

Facility: **Oconee**

Scenario No.: **1**

Op-Test No.: **1**

Examiners: _____

Operators: _____ **SRO**
 _____ **OATC**
 _____ **BOP**

Initial Conditions:

- Rx Power = 100%

Turnover:

- CT-5 OOS
- PSW Booster Pump OOS
- AMSAC DSS Bypassed

Critical Tasks:

- CT-1: Close 1RC-3 to restore Safety Function 3 (Reactor Pressure Control) prior to requiring a change in the mitigation strategy resulting in a Mode 3 entry and shutdown of 3 RCPs (**Event 6 Page 2**)
- CT-2: Manually start TDEFWP to feed the 1B SG prior to meeting requirements for initiation of HPI Forced Cooling (**Event 7 Page 4**)

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		CT-5 OOS
0b	Override		PSW Booster Pump OOS
0c	Override		AMSAC/DSS Bypassed
1	Override	N: BOP, SRO (TS)	Pump the RBNS (Sump Level Indication fails)
2	MCS019	I: OATC, SRO (MC)	ΔT_c Controller Failure
3	Override	C: BOP, SRO	1A CCW Pump Motor Stator Temperature High
4	Override	C: OATC, SRO (TS)	1B MDEFW Pump oil bubbler is empty
5	Override	C: BOP, SRO (TS) R: OATC, SRO (MC)	1A2 RCP Seal Return valve fails closed requiring a manual power reduction
6	Override	C: OATC, SRO	1RC-1 (PZR Spray) fails open (CT-1)
7	MALF_ SG11	M: ALL	1A MSLB inside RB (Failures: AFIS/1RC-3 closed /TDEFWP fails to auto start) (CT-2)

* (N)ormal / (R)eactivity / (I)nstrument / (C)omponent / (M)ajor / (TS) Tech Spec / (MC)Manual Control

SCENARIO 1 EVENT SUMMARY

- Event 1:** When the crew takes the shift, the SRO will direct the BOP to lower the level in the RBNS to ~ 3 inches using OP/1/A/1104/007 Enclosure 4.1. RBNS Level indication will fail. This will require the SRO to enter **TS 3.4.15 Condition A**.
- Event 2:** The ΔT_c Controller will fail causing 1A Feedwater flow to increase and 1B Feedwater flow to decrease. Once alarms are received, the crew will perform Plant Transient Response to stabilize the plant. Once the plant is stable, the SRO will enter AP/1/A/1700/028 (ICS Instrument Failures) and ensure the appropriate ICS stations are in manual.
- Event 3:** The 1A CCW pump motor stator temperature will begin to rise. An OAC alarm will alert the crew of the issue and the BOP will refer to the alarm response for the OAC alarm. The BOP will refer to OP/1/A/1104/012A (CCW Pump Operation) Enclosures 4.1 (CCW Pump Startup) and 4.2 (CCW Pump Shutdown) to remove the 1A CCW pump from service. The crew may elect to start the 1D CCW pump, but it is not a required action.
- Event 4:** The AO calls from the field during rounds and reports that the 1B MDEFW Pump oil level sight glass is empty. The SRO declares the pump inoperable and enters **TS 3.7.5 Condition A and TS 3.3.14 Condition B**.
- Event 5:** The 1A2 RCP Seal Return valve will fail closed. The crew will perform AP/16 (RCP Malfunction) to perform a manual power reduction to below 70% to remove the 1A2 RCP from service. The SRO will enter **TS 3.4.4 Condition A**.
- Event 6:** The 1RC-1 (Pressurizer Spray Valve) will fail open causing RCS pressure to unexpectedly lower. The crew will enter AP/1/A/1700/044 (Abnormal Pressurizer Pressure Control) and will be required to close 1RC-3 (Pressurizer Spray Block Valve) to stop the pressure reduction and prevent tripping the Reactor.
- Event 7:** A large MSLB will occur on the 1A SG inside containment. The SRO will direct the OATC to perform IMAs, the BOP to perform a Symptoms Check. The BOP will perform Rule 5 and will manually start the TDEFWP. If the 1B MDEFWP was not placed in OFF in Event 4, it will fail upon initiation of Event 7. The SRO will transfer to the LOSCM tab (if SCM is lost) from the Subsequent Actions Parallel Action page, and then to the EHT tab for the steam line break. The crew will isolate the 1A SG and then transfer to the Forced Cooldown (FCD) tab.

Op-Test No.: **ILT 24-1**Scenario No.: **1**Event No.: **1**

Page 1 of 5

Event Description: **Lower RBNS level to ~ 3 inches (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

NRC Examiners: this guide highlights **Verifiable Action Steps in Green** and **RNO/Branching Steps in Yellow**.

Event 1 Crew/Plant Response:

- After turnover, the **CRS** will direct the **BOP** to lower the RBNS to ~ 3 inches per OP/1/A/1104/007, Encl. 4.1. (Rev 30)
- RBNS Level indication will fail requiring entry into TS 3.4.15 Condition A (**Event 1 page 3**)
- 1SA-9/A-6 (Reactor Building Normal Sump Level HIGH/LOW) (**next page**)

Enclosure 4.1
Pumping RBNS to Greater Than or Equal to 1
Inch

OP/1/A/1104/007
Page 1 of 1

1. Limits and Precautions

None

2. Initial Conditions

____ 2.1 Verify required to lower RBNS to ≥ 1 ".

3. Procedure

____ 3.1 Verify MWHUT level adequate to receive waste volume.

3.2 Position the following:

- ____ • Ensure open 1LWD-1 (RB NORMAL SUMP ISOLATION)
- ____ • Ensure open 1LWD-2 (RB NORMAL SUMP ISOLATION)

3.3 Start one or both of the following:

- ____ • 1A RB NORM SUMP PUMP
- ____ • 1B RB NORM SUMP PUMP

NOTE:

- Changes in LAWT levels may occur during pumping.
- RIA Alarms may be indicative of gas leakage.
- If RBNS level was above 14" when pumps were started, a level increase following securing the RBNS pumps may occur. {7}
- During outages, it is desirable to maintain RBNS > 6" for shielding to decrease dose rates in RBNS area.

This event is complete when CRS has evaluated TS 3.4.15, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **1**Event No.: **1**

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Event Description: **Lower RBNS level to ~ 3 inches (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

Examiner Note: RBNS Level indication will fail to 0 inches when RBNS Level reaches ~5 inches. The OAC indication fails to -7.5 inches. This failure automatically stops the running RB Normal Sump Pumps. TS 3.4.15 Condition A applies. (Event 1 page 3)

3.4 WHEN RBNS is at desired level OR at 1" (low level alarm), ensure the following:

- _____ • 1A RB NORMAL SUMP PUMP "OFF".
- _____ • 1B RB NORMAL SUMP PUMP "OFF".

3.5 IF required to close the valves, position the following:

- _____ • Close 1LWD-1 (RB NORMAL SUMP ISOLATION)
- _____ • Close 1LWD-2 (RB NORMAL SUMP ISOLATION)

1SA-9/A-6**RB NORMAL SUMP LEVEL HIGH/LOW****3. Manual Action**

3.1 IF RB Normal Sump Level indication is lost, refer to T.S. 3.4.15.

3.2 High Level: Align normal sump pump and lower level in sump per OP/1-2/A/1104/007 (Liquid Waste Disposal System).

3.2.1 Investigate possible RCS leakage per OP/0/B/1106/033 (Primary System Leak Identification) or PT/1/A/0600/010 (Reactor Coolant Leakage).

3.2.2 Monitor RB RIAs, CC Surge Tank level, CFT Level and LPSW flow to and from RB and sample RB Normal Sump to determine source.

3.2.3 Calculate RB Normal Sump Rate from Digital Trend (Use 15 gal/inch conversion factor).

3.2.4 Refer to AP/1/A/1700/002 (Excessive RCS Leakage).

3.3 Low Level: Verify sump pump(s) stopped, and realign valves per OP/1-2/A/1104/007 (Liquid Waste Disposal System).

This event is complete when CRS has evaluated TS 3.4.15, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

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Event Description: **Lower RBNS level to ~ 3 inches (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

RCS Leakage Detection Instrumentation
3.4.15

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.15 RCS Leakage Detection Instrumentation

LCO 3.4.15 The following RCS leakage detection instrumentation shall be OPERABLE:

- a. One containment normal sump level indication; and
- b. One containment atmosphere radioactivity monitor (gaseous or particulate).

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment sump level indication inoperable.	A.1 <u>NOTE</u> Not required until 12 hours after establishment of steady state operation.	
	Perform SR 3.4.13.1.	Once per 24 hours
	<u>AND</u> A.2 Restore containment sump level indication to OPERABLE status.	30 days

(continued)

This event is complete when CRS has evaluated TS 3.4.15, or when directed by the Lead Examiner.

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 Scenario No.: **1**

 Event No.: **1**

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 Event Description: **Lower RBNS level to ~ 3 inches (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

 RCS Leakage Detection Instrumentation
3.4.15

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required containment atmosphere radioactivity monitor inoperable.	B.1.1 Analyze grab samples of the containment atmosphere.	Once per 24 hours
	<u>OR</u>	
	B.1.2 <u>-----NOTE-----</u> Not required until 12 hours after establishment of steady state operation.	Once per 24 hours
	Perform SR 3.4.13.1.	
C. <u>-----NOTE-----</u> Only applicable when the containment atmosphere gaseous radiation monitor is the only OPERABLE monitor. <u>-----</u> Containment sump level indication inoperable.	<u>AND</u>	30 days
	B.2 Restore required containment atmosphere radioactivity monitor to OPERABLE status.	
	C.1 Analyze grab samples of the containment atmosphere.	Once per 12 hours
	<u>AND</u>	
D. Required Action and associated Completion Time not met.	C.2 Restore containment sump level indication to OPERABLE status.	7 days
	D.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	D.2 Be in MODE 5.	36 hours

This event is complete when CRS has evaluated TS 3.4.15, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **1**Event No.: **1**

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Event Description: **Lower RBNS level to ~ 3 inches (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

RCS Leakage Detection Instrumentation
3.4.15

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Both required instrument functions inoperable.	E.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.2	Perform CHANNEL FUNCTIONAL TEST of required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.3	Perform CHANNEL CALIBRATION of required containment sump level indication.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.4	Perform CHANNEL CALIBRATION of required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program

This event is complete when CRS has evaluated TS 3.4.15, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 2

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Event Description: **ΔT_C Controller Failure (I: OATC, SRO)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, fire **EVENT 2 to initiate the Loop 1A RC Flow failure.****Event 2 Plant response:**

- FDW flow will ratio incorrectly based on the failure
- "A" FDW flow will rise causing "A" loop T_C to lower
- "B" FDW flow will lower causing "B" loop T_C to rise
- This causes actual ΔT_C to become more negative. Failure to adjust FDW flow will result in QPT alarms
- 1SA-02/B-5 (RC Cold Leg Diff. Temperature High) actuates if actual ΔT_C increases to $\pm 5^\circ\text{F}$
- 1SA-02/B-9 (MS STM GEN 'A' LEVEL High/Low) actuates if 1A SG Operating Range Level $\geq 86\%$

Event 2 Crew response:

When the Statalarms are received, the crew should perform Plant Transient Response (PTR) to stabilize the plant

- Diagnose the ΔT_C failure by observing the ΔT_C meter on 1UB1
- The **OATC** will place the Feedwater Masters and the Diamond to MANUAL and re-ratio feedwater using the Loop T_C meters and/or OAC (RCS01) to return actual ΔT_C to near zero

The **OATC** should:

- Communicate to the **CRS** the initial alarm (if applicable) followed by reactor power level and direction
- Place the appropriate ICS stations in manual (Diamond and both FDW Masters in this case) in manual if any of the following occur:
 - NI power rising above the pre-transient power level
 - Failed instrument is diagnosed
 - Invalid input exists and the **CRS** directs the ICS be placed in manual
- Remain focused on reactor power level and FDW response during the transient

The **BOP** should:

- Determine if a valid ICS runback exists and inform the **CRS**
- Monitor plant response and verify operating limits NOT exceeded
- If ICS is placed in Manual, remain focused on RCS pressure, SG outlet pressure and RCS inventory

The **CRS** should:

- Refer to AP/28 (ICS Instrument Failures) (**next page**)
- Ensure Maintenance is contacted to repair the failed instrument

This event is complete when the SRO reaches Step 4 of AP/28 Section 4F, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 2

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Event Description: **ΔTc Controller Failure (I: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/028

Duke Energy Oconee Nuclear Station ICS Instrument and Component Failures	Procedure No.
	AP/1/A/1700/028
	Revision No.
	026

AP/1/A/1700/028

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1. Entry Conditions1.1 Both of the following:

- Rx Power > 3%
- Any required Plant Transient Response actions taken and TPB ≤ the pre-transient power level.

AND any of the following:A. Median Select or SASS fails to prevent a transient for any of the following controlling instrument failures:

- RCS Temperature
- Turbine Header Pressure (THP)
- Controlling NI
- Feedwater Loop Flow
- RCS Flow
- **Delta Tc**
- Narrow Range RCS Pressure
- Feedwater Valve ΔP
- SG Startup Level
- Feedwater Temperature
- Core Thermal Power
- SG Operating Level
- SG Outlet Pressure

This event is complete when the SRO reaches Step 4 of AP/28 Section 4F, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 2

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Event Description: **ΔT_c Controller Failure (I: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/028AP/**1**/A/1700/028

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 Provide control bands as required.	

Examiner Note: The CRS references the placard for AD-OP-ONS-0002 to determine the appropriate control bands. Placard provided below.

OCONEE SPECIFIC ABNORMAL OPERATIONS GUIDANCE	AD-OP-ONS-0002
	Rev. 007
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ATTACHMENT 17

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<< Initial Control Bands >>

1.0 Plant Conditions Stable or TPB < Pre-transient Conditions

1. The following bands are to be established during manual control of plant conditions (as needed) but may be adjusted by the CRS if required:
 - a. NI Power $\pm 1\%$ not to exceed the pre-transient or allowable power. If at the pre-transient or allowable level, band is NI Power - 1%
 - b. Current Tave $\pm 2^\circ\text{F}$
 - c. Current SG Outlet Pressure ± 10 PSIG
 - d. Delta Tc $0^\circ\text{F} \pm 2^\circ\text{F}$

This event is complete when the SRO reaches Step 4 of AP/28 Section 4F, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 2

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Event Description: **ΔTc Controller Failure (I: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/028

AP/1/A/1700/028

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4. Subsequent Actions

4.2 Initiate the following notifications: ___ SM to reference: • AD-LS-ALL-0006 (Notification/Reportability Evaluation) • Emergency Plan ___ STA	
4.3 ___ Verify <u>both</u> : • A power transient $\geq 5\%$ has occurred. • Plant is stabilized.	___ GO TO Step 4.5.
4.4 ___ Notify Rx Engineering <u>and</u> discuss the need for a maneuvering plan.	

Examiner Note: At step 4.3 the crew will evaluate whether or not power has stabilized within 5% of pre-transient power. If power is 5% or more less than pre-transient the crew will contact Rx Engineering for a maneuvering plan. Otherwise the crew takes the RNO to step 4.5.

AP/1/A/1700/028

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.5 ___ Use the following, as necessary, to determine the applicable section from table in Step 4.6: • OAC alarm video • OAC display points • Control Board indications • Maintenance assistance, as needed	

This event is complete when the SRO reaches Step 4 of AP/28 Section 4F, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 2

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Event Description: **ΔTc Controller Failure (I: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/028

4.6 GO TO the applicable section per the following table:

✓	Section	Failure
	4A	RCS Temperature
	4B	Turbine Header Pressure
	4C	Controlling NI
	4D	Feedwater Loop Flow
	4E	RCS Flow
	4F	Delta T _c
	4G	NR RCS Pressure
	4H	Feedwater Valve ΔP
	4I	SG Startup Level
	4J	Feedwater Temperature
	4K	Core Thermal Power
	4L	SG Operating Level
	4M	ICS Star or Memory Module
	4N	SG Outlet Pressure
	4O	Turbine Master Trips to Hand for Unknown Reason (3)
	4P	TBV Failure (5)
	4Q	SG FDW Valves
	4Q	MFDWPs

Examiner Note: The CRS will transfer to Section 4F of AP/28 for the Delta T_c failure.

