LaSalle County Station

DYNAMIC SIMULATOR EXAM SCENARIO GUIDE

ILT CLASS 99-01 NRC EXAM

ESG-1.1

Rev. 0

08/07/2000

DEVELOPED BY:	Site Exam Developer	8-11-00 Date
APPROVED BY:	Facility Representative	8-11-00 Date

Scenario Outline

Facility: *LaSalle Station* **Scenario No.:** *ESG 1.1* **Op Test No.:** *1*

Examiners: _____ **Operators:** _____

Initial Conditions:

- *Unit 1 is operating at 85% reactor power with flow control line at 105%.*
- *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-VG-M1 is scheduled to be performed this shift.*
- *A flow control line adjustment is also scheduled for this shift.*
- *Reactor Power has been reduced to 85% to allow for rod moves.*
- *The Control Rod Maneuver Request has been approved.*

Event No.	Malf. No.	Event Type*		Event Description
1	N/A	R	RO SRO	Withdraw control rods to 110% flow control line.
2	N/A	N	BOP SRO	Perform VG monthly surveillance IAW LOS-VG-M1.
3	CAEP	C	RO SRO	Stuck control rod (excess friction).
4	MRD131	I	RO SRO	Loss of rod position indication at specific notch position.
5	CAEP	I	BOP SRO	RCIC drain pot alarm w/failure of 1E51-F054 to open automatically (can be opened with control switch).
6	MCA004	C	BOP SRO	VG supply fan trips on overload.
7	MES019	M	ALL	RCIC steam supply line breaks with a failure of isolation valves to close.
8	CAEP		BOP SRO	Failure of RCIC steam supply valve 1E51-F063.
9	CAEP		BOP SRO	Failure of RCIC steam supply valve 1E51-F008.

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

Narrative Summary

Event(s)	Description
1.1.1	Once the turnover is completed, The SRO should direct the RO to withdraw control rods to the 110% flow control line. The RO should withdraw control rods in accordance with LGP 3-1, LOP-RM-01, and the rod sequence package.
1.1.2	The SRO should also direct the BOP operator to perform the VG monthly surveillance in accordance with LOS-VG-M1.
1.1.3	While pulling control rods for flow control line adjustment, a control rod will be stuck. The RO should refer to the abnormal operating procedures (LOA-RD-101). The rod can be moved by increasing drive pressure.
1.1.4	Also while moving control rods, the RO should find that rod position indication has failed (single notch position) for one of the rods to be moved. The crew should refer to the abnormal operating procedures and tech specs for required action.
1.1.5	After FCL rod moves are complete, drain trap failure will cause the hi level alarm on the RCIC steam line drain pot to come in. A failure of a hi level instrument switch will disable automatic opening of the 1E51-F054, requiring the BOP operator to take action to operate the valve using the control switch and lower drain pot level. The Crew should determine appropriate tech spec and administrative actions for the instrument failure.
1.1.6	Once the crew has carried out actions for the RCIC drain pot alarm, the VG supply fan trips on overload. The BOP should acknowledge/announce the alarms and refer to the applicable alarm procedures. The BOP should realign the VG train for shutdown and dispatch an operator locally to investigate the cause of the trip. The SRO should refer to tech specs for required action.
1.1.7, 8, 9	Once actions have been completed for the VG supply fan trip, the steam supply line breaks for the reactor core isolation cooling system (RCIC) with a failure of the isolation valves to close. The BOP should recognize the situation and attempt to manually isolate RCIC. The SRO should enter LGA-02 on high secondary containment temperature and LGA-01 for reactor pressure and level control after the scram. With the RCIC area temperature reaching maximum safe values, the crew should scram. As area temperatures rise in the secondary containment, the crew should emergency depressurize per the emergency operating procedures.

Critical Tasks

1. Crew recognizes primary release in secondary containment and manually scrams prior to 2 or more area temperatures reaching the "Max Safe" levels.

2. Crew recognizes failure of RCIC steam line isolation valves to close on valid isolation conditions, and take actions to attempt to isolate the line.

3. Crew performs an emergency depressurization (ADS) when area temperatures exceed Max Safe levels in more than one area. If crew elects to rapidly depressurize with BPVs and thus prevents second are from reaching max safe, this critical task should be considered met.

Shift Turnover Information

⇒ **Day of week and shift**

- Monday Day Shift

⇒ **Weather conditions**

- No adverse whether conditions expected in the next 24 hours

⇒ **(Plant power levels)**

♦ Unit 1 - 85% Power/101% FCL	♦ Unit 2 – 100% Power
♦ 2965 MWt	♦ 3323 MWt
♦ 945 MWe	♦ 1142 MWe
♦ 85 Mlbm/hr CORE FLOW	♦ 108.5 Mlbm/hr CORE FLOW

⇒ **Thermal Limit Problems/Power Evolutions**

♦ A flow control line adjustment is scheduled for this shift.	♦ None
♦ Reactor Power has been reduced to 85% to allow for rod moves.	♦
♦ The Control Rod Maneuver Request has been approved.	♦

⇒ **Existing LCOs, date of next surveillance**

♦ T/S 3.5.1, 7 days for 1C RHR	♦ None
♦	♦

⇒ **LOSs in progress or major maintenance**

♦ LOS-VG-M1 is in progress and complete to step 2..	♦ 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 Division 2 work week.
♦ TLO Temperature controller in manual.	

Operator Actions

Event No.(s): 1.1.1		**Page** 1 **of** 1
Description: Once the turnover is completed, The SRO should direct the RO to withdraw control rods to the 110% flow control line.		
Initiation: Following shift turnover on the signal of lead examiner		
Cues: Directed by SRO		
Time	**Position**	**Applicant's Actions or Behavior**

	RO	Per LGP-3-1 and LOP-RM-01:
		• Place additional condensate polishers into service as necessary, per LOP-CP-02.
		• Increase power as recommended by QNE.
		• 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:
		  ° Rod insert light is lit and a drive flow of approximately four gpm is indicated.
		  ° Rod withdraw light is lit and drive flow of approximately two 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 approximately 6 seconds.

	SRO	• 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: Clearly observable plant response from change in power level.		

NOTES:

Operator Actions

Event No.(s): 1.1.2 **Page** 1 **of** 1

Description: The SRO should direct the BOP operator to perform the VG monthly surveillance in accordance with LOS-VG-M1.

Initiation: Following shift turnover on the signal of lead examiner

Cues: Directed by SRO

Time	Position	Applicant's Actions or Behavior

	RO	Per LOS-VG-M1:
		• Open 1VG001, U1 SBGT Inlet Isol Vlv.
		• Notify the Chemistry Technician on duty to take samples per ODCM.
		• Start 1VG01C, U1 SBGT primary fan and record the fan start time.
		• VERIFY the following damper positions on Panel 1PM07J:
		  ° 1VG003, U1 SBGT Dsch Isol Vlv, open.
		  ° 1VG002Y, U1 SBGT Flow Cont Vlv, throttled
		• Verify 1VG01A, U1 SBGT Elec Heating Coil is ON.
		• When the system has been running for one hour, record system parameters.
		• Perform the Shiftly Surveillance channel check for the SBGT PRM system on LOS-AA-S101.
		• Inspect the Filter Train locally for excessive vibration, high fan bearing temperatures, or other abnormal parameters or noises.

	SRO	• Authorizes and directs performance of scheduled surveillance • 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: VG train in operation and 1 hour wait period (for readings) started

NOTES:

Operator Actions

Event No.(s): 1.1.3		**Page** 1 **of** 1
Description: While pulling control rods for flow control line adjustment, a control rod will be stuck. The rod can be moved by increasing drive pressure.		
Initiation: Will occur automatically when rod is selected		
Cues: No rod motion after W/D pushbutton is depressed		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	Per LOP-RM-01: • If desired, RAISE CRD Drive Pressure Initially by no more than 100 psid. • Apply single withdraw signal. • If control rod fails to withdraw, attempt to withdraw by double clutching. • If rod does not withdraw, repeat Steps with drive pressure not to exceed 450 psid. • If control rod still can not be withdrawn, consult LOA-RD-101. Per LOA-RD-101: • Verify CRD Hydraulic System configuration is normal. • Raise Drive pressure to 500 psid and attempt to withdraw control rod per control rod sequence. • If rod fails to move, raise Drive Water Pressure to 550 psid. • If/when rod is successfully positioned, return Drive Water pressure to NORMAL. • NOTE applicable information in Unit Log and LOP-RM-01, Attachment A. • Closely monitor further movements of affected rod.
	SRO	• Directs actions above • Ensures RO is aware that moving a rod at elevated pressure may cause it to double notch. • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
Terminus: Rod has been positioned using elevated drive pressure IAW LOA-RD-101		

NOTES:

Operator Actions

Event No.(s): 1.1.4		**Page 1 of 2**
Description: Rod position indication has fails (single notch position) for one of the rods to be moved.		
Initiation: Will occur automatically when rod is at failed notch position		
Cues: No rod position on 4-Rod Display, RWM, or process computer (OD7).		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	Per LOA-RM-101, For Loss of RPIS Display: • Prior to notching control rods to verify position displays, a Qualified Nuclear Engineer shall be consulted for guidance. • Complete Attachment B of LOA RM-01 and Forward a copy to IMD for Troubleshooting. • Check several rods for different four-rod displays -only one four rod display has failed RPIS. • Check RPIS INOP alarm - OFF when rods with good display are selected. • Attempt to notch withdraw peripheral rod at position 48 - normal withdraw sequence results. • Check all rods in selected four rod display - ONLY one rod has failed RPIS.
	BOP	Per LOA-RM-101, For Loss of RPIS Display: • Check DMM "RPIS LOST" LED - OFF (RMCS Display Memory Module Source Selector Card (1) at back of panel 1H13-P603 lower left of file monitor cards (4)).

NOTES:

Operator Actions

Event No.(s): 1.1.4		**Page** 2 **of** 2
Time	**Position**	**Applicant's Actions or Behavior**

	RO	Per LOA-RM-101, For Loss of RPIS Display (continued):
		• Complete actions per Tech. Spec. 3.1.3.7. If a rod must be fully inserted, perform Att. C. If a rod must be declared INOP, refer to Tech Spec. 3.1.3.1.
		  ° Bypass RWM
		  ° Disable blocks on RWM per LOP-RW-01
		  ° Insert rod position for inoperable position:
		  • Process computer using OD-14, Option 1.
		  • RWM
		• Check affected rod(s) - Left at operable position

	SRO	• Directs actions above
		• Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
		• Declares failed notch position indicator inoperable and IAW T/S 3.1.3.7, directs one of the following:
		  ° Moves rod by single notch movement to an operable position then returns rod to its original position and verifies no drifts once every 12 hours.
		  ° Moves rod to position with operable indication.

Terminus: Crew has addressed failed RPI and SRO has directed one of the T/S actions listed.		

NOTES:

Operator Actions

Event No.(s): 1.1.5 **Page** 1 **of** 1

Description: Drain trap failure will cause the hi level alarm on the RCIC steam line drain pot to come in. A failure of a hi level instrument switch will disable automatic opening of the 1E51-F054. Valve can be operated from CR using C/S.

Initiation: After crew has addressed RPIS failure, on the signal of lead examiner

Cues: Annunciator 1H13-P601-D502 alarming

Time	Position	Applicant's Actions or Behavior
	BOP	Per LOR-1H13-P601-D502 • Recognizes failure of 1E51-F054, RCIC Turbine Inlet Steam Line Water Drain Pot Trap Bypass to open and opens the valve manually. • Verifies AO-1E51-F025 and AO-1E51-F026, Upstream and Downstream RCIC Turbine Inlet Steam Line Water Drain Pot Normal Drains to Main Condenser are open, if MO-1E51-F045, RCIC Turbine Steam Supply Stop, is closed. • Initiate a PIF for each occurrence. • Initiate an Action Request for 1E51-D003.

	SRO	• Directs actions listed above.
		• Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
		• Declares interlock for 1E51-F054 inoperable and considers actions based on T/S 3.7.3. Acceptable responses would include:
		  ° Declare RCIC inoperable based on "attendant controls" not performing its function and moisture accumulation concerns. System may be tripped or disabled from auto operation. Enter 14 day timeclock.
		  ° Declare RCIC degraded but operable and establish some action to monitor for proper drain trap performance.
		• Enforces OPS expectations and standards.
		• Contacts Shift Manager and recommends notifications IAW OP-AA-101-501.

Terminus: Drain Pot level alarm clear, SRO has addressed T/S operability and directed actions accordingly.

