

# LaSalle County Station

## DYNAMIC SIMULATOR SCENARIO GUIDE

### ILT CLASS 07-01 NRC EXAM

#### NRC 07-1-1

Rev. 3

07/28/08

DEVELOPED BY:

\_\_\_\_\_  
Facility Author

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Date

APPROVED BY:

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Facility Representative

\_\_\_\_\_  
Date

Facility: LaSalle StationScenario No.: NRC 07-1-1Operating Test No. 05000373**Evaluators****Operators****Crew Position****Initial Conditions: IC-51****Turnover:**

Unit 1 is currently at 93% reactor power with flow control line at 107%. Following completion of the turnover, the crew is to adjust RR flow to return to 98% power operation at a rate of 300 MWE per hour and in accordance with LGP 3-1 and LOP-RR-07, and then 50 MWE per hour to full power. After the power ascension is complete, the crew will perform LOS-RP-W1, Attachment 1A "Manual Scram Instrumentation".

Additional plant status items include:

- Unit 1 is in a Division 2 work week.
- 1B IN Compressor is OOS for lube oil change.
- 1C RHR OOS for motor inspection.
- Online Safety level is green.
- Unit 2 is operating at 100% power.

Event No.	Malf. No.	Event Type*		Event Description
Preload	imf R1436 on	setup		B IN Compress OFF (simulates OOS)
1	None	R	RO, SRO	Power ascension to 98% power at 300 MWE/hour.
2	None	N	BOP, SRO	Perform LOS-RP-W1, Manual Scram Instrumentation.
3	iro k3k07pz7		SRO	Scram Pushbutton B2 fails during LOS-RP-W1. (Tech Spec)
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 to auto start.
6	MCF072	I	RO, SRO	Output signal from the TDRFP A flow transmitter fails low.
7	MES019 IARI1 JMP	C	BOP, SRO	RCIC Steam Leak that will not isolate automatically, but will isolate manually if attempted. (Tech Spec)
8	MNB104	M	ALL	Major steam leak propagates inside the primary containment.
9	CAEP imf MCA005	I	ALL	Failure of Div. 1 D/W pressure indication due to broken Division 1 containment monitoring instrument line.
9	CAEP			Failure of Div.1 ECCS to initiate on high D/W pressure signal due to broken Division 1 containment monitoring instrument line.
9	CAEP			Inability to start drywell sprays due to lack of a high D/W pressure signal due to broken Division 1 containment monitoring instrument line.

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

## NARRATIVE SUMMARY

Event(s)	Description
1	After accepting the unit, the SRO will direct the RO to commence the power ascension from 93% to 98% power at 300 MWE/hour in accordance with LGP 3-1 and LOP-RR-07.
2, 3	(Tech Spec) The SRO will direct the BOP to complete LOS-RP-W1 (Event 2). The final scram pushbutton tested will NOT cause a ½ scram, requiring an entry into a Tech Spec LCO with a short duration timeclock. (Event 3).
4	When the crew has completed addressing the LOS-RP-W1 issue. The running Instrument Nitrogen (IN) compressor will trip. 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 the IN issue.
5	After the crew has cross-tied the Instrument Nitrogen system, the operating TDRFP seal injection pump will trip and the standby pump will fail to auto start. The RO will be able to start the standby pump manually.
6	Once the crew has the standby TDRFP seal injection pump running, 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 place the feed pump min flow in the closed position, as required for plant conditions.
7	(Tech Spec) After the crew has stabilized reactor water level, a RCIC steam leak will develop in the RCIC room upstream of the F045 valve that will not auto isolate. Shortly after the steam leak develops, a RB high rad alarm will annunciate causing the crew to enter LGA-002. At this point the SRO may direct attempting to manually isolate RCIC – the manual isolation attempt will be successful. RCIC must be declared inoperable and a Tech Spec LCO entered.
8	After the crew has manually isolated the steam leak in RCIC, a steam leak propagates inside the primary containment which results in a reactor scram and requires entry into the EOPs. (The leak will get larger shortly after the scram.)
9	Response to the scram is complicated by a broken Div. 1 containment monitoring instrument line caused by the malfunction preloaded during the initial set-up. The Div. 1 containment monitoring instrument line will cause the following to occur: <ul style="list-style-type: none"> <li>• Failure of Division 1 drywell pressure indication</li> <li>• Failure of the automatic initiation of Division 1 ECCS and EDG</li> <li>• Inability to open both Division 1 drywell spray valves at the same time from the main control</li> </ul> The diagnosis of the cause of these failures is not an immediate concern while performing the actions of the symptom-based LGAs. The operators must recognize the impact of these failures while performing the EOPs (e.g., using redundant instrumentation, manually initiating affected systems if needed).

### Critical Tasks

1. With the reactor at power and with a primary system discharging (RCIC) into the secondary containment, and the automatic isolation failed, manually isolate the leak.
2. When drywell pressure exceeds 1.93 psig, containment flood level below 723 feet start suppression chamber sprays.
3. When drywell pressure exceeds 12 psig, containment flood level below 722 feet and drywell parameters below Drywell Spray Initiation Limit (DSIL), trip all the recirculation pumps and start drywell sprays using RHR pumps not needed for adequate core cooling.

**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 - 93% Power/107% RL | ◆ Unit 2 – 100% Power   |
| ◆ 3250 MWt                   | ◆ 3454 MWt              |
| ◆ 1130 MWe                   | ◆ 1149 MWe              |
| ◆ 90 Mlbm/hr CORE FLOW       | ◆ 107 Mlbm/hr CORE FLOW |

**⇒ Thermal Limit Problems/Power Evolutions**

- |  |        |
|--|--------|
| ◆ Power ascension for load following is continuing this shift (300 MWe/hr) after being reduced in power for < 4 hours. | ◆ None |
| ◆ Continue load ramp up to 98% power immediately after taking the shift. Hold at 98% per QNE.                          |        |

- |   |                       |
|---|-----------------------|
| ◆ | ◆ 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-RP-W1 to be performed this shift.        | ◆ 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) |
| ◆ Unit 1 is in a Division 2 work week. | ◆ Unit 2 is in a RCIC work week.     |

## Operator Actions

<b>Event No.(s):</b> 1		<b>Page</b> 1 <b>of</b> 1
<b>Description:</b> After the crew has taken the shift, the SRO directs the RO to continue to raise reactor power from 93% to 98% at 300 MWe/hr.		
<b>Initiation:</b> Following shift turnover and on the signal of lead examiner.		
<b>Cues:</b> Directed by SRO		
Time	Position	Applicant's Actions or Behavior
	RO	Per LGP-3-1: <ul style="list-style-type: none"> <li>Increase power at the rate recommended by a QNE, or applicable Attachment from LGP-3-1, or computer generated equivalent.</li> <li>Recirculation flow changes shall be made per LOP-RR-07.</li> </ul> Per LOP-RR-07: <ul style="list-style-type: none"> <li>Verify AUTO light on recirculation loop flow controller M/A station A/B is ON.</li> <li>To adjust A and B Recirculation Loop Flow Controller Setpoint, DEPRESS the Ganged Flow Setpoint Station RAISE/LOWER pushbutton(s) as required.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Directs actions above.</li> <li>Enforces OPS expectations and standards</li> <li>Ensures RO monitors critical parameters carefully.</li> <li>Stresses awareness of where operation is on the power to flow map.</li> <li>Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.</li> <li>Ensures OPS activities are completed as scheduled.</li> </ul>
<b>Terminus:</b> Clearly observable plant response from change in power level.		

## NOTES:


## Operator Actions

Event No.(s): 2, 3		Page 1 of 1
<b>Description:</b> The SRO directs the BOP to complete LOS-RP-W1.		
<b>Initiation:</b> Following completion of the load ramp and on the signal of lead examiner		
<b>Cues:</b> Directed by SRO		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Per LOS-RP-W1:</p> <ul style="list-style-type: none"><li>• Verify relays 1C71A-K15A/B/C/D energized.</li><li>• Alarms 1H13-P603-B510/B504/B203/B303/B211/B311 cleared. (May flag the alarms for the surveillance.)</li><li>• Checks rod positions on control rod log provided with LOS-RP-W1 during turnover.</li><li>• <b>TRIP SYSTEM A1</b><ul style="list-style-type: none"><li>• Arm Reactor Manual Scram Pushbutton for system A1 and VERIFY the CHAN A MANUAL SCRAM SWITCH ARMED alarm illuminates.</li><li>• Momentarily Press the Reactor Manual Scram Pushbutton for Trip System A1 and CHECK the following:<ul style="list-style-type: none"><li>• CHAN A1 REACTOR AUTO SCRAM alarm illuminates.</li><li>• SCRAM GROUP A solenoid lights de-energize.</li></ul></li><li>• RESET the tripped channel and CHECK the following:<ul style="list-style-type: none"><li>• SCRAM GROUP A solenoid lights re-energize.</li><li>• CHAN A1 REACTOR AUTO SCRAM alarm can be reset</li></ul></li><li>• 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.</li></ul></li><li>• <b>TRIP SYSTEM A2, B1 and B2</b><ul style="list-style-type: none"><li>• Perform actions as performed for trip system A1 for appropriate trip system.</li><li>• The B2 scram pushbutton depressed will not cause the expected response, requiring entry into Tech Spec 3.3.1.1 Condition A.2, a 12 hour timeclock to place the channel or trip system in the tripped condition.</li></ul></li><li>• RUN Auto Scan of rod positions and check rod positions.</li></ul>
	RO	<ul style="list-style-type: none"><li>• Monitors reactor to ensure operations remain within established bands</li><li>• Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.</li><li>• Must insert a channel B half scram within 12 hours following failure of the B2 scram pushbutton per T.S. 3.3.1.1 Condition A.</li></ul>
	SRO	<ul style="list-style-type: none"><li>• Directs actions above.</li><li>• Enforces OPS expectations and standards</li><li>• Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.<ul style="list-style-type: none"><li>• Entry into Tech Spec 3.3.1.1 Condition A.2, a 12 hour timeclock to place the channel or trip system in the tripped condition required on failure of the B2 scram pushbutton.</li></ul></li><li>• Ensures OPS activities are completed as scheduled.</li></ul>
<b>Terminus:</b> LOS-RP-W1 complete.		

