

**JAMES A. FITZPATRICK NUCLEAR POWER PLANT
2008 NRC INITIAL LICENSE EXAMINATION SCENARIO 1**

TITLE: *LOI-08-01 NRC EXAMINATION SCENARIO 1, Swap CRD pumps, HPCI aux oil pump breaker failure, power reduction, RFP trip and failure to runback, Loss of all CRD pumps, ATWS, RCIC controller failure, Emergency Depressurization*

SCENARIO NUMBER: *NEW*

PATH: *LOI EXAM STANDALONE COMPUTER:*

{PRIVATE }	APPLICANTS
CRS <i>SRO With Command</i>	
ATC <i>Primary At The Controls Operator</i>	
SNO2 <i>Primary BOP Operator</i>	

{PRIVATE }	SIGNATURES
VALIDATION	
TRAINING	
OPERATIONS	

{PRIVATE } RECORD OF CHANGES

[illegible]

A. **TITLE:** LOI-08-01 NRC LOI EXAMINATION SCENARIO 1, ATWS/Emergency Depressurization

B. **SCENARIO SETUP:**

1. Initial Protected IC 227

2. Special Instructions:

a. Plant operating normally at 87% CTP

3. Preset Conditions:

4. Consumable Forms and Procedures:

C. **SCENARIO SUMMARY:**

{PRIVATE }

Shift Turnover

{PRIVATE }

Operating normally at 87%, after assuming shift will continue to 65% in preparation for cleaning condenser water boxes; Perform a swap of CRD pumps to allow maintenance to record vibration data on the 'B' CRD pump.

Critical Tasks/Standards

{PRIVATE }

Critical Task #1: Directs insertion of scram when All CRD is lost and HCU alarms are in

Critical Task #2: EP-3 Insert control rods by alternate means. Diagnose that success path is to de-energize scram solenoids

Critical Task #3: Emergency depressurize by opening 7 ADS valves

{PRIV ATE }EVEN T NO.	EVENT SEQUENCE
1.	<i>Swap in service CRD pumps. (Normal evolution)</i>
2.	<i>HPCI Aux Oil Pump breaker failure. (Component Failure)</i>
3.	<i>5% power reduction. (Reactivity Manipulation)</i>
4.	<i>'A' RFP trip and failure of Recirc runback. (Component Failure)</i>
5.	<i>Loss of all CRD pumps (Technical Specification)</i>
6.	<i>ATWS due to RPS failure. (Major Transient)</i>
7.	<i>Main turbine trip, loss of Auxiliary busses (Component Failure)</i>
8.	<i>RCIC controller failure. (Component Failure)</i>
9.	<i>Emergency Depressurization (Major Transient)</i>

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
Simulator in RUN Recorder and Alarm Power ON Simulator Checklist Complete			
Provide Turnover (Attach. 1)		Maintenance and performance monitoring is on station for CRD pump vibration monitoring; need to swap CRD first thing.	
After the shift turnover, allow no more than five minutes for panel walkdown	All	Walkdown the control panels and assume the watch.	SAT / UNSAT / NA
	CRS	Provide crew brief.	SAT / UNSAT / NA
1. Swap in service CRD pumps. (Normal evolution) [Cue CRS if needed]		OP-25 G.10 Changing In-service CRD Pumps	SAT / UNSAT / NA
		•Start CRD pump (CRD PMP 03P-16A).	SAT / UNSAT / NA
		•Stop other CRD pump (CRD PMP 03P-16B).	SAT / UNSAT / NA
		•Adjust CRD FLOW CNTRL 03FIC-301 to establish 59 to 61 gpm on 03FI-310 or 03FIC-301.	SAT / UNSAT / NA
		•Verify normal operating values on the following indicators at panel 09-5: ♦ CHG WTR PRESS 03PI-302: BETWEEN 1390 and 1580 psig, <u>not</u> to exceed 1670 psig	SAT / UNSAT / NA

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
		<ul style="list-style-type: none"> ◆ DRV WTR DIFF PRESS 03DPI-303: 260 to 270 psid ◆ CLG WTR DIFF PRESS 03DPI-304: approximately 10 to 26 psid ◆ DRV WTR FLOW 03FI-305: zero when no CRD is being driven ◆ CLG WTR FLOW 03FI-306: 59 to 61 gpm 	
2. Trip of HPCI Aux Oil Pump breaker. (Component Failure) [Cue booth]			
<i>ARP 9-3-3-38</i> <i>LCO 3.5.1 Condition 'C'</i>	SNO-2	Recognize/report annunciator alarm for HPCI component loss of power	SAT / UNSAT / NA
	SNO-2	Recognize/report Loss of power indication for 23P-150	SAT / UNSAT / NA
	ATC/ SNO-2	Dispatches NPO to HPCI to investigate	SAT / UNSAT / NA
Role play: After several minutes, NPO reports no obvious problem at 23P-150. Acrid odor at breaker		Locally: Verify green light at pump control switch. Stop AUX OIL PMP 23P-150. Reset the thermal overloads on the pump circuit breaker. Start AUX OIL PMP 23P-150. IF motor trips again, THEN perform the following: , determine ampere loading of motor .	

