generator are tripped <p>Performs additional EOP actions as directed by SRO</p> <ul style="list-style-type: none"> • Coordinates with BOP to maintain/restore RPV level in band specified using preferred injection systems • Monitors RPV parameters <ul style="list-style-type: none"> ◦ Report lowering RPV level/pressure (value, rate, trend) ◦ Report indications of steam line break

NOTES:

[illegible]

Operator Actions

Event No.(s): 1.3.7, 1.3.8		Page 2 of 4
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Makes plant announcement for reactor scram</p> <p>Verifies needed auto actions (PCIS, ECCS)</p> <ul style="list-style-type: none"> • Report failure of Division 1 systems to initiate on LOCA condition • Manually initiates/starts division 1 ECCS using one of the following methods: <ul style="list-style-type: none"> ◦ Arm and depress Div 1 ECCS Initiation push button ◦ Starts, 1A RHR and/or LPCS manually as required. <p>Performs additional EOP actions as directed by SRO</p> <ul style="list-style-type: none"> • Starts 2 loops of suppression pool cooling <ul style="list-style-type: none"> ◦ Startup RHR Service Water as follows: <ul style="list-style-type: none"> ◆ Start first RHR Service Water Pump. ◆ Open 1A/1B RHR Hx Service Water Outlet Valve. ◆ When indicated flow reaches 3000 gpm, START second RHR Service Water Pump. ◦ Start 1A/1B RHR Pump. ◦ Establish RHR flow of 1500 to 7450 gpm. <ul style="list-style-type: none"> ◆ Throttle 1E12-F024A/B open. ◆ Throttle 1E12-F048A/B closed. • Initiates Suppression Chamber Spray • Initiates DW Spray • Coordinates with RO to maintain/restore RPV level in band specified using preferred injection systems • Restarts VR IAW LGA-VR-01 (as time permits)

NOTES:

[illegible]

Operator Actions

Event No.(s): 3.7, 1.3.8

Page 3 of 4

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Directs entry into EOPs and EOP actions as entry conditions are met.</p> <p>Per LGA-001:</p> <ul style="list-style-type: none"> • Directs RO to control RPV level 11-59.5 inches. <p>Per LGA-003:</p> <ul style="list-style-type: none"> • Per Primary Containment Pressure Leg, directs the following: <ul style="list-style-type: none"> • Spray the Suppression Chamber before pressure reaches 8 psig • When SC pressure is 8 psig, then <ul style="list-style-type: none"> ◆ VERIFY within the limits of the DSL ◆ TRIP all RR pumps ◆ SPRAY the Drywell (per LGA-RH-103) • If SC pressure can't be restored and held below the PSP limits, initiate ADS IAW LGA-004. • Per Drywell Temperature Leg, directs the following: <ul style="list-style-type: none"> • If determined can't stay below 135 F in DW, then start all available drywell cooling (per LGA-VP-01) • Per Pool Temperature Leg, directs the following: <ul style="list-style-type: none"> • Start two loops of pool cooling • If determined can't stay below 105 F in Suppression Pool, then start all available pool cooling per (LGA-RH-103) • Pool Level Leg <ul style="list-style-type: none"> • Monitor Suppression Pool Level (-4.5 to +3.0 inches) • Hydrogen Leg <ul style="list-style-type: none"> • Start Hydrogen and Oxygen Monitors (per LGA-CM-01)

NOTES:

[illegible]

Operator Actions

Event No.(s): 3.7, 3.8, 3.9		Page 4 of 4
Time	Position	Applicant's Actions or Behavior
	SRO	<p>Directs entry into EOPs and EOP actions as entry conditions are met.</p> <p>Per LGA-04 directs the following (if RPV blowdown required)</p> <ul style="list-style-type: none"> • Verify SP level >-18 feet • Initiate ADS • Verify 7 SRVs open • Wait until Shutdown Cooling interlocks clear <p>General:</p> <ul style="list-style-type: none"> • On transient, positions himself as command authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications IAW OP-AA-101-501. <p>GSEP Event Classification and PARS Determination (if performed):</p> <ul style="list-style-type: none"> • GSEP - "Alert" per EAL FA1 • PARS – None
<p>Terminus:</p> <ul style="list-style-type: none"> • RPV level stable and under control above TAF and in required band • DW Spray initiated and DW pressure lowering • Upon approval of lead examiner • 		