## Operator Actions

<b>Event No.(s):</b> 4		<b>Page</b> 1 <b>of</b> 1
<b>Description:</b> When the crew has completed addressing the LOS-RP-W1 issue, a trip of the running Instrument Nitrogen (IN) compressor will occur.		
<b>Initiation:</b> After crew has addressed the LOS-RP-W1 issue, on the signal of lead examiner.		
<b>Cues:</b> Annunciator LOR-1PM13J-A404 "Instrument Nitrogen Sys Trouble" alarming		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Per LOR-1PM13J-A404, Instrument Nitrogen System Trouble, step 8:</p> <ul style="list-style-type: none"> <li>If alarm is due to R0103 1A Instr N2 Comp O/L Trip <ul style="list-style-type: none"> <li>Dispatch an operator to 1IN02CA and associated breaker to determine the cause of the trip.</li> <li>May attempt to expedite restoring B IN compressor to service (it can not be restored due to a stripped oil drain plug)</li> <li>Determines that the IN system cannot be restarted.</li> </ul> </li> </ul> <p>Per LOA-IN-101 Hardcard: (LOA-IN-101 procedure may also be used)</p> <ol style="list-style-type: none"> <li>VERIFY NO Group 10 Isolation Signal exists.</li> <li>OPEN 1IN059 / 1IN060 by placing control switch on the 1PM13J panel to open</li> <li>Directs a non-licensed operator to follow-up with LOA-IN-101 section B.1 to check in plant equipment.</li> </ol>
	RO	<ul style="list-style-type: none"> <li>Monitors reactor to ensure operations remain within established bands</li> <li>Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.</li> </ul>
	SRO	<p>Specific:</p> <ul style="list-style-type: none"> <li>Directs actions listed above</li> <li>Should consider contacting Work Control to expedite work on 1B IN compressor.</li> <li>Considers tech spec implications of rising O2 levels in containment <ul style="list-style-type: none"> <li>Refers to T/S 3.6.6.2, Drywell and Suppression Chamber Oxygen Concentration</li> </ul> </li> </ul> <p>General:</p> <ul style="list-style-type: none"> <li>On transient, positions himself as command authority on the unit.</li> <li>Acknowledges immediate operator actions and directs subsequent actions.</li> <li>Enforces OPS expectations and standards.</li> <li>Contacts Shift Manager and recommends notifications IAW OP-AA-106-101.</li> </ul>
<b>Terminus:</b> Actions of LOA-IN-101 directed. In field actions are not required to be complete.		

## NOTES:


## Operator Actions

<b>Event No.(s):</b> 5		<b>Page</b> 1 <b>of</b> 1
<b>Description:</b> After the IN system has cross-tied with IA, the operating TDRFP seal injection pump will trip and the standby pump will fail to auto start.		
<b>Initiation:</b> After crew has restored IN pressure, on the signal of lead examiner.		
<b>Cues:</b> Annunciator LOR-1PM03J-A307 "1A TDRFP Seal Leakoff Drain line Temp Hi" alarming		
Time	Position	Applicant's Actions or Behavior
	RO	Per LOR-1PM03J-A307, <ul style="list-style-type: none"> <li>• <b>VERIFY a Seal Injection Pump is operating</b> (it is not)</li> <li>• Dispatch an EO to Panel 1FW01JA (768' outside feedpump room) and VERIFY pressure at 1PS-FW187/188/189 is greater than 50 PSID.               <ul style="list-style-type: none"> <li>◦ If pressure is less than 40 PSID and a second pump is NOT running  <b>START the second Seal Injection Pump.</b></li> </ul> </li> </ul> (Second Seal Injection Pump should have auto-started at 40 PSID. When it fails to do so, the RO may start the stand-by pump without checking a procedure due to failure of the auto start, as allowed by HU-AA-104-101, "Procedure Use and Adherence", step 4.9.1.)
	BOP	<ul style="list-style-type: none"> <li>• Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>• Directs actions above.</li> <li>• Enforces OPS expectations and standards</li> <li>• Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.</li> <li>• Contacts Work Control to investigate problem and initiate repairs.</li> </ul>
<b>Terminus:</b> TDRFP Seal Injection Pump running and hi temperature alarms clear.		

## NOTES:




## Operator Actions

Event No.(s): 6		Page 1 of 1
<b>Description:</b> Once the crew has restored seal injection, the 1A TDRFP flow instrument will fail low.		
<b>Initiation:</b> After crew has restored TDRFP Seal Injection, on the signal of lead examiner.		
<b>Cues:</b> Annunciator LOR-1H13-P603-A511 alarming, RWLCS TROUBLE		
Time	Position	Applicant's Actions or Behavior
	RO	<p>Per LOR-1H13-P603-A511:</p> <ul style="list-style-type: none"> <li>At the 1DS001 Operation Station Event List, CHECK alarm message.</li> <li>If alarm message is "Dev Header/Pump Flow" then CHECK for failing reactor feed pump discharge flow signal.</li> <li>If a Reactor feed pump discharge flow signal has failed, <ul style="list-style-type: none"> <li>VERIFY the corresponding reactor feed pump min. flow M/A station is in MANUAL.</li> <li>POSITION the corresponding reactor feedpump min flow as required for plant conditions, (CLOSED).</li> <li>Soft trip detection is blocked</li> </ul> </li> <li>REFER to LOP-FW-16 to determine cause of alarm and required actions.</li> </ul> <p>The RO may take manual control of the 1A TDRFP minimum flow valve without referencing the LOR the failure is quickly diagnosed. This is permitted per LaSalle's "Strategy for Successful Transient Mitigation", step C.1 which allows placing a system in a desired state if the automatic action fails, which in this case the automatic control of the feedwater system has failed.</p>
	BOP	<ul style="list-style-type: none"> <li>Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. <ul style="list-style-type: none"> <li>Power will rise if the 1A TDRFP min flow valve is allowed to go open.</li> </ul> </li> </ul>
	SRO	<ul style="list-style-type: none"> <li>On transient, positions himself as command authority on the unit and may set scram criteria for level control (20 to 50 inches and not in control).</li> <li>Acknowledges immediate operator actions and directs subsequent actions.</li> <li>May request an additional NSO to the control room for manual FW control.</li> <li>Enforces OPS expectations and standards.</li> </ul>
<b>Terminus:</b> RPV level stable in the green band, actions taken per LOR 1H13-P603-A511.		

## NOTES:


## Operator Actions

<b>Event No.(s):</b> 7		<b>Page</b> 1 <b>of</b> 1
<b>Description:</b> After level has been stabilized, RCIC will develop a steam leak upstream of the 1E51-F045 valve RCIC Steam Inlet Valve that will not auto isolate – but will manually isolate.		
<b>Initiation:</b> After level is stable from the previous event, on the signal of lead examiner.		
<b>Cues:</b> Annunciator LOR-1H13-P601-B110, RB High Rad		
Time	Position	Applicant's Actions or Behavior
	BOP	Per LOR-1H13-P601-B110: <ul style="list-style-type: none"> <li>Check Reactor Building Area Rad Monitors on Panel 1D21-P600 to determine affected area.</li> <li>Depress RESET button. If alarm does not clear, then FLIP appropriate toggle switch from NORMAL to BYPASS position.</li> <li>VERIFY alarm at 1H13-P601-B310 ANNUNCIATES</li> <li>REFER to LOA-AR-101</li> <li>REFER to LGA-002 (informs Unit Supervisor to enter LGA-002)</li> <li>NOTIFY Unit Supervisor of existing condition.</li> <li>Dispatch operator locally.</li> <li>Isolates RCIC by closing the 1E51-F063 and 1E51-F008 when directed</li> </ul>
	RO	<ul style="list-style-type: none"> <li>Monitors reactor to ensure operations remain within established bands</li> <li>Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Directs actions above.</li> <li>Enforces OPS expectations and standards.</li> <li>Enters LGA-002</li> <li><b>Directs manual isolation of RCIC by closing the 1E51-F063 and 1E51-F008.</b></li> <li>Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.</li> <li>Declares RCIC inoperable and performs the actions of T/S 3.5.3:               <ul style="list-style-type: none"> <li>IMMEDIATELY VERIFIES HPCS is operable.</li> <li>Enters 14 day timeclock to restore RCIC to operable.</li> </ul> </li> <li>May inform Shift Manager that PARAGON need to be checked for RCIC inoperable.</li> </ul>
<b>Terminus:</b> SRO has declared RCIC INOP and entered appropriate timeclocks.		

## NOTES:

RCIC INOP – PARAGON RISK will be YELLOW

## Operator Actions

Event No.(s): 8, 9, 10, 11		Page 1 of 4
<b>Description</b> After the RCIC leak has been isolated, 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 drywell spray – Fail SPDS DW Pressure Indication.		
<b>Initiation:</b> After RCIC has been manually isolated, at the direction of the lead examiner.		
<b>Cues:</b> 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-1 (hardcard): <ul style="list-style-type: none"> <li>• Arm and Depress scram pushbuttons in both RPS trip systems</li> <li>• Place reactor mode switch in Shutdown</li> <li>• Insert IRMs and SRMs</li> <li>• Check all rods in and power decreasing</li> <li>• Inform Unit Supervisor of Control Rod Status and Reactor Power:</li> <li>• Operate FW and ECCS as necessary to control level within level band of 20" to 50" (not to exceed Level 8, 55.5 inches) or as specified by US.</li> <li>• After initial level shrink, as level recovers, TRIP one TDRFP and CLOSE its discharge valve</li> <li>• START MDRFP and VERIFY proper operation               <ul style="list-style-type: none"> <li>• PLACE LFFRV in AUTO</li> <li>• VERIFY FRV CLOSED in MANUAL</li> </ul> </li> <li>• Report level and pressure trends</li> <li>• If needed for level control               <ul style="list-style-type: none"> <li>• Establish RWCU reject per hardcard</li> <li>• PLACE FRV in AUTO</li> <li>• RESET the scram</li> <li>• DISPATCH EO to CLOSE 1C11-F034, Charging Water Supply</li> </ul> </li> <li>• Verified RR downshifted to slow speed</li> <li>• Verify turbine and generator are tripped</li> <li>• Monitor Reactor pressure.               <ul style="list-style-type: none"> <li>• Close MSIVs to reduce pressure reduction</li> </ul> </li> <li>• GO to Step E.2 of LGP 3-2.</li> </ul> Performs additional EOP actions as directed by SRO <ul style="list-style-type: none"> <li>• Coordinates with BOP to maintain/restore RPV level in band specified using preferred injection systems</li> <li>• Monitors RPV parameters               <ul style="list-style-type: none"> <li>◦ Report lowering RPV level/pressure (value, rate, trend)</li> <li>◦ Report indications of steam line break</li> </ul> </li> </ul>

NOTES:


## Operator Actions

Event No.(s): 8, 9, 10, 11		Page 2 of 4
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Makes plant announcement for reactor scram</p> <p>Verifies needed auto actions (PCIS, ECCS)</p> <ul style="list-style-type: none"> <li>Report failure of Division 1 systems to initiate on LOCA condition <u>and</u></li> <li>Manually initiates/starts Division 1 ECCS using one of the following methods: <ul style="list-style-type: none"> <li>Arm and depress Div 1 ECCS Initiation push button</li> <li>Starts, 1A RHR and/or LPCS manually as required.</li> </ul> </li> </ul> <p>Performs additional EOP actions as directed by SRO</p> <ul style="list-style-type: none"> <li>Starts 2 loops of suppression pool cooling using hard card: <ul style="list-style-type: none"> <li>Startup RHR Service Water as follows: <ul style="list-style-type: none"> <li>Open 1A/1B RHR Hx Service Water Outlet Valve 1E12-F068A/B.</li> <li>Wait approximately 9 to 10 seconds, then start first RHR WS pump</li> <li>When indicated flow reaches 3000 gpm, START second RHR Service Water Pump.</li> </ul> </li> <li>Start 1A/1B RHR Pump.</li> <li>Establish RHR flow of 1500 to 7450 gpm. <ul style="list-style-type: none"> <li>Throttle 1E12-F024A/B open.</li> <li>Throttle 1E12-F048A/B closed.</li> </ul> </li> </ul> </li> </ul> <p><b>Critical Task</b></p> <ul style="list-style-type: none"> <li><b>Initiates Suppression Chamber Spray before pressure reaches 12 psig</b> <ul style="list-style-type: none"> <li><b>Verify 1A/1B RHR Pump is running</b></li> <li><b>OPEN 1E12-F027A/B</b></li> </ul> </li> </ul> <p><b>Critical Task</b></p> <ul style="list-style-type: none"> <li><b>Initiates DW Spray when Suppression Chamber pressure is above 12 psig.</b> <ul style="list-style-type: none"> <li><b>Verify 1B RHR Pump is running</b></li> <li><b>THROTTLE 1E12-F024B CLOSED</b></li> <li><b>OPEN: 1E12-F016B and 1E12-F017B</b> <ul style="list-style-type: none"> <li><b>If 1A RHR DW Spray is attempted to be placed in operation, the 1E12-F016A and 1E12-F017A valves can not be opened at the same time due to the failed instrument line.</b></li> </ul> </li> </ul> </li> <li>Coordinates with RO to maintain/restore RPV level in band specified using preferred injection systems</li> <li>Restarts VR IAW LGA-VR-01 (as time permits)</li> </ul>