This event is complete when the SRO reaches Step 4 of AP/28 Section 4F, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 1 Event No.: 2 Page 6 of 7
 Event Description: **ΔTc Controller Failure (I: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/028

Section 4F
Delta T_c Failure

AP/1/A/1700/028
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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Unit Status

The Controlling Delta T_c Instrument has failed. Any required Plant Transient Response actions have been taken and TPB is ≤ the pre-transient power level.

NOTE

- This Section applies to Delta T_c controller failures. T_c input signal failures are addressed in Section 4A.
- The following may occur when an ICS Delta T_c controller fails:
 - Delta T_c controller re-ratios loop feedwater flows
 - Possible ICS RUNBACK

1. Ensure in HAND:

- ___ 1A FDW MASTER
- ___ 1B FDW MASTER
- ___ DELTA T_c

Examiner Note: The FDW Masters were taken to HAND during PTR. The DELTA T_c controller is taken to HAND at this step.

CAUTION

Total feedwater flow should be maintained constant while individual loop flows are adjusted to establish the desired ΔT_c. Maintaining total FDW flow constant will prevent unwanted changes in reactor power.

2. ___ Re-ratio feedwater flow, as required, to establish desired Delta T_c while maintaining total feedwater flow constant.

Examiner Note: The FDW Masters were adjusted during PTR. Further adjustments may be made to stabilize Delta T_c within a band of 0 +/- 2°F.

3. ___ Notify Maintenance to investigate and repair the failed Delta T_c instrumentation.

4. ___ WHEN notified by Maintenance that Delta T_c controller has been repaired, THEN GO TO OP/1/A/1102/004 A Encl (Placing ICS Stations To Auto).

Examiner Note: If 1SA-2/B-1 (HP Letdown Tank Level High/Low) alarms, the crew may take actions to lower level as directed by the Alarm Response guide (next page). ICS will remain in MANUAL for the rest of the scenario.

This event is complete when the SRO reaches Step 4 of AP/28 Section 4F, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 2

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Event Description: **ΔTc Controller Failure (I: OATC, SRO)**

Applicant's Actions or Behavior

Examiner Note: Alarm setpoint may or may not be exceeded based on heat balance mismatch and operator response to the failed instrument.

OP/1/A/6101/002**ARG 1SA-02/B-1**

The crew may refer to ARG 1SA-02/B-1 (HP LETDOWN TANK LEVEL HIGH/LOW) and perform the required actions.

3.1 Instrument Failed:**3.1.1 Compare alternate channels to verify alarm validity:**

- O1A1042 LDST LEVEL 1
- O1A1043 LDST LEVEL 2

3.2 Verify LDST pressure does not exceed LDST level/pressure operability requirement per OP/0/A/1108/001 (Curves and General Information).**3.3 IF High Level alarm is received:****3.3.1 Bleed as required by OP/1/A/1103/004 (Soluble Poison Concentration Control).**

Examiner Note: Since the crew is in an abnormal event procedure, the CRS can choose to implement EOP Enclosure 5.5 to control LDST level, as opposed to the OP listed above. If you need to reference EOP Enclosure 5.5, it is located on **Event 7 page 31.**

This event is complete when the SRO reaches Step 4 of AP/28 Section 4F, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 3

Page 1 of 6

Event Description: **1A CCW Pump Motor Stator Temperature High (C: BOP, SRO)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, **fire EVENT 3** to initiate the 1A CCW Pump Motor Stator temperature alarm.

Event 3 Plant response:

- O1A0844 (CCW 1A MTR STATOR TEMP) HI will alarm
- 1A CCWP Mtr Stator temp will be >250°F and rising

Event 3 Crew response:

The **BOP** will refer to the ARG and will pull OP/1/A/1104/012 A (CCW Pump Operation) to swap CCW pumps or secure the 1A CCWP.

OAC Alarm O1A0844**Alarm Response for OAC Alarm O1A0844**

- HI-HI 1) Refer to OP/1/A/1104/012 A (CCW Pump Operation) to remove the CCWP from service
- 2) Notify System Engineer
- HI Display the graphic for 1A CCWP and monitor closely

The **CRS** should:

- Direct the **BOP** to secure the 1A CCW Pump using OP/1/A/1104/012 A. The crew may elect to start the 1D CCW Pump to maintain the same number of CCW Pumps running.

Duke Energy Oconee Nuclear Station CCW Pump Operation Continuous Use	Procedure No.
	OP/1/A/1104/012 A
	Revision No. 019
	Electronic Reference No. OP0094BL

Examiner Note: It is acceptable to perform Enclosures 4.1 and 4.2 in any order since one CCW Pump will always remain running on each ECCW Header.

It is rare, but the LPSW Accumulator may come into alarm during the CCW Pump swap. If it does, then TS 3.7.7 Condition B will be entered. (Event 3 page 6)

The CRS may elect to direct securing the 1A CCW Pump IAW AD-OP-ALL-1000 Conduct of Operations step 5.6.3.8.a (Event 3 page 6)

This event is complete when the 1A CCW pump is secured, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 3

Page 2 of 6

Event Description: **1A CCW Pump Motor Stator Temperature High (C: BOP, SRO)**

Applicant's Actions or Behavior

Enclosure 4.1
CCW Pump Startup

OP/1/A/1104/012 A
Page 1 of 2

1. Initial Conditions

- ____ 1.1 Verify seal water aligned to CCW Pump to be started per OP/0/A/1104/052 (SSW System).
- ____ 1.2 **IF** this is the 4th CCW pump to be started, perform the following on all operating Amertap Trains:
- ____ • Ensure CCW Pumps in "4". (1A1 Amertap Train Set-up 1 Screen)
 - ____ • Ensure CCW Pumps in "4". (1A2 Amertap Train Set-up 1 Screen)
 - ____ • Ensure CCW Pumps in "4". (1B1 Amertap Train Set-up 1 Screen)
 - ____ • Ensure CCW Pumps in "4". (1B2 Amertap Train Set-up 1 Screen)
 - ____ • Ensure CCW Pumps in "4". (1C1 Amertap Train Set-up 1 Screen)
 - ____ • Ensure CCW Pumps in "4". (1C2 Amertap Train Set-up 1 Screen)
- ____ 1.3 **IF** this is the 1st, 2nd, **OR** 3rd CCW pump to be started, perform the following on all operating Amertap Trains:
- ____ • Ensure CCW Pumps in "3". (1A1 Amertap Train Set-up 1 Screen)
 - ____ • Ensure CCW Pumps in "3". (1A2 Amertap Train Set-up 1 Screen)
 - ____ • Ensure CCW Pumps in "3". (1B1 Amertap Train Set-up 1 Screen)
 - ____ • Ensure CCW Pumps in "3". (1B2 Amertap Train Set-up 1 Screen)
 - ____ • Ensure CCW Pumps in "3". (1C1 Amertap Train Set-up 1 Screen)
 - ____ • Ensure CCW Pumps in "3". (1C2 Amertap Train Set-up 1 Screen)
- ____ 1.4 Review Limits and Precautions.

Examiner Note: If the 1D CCWP is started first (before securing 1A CCWP), then Step 1.2 will be performed and 1.3 will be N/A. If the 1A CCWP is secured first, then Step 1.3 will be performed and 1.2 will be N/A.

Booth Cue: If dispatched as an AO to select 3 or 4 on the Amertap Screens, then report back "using time compression, the amertap screens are selected to ____".

Booth Cue: If dispatched as an AO to repo, then report back "parameters are normal for/following pump start. Area is clear". (as appropriate)

This event is complete when the 1A CCW pump is secured, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 3

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Event Description: **1A CCW Pump Motor Stator Temperature High (C: BOP, SRO)**

Applicant's Actions or Behavior

*OP/1/A/1104/012 Encl. 4.1***2. Procedure**

NOTE: Do NOT operate CCW Pumps in the same header until adjacent CCW Pump discharge valves have fully repositioned to prevent CCW Pump discharge valve malfunction. {3}

- ____ 2.1 **IF** this is the first CCW Pump to be started, verify closed CCW Pump discharge valves on adjacent CCW Pumps.
- ____ 2.2 Verify closed discharge valve on CCW Pump to be started.

Enclosure 4.1
CCW Pump Startup

OP/1/A/1104/012 A
Page 2 of 2

- NOTE:**
- CCW Pump starts when discharge valve $\approx$ 20% open.
 - ESV Tank low vacuum alarms may occur during CCW Pump start. {1}
 - LPSW Leakage Accumulator level is a function of LPSW System pressure. When CCW Pump status is changed, LPSW Leakage Accumulator level may exceed the limits of SR 3.7.7.1 until LPSW system pressure stabilizes. As a result, momentary entry into TS 3.7.7 Condition 'B' may be necessary.
 - During two CCW pump operation, operating 1A CCWP and 1D CCWP should be avoided as much as possible since they are both powered from 1TC.

- ____ **2.3** Start desired CCW Pump: _____.
- ____ 2.4 Verify CCW Pump discharge valve opens.
- ____ 2.5 Ensure CCWP LOAD SHED DEFEAT switch is positioned to a running CCW Pump.

Examiner Note: The 1D CCW Pump will be started at Step 2.3

This event is complete when the 1A CCW pump is secured, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 3

Page 4 of 6

Event Description: **1A CCW Pump Motor Stator Temperature High (C: BOP, SRO)**

Applicant's Actions or Behavior

OP/1/A/1104/012 Encl. 4.2

**Enclosure 4.2
CCW Pump Shutdown**

OP/1/A/1104/012 A
Page 1 of 3

1. Initial Conditions

- 1.1 **IF** Enclosure "Hot Lake Water Surveillance" of OP/1/A/1105/014 (Control Room Instrumentation Operation And Information) in effect, ensure System Engineer notified prior to stopping CCW Pump.

Person Notified _____

Date _____

Booth Cue: If contacted as WCC SRO and asked if the Hot Lake Surveillance is in progress, inform the crew it is NOT in progress.

- 1.2 Review Limits and Precautions.

NOTE: LPSW Leakage Accumulator level is a function of LPSW System pressure. When CCW Pump status is changed, LPSW Leakage Accumulator level may exceed the limits of SR 3.7.7.1 until LPSW system pressure stabilizes. As a result, momentary entry into TS 3.7.7 Condition 'B' may be necessary.

2. Procedure

- NOTE**
- 1A and 1B CCWPs are on same CCW header.
 - 1C and 1D CCWPs are on same CCW header.
 - The CCW header **CANNOT** be credited as an operable ECCW header unless a CCWP discharge valve is open.
 - During two CCW pump operation, operating 1A CCWP and 1D CCWP should be avoided as much as possible since they are both powered from 1TC.

- 2.1 **IF** CCW header will still have an operating CCWP when desired CCWP is secured, perform the following:

2.1.1 Stop desired CCW Pump: _____

2.1.2 Verify CCW Pump discharge valve closes.

2.1.3 Ensure CCWP LOAD SHED DEFEAT switch is positioned to a running CCW Pump.

Examiner Note: The 1A CCW Pump will be stopped at Step 2.1.1.

This event is complete when the 1A CCW pump is secured, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 3

Page 5 of 6

Event Description: **1A CCW Pump Motor Stator Temperature High (C: BOP, SRO)**

Applicant's Actions or Behavior

LPSW System
3.7.7

3.7 PLANT SYSTEMS

3.7.7 Low Pressure Service Water (LPSW) System

LCO 3.7.7

For Unit 1 or Unit 2, three LPSW pumps and one flow path shall be OPERABLE.

For Unit 3, two LPSW pumps and one flow path shall be OPERABLE.

The LPSW Waterhammer Prevention System (WPS) shall be OPERABLE.

-----NOTE-----

With either Unit 1 or Unit 2 defueled and appropriate LPSW loads secured on the defueled Unit, such that one LPSW pump is capable of mitigating the consequences of a design basis accident on the remaining Unit, only two LPSW pumps for Unit 1 or Unit 2 are required.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required LPSW pump inoperable.		-----NOTE----- During Unit 2, Refuel 31 with Unit 2 defueled, appropriate LPSW loads secured, and contingent on implementation of the compensatory measures described in Attachment 1 of letter RA-22-0089 dated April 14, 2022, the Completion Time is 288 hours for the tie-in and testing of an alternate suction source to the shared Unit 1/2 LPSW Pumps A and B.
	A.1 Restore required LPSW pump to OPERABLE status.	72 hours

(continued)

This event is complete when the 1A CCW pump is secured, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 3

Page 6 of 6

Event Description: **1A CCW Pump Motor Stator Temperature High (C: BOP, SRO)**

Applicant's Actions or Behavior

LPSW System
3.7.7ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. LPSW WPS inoperable.	B.1 Restore the LPSW WPS to OPERABLE status.	7 days
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3.	12 hours
	<u>AND</u> C.2 Be in MODE 5.	60 hours

Examiner Note: It is rare, but the LPSW Accumulator may come into alarm during the CCW Pump swap. If it does, then TS 3.7.7 Condition B will be entered.

The CRS may elect to direct securing the 1A CCW Pump IAW AD-OP-ALL-1000 Conduct of Operations step 5.6.3.8.a given below.

CONDUCT OF OPERATIONS	AD-OP-ALL-1000
	Rev. 023
	Page 56 of 93

5.6.3 Equipment Manipulation and Status Control

8. Written process are not necessary for the following: {7.1.7}

- a. Prompt action is necessary to minimize personnel injury, damage to the facility, and to protect the health and safety of the public.

This event is complete when the 1A CCW pump is secured, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 1 Event No.: 4 Page 1 of 5
 Event Description: **1B MDEFW pump oil bubbler empty (SRO) (TS)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, call Control Room as the Basement AO to report "1B MDEFW Pump has no oil level indicating in the sight glass. WCC and Maintenance have been notified".

If asked, "there is no oil on the floor".

Event 4 Plant/Crew response:

- The CRS may make the decision to place the 1B MDEFW Pump switch in OFF
- The **CRS** should enter TS 3.7.5 Condition A and TS 3.3.14 Condition B (**next page**)

Examiner Note: The CRS may direct an RO to place the 1B MDEFWP switch in OFF per AD-OP-ALL-1000 Step 5.6.3.8.b. (below)

CONDUCT OF OPERATIONS	AD-OP-ALL-1000
	Rev. 023
	Page 56 of 93

5.6.3 Equipment Manipulation and Status Control

8. Written process are not necessary for the following: {7.1.7}
 - a. Prompt action is necessary to minimize personnel injury, damage to the facility, and to protect the health and safety of the public.
 - b. Prompt action is necessary to prevent the deterioration of plant conditions or components to a possibly unsafe or unstable level.
 - (1) If time permits, then approval from the SM or CRS shall be obtained, including the following factors:
 - Complexity of action
 - Potential for damage from common cause
 - Conditions exist which may require timely actions due to failure of automatic control systems or uncertain equipment status (e.g., taking manual control of hand/auto stations, position of selector switches).
 - Automatic actuation failure

Booth Cue: If contacted as Unit 2 and asked to perform the spill response procedure, state that "Unit 2 will perform the spill response procedure".

This event is complete when the CRS has entered TS 3.7.5 Condition A and TS 3.3.14 Condition B, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 4

Page 2 of 5

Event Description: **1B MDEFW pump oil bubbler empty (SRO) (TS)**

Applicant's Actions or Behavior

EFW System
3.7.5

3.7 PLANT SYSTEMS

3.7.5 Emergency Feedwater (EFW) System

LCO 3.7.5 The EFW System shall be OPERABLE as follows:

- a. Three EFW pumps shall be OPERABLE, and
- b. Two EFW flow paths shall be OPERABLE.