NOTES:

[illegible]

REFERENCES

<u>Procedure</u>	<u>Title</u>	<u>Revision</u>
LGA-001	RPV Control	00
LGA-002	Secondary Containment Control	00
LGA-003	Primary Containment Control	00
LGA-CM-01	Emergency Operation of Post LOCA H ₂ /O ₂ Monitors	04
LGA-RH-103	Unit 1 RHR operations in the LGAs	02
LGP-3-1	Power Changes	25
LGP-3-2	Reactor Scram	42
LOA-IN-101	Loss of Drywell Pneumatic Air Supply	01
LOP-RR-07	Operation of RR Flow Control System	19
LOR-1H13-P603-A409	Feedwater Control Reactor Water Low – Level 4	01
LOR-1PM03J-A307	RFP 1A Seal Leakoff Drain Line Temperature High	01
LOR-1PM13J-A103	Drywell Air Hydrogen High	00
LOR-1PM13J-A404	Instrument Nitrogen System Trouble	01
LOR 1H13-P601-D502	RCIC Turbine Steam Line Water Drain Pot Level High	01
LOS-RP-W1	Manual Scram Instrumentation	

Simulator Operator Instructions

Initial Setup

1. Recall IC-32 (Power reduced to 85% for rod set).
2. Place simulator in RUN.
3. Load and run the setup CAEP written for this scenario (**esg.3r1**.cae on zip disc)
4. Reduce RR flow to 85% power.
5. Post the FCL Greater Than 100% placard.
6. Hang OOS cards for 1C RHR
7. Write T/S 3.5.1, 7 days, for 1C RHR being OOS

Event Triggers and Role Play

Event

18. Raise Power with RR Flow
 - a. No triggers
 - b. Role play for rounds operators as necessary
19. Perform LOS-RP-W1
 - a. No triggers
 - b. Role play for operator actions as necessary
20. RCIC Drain Pot alarm
 - a. **Trigger 3** on request from lead evaluator
 - b. Role play for operator actions at RCIC
21. Trip of 1A IN Compressor
 - a. **Trigger 4** on request from lead evaluator
 - b. Role play as operators at breaker and IN skid
 - (1) No visible signs of damage.
 - (2) NO IN leaks
22. Trip of Running TDRFP Seal Injection Pump
 - a. **Trigger 5** on request from lead evaluator
 - b. Role play as rounds operator.
 - (1) Local controls for Seal Injection FCVs are operating normally
23. 1A TDRFP Flow Instrument Fails Low
 - a. **Trigger 6** on request from lead evaluator
 - b. Role play as necessary
24. Division 1 Containment Monitoring Instrument Line Broken
 - a. No Trigger, malfunction inserted on initial setup
 - b. Role play as necessary
25. Steam Leak Inside Primary Containment
 - a. **Trigger 8** on request from lead evaluator, or shortly after scram if level control is lost

LaSalle County Station

DYNAMIC SIMULATOR SCENARIO GUIDE

ILT CLASS 02-01 NRC EXAM

ESG 4

Rev. 0

01/07/2003

DEVELOPED BY:

Facility Author

Date

APPROVED BY:

Facility Representative

Date

Facility: LaSalle StationScenario No.: ESG 4Op Test No.: (Extra)

Examiners: _____

Operators: _____

Initial Conditions:

- Unit 1 is operating at 100% reactor power with flow control line at 107%.
- TLO Temperature controller in manual.
- 1A GC Pump OOS
- 1B EHC Pump is OOS
- Online Safety level is green.
- Unit 2 is operating at 100% power.