## NOTES:


## Operator Actions

Event No.(s):		8, 9, 10, 11	Page	3	of	4
Time	Position	Applicant's Actions or Behavior				
	SRO	<p>Directs entry into EOPs and associated actions as entry conditions are met.</p> <p>Per LGA-001:</p> <ul style="list-style-type: none"> <li>• Directs RO to control RPV level 11 – 59.5 inches (20-50 inches).</li> </ul> <p>Per LGA-003:</p> <ul style="list-style-type: none"> <li>• Per Primary Containment Pressure Leg, directs the following:               <ul style="list-style-type: none"> <li>• <b>Spray the Suppression Chamber before pressure reaches 12 psig</b></li> <li>• When SC pressure is above 12 psig, then                   <ul style="list-style-type: none"> <li>◆ VERIFY Containment Flood Level &lt;722' and within limits of the DSL</li> <li>◆ TRIP all RR pumps</li> <li>◆ <b>START drywell sprays (per LGA-RH-103) when Suppression Chamber pressure is above 12 psig.</b></li> </ul> </li> </ul> </li> <li>• Per Drywell Temperature Leg, directs the following:               <ul style="list-style-type: none"> <li>◦ If determined can't stay below 135 F in DW, then start all available drywell cooling (per LGA-VP-01)</li> </ul> </li> <li>• Per Pool Temperature Leg, directs the following:               <ul style="list-style-type: none"> <li>◦ Hold Suppression Pool temperature below 105 F.</li> <li>◦ If determined can't stay below 105 F in Suppression Pool, then start all available pool cooling per (LGA-RH-103)</li> </ul> </li> <li>• Pool Level Leg               <ul style="list-style-type: none"> <li>◦ Monitor Suppression Pool Level (-4.5 to +3.0 inches)</li> </ul> </li> <li>• Hydrogen Leg               <ul style="list-style-type: none"> <li>◦ Start Hydrogen and Oxygen Monitors (per LGA-CM-01)</li> </ul> </li> </ul>				

NOTES:

[illegible]

## Operator Actions

<b>Event No.(s):</b> 8, 9, 10, 11		<b>Page</b> 4 <b>of</b> 4
<b>Time</b>	<b>Position</b>	<b>Applicant's Actions or Behavior</b>
	SRO	<p>Directs entry into EOPs and EOP actions as entry conditions are met.</p> <p>General:</p> <ul style="list-style-type: none"> <li>• On transient, positions himself as command authority on the unit.</li> <li>• Acknowledges immediate operator actions and directs subsequent actions.</li> <li>• Enforces OPS expectations and standards.</li> <li>• Contacts Shift Manager and recommends notifications IAW OP-AA-106-101.</li> </ul>
<p><b>Terminus:</b></p> <ul style="list-style-type: none"> <li>• RPV level stable and under control above TAF and in required band.</li> <li>• DW Spray initiated and DW pressure lowering.</li> <li>• Upon approval of lead examiner.</li> </ul>		

NOTES:

[illegible]

**REFERENCES**

<b><u>Procedure</u></b>	<b><u>Title</u></b>	<b><u>Revision</u></b>
LGA-001	RPV Control	09
LGA-002	Secondary Containment Control	04
LGA-003	Primary Containment Control	08
LGA-CM-01	Emergency Operation of Post LOCA H2/O2 Monitors	08
LGA-RH-103	Unit 1 RHR operations in the LGAs	08
LGP-3-1	Power Changes	43
LGP-3-2	Reactor Scram	58
LOA-IN-101	Loss of Drywell Pneumatic Air Supply	06
LOP-IN-101	Unit 1 Drywell Pneumatic System Startup and Operation	02
LOP-RR-07	Operation of RR Flow Control System	30
LOR-1H13-P603-A409	FW CONTROL RX VESSEL LO LVL 4	02
LOR-1H13-P603-A511	RWLCS TROUBLE	02
LOR-1PM03J-A307	1A TDRFP SEAL LEAKOFF DRAIN LINE TEMP HI	01
LOR-1PM13J-A103	DRYWELL AIR HYDROGEN HI	02
LOR-1PM13J-A404	INSTRUMENT NITROGEN SYS TROUBLE	01
LOS-RP-W1	Manual Scram Instrumentation	13

## Simulator Operator Instructions

### Initial Setup

1. Recall IC-51
2. Place simulator in RUN.
3. Load and run the CAEP written for this scenario (**07-1-1cae.cae** on jump drive)
4. Reduce RR flow to 94% power.
5. Verify WS pressure within green band.
6. Place 1C RHR in PTL and Hang OOS card for the pump
7. Write T/S 3.5.1, 7 days, for 1C RHR being OOS
8. Provide a completed Attachment B for LGP 3-1.
9. Provide a current REMA
10. Provide marked up copy of LOS-RP-W1, with steps 1 – 5 marked complete
11. Control Rod log.
12. Have the following documents available in the briefing room:
  - LOP-RR-07
  - LOA-RR-101
  - LGP 3-1 with Att. B (Marked Up)
  - LOS-RP-W1 (Marked Up with first page check marked and last page with two sigs)
  - Control Rod Log
  - LOA-RP-101
13. Have available in the simulator bright, numbered stickies for use during LOS-RP-W1.



**Event Triggers and Role Play**Event #

1. Raise Power with RR Flow
  - a. No triggers
  - b. Role play for rounds operators as necessary
  
- 2/3 Perform LOS-RP-W1, failure of B2 scram pushbutton
  - a. No triggers
  - b. Role play for operator actions as necessary
  - c. If BOP checks RPS relays in backpanel, report they appear normal.
  - d. If informed as the shift manager that a ½ scram must be inserted within 12 hours, direct the SRO to insert the ½ scram now.
  
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
    - (3) B IN compressor has a stripped oil drain plug and can not be restored quickly.
  
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
    - (2) Breaker tripped on overload, motor is hot to the touch
  
6. 1A TDRFP Flow Instrument Fails Low
  - a. **Trigger 6** on request from lead evaluator
  - b. Role play as necessary
  
7. RCIC Steam Leak in RCIC Room
  - a. **Trigger 12** on request from lead evaluator
  - b. Role play as dispatched operator
    - (1) Wait approx. 2 min – then report “Steam coming up the steps from the RCIC area and can not get into RCIC room.”
  
8. Steam Leak Inside Primary Containment
  - a. **Trigger 8** on request from lead evaluator, or shortly after scram if level control is lost
    - Leak is propagating and gets worse after the scram
  
- 9/10/11  
Division 1 Containment Monitoring Instrument Line Broken
  - a. No Trigger, malfunction inserted on initial setup
  - b. Role play as necessary, may be sent out to locally open the Div. 1 Drywell spray valve

# LaSalle County Station

## DYNAMIC SIMULATOR SCENARIO GUIDE

### ILT CLASS 07-01 NRC EXAM

**NRC 07-1-2**

**Rev. 3**

**07/28/08**

DEVELOPED BY:

\_\_\_\_\_  
Facility Author

\_\_\_\_\_  
Date

APPROVED BY:

\_\_\_\_\_  
Facility Representative

\_\_\_\_\_  
Date

<b>Facility:</b> <u>LaSalle Station</u>		<b>Scenario No.:</b> <u>NRC 07-1-2</u>		<b>Operating Test No.</b> 05000373
<b><u>Evaluators</u></b>		<b><u>Operators</u></b>		<b><u>Crew Position</u></b>
_____		_____		_____
_____		_____		_____
_____		_____		_____
<b>Initial Conditions: IC-51</b>  <b>Turnover:</b> Unit 1 is currently at 90% reactor power with flow control line at 107%. Following the turnover, the crew is to lower reactor power to 85%, at 300 MWE per hour, in accordance with LGP 3-1 and LOP-RR-07. After the power reduction is complete, the crew is scheduled to swap VR Supply and Exhaust Fans to balance run times on the fans. Additional plant status items include: <ul style="list-style-type: none"> <li>• 1B EHC Pump is OOS</li> <li>• Online Safety level is green.</li> <li>• Unit 2 is operating at 100% power.</li> </ul>				
<b>Event No.</b>	<b>Malf. No.</b>	<b>Event Type*</b>		<b>Event Description</b>
Preload	imf MRD042 imf MRD192 imf MRD029 imf MRD047 imf MRD040 imf MCF081			Rod 34-39 remains out to cause ATWS Rod 26-31 remains out to cause ATWS Rod 02-27 remains out to cause ATWS Rod 50-23 remains out to cause ATWS Rod 30-27 remains out to cause ATWS 1B TDRFP failure to trip
1	N/A	R	RO, SRO	Power reduction to 85% power at 300 MWe/hour using RR.
2	imf FPID1322		SRO	1B DG RM CO2 TRBL at the Unit 1 Main Fire Panel (1FP04JA) is received. Partial actuation and closure of fire dampers requires 1B DG to be declared inoperable. (Tech Spec)
3	N/A	N	BOP, SRO	Swap VR Supply and Exhaust Fans per LOP-VR-01.
4	ior g9d04g1g		SRO	Reactor Building dP degrades requiring entry into LOA-PC-101 to restore dP and T.S. 3.6.4.1 for loss of Secondary Containment. (Tech Spec)
5	MRD027	C	RO, SRO	Running 1A CRD Pump degradation, then trip, with a swap to 1B CRD Pump.
6	VHTM60AD	C	BOP, SRO	1A TDRFP Lube Oil Leak requires swap to MDRFP.
7	MCF030	I	BOP, SRO	Heater String trip requiring manual isolation.
8	MM5056	M	ALL	Turbine bearing vibes exceeds manual trip criteria.
9	MCF081	C	RO, SRO	1B TDRFP Failure to Trip.
10	Preload	C	RO, SRO	5 Rod ATWS.
11	MEH001 MMS007	C	ALL	Failure of 1A EHC Pp./EHC line rupture, loss of TBPVs.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor Transient				