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
		<ul style="list-style-type: none"> • observe pump for damage. 	
	CRS	Reviews Technical Specifications TS LCO 3.5.1, Condition C. 14 day action statement	SAT / UNSAT / NA
3. Power reduction to 65% CTP for water box cleaning. (Reactivity Manipulation) [Cue CRS if needed]	CRS	Directs ATC to reduce reactor power using recirc. Do not go below 55% core flow.	SAT / UNSAT / NA
		<i>Guidance given in RAP 7.3.16 for adjusting reactor power, including maximum rate of power change.</i> <ul style="list-style-type: none"> •Maintain core flow LESS THAN OR EQUAL TO 77 Mlb/hr. •Control mismatch between recirculation loop jet pump flow as follows: •Adjust speed in 1 to 3% increments. 	
	ATC	OP-27 Adjust RWR MG Set A/B speed to desired speed. Verify core flow and reactor power steady out following speed adjustment.	SAT / UNSAT / NA
4. 'A' RFP trip and failure of Recirc runback. (Component Failure) [Initiate from 83% CTP] [Cue booth]			

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
<p><i>AOP-42 Feedwater malfunction</i></p> <p><i>RWR pumps do not runback due to component failure</i></p>		<p>AOP-42 Automatic Actions</p> <p>Loss of one reactor feed pump</p> <p>Reactor feed pump trip annunciator alarms</p> <p>RPV water level lowers</p> <p>If RPV water level lowers to 196.5 inches, both RWR MG sets run back to 44% speed</p> <p>Operating reactor feed pump should restore level</p>	
	ATC	<ul style="list-style-type: none"> •Reduce core flow to 55% OP-27 Attachment 4 •Then reduce reactor power per RAP-7.3.16 by inserting CRAM groups 	SAT / UNSAT / NA
<p>5. Loss of all CRD pumps (Technical Specification)</p> <p>[Cue booth]</p> <p>Insert triggers 5 and 6</p>			
<p>AOP-69</p> <p><i>IF charging water header pressure <u>is not</u> restored to GREATER THAN OR EQUAL TO 940 psig WITHIN 20 minutes of a second accumulator light, THEN insert a manual scram.</i></p>			
	SNO2	<p>AOP-69: Monitor ACCUM alarm lights on full core display at panel 09-5, and execute ARP-09-5-1-43 as appropriate.</p> <p>ARP 09-5-1-43 actions:</p>	SAT / UNSAT / NA

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
		1. Initiate corrective action for HCU accumulator trouble per Section G of OP-25. 2. Monitor Full Core Display for additional HCU accumulator lights. 3. IF accumulator pressure is LESS THAN 940 psig or water can not be drained, then declare accumulator inoperable and refer to Technical Specifications	
	SNO2	AOP-69:•Ensure CRD FLOW CNTRL 03FIC-301 is in MAN. •Rotate manual control knob on CRD FLOW CNTRL 03FIC-301 fully counterclockwise. •Verify in-service CRD flow control valve (03FCV-19A or B) is closed. Attempt to start 'A' CRD pump (CRD PMP 03P-16A). If the first pump fails to start, attempt to start the other.	SAT / UNSAT / NA
		Role play: <i>Report as NPO that CRD is not recoverable. Mechanical failure of CRD pump. Oil is all over the floor.</i>	
<i>Insert manual scram when evident CRD is not recoverable and accumulator alarms are in</i>	CRS	Direct insertion of manual scram	CRITICAL TASK SAT / UNSAT / NA
	ATC	<ul style="list-style-type: none"> Depress manual scram pushbuttons Evaluator/Booth Operator Note: Spurious trip of "B" RFP should automatically occur when P/Bs are depressed. <ul style="list-style-type: none"> Place reactor mode switch in shutdown 	SAT / UNSAT / NA
		Fully insert IRMs and SRMs	SAT / UNSAT / NA
		Verify power decreasing APRM / IRM / SRM	SAT / UNSAT / NA

INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
6. ATWS due to RPS failure. (Major Transient) [AUTO]	SNO2	At 09-5 and 09-4, Recognize ATWS conditions, trend level performance and manipulate GEMAC Master/Individual controllers, RFP discharge valves and RFP trip as necessary to control level.	SAT / UNSAT / NA
	ATC	•Insert manual scram	SAT / UNSAT / NA
	ATC	•Mode switch to shutdown •Identify failure to scram	SAT / UNSAT / NA
	ATC	•Initiate ARI	SAT / UNSAT / NA
	CRS	•Enter EOP-3	
	SNO	•Reduce recirc flow to minimum	SAT / UNSAT / NA
	SNO	•Trip both recirc pumps	SAT / UNSAT / NA
	SNO	•Override ADS	SAT / UNSAT / NA
	SNO	•Inject with SLC	SAT / UNSAT / NA
	ATC	•EP-3 Insert control rods by alternate means •Diagnose that success path is to de-energize scram solenoids. Evaluator/Booth Operator: Pull fuses approx. 30 seconds after Crew requests it.	SAT / UNSAT / NA CRITICAL TASK
	ALL	•EP-5 Terminate and Prevent Injection <i>High pressure injection systems first</i> •Trip HPCI by depressing trip push buttons •Manual control of FW	SAT / UNSAT / NA
	CRS	Enter EOP-2	