-----NOTE-----

Only one motor driven emergency feedwater (MDEFW) pump and one EFW flow path are required to be OPERABLE in MODE 4.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

-----NOTE-----

LCO 3.0.4.b is not applicable when entering MODE 1.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One MDEFW pump inoperable in MODE 1, 2, or 3.	A.1 Restore MDEFW pump to OPERABLE status.	7 days
B. Turbine driven EFW pump inoperable in MODE 1, 2, or 3. <u>OR</u> One EFW flow path inoperable in MODE 1, 2, or 3.	B.1 Restore turbine driven EFW pump and EFW flow path to OPERABLE status.	72 hours

Examiner Note: TS 3.7.5 Cond A applies since the pump is out of oil. TS 3.3.14 Cond B applies when the pump switch is taken to OFF.

This event is complete when the CRS has entered TS 3.7.5 Condition A and TS 3.3.14 Condition B, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 4

Page 3 of 5

Event Description: **1B MDEFW pump oil bubbler empty (SRO) (TS)**

Applicant's Actions or Behavior

EFW System
3.7.5

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two MDEFW pumps inoperable in MODE 1, 2, or 3.	C.1 Restore one MDEFW pump to OPERABLE status.	12 hours
D. Required Action and associated Completion Time of Condition A, B, or C not met. <u>OR</u> Turbine driven EFW pump and one EFW flow path inoperable in MODE 1, 2, or 3.	D.1 Be in MODE 3. <u>AND</u> D.2 Be in MODE 4.	12 hours 24 hours

This event is complete when the CRS has entered TS 3.7.5 Condition A and TS 3.3.14 Condition B, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 4

Page 4 of 5

Event Description: **1B MDEFW pump oil bubbler empty (SRO) (TS)**

Applicant's Actions or Behavior

EFW System
3.7.5

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Three EFW pumps inoperable in MODE 1, 2, or 3. <u>OR</u> Two EFW flow path inoperable in MODE 1, 2, or 3.	E.1 -----NOTE----- LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one EFW pump and one EFW flow path are restored to OPERABLE status. Initiate action to restore one EFW pump and one EFW flow path to OPERABLE status.	Immediately
F. Required MDEFW pump inoperable in MODE 4. <u>OR</u> Required EFW flow path inoperable in MODE 4.	F.1 Initiate action to restore required MDEFW pump and required EFW flow path to OPERABLE status.	Immediately

This event is complete when the CRS has entered TS 3.7.5 Condition A and TS 3.3.14 Condition B, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 4

Page 5 of 5

Event Description: **1B MDEFW pump oil bubbler empty (SRO) (TS)**

Applicant's Actions or Behavior

EFW Pump Initiation Circuitry
3.3.14

3.3 INSTRUMENTATION

3.3.14 Emergency Feedwater (EFW) Pump Initiation Circuitry

LCO 3.3.14 Two loss of main feedwater (LOMF) pump instrumentation channels for each automatic initiation circuit, and an automatic and manual initiation circuit for each EFW pump shall be OPERABLE.

NOTE

The EFW pump automatic initiation circuit is not required to be OPERABLE in MODES 3 and 4.

APPLICABILITY: MODES 1, 2 and 3,
MODE 4 when the steam generator is relied upon for heat removal.

ACTIONS

NOTE

Separate Condition entry is allowed for each EFW pump initiation circuit.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more EFW pump automatic initiation circuits with one LOMF channel inoperable.	A.1 Place channel(s) in trip.	1 hour
B. One or more required EFW pump initiation circuits inoperable. <u>OR</u> Required Action and associated Completion Time not met.	B.1 Declare the affected EFW pump(s) inoperable.	Immediately

This event is complete when the CRS has entered TS 3.7.5 Condition A and TS 3.3.14 Condition B, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 5

Page 1 of 13

Event Description: **1A2 RCP Seal Return valve failed closed (C: BOP, SRO)**
Manual Power reduction (R: OATC, SRO)

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, fire **EVENT 5 to fail the 1A2 RCP Seal Return valve closed**

Event 5 Plant response:

The 1A2 RCP Seal Return valve closes

- 1SA06/B-5 (RC PUMP 1A2 SEAL CAVITY PRESS HIGH/LOW)
- 1SA06/B-6 (RC PUMP 1A2 SEAL RETURN FLOW HI/LOW) (see below)

Event 5 Crew response:

The **BOP** will refer to the ARG and will notify the CRS to Go To AP/1/A/1700/016 (Abnormal Reactor Coolant Pump Operation) (**next page**)

OP/1/A/6101/006 1SA06/B-6

**RC PUMP 1A2 SEAL RETURN FLOW
HI/LOW**

NOTE: This alarm is expected to actuate and lock in due to decreased RCS Pressure on Unit shutdown/startup.

1. Alarm Setpoint

1.1 2.69 gpm (High Alarm) {2}

1.2 1.25 gpm (Low Alarm) {2}

2. Automatic Action

None

3. Manual Action

3.1 **IF** in Mode 1 or 2, Perform the following:

3.1.1 Monitor RCP parameters including seal cavity pressures for possibility of lower seal failure on 1A2 RC Pump.

3.1.2 Go To AP/1/A/1700/016, Abnormal Reactor Coolant Pump Operation.

This event is complete when the 1A2 RCP is secured and ΔT_c is within $0 \pm 2^\circ\text{F}$, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 5

Page 2 of 13

Event Description: **1A2 RCP Seal Return valve failed closed (C: BOP, SRO)**
Manual Power reduction (R: OATC, SRO)

Applicant's Actions or Behavior

AP/1/A/1700/016

Duke Energy Oconee Nuclear Station Abnormal Reactor Coolant Pump Operation	Procedure No.
	AP/1/A/1700/016
	Revision No.
	038

AP/1/A/1700/016

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1. Entry Conditions

1.1. In MODE 1 or 2, any of the following RCP parameters reaching the alarm setpoint for an operating RCP:

- Seal ΔP
- Seal cavity pressure
- Seal return flow
- Seal leakage flow
- Seal return temperature
- Upper seal housing temperature
- Vibration
- Bearing temperature
- Stator temperature

Examiner Note: There will be multiple conditions in alarm which meet entry criteria for AP/16 (eg. Seal dP, Seal Cavity Pressure etc), but I've highlighted Seal Return Flow based upon the failure

This event is complete when the 1A2 RCP is secured and ΔT_c is within $0 \pm 2^\circ F$, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 5

Page 3 of 13

Event Description: **1A2 RCP Seal Return valve failed closed (C: BOP, SRO)
Manual Power reduction (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/016

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

If affected RCP has a seal failure, and immediate trip criteria is **NOT** met, then continue to Section 4A (Seal Failure) to ensure Seal Failure guidance steps are read. Section 4A (Seal Failure) contains steps to quickly secure affected RCP should the need arise.

4.1 IAAT either applies:

- Any RCP meets or approaches Immediate Trip Criteria of Encl 5.1 (RCP Immediate Trip Criteria)
 - There is an immediate need to stop a RCP at this time
- THEN perform Steps 4.2 - 4.12.

GO TO Step 4.13.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

4.13 Announce AP entry using the PA system.

4.14 Notify SM to request evaluation by RCP Component Engineer.

4.15 IAAT the failure is identified, THEN GO TO the applicable section per the following table:

✓	Section	Failure
	4A	Seal Failure
	4B	Abnormal Vibration
	4C	High <u>or</u> Low RCP Oil Pot Level
	4D	Loss of RCP Seal Return
	4E	Abnormal RCP Seal Inlet, Bearing <u>or</u> Stator Temperatures

Examiner Note: Based upon the RCP Seal indications, the crew may initially enter Section 4A (Seal Failure) located on **Event 5 Page 13** of this guide. This section will attempt to open 1HP-226, which is failed closed. The AP will then route the crew to Section 4D, which starts on the **next page**.

This event is complete when the 1A2 RCP is secured and ΔT_c is within $0 \pm 2^\circ\text{F}$, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 1 Event No.: 5 Page 4 of 13

Event Description: **1A2 RCP Seal Return valve failed closed (C: BOP, SRO)**
Manual Power reduction (R: OATC, SRO)

Applicant's Actions or Behavior

AP/1/A/1700/016

Section 4D
 Loss of RCP Seal Return

AP/1/A/1700/016
 Page 1 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. <u> </u> IAAT either applies: <u> </u> Any RCP meets Immediate Trip Criteria of Encl 5.1 (RCP Immediate Trip Criteria) <u> </u> There is an immediate need to stop a RCP at this time THEN perform Steps 2 - 12.	<u> </u> GO TO Step 13.

Examiner Note: The crew may elect to follow step 1 "there is an immediate need to stop a RCP at this time", based upon SRO discretion. If needed, that procedure path is picked up on **Event 5 Page 11.**

Step 1 RNO (GO TO Step 13) is continued below.

NOTE

With a loss of seal return flow, Seal Return Temperature is **NOT** representative of seal temperature. Upper Seal Housing Temperature will provide the best indication of seal temperatures.

13. <u> </u> Monitor RCP parameters for operational abnormalities. (Turn-on Code "RCP")	
14. Open: <u> </u> 1HP-20 <u> </u> 1HP-21	1. <u> </u> IF Rx NOT shut down, THEN initiate AP/29 (Rapid Unit Shutdown) to shut down the Rx. 2. <u> </u> WHEN the reactor is shut down, THEN stop <u>all</u> RCPs.

This event is complete when the 1A2 RCP is secured and ΔT_c is within $0 \pm 2^\circ\text{F}$, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 5

Page 5 of 13

Event Description: **1A2 RCP Seal Return valve failed closed (C: BOP, SRO)
Manual Power reduction (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/016

15. Open for the affected RCPs:

☒	Seal Return Stop	RCP
☐	1HP-228	1A1
☐	1HP-226	1A2
☐	1HP-232	1B1
☐	1HP-230	1B2

1. ☐ **IF** affected RCP is operating,
THEN GO TO Step 20 to secure the
affected RCP.

2. ☐ **GO TO** Step 31.

Section 4D

Loss of RCP Seal Return

AP/1/A/1700/016

Page 11 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20. ☐ Verify MODE 1 <u>or</u> 2.	1. ☐ IF time allows <u>and</u> plant conditions permit starting a previously secured RCP, THEN : A. ☐ Start a previously secured RCP per OP/1/A/1103/006 (RCP Operation). B. ☐ Stop <u>affected</u> RCP. C. ☐ GO TO Step 31.

Section 4D

Loss of RCP Seal Return

AP/1/A/1700/016

Page 13 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21. ☐ Verify three RCPs will remain operating after <u>affected</u> RCP is tripped.	1. ☐ IF time allows <u>and</u> plant conditions permit lowering power prior to securing the RCP, THEN :
22. ☐ Verify Rx power is $\leq 70\%$ as indicated on <u>all</u> NIs.	1. ☐ Direct an RO to initiate Encl 5.2 (Rapid Power Reduction). 2. ☐ WHEN Rx power is $\leq 70\%$ on <u>all</u> NIs, THEN continue this procedure.

Examiner Note: Enclosure 5.2 (Rapid Power Reduction) is on Event 5 Page 6.

Section 4D continues on Event 5 page 7.

This event is complete when the 1A2 RCP is secured and ΔT_c is within $0 \pm 2^\circ\text{F}$, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 5

Page 6 of 13

Event Description: **1A2 RCP Seal Return valve failed closed (C: BOP, SRO)
Manual Power reduction (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/016 Encl. 5.2

**Enclosure 5.2
Rapid Power Reduction**

AP/1/A/1700/016
Page 1 of 3

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

- This enclosure should be performed by an RO.
- The step to verify ICS in AUTO means that the ICS is capable of responding to a MAXIMUM RUNBACK signal.

1. __ Verify ICS in AUTO.

Examiner Note: The OATC will perform a manual power reduction by:
1) Reducing demand on the FDW Masters
2) Inserting Control Rods to control RCS temperature.

The OATC will notify the CRS once Rx power is <70% and in band.

1. __ Notify CRS to provide target power level, average power reduction rate, and control bands, as required.

2. __ Initiate manual power reduction to $\leq 70\%$.

3. __ **WHEN** Rx Power $\leq 70\%$ as indicated by all NIs,
THEN notify CRS.

4. Stop:

__ 1E1 HTR DRN PUMP

__ 1E2 HTR DRN PUMP

5. __ **GO TO** Step 7.

7. __ Verify Rx Power was reduced $\geq 15\%$ within a 1 hour period.

__ **GO TO** Step 9.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

8. __ Notify Primary Chemistry to perform Tech Spec SR 3.4.11.2, as required.

9. __ **EXIT** this enclosure.

... END ...

This event is complete when the 1A2 RCP is secured and ΔT_c is within $0 \pm 2^\circ\text{F}$, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 5

Page 7 of 13

Event Description: **1A2 RCP Seal Return valve failed closed (C: BOP, SRO)
Manual Power reduction (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/016

Section 4D

AP/1/A/1700/016

Loss of RCP Seal Return

Page 13 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. __ Verify <u>any</u> SG on Low Level Limits.	☒ GO TO Step 26.
24. __ Stop <u>affected</u> RCP.	
25. __ GO TO Step 29.	
26. __ Verify FDW masters in Auto.	CAUTION Total feedwater flow should be maintained constant to prevent changes in core reactivity. 1. __ Stop <u>affected</u> RCP. 2. __ Manually adjust FDW masters to achieve desired ΔT_c. 3. __ GO TO Step 29.

Section 4D

AP/1/A/1700/016

Loss of RCP Seal Return

Page 15 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Tech Spec 3.4.4 requires setting a high flux trip $\leq 80.5\%$ within 10 hours. OP/1/A/1102/004 (Operation at Power) Encl 4.3 (Special Instructions for < 4 RCP Operation) will initiate this action. (11)	
29. __ Initiate Encl 4.3 (Special Instructions for < 4 RCP Operation) of OP/1/A/1102/004 (Operation at Power).	

Examiner Note: The OATC will manually adjust the FDW Masters to establish desired ΔT_c by lowering the 1A FDW Master and raising the 1B FDW Master to compensate for the loss of pump heat from the 1A2 RCP.

OP/1/A/1102/004 Encl. 4.3 (Special Instructions for < 4 RCP Operation) is on next page.

Once the 1A2 RCP has been secured and ΔT_c stabilized, the Lead Examiner can proceed to the next event if you want to cover TS 3.4.4 Condition A in post-scenario questioning. TS 3.4.4 is on Event 5 Page 10.

This event is complete when the 1A2 RCP is secured and ΔT_c is within $0 \pm 2^\circ\text{F}$, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 5

Page 8 of 13

Event Description: **1A2 RCP Seal Return valve failed closed (C: BOP, SRO)
Manual Power reduction (R: OATC, SRO)**

Applicant's Actions or Behavior

OP/1/A/1102/004

Duke Energy Oconee Nuclear Station Operation At Power Continuous Use	Procedure No.
	OP/1/A/1102/004
	Revision No. 163
	Electronic Reference No. OX002VLA

Enclosure 4.3
Special Instructions For < 4 RCP Operation

OP/1/A/1102/004
Page 1 of 3

1. Initial Conditions

____ 1.1 Review Limits and Precautions.

2. Procedure

____ 2.1 **IF** conditions permit, log the current quadrant power tilt and the position of the ΔT_c controller prior to securing a RCP during power operations.

