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

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

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

Turnover:

- *Unit 1 is in a Division 3 work week.*
- *Ready to transfer HD Tank level control to pump forward.*
- *After HD in pump forward, perform RR pump upshift IAW LOP-RR-05 .*
- *MSR Second Stage Reheat will not be placed in service until after core flow is above 61 mlb/hr per step E.6.5.*
-

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.*
3/4	*CAEP/ MCF114*	*IC*	*BOP SRO*	*HD Tank level controller fails. 1C HD Pump trips immediately after starting.*
5	*MRD080*	*C*	*RO SRO*	*Rod Drift.*
6	*MRC027*	*I*	*RO SRO*	*Reactor Recirc FCV drifts open.*
7	*MRC041*	*M*	*ALL*	*Reactor Recirculation line break.*
8	*MNB078*		*BOP SRO*	*1B/1C RHR fails to auto initiate.*
9	*CAEP*		*BOP SRO*	*The selected DW spray valve fails to open (breaker trips), the other loops valves will operate.*

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

Facility: *LaSalle Station* **Scenario No.:** *ESG 4* **Op Test No.:** **Crew A1,B,C**

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

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

Turnover:

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

Event No.	Malf. No.	Event Type*		Event Description
~~1~~ 2	*N/A*	*C*	*RO SRO*	*1B RHR Service Water Header Pressure Low*
~~2~~ 1	*N/A*	*N*	*BOP SRO*	*Swap VP chillers from A and C to B and C.*
3	*P3E1A1D*	*I*	*RO SRO*	*CRD FCV Setpoint Failure.*
4	*VHTM60 AD*	*CR*	*RO SRO*	*1A TDRFP Lube Oil Leak.*
5	*MNB101*	*I*	*BOP SRO*	*Main Generator Hydrogen Temperature High*
6	*MCF030*	*IR*	*ALL*	*Heater String Isolation/Failure of 1CB005A/6A to auto close.*
7	*MGC002*	*M*	*RO SRO*	*Loss of Stator Cooling.*
8	*MCF081*	*C*	*RO SRO*	*1B TDRFP Failure to Trip.*
9		*M*	*ALL*	*5 Rod ATWS.*
10	*MEH001 MMS007*	*M*	*BOP SRO*	*Failure of 1A EHC Pp./EHC line rupture.*

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

Facility: *LaSalle Station* **Scenario No.:** *ESG 2* **Op Test No.:** **Crew B,C**

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

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

Turnover:

- *Unit 1 is in a Division 3 work week.*
- *Ready to transfer HD Tank level control to pump forward.*
- *After HD in pump forward, perform RR pump upshift IAW LOP-RR-05 .*
- *MSR Second Stage Reheat will not be placed in service until after core flow is above 61 mlb/hr per step E.6.5.*
-

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.*
~~*3/4*~~	~~*CAEP/ MCF114*~~	~~*IC*~~	~~*BOP SRO*~~	~~*HD Tank level controller fails. 1C HD Pump trips immediately after starting.*~~
5	*MRD080*	*C*	*RO SRO*	*Rod Drift.*
6	*MRC027*	*I*	*RO SRO*	*Reactor Recirc FCV drifts open.*
7	*MRC041*	*M*	*ALL*	*Reactor Recirculation line break.*
8	*MNB078*		*BOP SRO*	*1B/1C RHR fails to auto initiate.*
9	*CAEP*		*BOP SRO*	*The selected DW spray valve fails to open (breaker trips), the other loops valves will operate.*

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

Facility: *LaSalle Station* **Scenario No.:** *ESG 3* **Op Test No.:** **Crew D**

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

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

Turnover:

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

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

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

DYNAMIC SIMULATOR SCENARIO GUIDE

ILT CLASS 02-01 NRC EXAM

ESG 2

Rev. 0

01/05/2003

DEVELOPED BY: _____ _____
Facility Author Date

APPROVED BY: _____ _____
Facility Representative Date

Facility: *LaSalle Station* **Scenario No.:** *ESG 2* **Op Test No.:** 1

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

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

Turnover:

- *Unit 1 is in a Division 3 work week.*
- *Ready to transfer HD Tank level control to pump forward.*
- *After HD in pump forward, perform RR pump upshift IAW LOP-RR-05 .*
- *MSR Second Stage Reheat will not be placed in service until after core flow is above 61 mlb/hr per step E.6.5.*
-

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.*
3/4	*CAEP/ MCF114*	*IC*	*BOP SRO*	*HD Tank level controller fails. 1C HD Pump trips immediately after starting.*
5	*MRD080*	*C*	*RO SRO*	*Rod Drift.*
6	*MRC027*	*I*	*RO SRO*	*Reactor Recirc FCV drifts open.*
7	*MRC041*	*M*	*ALL*	*Reactor Recirculation line break.*
8	*MNB078*		*BOP SRO*	*1B/1C RHR fails to auto initiate.*
9	*CAEP*		*BOP SRO*	*The selected DW spray valve fails to open (breaker trips), the other loops valves will operate.*

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

NARRATIVE SUMMARY

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

Critical Steps

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

Shift Turnover Information

⇒ **Day of week and shift**

- Monday Day Shift

⇒ **Weather conditions**

- Hot, humid day. 96°F.
- No adverse whether conditions expected in the next 24 hours

⇒ **(Plant power levels)**

- Unit 1 - 30% Power/65% FCL
- 1000 MWt
- 287 MWe
- 36.7 Mlbm/hr CORE FLOW

- Unit 2 – 100% Power
- 3454 MWt
- 1149 MWe
- 107 Mlbm/hr CORE FLOW

⇒ **Thermal Limit Problems/Power Evolutions**

- Startup in progress. Ready to upshift RR pumps
- Transfer HD tank level control to Pump Forward

- 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. Protected pathways established on LPCS, RCIC and MDRFP.
- 1A GC pump is OOS for alignment.
- 1B HD pump OOS.