NOTES:

Operator Actions

Event No.(s): 1.1.6		**Page** 1 **of** 1
Description: The running VG supply fan trips on overload.		
Initiation: After RCIC problem has been addressed, on the signal of lead examiner		
Cues: Annunciator LOR-1PM07J-A502 alarming		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	Per LOR-1PM07J-A502 • Verify trip of Standby Gas Treatment System Primary Fan 1VG01C and start of Standby Gas Treatment System Cooling Fan 1VG02C. • Dispatches operator to Reactor Building 480V MCC 136X-1, to reset breaker for Standby Gas Treatment System Supply Fan 1VG01C. • Verify proper shutdown of Standby Gas Treatment System Supply Fan 1VG01C per LOP-VG-02, Shutdown of Standby Gas Treatment System (SBGT) • If SBGT was running for testing, initiate appropriate troubleshooting. • Verify 74 Relay at 136X-1 MCC is not chattering. Control Circuit logic allows a small voltage to remain on 74 Relay after Thermal Overload trip. This condition could cause relay chatter and possible premature relay failure. • If appropriate, initiate Action Request to have 74 (Alarm) Relay or Standby Gas Treatment System Supply Fan 1VG01C repaired. • Refer to CTS Section 3.6.5.3 (ITS Section 3.6.4.3).
	SRO	• Directs actions listed above. • Declares U1 SBGT inoperable and directs system shutdown. • Complies with action statement(s) for T.S. Section 3.6.5.3 (ITS Section 3.6.4.3). Enters 7 day timeclock • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
Terminus: VG train shutdown, SRO has addressed T.S. requirements.		

NOTES:

Operator Actions

Event No.(s): 1.1.7, 1.1.8, 1.1.9		**Page** 1 **of** 3
Description: The steam supply line breaks for the reactor core isolation cooling system (RCIC) with a failure of the isolation valves to close.		
Initiation: After VG fan trip has been addressed, on the signal of lead examiner		
Cues: Multiple secondary containment area temperature and area radiation alarms		
Time	**Position**	**Applicant's Actions or Behavior**
Critical Task	RO	Performs EOP actions as directed by SRO • Initiate a manual reactor scram before any two area temperatures exceed Max Safe temperatures • Per LGP-3-2 Attachment E (hardcard): ° 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 and power is decreasing ° Operate FW to control level 12.5 to 55.5 inches ° Report level and pressure are following expected trends ° Verified RR downshifted to slow speed ° Verify turbine and generator are tripped ° Stabilize pressure <1043 psig • Coordinates with BOP operator to monitor and control RPV level and press.
Critical Task	BOP	• Makes plant announcement for reactor scram • Reports secondary containment high temperature and rad alarms to SRO. • Should make plant announcement to evacuate turbine and reactor buildings. • Recognizes failure of RCIC steam line to isolate and attempts to close valves from the control room. • Monitors Secondary Containment parameters • Responds to ARM alarms: ° Checks back panel to determine affected areas ° Refers to LOA-AR-101 (as time permits) ° Informs SRO of any LGA-02 entry conditions.

NOTES:

Event No.(s): 1.1.7, 1.1.8, 1.1.9		**Page** 2 **of** 3
Time	**Position**	**Applicant's Actions or Behavior**

Critical Task	BOP	Performs EOP actions as directed by SRO
		• Performs EOP actions as directed by SRO
		  ° Restarts VR IAW LGA-VR-01 as directed.
		  ° Restarts VP IAW LGA-VP-01 as directed.
		  ° Starts H2/O2 Monitors IAW LGA-CM-01 as directed.
		• Places RHR HXs on line
		  ° Startup RHR Service Water as follows:
		  ♦ 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.
		  ♦ Throttle 1E12-F024A/B open.
		  ♦ Throttle 1E12-F048A/B closed.
		• Initiates ADS if/when 2 area temperatures exceed Max Safe
		• Coordinates with RO to monitor and control RPV level and press.

Critical Task	SRO	Directs entry into EOPs and EOP actions as entry conditions are met. Per LGA-001: • Directs RO to control RPV level 12.5-55.5 inches. • In anticipation of RPV blowdown, directs BOP to rapidly depressurize using Main Turbine BPVs. Per LGA-002: • Directs RO and BOP to isolate RCIC steam lines. May also direct isolation of main steam lines and main steam line drains. • Directs RPV blowdown (ADS) if/when 2 area temperatures exceed Max Safe • Directs restart of VR IAW LGA-VR-01 (as time and resources permit)

NOTES:

Event No.(s): 1.1.7, 1.1.8, 1.1.9		**Page** 3 **of** 3
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	Directs entry into EOPs and EOP actions as entry conditions are met. Per LGA-003: • Directs use of all available suppression pool cooling. • Directs restoration of VP system IAW LGA-VP-01 (as time and resources permit). • Directs start of Post LOCA H2/O2 monitors IAW LGA-CM-01 (as time and resources permit). Per LGA-04 directs the following (if RPV blowdown required) • Verify SP level >-18 feet • Initiate ADS • Verify 7 SRVs open • Wait until Shutdown Cooling interlocks clear General: • 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:
- RPV level stable and under control in required band
- ADS has been initiated
- Effort has been made to isolate RCIC steam lines
- Upon approval of lead examiner

NOTES:

REFERENCES

Procedure	Title	Revision
LGA-001	RPV Control	00
LGA-002	Secondary Containment Control	00
LGA-003	Primary Containment Control	00
LGA-004	RPV Blowdown	00
LGA-CM-01	Emergency Operation of Post LOCA H2/O2 Monitors	04
LGA-VP-01	Rx Bldg Ventilation Startup Following System Isolation	06
LGA-VR-01	Primary Containment Temperature Reduction	07
LGP-3-1	Power Changes	25
LGP-3-2	Reactor Scram	42
LOA-RD-101	Control Rod Drive Abnormal	02
LOA-RM-101	Unit 1 RMCS Abnormal Situations	03
LOP-RM-01	Reactor Manual Control Operation	14
LOR-1H13-P601-D502	RCIC Turbine Inlet Steam Line Drain Pot Level High	01
LOR-1PM07J-A502	SGTS Primary Fan Automatic Trip	01
LOS-VG-M1	Standby Gas Treatment System Operability Test	24

Simulator Operator Instructions

Initial Setup

1. Recall IC-**49** (Power reduced to 85% for rod set).
2. Place simulator in RUN.
3. Load and run the setup CAEP written for this scenario (**esg1.1.cae** on floppy disc)
4. Post the FCL Greater Than 100% placard.
5. Ensure Hotwell Level is near the bottom of the green band (set cnm2htws = 4.5E6).
6. Ensure CY Tank Level is near 20 feet (set cfm1cyts = 2.5E6).
7. Hang OOS cards for 1C RHR
8. Write T/S 3.5.1, 7 days, for 1C RHR being OOS
9. Provide marked up LOS-VG-M1 complete to step 2.

Event Triggers and Role Play

Event #

1. Withdraw Rods To 110% FCL
   a. No triggers

2. Perform LOS-VG-M1
   a. No triggers
   b. Turnover that procedure had been completed to step 2.

3. Control Rod Will Be Stuck
   a. **Trigger 3** is automatic on elevated drive pressure – to clear stuck rod mf.
   b. Role play for stuck rod IAW LOA-RD-101

4. Loss of Rod Position Indication for Control Rod
   a. No trigger. Malfunction will be inserted on initial setup
   b. Role play as QNE that movement of one notch in either direction is acceptable

5. RCIC Drain Pot Failure
   a. **Trigger 5** on request from lead evaluator
   b. No indications locally that would explain failure.

6. Unit 1 VG Fan Trips on Overload
   a. **Trigger 6** on request from lead evaluator
   b. Role play as operators
      (1) Fan motor seems hot, and no chattering at 74 relay.

7. RCIC Steam Supply Line Breaks
   a. **Trigger 7** on request from lead evaluator
   b. Role play as personnel in the field
      (1) Heavy steam in RCIC corner room
      (2) Steam on 740' RB

8. RCIC Steam Line Isolation Valve (1E51- F063) Fails
   a. **Triggers 8 & 18** are automatic on valve position
   b. Role Play – Too much steam in area to get to outboard valve

9. RCIC Steam Line Isolation Valve (1E51- F008) Fails
   a. **Trigger 9** is automatic on valve position
   b. Role Play –

LaSalle County Station

DYNAMIC SIMULATOR SCENARIO GUIDE

ILT CLASS 99-01 NRC EXAM

ESG 1.2

Rev. 0

08/07/2000

DEVELOPED BY:	Site Exam Developer	8-11-00 Date
APPROVED BY:	Facility Representative	8-11-00 Date

Scenario Outline

Facility: *LaSalle Station* **Scenario No.:** *ESG 1.2* **Op Test No.:** *1*

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

- *Unit 1 startup is in progress IAW LGP-1-1, step E.11, Heatup/Pressurization.*
- *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:

- *Control rods are being withdrawn to raise Rx power for mode change to OC1.*
- *1B RHR system is running for surveillance, LOS-RH-Q1 and is ready to be secured.*
- *Expect to have 1C RHR operable before mode change.*
- *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 1B RHR from surveillance LOS-RH-Q1.
3	CAEP	I	BOP SRO	1B RHR min flow valve 1E12-F064B fails to open.
4	MNI098	I	RO SRO	IRM C fails upscale. This results in half-scram 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	Rupture in OG piping results in loss of condenser vacuum.
7	MRD277 MRD278	M	ALL	Manual Scram/ATWS/Hydraulic lock of Scram Discharge Volume.
8	CAEP		BOP SRO	Trip of Bus 152.

* **(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 1B 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-F064B, 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 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 half-scram 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 rupture occurs in the OG piping that will result in a loss of condenser vacuum and ultimately a loss of the main condenser. The BOP/RO should acknowledge/announce the applicable OG system alarms and refer to the alarm procedures. The SRO should direct the RO to scram the reactor when he/she 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 trip of bus 152. RPV normal injection sources will be limited to RCIC and CRD.

Critical Steps

1. Crew initiates a manual scram before reactor pressure reaches the auto scram setpoint (1043 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.

Shift Turnover Information

⇒ **Day of week and shift**

- Monday Day Shift

⇒ **Weather conditions**

- No adverse whether 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
♦ 300 MWt	♦ 3454 MWt
♦ 0 MWe	♦ 1149 MWe
♦ 37 Mlbm/hr CORE FLOW	♦ 107 Mlbm/hr CORE FLOW

⇒ **Thermal Limit Problems/Power Evolutions**

♦ Unit 1 startup is in progress IAW LGP-1-1, step E.11, Heatup/Pressurization.	♦ None
♦ Control rods are being withdrawn to increase CTP for mode change to OC1.	♦

⇒ **Existing LCOs, date of next surveillance**

♦ T/S 3.5.1, 7 days for 1C RHR	♦ None
♦	♦

⇒ **LOSs in progress or major maintenance**

♦ 1C RHR Pump OOS for breaker repair.	♦ None
♦ 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)
♦ Unit 1 is in a Division 2 work week.	♦ Unit 2 is in a Division 2 work week.
♦ Turbine shell warming is in progress.	
♦ 1B RHR has been running for greater than 30 minutes for LOS-RH-Q1 and is now ready to be shutdown.	

Operator Actions

Event No.(s): 1.2.1		**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	Per LGP-1-1
		• Continue to increase CTP with control rod withdrawal. Do NOT allow CTP to increase above 12% in Startup Mode.
		  ° Monitor IRM and APRM recorders.
		  ° Verify Main Turbine BPVs open as reactor power increases.
		
		Per LOP-RM-01:
		• 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:
		  ° 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.

	SRO	• 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): 1.2.2, 1.2.3		**Page** 1 **of** 2
Description: The SRO directs the BOP to secure the 1B RHR pump which has been running for LOS-RH-Q1. An instrument failure will prevent the min flow valve, 1E12-F064B, from opening on the system flow decreases.		
Initiation: Following shift turnover on the signal of lead examiner		
Cues: Annunciator 1H13-P601-B306, does not clear as system flow is reduced		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	Per LOS-RH-Q1, Att. 1B: • VERIFY B RHR Pump motor has ran a minimum of 30 minutes. • CLOSE 1E12-F024B, B RHR Test to SP Vlv. • VERIFY 1E12-F064B, B RHR Min Flow Vlv OPENS as flow decreases. ° Operator recognizes failure of 1E12-F064B to open. ° Reports problem to SRO. ° Opens 1E12-F064B with C/S and/or continues with pump shutdown. • STOP B RHR Pump 1E12-C002B. • OPEN 1E12-F048B, B RHR HX Bypass Valve. • If corner room temperature is less than 104 °F, VERIFY B/C RHR Pump Cubicle Cooler Fan 1VY03C has stopped. • If no longer required, SHUTDOWN DG Cooling Water Pump at 1PM01J. • On Panel 1H13-P601, verify RHR PMP dsch press LO alarm (B306) is clear. • 1E12-F031B, B RHR Pump Dsch Check Valve, check to close is satisfactory. If NOT satisfactory, REFER to LAP-300-46 for applicable actions. • At RB 673 inside B/C RHR Corner Room, after the RHR pump motor has cooled to ambient temperature, VERIFY RHR pump motor bearing oil reservoir levels are proper.