Turnover:

- A swap of VP chillers is scheduled to be performed this shift.

Event No.	Malf. No.	Event Type*		Event Description
1	N/A	R	RO SRO	Power reduction to 85% power at 300 MWe/hour.
2	N/A	N	BOP SRO	Swap VP chillers from A and C to B and C.
3	P3E1A1 D	I	RO SRO	CRD FCV Setpoint Failure.
4	VHTM60 AD	CR	BOP SRO	1A TDRFP Lube Oil Leak.
5	MNB101	I	BOP SRO	Main Generator Hydrogen Temperature High
6	MCF030	I	ALL	Heater String Isolation.
7	MGC002	C	BOP SRO	Loss of Stator Cooling.
8	MCF081	M	BOP SRO	1B TDRFP Failure to Trip.
9			ALL	5 Rod ATWS.
10	MEH001 MMS007		BOP SRO	Failure of 1A EHC Pp./EHC line rupture.

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

NARRATIVE SUMMARY

Event(s)	Description
E.1	Once the turnover is completed, the SRO will first direct a power reduction to 85% at 300 MWe/hr for load following.
E.2	The SRO should also direct the BOP operator to swap the A swap of primary containment chillers from 1A and 1C online to 1B and 1C online in accordance with LOP-VP-02. This swap should occur without incident.
E.3	After sufficient progress in the containment chiller swap, the CRD FCV setpoint will fail low, requiring the RO to take manual control and open the FCV to regain flow.
E.4	Later, the 1A TDRFP will develop a lube oil leak requiring the S/U of the MDRFP and S/D of the 1A TDRFP. The crew should lower power to stay within the capacity of the MDRFP and the 1B TDRFP.
E.5	Once the major actions of the previous events have been completed, a main generator high hydrogen temperature alarm will come in. The crew will follow the annunciator and abnormal operating procedures and dispatch a NLO to the local skid. Upon investigation, they will discover that the hydrogen temperature controller has failed. The BOP operator will have to take manual control of the temperature controller to clear the alarm.
E.6	The next event will be an isolation of the A LP Heater String. The crew should maintain plant parameters IAW LOA-HD-101.
E.7,8,9, and 10.	When the crew has stabilized the plant following the heater string isolation, a trip of the 1B Stator Cooling Pump will occur, requiring a scram. The 1B TDRFP will not trip, requiring immediate actions per LOA-FW-101. A five (5) rod ATWS will occur and the 1A EHC Pump will trip due to a rupture in the EHC line. This will remove the ability to control Reactor pressure via the Main Condenser.

Critical Steps

8. With a reactor scram required and the reactor not shutdown, take action to reduce power by injecting boron and/or inserting control rods, to protect the primary containment.
9. During an ATWS, with reactor power less than 3%, maintain reactor water level between -150 inches and +59.5 inches using only preferred ATWS systems..

Shift Turnover Information

⇒ Day of week and shift

- ◆ Monday Day Shift

⇒ Weather conditions

- ◆ No adverse weather conditions expected in the next 24 hours

⇒ (Plant power levels)

- ◆ Unit 1 @ 100% power, 107 % FCL
- ◆ 3494 MWt
- ◆ 1161 MWE
- ◆ 94.5 Mlbm/hr CORE FLOW
- ◆ U-2 100% power.
- ◆ 3489 MWt
- ◆ 1149 MWe
- ◆ 95 Mlbm/hr

⇒ Thermal Limit Problems/Power Evolutions

- ◆ Reducing power to 85% power, at 300 MWE/hr per Load Dispatcher.
- ◆ None

⇒ Existing LCOs, date of next surveillance

- ◆ None
- ◆ None

⇒ LOSs in progress or major maintenance

- ◆
- ◆
- ◆
- ◆ None
- ◆
- ◆

⇒ Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment

- ◆ Swapping VP from A and C to B and C.
- ◆ 1A GC pump OOS
- ◆ 1B EHC OOS
- ◆ None
- ◆

⇒ Comments, evolutions, problems, etc.