-
-
-

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

- None
-

- None
-

⇒ **Comments, evolutions, problems, etc.**

- Online Safety is Yellow.
- The Unit 1 is in a Division 3 work week.
- TLO Temperature controller in manual.
- SP temp. at 98°F.

- Online Safety is Green.
- The Unit 2 is in a Division 3 work week.

Operator Actions

Event No.(s): 2.1		**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.
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	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): 2.2 **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, Check the following:
		• Both RR PPs. In slow speed and FCV's full open.
		• Reactor Power is between 25% and 35% with FCL < 66.7%.
		• Both 1B33-P611A and B, Flow Controller M/A Stations A and B in Manual.
		• Both RR Mptpr Breakers 4A and 4B are closed.
		• Feedwater flow >2.83 million pounds per hour (>20% of rated flow). Refer to the discussion in LOA-RR-101.
		• Differential temperature between RR Pp. Suction and Steam Dome is >10.1°F for the loop to be upshifted.
		• Reactor Level between high and low level alarm.
		• AT the 1DS001 Operator Station RRFCV Interlock Screen, BYPASS both A and B RR Interlocks as follows:
		  • Select "Low Flow Bypass" for Loop A and then Press the "Activate button
		  • Select "Low Flow Bypass" for Loop B and then Press the "Activate button
		  • Select "Low Power Bypass" for Loop A and then Press the "Activate button
		  • Select "Low Power Bypass" for Loop B and then Press the "Activate button
		• Verify RR FCV Motion Inhibit Reset
		• Depress Lower pushbutton on RR Loop A/B M/A Station for loop in which pp. speed will be changed until 1B33-F060A/B, FCV is at Min. (<20% indicated).
		• At the 1DS001 Operator Station Interlocks screen, Verify the following Interlocks are reset:
		  • A RR Loop "Feedwater Flow Low".
		  • B RR Loop "Feedwater Flow Low".
		  • A RR Loop "Suction Delta Temp Low"
		  • B RR Loop "Suction Delta Temp Low"
		• Verify Hi Speed Start Permissive indicating light is ON.
		• Initiate TADS datalogger to collect data.
		• PLACE selected Breaker RR Motor Bkr 3A/B Control Switch to START position and Release.
		• OBSERVE the following in the selected loop:
		  ◦ 1A/B and 2A/B breakers OPEN.
		  ◦ 3A/B breaker CLOSES after pump speed DECREASES to 350 RPM.
		  ◦ Pump speed INCREASES to approximately 1750 RPM.
		  ◦ Reactor level DROPS then RETURNS to level controller setpoint.
		  ◦ Reactor Power initially INCREASES then STABILIZES.

NOTES:

Operator Actions

Event No.(s): 2.2		**Page** 2 **of** 2
Time	**Position**	**Applicant's Actions or Behavior**

	RO	• Second RR Pp. Transfer from slow to fast speed.
		• Perform actions as performed for first pp. Upshift.
		• Verify Loop A flow approximately the same as B loop.
		• Observe Feedwater Flow from CR recorder at the 1H13-P603 panel to ensure FW flow is>20% of rated (>2.83 million pounds per hour).
		• At the 1DS001 Operator Station Interlocks screen, Verify the following Interlocks are reset:
		  • A RR Loop "Feedwater Flow Low".
		  • B RR Loop "Feedwater Flow Low".
		  • A RR Loop "Suction Delta Temp Low"
		  • B RR Loop "Suction Delta Temp Low"
		• AT the 1DS001 Operator Station RRFCV Interlock Screen Place both A and B RR Interlocks in NORMAL as follows:
		  • Select "Low Flow Bypass" for Loop A and then Press the "Deactivate button
		  • Select "Low Flow Bypass" for Loop B and then Press the "Deactivate button
		  • Select "Low Power Bypass" for Loop A and then Press the "Deactivate button
		  • Select "Low Power Bypass" for Loop B and then Press the "Deactivate button
		• Throttle 1(2)G33-F102, RWCU Suct Header Stop Valve until flow indicator 1(2)G33-R610 indicates >25 gpm.
		• CONTROL Reactor Recirc Flow using Reactor Recirc Loop Flow Controller M/A Station(s) per LOP-RR-07.
		• Increase Reactor Power per LGP 1-1, Normal Unit Startup, to 61mlb/hr.

	BOP	• Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	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, 2.4		**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 occurring 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 1PL10J. (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: • 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, 2.4		**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 (May not perform if another HD pump is started) • 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 (Fig. 1 – FW temp. vs. Power) • INITIATE action to determine why pump(s) tripped and INITIATE Action Request if applicable.
	RO	• Reduce core flow as necessary while maintaining the following: ◦ Cond Polisher D/P less than 60 psid. ◦ Feedwater pump suction pressure greater than 250 psig. ◦ Reactor water level greater than 31.5". ◦ Core flow greater than 49 Mlb/hr. • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	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): 2.5		**Page** 1 **of** 1
Description: After recovery from the HD transient, rod 30-43 will drift in.		
Initiation: After recovery from HD transient, on the signal of lead examiner.		
Cues: Alarm 1H13-P603-A504, "CRD DRIFT"		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	Per LOR 1H13-P603-A504, "CRD DRIFT": • If more than one rod moving – manually scram the reactor • Enter LOA-RD-101. Per LOA-RD-101: • Check no more than 1 control rod moving at the same time or no more than 3 rods have drifted or scrammed full in. • Select drifting control rod. • Verify Insert Block light is off. If required, remove insert block by bypassing RWM. If < LPSP, refer to T.S. 3.3.2.1. • Insert control rod to position 00. If < LPSP, second verifier required. • Check rod remains at 04 or less. • Enter mispositioned control rod subsection while continuing. • Verify CRD cooling water parameters normal. • Run OD-7 option 2, OD-8 (N/A at this time) and OD-20 option 1. • Notify QNE to monitor core parameters and recommend additional power changes. • Check other rods at correct sequence positions. • Refer to T.S. 3.1.3 and 3.1.6. • Restore RWM and investigate drift/scram.
	BOP	• Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions above. • Refer to T.S. 3.1.3 (RA C.1 and C.2)and 3.1.6. • Enforces OPS expectations and standards • Ensures operations are conducted IAW Operations standards and approved procedures.
Terminus: Rod 30-43 inserted, corrective actions initiated.		