NOTES:

Operator Actions

Event No.(s): 1.2.2, 1.2.3		**Page 2 of 2**
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	Per LOR-1H13-P601-B306, RHR Pump 1B Injection Flow High: • VERIFY automatic action has occurred. • VERIFY RHR Pump flow is maintained above 1100 gpm per appropriate operating procedure to insure adequate flow for cooling. • If alarm does not function as required: ° VERIFY sensor is properly valved in. ° INITIATE appropriate corrective action. ° Instrument setpoint is specified in Technical Specification Section 3/4.3.3. ° NOTIFY Unit Supervisor.
	SRO	• 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: 1. Declare Flow instrument inoperable and enter 24hr to trip/7days to restore timeclock (T/S 3.3.3) 2. Declare 1B LPCI inoperable and enter 24hr to restore timeclock (T/S 3.5.1). • Enforces OPS expectations and standards
Terminus: 1B RHR system shutdown. Applicable timeclocks started		

NOTES:

Operator Actions

Event No.(s): 1.2.4, 1.2.5	**Page** 1 **of** 2

Description: IRM C fails (inop trip) resulting in a half-scram on RPS bus A.. The crew 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.

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	Per LOR-1H13-P603-B304, Channel A IRM HI-HI/INOP:
		• 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 3/4.3.1.
		• NOTIFY Unit Supervisor.
		
		Per LOA-NR-101,
		• 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:
		  ° Digital indication.
		  ° Pens tracking.
		• Check IRM indications on 1H13-P603 and 1H13-P635/636 -NORMAL.
		• If IRM inop, BYPASS the IRM.
		  ° Refer to Tech Spec 3.3.1 and 3.3.6.
		  ° Contact QNE.

NOTES:

Operator Actions

Event No.(s): 1.2.4, 1.2.5		**Page** 2 **of** 2
Time	**Position**	**Applicant's Actions or Behavior**

	RO	Per LOA-RP-101
		• 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:
		  ° Replace affected bulb.
		  ° If light remains de-energized, immediately insert a half scram on the affected RPS Bus.
		• Check if affected 1C71-F18 fuse is blown at panels 1H13-P609 and P611.
		  ° Replace blown fuse
		  ° Reset half scram.
		• Verify proper rod position per OD-7 Option 2.

	SRO	• 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: 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:

Operator Actions

Event No.(s): 1.2.6		**Page 1 of 2**
Description: A rupture occurs in the OG piping that will result in a loss of condenser vacuum and ultimately a loss of main condenser availability.		
Initiation: On the signal of lead examiner.		
Cues: Annunciator LOR-1PM03J-B511, Condenser Vacuum Low		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	Per LOR-1PM03J-B511, Condenser Vacuum Low: • Monitor Condenser Vacuum Indication. • 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.

Critical Task	RO	Per LOR-1PM03J-B511, Condenser Vacuum Low:
		• 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.
		  ° With the turbine off line, RO should initiate a manual reactor scram prior to receiving an automatic scram on high Rx pressure or power.
		Per LGP-3-2 Attachment E (hardcard):
		• Arm and Depress scram pushbuttons
		• Place mode switch in Shutdown
		• Insert IRMs and SRMs
		• Check rods in and power decreasing
		  ° 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 <1043 psig

NOTES:

Operator Actions

Event No.(s): 1.2.6		**Page** 2 **of** 2
Time	**Position**	**Applicant's Actions or Behavior**
Critical Task	SRO	Specific: • 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. General: • 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-101-501.
Terminus: This failure will lead to an automatic or manual reactor scram		

NOTES:

Operator Actions

Event No.(s): 1.2.7, 1.2.8		**Page** 1 **of** 2
Description: A scram discharge volume hydraulic lock will cause an ATWS on a manual or automatic scam. Overall plant control will be further complicated by a trip of bus 152. RPV normal injection sources will be limited to RCIC and CRD.		
Initiation: Will occur automatically on a manual or automatic scram.		
Cues: Numerous rods remain out after auto/manual scram		
Time	**Position**	**Applicant's Actions or Behavior**
Critical Task	RO	Per LGA-NB-01, Alternate Rod Insertion: • 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 ° As necessary, coordinates Attachment 1B to defeat scram trip relays. ° As necessary, resets/defeats ARI. ° 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 to the Unit Supervisor when all control rods are FULL-IN • Performs additional EOP actions as directed by SRO ° 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	Per LOA-AP-101 for a loss of Bus 152: • Check if alarm 1PM01J-A206 for over-current condition • Dispatch operator to check targets and signs of damage at BUS 152 • Determine and correct cause of over current before reenergizing bus. Note: Operator should normally not start a condensate pump w/o first performing a system fill and vent.

NOTES:

Operator Actions

Event No.(s): 1.2.7, 1.2.8 **Page** 2 **of** 2

Time	Position	Applicant's Actions or Behavior
	BOP	• Performs EOP actions as directed by SRO ° Inhibits ADS and prevents ECCS injection ° Starts suppression pool cooling • Coordinates with RO to control pressure with SRVs
Critical Task	SRO	Directs entry into EOPs and EOP actions as entry conditions are met. Per LGA-10 as directed from LGA-01: • Per the Power Leg directs the following: ° 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: ° Hold level between -150 and +55.5 inches ° If/When can't hold level >-189 (-150) inches, enters LGA-06 General: • 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-101-501.

Terminus:
- All rods fully inserted (or proper actions in progress).
- RPV level stable and under control in required band.
- Upon approval of lead examiner.

NOTES:

REFERENCES

Procedure	Title	Revision
LGA-001	RPV Control	00
LGA-010	Failure to Scram	00
LGA-NB-01	Alternate Rod Insertion	05
LGA-RH-103	Unit 1 RHR operations in the LGAs	02
LGP-1-1	Normal Unit Startup	62
LGP-3-2	Reactor Scram	42
LOA-NR-101	Neutron Monitoring Trouble	01
LOA-RP-101	Unit 1 Loss of RPS Power	03
LOP-RH-05	Operation of RHR Service Water System	20
LOP-RH-13	Suppression Pool Cooling Operation	22
LOP-RM-01	Reactor Manual Control Operation	14
LOR-1H13-P603-B304	Channel A IRM HI-HI/INOP	00
LOR-1PM03J-B511	Condenser Low Vacuum	01

Simulator Operator Instructions

Initial Setup

1. Recall **IC-36** (S/U in progress at 935 psig, ½ BPV, pulling rods for mode change to OC1).
2. Place simulator in RUN.
3. Verify RWM sequence loaded
4. Load and run the setup CAEP written for this scenario (**esg1.2.cae** on floppy disc)
5. Ensure Hotwell Level is near the bottom of the green band (set cnm2htws = 4.5E6).
6. Ensure CY Tank Level is near 20 feet (set cfm1cyts = 2.5E6).
7. Hang OOS cards for 1C RHR
8. Write T/S 3.5.1, 7 days, for 1C RHR being OOS

Event Triggers and Role Play

Event #

1. Withdraw Rods To Raise Power for Mode Change to OC1
   a. No triggers

2. Shutdown 1B RHR From LOS-RH-Q1
   a. No triggers

3. 1E12-F064B 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.

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.

6. Rupture of Off Gas Piping From Main Condenser
   a. **Trigger 6** on request from lead evaluator
   b. Role play as operators
      (1) Perform actions for LOP-OG-02 as directed
      (2) If dispatched to heaterbay, report severe air leak along A hood but can't determine where.

7. ATWS/Hydrualic 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. Trip of bus 152
   a. **Triggers 8** automatic on reactor scram
   b. Role Play – No signs of damage at bus. Over current target up.

LaSalle County Station

DYNAMIC SIMULATOR SCENARIO GUIDE

ILT CLASS 99-01 NRC EXAM

ESG 1.3

Rev. 0

08/08/2000

DEVELOPED BY:	Site Exam Developer	8-11-00 Date
APPROVED BY:	Facility Representative	8-11-00 Date

Facility: *LaSalle Station* **Scenario No.:** *ESG 1.3* **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-CM-M1 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-CM-M1, start both Post-LOCA H2/O2 monitors IAW LOP-CM-02.
3	CAEP	I	BOP SRO	Div 1 Post LOCA H2/O2 Monitor fails upscale.
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	MCF123	I	RO SRO	Output signal from the TDRFP A manual-auto (M/A) control station fails low.
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
1.3.1	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.
1.3.2	The SRO should also direct the BOP to complete LOS-CM-M1. The BOP will need to start both Post-LOCA hydrogen-oxygen monitors in accordance with LOP-CM-02.
1.3.3	After both Post-LOCA hydrogen-oxygen monitors are started, the Division 1 monitor O_2 channel will fail upscale. The crew will have to address the tech spec requirements for the monitor being inoperable.
1.3.4	When the crew has addressed the containment monitoring 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.
1.3.5	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.
1.3.6	Once the crew has restored seal injection, the output signal from the TDRFP A manual-auto (M/A) control station will fail low. As a result, TDRFP A will be driven to minimum speed. The RO may attempt to stabilize reactor water level; however, if the RO/SRO determines that water level cannot be stabilized, the RO should manually scram the reactor and carry out the actions of LGP 3-2.
1.3.7	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).
1.3.8	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

1. Crew recognizes failure of Division 1 ECCS to initiate and take action to manually initiate Division 1 logic and systems as required.

2. 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 whether conditions expected in the next 24 hours

⇒ **(Plant power levels)**

♦ Unit 1 - 85% Power/101% FCL	♦ Unit 2 – 100% Power
♦ 2965 MWt	♦ 3454 MWt
♦ 945 MWe	♦ 1149 MWe
♦ 85 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
♦	♦ 3454 MWt

⇒ **LOSs in progress or major maintenance**

♦ LOS-CM-M1, continue at step for running Post LOCA H2/O2 Monitors	♦ 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 Division 2 work week.
♦ TLO Temperature controller in manual.	

Operator Actions

Event No.(s): 1.3.1		**Page 1 of 1**
Description: After the crew has taken the shift, the SRO should direct the RO to continue 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	Per LGP-3-1: • 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. Per LOP-RR-07: • Verify manual light on recirculation loop flow controller M/A station A/B is ON. Change flow evenly in both loops by pressing RAISE/LOWER buttons and observing flow indication to flow conrtoller M/A station.
	SRO	• 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:

Operator Actions

Event No.(s): 1.3.2 **Page** 1 **of** 1

Description: The SRO should also direct the BOP to complete LOS-CM-M1. The BOP will need to start both Post-LOCA hydrogen-oxygen monitors in accordance with LOP-CM-02.

Initiation: Following shift turnover on the signal of lead examiner

Cues: Directed by SRO

Time	Position	Applicant's Actions or Behavior

	RO	Per LOS-CM-M1:
		• Start Post-LOCA Containment Monitoring System A and B per LOP-CM-02.
		• Record both division O2 readings and calculate the differentials.
		• Record both division H2 readings and calculate the differentials.
		• Shutdown to standby Post-LOCA Monitor Systems A and B per LOP-CM-02.
		
		Per LOP-CM-02
		• Prior to placing Post LOCA H2/O2 Monitoring System in analyze, refer to T/S 3.4.3.1 to determine if 1(2)PL75J should be shutdown or left in operation.
		• If securing 1(2)PL75J, perform the following.
		  ° At 1(2)PM13J, STOP 1(2)PL75J, Pri Cnmt Cam Smpl Pmp.
		  ° At 1(2)PL75J, close 1(2)CM035, PC CAM Panel 1(2)PL75J Inlet Stop.
		• To sample DW, place 1(2)A Post LOCA H2/O2 Monitor Isol Vlvs in DW.
		• To sample SC, place 1(2)A Post LOCA H2/O2 Monitor Isol Vlvs in SP.
		• At 1(2)PM13J:
		  ° Depress 1(2)A Post LOCA Remote Control Selector.
		  ° Verify 1(2)A Post LOCA Mon 1(2)PL76J Function Selector in sample.
		  ° Place 1(2)A Post LOCA Mon 1(2)PL76J Mode Selector in analyze.
		  ° Monitor H2 and O2 concentrations on recorders at 1(2)PM13J.

	SRO	• 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 Post LOCA H2/O2 Monitors in operation in analyze mode.

NOTES:

Operator Actions

Event No.(s): 1.3.3		**Page** 1 **of** 2
Description: After both Post-LOCA hydrogen-oxygen monitors are started, the Division 1 monitor H_2 channel will fail upscale.		
Initiation: After both Post LOCA monitors are in operation, on the signal of lead examiner.		
Cues: Annunciator LOR-1PM13J-A103, recorder indication upscale		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	Per LOR-1PM13J-A1031 • Verify Post-LOCA sample system mode switch is in standby or analyze. • If power ON light is OFF at 1PM13J, then verify 120 VAC Ckt Bkr #5 at MCC 135X-1 is ON. • If Drywell percent Hydrogen is >2%, enter LGA-03, Primary Containment Control. • Notify Unit Supervisor.
	SRO	• 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 the division 1 Post LOCA H2/O2 Monitor inoperable and performs the actions of T/S 3.3.7.5: ° Enters 30 day timeclock to restore to operable.
Terminus: SRO has declared monitor inop and entered appropriate timeclocks.		