- ◆ Online Safety is Green (RAW = 1.0)
- ◆ Unit 1 is in a Division 2 work week.
- ◆ Online Safety is Green (RAW = 1.0)
- ◆ Unit 2 is in a RCIC work week.
- ◆

Operator Actions

Event No.(s): 1		Page 1 of 1	
Description: Once the crew has accepted the unit, the SRO should direct to decrease power to 85% power at 300 MWe/hour IAW LGP 3-1.			
Initiation: Following shift turnover.			
Cues: Directed by SRO			
Time	Position	Applicant's Actions or Behavior	

	RO	<ul style="list-style-type: none">Decreases power via recirculation flow via LOP-RR-07, Operation of the Reactor Recirculation Flow Control System, per LGP 3-1, Power Changes.
	BOP	<ul style="list-style-type: none">Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none">Directs actions above.Enforces OPS expectations and standardsEmphasizes need for caution and conservatism during the power change.Stresses awareness of where operation is on the power to flow map.Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.Ensures OPS activities are completed as scheduled.
Terminus: Clearly observable plant response from change in power level.		

NOTES:

Operator Actions

Event No.(s):	2		Page	1	of	1
Description: The SRO should direct the BOP to swap the A loop of VP so the B and C loops are on line..						
Initiation: Per Lead Evaluator after power decrease.						
Cues: Per SRO direction.						
Time	Position	Applicant's Actions or Behavior				
	BOP	<ul style="list-style-type: none"> Starts B VP loop per Section E.10 of LOP-VP-02. Directs NLO to open the following valves: <ul style="list-style-type: none"> 1VP145, C PCCW Vent Chlr Evap Loop B Supply Valve 1VP149, C PCCW Vent Chlr Evap Outlet Loop B Return Valve Directs NLO to close the following valves: <ul style="list-style-type: none"> 1VP144, C PCCW Vent Chlr Evap Loop A Supply Valve 1VP148, C PCCW Vent Chlr Evap Outlet Loop A Return Valve Record "C" VP ammeter reading prior to the start of additional chiller START B VP Chiller per Section E.11 of LOP-VP-02. SHUTDOWN A VP Chiller per Section E.8 of LOP-VP-02. Shutdown A VP Loop per Section E.9 of LOP-VP-02. Directs NLO to THROTTLE 1VP147, C PCCW Vent Chlr Evap Outlet Valve to maintain: <ul style="list-style-type: none"> B chiller amps between 55 and 75. C chiller amps between 300 and 538. 				
	RO	<ul style="list-style-type: none"> Monitors reactor to ensure operations remain within established bands. Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. 				
	SRO	<ul style="list-style-type: none"> Directs actions above. Enforces OPS expectations and standards Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. Ensures OPS activities are completed as scheduled. 				
Terminus: B VP loop running and C shutdown.						

NOTES:

Operator Actions

Event No.(s):	3	Page 1 of 1
Description: The CRD FCV setpoint will fail low, requiring the RO to take manual control and open the FCV to regain flow.		
Initiation: When sufficient progress has been made on the VP chiller swap, t the direction of the Lead Examiner.		
Cues: RO observance of FCV failing or LOR 1H13-P603-A403, "CRD HYD EMP HI".		
Time	Position	Applicant's Actions or Behavior
	RO	<ul style="list-style-type: none"> Notifies FCV failing or responds on receipt of "CRD HYD TEMP HI" alarm (1H13-P603-A403) Per LOA-RD-101: <ul style="list-style-type: none"> CHECK Drift lights – OFF CHECK the following: <ul style="list-style-type: none"> CRD system flow 63 gpm. Cooling Header $\Delta P < 30$psid. Drive Water Header $\Delta P < 600$ psid. THROTTLE Drive Water PCV 1C11-F003. TRANSFER Flow Controller, 1C11-R600, to MANUAL. ADJUST Flow Controller output using OPEN/CLOSE pushbuttons to obtain a CRD system flow of approximately 63 gpm. CHECK Flow Control Valve 1C11-F002A controlling flow at approximately 63 gpm.
	BOP	<ul style="list-style-type: none"> Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> Directs actions above. Enforces Operations expectations and standards. Ensures operations are conducted within the bounds of Tech Specs and IAW operations standards and approved procedures.
Terminus: CRD FCV in manual controlling flow at approximately 63 gpm.		