NOTES:

Operator Actions

Event No.(s): 2.6		**Page** 1 **of** 1
Description: 1A RR flow control valve spuriously drifts open.		
Initiation: After addressing rod 30-43 drift, on the signal of lead examiner.		
Cues: Increasing power, core flow, MWe, w/o operator action/control		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	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 prior to FCV reaching 80% open. • Check core flow and loop flows - less than T.S. mismatch. ◦ Within 5.425Mlbm/hr as read from 1B21-R611A/B if core flow is greater than or equal to 75.95 Mlbm/hr. ◦ Within 10.85 Mlbm/hr as read from 1B21-R611 A/B if core flow is less than 75.95 Mlbm/hr. • Check instrumentation for signs of fuel damage. • Notify QNE to evaluate core performance. • Go to Subsection B.10, Loop flow mismatch, if pp. Flows not within T.S. limits.
	BOP	• Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	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 3.4.1R.A.F-1. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications IAW OP-AA-106-101.
Terminus: Drifting RR FCV locked up, SRO has addressed loop flow mismatch T.S.		

NOTES:

Operator Actions

Event No.(s): 2.7, 2.8, 2.9		**Page** 1 **of** 4
Description: RR Line break occurs in the drywell. Additional failures will include a failure of 1B/1C RHR to auto start (can be started manually) and a failure of the drywell spray valves that are initially selected for use.		
Initiation: After conditions stable following RR FCV drift, on the signal of lead examiner		
Cues: Multiple annunciators for High DW pressure and Low RPV level		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	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 32" to 45" or as specified by US. • Report level and pressure trends • Verified RR downshifted to slow speed • Verify turbine and generator are tripped • Stabilize pressure <1020 psig 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): 2.7, 2.8, 2.9		**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/1C RHR to initiate on LOCA condition • Manually starts and aligns 1B/1C RHR. 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. Critical Task ♦ Throttle 1E12-F048A/B closed. • Initiates Suppression Chamber Spray Critical Task • Initiates DW Spray (initial selected valve will fail, other will work). • 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): 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 11-59.5 inches.
		• Upon recognition of 1B/1C LPCI initiation failure, directs BOP operator to manually start 1B/1C RHR pump and align it as required.
		• 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 12 psig
		  • When SC pressure is 12 psig, then
		  ♦ VERIFY within the limits of the DSL
		  ♦ TRIP all RR pumps
		  ♦ SPRAY the Drywell (per LGA-RH-103)
		Critical Task
		  • If SC pressure can't be restored and 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
		Critical Task 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): 2.7, 2.8, 2.9		**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-106-101.
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	04
LGA-002	Secondary Containment Control	01
LGA-003	Primary Containment Control	04
LGA-CM-01	Emergency Operation of Post LOCA H2/O2 Monitors	06
LGA-RH-103	Unit 1 RHR operations in the LGAs	04
LGA-VR-01	Primary Containment Temperature Reduction	08
LGP-1-1	Normal Unit Startup	68
LGP-3-2	Reactor Scram	47
LOA-RD-101	Control Rod Drive Abnormal	06
LOA-HD-101	Heater Drain System Trouble	07
LOA-RR-101	Unit 1 RR System Abnormal	11
LOP-HD-02	Normal Startup and Operation of the HD System	29
LOP-RM-01	Reactor Manual Control Operation	21
LOP-RR-05	Changing RR Pump Speed From Slow to Fast	32
LOP-RR-07	Operation of RR Flow Control System	25
LOR 1H13-P603-A504	CRD Drift	03
LOR-1PM03J-B503	Heater Drain Tank Level Hi/Lo	01
LOR-1PM03J-B504	Heater Drain Pump Auto Trip	00

Simulator Operator Instructions

Initial Setup

1. Recall IC- **_25__** (Ready to upshift RR pumps)
2. Place simulator in RUN.
3. Load and run the setup CAEP written for this scenario (**esg2r1**.cae on floppy disc)
4. Latch 16 heaters.(HD1)
5. Hang OOS cards for HPCS
6. Start 1B GC Pump. Hang OOS on 1A GC Pump. **Clear GC local panel alarm.**
7. Hang OOS on 1B HD Pump.
8. Write T/S 3.5.1, 14 days, for HPCS being OOS
9. Verify ESF light for HPCS on.
10. Verify ESF light for Div II off.
11. Run APRM gain adjust.
12. Imf r0692 on
13. Imf r1410 off
14. Change wind from MI1 (direction and variance).
15. Provide marked up copy of LGP 1-1.
16. Select an edge rod (prevents RBM alarms).

Event Triggers and Role Play

Event #

1. Upshift RR Pumps
   a. No triggers
   b. Role play for EO actions in RB
   c. After the upshift, with power > 30%, **dmf r0692.**

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. Rod 30-43 drift
   a. **Trigger 5** to insert drift for 30-43.
   b. Role play as rounds operator.

6. RR FCV Drifts Open (prior to trigger, verify OPRM override deleted).
   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 and 1C RHR fails to auto initiate
   a. No triggers. Signal is defeated on initial setup.

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.

LaSalle County Station

DYNAMIC SIMULATOR SCENARIO GUIDE

ILT CLASS 02-01 NRC EXAM

ESG 3

Rev. 0

1/07/2003

DEVELOPED BY: _____ _____
Facility Author Date

APPROVED BY: _____ _____
Facility Representative Date

Facility: *LaSalle Station* **Scenario No.:** *ESG 3* **Op Test No.:** 1

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

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

Turnover:

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

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

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

NARRATIVE SUMMARY

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

Critical Steps

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

4. Crew initiates Drywell Sprays before drywell pressure exceeds the limits of the Pressure Suppression Pressure curve in the emergency operating procedures.