**NARRATIVE SUMMARY**

<b>Event(s)</b>	<b>Description</b>
1	The SRO will first direct a power reduction to 85% at 300 MWe/hr for load following, after the turnover is completed.
2	During the power reduction, trouble alarm for 1B DG RM CO2 TRBL at the Unit 1 Main Fire Panel (1FP04JA) is received. An NLO will be dispatched to check out the problem and discover that a worker bumped the CO2 Fire Suppression cabinet in the U-1 DG Corridor while moving a gang box of tools. The event has resulted in several dampers going closed in the 1B DG Room, however a CO2 actuation did not occur. This will require the SRO to declare the 1B DG inoperable per T.S. 3.8.1.
3, 4	The SRO will direct the BOP operator to swap both VR Supply and Exhaust Fans per LOP-VR-01. The fan swap will occur without incident, however reactor building differential pressure will slowly degrade requiring entry into T.S. 3.6.4.1 for loss of secondary containment. Two methods may be taken to address the loss of secondary containment dP. LOA-PC-101 may be followed to adjust flows in the VR system, or LOP-VR-01 to restore the VR fans to the original line-up, both methods will restore the required Reactor Building differential pressure.
5	After restoring Reactor Building differential pressure and exiting the associated LCO, the 1A CRD Pump will degrade, then trip after three minutes, requiring the RO to swap running CRD Pumps. The RO will review LOP-RD-03 for swapping with the pump degraded, and then perform an emergency swap using the LOR when the pump trips.
6	Later, the 1A TDRFP will develop a lube oil leak requiring the S/U of the MDRFP and S/D of the 1A TDRFP. Power is low enough to be within the capacity of the MDRFP and the 1B TDRFP. The 1A TDRFP lube oil pressure will continue to degrade below the low lube oil trip setpoint and pump vibration will continue to rise above the required trip point of 5 mils as listed in LOR 1PM02J-B403. The pump will auto trip at 2 psig.
7	The next event will be an isolation of the A LP Heater String. The crew should maintain plant parameters IAW LOA-HD-101, which will require the manual isolation of the A LP heater sting due to the failure of the string to automatically isolate and insertion of 6 of the 8 Cram rods to reduce reactor power to 70%.
8, 9, 10, and 11	When the crew has stabilized the plant following the heater string isolation, turbine vibrations will steadily increase (Event 8), requiring a scram. The 1B TDRFP will not trip (Event 9), requiring immediate actions per LOA-FW-101. A five (5) rod ATWS (Event 10) will occur and the 1A EHC Pump will trip due to a rupture in the EHC line (Event 11). The EHC failure will remove the ability to control Reactor pressure via the Turbine Bypass Valves.

**Critical Tasks**

1. 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.
2. Stabilize reactor pressure below 1059 psig using Alternate Pressure Control 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 - 90% - will continue ramping down to 85% at 300 MWe/hr at start of shift. | ◆ Unit 2 – 100%         |
| ◆ 3110 MWt  | ◆ 3454 MWt              |
| ◆ 1070 MWe  | ◆ 1149 MWe              |
| ◆ 80 Mlbm/hr CORE FLOW  | ◆ 107 Mlbm/hr CORE FLOW |

### ⇒ Thermal Limit Problems/Power Evolutions

- |   |   |
|---|---|
| ◆ Ramp down to 85% at 300 MWe/hr at start of shift for load following | ◆ |
| ◆   | ◆ |

### ⇒ 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

- |   |        |
|---|--------|
| ◆ 1B EHC Pump is OOS for pump replacement | ◆ 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 RCIC work week.     |
| ◆ Swap VR Supply and Exhaust Fans, starting C fans and shutting down A fans per LOP-VR-01, Step E.3.6. |                                      |

## Operator Actions

<b>Event No.(s):</b> 1		<b>Page</b> 1 <b>of</b> 1
<b>Description:</b> Once the crew has accepted the unit, the SRO will direct the RO to reduce power to 85% power at 300 MWe/hour IAW LGP 3-1.		
<b>Initiation:</b> Following shift turnover.		
<b>Cues:</b> Directed by SRO		
Time	Position	Applicant's Actions or Behavior
	RO	Per LGP-3-1: <ul style="list-style-type: none"> <li>Lower power at the rate recommended by a QNE, or applicable Attachment from LGP-3-1, or computer generated equivalent.</li> <li>Recirculation flow changes shall be made per LOP-RR-07.</li> </ul> Per LOP-RR-07: <ul style="list-style-type: none"> <li>Verify AUTO light on recirculation loop flow controller M/A station A/B is ON.</li> <li>To adjust A and B Recirculation Loop Flow Controller Setpoint, DEPRESS the Ganged Flow Setpoint Station RAISE/LOWER pushbutton(s) as required.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.</li> <li>Provides peer check of RR flow manipulations as required.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Directs actions above.</li> <li>Enforces OPS expectations and standards</li> <li>Emphasizes need for caution and conservatism during the power change.</li> <li>Stresses awareness of where operation is on the power to flow map.</li> <li>Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.</li> <li>Ensures OPS activities are completed as scheduled.</li> </ul>
<b>Terminus:</b> Clearly observable plant response from change in power level.		

NOTES:


### Operator Actions

<b>Event No.(s):</b>	2	1B DG RM CO2 TRBL at the Unit 1 Main Fire Panel (1FP04JA)	<b>Page</b>	1	<b>of</b>	1
<p><b>Description:</b> After the power reduction, trouble alarm for 1B DG RM CO2 TRBL at the Unit 1 Main Fire Panel (1FP04JA) is received. An NLO will be dispatched to check out the problem and discover that a worker bumped the CO2 Fire Suppression cabinet in the U-1 DG Corridor while moving a gang box of tools. The event has resulted in several dampers going closed in the 1B DG Room, however a CO2 actuation did not occur. This will require the SRO to declare the 1B DG inoperable per T.S. 3.8.1.</p>						
<p><b>Initiation:</b> Following the completion of the load reduction and per the Lead Evaluator</p>						
<p><b>Cues:</b> When deemed appropriate.</p>						
<b>Time</b>	<b>Position</b>	<b>Applicant's Actions or Behavior</b>				
	BOP	<ul style="list-style-type: none"> <li>Identifies FP alarm and notifies SRO</li> <li>Reviews Process Computer to determine specific FP alarm</li> <li>Performs actions of LOA-FP-101                             <ul style="list-style-type: none"> <li>Dispatch an NLO to check out the alarm.</li> <li>Determines that the Fire Brigade is not required due to no fire in progress</li> </ul> </li> </ul>				
	SRO	<ul style="list-style-type: none"> <li>Determines the 1B D/G is inoperable per T.S. 3.8.1.C                             <ul style="list-style-type: none"> <li>C.4 Enters a 72 hour timeclock to restore the 1B D/G to operable, (SRO can declare HPCS inoperable if desired, but unlikely).</li> <li>C.1 Performs SR 3.8.1.1 for operable required off-site circuit within 1 hour and every 8 hours thereafter.                                     <ul style="list-style-type: none"> <li>(delegate to Unit 2 Assist NSO)</li> </ul> </li> <li>C.3.1, determines that other D/Gs are not inoperable due to common cause failure within 24 hours</li> </ul> </li> <li>Directs a 1/ hour fire watch per TRM 3.7.I.</li> <li>Enforces OPS expectations and standards</li> </ul>				
<p><b>Terminus:</b> Appropriate Tech Spec and TRM actions identified and addressed.</p>						
<p>PARAGON – 1B D/G unavailable makes RISK YELLOW.</p>						

**NOTES:**


## Operator Actions

<b>Event No.(s):</b> 3 and 4		<b>Page</b> 1 <b>of</b> 1
<b>Description:</b> The SRO will direct the BOP operator to swap VR Supply and Exhaust Fans per LOP-VR-01 step E.3.6. The fan swap will occur without incident, however reactor building differential pressure will slowly degrade after the fan swap requiring entry into T.S. 3.6.4.1 for loss of secondary containment. The crew has two success paths, the first is to enter LOA-PC-101 to adjust flows in the VR system to restore the required Reactor Building differential pressure, and the second is to swap back to the originally running fans.		
<b>Initiation:</b> After the power decrease is complete and per the Lead Examiner.		
<b>Cues:</b> Per SRO direction.		
Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> <li>Swaps VR Supply and Exhaust Fans per LOP-VR-01, beginning at step E.3.6. <ul style="list-style-type: none"> <li>If desired, take CRD Room Fan C/S to START</li> <li>Directs NLO to VERIFY at 1PL27 that VR discharge Check Dampers of fans to be started are CLOSED.</li> <li>STOP Supply Fan 1VR01CAA by placing the control switch to STOP.</li> <li>IMMEDIATELY STOP Exhaust Fan 1VR02CA by placing the control switch to STOP.</li> <li>Directs NLO to VERIFY at 1PL27 that VR discharge Check Dampers of fans that were STOPPED go CLOSED.</li> <li>START VR Exhaust Fan 1VR02CC.</li> <li>IMMEDIATELY START VR Supply Fan 1VR01CC.</li> <li>Directs NLO to VERIFY at 1PL27 that VR discharge Check Dampers of fans that were started are OPEN</li> </ul> </li> <li>Identifies degraded reactor building dP (this might be identified by another crew member or prompted by a phone call from Unit 2).</li> <li>Enters LOA-PC-101 to adjust dampers to restore reactor building dP OR restores original fan line-up per LOP-VR-01 by repeating the above steps by securing C fans and returning A fans to service.</li> </ul>
	RO	<ul style="list-style-type: none"> <li>Monitors reactor to ensure operations remain within established bands.</li> <li>Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Directs VR fan swap.</li> <li>Enforces OPS expectations and standards</li> <li>Identifies entry into T.S. 3.6.4.1 with 4 hours to restore R.B. dP.</li> <li>Directs crew to enter LOA-PC-101 to adjust dampers to restore reactor building dP OR restores original fan line-up per LOP-VR-01 step E.3.6.</li> </ul>
<b>Terminus:</b> VR supplies fans swapped and reactor building dP restored.		



## Operator Actions

<b>Event No.(s):</b>	5	<b>Page</b> 1 <b>of</b> 1
<b>Description:</b> The 1A CRD Pump will degrade, then trip, requiring the RO to swap the running CRD Pump.		
<b>Initiation:</b> When Reactor Building dP has been restored, at the direction of the Lead Examiner.		
<b>Cues:</b> RO observance of degraded CRD Pump flow or response to alarms associated with reduction in CRD flow, as listed below.		
Time	Position	Applicant's Actions or Behavior
	RO	<ul style="list-style-type: none"> <li>Notifies 1A CRD flow going down or responds to the following alarms at the 1H13-P603 Panel:               <ul style="list-style-type: none"> <li>A204; CRD CHARGING WTR PRESS LO</li> <li>A302; LO CHARGING WATER HEADER A1/B1 SCRAM</li> <li>A403; CRD HYD TEMP HI</li> <li>B302; LOW CHARGING WATER HEADER A2/B2 SCRAM</li> <li>A103; 1A CRD FEED PMP AUTO TRIP</li> </ul> </li> <li>Determines that preferred course of action is to swap CRD pumps per LOP-RD-03, "Startup of Standby CRD Pump in Non-emergency Conditions".               <ul style="list-style-type: none"> <li>This will change to an emergency pump swap per the LOR when the running pump trips</li> <li>Directs NLOs as required to perform in-plant actions.</li> </ul> </li> <li>Starts 1B CRD pump after 1A CRD pump trips by:               <ul style="list-style-type: none"> <li>Verifies CRD Header pressure is greater than 500 psig by checking indicator on the 1H13-P603 panel</li> <li>Places 1B CRD Pump control switch to the start position.</li> </ul> </li> <li>Monitors CRD system parameters to ensure normal conditions are restored.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Directs actions above.</li> <li>Enforces Operations expectations and standards.</li> <li>Ensures operations are conducted within the bounds of Tech Specs and IAW operations standards and approved procedures.</li> </ul>
<b>Terminus:</b> 1B CRD Pump is on-line and CRD system parameters restored to normal.		