NOTES:

Operator Actions

Event No.(s): 1.3.4		**Page** 1 **of** 2
Description: When the crew has addressed the containment monitoring problem. a trip of the running Instrument Nitrogen (IN) compressor will occur.		
Initiation: After crew has addressed the failed Post LOCA instrument, on the signal of lead examiner.		
Cues: Annunciator LOR-1PM13J-A404 alarming		
Time	**Position**	**Applicant's Actions or Behavior**

	BOP	Per LOR-1PM13J-A404, Instrument Nitrogen System Trouble:
		• If alarm is due to R0103 1A Instr N2 Comp O/L Trip
		  ° 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:
		  ▪ If available, 1B Drywell Pneumatic compressor in HAND.
		  ▪ 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.
		
		Per LOA-IN-101:
		• 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
		  ° RESTART system per LOP-IN-01.

NOTES:

Operator Actions

Event No.(s): 1.3.4		**Page** 2 **of** 2
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	Per LOA-IN-101 (continued) • 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.
	SRO	Specific: • 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 ° Refers to T/S 3.6..6.2, Drywell and Suppression Chamber Oygen Concentration General: • 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:

Operator Actions

Event No.(s): 1.3.5		**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, • 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. ° 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. ° 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. ° 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.
	SRO	• 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 initate repairs.
Terminus: TDRFP Seal Injection Pump running and hi temperature alarms clear		

NOTES:

Operator Actions

Event No.(s): 1.3.6		**Page** 1 **of** 1
Description: Once the crew has restored seal injection, the output signal from the TDRFP A manual-auto (M/A) control station will fail low. As a result, TDRFP A will be driven to minimum speed.		
Initiation: After crew has restored TDRFP Seal Injection, on the signal of lead examiner.		
Cues: Annunciator LOR-1H13-P603-A409 alarming, Lowering RPV level		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	Per LOR-1H13-P603-A409: • Check Rx Vessel level less than or equal to alarm setpoint. • If Automatic Level Control has malfunctioned, refer to LOA-FW-101. • If only one TDRFP running, and Rx Water level reaches Level 4 (31.5"), VERIFY RR Flow Control Valves RUNBACK to minimum position. Per LOA-FW-101 • Verify all TDRFP M/A Xfr Stations are in manual. • Check MDRFP shutdown. • Stabilize reactor water level using feedpump M/A stations or TDRFP manual backup stations by initially matching feedwater flow with steam flow. • Check selected reactor water level instrument is operating properly. • Check reactor water level >12.5 inches and < 55.5 inches. • Check S/U controller deviations and indications normal. • Check steam flows and feed pump flows are normal. • Do not use 3 element auto until all feedpump flow indication is operable.
	SRO	• 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, RWLC in manual, or Reactor scram		

NOTES:

Operator Actions

Event No.(s): 1.3.7, 1.3.8		**Page 1 of 4**
Description: Once the reactor is manually scrammed or reactor water level is stabilized, a major steam leak 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 drywell spray		
Initiation: Conditions stable following RWLC failure, or shortly after reactor scram if RPV level control is lost.		
Cues: Multiple annunciators for High DW pressure		
Time	**Position**	**Applicant's Actions or Behavior**

	RO	When RO/BOP recognize indications of LOCA:
		Per LGP-3-2 Attachment E (hardcard):
		• 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
		
		Performs additional EOP actions as directed by SRO
		• Coordinates with BOP to maintain/restore RPV level in band specified using preferred injection systems
		• Monitors RPV parameters
		  ° Report lowering RPV level/pressure (value, rate, trend)
		  ° Report indications of steam line break

NOTES:

Operator Actions

Event No.(s): 1.3.7, 1.3.8		**Page 2 of 4**
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	Makes plant announcement for reactor scram Verifies needed auto actions (PCIS, ECCS)
Critical Task		• Report failure of Division 1 systems to initiate on LOCA condition • Manually initiates/starts division 1 ECCS

		Performs additional EOP actions as directed by SRO
		• Starts 2 loops of suppression pool cooling
		  ° Startup RHR Service Water as follows:
		  ♦ 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.
		  ♦ Throttle 1E12-F024A/B open.
		  ♦ Throttle 1E12-F048A/B closed.
		• Initiates Suppression Chamber Spray

Critical Task		• 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:

Operator Actions

Event No.(s): 1.3.7, 1.3.8		**Page 3 of 4**
Time	**Position**	**Applicant's Actions or Behavior**

Critical Task	SRO	Directs entry into EOPs and EOP actions as entry conditions are met.
		
		Per LGA-001:
		• Directs RO to control RPV level 12.5-55.5 inches.
		
		Per LGA-003:
		• Per Primary Containment Pressure Leg, directs the following:
		  ° Spray the Suppression Chamber before pressure reaches 8 psig
		  ° When SC pressure is 8 psig, then
		  ♦ VERIFY within the limits of the DSL
		  ♦ TRIP all RR pumps
		  ♦ SPRAY the Drywell (per LGA-RH-103)
		  ° If SC pressure can't be maintained below the PSP limits, initiate ADS IAW LGA-004.
		• Per Drywell Temperature Leg, directs the following:
		  ° 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:
		  ° 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
		  ° Monitor Suppression Pool Level (-4.5 to +3.0 inches)
		• Hydrogen Leg
		  ° Start Hydrogen and Oxygen Monitors (per LGA-CM-01)

NOTES:

Operator Actions

Event No.(s): 2.3.7, 2.3.8, 2.3.9		**Page 4 of 4**
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	Directs entry into EOPs and EOP actions as entry conditions are met. Per LGA-04 directs the following (if RPV blowdown required) • Verify SP level >-18 feet • Initiate ADS • Verify 7 SRVs open • Wait until Shutdown Cooling interlocks clear General: • 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:
- 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:

REFERENCES

Procedure	Title	Revision
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 H2/O2 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-CM-02	Operation of Post LOCA H2/O2 Monitoring System	19
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
LOS-CM-M1	Monthly Accident Monitoring Instrument Channel Check	19

Simulator Operator Instructions

Initial Setup

1. Recall IC-**49** (Power reduced to 85% for rod set).
2. Place simulator in RUN.
3. Load and run the setup CAEP written for this scenario (**esg1.3**.cae on floppy disc)
4. Post the FCL Greater Than 100% placard.
5. Ensure Hotwell Level is near the bottom of the green band (set cnm2htws = 4.5E6).
6. Ensure CY Tank Level is near 20 feet (set cfm1cyts = 2.5E6).
7. Hang OOS cards for 1C RHR
8. Write T/S 3.5.1, 7 days, for 1C RHR being OOS

Event Triggers and Role Play

Event #

1. Raise Power with RR Flow
   a. No triggers
   b. Role play for rounds operators as necessary

2. Perform LOS-CM-M1
   a. No triggers
   b. Role play for operator actions at 1PL15J/1PL75J
      (1) Crew should elect to secure the 1PL75J
      (2) Operate the 1CM035/36 as requested – not modeled

3. Div 1 Post LOCA H2 Monitor Fails Upscale
   a. **Trigger 3** on request from lead evaluator
   b. Role play for operator actions at HD racks

4. 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

5. 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

6. Output Signal from 1A TDRFP M/A Station Fails Low
   a. **Trigger 6** on request from lead evaluator
   b. Role play as necessary

7. Division 1 Containment Monitoring Instrument Line Broken
   a. No Trigger, malfunction inserted on initial setup
   b. Role play as necessary

8. Steam Leak Inside Primary Containment
   a. **Trigger 8** on request from lead evaluator, or shrtly after scram if level control is lost

LaSalle County Station

DYNAMIC SIMULATOR SCENARIO GUIDE

ILT CLASS 99-01 NRC EXAM

ESG 2.1

Rev. 0

08/08/2000

DEVELOPED BY:	Site Exam Developer	8-11-00 Date
APPROVED BY:	Facility Representative	8-11-00 Date

Facility: *LaSalle Station* **Scenario No.:** *ESG 2.1* **Op Test No.:** *2*

Examiners: _____ **Operators:** _____

Initial Conditions:

- *Unit 1 is operating at 85% reactor power with flow control line at 105%.*
- *TLO Temperature controller in manual.*
- *1A GC pump is OOS for alignment.*
- *HPCS is OOS to megger and inspect motor.*
- *Online Safety level is green.*
- *Unit 2 is operating at 100% power.*

Turnover:

- *Unit 1 is in a Division 3 work week.*
- *LOS-DG-M3 is scheduled to be performed this shift.*

Event No.	Malf. No.	Event Type*		Event Description
1	N/A	N	BOP SRO	Monthly operability surveillance for EDG.
2	MRD279	I	RO SRO	Output for the control rod drive (CRD) flow controller fails high.
3	MRD070	C	RO SRO	Control rod drift.
4	N/A	R	RO SRO	Reduce core flow by 15 Mlbm due to CRD drift.
5	MNB101	I	BOP SRO	Main generator hydrogen high temperature.
6	MCF081	I	RO SRO	1B TDRFP flow instrument fails downscale.
7	CAEP	M	BOP SRO	RCIC fails upon initiation (1E51-F045 trips).
8	MCF033		ALL	Large break in feedwater line (steam tunnel).
9	MNB038		BOP SRO	SRVs "S" and "U" fail to open on ADS initiation.

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

NARRATIVE SUMMARY

Event(s)	Description
2.1.1	Once the crew has accepted the unit, the SRO should direct the BOP to complete the monthly operability surveillance for the EDG. The BOP will need to synchronize the EDG to the grid and step load it to 2600 KW.
2.1.2, 3, 4	After the DG has been loaded, the output for the control rod drive (CRD) flow controller fails high. Moments later, a control rod begins to drift in from high cooling water pressure/flow. The actual sequence of actions may vary at this point. The RO may immediately recognize the flow controller failure and begin to take action or may not notice until after the rod drift begins. In either case, once the rod begins to drift, actions should be prioritized to mitigate the consequences of the drifting rod. The immediate action should be to determine which rod is drifting, watch for any additional drifting rods (which requires a scram), and refer to LOA-RD-101 for guidance. Subsequently, the procedure will have the operators command an insert signal to position 00 and reduce core flow by 15 Mlbm. Next, the operators will need to respond to the failed flow controller output by placing the controller in manual and returning flow to normal in accordance with the same LOA.
2.1.5	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 an EO 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.
2.1.6, 7	After main generator temperature is under control, the 1B TDRFP flow instrument will fail downscale. As a result, the TDRFP will ramp to maximum speed. The RO should recognize this failure and place the RWLC System in manual. If the RO is slow in responding, or is unable to control RPV level, an auto or manual scram may result. In any event, as RPV level drops and RCIC starts (auto start at –50" or manual start), the breaker for the RCIC turbine steam inlet valve, 1E51-F045, will trip. This prevents RCIC from running.
2.1.8, 9	Shortly after the feedwater transient, a large break in one of the feedwater lines occurs in the main steam tunnel area of secondary containment. The crew will have to recognize the high energy line break and take action to isolate feedwater (there is no automatic isolation for feedwater). Once the operators recognize that condensate and feedwater are unavailable, they will attempt to start RCIC and other available injection sources. However, as mentioned above, RCIC will not start. The MSIVs may have closed on high steam tunnel temperature from the feedwater break. This could prevent depressurization with the turbine bypass valves. The SRO should enter the LGAs for reactor pressure and level control and secondary containment control. When level drops to the top of active fuel (TAF), the crew should perform an emergency depressurization. When ADS logic is initiated, two SRVs, "S" and "U", will fail to open. The BOP operator will have to recognize this failure and open two additional SRV's for a total of seven open.

Critical Steps

1. Crew recognizes high energy line break in secondary containment and takes steps to isolate the Feedwater system from the break.

2. Crew performs an emergency depressurization when RPV level can't be maintained above TAF

Shift Turnover Information

⇒ **Day of week and shift**

- Monday Day Shift

⇒ **Weather conditions**

- No adverse whether conditions expected in the next 24 hours

⇒ **(Plant power levels)**

♦ Unit 1 - 85% Power/107% FCL	♦ Unit 2 – 100% Power
♦ 2965 MWt	♦ 3454 MWt
♦ 1000 MWe	♦ 1149 MWe
♦ 93 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
♦ .	♦

⇒ **Existing LCOs, date of next surveillance**

♦ T/S 3.5.1, 14 days for HPCS	♦ None
♦ Att 1D of LOS-AA-W1 1/8 hours	♦

⇒ **LOSs in progress or major maintenance**

♦ LOS-DG-M3, continue at step 2 of Att 1B-Idle for running the 1B DG	♦ None
♦ 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 Green (RAW = 1.0)	♦ Online Safety is Green (RAW = 1.0)
♦ The Unit 1 is in a Division 3 work week.	♦ The Unit 2 is in a Division 2 work week.
♦ TLO Temperature controller in manual.	

Operator Actions

Event No.(s): 2.1.1 **Page** 1 **of** 1

Description: Once the crew has accepted the unit, the SRO should direct the BOP to complete the monthly operability surveillance for the EDG. The BOP will need to synchronize the EDG to the grid and step load it to 2600 KW.