NOTES:

Operator Actions

Event No.(s): 4		Page 1 of 1
Description:. The 1A TDRFP will develop a lube oil leak requiring the startup of the MDRFP and shutdown of the 1A TDRFP. The crew should lower power to stay within the capacity of the MDRFP and 1B TDRFP.		
Initiation: Following placing the CRD FCV in manual and adjusting flow, at the Lead Examiners direction.		
Cues: Notices 1A TDRFP lube oil pressure decreasing / notified by rounds NLO.		
Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> Note and inform US of lowering TDRFP lube oil pressure. If 1PM02J-A403 (TDRFP VIBR HI) is received, take actions to remove "1A" TDRFP and place the MDRFP on line. Take action IAW LOR-1PM03J-A104 (TDRFP Bearing Oil Pressure Low). <ul style="list-style-type: none"> Determine the "A" pump is the only one affected. Place the MDRFP in service IAW LOP-FW-03. S/D the 1A TDRFP IAW LOP-FW-05. Determine if reactor feedwater flowrate is adequate for current Reactor Power level and reduce as necessary.
	RO	<ul style="list-style-type: none"> Monitors reactor to ensure operations remain within established bands. Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> Directs crew actions IAW LOR 1PM03J-A104, LOR-1PM02J-A403 and LOP-FW-03 to start the MDRFP. Establishes Reactor Level Based Scram criteria.
Terminus:. MDRFP and 1B TDRFP on line, Reactor level stable.		

NOTES:

Operator Actions

Event No.(s): 5		Page 1 of 1
Description: A main generator high hydrogen temperature alarm will come in. Upon investigation, the crew should discover that the hydrogen temperature controller has failed.		
Initiation: Following the feedpump transfers, at the Lead Examiners direction.		
Cues: LOR-1PM02J-B101, Hydrogen Panel Trouble and LOR-1PM02J-B301, Generator 1 Temperature High or Low.		
Time	Position	Applicant's Actions or Behavior
	BOP	Per LOR-1PM02J-B101: <ul style="list-style-type: none"> DISPATCH operator to CHECK 1PL19J for source of Trouble alarm. Proceed per LOR for alarm at Hydrogen Panel 1PL19J. Per LOR-1PM02J-B301 and LOR-1PL19JB1-3: <ul style="list-style-type: none"> CHECK 1TI-WS001, Generator Cold Gas Temp., >50°C or < 30°C. PLACE 1TK-WS001, Gen H2 Coolers Temp. Contrlr, in MANUAL and POSITION 1WS043, Gen H2 Coolers WS Outlet Temperature Control Valve, to maintain Generator Cold Gas Temperature between 30°C and 56°C. If Cold Gas Temperature can NOT be controlled using 1TK-WS001: <ul style="list-style-type: none"> Concurrently throttle open 1WS045, Gen H2 Coolers TCV 10 inch B/P valve and throttle closed 1WS042, Gen H2 Coolers TCV Stop Valve. Continuously monitor 1TI-WS001, Generator Cold Gas Temperature. Adjust 1WS045 to maintain Cold Gas Temp. 30°C and 56°C. If Generator Cold Gas Temperature exceeds 56°C on 1TI-WS001 or Hydrogen Cooler H2 Inlet Temp exceeds 72°C, REDUCE VARS to approximately 0. If Generator Cold Gas Temperature cannot be reduced below 56°C, load should be reduced in 30 MWe increments to limit winding temperatures.
	RO	<ul style="list-style-type: none"> Monitors reactor to ensure operations remain within established bands. Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> Enforces Operations expectations and standards. On transient, positions himself as command and authority on the unit. Acknowledges immediate operator actions and directs subsequent actions. Contacts Shift Manager.
Terminus: Main generator H2 temperature below alarm setpoint with control restored in manual..		