NOTES:


## Operator Actions

<b>Event No.(s):</b> 6		<b>Page</b> 1 <b>of</b> 1
<b>Description:</b> The 1A TDRFP will develop a lube oil leak requiring the startup of the MDRFP and shutdown of the 1A TDRFP. The crew will have already lowered power to within the capacity of the MDRFP and 1B TDRFP. The 1A TDRFP lube oil pressure will continue to degrade below the low lube oil trip setpoint and pump vibration will continue to rise above the required trip point of 5 mils as listed in LOR 1PM02J-B403. The pump will auto trip at 2 psig.		
<b>Initiation:</b> Following the swapping of the CRD pumps, at the direction of the Lead Examiner.		
<b>Cues:</b> Notices 1A TDRFP lube oil pressure decreasing / notified by rounds NLO.		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>NOTE: There are two success paths for swapping the feedwater pumps. The first is to start the MDRFP and utilize the auto-transfer feature of digital FW control to place the MDRFP on line and remove the 1A TDRFP from service. The second is to TRIP the 1A TDRFP and allow the digital FW system to start the MDRFP and place the it on-line.</p> <p>If the MDRFP is started and the 1A TDRFP tripped, loss of level control will most likely result in a scram.</p> <ul style="list-style-type: none"> <li>• Note and inform US of lowering TDRFP lube oil pressure.</li> <li>• If 1PM02J-A403; TDRFP VIBR HI is received, take actions to remove "1A" TDRFP and place the MDRFP on line.</li> <li>• Take action IAW LOR-1PM03J-A104; 1A/1B TDRFP BRG OIL PRESS LO <ul style="list-style-type: none"> <li>• Determine the "A" pump is the only one affected.</li> </ul> </li> <li>• LOP-RL-01, Section E.6 "Automatic Transfer Sequence: A TDRFP to FRV"</li> <li>• Verify the following: <ul style="list-style-type: none"> <li>• FRV and LFFRV re in Manual Control</li> <li>• MDRFP min Flow Valve M/A Station in Auto</li> <li>• BOTH TDRFP Min Flow Valve M/A Station is in Auto</li> <li>• MDRFP is running IAW LOP-FW-03.</li> <li>• Adequate feedwater capacity exists without the 1A TDRFP in operation</li> <li>• At the 1DS001 panel, select the A TDRFP to FRV transfer sequence and press START, and monitor the complete transfer sequence</li> </ul> </li> <li>• S/D the 1A TRFP IAW LOP-FW-05.</li> </ul>
	RO	<ul style="list-style-type: none"> <li>• Monitors reactor to ensure operations remain within established bands.</li> <li>• Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>• Directs crew actions IAW: <ul style="list-style-type: none"> <li>• LOR 1PM03J-A104; 1A/1B TDRFP BRG OIL PRESS LO</li> <li>• LOR-1PM02J-A403; TDRFP VIBR HI</li> <li>• LOP-FW-03 to start the MDRFP</li> <li>• LOP-RL-01, Section E.6 "Automatic Transfer Sequence: A TDRFP to FRV"</li> <li>• LOP-FW-05 to S/D the 1A TRFP</li> </ul> </li> <li>• Establishes Scram criteria for reactor level.</li> </ul>
<b>Terminus:</b> MDRFP and 1B TDRFP on line, Reactor level stable.		

## Operator Actions

<b>Event No.(s):</b>	7	<b>Page</b>	1	<b>of</b>	1
<b>Description:</b> High level in the 11A Low Pressure Heater will cause a heater string isolation. The string will fail to automatically isolate, requiring manual isolation. The crew should control and maintain plant parameters IAW LOA-HD-101.					
<b>Initiation:</b> After the crew has placed the MDRFP on line and removed the 1A TDRFP, at the direction of the Lead Examiner.					
<b>Cues:</b> 1PM03J-B106 LP HTR 11 LEVEL HI					
<b>Time</b>	<b>Position</b>	<b>Applicant's Actions or Behavior</b>			
	BOP	<ul style="list-style-type: none"> <li>Respond per:               <ul style="list-style-type: none"> <li>1PM03J-B106 LP HTR 11 LEVEL HI</li> <li>LOA-HD-101, Section B.2, and refers to Section B.1 for loss of FW heating</li> </ul> </li> <li>Verify closed 1CB005A,6A, and 45A.               <ul style="list-style-type: none"> <li>Take the control switches for 1CB005A/6A to the closed position.</li> </ul> </li> </ul>			
	RO	<ul style="list-style-type: none"> <li>Refers to LOA-HD-101</li> <li>Assists BOP as necessary.</li> <li>REDUCE Reactor Power to less than 70%:               <ul style="list-style-type: none"> <li>Reduce RR flow</li> <li>Insert CRAM arrays, if available (sequence is top to bottom on CRAM Sheet – bottom to top in SEQUENCE)                   <ul style="list-style-type: none"> <li>Rods will be inserted as necessary in the following sequence: 38-47, 22-15, 38-15, 22-47, 46-39, 14-23, 46-23 and 14-39</li> </ul> </li> <li>INSERT control rods continuing from the back of the sequence</li> </ul> </li> <li>Monitors reactor to ensure operations remain within established bands.</li> <li>Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.</li> </ul>			
	SRO	<ul style="list-style-type: none"> <li>Enforces Operations expectations and standards.</li> <li>On transient, positions himself as command and authority on the unit.</li> <li>Acknowledges immediate operator actions and directs subsequent actions.</li> <li>Contacts Shift Manager.</li> </ul>			
<b>Terminus:</b> Heater string isolated, power and level stable.					

NOTES:


## Operator Actions

<b>Event No.(s):</b>	8	<b>Page</b>	1	<b>of</b>	1
<b>Description:</b> Increase in Low Pressure Turbine bearing vibrations, requiring a manual reactor scram.					
<b>Initiation:</b> Following the Low Pressure Heater String Isolation, with level and power under control, at the Lead Examiners direction.					
<b>Cues:</b> LOR 1PM02J-A401; TURB GEN VIBR HI					
<b>Time</b>	<b>Position</b>	<b>Applicant's Actions or Behavior</b>			
	BOP	<ul style="list-style-type: none"> <li>Per LOR 1PM02J-A401</li> <li>CHECKS turbine vibration levels on video display</li> <li>CHECKS turbine vibration levels on recorders</li> <li>Dispatch an operator to the TSI panel to check vibrations</li> <li>Enter LOA-TG-101, U-1 Turbine Generator                             <ul style="list-style-type: none"> <li>Attachment A directs a manual scram if bearings 1 through 10 exceed 12 mils <b>or</b> 10 mils for 15 minutes (vibrations will increase to 14 mils in 5 minutes, requiring a scram)</li> </ul> </li> </ul>			
	RO	<ul style="list-style-type: none"> <li>Per LOA-TG-101, U-1 Turbine Generator</li> <li>Inserts a manual scram when turbine vibrations exceed 12 mils</li> </ul>			
	SRO	<ul style="list-style-type: none"> <li>Enforces Operations expectations and standards.</li> <li>Sets scram criteria for turbine vibration in alignment with direction in LOA-TG-101, as listed above.</li> <li>On transient, positions himself as command and authority on the unit.</li> <li>Acknowledges immediate operator actions and directs subsequent actions.</li> </ul>			
<b>Terminus:</b> Manual Reactor Scram.					

NOTES:


## Operator Actions

**Event No.(s):** 9, 10 and 11

**Page** 1 **of** 1

**Description:** Following the manual scram, the 1B TDRFP will not trip, requiring immediate operator actions per LOA-FW-101. A five rod ATWS will occur and the 1A EHC pump will trip (with 1B EHC pump OOS) due to a rupture in the EHC line. This will remove the ability to control Reactor Pressure via the Turbine Bypass Valves.

**Initiation:** Events will occur following the insertion of a manual scram in response to increasing turbine vibrations.

**Cues:** None

Time	Position	Applicant's Actions or Behavior
Critical Task	RO	<ul style="list-style-type: none"> <li>Performs LGP 3-2.</li> <li>Notifies US of 5 rods out.</li> <li>Notifies US of failure of 1B TDRFP to trip and performs one or all of the following actions per LOA-FW-101:                             <ul style="list-style-type: none"> <li>Depress trip pushbutton.</li> <li>Place Manual Backup station in MANUAL and DEPRESS Fast Lower <u>until</u> CV is closed or,</li> <li>Close the Hi and Low Pressure Steam Supply Stops and the Feedpump discharge valve, or</li> <li>Dispatch an operator to manually trip the TDRFP at the Front Standard.</li> </ul> </li> <li><b>Inserts control rods per LGA-NB-01.</b> <ul style="list-style-type: none"> <li>Closes 1C11-F003 to increase drive water pressure.</li> <li>Opens CRD Flow control valve 1C11-F002A/B by placing flow controller in Manual and fully opening it.</li> </ul> </li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.</li> <li>Inhibits ADS and Prevents Injection from HPCS, LPCS, and LPCI</li> <li>Places equipment in service per US direction.</li> <li><b>Uses alternate pressure control systems to stabilize reactor pressure below 1059 psig.</b></li> </ul>
Critical Task	SRO	<ul style="list-style-type: none"> <li>Directs performance of LGP 3-2.</li> <li>Directs performance of LOA-FW-101 for 1B TDRFP failure to trip.</li> <li>When conditions exist, enters LGA-001 and transitions to LGA-010.</li> <li><b>Directs performance of LGA-NB-01.</b></li> <li>Provide direction to Inhibit ADS and Prevent Injection from HPCS, LPCS, and LPCI</li> <li>When LGA-010 entered, determines reactor power to be less than 3% and directs water level band of –150 inches to 59.5 inches.                             <ul style="list-style-type: none"> <li>When rods inserted, exits LGA-010 and returns to LGA-001.                                     <ul style="list-style-type: none"> <li>Directs Reactor Water Level band of 11 inches to 59.5 inches.</li> </ul> </li> </ul> </li> <li><b>Directs reactor pressure stabilized below 1059 psig using Alternate Pressure Control Systems.</b></li> </ul>
Critical Task		
<b>Terminus:</b> Rods inserted, reactor water level under control.		