Initiation: Following shift turnover on the signal of lead examiner

Cues: Directed by SRO

Time	Position	Applicant's Actions or Behavior
	BOP	Per LOS-DG-M3 • Verify 1B Diesel Gen Cooling Wtr Pmp control switch in normal. • Direct EO to perform steps for local start. • Record time and date of start. • Verify 1B Diesel Gen Cooling Wtr Pmp 1E22-C002 running. • Direct EO to complete steps for local start. • Place 1B Diesel Gen Control Selector switch in remote manual. • Verify proper DG frequency and volts. • Place 1B DG/143 Synchronizing (synchroscope select) Switch to ON. • Adjust Speed until synchroscope rotates slowly in the fast direction. • Adjust Incoming Volts until it is slightly above Running Volts. • When synchroscope is just before 12 o'clock, close ACB 1433. • Place 1B DG/143 Synchronizing (synchroscope select) Switch to OFF. • Slow LOAD DG as follows: ° Load to 1000-1300 KW and 350-750 kvar, maintain for two minutes. ° Load to 1750-2000 KW and 500-1300 kvar, maintain for two minutes. ° Load to 2400-2600 KW and 650-1750 kvar. • Record Time/Date Diesel Generator loaded to 2400 KW. • Direct EO to perform DG local running checks
	SRO	• 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: DG loaded to 2400-2600 KW.

NOTES:

Operator Actions

Event No.(s): 2.1.2, 2.1.3, 2.1.4	**Page** 1 **of** 2

Description: After the DG has been loaded, the output for the control rod drive (CRD) flow controller fails high. Moments later, a control rod begins to drift in from high cooling water pressure/flow. Procedure requirements will include directions to reduce reactor power by 75 MWe.

Initiation: Following 1B DG loading, on the signal of lead examiner

Cues: Annunciator for control rod drift, CRD system flows and pressures outside normal bands.

Time	Position	Applicant's Actions or Behavior
	RO	Per LOR-1H13-P603-A504 (for control rod drift): • Check all control rods. • If more than one rod has drifted / scrammed, manually scram Reactor. • If the alarm is unexpected, reduce core flow by at least 15 million lbs/hr, but DO NOT go below 60 million lbs/hr. • Refer to LOA-RD-101, Control Rod Drive Abnormal. Per LOA-RD-101 (for control rod drift): • Check control rods - only one rod drifted/scrammed. • Verify core flow dropped 15 M#/hr. minimum. • Select drifting/scrammed rod. • Check insert block light – OFF at rod select matrix. • Insert rod to position 00 (full-in). • Check control rod remains at position 00. • Verify cooling water -normal: • Notify QNE • Obtain OD-7 option 2. • Check all other control rods are in their correct sequence positions. • Declare control rod inoperable and refer to Tech Spec 3.1.3.1. • Investigate cause of drift/scram.

NOTES:

Operator Actions

Event No.(s): 2.1.2, 2.1.3, 2.1.4		Page 2 of 2
Time	**Position**	**Applicant's Actions or Behavior**

	RO	Per LOA-RD-101 (for flow control failure):
		• Check CRD parameters in normal range.
		• Transfer Flow Controller, 1C11-R600, to manual.
		• Adjust Flow Controller Output using open/close pushbuttons to obtain a CRD system flow of approximately 60 gpm.
		• Check Flow Control Valve controlling flow at approximately 60 gpm. If not:
		  ° Place Inservice Flow Control Valve in local manual operation as follows:
		  ° Adjust Manual/Auto Station 1C11-D009A/B, to minimum.
		  ° Position Manual/Auto Station Manual/Auto switch to Manual.
		  ° Slowly raise valve percent open setpoint tape to obtain approximately 60 gpm flow as indicated on local indicator 1C11-R019.
		  ° Check Flow Control Valve controlling flow at approximately 60 gpm.
		  ° If FCV is NOT controlling at approximately 60 gpm, transfer to Standby Flow Control Valve per Attachment B.
		
		Per LGP-3-1
		• Remove condensate polishers from service when no longer needed.
		• Maintain Condensate System Flow per LOP-CD-03 as measured through the condensate polishers, while continuing to perform the following steps.
		• For a power decrease to a final power > 60%, perform the following:
		  ° Reduce core flow to approximately 70 Mlbm/hr, per LOP-RR-07 at a rate up to 300 MWe/hr

	SRO	• On transient, positions himself as command authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. • Declare control rod inoperable and refer to Tech Spec 3.1.3.1. ° W/I 1 hour, disarm associated directional control valves. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications IAW OP-AA-101-501.
Terminus: Core flow reduced by 15 M#/hr, drifting rod fully inserted, CRD flow control restored		

NOTES:

Operator Actions

Event No.(s): 2.1.5 **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 recovery from rod drift and on the signal of lead examiner.

Cues: Annunciators 1PM02J-B101 and 1PM02J-B301

Time	Position	Applicant's Actions or Behavior
	BOP	Per LOR-1PM02J-B101: • 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-1PL19JB-1-3: • CHECK 1TI-WS001, Generator Cold Gas Temp, > 51°C or < 30°C. • PLACE 1TK-WS0C1, Gen H2 Coolers Temp Contlr, in MANUAL and POSITION 1WS043, Gen H2 Coolers WS Outlet Temperature Control Valve, to maintain Generator Cold Gas Temperature between 30°C to 56°C. • If Cold Gas Temperature can NOT be controlled using 1TK-WS0C1: ° Concurrently THROTTLE open 1WS045, Gen H2 Coolers WS Outlet TCV 10" Bypass Stop Valve and THROTTLE closed 1WS042, Gen H2 Coolers WS Outlet TCV Upstream Stop Valve. ° Continuously MONITOR 1TI-WS001, Generator Cold Gas Temp. ° ADJUST 1WS045 to maintain Cold Gas Temperature 30°C-56°C. • If Generator Cold Gas Temperature exceeds 56°C on 1TI-WS001 or Hydrogen Cooler H2 Inlet Temperatures exceed 72°C (computer points G237, G239), 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 temperature. • VERIFY H2 Coolers are vented per LOP-GA-03, H2 Cooler Operation.
	SRO	• 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: Main generator H2 temp below alarm setpoint with control restored in manual

NOTES:

Operator Actions

Event No.(s): 2.1.6 **Page** 1 **of** 1

Description: The 1B TDRFP flow instrument will fail downscale. As a result, the TDRFP goes to maximum speed. The RO will have to take manual control of FW.

Initiation: On the signal of lead examiner.

Cues: Annunciator 1H13-P603-A309 on hi RPV level, rising flow and speed on 1B TDRFP

Time	Position	Applicant's Actions or Behavior
	RO	Per LOR-1H13-P603-A309: • Check Rx Vessel level greater than or equal to alarm setpoint. • If Automatic Level Control has malfunctioned, refer to LOA-FW-101. • If TDRFP flow setback has initiated, reduce flow demand within 30 seconds to avoid a repeat flow excursion. • If control of TDRFP can NOT be established, TRIP malfunctioning Feed Pump prior to reaching Level 8. • If control of RPV level has been re-established prior to automatic protective action, station an additional NSO in CR to monitor and control RPV level. • If a TDRFP was manually tripped, and Rx Water level reaches Level 4 (31.5"), VERIFY RR Flow Control Valves RUNBACK to minimum position. Per LOA-FW-101 • Verify all TDRFP M/A Xfr Stations are in manual. • Check MDRFP shutdown. • Stabilize reactor water level using feedpump M/A stations or TDRFP manual backup stations by initially matching feedwater flow with steam flow. • Check selected reactor water level instrument is operating properly. • Check reactor water level >12.5 inches and < 55.5 inches. • Check S/U controller deviations and indications normal. • Check steam flows and feed pump flows are normal. • DO not use 3 element auto until all feedpump flow indication is operable.
	SRO	• 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, RWLC in manual, or Rx scram

NOTES:

Operator Actions

Event No.(s): 2.1.7 **Page** 1 **of** 1

Description: RCIC fails on initiation signal (1E51-F045 trips). Steps for a manual reactor scram are also included here should RPV level control be lost during the previous event.

Initiation: On the signal of lead examiner or automatically if RPV level control is lost.

Cues: Annunciator 1H13-P603-B505 or 1H13-P601-D405 on low or high RPV level

Time	Position	Applicant's Actions or Behavior
	RO	Per LGP-3-2 Attachment E (hardcard): • 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 and power is decreasing • Operate FW to control level 12.5 to 55.5 inches • Report level and pressure are following expected trends • Verified RR downshifted to slow speed • Verify turbine and generator are tripped • Stabilize pressure <1043 psig
	BOP	• Makes plant announcement for reactor scram Per LOR-1H13-P601-D104 (RCIC trip): • Verify auto closure of Trip & Throttle valve, injection valve, and Min flow vlv. • Verify closed the steam supply valve and LO cooler supply valve. • Determine cause of trip and reset if possible IAW LOP-RI-04. • If cause of trip cannot be determined, shutdown RCIC IAW LOP-RI-03. • Notify SRO of RCIC failure
	SRO	• 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: This event will lead directly into the major transient

NOTES:

Operator Actions

Event No.(s): 2.1.8, 2.1.9 **Page** 1 **of** 2

Description: A large break in one of the feedwater lines occurs in the main steam tunnel area of secondary containment. If/when ADS logic is initiated, 2 SRVs will fail to open.

Initiation: On the signal of lead examiner, or immediately following reactor scram

Cues: High Temp Alarms in Secondary Containment, Lowering RPV level, SRV "S" & "U" not open after ADS initiated.

Time	Position	Applicant's Actions or Behavior
	RO	• Recognizes hi FW flow and indications of FW line break and reports to SRO. • Coordinates with BOP operator to monitor and control RPV level and press. Performs EOP actions as directed by SRO • Lines up CRD for alternate injection IAW LGA-RD-01 as directed
Critical Task Critical Task	BOP	• Reports secondary containment high temperature alarms to SRO • Should make plant announcement to evacuate turbine and reactor buildings. • Recognizes symptoms of FW line break and isolates Feedwater from the break (may also be recognized by the RO). Performs EOP actions as directed by SRO • Starts 2 loops of suppression pool cooling ° Startup RHR Service Water as follows: ♦ Start first RHR Service Water Pump. ♦ Open 1A/1B RHR Hx Service Water Outlet Valve. ♦ When indicated flow reaches 3000 gpm, START second pump. ° Start 1A/1B RHR Pump. ° Establish RHR flow of 1500 to 7450 gpm. ♦ Throttle 1E12-F024A/B open. ♦ Throttle 1E12-F048A/B closed. • Initiates ADS when RPV level reaches –150 inches. ° Recognizes failure of "S" and "U" SRVs to open on initiation of ADS. ° Manually open "S" & "U" SRVs or any 2 additional SRVs for a total of 7. • Restarts VR IAW LGA-VR-01 as directed. • Restarts VP IAW LGA-VP-01 as directed. • Starts H2/O2 Monitors IAW LGA-CM-01 as directed.

NOTES:

Operator Actions

Event No.(s): 2.1.8, 2.1.9		**Page 2 of 2**
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	• Directs entry into EOPs as entry conditions are met. Per LGA-001: • Directs RO to control RPV level 12.5-55.5 inches. • Directs BOP to inhibit ADS when RPV level cannot be maintained > -150". • Directs use of alternate injection systems to maintain RPV level. • Directs initiation of ADS IAW LGA-004 when RPV level drops to -150". • After RPV blowdown, directs restoration of level using preferred injection systems. Per LGA-002: • Directs RO and BOP to isolate FW an lines. May also direct isolation of RWCU lines, Main Steam lines and Main Steam line drains. • Directs restart of VR IAW LGA-VR-01 (as time and resources permit) Per LGA-003: • Directs use of all available suppression pool cooling. • Directs restoration of VP system IAW LGA-VP-01 (as time and resources permit) • Directs start of Post LOCA H2/O2 monitors IAW LGA-CM-01 (as time and resources permit).
Critical Task		
Critical Task		

Terminus:
- RPV level stable and under control above TAF
- RPV blowdown complete,
- Upon approval of lead examiner

NOTES:

REFERENCES

Procedure	Title	Revision
LGA-001	RPV Control	00
LGA-002	Secondary Containment Control	00
LGA-003	Primary Containment Control	00
LGA-004	RPV Blowdown	00
LGA-CM-01	Emergency Operation of Post LOCA H2/O2 Monitors	04
LGA-VP-01	Rx Bldg Ventilation Startup Following System Isolation	06
LGA-VR-01	Primary Containment Temperature Reduction	07
LGP-3-1	Power Changes	25
LGP-3-2	Reactor Scram	42
LOA-FW-101	Reactor Level/Feedwater Pump Control Trouble	03
LOA-RD-101	Control Rod Drive Abnormal	02
LOA-SRV-101	Unit 1 Stuck Open Safety Relief Valve	01
LOP-RM-01	Reactor Manual Control Operation	14
LOP-RR-07	Operation of RR Flow Control System	19
LOR-1H13-P601-D104	RCIC Turbine Trip	00
LOR-1H13-P603-A309	FW Control – Reactor Water Level Seven-High	00
LOR-1H13-P603-A504	Control Rod Drive Drift Alarm	01
LOR-1PL19JB-1-3	Generator 1 Machine Gas Temperature High	00
LOR-1PM02J-B101	Hydrogen Panel Trouble	00
LOR-1PM02J-B301	Generator 1 Hydrogen Temperature High or Low	00
LOS-DG-M3	1B Diesel Generator Operability Test	44