NOTES:

Operator Actions

Event No.(s): 6		Page 1 of 1
Description: High level in the 11A Low Pressure Heater will cause a heater string isolation. The crew should control and maintain plant parameters IAW LOA-HD-101.		
Initiation: After the crew has Main Generator temperature under control, at the Lead Examiners direction.		
Cues: 1PM03J-B106 LP HTR 11 LEVEL HI		
Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> Respond per LOA-HD-101. Verify closed 1CB005A,6A, and 45A. Rapidly reduce core flow as low as required to maintain the following without entering the instability region: <ul style="list-style-type: none"> CP DP < 60psid FW suction > 300 psig Reactor Water Level > 31 inches Core Flow > 49 Mlb/hr
	RO	<ul style="list-style-type: none"> Assists BOP by reducing core flow as needed. Monitors reactor to ensure operations remain within established bands. Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> Enforces Operations expectations and standards. On transient, positions himself as command and authority on the unit. Acknowledges immediate operator actions and directs subsequent actions. Refers to Fig. 1 of LOA-HD-101 and applicable T.S.'s. Contacts Shift Manager.
Terminus: Heater string isolated, power and level stable.		

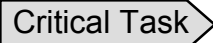
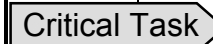
NOTES:

Operator Actions

Event No.(s):	7	Page	1	of	1
Description: A trip of the 1B Stator Water Cooling Pump will occur, requiring a manual reactor scram.					
Initiation: Following the Low Pressure Heater String Isolation, with level and power under control, at the Lead Examiners direction.					
Cues: LOR 1PM02J-B106, GENERATOR STATOR COOLANT PUMP A/B TRIP					
Time	Position	Applicant's Actions or Behavior			
	RO	<ul style="list-style-type: none"> Per LOA-GC-101, U-1 Generator Stator Cooling Abnormal Scram if power $\geq 20\%$ of rated and either: <ul style="list-style-type: none"> Uncontrolled reactor pressure increase <u>or</u> Bypass valves open and power between 20% and 70% RTP measured by an operable APRM. 			
	BOP	<ul style="list-style-type: none"> Per LOA-GC-101, U-1 Generator Stator Cooling Abnormal Scram if power $\geq 20\%$ of rated and either: <ul style="list-style-type: none"> Uncontrolled reactor pressure increase <u>or</u> Bypass valves open and power between 20% and 70% RTP measured by an operable APRM. 			
	SRO	<ul style="list-style-type: none"> Enforces Operations expectations and standards. On transient, positions himself as command and authority on the unit. Acknowledges immediate operator actions and directs subsequent actions. 			
Terminus: Manual Reactor Scram					

NOTES:

Operator Actions

Event No.(s):		8,9 and 10	Page 1 of 1
Description: Following the manual scram, the 1B TDRFP will not trip, requiring immediate operator actions per LOA-FW-101. A five rod ATWS will occur and the 1A EHC pump will trip due to a rupture in the EHC line. This will remove the ability to control Reactor Pressure via the Main Condenser.			
Initiation:			
Cues:			
Time	Position	Applicant's Actions or Behavior	
	RO	<ul style="list-style-type: none"> • Performs LGP 3-2. • Notifies US of 5 rods out. • Notifies US of failure of 1B TDRFP to trip. • Performs LOA-FW-101. <ul style="list-style-type: none"> • Depress trip pushbutton. • Place Manual Backup station in MANUAL and DEPRESS Fast Lower until CV is closed or, • Close the Hi and Low Pressure Steam Supply Stops and the Feedpump discharge valve, or • Dispatch an operator to manually trip the TDRFP at the Front Standard. 	
		<ul style="list-style-type: none"> • Inserts rods per LGA-NB-01. 	
	BOP	<ul style="list-style-type: none"> • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. • Places equipment in service per US direction. • Uses alternate pressure control systems to control reactor pressure. 	
	SRO	<ul style="list-style-type: none"> • Directs performance of LGP 3-2. • Directs performance of LOA-FW-101. • If conditions exist, enters LGA-002 and transitions to LGA-010. • Directs LGA-NB-01. 	
		<ul style="list-style-type: none"> • If LGA-010 entered, directs water level band of –150 inches to 59.5 inches. <ul style="list-style-type: none"> • When rods inserted, exits LGA-010 and returns to LGA-001. <ul style="list-style-type: none"> • Directs Reactor Water Level band of 11 inches to 59.5 inches. • Directs Reactor Pressure control via alternate methods. 	
Terminus: Rods inserted, reactor water level under control.			