PRIVATE / INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
	ALL	•Lower level maintain level 80 – 100"	SAT / UNSAT / NA
7. Main turbine trip, loss of Auxiliary busses (Component Failure)		Evaluator/Booth Operator: When scram fuses are pulled (see above), power will rapidly drop as rods insert, and the MT will either auto trip on reverse power or due to ATC action. Aux busses will fail to auto transfer, leading to loss of condensate, and forcing level control over to RCIC.	
<i>Loss of Condensate and condensate booster pumps</i>		MSIVs shut	
8. RCIC controller failure. (Component Failure) [After manual control is established, RCIC will auto trip]	SNO2	Inject with RCIC maintain level 80 – 100" Evaluator/Booth Operator: RCIC will trip 3 minutes after applicant shifts controller to Manual.	SAT / UNSAT / NA
<i>RCIC starts, runs to low speed stop</i>	SNO2	Take manual control of RCIC	SAT / UNSAT / NA
9. Emergency Depressurization (Major Transient)	ALL	All rods in (after RPS fuses are pulled in EP-3) Exit EOP-3, enter EOP-2	SAT / UNSAT / NA
	CRS	Directs SNO to open 7 ADS valves	CRITICAL STEP SAT / UNSAT / NA
	SNO	Opens seven ADS valves	CRITICAL STEP SAT / UNSAT / NA
	CRS	Directs the SNO to maintain level 0" to 222.5" with LPCI	SAT / UNSAT / NA

PRIVATE INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
	SNO	Maintains RPV level above TAF during the RPV depressurization	SAT / UNSAT / NA

TERMINATE THE SCENARIO

ATTACHMENT 1

Shift Turnover

{PRIVATE }

Operating normally at about 87%. After assuming shift, perform a swap of CRD pumps to allow maintenance to record vibration data on the 'B' CRD pump. Reduce reactor power to 65% in preparation for cleaning condenser water boxes.;

**JAMES A. FITZPATRICK NUCLEAR POWER PLANT
2008 NRC INITIAL LICENSE EXAMINATION SCENARIO 3**

TITLE: *LOI-08-01 NRC EXAMINATION SCENARIO 3. APRM instrument failure. Restoration of busses 10200 and 10400 to T4, Failure of LPCI inverter, Inadvertent HPCI initiation, Loss of Instrument Air, SBLOCA, Both loop of RHR Containment spray fail, Spray Torus/Drywell with RHR SW*

SCENARIO NUMBER: *NEW*

PATH: *LOI EXAM STANDALONE COMPUTER:*

{PRIVATE }	APPLICANTS
<i>CRS SRO With Command</i>	
<i>ATC Primary At The Controls Operator</i>	
<i>SNO2 Primary BOP Operator</i>	

{PRIVATE }	SIGNATURES
VALIDATION	
TRAINING	
OPERATIONS	

{PRIVATE } RECORD OF CHANGES

[illegible]

TITLE: ***LOI-08-01 NRC EXAMINATION SCENARIO 3. APRM instrument failure. Restoration of busses 10200 and 10400 to T4, Failure of LPCI inverter, Inadvertent HPCI initiation, Loss of Instrument Air, SBLOCA, Both loop of RHR Containment spray fail, Spray Torus/Drywell with RHR SW***

A.

B. SCENARIO SETUP:

1. Initial Protected IC 228

2. Special Instructions:

 a. Plant operating normally at 50% CTP

3. Preset Conditions:

Trigger 1 NM15:B APRM Channel B inoperative – True

Trigger 4 ED04:B Inverter 71-INV-3B Failure – True

Trigger 5 HP05 HPCI Inadvertent initiation – True

Trigger 6 IA02 Loss of Instrument Air – 100% Ramp 7:00 minutes

Trigger 7 - /*scram push button*/(zd5as3a = 1) || (zd5as3b = 1) || manual scram

Trigger 8 - */zlo10as13a(2) = 1 || 10mov38a

Trigger 9 - */zlo10as13b(2) = 1 || 10mov38b red light is on

4. Consumable Forms and Procedures:

C. SCENARIO SUMMARY:

{PRIVATE }

Shift Turnover

{PRIVATE }

The plant at 50% power. Power ascension was suspended to allow Electrical Maintenance to perform an inspection of T4 following a report of a cooling fan problem. Busses 10200 and 10400 are currently fed from Reserve. Electrical Maintenance has successfully completed the inspection of T4. The shift will restore the electric plant lineup to normal by transferring busses 10200 and 10400 from Reserve to Normal.

Raise reactor power with control rods. Start at Step 46 with rod 30-19. Pull from notch 12 to 24.

Continue power ascension per OP-65.

Critical Tasks/Standards

{PRIVATE }

Critical Task #1: Manual scram on loss of instrument air

Critical Task #2: Sprays containment

Critical Task #3:

Critical Task #4:

{PRIVATE EVENT T NO.	EVENT SEQUENCE
1.	<i>APRM instrument failure. (Instrument failure) RO</i>
2.	<i>Restoration of busses 10200 and 10400 to T4. (Normal Evolution) All</i>
3.	<i>Raises power with control rods (Reactivity manipulation) RO</i>
4.	<i>Failure of LPCI inverter (Component failure) BOP</i>
5.	<i>Inadvertent HPCI initiation (Component failure) BOP/SRO</i>
6.	<i>Unisolable leak on Instrument Air header (Component failure) All</i>
7.	<i>SBLOCA on recirc line, containment spray required (Major transient) All</i>
8.	<i>Spray torus, both loop of RHR fail (Component failure) All</i>
9.	<i>Spray Torus/Drywell with RHR SW (Major transient) All</i>