Shift Turnover Information

⇒ **Day of week and shift**

- Monday Day Shift

⇒ **Weather conditions**

- No adverse weather conditions expected in the next 24 hours

⇒ **(Plant power levels)**

- Unit 1 - 85% Power/101% FCL
- 3001 MWt
- 964 MWe
- 73 Mlbm/hr CORE FLOW

- Unit 2 – 100% Power
- 3489 MWt
- 1149 MWe
- 107 Mlbm/hr CORE FLOW

⇒ **Thermal Limit Problems/Power Evolutions**

- Power ascension for load following is scheduled this shift (300 MWe/hr)
-

- None
- Unit 2 – 100% Power

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

- T/S 3.5.1, 7 days for 1C RHR
-

- None
-

⇒ **LOSs in progress or major maintenance**

- LOS-RP-W1 needs completed following thermography on scram solenoids.
- 1C RHR Pump OOS for breaker repair.
- 1B IN Compressor is OOS for lube oil change.

- None
-
-

⇒ **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)
- The Unit 1 is in a Division 2 work week.
- TLO Temperature controller in manual.

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

Operator Actions

Event No.(s): 3.1		**Page** 1 **of** 1
Description: After the crew has taken the shift, the SRO should direct the RO to continue to raise reactor power to 100% at 300 MWe/hr.		
Initiation: Following shift turnover on the signal of lead examiner		
Cues: Directed by SRO		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	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 AUTO light on recirculation loop flow controller M/A station A/B is ON. • To adjust A and B Recirculation Loop Flow Controller Setpoint, DEPRESS the Ganged Flow Setpoint Station RAISE/LOWER pushbutton(s) as required.
	BOP	• Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	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): 3.2		**Page** 1 **of** 1
Description: The SRO should also direct the BOP to complete LOS-RP-W1.		
Initiation: Following shift turnover on the signal of lead examiner		
Cues: Directed by SRO		
Time	**Position**	**Applicant's Actions or Behavior**

	BOP	Per LOS-RP-W1:
		• Verify relays 1C71A-K15A/B/C/D energized.
		• Alarms 1H13-P603-B510/B504/B203/B303/B211/B311 cleared.
		• Run OD-7 and check rod positions.
		• **TRIP SYSTEM A1**
		  • Arm Reactor Manual Scram Pushbutton for system A1 and VERIFY the CHAN A MANUAL SCRAM SWITCH ARMED alarm illuminates.
		  • Momentarily Press the Reactor Manual Scram Pushbutton for Trip System A1 and CHECK the following:
		  • CHAN A1 REACTOR AUTO SCRAM alarm illuminates.
		  • SCRAM GROUP A solenoid lights de-energize.
		  • RESET the tripped channel and CHECK the following:
		  • SCRAM GROUP A solenoid lights re-energize.
		  • CHAN A1 REACTOR AUTO SCRAM alarm can be reset
		  • Disarm the Reactor Manual Scram Pushbutton for trip system A1 and VERIFY the alarm for CHAN A MANUAL SCRAM SWITCH ARMED alarm can be reset.
		• **TRIP SYSTEM A2, B1 and B2**
		  • Perform actions as performed for trip system A1 for appropriate trip system.
		• RUN OD-7 and check rod positions.

	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	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: LOS-RP-W1 complete,		

NOTES:

Operator Actions

Event No.(s): 3.3		**Page** 1 **of** 2
Description: After LOS-RP-W1 has been performed, the RCIC Drain Pot alarm will annunciate.		
Initiation: After LOS-RP-W1 is complete, on the signal of lead examiner.		
Cues: Annunciator LOR-1H13-P601-D502, RCIC Drain Pot Level High		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	Per LOR-1H13-P601-D502: • VERIFY automatic actions (OPENS AO 1E51-F054, RCIC Turbine Inlet Steam Line Water Drain Pot Trap Bypass) occurs. • VERIFY AO 1E51-F025 and AO 1E51-F026 open, and MO 1E51-F045 closed. • If RCIC is in standby, and the alarm does NOT clear and the 1E51-F054 does NOT close within two minutes, CLOSE 1E51-F360 and declare RCIC INOP. • Dispatch operator locally. • Enters information in Unit Log.
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	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 RCIC INOP and enters T.S. 3.5.3 R.A. A.1 and A.2. Verify HPCS operable and restore RCIC in 14 days.
Terminus: SRO has declared RCIC inop and entered appropriate timeclocks.		

NOTES:

Operator Actions

Event No.(s): 3.4		**Page** 1 **of** 2
Description: When the crew has addressed the RCIC problem, a trip of the running Instrument Nitrogen (IN) compressor will occur.		
Initiation: After crew has addressed RCIC, on the signal of lead examiner.		
Cues: Annunciator LOR-1PM13J-A404 alarming		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	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 (*not available due to OOS*) ▪ 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 (operator may use hardcard): • 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): 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.
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	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 Oxygen 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): 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.
	BOP	• Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	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 initiate repairs.
Terminus: TDRFP Seal Injection Pump running and hi temperature alarms clear		

NOTES:

Operator Actions

Event No.(s): 3.6		**Page** 1 **of** 1
Description: Once the crew has restored seal injection, the 1A TDRFP flow instrument will fail low.		
Initiation: After crew has restored TDRFP Seal Injection, on the signal of lead examiner.		
Cues: Annunciator LOR-1H13-P603-A511 alarming, RWLCS TROUBLE		
Time	**Position**	**Applicant's Actions or Behavior**

	RO	Per LOR-1H13-P603-A511:
		• At the 1DS001 Operation Station Event List, CHECK alarm message.
		• If alarm message is"Dev Header/Pump Flow" then CHECK for failing reactor feed pump discharge flow signal.
		• If a Reactor feed pump discharge flow signal has failed,
		  • VERIFY the corresponding reactor feed pump min. flow M/A station is in MANUAL.
		  • POSITION the corresponding reactor feedpump min flow as required for plant conditions.
		• REFER to LOP-FW-16 to determine cause of alarm and required actions.

	BOP	• Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	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, actions taken per LOR 1H13-P603-A511.		