Simulator Operator Instructions

Initial Setup

1. Recall IC-**49** (Power reduced to 85% for rod set).
2. Place simulator in RUN.
3. Load and run the setup CAEP written for this scenario (**esg2.1**.cae on floppy disc)
4. Post the FCL Greater Than 100% placard.
5. Ensure Hotwell Level is near the bottom of the green band (set cnm2htws = 4.5E6).
6. Ensure CY Tank Level is near 20 feet (set cfm1cyts = 2.5E6).
7. Hang OOS cards for HPCS
8. Write T/S 3.5.1, 14 days, for HPCS being OOS

Event Triggers and Role Play

Event#

1. DG Run IAW LOS-DG-M3
   a. No triggers
   b. Role play for DG run

2. RD Flow Control Valve Failure
   a. **Trigger 2** on request from lead evaluator
   b. Role play for RD flow control valve failure IAW LOA-RD-101

3. Rod Drift
   a. **Trigger 3** on request from lead evaluator
   b. Role play for Rod drift IAW LOA-RD-101

4. Power Reduction For Rod Drift
   a. No triggers

5. Generator H2 Temperature Controller Failure
   a. **Trigger 5** on request from lead evaluator
   b. Role play for activities at H2 Skid
      (1) Alarm at 1PL19JB is 1-3. It has basically the same instructions as the LOR at 1PM02J.
      (2) Need to verify that WS is lined up to H2 cooler and then throttle the bypass if directed.

6. 1B TDRFP Flow Instrument Fails Downscale
   a. **Trigger 6** on request from lead evaluator
   b. Role play as IMD as requested.

7. RCIC Fails On Initiation
   a. **Trigger 7** is automatic on RCIC start
   b. If sent to breaker for 1E51-F045, you can't reset it. If sent to valve, you can't engage the handwheel.

8. Large FW Line Break In Steam Tunnel
   a. **Trigger 8** on request from lead evaluator. Don't wait to long after scram. Prompt as necessary.
   b. Report steam in heater bay and on turbine deck (blow out panels in steam tunnel burst).
   c. Also can report steam in RB raceway

9. SRVs "S" and "U" Will Fail To Open on ADS Initiation
   a. No triggers

LaSalle County Station

DYNAMIC SIMULATOR SCENARIO GUIDE

ILT CLASS 99-01 NRC EXAM

ESG 2.2

Rev. 0

08/08/2000

DEVELOPED BY:	Site Exam Developer	8-11-00 Date
APPROVED BY:	Facility Representative	8-11-00 Date

Facility: *LaSalle Station* **Scenario No.:** *ESG 2.2* **Op Test No.:** *2*

Examiners: _____ **Operators:** _____

Initial Conditions:

- *Unit 1 is operating at 85% reactor power with flow control line at 105%.*
- *TLO Temperature controller in manual.*
- *1A GC pump is OOS for alignment.*
- *HPCS is OOS to megger and inspect motor.*
- *Online Safety level is green.*
- *Unit 2 is operating at 100% power.*

Turnover:

- *Unit 1 is in a Division 3 work week.*
- *Drywell inerting is scheduled to be secured 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 securing of drywell inerting lineup
3	CAEP	I	BOP SRO	Drywell N2 pressure controller fails high.
4	MCA006	C	BOP SRO	1D vacuum breaker sticks open
5	MNB135	I	RO SRO	APRM Flow Unit B fails downscale.
6	MRD029	C	RO SRO	Half scram/Single rod scram.
7	N/A	R	RO SRO	Reduce core flow by 15 Mlbm due to rod scram.
8	MMS007	C	BOP SRO	EHC leak/Turbine trip/BPV failure.
9	MRP017	M	ALL	1B RPS channel fails to trip/ATWS.
10	MNB104		ALL	Steam Line Break in Containment.

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

NARRATIVE SUMMARY

Event(s)	Description
2.2.1	Once the crew has accepted the unit, the SRO should direct the RO to continue the power ascension in accordance with LGP 3-1.
2.2.2	The BOP operator will be directed to complete securing the drywell inerting lineup that was established the previous shift.
2.2.3, 4	After the inerting lineup has been secured and the drywell N2 pressure controller has been returned to normal, the controller will fail high causing containment pressure to rise and bringing up some trouble alarms from the nitrogen vaporizer. The crew should diagnose the cause of the alarms and rising containment pressure and take manual control and/or secure the makeup lineup. During this time, an imbalance between drywell and suppression chamber pressure will cause the 1D vacuum breaker to open. The vacuum breaker will stick in the open position and the crew will have to perform the actions of LOA-PC-101 to isolate the vacuum breaker and will refer to tech specs for required actions.
2.2.5, 6, 7	When the drywell N2 controller problem has been addressed, the crew will respond to a half scram signal that results from a Nuclear Instrumentation Flow Unit failure. A blown fuse on the opposite channel (unknown until half scram) will cause a single control rod to scram full in simultaneously. The RO should determine which rod has scrammed and refer to LOA-RD-101. The procedure will direct the RO to reduce power by 75 MWe and contact the nuclear engineer. An operator should be dispatched locally to determine the cause. The SRO should refer to tech specs to ensure compliance.
2.2.8	When the major actions for the previous events have been completed, an EHC leak occurs. This leak will become large enough to cause a trip of the turbine and subsequent loss of the turbine bypass valves. The turbine trip will result in a auto-scram signal; however, the operators may elect to scram the reactor prior to the trip.
2.2.9, 10	Once the reactor scrams, the RO should recognize that all rods failed to insert. The RO should attempt initiating alternate rod insertion (ARI), however; the control rods become hydraulically locked. The SRO should enter the ATWS emergency operating procedures and direct the applicable actions. The RO should perform method 4 of LGA-NB-01 to reset the scram, drain the scram discharge volume, then rescram the reactor. About two minutes following the turbine trip, a small main steam line break occurs in the drywell. This will raise containment pressure to the point where drywell sprays will be required.

Critical Steps

1. Crew uses alternate methods for inserting the control rods that remain out IAW the emergency operating procedures.
2. The crew establishes drywell sprays as directed by the emergency operating procedures.

Shift Turnover Information

⇒ **Day of week and shift**

- Monday Day Shift

⇒ **Weather conditions**

- No adverse whether conditions expected in the next 24 hours

⇒ **(Plant power levels)**

♦ Unit 1 - 85% Power/107% FCL	♦ Unit 2 – 100% Power
♦ 2965 MWt	♦ 3454 MWt
♦ 1000 MWe	♦ 1149 MWe
♦ 93 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
♦ .	♦

⇒ **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.	♦ None
♦ 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 Green (RAW = 1.0)	♦ Online Safety is Green (RAW = 1.0)
♦ The Unit 1 is in a Division 3 work week.	♦ The Unit 2 is in a Division 2 work week.
♦ TLO Temperature controller in manual.	
♦ Crew needs to complete securing the DW inerting lineup by securing the VQ train (LOP-VQ-03) and the VC train (LOP-VC-01).	

Operator Actions

Event No.(s): 2.2.1		**Page** 1 **of** 1
Description: Once the crew has accepted the unit, the SRO should direct the RO to continue the power ascension in accordance with LGP 3-1.		
Initiation: Following shift turnover.		
Cues: Directed by SRO		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	Per LGP-3-1: • 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. Per LOP-RR-07: • Verify manual light on recirculation loop flow controller M/A station A/B is ON. • Change flow evenly in both loops by pressing RAISE/LOWER buttons and observing flow indication to flow controller M/A station.
	SRO	• Ensures RO monitors critical parameters carefully. • Emphasizes need for caution and conservatism during the power change. • Communicate expected thermal limits/LPRM response and thresholds for any contingency actions. • Stresses awareness of where operation is on the power to flow map.
Terminus: Clearly observable plant response from change in power level.		

NOTES:

Operator Actions

Event No.(s): 2.2.2		**Page** 1 **of** 1
Description: The BOP operator will be directed to complete securing the drywell inerting lineup		
Initiation: Following shift turnover.		
Cues: Directed by SRO		
Time	**Position**	**Applicant's Actions or Behavior**

	BOP	Per LOP-VQ-03:
		• STOP 1(2)VQ01C, PC Purge Sys Exhaust Fan.
		• CHECK CLOSED 1(2)VQ02Y, PC Purge Filt Trn Otlt Isol Vlv.
		• CHECK CLOSED 1(2)VQ01Y, PC Purge Filt Trn Inlt Isol Vlv.
		• VERIFY CLOSED the following dampers:
		  ° 1VQ03Y, RWCU Areas Exhaust Isol Damper.
		  ° 2VQ03Y, RWCU Areas Exhaust Isol Damper.
		  ° 1VQ037, VQ Train Inlet Upstrm Isol Vlv.
		  ° 1VQ038, VQ Train Inlet Dwnst Isol Vlv.
		
		Per LOP-VC-01,Train A Recirculation Charcoal Filter Shutdown (Bypass)
		• VERIFY 0A Recirculation Charcoal Filter operation is NO longer required.
		• PLACE 0A CR HVAC Charcoal Filter Damper Control switch to BYPASS position.
		• VERIFY following Damper positions:
		  ° Inlet 0VC11YA is CLOSED.
		  ° Outlet 0VC12YA is CLOSED.
		  ° Bypass 0VC13YA is OPEN.
		  ° Direct operator to shutdown the VE Charcoal Filter Unit per LOP-VE-01.

	SRO	• 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:** VQ train shutdown, VC train shutdown		

NOTES:

Operator Actions

Event No.(s): 2.2.3, 2.2.4	**Page** 1 **of** 2

Description: The drywell N2 pressure controller will fail high causing Containment pressure to rise and bringing up some trouble alarms from the nitrogen vaporizer. An imbalance between drywell and suppression chamber pressure will cause the 1D vacuum breaker to open. The vacuum breaker will stick in the open position.

Initiation: After VQ and VC trains have been secured, on signal from lead evaluator

Cues: Annunciator LOR-1H13-P603-B501, Primary Containment Pressure Hi/Lo

Time	Position	Applicant's Actions or Behavior

	BOP	Per LOR-1H13-P603-B501, Primary Containment Pressure Hi/Lo
		• Verify Primary Containment Chill Water and Ventilation System is operating properly.
		• NOTE: If Suppression Pool pressure exceeds Primary Containment Pressure by 0.5 psi, then Primary Containment Vacuum Breakers may open
		• Verify proper operation of Suppression Pool/Drywell Vent or Purge Systems.
		  ° *Recognizes failure of DW N2 pressure controller*
		  ° *Informs SRO*
		  ° *Takes manual control of N2 pressure controller or directs local actions to isolate N2 path.*
		• VENT to maintain containment pressure < 0.75 psig.
		• Refer to Tech Spec 3.6.1.6.
		
		Per LOP-VQ-04, for DW venting:
		• Start the VQ Purge train
		• Place VC and VE charcoal filter units in service
		• Open 1VQ068 and 1VQ035 to establish vent path
		• Monitor SVS release rates
		• When venting is complete, secure the vent path and shutdown the VQ train and VC/VE charcoal units.

NOTES:

Operator Actions

Event No.(s): 2.2.3, 2.2.4		**Page 2 of 2**
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	Per LOA-PC-101, for Stuck Open Suppression Pool to Drywell Vacuum Breaker • Check containment pressures • Check Primary Containment Vacuum Breakers 1PC001A/B/C/D - closed. ° Close the valve using the small crescent wrench on the pallet (disc) shaft. ° If the vacuum breaker can not be closed, close the Primary Containment Vacuum Breakers isolation valves on Attachment B. ° Refer to TS 3.6.4 & ATR 3.6.4
	SRO	• 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. • Per T/S 3.6.1.6, if DW pressure exceeds 0.75 psig, directs actions to restore pressure within one hour. • Per T/S 3.6.4, with one DW vacuum breaker inoperable and open, directs actions to isolate the affected vacuum breaker within 4 hours and restore it to operable within 72 hours.
Terminus: N2 pressure regulator in manual or isolated, actions initiated to reduce DW pressure		

NOTES:

Operator Actions

Event No.(s): 2.2.5, 2.2.6, 2.2.7 **Page** 1 **of** 2

Description: a Nuclear Instrumentation Flow Unit failure results in a half scram signal. A blown fuse on the opposite channel (unknown until half scram) will cause a single control rod to scram full in simultaneously.

Initiation: After actions for DW pressure problem are complete, on the signal of lead examiner.