D. TERMINATION CUES:

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
Simulator in <i>RUN</i> Recorder and Alarm Power <i>ON</i> Simulator Checklist <i>Complete</i>			
Provide Turnover (Attach. 1)			
After the shift turnover, allow no more than five minutes for panel walkdown	All	Walkdown the control panels and assume the watch.	SAT / UNSAT / NA
	CRS	Provide crew brief.	SAT / UNSAT / NA
<i>1. APRM instrument failure.</i> <i>(Instrument failure)</i> <i>[Cue Booth]</i>	ALL ATC	<ul style="list-style-type: none"> •Identify ½ scram •Identifies 'B' APRM inop •Bypass 'B' APRM •Reset ½ Scram (note: procedure use is not required for bypassing APRM and resetting ½ scram) 	SAT / UNSAT / NA

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
<i>Inop trip of APRM</i>	CRS	TS for failed APRM: •No impact TRM for rod block	SAT / UNSAT / NA
2. Restoration of busses 10200 and 10400 from reserve to normal. (Normal Evolution) [Cue CRS]	ALL	OP-46A D.21 for 10200 (shift prior to 10400 bus by procedure note) •Station operators as follows: One to adjust bus voltage at LTC CONTROL One to operate breaker control switches •Place BUS 10200 FDR SYNCH SW switch in NORM. •Match voltages on NON-EMERG BKRS INCOMING and RUNNING volt meters using LTC CONTROL switch. •WHEN incoming and running voltages are matched, AND synchroscope is at approximately 12 o'clock, perform the following bus transfer using the same hand, without unnecessary delay, to perform each breaker operation: •Close NSS TO BUS 10200 BKR 10202. •Open RSS TO BUS 10200 BKR 10212. •Place BUS 10200 FDR SYNCH SW switch in OFF and remove handle. •Verify all white lights for RPS A and RPS B power source selectors are on at panel 09-16. D.23 for 10400 •Station operators as follows:	SAT / UNSAT / NA

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
		<p>One to adjust bus voltage at LTC CONTROL</p> <p>One to operate breaker control switches</p> <ul style="list-style-type: none"> •Place BUS 10400 FDR SYNCH SW switch in NORM. •Match voltages on NON-EMERG BKRS INCOMING and RUNNING volt meters using LTC CONTROL switch. •WHEN incoming and running voltages are matched, AND synchroscope is at approximately 12 o'clock, perform the following bus transfer using the same hand, without unnecessary delay, to perform each breaker operation: •Close NSS TO BUS 10400 BKR 10402. •Open RSS TO BUS 10400 BKR 10412. •Place BUS 10400 FDR SYNCH SW switch in OFF and remove handle. •Verify all white lights for RPS A and RPS B power source selectors are on at panel 09-16. <p><i>Possible EPIC alarm on low volts, volts are in acceptable range [546 – 615] no action required until after bus shift complete</i></p>	
<p>3. Raises power with control rods (Reactivity manipulation)</p> <p>[Cue CRS]</p>	ATC	<p>Step 46 of pull sheet, Rod 30-19 from notch 12 to 24</p> <p>Rod 22-19 from notch 12 to 24</p>	
<p>4. Failure of LPCI inverter</p>	ALL	<p>09-8-5-11 LPCI MOV IPS B 71INV-3B MINOR ALARM TROUBLE</p>	

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
	SNO	Secure the HPCI turbine	SAT / UNSAT / NA
<i>If HPCI injects</i>	CRS	Enters AOP-32, Unexplained /Unanticipated Reactivity Addition (<i>if HPCI injected and power changes</i>)	SAT / UNSAT / NA
	CRS	TS 3.5.1 D and C, 14 day LCO, verify RCIC operable 72 hours to restore HPCI or LPCI	
	SNO2	SBGT started on HPCI start, secure SBGT or lineup flow path by opening suction valve	
6. Unisolable leak on Instrument Air Header <i>[Cue Booth to start while HPCI recovery is in progress]</i>	ALL	Air compressors start, air pressure trends down AOP-12	
	CRS	Directs manual scram	
<i>Role play:</i> As NPO report massive air leak on common discharge piping of air compressors. Leak is not isolable	ATC	9-6-2-39 SERV AIR HDR ISOL VLV CLOSED (95 psig) 9-6-2-31 SERV AIR HDR PRESS LO (95 psig) 9-7-3-43 SPE Vac Lo EOP-5 entry on RB pressure INSERT Manual Scram	SAT / UNSAT / NA CRITICAL TASK upon rod drift alarm or recognize not recoverable AOP-12