____ 2.2 Perform one of the following: (Continue)

- ____ SRO • Ensure TS 3.4.4 Condition A entered when fourth RCP secured.
- ____ • Verify the following:

____ ◇ 01E4021 (1A RPS Var Flux Trip Value) set at 79.75%

____ ◇ 01E4022 (1B RPS Var Flux Trip Value) set at 79.75%

____ ◇ 01E4023 (1C RPS Var Flux Trip Value) set at 79.75%

____ ◇ 01E4024 (1D RPS Var Flux Trip Value) set at 79.75%

Examiner Note: Based upon having 3 RCPs operating in MODE 1, the CRS is required to enter TS 3.4.4 Condition A until the NI trip setpoints are adjusted to 79.75%. TS 3.4.4 is on **Event 5 Page 10.**

This event is complete when the 1A2 RCP is secured and ΔT_c is within $0 \pm 2^\circ\text{F}$, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 5

Page 9 of 13

Event Description: **1A2 RCP Seal Return valve failed closed (C: BOP, SRO)
Manual Power reduction (R: OATC, SRO)**

Applicant's Actions or Behavior

OP/1/A/1102/004

____ 2.3 Using turn-on code T6 3RCP, digitally trend the following data at one minute intervals:

<u>Point ID</u>	<u>Description</u>
☐ O1P0889	CORE THERMAL POWER BEST
☐ O1P0877	INCORE IMBALANCE
☐ O1E3335	API GROUP AVE FOR GROUP 7
☐ O1E3336	API GROUP AVE FOR GROUP 8
☐ O1P0737	INCORE TILT QUADRANT W-X
☐ O1P0738	INCORE TILT QUADRANT X-Y
☐ O1P0739	INCORE TILT QUADRANT Y-Z
☐ O1P0740	INCORE TILT QUADRANT Z-W
☐ O1I0828	RC COLD LEG A1 TEMP
☐ O1I0829	RC COLD LEG A2 TEMP
☐ O1I0830	RC COLD LEG B1 TEMP
☐ O1I0831	RC COLD LEG B2 TEMP

NOTE: The 100% Power Imbalance curves also apply for runs at reduced power.

2.4 Maintain Control Rod position and Power Imbalance within COLR limits.

____ 2.5 **IF** NI calibration **NOT** within requirements of Limit and Precaution Step 2.2.6, calibrate NIs to Thermal Power Best. (R.M.)

2.6 Perform the following per AM/1/A/0315/017 (TXS RPS Channels A, B, C, And D Parameter Changes For Abnormal/Normal Operating Conditions): (R.M.)

____ 2.6.1 Notify I&E to reset RPS Overpower High Trip Setpoint for three RCP Operation.

____ Person Notified _____ Date _____

____ 2.6.2 **IF AT ANY TIME** Quadrant Power Tilt problems exist, notify I&E to adjust Flux/Imbalance/Flow trip setpoints as required to comply with TS 3.2.3.

____ Person Notified _____ Date _____

NOTE: The Maximum Allowed Power Setpoint (P_{max}) is reduced when operating for extended periods when only three RCPs operating as a conservative action.

____ 2.6.3 **IF** expected to operate for an extended period of time with only three RCPs operating, notify I&E to adjust Flux/ Imbalance /Flow trip setpoints for three RCP operation.

____ Person Notified _____ Date _____

This event is complete when the 1A2 RCP is secured and ΔT_c is within $0 \pm 2^\circ\text{F}$, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 5

Page 10 of 13

Event Description: **1A2 RCP Seal Return valve failed closed (C: BOP, SRO)**
Manual Power reduction (R: OATC, SRO)

Applicant's Actions or Behavior

TS 3.4.4

RCS Loops – MODES 1 and 2
 3.4.4

3.4 REACTOR COOLANT SYSTEM (RCS)**3.4.4 RCS Loops – MODES 1 and 2**

LCO 3.4.4

Two RCS Loops shall be in operation, with:

- a. Four reactor coolant pumps (RCPs) operating; or
- b. Three RCPs operating and:
 1. THERMAL POWER is $\leq 75\%$ RTP*; and
 2. LCO 3.3.1, "Reactor Protection System (RPS) Instrumentation," Function 1.a (Nuclear Overpower – High Setpoint), Allowable Value of Table 3.3.1-1 is reset for 3 RCPs operating.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of LCO 3.4.4.b not met.	A.1 Reset the RPS to satisfy the requirements of LCO 3.4.4.b.2.	10 hours
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> Requirements of LCO not met for reasons other than Condition A.	B.1 Be in MODE 3.	12 hours

This event is complete when the 1A2 RCP is secured and ΔT_c is within $0 \pm 2^\circ\text{F}$, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 1 Event No.: 5 Page 11 of 13

Event Description: **1A2 RCP Seal Return valve failed closed (C: BOP, SRO)**
Manual Power reduction (R: OATC, SRO)

Applicant's Actions or Behavior

AP/1/A/1700/016

Section 4D
 Loss of RCP Seal Return

AP/1/A/1700/016
 Page 1 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ <u>IAAT either</u> applies: ☐ <u>Any</u> RCP meets Immediate Trip Criteria of Encl 5.1 (RCP Immediate Trip Criteria) ☐ There is an immediate need to stop a RCP at this time THEN perform Steps 2 - 12.	☐ GO TO Step 13.
2. ☐ Verify <u>MODE 1 or 2</u> .	1. ☐ Stop <u>affected</u> RCP.
3. ☐ Verify three RCPs will remain operating after <u>affected</u> RCP is tripped.	1. ☐ Trip Rx. 2. ☐ Stop <u>affected</u> RCP. 3. ☐ GO TO Step 13.
4. ☐ Verify Immediate Trip Criteria met.	1. ☒ IF Rx Power on <u>any</u> NI > 70%, AND time permits reducing power, THEN : ☒ Reduce Rx Power ≤ 70% using Encl 5.2 (Rapid Power Reduction). ☒ WHEN Rx Power ≤ 70%, THEN GO TO Step 6.
6. ☐ Verify <u>any</u> SG on Low Level Limits.	☒ GO TO Step 9.
9. ☐ Verify FDW masters in Auto.	CAUTION Total feedwater flow should be maintained constant to prevent changes in core reactivity. 1. ☒ Stop <u>affected</u> RCP. 2. ☒ Manually adjust FDW masters to achieve desired ΔT_c . 3. ☒ GO TO Step 12.

Examiner Note: The OATC will manually adjust the FDW Masters to establish desired ΔT_c by lowering the 1A FDW Master and raising the 1B FDW Master to compensate for the loss of pump heat from the 1A2 RCP.

This event is complete when the 1A2 RCP is secured and ΔT_c is within $0 \pm 2^\circ\text{F}$, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 1 Event No.: 5 Page 12 of 13

Event Description: **1A2 RCP Seal Return valve failed closed (C: BOP, SRO)
Manual Power reduction (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/016

Section 4D
Loss of RCP Seal Return

AP/1/A/1700/016
Page 7 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Tech Spec 3.4.4 requires setting a high flux trip $\leq 80.5\%$ within 10 hours. OP/1/A/1102/004 (Operation at Power) Encl 4.3 (Special Instructions for < 4 RCP Operation) will initiate this action. {11}	
12. <u> </u> Initiate Encl 4.3 (Special Instructions for < 4 RCP Operation) of OP/1/A/1102/004 (Operation at Power).	

Examiner Note: OP/1/A/1102/004 Encl. 4.3 (Special Instructions for < 4 RCP Operation) is on Event 5 Page 8.

Once the 1A2 RCP has been secured and ΔT_c stabilized, the Lead Examiner can proceed to the next event if you want to cover TS 3.4.4 Condition A in post-scenario questioning. TS 3.4.4 is on **Event 5 Page 10**.

The continuation of the procedure above, starting with step 13, is on **Event 5 Page 4**.

This event is complete when the 1A2 RCP is secured and ΔT_c is within $0 \pm 2^\circ\text{F}$, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 1 Event No.: 5 Page 13 of 13

Event Description: **1A2 RCP Seal Return valve failed closed (C: BOP, SRO)**
Manual Power reduction (R: OATC, SRO)

Applicant's Actions or Behavior

AP/1/A/1700/016

Examiner Note: This path picks up in Section 4A (Seal Failure). If the crew takes this path, it will direct them to open 1HP-226 (failed closed), and will transfer them to Section 4D starting on Page 4 of this event.

Section 4A
RCP Seal Failure

AP/1/A/1700/016
Page 1 of 21

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED															
1. <u>IAAT</u> either applies: <u>Any RCP meets Immediate Trip Criteria of Encl 5.1 (RCP Immediate Trip Criteria)</u> <u>There is an immediate need to stop a RCP at this time</u> THEN perform Steps 2 - 12.	<u>GO TO Step 13.</u>															
13. <u>IAAT</u> any of the following indicate external RCP seal leakage: <u>RB RIAs rising <u>or</u> in alarm</u> <u>RCS T_{ave} constant with LDST level lowering more than normal</u> <u>Quench Tank level rate rising</u> <u>RB Normal Sump rate rising</u> <u>Visual confirmation</u> THEN initiate AP/02 (Excessive RCS Leakage).																
14. Verify open: <u>1HP-20</u> <u>1HP-21</u>	<u>GO TO Section 4D (Loss of RCP Seal Return).</u>															
15. Verify open for the <u>affected</u> RCP: <table><tr><td>✓</td><td>Seal Return Stop</td><td>RCP</td></tr><tr><td></td><td>1HP-228</td><td>1A1</td></tr><tr><td></td><td>1HP-226</td><td>1A2</td></tr><tr><td></td><td>1HP-232</td><td>1B1</td></tr><tr><td></td><td>1HP-230</td><td>1B2</td></tr></table>	✓	Seal Return Stop	RCP		1HP-228	1A1		1HP-226	1A2		1HP-232	1B1		1HP-230	1B2	<u>GO TO Section 4D (Loss of RCP Seal Return).</u>
✓	Seal Return Stop	RCP														
	1HP-228	1A1														
	1HP-226	1A2														
	1HP-232	1B1														
	1HP-230	1B2														

This event is complete when the 1A2 RCP is secured and ΔT_c is within $0 \pm 2^\circ\text{F}$, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 6

Page 1 of 4

Event Description: **1RC-1 (PZR Spray) fails open (C: OATC, SRO)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, **fire EVENT 6** to cause SA-9/B-1 (525KV SWYD Events Recorder Trouble) to alarm to remove the BOP from the front board. When this alarm is acknowledged, it will clear and the PZR Spray valve for Event 2 will fail open. If AO is dispatched to the 525KV relay house to investigate, notify the operator "using time compression, the alarm was caused by the printer going offline. Printer is now online."

Event 6 Crew/Plant Response:

- 1RC-1 indicates open
- O1D1047 1RC-1 PZR Spray Control Valve 'Not Closed'
- RCS pressure lowering
- **OATC** should recognize that RCS pressure is below the setpoint (2155 psig) and attempt to close 1RC-1. When this doesn't work, the OATC should close 1RC-3 (PZR Spray Block). These are Immediate Manual Actions from AP/44 Abnormal Pressurizer Pressure Control.
- **SRO** should enter AP/1/A/1700/044 (Rev 05)

Duke Energy Oconee Nuclear Station Abnormal Pressurizer Pressure Control	Procedure No. AP/1/A/1700/044
	Revision No. 005

AP/1/A/1700/044

Page 1 of 13

1. Entry Conditions

1.1 Inability to maintain control of RC pressure due to failure of the PORV, 1RC-1, or PZR heaters as indicated by any of the following:

- High or Low RC pressure alarms
- RC pressure outside of control band
- Pressurizer Relief Valve Flow Statalarm

2. Automatic Systems Actions

- 2.1 In HIGH, 1RC-66 opens at 2450 psig rising and closes at approximately 2400 psig lowering.
- 2.2 In LOW, 1RC-66 opens at 530 psig rising and closes at approximately 480 psig lowering.
- 2.3 1RC-1 opens at 2205 psig rising and closes at 2155 psig lowering.
- 2.4 Bank #2- energizes at 2140 psig lowering and de-energizes at 2150 psig rising.
- 2.5 Bank #3- energizes at 2145 psig lowering and de-energizes at 2175 psig rising. (Bank #3 normally remains energized with Heater Bank #1 cycling on and off to maintain RCS pressure at set point).
- 2.6 Bank #4- energizes at 2130 psig lowering and de-energizes at 2145 psig rising.

This event is complete at Step 4.13 and when RCS pressure is stable, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 6

Page 2 of 4

 Event Description: **1RC-1 (PZR Spray) fails open (C: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/044

AP/1/A/1700/044

Page 3 of 13

3. Immediate Manual Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.1 — IAAT PORV is open, AND RC pressure is < setpoint (2400 psig (HIGH) or 480 psig (LOW)), THEN close 1RC-4.	
3.2 — IAAT RC pressure < 2155 psig, AND 1RC-1 indicates open, THEN select 1RC-1 to CLOSE.	Examiner Note: 1RC-1 will fail to close
3.3 — IAAT <u>all</u> the following conditions exist: — RC pressure < 2155 psig — RC pressure lowering without a corresponding reduction in PZR level, THEN close 1RC-3.	CT-1: Close 1RC-3 to regain Safety Function 3 (Reactor Pressure Control) prior to requiring a change in mitigation strategy resulting in a Mode 3 entry and the securing of 3 RCPs

This event is complete at Step 4.13 and when RCS pressure is stable, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 6

Page 3 of 4

Event Description: **1RC-1 (PZR Spray) fails open (C: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/044

AP/1/A/1700/044

Page 5 of 13

4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED									
4.1 __ Announce AP entry using the PA system.										
4.2 GO TO the applicable step per the following table: <table><tr><td>✓</td><td>Failure Caused RCS Pressure</td><td>Step</td></tr><tr><td></td><td>Lower</td><td>4.3</td></tr><tr><td></td><td>Rise</td><td>4.18</td></tr></table>	✓	Failure Caused RCS Pressure	Step		Lower	4.3		Rise	4.18	
✓	Failure Caused RCS Pressure	Step								
	Lower	4.3								
	Rise	4.18								
4.3 __ Verify 1RC-4 is closed.	__ IF PORV is open, AND 1RC-4 has failed to close, THEN: A. __ Dispatch an operator to open 1DIB Panelboard breaker #24. B. __ Manually trip the reactor. C. __ Initiate AP/02 (Excessive RCS Leakage).									
4.4 __ Verify 1RC-3 is closed.	1. __ IF RC pressure is uncontrollable, THEN GO TO Step 4.7. 2. __ IF 1RC-1 is selected to CLOSE, THEN maintain RC pressure within desired band with 1RC-1 in manual control. 3. __ GO TO Step 4.13.									

This event is complete at Step 4.13 and when RCS pressure is stable, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 6

Page 4 of 4

Event Description: **1RC-1 (PZR Spray) fails open (C: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/044

Page 5 of 13

4. Subsequent Actions

CAUTION

Damage could occur if 1RC-3 is closed for ≥ 36 minutes at a time due to a thermal transient in piping between 1RC-3 and the PZR Spray Nozzle. (4)

4.5 ☐ Position 1RC-3 as required to maintain RC pressure within desired band.

Examiner Note: The CRS will determine the band for the OATC.

4.6 ☐ GO TO Step 4.13.

4.13 ☐ Verify PZR heaters maintaining RCS pressure within desired band.

☐ Cycle PZR heaters as necessary to maintain RCS pressure within desired band.

4.14 ☐ Notify Maintenance to repair malfunctioning component.

4.15 Refer to:
☐ TS 3.4.1 (RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling Limits)
☐ TS 3.4.9 (Pressurizer)
☐ TS 3.4.12 (Low Temperature Overpressure Protection System)
☐ SLC 16.5.1 (Reactor Coolant System Vents)

4.16 ☐ WHEN repairs complete, THEN place following components in desired position for current plant conditions as determined by CRS:

Examiner Note: 1RC-1 will NOT be repaired.

- ☐ 1RC-1
- ☐ 1RC-3
- ☐ 1RC-4
- ☐ PZR heater bank #1
- ☐ PZR heater bank #2
- ☐ PZR heater bank #3
- ☐ PZR heater bank #4

4.17 ☐ WHEN conditions permit, THEN EXIT this procedure.

This event is complete at Step 4.13 and when RCS pressure is stable, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

Page 1 of 54

Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, **fire EVENT 7** to initiate the 1A MSLB inside RB.

Event 7 Plant response:

The 1A SG Pressure will lower rapidly

- 1SA-2/D-3 (RC Press High/Low)
- 1SA-02/A-9 (MS PRESS HIGH/LOW)

Event 7 Crew response:

- The **CRS** will direct the **OATC** to trip the Reactor and perform IMAs. (IMAs listed below)
- The **CRS** will direct the **BOP** to perform a Symptom Check (next page)
- **CT-2** (manually start the TDEFWP prior to reaching requirements for initiating HPI Forced Cooling) located on **Event 7 Page 4**.