## REFERENCES

<u>Procedure</u>	<u>Title</u>	<u>Revision</u>
LGA-001	RPV Control	09
LGA-010	Failure to Scram	08
LGA-NB-01	Alternate Rod Insertion	09
LGP-3-1	Power Changes	44
LGP-3-2	Reactor Scram	58
LOA-FW-101	Reactor Level/Feedwater Pump Control Trouble	08
LOA-HD-101	Heater Drain System Trouble	18
LOA-TG-101	Unit 1 Turbine Generator	06
LOP-FW-03	Startup of the Motor Driven Reactor Feed Pump (MDRFP)	36
LOP-FW-05	Shutdown of Turbine Driven Reactor Feedwater Pump	27
LOP-PR-04	Startup, Operation, and Troubleshooting of SVS WRGM	26
LOP-RD-03	Startup of Standby CRD Pump in Non-emergency Conditions	14
LOP-RL-01	Operation of the Reactor Level Control System	20
LOP-RR-07	Operation of RR Flow Control System	30
LOP-VR-01	Reactor Building Ventilation System Startup and Operation	43
LOR-1H13-P603-A204	CRD CHARGING WTR PRESS LO	00
LOR-1H13-P603-A403	CRD HYD TEMP HI	02
LOR-1PM02J-A401	TURB GEN VIBR HI	01
LOR-1PM02J-A403	TDRFP VIBR HI	01
LOR-1PM03J-A104	1A/1B TDRFP BRG OIL PRESS LO	01
LOR-1PM03J-B106	LP HTR 11 LVL HI	04

## Simulator Operator Instructions

### Initial Setup

1. Recall full power IC 51
2. Place simulator in RUN.
3. Load and run the setup CAEP written for this scenario (**07-1-2cae.cae** on thumbdrive/floppy disc)
4. Reduce power 90%.
5. Place OOS on 1B EHC Pump.
6. Provide a marked up copy of LOP-VR-01 for swapping fans starting at Step E.3.6

## Event Triggers and Role Play

### Event #

1. Reduce Power with RR Flow from 90% to 85% power (74M#/hr).
  - a. No triggers
  - b. Role play for rounds operators as necessary
2. Trouble alarm for 1B DG RM CO2 TRBL (**Trigger 1**)
  - a. Imf fpid1322
  - b. Trouble alarm for 1B DG RM CO2 TRBL at the Unit 1 Main Fire Panel (1FP04JA) is received.  
PPC alarm on page 2 of FP screen for 1B D/G CO2 Trouble
  - c. When dispatched, report that a worker bumped the CO2 Fire Suppression cabinet in the U-1 DG Corridor while moving a gang box of tools. The event has resulted in several fire dampers going closed in the 1B DG Room due to the firing of the ETLs, however a CO2 actuation did not occur. Also report that you spot-checked the other D/G rooms and everything is OK.
  - d. If asked, PARAGON indicates on-line risk is Yellow.
3. Perform LOP-VR-01, Swap VR Supply and Exhaust Fans
  - a. No triggers
  - b. Role play for operator actions of LOP-VR-01.
    - (1) Discharge dampers of the 1C Supply and Exhaust fans are CLOSED during prestart checks
    - (2) Discharge dampers of the 1A Supply and Exhaust fans are CLOSED after each fan is secured
    - (3) Discharge dampers of the 1C supply and exhaust fans are OPEN after they are started  
Report flows and  $\Delta$ Ps per E.2.8 of LOP-VR-01 pg. 16.  
Report  $\Delta$ Ps per E.2.7 of LOP-VR-01 pg. 13
4. Reactor Building dP degrades following VR fan swap. (**Trigger 2**)
  - a. ior g9d04g1g (2) -0.21 120
  - b. If crew does not identify reduction in Reactor Building dP, call from Unit 2 to ask if Unit 1 is indicating degraded dP as observed on Unit 2.
  - c. Role play for operator actions of LOA-PC-101
    - (1) When dispatched to the refuel floor to check dP indicators, report back that the average dP is -0.21 inches and VR inlet temperature is stable.
    - (2) When directed to balance flows, reply that VR delta flow is 10,000scfm and that you will adjust flows to go up to a flow delta of 14,000 scfm.
  - d. Ramp the override for degraded reactor building dP back to normal.
  - e. If the crew decides to restore VR fans to the original fan line-up, delete the degraded dP following the completion of the swap back to original.



5. 1A CRD Pump Degradation followed by 1A CRD Pump Trip
  - a. **Trigger 3** on request from lead evaluator
  - b. Role play for operator actions at CRD pump.
    - (1) Report the pump is making a rumbling noise, definitely different than it was yesterday
  - c. 3 minutes after Trigger 3 is initiated, the 1A CRD pump will trip.
6. 1A TDRFP Lube Oil Leak
  - a. **Trigger 4** (loaded from the CAE) on request from lead evaluator
  - b. Call as U-1 rounds operator and report an oil leak on the 1A TDRFP. Report the leak was identified yesterday and is rapidly getting worse.
    - (1) Role play as operators at 1A TDRFP. If sent as the Field Supervisor, recommend removing the pump from service immediately.
    - (2) The 1A TDRFP will indicate a reduction in lube oil pressure down to 2 psig (which is below the 4 psig trip setpoint) without tripping by performing the following:
      - a) G4C07G1Y and G4C06G1Y overridden to a value of 2
      - b) **If the crew has not already done so, manually trip the 1A TDRFP when indicated lube oil pressure is 2 psig.**
7. LP Heater 11A Level High
  - a. **Trigger 5** on request from lead evaluator  
The A heater string will not automatically isolate and requires crew to manually close the 1CB005A/6A.
  - b. Role play as rounds operator.
    - (1) Report back status of A string LP heaters as requested.
8. Low pressure turbine high vibrations
  - a. **Trigger 6** on request from lead evaluator
  - b. Role play as necessary
9. 1B TDRFP will not trip.
  - a. No Trigger, malfunction inserted on initial setup
  - b. Role play as necessary for local TDRFP trip
10. 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.
11. 1A EHC Pump trip/EHC rupture (**Trigger 7**)
  - a. Inserted on initial setup.
  - b. Respond as requested to EHC system

# ***LaSalle County Station***

## **DYNAMIC SIMULATOR SCENARIO GUIDE**

**ILT CLASS 07-01 NRC EXAM**

**NRC 07-1-3**

**Rev. 3**

**07/28/08**

DEVELOPED BY:

\_\_\_\_\_  
Facility Author

\_\_\_\_\_  
Date

APPROVED BY:

\_\_\_\_\_  
Facility Representative

\_\_\_\_\_  
Date

<b>Facility:</b> <u>LaSalle Station</u>		<b>Scenario No.:</b> <u>NRC 07-1-3</u>		<b>Operating Test No.</b> 05000373
<b><u>Evaluators</u></b>		<b><u>Operators:</u></b>		<b><u>Crew Position</u></b>
_____		_____		_____
_____		_____		_____
_____		_____		_____

**Initial Conditions: IC-18**

- 

**Turnover:**

- Unit 1 startup is in progress IAW LGP-1-1, step E.4.5, Heatup/Pressurization.
- Control rods are being withdrawn to raise Rx power for mode change to OC1.
- 1A RHR system is running for surveillance, LOS-RH-Q1 and is ready to be secured.
- 1B IN Compressor is OOS for lube oil change.
- Online Safety level is green.
- Unit 2 is operating at 100% power.

Event No.	Malf. No.	Event Type*		Event Description
1	N/A	R	RO, SRO	Pull rods for reactor startup. LGP-1-1 in progress.
2	N/A	N	BOP, SRO	Secure 1A RHR from surveillance LOS-RH-Q1.
3	set ze1210a		SRO	1A RHR min flow valve 1E12-F064A fails to open. (Tech Spec)
4	lmf mrd105	C	RO, SRO	Rod 42-43 drifts out from intermediate position, requires insertion to 00. (Tech Spec)
5	imf r-0624 CAEP imf MCN002	C	BOP, SRO	Lake Screen House Traveling Screen Trouble CW Pump Trip and associated indications Start of the stand-by CW pump Loss of condenser vacuum Off-gas high flow (ODCM)
6	imf MRD277 imf MRD278	M	ALL	Manual Scram/ATWS/Method 1 Fuse Removal Required/ARI Fails/Method 4 for full SDV resulting from sequentially removing scram fuses.
7	CAEP	C	RO, SRO	Failure of the first SBLC pump to initiate, second pump successfully injects when started.
8	CAEP	C	BOP, SRO	Small LOCA from 1B RR discharge leak, requiring spraying the SC and DW.

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

## Narrative Summary

Event(s)	Description
1	After the crew has taken the shift, the SRO will direct the RO to continue with control rod withdrawal to raise reactor power in preparation for mode change to OC1.
2, 3	<p>The SRO will also direct the BOP to secure the 1A RHR system from its quarterly surveillance test. The BOP will shutdown the RHR loop in accordance with LOS-RH-Q1. (Event 2)</p> <p>The RHR minimum flow valve, 1E12-F064A, will fail to open due to a bad flow switch instrument while securing the RHR loop. The operator will be able to open the valve manually but it will not remain open and will go closed due to the failed flow switch. The flow instrument must be considered inoperable and appropriate tech spec actions taken. (Event 3)</p>
4	CRD 42-43 drifts out from intermediate position. RO responds per LOA-RD-101 and inserts rod. The rod will remain in only if placed at 00. SRO declares the rod inop per Tech Spec 3.1.3 and refers to 3.1.6 for rod pattern control. Bypassing of the RWM requires entry into Tech Spec 3.3.2.1 until RWM is placed back in operation.
5	Once the crew has addressed the RPS problems, a Lake Screen House Traveling Screen Trouble alarm is received with a subsequent trip of one of the two running CW pumps. The BOP will start the stand-by CW pump in an effort to restore condenser vacuum. High off-gas flow will require that the O/G pre and post treat monitors be declared inop per the ODCM. The SRO will direct the RO to scram the reactor when it is determined vacuum will not be recovered. (Event 5)
6	When the RO attempts to scram the reactor, he/she must recognize that B RPS remained energized. The RO will initiate the alternate rod insertion (ARI) system, however it fails to actuate. The SRO will enter LGA-010, Failure to Scram and direct the RO to perform alternate rod insertion in accordance with LGA-NB-01, Method 1 Fuse Removal. (Event 6) The SRO should also direct the BOP to start suppression pool cooling in anticipation of a loss of the main condenser.
7	With power above 3%, the RO will initiate SBLC, however the first pump selected will fail to initiate requiring the initiation of the other SBLC pump, which injects satisfactorily.
8	Plant control will be further complicated by a small LOCA in the Drywell from a 1B RR discharge leak requiring the initiation of suppression chamber and drywell sprays (Event 8).

### **Critical Tasks**

1. With a reactor scram required and the reactor not shutdown, take actions to REDUCE power by injecting boron and/or inserting control rods to protect primary containment.
2. When drywell pressure exceeds 1.93 psig, containment flood level below 723 feet start suppression chamber sprays.
3. When drywell pressure exceeds 12 psig, containment flood level below 722 feet and drywell parameters below Drywell Spray Initiation Limit (DSL), trip all the recirculation pumps and start drywell sprays using RHR pumps not needed for adequate core cooling.