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
<p><i>Depending on the severity of the loss of air or the source of the problem, the following could occur:</i></p> <p><i>Control rods drift inward.</i></p> <p><i>Air operated valves fail as-is or in fail safe position.</i></p> <p><i>Valves drift from expected position due to vibration or system pressure.</i></p> <p><i>Outboard MSIVs drift closed (accumulators could delay closure for up to 30 minutes).</i></p> <p><i>01-107AOV-100 (off gas disch to stack) fails open.</i></p>	CRS	<p>OUTBD MSIVs will eventually shut on loss of air</p> <p>EOP-2 on low RPV level after scram</p> <p>Level control 177-222.5 inches</p> <p>Directs 100F/hr cooldown</p>	
<p>7. SBLOCA on recirc line, containment spray required (Major transient)</p> <p>[Auto initiation upon insertion of scram]</p>	CRS	<p>AOP-39</p> <p>Drywell pressure increasing</p> <p>EOP-2 and EOP-4 on High DW pressure</p> <p>All EDGs start</p> <p>Prevent injection from LPCI and CS (EP-5)</p>	
<p>8. Spray Torus failure</p> <p>[Auto initiation]</p>	CRS	<p>Directs initiation of Torus Sprays when torus pressure is greater than 2.7 psi.</p> <p>Directs SNO to place loop of RHR in torus spray.</p>	SAT / UNSAT / NA
	SNO2	Places loop of RHR in torus spray	SAT / UNSAT / NA
<p><i>Use other loop of RHR for success</i></p>	SNO2	<p>Pumps tripped when starting torus spray</p> <p>Shift to other RHR loop, both RHR pumps trip</p>	SAT / UNSAT / NA

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
	ALL	Crew uses RHR Service Water for torus and/or drywell spray per EP-14 (5.1 'A' loop or 5.2 'B' loop)	SAT / UNSAT / NA CRITICAL TASK
9. Spray Torus/Drywell	SNO2	Maintain RPV pressure with SRVs after MSIVs shut	SAT / UNSAT / NA
	SNO2	Spray DW when pressure reaches 15 psig.	SAT / UNSAT / NA

TERMINATE THE SCENARIO

ATTACHMENT 1

Shift Turnover

{PRIVATE }

The plant at 50% power. Power ascension was suspended to allow Electrical Maintenance to perform an inspection of T4 following a report of a cooling fan problem. Busses 10200 and 10400 are currently fed from Reserve. Electrical Maintenance has successfully completed the inspection of T4. The shift will restore the electric plant lineup to normal by transferring busses 10200 and 10400 from Reserve to Normal.

Raise reactor power with control rods. Start at Step 46 with rod 30-19. Pull from notch 12 to 24.

Continue power ascension per OP-65.

**JAMES A. FITZPATRICK NUCLEAR POWER PLANT
2008 NRC INITIAL LICENSE EXAMINATION SCENARIO 4**

TITLE: *LOI-08-01 NRC EXAMINATION SCENARIO 4, Trip of Service water pump/ Stuck control rod/ Swap TBCLC pumps / Loss of FW heater level control / Feed pump trip, loss of condensate pumps, / RCIC pump trip / HPCI fail to auto start/ RWR loop break inside drywell / Containment sprays required*

SCENARIO NUMBER: *NEW*

PATH: *LOI EXAM STANDALONE COMPUTER:*

{PRIVATE }	APPLICANTS
CRS <i>SRO With Command</i>	
ATC <i>Primary At The Controls Operator</i>	
SNO2 <i>Primary BOP Operator</i>	

{PRIVATE }	SIGNATURES
VALIDATION	
TRAINING	
OPERATIONS	

{PRIVATE } RECORD OF CHANGES

[illegible]

TITLE: ***LOI-08-01 NRC LOI EXAMINATION SCENARIO 4, Trip of Service water pump/ Stuck control rod/ Swap TBCLC pumps / Loss of FW heater level control / Feed pump trip, loss of condensate pumps, / RCIC pump trip / HPCI fail to auto start/ RWR loop break inside drywell / Containment sprays required***

B. SCENARIO SETUP:

1. Initial Protected IC 229

2. Special Instructions:

 a. Plant operating normally at 92% CTP

3. Preset Conditions:

 Event 7 /*scram push buttons*/(zd5aas3a = 1) || (zd5as3b = 1) || man scram

 Event 10 /*38A open*/zlo10as13a(2) = 1

 Event 11 /*38B open*/zlo10as13b(2) = 1

4. Consumable Forms and Procedures:

C. SCENARIO SUMMARY:

{PRIVATE }

<i>Shift Turnover</i>	{PRIVATE }
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92% CTP, pulling rods to 103% rod line and 96% CTP, then hold for one hour prior to proceeding to 100% CTP using recirc flow.

Rod pull sheet step 65. Next rod will be rod 18-15. rod pull from 12 - 16

Crew will swap TBCLC pumps in preparation for maintenance.

<i>Critical Tasks/Standards</i>	{PRIVATE }
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Critical Task #1: Insert Reactor Scram on trip of both feed pumps

Critical Task #2: Spray torus/drywell on high pressure

{PRIV ATE }EVEN T NO.	EVENT SEQUENCE
1.	<i>Trip of 'B' Service Water pump. Manual start of 'A' SW pump. (Component Failure)</i>
2.	<i>Raise power by withdrawing control rods (Reactivity manipulation)</i>
3.	<i>Stuck control rod (Component Failure)(Tech Spec)</i>
4.	<i>Swap TBCLC pumps. (Normal evolution)</i>
5.	<i>Loss of level control 6A FW heater. (Component failure)</i>
6.	<i>Both Feed pumps trip. (Component Failure)</i>
7.	<i>Condensate pumps trip. (Component Failure)</i>
8.	<i>RCIC starts then trips after two minutes. HPCI fail to auto start. (Component Failure)</i>
9.	<i>Recirc loop break in drywell. Containment sprays required. (Major transient)</i>