EP/1/A/1800/001 00 (Rev 03)

3. Immediate Manual Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.1 ☐ Depress REACTOR TRIP pushbutton.	
3.2 ☐ Verify reactor power < 5% FP and lowering.	☐ GO TO Rule 1 (ATWS/Unanticipated Nuclear Power Production).
3.3 ☐ Depress turbine TRIP pushbutton.	
3.4 ☐ Verify <u>all</u> turbine stop valves closed.	☐ Place <u>both</u> EHC pumps in PULL TO LOCK.
3.5 ☐ Verify RCP seal injection available.	☐ IF CC is unavailable, THEN immediately: A. ☐ Stop <u>all</u> RCPs. (10) B. ☐ Notify CRS to initiate AP/25 (Standby Shutdown Facility Emergency Operating Procedure).

Examiner Note: The OATC will perform the steps above, then announce each of them to the CRS. Upon completion, the CRS will direct the OATC to perform a Symptom Check located on the **next page**.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 1 Event No.: 7 Page 2 of 54
 Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

AD-OP-ONS-0002 ATT 13 (Rev 07)

<< Symptom Check Guidelines >>

Symptom	Plant Parameters	Applicable Rules
Reactivity Control	- Power Range NIs NOT < 5% - Power Range NIs NOT decreasing	Rule 1, ATWS/Unanticipated Nuclear Power Production
ICC/Loss of Subcooling Margin (LOSCM)	Any SCM $\leq 0^{\circ}\text{F}$	Rule 2, Loss Of SCM
Loss of Heat Transfer (LOHT)	Loss of Main <u>and</u> Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, Loss of Main or Emergency FDW Rule 4, <i>Initiation of HPI Forced Cooling</i> (Inability to feed SGs (Main/CBP/Emergency/PSW) and ≥ 2300 psig, NDT limit reached, or PZR level $\geq 375^{\circ}\text{F}$)
Excessive Heat Transfer (EHT)	Uncontrolled Main steam line(s) pressure reduction.	Rule 5, Main Steam Line Break
Steam Generator Tube Rupture (SGTR)	- CSAE Offgas alarms - Process monitor alarms (RIA-40, 59, 60) - Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identified SG Tube Leakage ≥ 25 gpm)

Examiner Note:

During the BOPs performance of the Symptom Check, they will initiate Rule 5 (Main Steam Line Break) starting on **Event 7 Page 4**.

During the OATCs performance of the Symptom Check, they will initiate Rule 2 (Loss of Subcooling Margin) listed on **Event 7 Page 19, IF IT APPLIES – OR –** they will report that “Rule 5 is in progress (by the BOP) and there are no additional symptoms to report. Valid ES Channel actuation does exist”.

The CRS will review the IMAs and transfer to the Subsequent Actions Tab which is on the **next page** of this guide.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

Subsequent Actions Tab/Yellow Page (Rev 03)

Subsequent Actions

EP/1/A/1800/001 00

Parallel Actions

Page 1 of 1

CONDITION	ACTIONS	
1. PR NIs $\geq$ 5% FP OR NIs NOT lowering	GO TO UNPP tab.	UNPP
2. <u>All</u> 4160V SWGR de-energized (13)	GO TO Blackout tab.	BLACKOUT
3. <u>Core</u> SCM indicates superheat	GO TO ICC tab.	ICC
4. <u>Any</u> SCM = 0°F	GO TO LOSCM tab.	LOSCM
5. <u>Both</u> SGs intentionally isolated to stop excessive heat transfer	GO TO EHT tab.	LOHT
6. Loss of heat transfer (including loss of all Main and Emergency FDW)	GO TO LOHT tab.	
7. Heat transfer is <u>or</u> has been excessive	GO TO EHT tab.	EHT

Examiner Note: The CRS will review the Subsequent Actions Tab Yellow Page and transfer to the appropriate tab.

If LOSCM exists, the CRS will transfer to the LOSCM Tab on Event 7 Page 18.

If LOSCM does NOT exist, the CRS will transfer to EHT Tab on Event 7 Page 7.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

Page 4 of 54

Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EOP Rule 5 (Rev 05)

**Rule 5
Main Steam Line Break**

EP/1/A/1800/001 0L
Page 1 of 5

ACTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED
1. Perform on <u>affected</u> headers:		
☒ A Header	☒ B Header	
☒ On AFIS HEADER A, depress CH. 1 INIT.	On AFIS HEADER B, depress CH. 1 INIT.	
☒ On AFIS HEADER A, depress CH. 2 INIT.	On AFIS HEADER B, depress CH. 2 INIT.	
☒ Select OFF for 1A MD EFDWP.	Select OFF for 1B MD EFDWP.	
☒ Trip <u>both</u> Main FDWPTs.	Trip <u>both</u> Main FDWPTs.	
☒ Close 1FDW-315.	Close 1FDW-316.	
☒ Place 1FDW-33 switch to CLOSE.	Place 1FDW-42 switch to CLOSE.	
☒ Place 1FDW-31 switch to CLOSE.	Place 1FDW-40 switch to CLOSE.	
Close 1PSW-22.	Close 1PSW-24.	
Close 1PSW-23.	Close 1PSW-25.	
2. ___ Verify 1 TD EFDW PUMP operating.		1. ___ IF MD EFDWP for the <u>intact</u> SG is operating, THEN GO TO Step 5. 2. ☒ Start 1 TD EFDW PUMP.
CT-2: Manually start TDEFWP to feed the 1B SG prior to meeting requirements for initiation of HPI Forced Cooling.		
3. ___ Verify 1 TD EFDW PUMP is feeding <u>affected</u> SGs.		☒ GO TO Step 5.
ACTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED
5. ___ Verify 1B SG is an <u>affected</u> SG.		☒ GO TO Step 7.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 1 Event No.: 7 Page 5 of 54
 Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EOP Rule 5 (Rev 05)

Rule 5
Main Steam Line Break

EP/1/A/1800/001 0L
 Page 3 of 5

7. ☐ **WHEN** overcooling is stopped,
THEN adjust steaming of unaffected
 SG to maintain CETCs constant using
either:
☐ TBVs
☐ Dispatch two operators to perform
 Encl 5.24 (Operation of the ADVs).
 (PS)

Examiner Note: The BOP will adjust the 1B TBVs, if possible in AUTO (MS pressure ≥ 725 psig), to throttle open the valves which will stabilize CETCs. If the TBVs are not adjusted, 1B SG pressure will re-pressurize to 1010 psig causing a primary temperature heatup.

CAUTION

Thermal shock conditions may develop if HPI is **NOT** throttled and RCS pressure **NOT** controlled.

8. ☐ **WHEN** all exist:
☐ Core SCM $> 0^{\circ}\text{F}$
☐ Rx power $\leq 1\%$
☐ Pzr level rising
THEN continue.

9. ☐ Verify ES HPI actuated.

☐ **GO TO** Step 12.

10. ☐ Place Diverse HPI in BYPASS.

☐ Place Diverse HPI in OVERRIDE.

11. Perform both:
☐ Place ES CH 1 in MANUAL.
☐ Place ES CH 2 in MANUAL.

1. ☐ **IF** ES CH 1 fails to go to MANUAL,
THEN place ODD voter in OVERRIDE.
 2. ☐ **IF** ES CH 2 fails to go to MANUAL,
THEN place EVEN voter in OVERRIDE.

12. Perform the following to stabilize RCS P/T:
☐ Throttle HPI.
☐ Reduce 1HP-120 setpoint to control at
 $> 100''$ [180" acc].
☐ Adjust steaming of unaffected SG as
 necessary to maintain CETCs constant.

Examiner Note: Since RB pressure is > 3 psig, ACC Levels apply. 1HP-120 setpoint will be adjusted above a minimum value of 45% demand which correlates to 180 inches of PZR level.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

Page 6 of 54

Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EOP Rule 5 (Rev 05)

**Rule 5
Main Steam Line Break**

EP/1/A/1800/001 0L
Page 5 of 5

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. __ WHEN CETCs have stabilized, THEN resume use of T _c for RCS temperature control.	
14. __ Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete.	
15. __ Ensure Rule 8 (Pressurized Thermal Shock (PTS)) is in progress or complete.	
16. __ WHEN directed by CRS, THEN EXIT.	

... END ...

Examiner Note: Per step 14 above, the BOP performs Rule 3 starting on **Event 7 Page 15**.

Per step 15 above, the BOP ensures that Rule 8 is in progress or complete. Rule 8 must be performed if one of the two following conditions is met:

- (1) A cooldown below 400F T_c at > 100F/hr has occurred
- (2) HPI has injected through an open HP-26, 27, 409, 410 with RCPs off (LOSCM)

If either of those two conditions is met, Rule 8 will be performed and is located on **Event 7 Page 24**.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

Page 7 of 54

Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EHT
Parallel Actions*EHT Tab Yellow Page (Rev 0)*EP/1/A/1800/001 OF
Page 1 of 1

CONDITION	ACTIONS	
1. PR NIs $\geq$ 5% FP OR NIs NOT decreasing	GO TO UNPP tab.	UNPP
2. <u>All</u> 4160V SWGR de-energized ⁽¹³⁾	GO TO Blackout tab.	BLACKOUT
3. <u>Core</u> SCM indicates superheat	GO TO ICC tab.	ICC
4. <u>Any</u> SCM = 0°F AND HPI forced cooling NOT in progress	IF LOSCM tab has NOT been entered due to current EHT event, THEN GO TO LOSCM tab.	LOSCM
5. <u>Both</u> SGs intentionally isolated to stop excessive heat transfer after EHT tab initiated	RETURN TO beginning of EHT tab.	LOHT
6. Loss of heat transfer AND at least one SG NOT isolated	GO TO LOHT tab.	
7. Indications of excessive heat transfer in another SG after EHT tab initiated	RETURN TO beginning of EHT tab.	EHT
8. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	ES
9. <u>Valid ES actuation has occurred or should have occurred</u>	<u>Initiate Encl 5.1 (ES Actuation).</u>	ES
10. Power lost to <u>all</u> 4160V SWGR and <u>any</u> 4160V SWGR re-energized	- Initiate AP/11 (Recovery from Loss of Power). - IF Encl 5.1 (ES Actuation) has been initiated, THEN reinitiate Encl 5.1.	ROP
11. RCS leakage > 160 gpm with letdown isolated OR SGTR > 25 gpm	Notify plant staff that Emergency Dose Limits are in affect using PA system.	EDL
12. Individual available to make notifications	- Announce plant conditions using PA system. - Notify OSM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification/Reportability Evaluation).	NOTIFY

Examiner Note: If the OATC is NOT performing Rule 2, then the CRS will direct the OATC to perform EOP Enclosure 5.1 (ES Actuation) on **Event 7 Page 37.**

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EHT Tab (Rev 0)

Duke Energy Oconee Nuclear Station Unit 1 EOP Excessive Heat Transfer	Procedure No. EP/1/A/1800/001 OF
	Revision No. 0
	Electronic Reference No. OP0097DG

EHT
Excessive Heat Transfer

EP/1/A/1800/001 OF
Page 1 of 27

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED																												
1. __ Verify <u>any</u> SG pressure < 550 psig.	1. __ IF excessive heat transfer has been stopped, THEN GO TO Step 5.																												
2. __ Ensure Rule 5 (Main Steam Line Break) in progress or complete.	2. __ GO TO Step 3.																												
3. Place the following in HAND and decrease demand to zero on <u>all affected</u> SGs: <table><tr><td>✓</td><td>1A SG</td><td>✓</td><td>1B SG</td></tr><tr><td></td><td>1FDW-32</td><td></td><td>1FDW-41</td></tr><tr><td></td><td>1FDW-35</td><td></td><td>1FDW-44</td></tr></table>	✓	1A SG	✓	1B SG		1FDW-32		1FDW-41		1FDW-35		1FDW-44	Examiner Note: Rule 5 is being performed by the BOP. The CRS may hand this page to a available RO to perform steps 3 and 4 for isolation of the 1A SG.																
✓	1A SG	✓	1B SG																										
	1FDW-32		1FDW-41																										
	1FDW-35		1FDW-44																										
4. Close the following on <u>all affected</u> SGs: <table><tr><td>✓</td><td>1A SG</td><td>✓</td><td>1B SG</td></tr><tr><td></td><td>1FDW-372</td><td></td><td>1FDW-382</td></tr><tr><td></td><td>1MS-17</td><td></td><td>1MS-26</td></tr><tr><td></td><td>1MS-79</td><td></td><td>1MS-76</td></tr><tr><td></td><td>1MS-35</td><td></td><td>1MS-36</td></tr><tr><td></td><td>1MS-82</td><td></td><td>1MS-84</td></tr><tr><td></td><td>1FDW-368</td><td></td><td>1FDW-369</td></tr></table>	✓	1A SG	✓	1B SG		1FDW-372		1FDW-382		1MS-17		1MS-26		1MS-79		1MS-76		1MS-35		1MS-36		1MS-82		1MS-84		1FDW-368		1FDW-369	
✓	1A SG	✓	1B SG																										
	1FDW-372		1FDW-382																										
	1MS-17		1MS-26																										
	1MS-79		1MS-76																										
	1MS-35		1MS-36																										
	1MS-82		1MS-84																										
	1FDW-368		1FDW-369																										

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 1 Event No.: 7 Page 9 of 54
 Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EHT Tab (Rev 0)

EHT
Excessive Heat Transfer

EP/1/A/1800/001 OF
 Page 1 of 27

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5. ☐ Verify level in <u>both</u> SGs < 96% O.R.	1. ☐ Trip <u>both</u> Main FDW pumps. 2. ☐ Ensure EFDW actuation. 3. ☐ Stop steaming <u>all affected</u> SGs.
6. ☐ <u>IAAT core</u> SCM is > 0°F, THEN perform Steps 7 and 8.	☐ GO TO Step 9.
7. ☒ Throttle HPI per Rule 6 (HPI).	
8. ☐ Verify letdown in service.	☒ IF desired to restore letdown, THEN initiate Encl 5.5 (Pzr and LDST Level Control).

Examiner Note: Rule 6 is located on Event 7 Page 28. The CRS will have an available RO initiate EOP Enclosure 5.5 which starts on Event 7 Page 31.

EHT
Excessive Heat Transfer

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 Page 3 of 27

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9. ☐ Verify <u>any</u> SG has an intact secondary boundary (intact SG).	☐ GO TO Step 14.

NOTE

If only one SG is intact and has been isolated for SGTR, the following steps will unisolate and use it for heat removal.

10. Open the following on all intact SGs:

☒	1A SG	☒	1B SG
☐	1FDW-372	☐	1FDW-382
☐	1FDW-368	☐	1FDW-369
☐	1MS-17	☐	1MS-26

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EHT Tab (Rev 0)

EHT
Excessive Heat Transfer

EP/1/A/1800/001 OF
Page 3 of 27

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
11. Start MDEFDWP associated with <u>all intact</u> SGs: <table><tr><td>✓</td><td>1A SG</td><td>✓</td><td>1B SG</td></tr><tr><td></td><td>1A MDEFDWP</td><td></td><td>1B MDEFDWP</td></tr></table>	✓	1A SG	✓	1B SG		1A MDEFDWP		1B MDEFDWP	___ Start TDEFDWP.
✓	1A SG	✓	1B SG						
	1A MDEFDWP		1B MDEFDWP						
12. ___ Feed and steam <u>all intact</u> SGs to stabilize RCS P/T using <u>either</u>: ● TBVs ● Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs). (PS)									
13. GO TO Step 32.									

EHT
Excessive Heat Transfer

EP/1/A/1800/001 OF
Page 11 of 27

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>Unit Status</u> At least one SG is providing adequate heat transfer.	
CREW BRIEF OPPORTUNITY	
32. Verify <u>any</u>: ___ HPI has operated in the injection mode while NO RCPs were operating ___ A cooldown below 400°F at > 100°F/hr has occurred	___ GO TO Step 34.
33. ___ Initiate Rule 8 (Pressurized Thermal Shock (PTS)).	