NOTES:

Operator Actions

Event No.(s): 3.7, 3.8		**Page** 1 **of** 4
Description After failure of the A TDRFP flow instrument, a major steam leak (steam line "D") propagates inside the primary containment. A broken containment monitoring instrument line will have the following effects: - Fail Division 1 drywell pressure indication - Fail Division 1 ECCS and EDG automatic initiation - Prevent remote operation of Division 1 containment spray – Fail SPDS DW Pressure Indication.		
Initiation: Conditions stable following RWLC failure.		
Cues: Multiple annunciators for High DW pressure		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	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) • Report failure of Division 1 systems to initiate on LOCA condition
	Critical Task	• Manually initiates/starts division 1 ECCS using one of the following methods: ◦ Arm and depress Div 1 ECCS Initiation push button ◦ Starts, 1A RHR and/or LPCS manually as required. 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): 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 11-59.5 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 restored and held 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): 3.7, 3.8, 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. GSEP Event Classification and PARS Determination (if performed): • GSEP - "Alert" per EAL FA1 • PARS – None

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-RR-07	Operation of RR Flow Control System	19
LOR-1H13-P603-A409	Feedwater Control Reactor Water Low – Level 4	01
LOR-1PM03J-A307	RFP 1A Seal Leakoff Drain Line Temperature High	01
LOR-1PM13J-A103	Drywell Air Hydrogen High	00
LOR-1PM13J-A404	Instrument Nitrogen System Trouble	01
LOR 1H13-P601-D502	RCIC Turbine Steam Line Water Drain Pot Level High	01
LOS-RP-W1	Manual Scram Instrumentation	

Simulator Operator Instructions

Initial Setup

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

Event Triggers and Role Play

Event #

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

11. Perform LOS-RP-W1
    a. No triggers
    b. Role play for operator actions as necessary

12. RCIC Drain Pot alarm
    a. **Trigger 3** on request from lead evaluator
    b. Role play for operator actions at RCIC

13. 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

14. 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

15. 1A TDRFP Flow Instrument Fails Low
    a. **Trigger 6** on request from lead evaluator
    b. Role play as necessary

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

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

LaSalle County Station

DYNAMIC SIMULATOR SCENARIO GUIDE

ILT CLASS 02-01 NRC EXAM

ESG 4

Rev. 0

01/07/2003

DEVELOPED BY: _____ _____
Facility Author Date

APPROVED BY: _____ _____
Facility Representative Date

Facility: *LaSalle Station* **Scenario No.:** *ESG 4* **Op Test No.:** *1*

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

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

Turnover:

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

Event No.	Malf. No.	Event Type*		Event Description
1	*N/A*	*C*	*RO SRO*	*1B RHR Service Water Header Pressure Low*
2	*N/A*	*N*	*BOP SRO*	*Swap VP chillers from A and C to B and C.*
3	*P3E1A1D*	*I*	*RO SRO*	*CRD FCV Setpoint Failure.*
4	*VHTM60 AD*	*CR*	*RO SRO*	*1A TDRFP Lube Oil Leak.*
5	*MNB101*	*I*	*BOP SRO*	*Main Generator Hydrogen Temperature High*
6	*MCF030*	*IR*	*ALL*	*Heater String Isolation/Failure of 1CB005A/6A to auto close.*
7	*MGC002*	*M*	*RO SRO*	*Loss of Stator Cooling.*
8	*MCF081*	*C*	*RO SRO*	*1B TDRFP Failure to Trip.*
9		*M*	*ALL*	*5 Rod ATWS.*
10	*MEH001 MMS007*	*M*	*BOP SRO*	*Failure of 1A EHC Pp./EHC line rupture.*

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

NARRATIVE SUMMARY

Event(s)	Description
E.1	Once the turnover is completed, "1B RHR SERV WTR HDR PRESS LO" will be received. The crew will identify associated T.S.'s and start the 1A DG cooling water pump. The low pressure alarm will clear and the SRO will declare Division 2 RHR WS Operable provided the 1A DG Cooling Water Pump remains in operation, the alarm clears and pressure is greater than 30 psig.
E.2	The SRO should also direct the BOP operator to swap the A swap of primary containment chillers from 1A and 1C online to 1B and 1C online in accordance with LOP-VP-02. This swap should occur without incident.
E.3	After sufficient progress in the containment chiller swap, the CRD FCV setpoint will fail low, requiring the RO to take manual control and open the FCV to regain flow.
E.4	Later, the 1A TDRFP will develop a lube oil leak requiring the S/U of the MDRFP and S/D of the 1A TDRFP. The crew should lower power to stay within the capacity of the MDRFP and the 1B TDRFP.
E.5	Once the major actions of the previous events have been completed, a main generator high hydrogen temperature alarm will come in. The crew will follow the annunciator and abnormal operating procedures and dispatch a NLO to the local skid. Upon investigation, they will discover that the hydrogen temperature controller has failed. The BOP operator will have to take manual control of the temperature controller to clear the alarm.
E.6	The next event will be an isolation of the A LP Heater String. The 1CB005A/6A will not auto close but can be closed manually via the Control Room C/S. The crew should maintain plant parameters IAW LOA-HD-101.
E.7,8,9, and 10.	When the crew has stabilized the plant following the heater string isolation, a trip of the 1B Stator Cooling Pump will occur, requiring a scram. The 1B TDRFP will not trip, requiring immediate actions per LOA-FW-101. A five (5) rod ATWS will occur and the 1A EHC Pump will trip due to a rupture in the EHC line. This will remove the ability to control Reactor pressure via the Main Condenser.

Critical Steps

5. With a reactor scram required and the reactor not shutdown, take action to reduce power by injecting boron and/or inserting control rods, to protect the primary containment.

6. During an ATWS, with reactor power less than 3%, maintain reactor water level between –150 inches and +59.5 inches using only preferred ATWS systems..