D. TERMINATION CUES:

1. All Rods in.
2. DW sprays in service

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
Simulator in RUN Recorder and Alarm Power ON Simulator Checklist Complete			
Provide Turnover (Attach. 1)			
After the shift turnover, allow no more than five minutes for panel walkdown	All	Walkdown the control panels and assume the watch.	SAT / UNSAT / NA
	CRS	Provide crew brief.	SAT / UNSAT / NA
1. Trip of 'B' Service Water pump. Manual start of 'A' SW pump. (Component Failure) [Cue booth] Insert Trigger 1			
	ALL	ARP 9-6-2-13 <i>SERV WTR PMP 46P-IB OVERLOAD OR TRIP</i> ARP 9-6-2-34 <i>Service water header pressure low</i>	
	SNO2	Operator starts standby pump. Reports failure of standby pump to start automatically.	SAT / UNSAT / NA

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
<i>At this power level, the crew recognizes that two SW pumps are required and the SNO2 must manually start the 'A' SW pump. A circuit failure will prevent the auto start, so if the crew waits, a low pressure condition will result</i>	CRS SNO2	Acknowledges reports from SNO2 Places 'B' SWP in PTL	
2. Raise power by withdrawing control rods (Reactivity manipulation)		OP-25	
<i>The crew will raise power by withdrawing control rods</i>			
Step 65 Rod 18-15 Rod 18-39 Rod 34-39 Rod 34-15			
3. Stuck control rod (Component Failure)(Tech Spec)		Pull Sheet Step 65 from 12 to 16 OP-25 OP-26	
<i>The ATC will recognize and report control rod 18-39 fails to move</i>	ATC	Reports rod 18-39 will not withdraw with normal drive pressure	
	CRS	Acknowledge and concur with raising drive pressure	
After first increase in drive	ATC	IAW OP-25 E. Incrementally raises drive water pressure to	

PRIVATE INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
water pressure, rod moves When drive dP raised 1 st time delete RD10 stuck rod		attempt rod withdrawal <i>Rod may double notch at raised drive pressure</i>	
	ATC	Recognizes and reports rod is withdrawing, restores CRD parameters to normal range	
4. Swap TBCLC pumps. (Normal evolution)	CRS	Directs TBCLC pump swap	
<i>In support of maintenance, the crew swaps TBCLC starts the 'C' pump, secures the 'B' pump.</i>	SNO2	OP-41 G.1 Steps 1 - 5	
[Cue CRS]			
5. Loss of level control 6A FW heater string. (Component failure)		AOP-32, Unexplained power change (if crew does not recognize level control failure but notes a rise in CTP) AOP-62, Loss of Feedwater Heating	
[Cue Booth]			
Insert Trigger 5:	ALL	09-6-3-36 HI FDWTR HTR 6A LVL HI 09-6-3-26 Hi-HI FDWTR HTR 6A LVL HI-HI 09-7-3-11,12 1ST STAGE RHTR DRN TK 3A LVL HI 2ND STAGE RHTR DRN TK 4A LVL HI	
NPO reports both valves are closed. No response when operated locally	All	Normal and dump valve are not responding	
	All	AOP-62 Loss of Feedwater Heating	
	ATC	Monitor for thermal hydraulic instability	
	CRS	Upon a noted rise in thermal power, Directs to rapidly lower recirc flow until power < 72%, do not go <55% core flow	
	ATC	Lowers reactor power with recirc	

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
6. Both Feed pumps trip. (Component Failure)			
Insert Trigger 6: when recirc is being lowered in Event 5	ALL	Recognize/report trip of both Feed Pumps	SAT / UNSAT / NA
	CRS	Directs insertion of manual scram.	SAT / UNSAT / NA Critical Task
	SNO2	Inserts manual scram. Takes mode switch to SHUTDOWN Makes post scram reports	SAT / UNSAT / NA Critical Task
7. Condensate pumps trip on reactor scram (Component failure)	CRS	EOP-2 on low RPV level AOP-1 for reactor scram	SAT / UNSAT / NA
<i>Loss of all feed</i>	SNO2	Maintain level 177 – 222.5 inches	SAT / UNSAT / NA
8. RCIC starts and trips after two minutes, 10 seconds HPCI fails to AUTO start, but is available to start manually. (Component failure)	SNO2	Operator identifies RCIC trip Operator identifies HPCI failure to auto start, manually aligns and injects with HPCI (opens 23 MOV-14) HPCI in pressure control mode	SAT / UNSAT / NA
	CRS	TS entries on HPCI and RCIC	
9. RWR loop break in drywell. Containment sprays required. (Major transient)		EOP-2 EOP-4 High DW pressure, High Torus level 9-5-1-34 High Drywell pressure	SAT / UNSAT / NA
[Cue Booth]			
		Terminate and prevent Core Spray and RHR per EP-5	SAT / UNSAT / NA

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
<i>Torus spray first and then Drywell</i>		Spray torus until torus pressure is 0 psig Spray DW when torus > 15 psig	SAT / UNSAT / NA
			Critical Task

TERMINATE THE SCENARIO

EALs

Unusual Event

2.1.1 Unidentified DW leakage > 10 gpm

Alert

3.1.1 Primary Containment pressure > 2.7

ATTACHMENT 1

Shift Turnover

{PRIVATE }

92% CTP, pulling rods to 103% rod line and 96% CTP, then hold for one hour prior to proceeding to 100% CTP using recirc flow.