Examiner Note: If the RCS saturated (turned RCPs off) due to the MSLB or the BOP took long enough to isolate the SG (failure of AFIS) for RCS temperature to go <400°F, then Step 32 will be met. Otherwise, the crew will proceed to the RNO.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EHT Tab (Rev 0)**EHT****Excessive Heat Transfer**

EP/1/A/1800/001 OF

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED																
34. Verify <u>both</u> closed: ___ 1MS-24 ___ 1MS-33	1. ___ IF an <u>unaffected</u> Unit 1 SG is available to supply aux steam, THEN: A. Open aux steam supply from <u>unaffected</u> SG: <table><tr><td>☒</td><td>1A SG</td><td>☒</td><td>1B SG</td></tr><tr><td>☐</td><td>1MS-24</td><td>☐</td><td>1MS-33</td></tr></table> B. Close aux steam supply from <u>affected</u> SG: <table><tr><td>☒</td><td>1A SG</td><td>☒</td><td>1B SG</td></tr><tr><td>☐</td><td>1MS-24</td><td>☐</td><td>1MS-33</td></tr></table> C. ___ GO TO Step 35. 2. ___ Initiate Encl 5.33 (Swapping Aux Steam Header to Another Unit).	☒	1A SG	☒	1B SG	☐	1MS-24	☐	1MS-33	☒	1A SG	☒	1B SG	☐	1MS-24	☐	1MS-33
☒	1A SG	☒	1B SG														
☐	1MS-24	☐	1MS-33														
☒	1A SG	☒	1B SG														
☐	1MS-24	☐	1MS-33														
35. ___ Open 1AS-8.																	
36. ___ Close 1SSH-9.																	
37. Perform notifications: ___ Notify Chemistry to determine RCS boron concentration. ___ Notify Secondary Chemistry to check for indications of SGTR. (2) ___ Notify RP to check for indications of SGTR.																	
38. ___ IAAT RCS boron is determined to be insufficient for adequate SDM, THEN initiate Encl 5.11 (RCS Boration).																	
39. ___ IAAT <u>all</u> exist: ___ ES Bypass Permit satisfied ___ <u>All</u> SCMs > 0°F ___ RCS pressure controllable THEN perform Steps 40 - 41.	___ GO TO Step 42.																

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EHT Tab (Rev 0)**EHT**
Excessive Heat TransferEP/1/A/1800/001 OF
Page 13 of 27

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40. Bypass <u>applicable</u> ES: To Bypass HPI: ___ Bypass HPI ES CH A,B,C To Bypass LPI: ___ Bypass LPI ES CH A,B,C	1. ___ IF ≥ 2 ES bypass channels <u>fail to bypass</u> , THEN perform <u>either</u> : ___ Hold RCS pressure above actuation setpoint until <u>at least two</u> ES bypass channels are bypassed. ___ Place <u>both</u> ODD and EVEN voters to OVERRIDE. 2. ___ IF ODD and EVEN voters are placed in OVERRIDE, THEN notify OSM to consult Technical Specifications.
41. Bypass <u>applicable</u> Diverse ES: To Bypass HPI: ___ Bypass Diverse HPI To Bypass LPI: ___ Bypass Diverse LPI	___ IF <u>applicable</u> Diverse actuation circuit fails to bypass, THEN place the <u>applicable</u> Diverse actuation circuit to OVERRIDE.

Examiner Note: Diverse HPI has already been placed in Bypass by the BOP during the performance of Rule 5 (Main Steam Line Break).

EHT
Excessive Heat TransferEP/1/A/1800/001 OF
Page 15 of 27

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
42. ___ Verify <u>any</u> SG is dry.	___ GO TO Step 46.

Examiner Note: The 1A SG is considered dry when its level is empty and it is no longer being fed by any source.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 1 Event No.: 7 Page 13 of 54
 Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EHT Tab (Rev 0)

EHT
Excessive Heat Transfer

EP/1/A/1800/001 OF
 Page 15 of 27

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE - Minimizing SCM reduces tensile stress on the SG. - PORV should be used if Pzr spray is not available. - Procedure progression may continue when actions to minimize SCM are in progress.	
43. ☒ Maintain minimum SCM using the following methods <u>as necessary</u>: ☒ De-energize <u>all</u> Pzr heaters ☐ Use Pzr spray ☐ Throttle HPI to maintain Pzr level > 100" [180" acc] ☒ Use PORV	Examiner Note: 1RC-3 (Spray Block Valve) fails closed on initiation of the MSLB. This renders PZR Spray unavailable. The crew is required to use the PORV to reduce SCM.
44. ☐ Verify <u>any</u> RCP operating.	☐ <u>GO TO</u> Step 46.
45. ☒ Maintain RCP NPSH. ☒ OAC ☒ Encl 5.18 (P/T Curves)	Examiner Note: If the RCS saturates, the RCPs will be secured.
46. ☐ Initiate Encl 5.16 (SG Tube-to-Shell ΔT Control).	Examiner Note: Encl 5.16 is on Event 7 Page 53.
NOTE RCP 1A1 provides the best Pzr spray.	
47. ☐ <u>IAAT all</u> exist: ☐ < one RCP operating in <u>any</u> loop ☐ <u>All</u> SCMs > 0°F ☐ RCP available in an idle loop THEN initiate Encl 5.6 (RCP Restart) to start one RCP in each idle loop.	Examiner Note: If the MSLB caused the RCS to saturate, this step is required.
48. ☒ <u>IAAT all</u> exist: ☐ RBS actuated ☐ RB pressure < 10 psig ☐ 1RIA-57 NOT in alarm ☐ 1RIA-58 NOT in alarm THEN stop <u>both</u> RBS pumps.	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EHT Tab (Rev 0)**EHT**
Excessive Heat TransferEP/1/A/1800/001 OF
Page 17 of 27

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
49. <u> </u> IAAT T_{cold} approaches 470°F, AND <u>all</u> RCPs are operating, THEN ensure < four RCPs are operating.	
50. <u> </u> IAAT BWST level is ≤ 19', THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).	
51. <u> </u> Verify <u>all</u> SCMs > 0°F.	<u> </u> GO TO LOSCM tab.
52. <u> </u> Verify indications of SGTR ≥ 25 gpm.	GO TO Step 54.
53. <u> </u> GO TO SGTR tab.	
54. <u> </u> Verify required RCS makeup flow within normal makeup capability.	<u> </u> GO TO LOCA CD tab.
55. Verify <u>either</u>: <u> </u> <u>Any</u> SG isolated <u> </u> <u>Any</u> SG has an unisolable steam leak	<u> </u> GO TO Step 57.
56. GO TO FCD tab.	
57. <u> </u> GO TO Subsequent Actions tab.	

... END ...

Examiner Note: The event is complete once the crew has transferred to the FCD tab. The first few steps of the FCD tab start on Event 7 Page 29.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

Page 15 of 54

Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EOP Rule 3 (Rev 05)

**Rule 3
Loss of Main or Emergency FDW**

EP/1/A/1800/001 0L
Page 1 of 13

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. Verify loss of MFDW and/or EFDW was due to <u>any</u> of the following: ___ Turbine Building Flooding ___ Actions taken to raise SG level due to Turbine Building Flooding	☒ GO TO Step 3.
2. ___ EXIT this Rule.	
3. ___ IAAT NO SGs can be fed with FDW (Main/CBP/Emergency/PSW), AND <u>any</u> of the following exist: ___ RCS pressure reaches 2300 psig OR NDT limit ___ Pzr level reaches 375" [340" acc] THEN PERFORM Rule 4 (Initiation of HPI Forced Cooling).	
4. ___ Start <u>operable</u> EFDW pumps, as required, to feed <u>all intact</u> SGs.	
5. ___ Verify <u>any</u> EFDW pump operating.	___ GO TO Step 7.
☒ GO TO Step 38.	

Examiner Note: The TD EFWP is the only available EFDW pump but does satisfy the requirement of Step 4.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 1 Event No.: 7 Page 16 of 54
 Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EOP Rule 3 (Rev 05)

Rule 3
Loss of Main or Emergency FDW

EP/1/A/1800/001 0L
 Page 13 of 13

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Manual operation may be desired to maintain SG acc levels if degraded containment exists.	
38. __ IAAT an EFDW valve CANNOT control in AUTO, OR manual operation of EFDW valve is desired to control flow/level, THEN perform Steps 39 - 43.	__ GO TO Step 44.
39. __ Place EFDW valve in MANUAL.	Examiner Note: The crew is required to take MANUAL control of 1FDW-316 to control the 1B SG at ACC Levels (60 inches).
40. __ Control EFDW flow with EFDW valve in MANUAL.	
41. __ GO TO Step 44.	
42. __ Notify CRS that Encl 5.27 (Alternate Methods for Controlling EFDW Flow) is being initiated. (22)	
43. __ Initiate Encl 5.27 (Alternate Methods for Controlling EFDW Flow).	
44. __ Verify any SCM ≤ 0°F.	CAUTION ATWS events may initially require throttling to prevent exceeding pump limits and additional throttling once the Rx is shutdown to prevent overcooling. __ IF overcooling, OR exceeding limits in Rule 7 (SG Feed Control), THEN throttle EFDW, as necessary.
45. __ IAAT Unit 1 EFDW is in operation, THEN initiate Encl 5.9 (Extended EFDW Operation).	Examiner Note: Rule 7 is located on Event 7 Page 25. EOP Enclosure 5.9 starts of Event 7 Page 51.
46. __ WHEN directed by CRS, THEN EXIT.	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

Page 17 of 54

Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

LOSCM Yellow Page (Rev 02)**LOSCM
Parallel Actions**EP/1/A/1800/001 0D
Page 1 of 1

CONDITION	ACTIONS	
1. PR NIs $\geq$ 5% FP OR NIs NOT lowering	GO TO UNPP tab.	UNPP
2. All 4160V SWGR de-energized (13)	GO TO Blackout tab.	BLACKOUT
3. Core SCM indicates superheat	GO TO ICC tab.	ICC
4. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	ES
5. Valid ES actuation has occurred or should have occurred	Initiate Encl 5.1 (ES Actuation).	ES
6. Power lost to all 4160V SWGR and any 4160V SWGR re-energized	- Initiate AP/11 (Recovery from Loss of Power). - IF Encl 5.1 (ES Actuation) has been initiated, THEN reinitiate Encl 5.1.	ROP
7. RCS leakage > 160 gpm with letdown isolated OR SGTR > 25 gpm	Notify plant staff that Emergency Dose Limits are in affect using PA system.	EDL
8. Individual available to make notifications	- Announce plant conditions using PA system. - Notify SM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification/Reportability Evaluation).	NOTIFY

Examiner Note: If SCM is lost, the OATC will be performing Rule 2 (Event 7 Page 18) and the BOP will be performing Rule 5 (Event 7 Page 4). Whichever RO finishes their associated Rule first will then perform Rule 3 (Event 7 Page 15). Once Rule performance is complete, the CRS will direct an RO to perform EOP Enclosure 5.1 (ES Actuation) on Event 7 Page 37.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

Page 18 of 54

Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

LOSCM tab (Rev 02)

Duke Energy Oconee Nuclear Station Unit 1 EOP Loss of Subcooling Margin	Procedure No. EP/1/A/1800/001 0D
	Revision No. 002

LOSCM
Loss Of Subcooling Margin

EP/**1**/A/1800/001 0D
Page 1 of 41

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ Ensure Rule 2 (Loss of SCM) is in progress <u>or</u> complete.	
2. ☐ Verify LOSCM caused by excessive heat transfer.	☐ GO TO Step 4.
3. ☐ Verify EHT tab has been performed.	☒ GO TO EHT tab.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

Rule 2 Rev 05

Rule 2
Loss of SCM

EP/1/A/1800/001 0L
Page 1 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ IAAT <u>all</u> exist: ☐ <u>Any</u> SCM $\leq 0^{\circ}\text{F}$ ☐ Rx power $\leq 1\%$ ☐ ≤ 2 minutes elapsed since loss of SCM THEN perform Steps 2 and 3. (9)	1. ☐ IF <u>all</u> SCMs $> 0^{\circ}\text{F}$, THEN : A. ☐ Obtain CRS concurrence to exit Rule 2. B. ☐ EXIT Rule 2. 2. ☐ Notify CRS of RCP status. (9, 22) 3. ☐ GO TO Step 4.
2. ☒ Stop <u>all</u> RCPs.	1. ☐ Place 1TA AUTO/MAN switch in MAN. 2. ☐ Place 1TB AUTO/MAN switch in MAN. 3. ☐ Open 1TA SU 6.9 KV FDR. 4. ☐ Open 1TB SU 6.9 KV FDR.
3. ☐ Notify CRS of RCP status. (22)	
4. ☐ Verify Blackout exists.	☒ GO TO Step 6.

Rule 2
Loss of SCM

EP/1/A/1800/001 0L
Page 3 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. Open: ☐ 1HP-24 ☐ 1HP-25	1. ☐ IF <u>both</u> BWST suction valves (1HP-24 and 1HP-25) are closed, THEN : A. ☐ GO TO Step 13.
7. ☐ Start <u>all</u> <u>available</u> HPI pumps.	

Rule 2
Loss of SCM

EP/1/A/1800/001 0L
Page 5 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8. ☒ GO TO Step 13.	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 1 Event No.: 7 Page 20 of 54
 Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

Rule 2 Rev 05

Rule 2
Loss of SCM

EP/1/A/1800/001 0L
 Page 5 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. Open: — 1HP-26 — 1HP-27	
14. — Verify <u>at least two</u> HPI pumps are operating using two diverse indications.	— GO TO Step 27.

Examiner Note: All three HPI pumps are operating.

Rule 2
Loss of SCM

EP/1/A/1800/001 0L
 Page 7 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15. — IAAT ≥ 2 HPI pumps operating, AND HPI flow in <u>any</u> header is in the Unacceptable Region of Figure 1 THEN perform Step 16.	 GO TO Step 17.

Rule 2
Loss of SCM

EP/1/A/1800/001 0L
 Page 9 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED						
17. — IAAT flow limits are exceeded, <table border="1"> <thead> <tr> <th>Pump Operation</th><th>Limit</th></tr> </thead> <tbody> <tr> <td>1 HPI pump/hdr</td><td>475 gpm (incl. seal injection for <u>A</u> hdr)</td></tr> <tr> <td>1A & 1B HPI pumps operating with 1HP-409 open</td><td>Total flow of 950 gpm (incl. seal injection)</td></tr> </tbody> </table> THEN perform Steps 18 - 20.	Pump Operation	Limit	1 HPI pump/hdr	475 gpm (incl. seal injection for <u>A</u> hdr)	1A & 1B HPI pumps operating with 1HP-409 open	Total flow of 950 gpm (incl. seal injection)	 GO TO Step 21.
Pump Operation	Limit						
1 HPI pump/hdr	475 gpm (incl. seal injection for <u>A</u> hdr)						
1A & 1B HPI pumps operating with 1HP-409 open	Total flow of 950 gpm (incl. seal injection)						
21. — Notify CRS of HPI status. (22)							
22. — Verify RCS pressure > 550 psig.	— Ensure ES Channels 3 <u>and</u> 4 actuated.						

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

Page 21 of 54

Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

Rule 2 Rev 05**Rule 2**
Loss of SCMEP/1/A/1800/001 0L
Page 11 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. <u>IAAT</u> either exists: <u> </u> LPI FLOW TRAIN A <u>plus</u> <u> </u> LPI FLOW TRAIN B $\geq$ 3400 gpm <u> </u> <u>Only one</u> LPI header in operation with header flow $\geq$ 2900 gpm THEN GO TO Step 24.	 GO TO Step 35.