**Shift Turnover Information****⇒ Day of week and shift**

- ◆ Monday Day Shift

**⇒ Weather conditions**

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

**⇒ (Plant power levels)**

- |   |                         |
|---|-------------------------|
| ◆ Unit 1 – M/S in startup, on IRM ranges 8 & 9. | ◆ Unit 2 – 100% Power   |
| ◆ 170 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.4.5, Heatup/Pressurization. | ◆ None |
| ◆ Control rods are being withdrawn to increase CTP for mode change to OC1.      | ◆      |

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

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

**⇒ LOSs in progress or major maintenance**

- |  |        |
|--|--------|
| ◆ 1B IN Compressor is OOS for lube oil change. | ◆ None |
| ◆ LOS-RH-Q1 In progress, see comments below.   | ◆      |
| ◆  | ◆      |

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

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

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

- |  |                                      |
|--|--------------------------------------|
| ◆ Online Safety is Green (RAW = 1.0)   | ◆ Online Safety is Green (RAW = 1.0) |
| ◆ Unit 1 is in a Division 2 work week.   | ◆ Unit 2 is in a RCIC work week.     |
| ◆ 1A RHR has been running for greater than 30 minutes for LOS-RH-Q1 and is now ready to be shutdown. All data has been confirmed satisfactory. |                                      |
| ◆ Pull rods to ~10% CTP then S/D 1A RHR.   |                                      |
| ◆ LOS-RW-SR1 Att. 1A "RWM Operability Check" was completed last shift.   |                                      |

## Operator Actions

<b>Event No.(s):</b> 1		<b>Page</b> 1 <b>of</b> 1
<b>Description:</b> After the crew has taken the shift, the SRO will direct the RO to continue with control rod pulls to increase CTP in preparation for mode change to OC1.		
<b>Initiation:</b> Following shift turnover on the signal of lead examiner		
<b>Cues:</b> Directed by SRO		
Time	Position	Applicant's Actions or Behavior
	RO	Per LGP-1-1 <ul style="list-style-type: none"> <li>Continue to increase CTP with control rod withdrawal. <b>Do NOT allow CTP to increase above 12% in Startup Mode.</b> <ul style="list-style-type: none"> <li>Monitor IRM and APRM recorders.</li> <li>Verify Main Turbine BPVs open as reactor power increases.</li> <li>Control rods 18-43, 18-19, and 42-19 will be withdrawn to raise power to 10%.</li> </ul> </li> </ul> Per LOP-RM-01: <ul style="list-style-type: none"> <li>Verify Rod Select power available with rod position information correct on Four Rod Display.</li> <li>Verify withdraw block light de-energized when rod is selected.</li> <li>Press rod withdraw push-button, release and verify the following:               <ul style="list-style-type: none"> <li>Rod insert light is lit and a drive flow of <math>\approx 4</math> gpm is indicated.</li> <li>Rod withdraw light is lit and drive flow of <math>\approx 2</math> gpm is indicated.</li> <li>Rod position indication on Four Rod Display shows new rod position.</li> <li>Observe changes in nuclear instrumentation indications.</li> <li>Rod settle light is lit for <math>\approx 6</math> seconds.</li> </ul> </li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Directs actions above.</li> <li>Enforces OPS expectations and standards</li> <li>Emphasizes need for caution and conservatism during the power change.</li> <li>Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.</li> <li>Ensures OPS activities are completed as scheduled.</li> </ul>
<b>Terminus:</b> Clearly observable plant response from change in power level.		

## NOTES:

Pull Rods to just before MODE Change (Approximately 10% CTP).

## Operator Actions

<b>Event No.(s):</b> 2, 3		<b>Page</b> 1 <b>of</b> 2
<p><b>Description:</b> The SRO directs the BOP to secure the 1A RHR pump which has been running for LOS-RH-Q1. An instrument failure will prevent the min flow valve, 1E12-F064A, from opening automatically as the system flow decreases.</p>		
<p><b>Initiation:</b> Following rod pulls to 10% power/prior to Mode Change and on the direction of the lead examiner.</p>		
<p><b>Cues:</b> 1A RHR minimum flow valve 1E12-F064A does not open as system flow is reduced</p>		
<b>Time</b>	<b>Position</b>	<b>Applicant's Actions or Behavior</b>
	BOP	<p>Per LOS-RH-Q1, Att. 1A:</p> <ul style="list-style-type: none"> <li>• VERIFY B RHR Pump motor has ran a minimum of 30 minutes.</li> <li>• CLOSE 1E12-F024A, B RHR Test to SP Vlv.</li> <li>• VERIFY 1E12-F064A, B RHR Min Flow Vlv OPENS as flow decreases. <ul style="list-style-type: none"> <li>▪ Operator recognizes failure of 1E12-F064A to open.</li> <li>▪ Reports problem to SRO.</li> <li>▪ Manually opens 1E12-F064A with C/S and/or continues with pump shutdown.</li> </ul> </li> <li>• STOP A RHR Pump 1E12-C002A.</li> <li>• OPEN 1E12-F048A, A RHR HX Bypass Valve.</li> <li>• If corner room temperature is less than 104 °F, VERIFY B/C RHR Pump Cubicle Cooler Fan 1VY01C has stopped.</li> <li>• If no longer required, SHUTDOWN DG Cooling Water Pump at 1PM01J.</li> <li>• On Panel 1H13-P601, verify RHR PMP dsch press LO alarm (C405) is clear.</li> <li>• 1E12-F031A, A RHR Pump Dsch Check Valve, check to close is satisfactory. If NOT satisfactory, REFER to ER-AA-321 for applicable actions.</li> <li>• At RB 673 inside A RHR Corner Room, after the RHR pump motor has cooled to ambient temperature, VERIFY RHR pump motor bearing oil reservoir levels are proper.</li> </ul>

NOTES:

[illegible]

## Operator Actions

Event No.(s): 2, 3		Page 2 of 2
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Per LOR-1H13-P601-C304, RHR Pump 1A Injection Flow High:</p> <ul style="list-style-type: none"> <li>• VERIFY automatic action has occurred.</li> <li>• VERIFY RHR Pump flow is maintained above 1100 gpm per appropriate operating procedure to insure adequate flow for cooling.</li> <li>• If alarm does not function as required: <ul style="list-style-type: none"> <li>▪ VERIFY sensor is properly valved in.</li> <li>▪ INITIATE appropriate corrective action.</li> <li>▪ Instrument setpoint is specified in Technical Specification Section 3.3.5.1</li> <li>▪ NOTIFY Unit Supervisor.</li> </ul> </li> </ul>
	RO	<ul style="list-style-type: none"> <li>• Monitors reactor to ensure operations remain within established bands</li> <li>• Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>• Authorizes and directs completion of scheduled surveillance</li> <li>• Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.</li> <li>• Refers to Tech Spec 3.3.5.1 function 1.f. and Condition D from Required Action A.1 for LPCI Pump A Discharge Flow-Low (Bypass) for failed instrument:</li> <li>• Acceptable tech spec actions include: <ol style="list-style-type: none"> <li>1. Declare Flow instrument inoperable and declare 1A RHR inoperable within 24 hours from discovery (T/S 3.3.5.1 D.2) and restore to operable within 7 days(T/S 3.3.5.1 D.4)</li> <li>2. Declare 1A LPCI inoperable and enter 7 days to restore timeclock (T/S 3.5.1.A, Action A.1).</li> </ol> </li> <li>• Enforces OPS expectations and standards</li> <li>• SRO should direct placing 1A RHR pump in PTL. Pump remains AVAILABLE.</li> </ul>
<b>Terminus:</b> 1A RHR system shutdown. Applicable timeclocks started		

## NOTES:




## Operator Actions

<b>Event No.(s):</b>	4	<b>Page</b>	1	<b>of</b>	1
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**Description:** CRD 42-43 Drifting Out from intermediate position.

**Initiation:** After the crew has completed securing 1A RHR from LOS-RH-Q1 and on the signal of the lead examiner.

**Cues:** CRD Drift Alarm, 1H13-P603-A504, CRD Hyd Temp High, 1H13-P603-A504

Time	Position	Applicant's Actions or Behavior
	RO	Per LOR-1H13-P603-A504, CRD Drift <ul style="list-style-type: none"> <li>Enters LOA-RD-101, Control Rod Drive Abnormal, Sections B.1 for Rod Drift and B.2 for Mispositioned Control Rod.</li> <li>Verifies only one rod moving               <ul style="list-style-type: none"> <li>Monitors full core display, RWM, and/or four rod display</li> </ul> </li> <li>Selects and inserts rod 42-43 to 00. Requires bypassing the RWM.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Directs RO to enter LOA-RD-101, Control Rod Abnormal</li> <li>Directs scram criteria, scram if more than one rod moving or more than 3 control rods have SCRAMMED or DRIFTED full in.</li> <li>Refers to T.S. 3.1.3 and 3.1.6 to determine operability and declares control rod inoperable.</li> <li>Refers to T.S. 3.3.2.1 for RWM bypassed with power &lt;10%.</li> <li>Directs control rod be taken OOS at position 00.</li> <li>Suspends withdrawal of control rods</li> </ul>

**Terminus:** CRD inserted to 00 and timeclocks addressed

NOTES:


## Operator Actions

Event No.(s): 5		Page 1 of 2
<b>Description:</b> A Lake Screen House alarm will occur, O/G flow will increase, and condenser vacuum will decrease. The 1A CW pump will later trip leaving only the 1B CW pump in operation.		
<b>Initiation:</b> After the crew has addressed the drifted control rod, and at the direction of the lead examiner.		
<b>Cues:</b> Annunciator LOR-1PM03J-B509, LSH Travelling Screen Panel Trouble, LOR-1PM03J-B406, 1A CW Pp. Trip, LOR-1PM03J-B511, Condenser Vacuum Low		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Per LOR-1PM03J-B509,LSH Travelling Screen Trouble and LOR-1PM03J-B406, CW Pp. Trip:</p> <ul style="list-style-type: none"> <li>• Dispatch operator to Lake Screen House.</li> <li>• With alarm due to high diff. level refer to LOP-CW-03 for S/U of a Standby Pp.</li> <li>• Refer to LOA-CW-101.</li> </ul> <p>Per LOR-1PM03J-B511, Condenser Vacuum Low:</p> <ul style="list-style-type: none"> <li>• Monitor Condenser Vacuum Indication.</li> <li>• Verify SJAE are operating properly per LOP-OG-07, Startup of Off Gas System.</li> <li>• Verify Circulating Water System is operating properly per LOP-CW-03, Startup of Circulating Water System.</li> <li>• Initiate appropriate corrective action as required, including the start-up of the 1C CW pump following the trip of the 1A CW pump.</li> </ul>
	RO	<p>Per LOR-1PM03J-B511, Condenser Vacuum Low:</p> <ul style="list-style-type: none"> <li>• With the turbine off line, RO should initiate a manual reactor scram prior to receiving an automatic scram on high Rx pressure or power due to BPVs closing.</li> </ul> <p>Per LGP-3-2 Attachment E (hardcard):</p> <ul style="list-style-type: none"> <li>• Arm and Depress scram pushbuttons</li> <li>• Place mode switch in Shutdown</li> <li>• Insert IRMs and SRMs</li> <li>• Check rods in and power decreasing <ul style="list-style-type: none"> <li>▪ Inform SRO that rods have failed to insert.</li> </ul> </li> <li>• Operate FW to control level in band directed by SRO</li> <li>• Report level and pressure trends</li> <li>• Stabilize pressure &lt;1020 psig</li> </ul>