Shift Turnover Information

⇒ **Day of week and shift**

- Monday Day Shift

⇒ **Weather conditions**

- No adverse weather conditions expected in the next 24 hours

⇒ **(Plant power levels)**

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

⇒ **Thermal Limit Problems/Power Evolutions**

♦ Reducing power to 85% power, at 300 MWE/hr per Load Dispatcher.	♦ None
♦ Power/Flow Map does not work @ the simulator . Monitor Power/Flow map manually.	
♦	♦

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

♦ None	♦ None
♦	♦

⇒ **LOSs in progress or major maintenance**

♦	♦ None
♦	♦
♦	♦

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

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

⇒ **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 RCIC work week.

Operator Actions

Event No.(s): 1		**Page** 1 **of** 1
Description: 1B RHR Service Water Header Pressure Low.		
Initiation: Following shift turnover.		
Cues: LOR-1H13-P601-B202		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	BOP	Per LOR-1H13-P601-B202: • Dispatches NLO to determine 1B RHR Service Water Header pressure. • Starts the 1A DG Cooling Water Pump when pressure reported as 27 psig.
	SRO	• Directs actions above. • Enforces OPS expectations and standards. • Declares Div 2 RHR service water INOPERABLE, and refers to T.S. 3.7.1. • Declares Div 2 RHR service water OPERABLE provided alarm clears, 1A DG Cooling Water pump remains in operation, the alarm remains clear and pressure is greater than 30 psig.
Terminus: 1A DG Cooling Water Pump on and T.S.3.7.1 exited.		

NOTES:

Operator Actions

Event No.(s): 2		**Page** 1 **of** 1
Description: The SRO should direct the BOP to swap the A loop of VP so the B an C loops are on line.		
Initiation: Per Lead Evaluator after power decrease.		
Cues: Per SRO direction.		
Time	**Position**	**Applicant's Actions or Behavior**

	BOP	• Starts B VP loop per Section E.10 of LOP-VP-02. (Starts B chill water pp. and supply fan)
		• Directs NLO to open the following valves:
		  • 1VP145, C PCCW Vent Chlr Evap Loop B Supply Valve
		  • 1VP149, C PCCW Vent Chlr Evap Outlet Loop B Return Valve
		• Directs NLO to close the following valves:
		  • 1VP144, C PCCW Vent Chlr Evap Loop A Supply Valve
		  • 1VP148, C PCCW Vent Chlr Evap Outlet Loop A Return Valve
		• Record "C" VP ammeter reading prior to the start of additional chiller
		• START B VP Chiller per Section E.11 of LOP-VP-02.
		• SHUTDOWN A VP Chiller per Section E.8 of LOP-VP-02.
		• Shutdown A VP Loop per Section E.9 of LOP-VP-02. (Shuts off A VP chill water pp. and supply fan.)
		• Directs NLO to THROTTLE 1VP147, C PCCW Vent Chlr Evap Outlet Valve (per E.6.8) to maintain:
		  • B chiller amps between 55 and 75.
		  • C chiller amps between 300 and 538.

	RO	• Monitors reactor to ensure operations remain within established bands. • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	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: B VP loop running and C shutdown.		

NOTES:

Operator Actions

Event No.(s): 3		**Page** 1 **of** 1
Description: The CRD FCV setpoint will fail low, requiring the RO to take manual control and open the FCV to regain flow.		
Initiation: When sufficient progress has been made on the VP chiller swap, the direction of the Lead Examiner.		
Cues: RO observance of FCV failing or LOR 1H13-P603-A403, "CRD HYD TEMP HI".		
Time	**Position**	**Applicant's Actions or Behavior**

	RO	• Notices FCV failing or responds on receipt of "CRD HYD TEMP HI" alarm (1H13-P603-A403) **CUE: If CRD temperature recorder checked, inform examinee that many CRD temps are in alarm.**
		• Per LOA-RD-101:
		  • CHECK Drift lights – OFF
		  • CHECK the following:
		  • CRD system flow 63 gpm.
		  • Cooling Header ΔP < 30psid.
		  • Drive Water Header ΔP < 600 psid.
		  • THROTTLE Drive Water PCV 1C11-F003.
		• TRANSFER Flow Controller, 1C11-R600, to MANUAL.
		• ADJUST Flow Controller output using OPEN/CLOSE pushbuttons to obtain a CRD system flow of approximately 63 gpm.
		• CHECK Flow Control Valve 1C11-F002A controlling flow at approximately 63 gpm.

	BOP	• Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions above. • Enforces Operations expectations and standards. • Ensures operations are conducted within the bounds of Tech Specs (may refer to T.S. 3.1.3 Control Rod Operability) and IAW operations standards and approved procedures.
Terminus: CRD FCV in manual controlling flow at approximately 63 gpm.		

NOTES:

Operator Actions

Event No.(s): 4		**Page** 1 **of** 1
Description:. The 1A TDRFP will develop a lube oil leak requiring the startup of the MDRFP and shutdown of the 1A TDRFP. The crew should lower power to stay within the capacity of the MDRFP and 1B TDRFP.		
Initiation: Following placing the CRD FCV in manual and adjusting flow, at the Lead Examiners direction.		
Cues: Notices 1A TDRFP lube oil pressure decreasing / notified by rounds NLO.		
Time	**Position**	**Applicant's Actions or Behavior**

	BOP	• Note and inform US of lowering TDRFP lube oil pressure.
		• If 1PM02J-A403 (TDRFP VIBR HI) is received, take actions to remove "1A" TDRFP and place the MDRFP on line.
		• Take action IAW LOR-1PM03J-A104 (TDRFP Bearing Oil Pressure Low).
		  • Determine the "A" pump is the only one affected.
		  • Place the MDRFP in service IAW LOP-FW-03.
		  • Directs NLO to perform local actions for MDRFP S/U.
		  • Verifies 1PM03J-A102 FW Pump NPSH Lo Alarm clear.
		  • Verify Reactor Level below level 8 and alarms reset.
		  • Start MDRFP and observe amp indication and min. flow valve indicates ≥ 60% open.
		  • S/D MDRFP Aux Lube Oil Pump.
		  • S/D the 1A TDRFP IAW LOP-FW-05.
		  • Depress Turning Gear Reset Pushbutton.
		  • If manual S/D of A TDRFP is desired:
		  • Place M/A Station to Manual and lower or
		  • Place Manual Backup Station in Manual.
		  • If AUTO S/D of 1A TDRFP is desired, perform IAW LOP-RL-01.
		  • Determine if reactor feedwater flowrate is adequate for current Reactor Power level and reduce as necessary.