Rule 2
Loss of SCMEP/1/A/1800/001 0L
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35. <u>IAAT</u> TBVs are unavailable, THEN: A. <u> </u> Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs). (PS) B. <u> </u> Notify CRS that ADVs are being aligned for use. (22)	
36. <u> </u> Verify 1SA-2/C-8 (AFIS HEADER A INITIATED) lit.	 Select OFF for <u>both</u> digital channels on AFIS HEADER A.
37. <u> </u> Verify 1SA-2/D-8 (AFIS HEADER B INITIATED) lit.	 Select OFF for <u>both</u> digital channels on AFIS HEADER B.
38. <u> </u> Verify <u>any</u> EFDW pump operating.	Place in MANUAL and close: <u> </u> 1FDW-315 <u> </u> 1FDW-316

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

Rule 2 Rev 05

Rule 2
Loss of SCM

EP/1/A/1800/001 0L
Page 15 of 19

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
39. Start MD EFDW pumps on <u>all intact</u> SGs: ___ 1A MD EFDWP ___ 1B MD EFDWP	___ Start 1 TD EFDW PUMP.
40. ___ Verify <u>any</u> EFDW pump operating.	___ GO TO Step 47 to feed SGs with Main FDW.
41. ___ Verify <u>both</u> SGs <u>intact</u> .	1. ☒ Establish 450 gpm EFDW flow to the <u>intact</u> SG. 2. ☒ GO TO Step 43.
42. Establish 300 gpm EFDW flow to <u>each</u> SG: ___ 1A SG ___ 1B SG	___ Establish 450 gpm EFDW flow to available SG.
43. ___ Verify <u>both</u> MD EFDWPs operating.	1. ☒ IF <u>any</u> EFDW pump is feeding a SG, OR NO Main FDW pumps operating, THEN GO TO Step 45. 2. ___ GO TO Step 47.
44. ___ Place 1 TD EFDW PUMP in PULL TO LOCK.	
45. ___ Trip <u>both</u> Main FDW pumps.	
46. Place FDW block valve switches in CLOSE: ___ 1FDW-33 ___ 1FDW-31 ☒ 1FDW-42 ☒ 1FDW-40	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

Rule 2 Rev 05**Rule 2**
Loss of SCMEP/1/A/1800/001 0L
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE

- SG levels must continue to rise until the SG Level Control Point is reached.
- If Main FDW is feeding any SG, Rule 7 provides a different SG Level Control Point.
- TS cooldown rates are $\leq 50^{\circ}\text{F}/\frac{1}{2} \text{ hr}$ when $T_{\text{cold}} \geq 270^{\circ}\text{F}$ and $\leq 25^{\circ}\text{F}/\frac{1}{2} \text{ hr}$ when $T_{\text{cold}} < 270^{\circ}\text{F}$.

47. Begin feeding all available SGs to the appropriate SG Level Control Point in Rule 7 (SG Feed Control) using available feed sources; EFDW/Main FDW.

Examiner Note: Rule 7 is located on Event 7 page 25.

48. IAAT SG Level Control Point is reached, THEN maintain SG Level Control Point by feeding and steaming as necessary.

49. Notify CRS of SG feed status. (22)

CAUTION

If 1 TD EFDW PUMP is being used for SG feed and Unit 1 is supplying the Auxiliary Steam header, reducing SG pressure below ≈ 250 psig can result in reduced pumping capability.

50. IAAT SG pressure is $>$ RCS pressure, THEN reduce SG pressure $<$ RCS pressure using either:
TBVs
Dispatch two operators to perform Encl 5.24 (Operation of the ADVs) (PS)

51. Verify any Main FDW pump operating.

GO TO Step 58.

58. Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete.

Examiner Note: Rule 3 is located on Event 7 page 15.

59. WHEN directed by CRS, THEN EXIT.

... END ...

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

Rule 8 Rev 05

**Rule 8
Pressurized Thermal Shock (PTS)**

EP/1/A/1800/001 0L
Page 1 of 3

NOTE

This rule is invoked under either of the following conditions:

- A cooldown below 400°F T_c at > 100 °F/hr has occurred.
- HPI has injected through an open or throttled open 1HP-26, 27, 409, 410 with all RCPs OFF.

- Notify Shift Manager to review EAL Classifications.
- SCM must be minimized. The following methods may be used at the discretion of the CRS:
 - Throttling HPI per Rule 6 (HPI)
 - De-energizing Pzr heaters
 - Using Pzr normal spray
 - Using Pzr aux spray
 - Using PORV
 - Throttling LPI (22)
- Once RCS temperature is stable, a 1-hour hold of RCS temperature must be performed unless a LOCA, SGTR, or Blackout is in progress. Use T_c in loop with an operating RCP or use CETCs if NO RCPs are operating.
- Once invoked, SCM shall remain minimized until Engineering has performed an evaluation and determined that PTS restrictions NO longer apply. Starting RCPs and/or restoring cool down rates to normal values do NOT negate the need for this evaluation.

Examiner Note: The CRS will direct the reduction of SCM using the PORV and de-energizing PZR heaters by using Step 43 of the EHT tab located on Event 7 page 13.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

Examiner Note: Rule 7 contains guidance for MFW/EFW feed rates as well as desired SG levels. This procedure doesn't contain signoffs.

Rule 7
SG Feed Control

EP/1/A/1800/001 0L
Page 1 of 9

NOTE

Feed Rates listed in Table 1 are maximum allowable feed rates. Manual control of feed rates may be required for plant stabilization and are dependent on decay heat, RCP operation, and other factors. Feed rates for low decay heat conditions will be much lower and are determined by observing RCS indications for overcooling.

Table 1
Maximum Feed Rates When All SCMs are > 0°F

SG Condition	Flow Instrument	Maximum Feed Rate
Dry SG w/o Heat Transfer	EFDW flow indicator	100 gpm to <u>affected</u> SG
	S/U FDW flow indicator	0.05 x 10 ⁶ lbm/hr to <u>affected</u> SG
	SSF ASW flow indicator	100 gpm <u>total</u> to Unit 1
	PSW Moore Controller process indication	190 gpm to <u>affected</u> SG
Non-dry SG <u>OR</u> Dry SG with Heat Transfer	EFDW flow indicator	1000 gpm per header
	S/U FDW flow indicator	0.5 x 10 ⁶ lbm/hr per header
	SSF ASW flow indicator	500 gpm <u>total</u> to Unit 1
	PSW Moore Controller process indication	225 gpm per SG maximum when feeding <u>both</u> SGs on Unit 1 425 gpm maximum when feeding a <u>single</u> SG on Unit 1
SSF Event* occurred while in MODE 1 <u>or</u> 2 with TD EFDWP <u>OR</u> alternate unit providing SG feed	EFDW flow indicator <u>OR</u> S/U FDW flow indicator	- Feed as needed to maintain RCS pressure band of 1950 - 2250 psig (1600 - 2200 psig if notified by SSF of PZR Solid Ops Control Band) WHEN RCS pressure band is established, THEN feed to establish RCS Narrow Range T_c 550 - 555°F.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

Rule 7
SG Feed ControlEP/1/A/1800/001 0L
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Table 2
Feed Rates To Be Established When Any SCM is $\leq 0^{\circ}\text{F}$ and Rapid Cooldown NOT in Progress

NOTE

After initial feed rates are established, flow may be throttled to control cooldown but SG levels must continue to rise until LOSCM setpoint is reached. This note does NOT apply to SSF Event.

FDW source	Flow Instrument	Initial Feed Rates	
Emergency FDW	EFDW total flow indicator	1 SG	450 gpm
		2 SGs	300 gpm each
	S/U FDW flow indicator	1 SG	0.23×10^6 lbm/hr
		2 SGs	0.15×10^6 lbm/hr each
Main FDW	S/U FDW flow indicator	1 SG	0.33×10^6 lbm/hr
		2 SGs	0.22×10^6 lbm/hr each
SSF ASW AND NO SSF Event*	SSF ASW flow indicator	400 gpm <u>total</u> to Unit 1	

NOTE

SSF events, feeding with PSW, and LOCAs are NOT postulated at the same time. LOSCM during SSF event or when feeding with PSW is caused by overcooling. Cooldown while on SSF RC Makeup must be controlled due to capability of the SSF RC Makeup Pump. This note applies to SSF events and feeding from PSW.

EFDW AND SSF Event* that occurred while in MODE 1 or 2	EFDW flow indicator OR S/U FDW flow indicator	- Feed as needed to maintain RCS pressure band of 1950 - 2250 psig (1600 - 2200 psig if notified by SSF of PZR Solid Ops Control Band) WHEN RCS pressure band is established, THEN feed to establish RCS Narrow Range T_c 550 - 555°F.
PSW	PSW control valves Moore Controller process indication	PSW enclosure provides guidance on controlling RCS temperature and pressure.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

Rule 7
SG Feed ControlEP/L/A/1800/001 0L
Page 5 of 9

Table 3 Emergency FDW Pump and Header Maximum Flow Limits			
		EFDW flow indicator	S/U FDW flow indicator
MDEFDWP	(suction from HW)	440 gpm/pump	0.22 x 10 ⁶ lbm/hr
	(suction from UST)	600 gpm/pump	0.30 x 10 ⁶ lbm/hr
TDEFDWP (any suction source)		950 gpm	0.45 x 10 ⁶ lbm/hr
Emergency FDW Header Flow		1000 gpm	0.5 x 10 ⁶ lbm/hr

Table 4 SG Level Control Points			
<u>NOTE</u>			
Flow may be throttled as necessary to control cooldown during the approach to the SG Level Control Point.			
Plant Condition	Main FDW Pump	EFDW Pump	SSF ASW Pump <u>or</u> PSW Pump
<u>All</u> SCMs > 0°F AND <u>any</u> RCP on	25" - 35" [55" - 65" acc] S/U level	30" [60" acc] XSUR (use MFDW setpoint if feeding via S/U CVs)	30" [60" acc] XSUR
<u>All</u> SCMs > 0°F AND <u>all</u> RCPs off	50% [50% acc] Operating Range	240" [270" acc] XSUR (use MFDW setpoint if feeding via S/U CVs)	240" [270" acc] XSUR
<u>Any</u> SCM = 0°F AND NO SSF Event*	95% [95% acc] Operating Range	LOSCM setpoint (Band: +9"/-6") (Turn-on code "EFW" <u>or</u> Per Table 5)	LOSCM setpoint (Band: +9"/-6") (Turn-on code "EFW" <u>or</u> Per Table 5)
<u>Any</u> SCM = 0°F AND SSF Event*	N/A	240" [270" acc] XSUR	Per AP/25
<u>Any</u> SCM = 0°F AND SSF Event AND feeding with PSW	N/A	N/A	Per PSW Enclosure
Superheated with CETCs ≤ 1200°F	95% [95% acc] Operating Range	LOSCM setpoint (Band: +9"/-6") (Turn-on code "EFW" <u>or</u> Per Table 5)	LOSCM setpoint (Band: +9"/-6") (Turn-on code "EFW" <u>or</u> Per Table 5)

SSF Event* - SSF activated per AP/25 with SSF RC Makeup required. (31)

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

Examiner Note: Rule 6 contains guidance for throttling HPI flow. This procedure doesn't contain signoffs.

**Rule 6
HPI**

EP/1/A/1800/001 OL
Page 1 of 1

HPI Pump Throttling Limits

- HPI must be throttled to prevent violating the RV-P/T limit.
- HPI pump operation must be limited to two HPIPs when only one BWST suction valve (1HP-24 or 1HP-25) is open.
- HPI must be throttled ≤ 475 gpm/pump (including seal injection for A header) when only one HPI pump is operating in a header.
- Total HPI flow must be throttled ≤ 950 gpm including seal injection when 1A and 1B HPI pumps are operating with 1HP-409 open.
- Total HPI flow must be throttled < 750 gpm when all the following exist:
 - LPI suction is from the RBES
 - piggyback is aligned
 - either of the following exist:
 - only one piggyback valve is open (1LP-15 or 1LP-16)
 - only one LPI pump operating
- HPI may be throttled under the following conditions:

HPI Forced Cooling in Progress:	HPI Forced Cooling NOT in Progress:
<u>All</u> the following conditions must exist: • <u>Core</u> SCM > 0 • CETCs lowering	<u>All</u> the following conditions must exist: • <u>All</u> WR NIs $\leq 1\%$ • <u>Core</u> SCM > 0 • Pzr level rising • CRS concurrence required if throttling following emergency boration

HPI Pump Minimum Flow Limit

- Maintain ≥ 170 gpm indicated/pump. This is an instrument error adjusted value that ensures a real value of ≥ 65 gpm/pump is maintained. HPI pump flow less than minimum is allowed for up to 4 hours.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

FCD
Forced Cooldown

EP/**1**/A/1800/001 OK
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CREW BRIEF OPPORTUNITY	
1. ☐ IAAT cooldown rate CANNOT be controlled within Tech Spec limits: • $T_{cold} \geq 270^{\circ}\text{F}: \leq 50^{\circ}\text{F} / \frac{1}{2} \text{ hr}$ • $T_{cold} < 270^{\circ}\text{F}: \leq 25^{\circ}\text{F} / \frac{1}{2} \text{ hr}$ THEN GO TO EHT tab.	
2. ☐ Verify letdown in service.	1. ☐ Ensure CC System in operation. 2. ☐ IF 1A Letdown Cooler available, THEN open the following: ☐ 1HP-1 ☐ 1HP-3 3. ☐ IF 1B Letdown Cooler available, THEN open the following: ☐ 1HP-2 ☐ 1HP-4 4. Close the following: ☐ 1HP-6 ☐ 1HP-7 5. ☐ Open 1HP-5. 6. ☐ Adjust 1HP-7 for ≈ 20 gpm letdown. 7. ☐ Open 1HP-6. 8. ☐ Adjust 1HP-7 to control desired letdown flow.
3. ☐ Establish and maintain appropriate level per Rule 7 (SG Feed Control) <u>and</u> pressure in <u>available intact</u> SGs.	
4. ☐ IAAT T_{cold} approaches 470°F, THEN ensure < four RCPs operating.	

Examiner Note: Letdown has already been restored by Step 8 of the EHT tab.

Rule 7 (step 3 below) is located on Event 7 Page 25.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

FCD
Forced Cooldown

EP/1/A/1800/001 OK
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5. <u>IAAT</u> T _{cold} approaches 300°F, THEN ensure < three RCPs operating.	
6. <u>IAAT</u> <u>all</u> the following exist: <u>ES Bypass Permit</u> satisfied <u>All SCMs</u> > 0°F RCS pressure controllable THEN perform Steps 7 - 8.	<u>GO TO</u> Step 9.
7. Bypass <u>applicable</u> ES: To Bypass HPI: <u>Bypass HPI ES CH A,B,C</u> To Bypass LPI: <u>Bypass LPI ES CH A,B,C</u>	1. <u>IF</u> ≥ 2 ES bypass channels <u>fail to bypass</u> , THEN perform <u>one</u> of the following: <u>Hold</u> RCS pressure above actuation setpoint until <u>at least two</u> ES bypass channels are bypassed. <u>Place both</u> ODD and EVEN voters to OVERRIDE. 2. <u>IF</u> ODD and EVEN voters are placed in OVERRIDE, THEN notify OSM to consult Technical Specifications.
8. Bypass <u>applicable</u> Diverse ES: To Bypass HPI: <u>Bypass Diverse HPI</u> To Bypass LPI: <u>Bypass Diverse LPI</u>	<u>IF</u> <u>applicable</u> Diverse actuation circuit fails to bypass, THEN place the <u>applicable</u> Diverse actuation circuit to OVERRIDE.