Rod pull sheet step 65. Next rod will be rod 18-15 from 12 – 16.

Crew will swap TBCLC pumps in preparation for maintenance. Start 'C', secure 'B'.

**JAMES A. FITZPATRICK NUCLEAR POWER PLANT
2008 NRC INITIAL LICENSE EXAMINATION SCENARIO 5**

TITLE: **LOI-08-01 NRC EXAMINATION SCENARIO 5, SBTG trip / Shutdown condensate pump / Failure of NR level control / Fuel clad failure/ ATWS / RWCU failure to isolate / Steam leak in Reactor Building / Emergency Depressurization**

SCENARIO NUMBER: **NEW**

PATH: **LOI EXAM STANDALONE COMPUTER:**

{PRIVATE }	APPLICANTS
CRS <i>SRO With Command</i>	
ATC <i>Primary At The Controls Operator</i>	
SNO2 <i>Primary BOP Operator</i>	

{PRIVATE }	SIGNATURES
VALIDATION	
TRAINING	
OPERATIONS	

{PRIVATE } RECORD OF CHANGES

[illegible]

TITLE: ***LOI-08-01 NRC LOI EXAMINATION SCENARIO 5, SBTG trip / Shutdown condensate pump / Failure of NR level control / Fuel clad failure/ ATWS / RWCU failure to isolate / Steam leak in Reactor Building / Emergency Depressurization***

B. SCENARIO SETUP:

1. Initial Protected IC 230
2. Special Instructions:
 - a. Plant operating normally at 50% CTP
3. Preset Conditions:
4. Consumable Forms and Procedures:

C. **SCENARIO SUMMARY:**

{PRIVATE }

Shift Turnover

{PRIVATE }

Drywell is being purged IAW OP-37 D.6.11. SSGT 'A' is running to vent torus

'C' Condensate pump is running in preparation for securing 'B' condensate pump for maintenance

Control rods are at Step 47

Critical Tasks/Standards

{PRIVATE }

Critical Task #1: Announce ATWS and depress ARI pushbutton

Critical Task #2: Directs declaration of SAE due to failure of RWCU to isolate

Critical Task #3: Open 7 ADS valves

{PRIV ATE }EVEN T NO.	EVENT SEQUENCE
1.	<i>'A' Standby Gas Treatment fan trip. (Component Failure) (Technical Specification)</i>
2.	<i>Normal shutdown of 'B' condensate pump. (Normal evolution)</i>
3.	<i>Failure of 'B' NR level instrument upscale, level transient. (Instrument failure)</i>
4.	<i>Fuel clad failure (Component Failure) (Technical Specification)</i>
5.	<i>ATWS due to RPS 'A' failure. Startup level control valve fail closed (Instrument failure) (component failure)</i>
6.	<i>FW startup level control valve failure (Component Failure)</i>
7.	<i>RWCU failure to isolate (Component Failure)</i>
8.	<i>Steam leak in Reactor Building resulting in rad release. (Major Transient)</i>
9.	<i>Reactor depressurization. (Major Transient)</i>

D. TERMINATION CUES:

1. All rods in.
2. 7 ADS valves open.

INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
Simulator in <i>RUN</i> Recorder and Alarm Power <i>ON</i> Simulator Checklist <i>Complete</i>			
Provide Turnover (Attach. 1)		'C' condensate pump is running in preparation for securing 'B' condensate pump SBGT 'A' is running to purge drywell IAW OP-37 D.6.11	
After the shift turnover, allow no more than five minutes for panel walkdown	All	Walkdown the control panels and assume the watch.	SAT / UNSAT / NA
	CRS	Provide crew brief.	SAT / UNSAT / NA
<i>1. 'A' Standby Gas Treatment fan trip. (Component Failure) (Technical Specification) [Cue Booth]</i>	CRS	Annunciator 09-75-1-24 Swap vent lineup using OP-20	SAT / UNSAT / NA
NPO reports breaker for SGT 'A' is tripped, smell hot and there is NO fire	SNO2	Swap vent lineup using OP-20 Swap trains of SGT by opening 01-125MOV-12, 01-125MOV-100B, AUTO start of 'B' fan	SAT / UNSAT / NA
	CRS	Determine TS action statement 3.6.4.3 Condition 'A', 7 day AOT	SAT / UNSAT / NA
<i>2. Normal shutdown of 'B' condensate pump. (Normal</i>		OP-3 F.1 Shutdown of ONE condensate pump	

INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
<i>evolution)</i>			
<i>Ensure 'C' condensate pump is running prior to securing 'B' condensate pump.</i>	SNO-2	Place and hold pump control switch for the condensate pump to be shutdown in STOP. WHEN condensate discharge header pressure stabilizes, allow pump control switch to return to normal.	SAT / UNSAT / NA
3. Failure of 'B' NR level instrument upscale, level transient. (Instrument failure)			
Cue Booth			
	All	Recognize/report RV level high alarm 9-5-1-28 Recognizes/report RPV level is lowering (annunciator 9-5-1-28) Recognize/report failure of 'B' NR level indication	SAT / UNSAT / NA
	CRS	Enters AOP-42, Feedwater Malfunction (Lowering Feedwater Flow)	SAT / UNSAT / NA
NPO reports backfill system is normal. Nothing unusual at instrument rack	SNO	Takes manual control of feedwater, returns water level to the green band.	SAT / UNSAT / NA
	SNO	If annunciator 09-5-1-28, RX WTR LVL ALARM HI OR LO alarms, refers to ARP	SAT / UNSAT / NA
	CRS	Assigns an SNO to feedwater control with no other duties.	SAT / UNSAT / NA

INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
<i>Note: possible RWR runback if level column is shifted with level too low.</i>	SNO	Shift level column to A, per OP-2A G.30 Place RX WTR LVL COLUMN SEL 06-S1 switch in A-LEVEL. Ensure RPV water level stabilizes. IF reactor water level control was placed in manual control, THEN restore reactor water level control to automatic when directed by the Shift Manager. Restore RFP control to Auto per OP-2A G.41 Balance RX WTR LVL CNTRL 06LC-83 controller by adjusting SP ADJUST knob. Place RX WTR LVL CNTRL 06LC-83 controller in BAL.	
	CRS	Refer to Tech Spec's, table 3.3.2.2 A, 7 day AOT	SAT / UNSAT / NA
Cue Event 4 when RFP control is returned to AUTO			
4. Turbine Building Radiation Alarms indicate fuel clad failure (Component failure)			
<i>SJAE Rad Off-gas HI ARP 09-3-2-27</i>		AOP-3, High Activity in Reactor Coolant or Off-gas	
	CRS	Directs entry into AOP-3. Directs local evacuations of areas with ARMs in alarm. Directs reduction in power to reduce rad levels	SAT / UNSAT / NA
	All	09-3-2-10 Off-Gas timer initiates Announce evacuate TB	SAT / UNSAT / NA
<i>Crew performs a controlled power reduction to stabilize rad levels</i>	SNO	Inserts control rods to get below 70% rod line per RAP-7.3.16. Reduce power to < 40% CTP	

PRIVATE INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
	All	Identifies EOP-5 entry on high rad level approaching max safe. Identifies 15 min timer timed out.	SAT / UNSAT / NA
	CRS	Directs UE notification and applicable announcements [should activate TSC and OSC].	SAT / UNSAT / NA
	CRS	Directs a manual scram prior to reaching a max safe and execution of AOP-1.	SAT / UNSAT / NA
	SNO	Announces and inserts a manual scram.	SAT / UNSAT / NA
5. ATWS due to RPS 'A' failure. (Instrument failure)	ATC SNO-2 CRS	Recognizes and announces failure of manual scram. Places Mode Switch to Shutdown Recognizes and announces failure of mode switch to scram the reactor Enters EOP-3 EAL Alert for failure to scram	SAT / UNSAT / NA
<i>Rods fail to insert, ARI is successful</i>	ATC CRS	Announce ATWS and depress ARI pushbutton Announces success of ARI and carries out AOP-1. Exits EOP-3	CRITICAL STEP SAT / UNSAT / NA
	CRS	Directs entry into EOP-2 <ul style="list-style-type: none"> Directs level band of 177" to 222.5" Directs pressure stabilized 900 to 1000# with BPVs 	SAT / UNSAT / NA
		HPCI / RCIC starts HPCI may be tripped by operator if flow is not needed	
6. Startup level control valve fail closed (component failure)			

INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
<i>RPV level control will be coarse with only discharge valves for control.</i>	SNO2	Control RPV level using HPCI/RCIC/ feed via 34 MOV 100A or 100B	SAT / UNSAT / NA
7. RWCU fails to isolate (after scram RPV level shrink) (Component Failure)			
	SNO	Identifies failure of the RWCU 12MOV-15 to isolate. Identify entry conditions for AOP-39 (Loss of Coolant)	SAT / UNSAT / NA
	CRS	Directs entry into AOP-39. Directs execution of AOP-39 Attachment 2 by SNO. Attempt to isolate the leak by shutting 12MOV-15 EOP-5 on High Temps (RWCU and 300' RB) Evacuate RB	SAT / UNSAT / NA
	CRS	Directs declaration of SAE due to failure of RWCU to isolate. EAL 3.4.1	CRITICAL STEP SAT / UNSAT / NA
8. Steam leak in Reactor Building resulting in rad release. (Major Transient)			
Steam leak in RWCU area	CRS	May preemptively depressurize via the main condenser	
	CRS	Determines temperatures are approaching SAE level. EAL 4.1.1	SAT / UNSAT / NA
	CRS	Executes Emergency depressurization leg of EOP-2 due to reaching 2 MAX SAFES	SAT / UNSAT / NA

{PRIVATE }INSTRUCTOR ACTIVITY	POSITION	OPERATOR ACTIONS/STANDARD	COMMENTS/EVALUATION
9. Emergency Depressurization (Major Transient)			
	CRS	Directs 7 ADS valves opened. Directs level control maintained with feed and condensate at 177" to 222.5".	CRITICAL STEP SAT / UNSAT / NA
	SNO	As directed opens and verifies open 7 ADS valves	CRITICAL STEP SAT / UNSAT / NA

TERMINATE THE SCENARIO

ATTACHMENT 1

Shift Turnover

{PRIVATE }

Drywell is being purged IAW OP-37 D.6.11. SSGT 'A' is running to vent torus

'C' Condensate pump is running in preparation for securing 'B' condensate pump for maintenance

Control rods are at Step 47