Cues: Annunciators 1H13-P603-A209, 1H13-P603-B208, "B" Channel Half Scram

Time	Position	Applicant's Actions or Behavior

	RO	Per LOR-1H13-P603-A209, APRM Flow Bias Off Normal
		• VERIFY control rod withdrawal block action occurs.
		• If unable to clear alarm, then BYPASS affected Flow Unit.
		• INITIATE appropriate corrective action as required.
		• NOTIFY Unit Supervisor.
		• REFER to Tech Spec 3/4.3.6.
		
		Per LOR-1H13-P603-B208, Channel A2/B2 Neutron Monitor Trip
		• If RPS Subchannel A2 or B2 TRIPPED:
		  ° DETERMINE cause of tripped condition, by checking all instruments in that subchannel to see which instrument caused trip, and if it was inop, or failed Hi Hi.
		  ° BYPASS failed instrument provided there is NOT one of that type monitor bypassed already in that subchannel.
		  ° RESET tripped Subchannel.

	BOP	Per LOR-1H13-P603-A209, APRM Flow Bias Off Normal
		• CHECK for one of following causes of alarm on panel 1H13-P608:
		  ° Upscale (108%).
		  ° Inop (Module unplugged, switch not in operate).
		  ° Comparator Trip (10% difference in output flow signals).

NOTES:

Operator Actions

Event No.(s): 2.2.5, 2.2.6, 2.2.7		**Page 2 of 2**
Time	**Position**	**Applicant's Actions or Behavior**
	RO	Per LOA-RD-101 (for control rod drift): • Check control rods - only one rod drifted/scrammed. • Verify core flow dropped 15 M#/hr. minimum. • Select drifting/scrammed rod. • Check insert block light – OFF at rod select matrix. • Insert rod to position 00 (full-in). • Check control rod remains at position 00. • Verify cooling water -normal: • Notify QNE • Obtain OD-7 option 2. • Check all other control rods are in their correct sequence positions. • Declare control rod inoperable and refer to Tech Spec 3.1.3.1. • Investigate cause of drift/scram.
	BOP	Per LGP-3-1 • Remove condensate polishers from service when no longer needed. • Maintain Condensate System Flow per LOP-CD-03 as measured through the condensate polishers, while continuing to perform the following steps. • For a power decrease to a final power > 60%, perform the following: • Reduce core flow to approximately 70 Mlbm/hr, per LOP-RR-07 at a rate up to 300 MWe/hr
	SRO	• On transient, positions himself as command authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. • Declare control rod inoperable and refer to Tech Spec 3.1.3.1. ° W/I 1 hour, disarm associated directional control valves. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications IAW OP-AA-101-501.
Terminus: Half scram reset, Core flow reduced by 15 M#/hr, Scrammed rod declared inop		

NOTES:

Operator Actions

Event No.(s): 2.2.8		**Page** 1 **of** 1
Description: A Main Turbine EHC leak occurs. This leak will become large enough to cause a trip of the turbine and subsequent loss of the turbine bypass valves.		
Initiation: On the signal of lead examiner		
Cues: Annunciator 1PM02J-B403 on Low EHC Tank Level, Lowering EHC system pressure		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	• Responds to EHC related annunciators and reports adverse trend to SRO • Dispatches Rounds EO to EHC skid. • Verifies automatic actions on lowering EHC pressure: ° Auto start of standby pump ° Turbine trip ° Reactor scram • Coordinates with RO to reduce Rx power and turbine load in anticipation of complete loss of EHC
	RO	• Reduces reactor power in anticipation of complete loss of EHC. • Monitors reactor pressure at 1H13-P603 to ensure pressure under control • Initiates a reactor scram if/when pressure is not under control.
	SRO	• On transient, positions himself as command authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. • Establishes conservative scram criteria based on the adverse EHC system trends: ° Directs RO to scram if pressure control lost ° Directs RO to scram before turbine trips (auto scram) • Enforces OPS expectations and standards.
Terminus: EHC loss leads to turbine trip and reactor scram		

NOTES:

Operator Actions

Event No.(s): 2.2.9, 2.2.10		**Page** 1 **of** 3
Description: 1B RPS Channel will fail to trip on the Manual/Auto scram. About two minutes following the turbine trip, a small main steam line break occurs in the drywell. This will raise containment pressure to the point where drywell sprays will be required.		
Initiation: Automatic upon receipt of auto/manual scram signal, on the signal of lead examiner		
Cues: Rods out, 1B RPS scram bus lights on w/scram signal present, Hi DW Pressure		
Time	**Position**	**Applicant's Actions or Behavior**

Critical Task
Critical Task
	RO	Per LGA-NB-01, Alternate Rod Insertion:
		• Initiate ARI
		• Insert rods using normal means
		• Checks scram lights off and scram group lights on
		• Check that more that 25 rods failed to insert
		• Performs/Requests Method 1 for Scram Fuse Removal
		• Upon removal of scram fuses, performs Method 4 Scram Reset/Full Scram
		  ° Performs/Requests Attachment 1B to defeat scram trip relays.
		  ° Resets ARI by directing operator to locally open power supply breakers.
		  ° 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 to the Unit Supervisor when all control rods are FULL-IN
		
		Performs additional EOP actions as directed by SRO
		• Maintains RPV level in band specified using FW/CD/CB systems
		• Monitors RPV pressure and coordinates with BOP to control with SRVs.

Critical Task	BOP	Performs EOP actions as directed by SRO • Inhibits ADS and prevents ECCS injection • Starts 2 loops of suppression pool cooling • Initiates Suppression Chamber Spray • Initiates DW Spray • Coordinates with RO to control pressure with SRVs

NOTES:

Operator Actions

Event No.(s): 2.2.9, 2.2.10		**Page 2 of 3**
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	Directs entry into EOPs and EOP actions as entry conditions are met. Per LGA-10 as directed from LGA-01 (scram required and >5%) • Per the Power Leg directs the following: ° Initiate ARI, Start SBLC ° Run RR-FCVs to minimum, then Trip RR pumps ° Insert Rods per LGA-NB-01 • Per the Level Leg directs the following: ° Bypass Group 1 Isolations per LGA-MS-01 ° Rapidly lower level to at least -60 inches ° Hold level between -150 and -60 inches ° If/When can't hold level >-189 (-150) inches, enters LGA-06
Critical Task		
		Per LGA-003: • Per Primary Containment Pressure Leg, directs the following: ° Spray the Suppression Chamber before pressure reaches 8 psig ° When SC pressure is 8 psig, then ♦ 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: ° 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: ° 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 ° Monitor Suppression Pool Level (-4.5 to +3.0 inches) • Hydrogen Leg ° Start Hydrogen and Oxygen Monitors (per LGA-CM-01)
Critical Task		

NOTES:

Operator Actions

Event No.(s): 2.2.9, 2.2.10 **Page** 3 **of** 3

Time	Position	Applicant's Actions or Behavior
	SRO	Directs entry into EOPs and EOP actions as entry conditions are met. Per LGA-06 directs the following (if RPV blowdown required) • Verify SP level >-18 feet • Prevent all injection except SC, RD and RI • Initiate ADS • Verify 7 SRVs open • Return to LGA-10 Per LGA-10 directs the following (if RPV blowdown required): • Wait until pressure is <160 psig then: • Raise level to >-150 inches. General: • 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:
- All rods fully inserted (or proper actions in progress)
- 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:

REFERENCES

Procedure	Title	Revision
LGA-001	RPV Control	00
LGA-002	Secondary Containment Control	00
LGA-003	Primary Containment Control	00
LGA-006	ATWS Blowdown	00
LGA-010	Failure to Scram	00
LGA-CM-01	Emergency Operation of Post LOCA H2/O2 Monitors	04
LGA-NB-01	Alternate Rod Insertion	05
LGA-RH-103	Unit 1 RHR operations in the LGAs	02
LGA-VP-01	Rx Bldg Ventilation Startup Following System Isolation	06
LGA-VR-01	Primary Containment Temperature Reduction	07
LGP-3-1	Power Changes	25
LGP-3-2	Reactor Scram	42
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Simulator Operator Instructions

Initial Setup

1. Recall IC-**49** (Power reduced to 85% for rod set).
2. Place simulator in RUN.
3. Load and run the setup CAEP written for this scenario (**esg2.2**.cae on floppy disc)
4. Post the FCL Greater Than 100% placard.
5. Ensure Hotwell Level is near the bottom of the green band (set cnm2htws = 4.5E6).
6. Ensure CY Tank Level is near 20 feet (set cfm1cyts = 2.5E6).
7. Hang OOS cards for HPCS, place HPCS pump C/S in PTL
8. Hang OOS cards for 1A GC pump, place 1A GC pump C/S in PTL
9. Write T/S 3.5.1, 14 days, for HPCS being OOS

Event Triggers and Role Play

Event #

1. Raise Power With RR Flow
   a. No triggers
   b. Role play for power ascension

2. Secure DW Inerting
   a. No triggers
   b. Role play for shutdown of N2 Vaporizer and local valve lineups

3. N2 Pressure Regulator Fails High
   a. **Trigger 3** on request from lead evaluator
   b. Role play for any requested local VQ valve manipulation

4. 1D PC Vacuum Breaker Drifts and Sticks Open
   a. **Trigger 4** is automatic on elevated Suppression chamber pressure

5. APRM Flow Unit B Fails Downscale
   a. **Trigger 5** on request from lead evaluator
   b. Role play as IMD CST as necessary

6. Single Rod Scrams Full In On Half Scram Signal Due To Blown Fuse
   a. **Trigger 6** is automatic on half scram
   b. Role play as operator to replace fuse at HCU
   c. Scram Valves should reclose when half scram is reset

7. Lower Power For Rod Scram (15 Mlbm/hr)
   a. No trigger
   b. Role play as necessary

8. EHC Leak Leads To Turbine Trip/Scram
   a. **Trigger 8** on request from lead evaluator
   b. If dispatched to EHC skid, report loss of fluid but don't know where (leak is in HB).

9. 1B RPS Channel Fails To Trip
   a. **Trigger 9** is automatic on EHC leak (inserts failure just before scram)
   b. Will need to perform back panel actions to remove RPS fuses

10. Steam Line Break In Containment
    a. **Trigger 10** on request from lead evaluator
    b. Role play local actions as directed.

LaSalle County Station

DYNAMIC SIMULATOR SCENARIO GUIDE

ILT CLASS 99-01 NRC EXAM

ESG 2.3

Rev. 0

08/08/2000

DEVELOPED BY:	Site Exam Developer	8-11-00 Date
APPROVED BY:	Facility Representative	8-11-00 Date

Facility: *LaSalle Station* **Scenario No.:** *ESG 2.3* **Op Test No.:** *2*

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.*
- *HPCS is OOS to megger and inspect motor.*
- *Online Safety level is green.*
- *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	CAEP	C	RO SRO	1FW146 lockout during daily cycling.
6	MRC027	I	RO SRO	Reactor Recirc FCV drifts open.
7	MRC041	M	ALL	Reactor Recirculation line break.
8	MNB078		BOP SRO	1B 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
2.3.1	Once the turnover is completed the SRO should direct the BOP operator to transfer heater drain tank level control to pump forward.
2.3.2	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.
2.3.3, 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.
2.3.5	After heater drain system parameters have been stabilized, the RO will receive a request from the rounds operator to perform the daily cycling of the 1FW005 and 1FW146 feed water regulating valves for the daily operational check. The 1FW146 will lockout when the RO attempts to cycle it. He will have to reset the lockout in accordance with the annunciator and abnormal procedures.
2.3.6	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.
2.3.7, 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 RHR to auto start (can be started manually) and a failure of the drywell spray valves that are initially selected for use.

Critical Steps

1. Crew recognizes failure of 1B RHR Pump to auto start and takes action to start pump manually.
2. The crew establishes drywell sprays prior to exceeding the limits of the PSP curve.

Shift Turnover Information

⇒ **Day of week and shift**

- Monday Day Shift

⇒ **Weather conditions**

- No adverse whether conditions expected in the next 24 hours

⇒ **(Plant power levels)**

♦ Unit 1 - 30% Power/65% FCL	♦ Unit 2 – 100% Power
♦ 1000 MWt	♦ 3454 MWt
♦ 300 MWe	♦ 1149 MWe
♦ 50 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 Green (RAW = 1.0)	♦ Online Safety is Green (RAW = 1.0)
♦ The Unit 1 is in a Division 3 work week.	♦ The Unit 2 is in a Division 2 work week.
♦ TLO Temperature controller in manual.	

Operator Actions

Event No.(s): 2.3.1 **Page** 1 **of** 1

Description: The SRO should direct the BOP operator to transfer heater drain tank level control to pump forward.

Initiation: Following shift turnover.