NOTES:

REFERENCES

<u>Procedure</u>	<u>Title</u>	<u>Revision</u>
LGA-001	RPV Control	04
LGA-010	Failure to Scram	04
LGP-3-1	Power Changes	29
LGP-3-2	Reactor Scram	47
LOA-HD-101	Heater Drain System Trouble	07
LOA-FW-101	Reactor Level/Feedwater Pump Control Trouble	08
LOA-GC-101	Unit 1 Generator Stator Cooling Trouble	04
LOP-RR-07	Operation of RR Flow Control System	25
LOP-VP-02	S/U, Operation and S/D of PCCW and Vent. System	23
LOR-1H13-P603-A403	CRD Hydraulic Temp. High	02
LOR-1PM03J-A104	TDRFP Bearing Oil Pressure Low	00
LOR-1PM03J-B106	LP Heater 11 Level High	01
LOR-1PM02J-B101	Hydrogen Panel Trouble	00
LOR-1PM02J-B301	Generator 1 Hydrogen Temperature High or Low	00

Simulator Operator Instructions

Initial Setup

8. Recall a full power IC
9. Place simulator in RUN.
10. Load and run the setup CAEP written for this scenario (**esg4r1.cae** on floppy disc)
11. Post the FCL Greater Than 95.2% placard.
12. Place OOS card on 1A GC Pump.
13. Place OOS on 1B EHC Pump.

Event Triggers and Role Play**Event #**

26. Reduce Power with RR Flow
 - a. No triggers
 - b. Role play for rounds operators as necessary
27. Perform LOP-VP-02, Swap VP Chillers
 - a. No triggers
 - b. Role play for operator actions of LOP-VP-02
28. CRD FCV setpoint failure
 - a. **Trigger 1** on request from lead evaluator
 - b. Role play for operator actions at CRD FCV.
29. 1A TDRFP Lube Oil Leak
 - a. **Trigger 2** on request from lead evaluator
 - b. Call as U-1 rounds operator and report a leak on the 1A TDRFP.
 - (1) Role play as operators at 1A TDRFP.
30. Main Generator Hydrogen Temperature High
 - a. **Trigger 5** on request from lead evaluator.
 - b. As NLO, report back that the temp. controller appears to have closed.
31. LP Heater 11A Level High
 - a. **Trigger 3** on request from lead evaluator
 - b. Role play as rounds operator.
 - (1) Report back status of A string LP heaters as requested.
32. 1B Stator Cooling Pump trip
 - a. **Trigger 4** on request from lead evaluator
 - b. Role play as necessary
33. 1B TDRFP will not trip.
 - a. No Trigger, malfunction inserted on initial setup
 - b. Role play as necessary for local TDRFP trip
34. 5 rod Atws
 - a. No trigger, inserted on initial setup
 - b. Perform actions of LGA-NB-01 if requested.
 - c. After scram, delete stuck rod malfunctions to allow manual insertion.
35. 1A EHC Pump trip/EHC rupture
 - a. Trigger **6**, immediately after reactor scram.
 - b. Respond as requested to EHC system.