	RO	• Monitors reactor to ensure operations remain within established bands. • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs crew actions IAW LOR 1PM03J-A104, LOR-1PM02J-A403 and LOP-FW-03 to start the MDRFP. • Establishes Reactor Level Based Scram criteria.
Terminus:. MDRFP and 1B TDRFP on line, Reactor level stable.		

NOTES:

Operator Actions

Event No.(s): 5		**Page** 1 **of** 1
Description: A main generator high hydrogen temperature alarm will come in. Upon investigation, the crew should discover that the hydrogen temperature controller has failed.		
Initiation: Following the feedpump transfers, at the Lead Examiners direction.		
Cues: LOR-1PM02J-B101, Hydrogen Panel Trouble and LOR-1PM02J-B301, Generator 1 Temperature High or Low.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	Per LOR-1PM02J-B101: • DISPATCH operator to CHECK 1PL19J for source of Trouble alarm. • Proceed per LOR for alarm at Hydrogen Panel 1PL19J. Per LOR-1PM02J-B301 and LOR-1PL19JB1-3: • CHECK 1TI-WS001, Generator Cold Gas Temp., >50°C or < 30°C. • PLACE 1TK-WS001, Gen H2 Coolers Temp. Contrlr, in MANUAL and POSITION 1WS043, Gen H2 Coolers WS Outlet Temperature Control Valve, to maintain Generator Cold Gas Temperature between 30°C and 56°C. • If Cold Gas Temperature can NOT be controlled using 1TK-WS001, control locally by: o Concurrently throttle open 1WS045, Gen H2 Coolers TCV 10 inch B/P valve and throttle closed 1WS042, Gen H2 Coolers TCV Stop Valve. o Continuously monitor 1TI-WS001, Generator Cold Gas Temperature. o Adjust 1WS045 to maintain Cold Gas Temp. 30°C and 56°C. • If Generator Cold Gas Temperature exceeds 56°C on 1TI-WS001 or Hydrogen Cooler H2 Inlet Temp exceeds 72°C, REDUCE VARS to approximately 0. • If Generator Cold Gas Temperature cannot be reduced below 56°C, load should be reduced in 30 MWe increments to limit winding temperatures.
	RO	• Monitors reactor to ensure operations remain within established bands. • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Enforces Operations expectations and standards. • On transient, positions himself as command and authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. • Contacts Shift Manager.
Terminus: Main generator H2 temperature below alarm setpoint with control restored in manual..		

NOTES:

Operator Actions

Event No.(s): 6		**Page** 1 **of** 1
Description: High level in the 11A Low Pressure Heater will cause a heater string isolation. The 1CB005A/6A will not Auto close, but can be closed via the Control Room C/S.The crew should control and maintain plant parameters IAW LOA-HD-101.		
Initiation: After the crew has Main Generator temperature under control, at the Lead Examiners direction.		
Cues: 1PM03J-B106 LP HTR 11 LEVEL HI		
Time	**Position**	**Applicant's Actions or Behavior**

	BOP	• Respond per LOA-HD-101.
		• Verify closed 1CB005A,6A, and 45A.
		  • The 1CB005A/6A fails to Auto close. Must be manually closed via C/S.
		• Rapidly reduce core flow as low as required to maintain the following without entering the instability region:
		  • CP DP < 60psid
		  • FW suction > 300 psig
		  • Reactor Water Level > 31 inches
		  • Core Flow > 49 Mlb/hr

	RO	• Assists BOP by reducing core flow as needed. • Monitors reactor to ensure operations remain within established bands. • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Enforces Operations expectations and standards. • On transient, positions himself as command and authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. • Refers to Fig. 1 of LOA-HD-101 and applicable T.S.'s. • Contacts Shift Manager.
Terminus: Heater string isolated, power and level stable.		

NOTES:

Operator Actions

Event No.(s): 7		**Page** 1 **of** 1
Description: A trip of the 1B Stator Water Cooling Pump will occur, requiring a manual reactor scram.		
Initiation: Following the Low Pressure Heater String Isolation, with level and power under control, at the Lead Examiners direction.		
Cues: LOR 1PM02J-B106, GENERATOR STATOR COOLANT PUMP A/B TRIP		
Time	**Position**	**Applicant's Actions or Behavior**

	RO	• Per LOA-GC-101, U-1 Generator Stator Cooling Abnormal
		  • Scram if power ≥20% of rated and either:
		  • Uncontrolled reactor pressure increase or
		  • Bypass valves open and power between 20% and 70% RTP measured by an operable APRM.

	BOP	• Per LOA-GC-101, U-1 Generator Stator Cooling Abnormal
		  • Scram if power ≥20% of rated and either:
		  • Uncontrolled reactor pressure increase or
		  • Bypass valves open and power between 20% and 70% RTP measured by an operable APRM.