## NOTES:


## Operator Actions

Event No.(s):		5	Page	2	of	2
Time	Position	Applicant's Actions or Behavior				
	SRO	<p>Specific:</p> <ul style="list-style-type: none"> <li>Refers to ODCM 12.2.2 O/G and declares O/G Pre and Post Treat monitors Inop (1N62-P600-B204)</li> <li>SRO should anticipate a loss of reactor pressure control as condenser vacuum decreases and should prepare the crew for a manual scram.</li> <li>SRO directs a manual reactor scram when condenser backpressure can not be restored.</li> <li>Upon failed reactor scram, SRO should monitor for EOP entry conditions and direct the crew accordingly.</li> </ul> <p>General:</p> <ul style="list-style-type: none"> <li>Directs actions described above.</li> <li>On transient, positions himself as command authority on the unit.</li> <li>Acknowledges immediate operator actions and directs subsequent actions.</li> <li>Enforces OPS expectations and standards.</li> <li>Contacts Shift Manager.</li> </ul>				
<p><b>Terminus:</b> Scram signal initiated.</p>						

NOTES:

[illegible]

## Operator Actions

Event No.(s): 6, 7, 8		Page 1 of 3
<b>Description:</b> The failures of B RPS to de-energize and ARI to actuate will cause an ATWS. With power above 3% the RO will initiate SBLC, however the first pump started will fail, requiring the start of the redundant SBLC pump. Overall plant control will be further complicated by a small LOCA in the Drywell from a failed 1B RR Discharge line.		
<b>Initiation:</b> Will occur automatically on a manual or automatic scram.		
<b>Cues:</b> Numerous rods remain out after auto/manual scram, rising containment pressure, ECCS and PCIS initiations.		
Time	Position	Applicant's Actions or Behavior
	RO	<b>Per LGA-NB-01, Alternate Rod Insertion:</b> <ul style="list-style-type: none"> <li>Initiate ARI (which fails)</li> <li>Initiates SBLC, identifies failure of first pump started, and starts redundant pump</li> <li>Insert rods using normal means</li> <li>Checks scram lights on and scram group lights off (Condition NOT met)</li> <li>Check that more than 25 rods failed to insert</li> <li><b>Performs/Coordinates Method 1 Fuse Removal</b> <ul style="list-style-type: none"> <li><b>As necessary, coordinates Attachment 1A to remove Scram Solenoid Fuses</b></li> </ul> </li> <li><b>Perform individual rod insertion per Method 3 as time permits</b></li> <li><b>Perform Method 4 to drain the scram discharge volume and re-scram</b></li> <li>Reports to the Unit Supervisor when all control rods are FULL-IN</li> </ul> <p>Performs additional EOP actions as directed by SRO</p> <ul style="list-style-type: none"> <li>Monitors RPV level and coordinates with BOP to control in band specified using RCIC and CRD systems</li> <li>Monitors RPV pressure and coordinates with BOP to control with SRVs.</li> </ul>
	BOP	<p>Performs EOP actions as directed by SRO</p> <ul style="list-style-type: none"> <li>Inhibits ADS and prevents ECCS injection</li> <li>Starts 2 loops of suppression pool cooling using hard card:           <ul style="list-style-type: none"> <li>Startup RHR Service Water as follows:               <ul style="list-style-type: none"> <li>Open 1A/1B RHR Hx Service Water Outlet Valve 1E12-F068A/B.</li> <li>Wait approximately 9 to 10 seconds, then start first RHR WS pump</li> <li>When indicated flow reaches 3000 gpm, START second RHR Service Water Pump.</li> </ul> </li> <li>Start 1A/1B RHR Pump.</li> <li>Establish RHR flow of 1500 to 7450 gpm.               <ul style="list-style-type: none"> <li>Throttle 1E12-F024A/B open.</li> <li>Throttle 1E12-F048A/B closed.</li> </ul> </li> </ul> </li> </ul>

## NOTES:

Make the 1B RR leak occur on the scram (start with a value of 0.5 and then ramp it to create the drywell pressure as necessary to require spraying of the drywell).

## Operator Actions

Event No.(s): 6, 7, 8		Page 2 of 3
Time	Position	Applicant's Actions or Behavior
	BOP	Performs EOP actions as directed by SRO
	Critical Task 2	<ul style="list-style-type: none"> <li>Initiates Suppression Chamber Spray before pressure reaches 12 psig               <ul style="list-style-type: none"> <li>Verify 1A/1B RHR Pump is running</li> <li>OPEN 1E12-F027A/B</li> </ul> </li> </ul>
	Critical Task 3	<ul style="list-style-type: none"> <li>Initiates DW Spray when Suppression Chamber pressure is above 12 psig.               <ul style="list-style-type: none"> <li>Verify 1A/B RHR Pump is running</li> <li>THROTTLE 1E12-F024A/B CLOSED</li> <li>OPEN: 1E12-F016A/B and 1E12-F017A/B</li> </ul> </li> <li>Coordinates with RO to control pressure with SRVs</li> </ul>
	SRO	Directs entry into EOPs and EOP actions as entry conditions are met.
	Critical Task 1	<p>Per LGA-010 as directed from LGA-001:</p> <ul style="list-style-type: none"> <li>Per the Power Leg directs the following:               <ul style="list-style-type: none"> <li>Initiate ARI, Start SBLC</li> <li>Run RR-FCVs to minimum</li> </ul> </li> <li>Insert Rods per LGA-NB-01               <ul style="list-style-type: none"> <li>Approves Methods 1, 3, and 4 to insert control rods</li> </ul> </li> <li>Per the Level Leg directs the following:               <ul style="list-style-type: none"> <li>Hold level between -150 and -60 inches</li> <li>If/When can't hold level &gt; (-150) inches, enters LGA-006</li> </ul> </li> </ul>
	Critical Task 1	
	Critical Task 2	<p>Per LGA-003:</p> <ul style="list-style-type: none"> <li>Per Primary Containment Pressure Leg, directs the following:               <ul style="list-style-type: none"> <li>Spray the Suppression Chamber before pressure reaches 12 psig</li> <li>When SC pressure is 12 psig, then                   <ul style="list-style-type: none"> <li>VERIFY within the limits of the DSL</li> <li>TRIP all RR pumps</li> <li>SPRAY the Drywell (per LGA-RH-103)</li> </ul> </li> </ul> </li> <li>Per Drywell Temperature Leg, directs the following:               <ul style="list-style-type: none"> <li>If determined can't stay below 135 F in DW, then start all available drywell cooling (per LGA-VP-01)</li> </ul> </li> <li>Per Pool Temperature Leg, directs the following:               <ul style="list-style-type: none"> <li>Start two loops of pool cooling</li> <li>If determined can't stay below 105 F in Suppression Pool, then start all available pool cooling per (LGA-RH-103)</li> </ul> </li> <li>Pool Level Leg               <ul style="list-style-type: none"> <li>Monitor Suppression Pool Level (-4.5 to +3.0 inches)</li> </ul> </li> <li>Hydrogen Leg               <ul style="list-style-type: none"> <li>Start Hydrogen and Oxygen Monitors (per LGA-CM-01)</li> </ul> </li> </ul>
	Critical Task 3	

## NOTES:

Crew can use the broken 1A RHR for D/W sprays – the pump is still AVAILABLE.

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### Operator Actions

<b>Event No.(s):</b> 6, 7, 8		<b>Page</b> 3 <b>of</b> 3
Time	Position	Applicant's Actions or Behavior
	SRO	General: <ul style="list-style-type: none"> <li>• Directs actions described above.</li> <li>• On transient, positions himself as command authority on the unit.</li> <li>• Acknowledges immediate operator actions and directs subsequent actions.</li> <li>• Enforces OPS expectations and standards.</li> <li>• Contacts Shift Manager.</li> </ul>
<b>Terminus:</b> <ul style="list-style-type: none"> <li>• All rods fully inserted (or proper actions in progress).</li> <li>• RPV level stable and under control in required band.</li> <li>• Containment sprays initiated and pressure decreasing.</li> <li>• Upon approval of lead examiner.</li> </ul>		

#### NOTES:


**REFERENCES**

<b><u>Procedure</u></b>	<b><u>Title</u></b>	<b><u>Revision</u></b>
LGA-001	RPV Control	09
LGA-010	Failure to Scram	08
LGA-NB-01	Alternate Rod Insertion	09
LGA-RH-103	Unit 1 RHR operations in the LGAs	08
LGP-1-1	Normal Unit Startup	82
LGP-3-2	Reactor Scram	58
LOA-NR-101	Neutron Monitoring Trouble	13
LOA-RP-101	Unit 1 Loss of RPS Power	09
LOP-RH-05	Operation of RHR Service Water System	31
LOP-RH-13	Suppression Pool Cooling Operation	28
LOP-RM-01	Reactor Manual Control Operation	30
LOR-1H13-P603-A504	CRD Drift	03
LOR-1PM03J-B511	Condenser Low Vacuum	03
LOR-1N62-P600-B204	Off Gas Outlet Flow Abnormal	08
LOR-1PM03J-B509	Lake Screen House Travelling Screen Panel Trouble	02
LOR-1PM03J-B406	Circ. Water Pp. Auto Trip	03

## **Simulator Operator Instructions**

### **Initial Setup**

1. Recall **IC-18** (S/U in progress at 935 psig, ~1 BPV, pulling rods for mode change to OC1).
2. Place simulator in RUN.
3. Place "1A" RHR in Full Flow Test for LOS-RH-Q1. (Close the 48A)
4. Shutdown RHR Service Water.
5. Verify Pressure Setpoint is set at 920# and that pressure is being controlled in DOME Control.
6. Verify ONLY 1A and 1B CW pumps are in operation.
7. Perform Gain adjustment
8. Verify RWM sequence loaded
9. Load and run the setup CAEP written for this scenario (**07-1-3cae.cae** on jump drive/floppy disc)



## Event Triggers and Role Play

### Event #

1. Withdraw Rods To Raise Power for Mode Change to OC1
  - a. No triggers
2. Shutdown 1A RHR From LOS-RH-Q1
  - a. No triggers
  - b. Role Play as NLO “corner room fans are S/D”
3. 1E12-F064A Fails to Open Because of Bad Flow Switch
  - a. No triggers – Flow switch is failed on initial setup.
  - b. Delete failure when the valve is opened manually**
  - c. Failure is from setpoint drift. Can only be diagnosed by IMD cal or functional test.
4. Control Rod 42-43 drifts out from intermediate position
  - a. Trigger 4** or imf mrd105
  - b. Delete malfunction **mrd105** when the rod is inserted to 00.
  - c. If sent out to inspect the HCU report that it appears normal.
5. Lake Screen House Trouble/Loss of CW Pump
  - a. Trigger 6** on request from lead evaluator
  - b. Role play as operators
    - (1) Perform actions as requested.
    - (2) If dispatched to LSH, inform RO that debris has built up on the screens for the “A” CW pp. and dp is approx. 11 inches.
6. ATWS/Failure of B RPS to de-energize
  - a. No triggers – B RPS failure loaded on initial setup.
  - b. Role play for LGA-NB-01 as necessary.
  - c. Perform Attachment 1A of LGA-NB-01 when directed.
7. Failure of first SBLC pump to start
  - a. Failure of first pump started loaded on initial set-up.
8. 1B RR Discharge Leak
  - b. **Triggers 8** 1 minute after reactor scram
  - c. Leak will start out at a value of 0.5. In order to continue to build D/W pressure, the value will need to be ramped to no greater than a value of 5.0 to raise D/W pressure to >17#.