Cues: Directed by SRO

Time	Position	Applicant's Actions or Behavior
	BOP	Per LOP-HD-02, for Transferring HD Tank Level Control to Pump Forward: • Latch Heater Drain Pump Forward Valves 1(2)HD045A, B and C Solenoid Trip Valves. [1(2)PL10J] • Adjust Heater Drn Pmp Forward Contlr, 1(2)HK-HD066, SETPOINT to 7 feet. • Depress the Output Increase (up arrow) Push-button to open the Heater Drain Pump Forward Control Valves. • Verify Heater Drn Pmp Forward Contlr Deviation is at or near zero. • Transfer the Heater Drn Pmp Forward Contlr to AUTO by depressing the Auto Push-button. • Slowly adjust setpoint to 9' on Heater Drn Flushing Contlr, 1(2)HK-HD310. The Low Flow Flushing Valves 1(2)HD171A, B and C will go closed and the Pump Forward Valves 1(2)HD045A, B and C will control Heater Drain Tank Level. • Start or stop Heater Drain Pumps as necessary to maintain Heater Drain Tank Level.
	SRO	• 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: HD shifted to pump forward and HD tank controller in auto

NOTES:

Operator Actions

Event No.(s): 2.3.2		**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	Per LOP-RR-05: • BYPASS both A and B RR Interlocks. • DEPRESS Lower pushbutton on Reactor Recirc Loop A/B M/A Station for loop in which pump speed will be changed until 1(2)B33-F060A/B, Flow Control Valve is at Minimum (< 20% indicated). • DEPRESS the following RESET pushbuttons at 1(2)H13-P602 to reset previously sealed in trip signals: ° A/B RR FW Lo Flow Interlock [1(2)B33-S107A/B]. ° Stm Dome to A/B RR Pmp Suct Lo Diff Temp [1(2)B33-S108A/B]. ° Rx Lo Lvl A/B RR Interlock [1(2)B33-S113A/B]. • VERIFY HI Speed Start Permissive indicating light 1(2)B33-DS02A/B is ON. • INITIATE STARTREC (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: ° 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. Second Reactor Recirc Pump Transfer from Slow to Fast Speed from • DEPRESS Lower pushbutton on Reactor Recirc Loop A/B M/A Station for loop in which pump speed will be changed until 1(2)B33-F060A/B, Flow Control Valve is at Minimum (< 20% indicated). • DEPRESS the following RESET pushbuttons at 1(2)H13-P602 to reset previously sealed in trip signals: ° A/B RR FW Lo Flow Interlock [1(2)B33-S107A/B]. ° Stm Dome to A/B RR Pmp Suct Lo Diff Temp [1(2)B33-S108A/B]. ° Rx Lo Lvl A/B RR Interlock [1(2)B33-S113A/B].

NOTES:

Operator Actions

Event No.(s): 2.3.2		**Page 2 of 2**
Time	**Position**	**Applicant's Actions or Behavior**
	RO	• VERIFY HI Speed Start Permissive indicating light 1(2)B33-DS02A/B is ON. • INITIATE STARTREC (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: ° 1A/B breaker opens. ° 2A/B breaker opens. ° 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. • Observe FW Flow from Control Room Recorder at the 1(2)H13-P603 panel to ensure Feedwater Flow is >20% of rated (>2.83 Mlbm/hr). • At panel 1(2)H13-P602, PRESS Loop A and Loop B Low Feedwater Flow interlock reset pushbuttons and verify interlocks reset. • Place both A and B RR Interlocks in NORMAL. • 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. Per LGP 1-1, Normal Unit Startup. • Increase CTP by increasing Reactor Recirculation flow until total core flow is about 61 M#/hr. •
	SRO	• 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): 2.3.3, 2.3.4			**Page** 1 **of** 2
Description: The HD tank level controller output signal will fail causing pump forward valves to fail closed. If/when an attempt is made to start a standby HD pump, the first pump will trip but the second pump will start.			
Initiation: After RR upshift and HD controller in auto, on signal from lead evaluator			
Cues: Annunciator 1PM03J-B503, HD Tank Level Hi/Lo,			
Time	**Position**	**Applicant's Actions or Behavior**	
	BOP	**Note:** With this failure occuring at low power and shortly after transfer to auto, the crew would not be expected to perform all steps of these LOA/LOP/LOR's. Per LOR-1PM03J-B503, HD Tank Level Hi/Lo: • Start additional Heater Drain Pump(s) per LOP-HD-02 as needed. • Verify Heater Drain Tank Level Controller operating properly. • Recognizes HD controller failure and takes manual control • Verify Instrument Air available to 2PL10J. (TB 687' X-21) • Verify Latching Solenoids for 1HD045A/B/C are latched. (TB 687' X-21) • If Heater Drain Valves have failed closed AND any HD Pump is running, reduce setpoint for 1HD066, HD Pump Forward Controller to 2.5 ft. Per LOA-HD-101, for Reduced Pump Forward Flow: • Reduce core flow as necessary to MAINTAIN the following without entering the instability region while continuing below: ° Cond Polisher D/P less than 60 psid. ° Feedwater pump suction pressure greater than 300 psig. ° Reactor water level greater than 31". ° Core flow greater than 49 Mlb/hr. • If Heater Drain Tank Level high, START standby Heater Drain Pump. • Verify Heater Drain valves latched. • Replace Heater Drain valve fuses as needed. • Check Instrument Air available and controller operating properly for 1HD045A/B/C, HD Pump Forward Valves at LP Htr Rack 1PL10J	

NOTES:

Operator Actions

Event No.(s): 2.3.3, 2.3.4 **Page** 2 **of** 2

Time	Position	Applicant's Actions or Behavior
	BOP	Per LOP-HD-02, for Heater Drn Pmp Forward Controller in Manual Mode • 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). Per LOR-1PM03J-B504: • 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.
	SRO	• 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:

Operator Actions

Event No.(s): 2.3.5 **Page** 1 **of** 1

Description: The RO will receive a request from the rounds operator to perform the daily cycling of 1FW146. The 1FW146 will lockout when the RO attempts to cycle it. He should reset the lockout in accordance with the annunciator and abnormal procedures.

Initiation: After recovery from HD transient, on the signal of lead examiner.

Cues: Lockout of 1FW146 while cycling locally

Time	Position	Applicant's Actions or Behavior
	RO	Per Unit 1 NLO Rounds Package: • Cycle 1FW146 open, then closed, then return valve to 5% open. When 1FW146 lockout occurs: • Reports lockout to SRO • Refers to annunciator procedure and LOA-FW-101 Per LOA-FW-101, for Failure of Low Flow FRV: • Adjust 1FW146, LFCV M/A transfer station to match input and output signals. • Reset the lockout. • Check Low Flow FRV operating normally
	SRO	• 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.

Terminus: 1FW146 lockout reset, corrective actions initiated

NOTES:

Operator Actions

Event No.(s): 2.3.6		**Page** 1 **of** 1
Description: 1A RR flow control valve spuriously drifts open.		
Initiation: After reset of 1FW146 lockout, 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	When RO/BOP recognize drifting FCV:
		• Immediately lockup the drifting FCV from the 1H13-P602 panel
		• Inform the SRO
		• Refer to LOA-RR-101
		
		Per LOA-RR-101, for Recirculation FCV Failing Open:
		• 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.
		  ° Within 2360 gpm, if core flow is greater than or equal to 76 Mlbm/hr.
		  ° Within 4720 gpm, if core flow is less than 76 Mlbm/hr.
		• Start 2 hour timeclock per Tech Spec 3.4.1.3.
		• Check instrumentation for signs of fuel damage.

	SRO	• On transient, positions himself as command authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. ° If RR loop flows exceed T.S. limits, enters 2 hour timeclock per 3.4.1.3. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications IAW OP-AA-101-501.
Terminus: Drifting RR FCV locked up, SRO has addressed loop flow mismatch T.S.		

NOTES:

Operator Actions

Event No.(s): 2.3.7, 2.3.8, 2.3.9		**Page** 1 **of** 4
Description: RR Line break occurs in the drywell. Additional failures will include a failure of 1B 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	When RO/BOP recognize indications of LOCA:
		
		Per LGP-3-2 Attachment E (hardcard):
		• 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
		• Stabilize pressure <1043 psig
		
		Performs additional EOP actions as directed by SRO
		• Coordinates with BOP to maintain/restore RPV level in band specified using preferred injection systems
		• Monitors RPV parameters
		  ° Report lowering RPV level (value, rate, trend)
		  ° Report indications of RR line break

NOTES:

Operator Actions

Event No.(s): 2.3.7, 2.3.8, 2.3.9		**Page 2 of 4**
Time	**Position**	**Applicant's Actions or Behavior**

	BOP	Makes plant announcement for reactor scram
		
		Verifies needed auto actions (PCIS, ECCS)
		• Report failure of 1B RHR to initiate on LOCA condition
		• Manually initiates/starts 1B RHR
		
		Performs additional EOP actions as directed by SRO
		• Inhibits ADS and prevents ECCS injection
		• Starts 2 loops of suppression pool cooling
		  ° Startup RHR Service Water as follows:
		  ♦ 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.
		  ♦ 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)

	Critical Task	
	Critical Task	

NOTES:

Operator Actions

Event No.(s): 2.3.7, 2.3.8, 2.3.9		**Page 3 of 4**
Time	**Position**	**Applicant's Actions or Behavior**

	SRO	Directs entry into EOPs and EOP actions as entry conditions are met.
		
		Per LGA-001:
		• Directs RO to control RPV level 12.5-55.5 inches.
		Critical Task • Upon recognition of 1B LPCI initiation failure, directs BOP operator to manually start 1B RHR pump and align it as required.
		• Directs BOP to inhibit ADS when RPV level cannot be maintained > -150".
		• Directs initiation of ADS IAW LGA-004 if/when RPV level drops to -150".
		• After RPV blowdown, directs restoration of level using preferred injection systems.
		
		Per LGA-003:
		• Per Primary Containment Pressure Leg, directs the following:
		  ° Spray the Suppression Chamber before pressure reaches 8 psig
		  ° When SC pressure is 8 psig, then
		Critical Task ♦ VERIFY within the limits of the DSL
		  ♦ TRIP all RR pumps
		  ♦ SPRAY the Drywell (per LGA-RH-103)
		  ° If SC pressure can't be maintained below the PSP limits, initiate ADS IAW LGA-004.
		• Per Drywell Temperature Leg, directs the following:
		  ° 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:
		  ° 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
		  ° Monitor Suppression Pool Level (-4.5 to +3.0 inches)
		• Hydrogen Leg
		  ° Start Hydrogen and Oxygen Monitors (per LGA-CM-01)

NOTES:

Operator Actions

Event No.(s): 2.3.7, 2.3.8, 2.3.9 **Page** 4 **of** 4

Time	Position	Applicant's Actions or Behavior
	SRO	Directs entry into EOPs and EOP actions as entry conditions are met. Per LGA-04 directs the following (if RPV blowdown required) • Verify SP level >-18 feet • Initiate ADS • Verify 7 SRVs open • Wait until Shutdown Cooling interlocks clear General: • 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:
- 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:

REFERENCES

Procedure	Title	Revision
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 H2/O2 Monitors	04
LGA-RH-103	Unit 1 RHR operations in the LGAs	02
LGA-VR-01	Primary Containment Temperature Reduction	07
LGP-1-1	Normal Unit Startup	62
LGP-3-2	Reactor Scram	42
LOA-HD-101	Heater Drain System Trouble	03
LOA-RR-101	Unit 1 RR System Abnormal	05
LOP-HD-02	Normal Startup and Operation of the HD System	21
LOP-RM-01	Reactor Manual Control Operation	14
LOP-RR-05	Changing RR Pump Speed From Slow to Fast	27
LOP-RR-07	Operation of RR Flow Control System	19
LOR-1PM03J-B503	Heater Drain Tank Level Hi/Lo	00
LOR-1PM03J-B504	Heater Drain Pump Auto Trip	00

Simulator Operator Instructions

Initial Setup

1. Recall IC- **45** (Ready to upshift RR pumps)
2. Place simulator in RUN.
3. Load and run the setup CAEP written for this scenario (**esg2.3**.cae on floppy disc)
4. Post the FCL Greater Than 100% placard.
5. Ensure Hotwell Level is near the bottom of the green band (set cnm2htws = 4.5E6).
6. Ensure CY Tank Level is near 20 feet (set cfm1cyts = 2.5E6).
7. Hang OOS cards for HPCS
8. Write T/S 3.5.1, 14 days, for HPCS being OOS

Event Triggers and Role Play

Event #

1. Upshift RR Pumps
   a. No triggers
   b. Role play for EO actions in RB

2. Transfer HD Tank Level Control To Pump Forward
   a. No triggers
   b. Role play for operator actions at HD racks

3. 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

4. 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.

5. 1FW146 Lockout While Cycling For Shiftly
   a. **Trigger 5** is automatic when valve reaches 80% open.
   b. Role play as rounds operator.
      (1) Report no abnormalities at valve

6. RR FCV Drifts Open
   a. **Trigger 6** on request from lead evaluator
   b. Role play as necessary

7. RR Line Break In DW
   a. **Trigger 7** on request from lead evaluator
   b. Role play as necessary

8. 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).

9. 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.