	SRO	• Enforces Operations expectations and standards. • On transient, positions himself as command and authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions.
Terminus: Manual Reactor Scram		

NOTES:

Operator Actions

Event No.(s): 8,9 and 10	**Page** 1 **of** 2
Description: Following the manual scram, the 1B TDRFP will not trip, requiring immediate operator actions per LOA-FW-101. A five rod ATWS will occur and the 1A EHC pump will trip due to a rupture in the EHC line. This will remove the ability to control Reactor Pressure via the Main Condenser.	
Initiation:	
Cues:	

Time	Position	Applicant's Actions or Behavior

	RO	Performs LGP 3-2.
		• Arm and Depress Scram buttons in both RPS trip systems.
		• Mode Switch to Shutdown.
		• Insert IRM's and SRM's.
		• Check all Control Rods in and power decreasing.
		• Inform Supervisor of Control Room Status and Reactor Power.
		  • Notifies US of 5 rods out.
		  o Initiate SBLC per LGA-010.
		  o Initiate ARI.
		  o Insert Control Rods per LGA-NB-01.
		• Operate Feedwater and/or ECCS as necessary within the level band of 32 inches to 45 inches or as specified by the Unit Supervisor.
		  o After initial level shrink following scram, as level begins to recover, trip one TDRFP and close its discharge valve.
		  o Start MDRFP and verify proper operation (by control room indication).
		  • Place FRV and LFFRV in Auto.
		  o If MDRFP can maintain level, trip running TDRFP and close its discharge valve.
		• Notifies US of failure of 1B TDRFP to trip.
		• Performs LOA-FW-101.
		  • Depress trip pushbutton.
		  • Place Manual Backup station in MANUAL and DEPRESS Fast Lower until CV is closed or,
		  • Close the Hi and Low Pressure Steam Supply Stops and the Feedpump discharge valve, or
		  • Dispatch an operator to manually trip the TDRFP at the Front Standard.
		• Report to US Reactor level and pressure trend.
		• Verify Reactor Recirc. Pumps have downshifted.
		• Verify Main Turbine/Generator Trip.

	Critical Task	

Operator Actions

Event No.(s): 8,9 and 10	**Page** 2 **of** 2
Description: Following the manual scram, the 1B TDRFP will not trip, requiring immediate operator actions per LOA-FW-101. A five rod ATWS will occur and the 1A EHC pump will trip due to a rupture in the EHC line. This will remove the ability to control Reactor Pressure via the Main Condenser.	
Initiation:	
Cues:	

Time	Position	Applicant's Actions or Behavior

	RO (cont.)	• Stabilize Reactor pressure < 1020 psig.
		  o If Main Condenser available, open bypass valves.
		  o If Main Condenser not available (i.e. MSIV's closed):
		  o Verify LLS operation or cycle SRV's in alphabetical order.
		  o Start RCIC in pressure control per LOP-RI-09.
		  o Open Main Steam Line Drains.
		  o Operate RWCU per LOP-RT-13.
		• Go to step E.2 of LGP 3-2.

	BOP	• Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. • Places equipment in service per US direction. • Uses alternate pressure control systems to control reactor pressure. • SRV's, RCIC, TDRFP's, MSL drains, OG, RWCU.

Critical Task	SRO	• Directs performance of LGP 3-2.
		• Directs performance of LOA-FW-101.
		• If conditions exist, enters LGA-002 and transitions to LGA-010.
		• Directs LGA-NB-01.
		• If LGA-010 entered, directs water level band of –150 inches to 59.5 inches.
		  • When rods inserted, exits LGA-010 and returns to LGA-001.
		  • Directs Reactor Water Level band of 11 inches to 59.5 inches.
		• Directs Reactor Pressure control via alternate methods.

Terminus: Rods inserted, reactor water level under control.

NOTES:

REFERENCES

Procedure	Title	Revision
LGA-001	RPV Control	04
LGA-010	Failure to Scram	04
LGP-3-1	Power Changes	29
LGP-3-2	Reactor Scram	47
LOA-HD-101	Heater Drain System Trouble	07
LOA-FW-101	Reactor Level/Feedwater Pump Control Trouble	08
LOA-GC-101	Unit 1 Generator Stator Cooling Trouble	04
LOP-RR-07	Operation of RR Flow Control System	25
LOP-VP-02	S/U, Operation and S/D of PCCW and Vent. System	23
LOR-1H13-P603-A403	CRD Hydraulic Temp. High	02
LOR-1PM03J-A104	TDRFP Bearing Oil Pressure Low	00
LOR-1PM03J-B106	LP Heater 11 Level High	01
LOR-1PM02J-B101	Hydrogen Panel Trouble	00
LOR-1PM02J-B301	Generator 1 Hydrogen Temperature High or Low	00
LOR-1H13-P601-B202	1B RHR Serv Wtr Hdr Press Lo	07

Simulator Operator Instructions

Initial Setup

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

Event Triggers and Role Play

Event #

18. 1B RHR Serv Wtr Hdr Press Lo
    a. **IOR R1324 ON** (to bring alarm in)
    b. Role play for rounds operators as necessary (**report 1B Serv. Wtr Hdr Press @ 27 psig)**
    c. **After start of 1A DG cooling water pp. , delete override on alarm R1324 and report that pressure is 44 psig.**
19. Perform LOP-VP-02, Swap VP Chillers
    a. No triggers
    b. Role play for operator actions of LOP-VP-02
20. CRD FCV setpoint failure
    a. **Trigger 1** on request from lead evaluator
    b. Role play for operator actions at CRD FCV.
21. 1A TDRFP Lube Oil Leak
    a. **Trigger 2** on request from lead evaluator
    b. Call as U-1 rounds operator and report a leak on the 1A TDRFP.
        (1) Role play as operators at 1A TDRFP.
    c. **If crew does not lower power, call as the Shift Manager and tell them to drop 100MWE to ensure a margin for feedwater.**
22. Main Generator Hydrogen Temperature High
    a. **Trigger 5** on request from lead evaluator.
    b. As NLO, report back that the temp. controller appears to have closed.
23. LP Heater 11A Level High
    a. **Trigger 3** on request from lead evaluator
    b. Role play as rounds operator.
        (1) Report back status of A string LP heaters as requested.
24. 1B Stator Cooling Pump trip
    a. **Trigger 4** on request from lead evaluator
    b. Role play as necessary
25. 1B TDRFP will not trip.
    a. No Trigger, malfunction inserted on initial setup
    b. Role play as necessary for local TDRFP trip
26. 5 rod Atws
    a. No trigger, inserted on initial setup
    b. Perform actions of LGA-NB-01 if requested.
    c. After scram, delete stuck rod malfunctions to allow manual insertion.
27. 1A EHC Pump trip/EHC rupture
    a. Trigger **6**, immediately after reactor scram.
    b. Respond as requested to EHC system.