Examiner Note: Step 7 of the FCD tab directs the bypass of ES. This was already accomplished by Step 40 of the EHT tab. Step 8 directs the bypass of Diverse ES which was already accomplished in Rule 5.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EOP Encl. 5.5 Rev 02**Enclosure 5.5****Pzr and LDST Level Control**

EP/1/A/1800/001 0M

Page 1 of 15

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE • Maintaining Pzr level >100" [180" acc] will ensure Pzr heater bundles remain covered. • When Rx critical, use of 1HP-26 normally only necessary to mitigate SGTRs. • Auto-Start of Standby HPIP could occur if flow adjustments are made too rapidly. • Rule 8 and EALs may apply if 1HP-26 opened with all RCPs off.	
1. ☐ Utilize the following as necessary to maintain <u>desired</u> Pzr level: • 1A HPI Pump • 1B HPI Pump • 1HP-26 • 1HP-7 • 1HP-120 setpoint or valve demand • 1HP-5	☐ IF 1HP-26 will NOT open, THEN throttle 1HP-410 to maintain desired Pzr level.
2. ☐ IAAT <u>makeup</u> to the LDST is desired, THEN makeup from 1A BHUT.	
3. ☐ IAAT it is desired to <u>secure makeup</u> to LDST, THEN secure makeup from 1A BHUT.	
4. ☐ IAAT it is desired to <u>bleed</u> letdown flow to 1A BHUT, THEN perform the following: A. Open: ☐ 1CS-26 ☐ 1CS-41 B. ☐ Position 1HP-14 to BLEED. C. ☐ Notify CRS.	
5. ☐ IAAT letdown <u>bleed</u> is NO longer desired, THEN position 1HP-14 to NORMAL.	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

*EOP Encl. 5.5 Rev 02*Enclosure 5.5
Pzr and LDST Level ControlEP/1/A/1800/001 OM
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. <u>IAAT 1C HPI PUMP</u> is required, THEN perform Steps 7 - 9.	<u>GO TO</u> Step 10.

Enclosure 5.5
Pzr and LDST Level ControlEP/1/A/1800/001 OM
Page 7 of 15

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. <u>IAAT LDST level</u> CANNOT be maintained, THEN perform Step 11.	<u>GO TO</u> Step 12.

NOTE

Maintaining Pzr level >100" [180" acc] will ensure Pzr heater bundles remain covered.

12. <u>Operate Pzr heaters</u> as required to maintain heater bundle integrity.	
--	--

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EOP Encl. 5.5 Rev 02Enclosure 5.5
Pzr and LDST Level ControlEP/1/A/1800/001 0M
Page 9 of 15

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. ☐ IAAT additional makeup flow to LDST is desired, AND 1A BLEED TRANSFER PUMP is operating, THEN dispatch an operator to close 1CS-48 (1A BHUT Recirc). (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.)	
14. ☐ IAAT <u>two</u> Letdown Filters are desired, THEN perform the following: ☐ Open 1HP-17. ☐ Open 1HP-18	
15. ☐ IAAT <u>all</u> of the following exist: ☐ Letdown isolated ☐ LPSW available ☐ Letdown restoration desired THEN perform Steps 16 - 34. {41}	☐ GO TO Step 35.
16. ☒ Open: ☐ 1CC-7 ☐ 1CC-8	1. ☐ Notify CRS that letdown CANNOT be restored due to inability to restart the CC system. 2. ☐ GO TO Step 35.
17. ☒ Ensure only one CC pump running.	
18. ☒ Place the non-running CC pump in AUTO.	
19. Verify <u>both</u> are open: ☐ 1HP-1 ☐ 1HP-2	1. ☐ IF 1HP-1 is closed due to 1HP-3 failing to close, THEN GO TO Step 21. 2. ☐ IF 1HP-2 is closed due to 1HP-4 failing to close, THEN GO TO Step 21.
20. ☐ GO TO Step 23	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EOP Encl. 5.5 Rev 02

Enclosure 5.5
Pzr and LDST Level Control

EP/1/A/1800/001 OM
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. ☐ Monitor for unexpected conditions while restoring letdown.	
24. ☐ Verify <u>both</u> letdown coolers to be placed in service.	1. ☐ IF 1A letdown cooler is to be placed in service, THEN open: ☐ 1HP-1 ☐ 1HP-3 2. ☐ IF 1B letdown cooler is to be placed in service, THEN open: ☐ 1HP-2 ☐ 1HP-4 3. ☐ GO TO Step 26.
25. Open: ☐ 1HP-1 ☐ 1HP-2 ☒ 1HP-3 ☒ 1HP-4	
26. ☐ Verify <u>at least one</u> letdown cooler is aligned.	Perform the following: A. ☐ Notify CRS of problem. B. ☐ GO TO Step 35.
27. ☒ Close 1HP-6.	
28. ☒ Close 1HP-7.	
29. ☐ Verify letdown temperature < 125°F.	1. ☐ Open 1HP-13. 2. Close: ☐ 1HP-8 ☐ 1HP-9&11 3. ☐ IF <u>any</u> deborating IX is in service, THEN perform the following: A. ☐ Select 1HP-14 to NORMAL. B. ☐ Close 1HP-16. 4. ☐ Select LETDOWN HI TEMP INTLK BYP switch to BYPASS.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

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Pzr and LDST Level ControlEP/1/A/1800/001 0M
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. ☒ Open 1HP-5.	
31. ☒ Adjust 1HP-7 for ≈ 20 gpm letdown.	
32. ☐ WHEN letdown temperature is < 125°F, THEN place LETDOWN HI TEMP INTLK BYP switch to NORMAL.	
33. ☒ Open 1HP-6.	
34. ☒ Adjust 1HP-7 to control desired letdown flow.	

NOTE

AP/32 (Loss of Letdown) provides direction to cool down the RCS to offset rising pressurizer level.

35. ☐ IAAT it is determined that letdown is unavailable due to equipment failures <u>or</u> letdown system leakage, THEN notify CRS to initiate AP/32 (Loss of Letdown).	
36. ☐ IAAT > 1 HPI pump is operating. AND additional HPI pumps are NO longer needed, THEN perform the following: A. ☐ Obtain CRS concurrence to reduce running HPI pumps. B. ☐ Secure the desired HPI pumps. C. ☐ Place secured HPI pump switch in AUTO, if desired.	
37. ☐ IAAT <u>all</u> the following conditions exist: ☐ Makeup from BWST NOT required ☐ LDST level > 55" ☐ <u>All</u> control rods inserted ☐ Cooldown Plateau NOT being used THEN close: ☐ 1HP-24 ☐ 1HP-25	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

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Pzr and LDST Level ControlEP/1/A/1800/001 0M
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38. ☐ Verify 1CS-48 (1A BHUT Recirc) has been closed to provide additional makeup flow to LDST.	☐ GO TO Step 40.
40. ☐ Verify two Letdown Filters in service, AND <u>only one</u> Letdown filter is desired.	☐ GO TO Step 42.
41. Perform <u>one</u> of the following: ☐ Place 1HP-17 switch to CLOSE. ☐ Place 1HP-18 switch to CLOSE.	
42. ☐ WHEN directed by CRS, THEN EXIT this enclosure.	

... END ...

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EOP Encl. 5.1 Rev 02

Enclosure 5.1

EP/1/A/1800/001 OM

ES Actuation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED															
1. ☐ Determine <u>all</u> ES channels that <u>should</u> have actuated based on <u>RCS pressure and RB pressure</u>: <table><tr><th>✓</th><th>Actuation Setpoint (psig)</th><th>Associated ES Channel</th></tr><tr><td></td><td>1600 (RCS)</td><td>1 & 2</td></tr><tr><td></td><td>550 (RCS)</td><td>3 & 4</td></tr><tr><td></td><td>3 (RB)</td><td>1, 2, 3, 4, 5, & 6</td></tr><tr><td></td><td>10 (RB)</td><td>7 & 8</td></tr></table>	✓	Actuation Setpoint (psig)	Associated ES Channel		1600 (RCS)	1 & 2		550 (RCS)	3 & 4		3 (RB)	1, 2, 3, 4, 5, & 6		10 (RB)	7 & 8	
✓	Actuation Setpoint (psig)	Associated ES Channel														
	1600 (RCS)	1 & 2														
	550 (RCS)	3 & 4														
	3 (RB)	1, 2, 3, 4, 5, & 6														
	10 (RB)	7 & 8														
2. ☐ Verify <u>all</u> ES channels associated with actuation setpoints have actuated.	NOTE Voter OVERRIDE extinguishes the TRIPPED light on the associated channels that have <u>auto</u> actuated. Pressing TRIP on channels previously actuated will reposition components that may have been throttled or secured by this Enclosure. ☐ Depress TRIP on <u>affected</u> ES logic channels that have NOT previously been actuated.															
3. ☐ IAAT <u>additional</u> ES actuation setpoints are exceeded, THEN perform Steps 1 - 2.																
4. ☒ Place Diverse HPI in BYPASS.	☐ Place Diverse HPI in OVERRIDE.															
5. Perform for <u>actuated</u> channels: ☒ Place ES CH 1 in MANUAL. ☒ Place ES CH 2 in MANUAL.	NOTE • Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels. • In <u>OVERRIDE</u>, all components on the															

Examiner Note: Steps 4 and 5 for bypassing Diverse HPI and placing ES 1 and 2 in manual are also performed in Rule 5. Whichever operator gets there first will have the verifiable action.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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 Event Description: **1A MSLB inside RB (M: ALL)**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. ☐ IAAT <u>all</u> exist: ☐ Voter associated with ES channel is in OVERRIDE ☐ An ES channel is <u>manually</u> actuated ☐ Components on that channel require manipulation THEN depress RESET on the required channel.	
7. ☐ Verify Rule 2 in progress <u>or</u> complete.	☐ GO TO Step 75.

Examiner Note: If the RCS saturates, Rule 2 will be performed and the operator will continue to step 8 below. If Rule 2 not in progress, then continue to Step 75 on **Event 7 Page 44**.

8. ☐ Verify <u>any</u> RCP operating.	☐ GO TO Step 10.
9. Open: ☐ 1HP-20 ☐ 1HP-21	
10. ☐ IAAT ES Channels 5 <u>or</u> 6 has actuated, THEN perform Steps 11 - 15.	☐ GO TO Step 16.
11. Perform for <u>actuated</u> channels: ☒ Place ES CH 5 in MANUAL. ☒ Place ES CH 6 in MANUAL.	NOTE • Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels. • In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.
	1. ☐ IF ES CH 5 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. ☐ IF ES CH 6 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.
12. ☐ Verify <u>any</u> RCP is operating.	☐ GO TO Step 16.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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Event Description: **1A MSLB inside RB (M: ALL)**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. ☐ IAAT ES Channels 3 or 4 has actuated, THEN GO TO Step 17.	☐ GO TO Step 55.
17. ☒ Place Diverse LPI in BYPASS.	☐ Place Diverse LPI in OVERRIDE.
18. Perform for actuated channels: ☒ Place ES CH 3 in MANUAL. ☒ Place ES CH 4 in MANUAL.	NOTE • Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels. • In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch. 1. ☐ IF ES CH 3 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. ☐ IF ES CH 4 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.
CAUTION LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. {6}	
19. ☒ IAAT <u>any</u> LPI pump is operating against a shutoff head, THEN at the CRS's discretion, stop <u>affected</u> LPI pumps. {6, 22}	
20. ☐ IAAT RCS pressure is < LPI pump shutoff head, THEN perform Steps 21 - 22.	☒ GO TO Step 23.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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Event Description: **1A MSLB inside RB (M: ALL)**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. ☐ IAAT 1A and 1B LPI PUMPs are off / tripped, AND all exist: ☐ RCS pressure < LPI pump shutoff head ☐ 1LP-19 closed ☐ 1LP-20 closed THEN perform Steps 24 - 25.	☒ GO TO Step 26.
26. ☐ IAAT 1A LPI PUMP fails while operating, AND 1B LPI PUMP is operating, THEN close 1LP-17.	
27. ☐ IAAT 1B LPI PUMP fails while operating, AND 1A LPI PUMP is operating, THEN close 1LP-18.	
28. Start: ☒ A OUTSIDE AIR BOOSTER FAN ☒ B OUTSIDE AIR BOOSTER FAN	
29. Notify Unit 3 to start: ☐ 3A OUTSIDE AIR BOOSTER FAN ☐ 3B OUTSIDE AIR BOOSTER FAN	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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 Event Description: **1A MSLB inside RB (M: ALL)**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. Verify open: ☐ 1CF-1 ☐ 1CF-2	☐ IF CRS desires 1CF-1 and 1CF-2 open, THEN open: ☐ 1CF-1 ☐ 1CF-2
31. ☐ Verify 1HP-410 closed.	1. ☐ Place 1HP-120 in HAND. 2. ☐ Close 1HP-120.
32. ☐ Secure makeup to the LDST.	
33. ☐ Verify <u>all</u> ES channel 1 - 4 components are in the ES position.	1. ☐ IF 1HP-3 fails to close, THEN close 1HP-1. 2. ☐ IF 1HP-4 fails to close, THEN close 1HP-2. 3. ☐ IF 1HP-20 fails to close, AND NO RCPs operating, THEN close: ☐ 1HP-228 ☐ 1HP-226 ☐ 1HP-232 ☐ 1HP-230 4. ☐ Notify CRS to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
34. ☐ Verify Unit <u>2</u> turbine tripped.	 GO TO Step 37.
35. ☐ Close <u>2</u> LPSW-139.	
36. ☐ Verify <u>total</u> LPSW flow to Unit <u>2</u> LPI coolers $\leq$ 6000 gpm.	☐ Reduce LPSW to Unit <u>2</u> LPI coolers to obtain <u>total</u> LPSW flow $\leq$ 6000 gpm.
37.  Close 1LPSW-139.	
38. Place in FAIL OPEN:  1LPSW-251 FAIL SWITCH  1LPSW-252 FAIL SWITCH	
39. ☐ Start <u>all available</u> LPSW pumps.	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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Event Description: **1A MSLB inside RB (M: ALL)**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40. Verify <u>either</u> : ☐ Three LPSW pumps operating ☐ Two LPSW pumps operating when Tech Specs only requires two operable	☐ GO TO Step 42.
41. Open: ☒ 1LPSW-4 ☒ 1LPSW-5	☐ IF <u>both</u> are closed: ☐ 1LPSW-4 ☐ 1LPSW-5 THEN notify CRS to initiate action to open <u>at least one</u> valve prior to BWST level $\leq 19'$.
42. ☐ IAAT BWST level $\leq 19'$, THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).	1. ☐ Display BWST level using OAC Turn-on Code "SHOWDIG O1P1600". 2. ☐ Notify crew of BWST level IAAT step.
43. ☐ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (PS)	
44. ☒ Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.	
45. ☐ IAAT ES channels 5 <u>or</u> 6 has actuated, THEN perform Step 46.	☐ GO TO Step 47.
NOTE RBCU transfer to low speed will NOT occur until 3 minute time delay is satisfied.	
46. ☐ Verify <u>all</u> ES channel 5 & 6 components are in the ES position.	☐ Notify CRS to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
47. ☐ IAAT ES channels 7 or 8 has actuated, THEN perform Steps 48 - 49.	 GO TO Step 50.
48. Perform for <u>actuated</u> channels: ☐ Place ES CH 7 in MANUAL. ☐ Place ES CH 8 in MANUAL.	NOTE • Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels. • In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch. 1. ☐ IF ES CH 7 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. ☐ IF ES CH 8 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.
49. ☐ Verify <u>all</u> ES channel 7 & 8 components are in the ES position.	☐ Notify CRS to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
50. ☐ Notify U2 CRS that SSF is inoperable due to OTS1-1 open.	
51. ☐ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
NOTE • Leakage from the RB atmosphere to adjacent buildings can occur when there is significant positive pressure in the RB. • AB/PR RIAs, RB pressure lowering, and/or PR Fire alarms due to steam could be indications of RCS leakage outside containment. • EALs may apply when RIA counts are elevated if indicates RCS leakage outside containment.	
52. ☐ Monitor AB <u>and</u> Unit Vent RIAs for elevated counts.	
53. ☐ IAAT conditions causing ES actuation have cleared, THEN initiate Encl 5.41 (ES Recovery).	
54. ☐ WHEN CRS approves, THEN EXIT.	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
75. Open: ___ 1HP-24 ___ 1HP-25	1. ___ IF both BWST suction valves (1HP-24 and 1HP-25) are closed, THEN: Δ Start 1A TPI PUMP

Examiner Note: 1HP-24 and 25 have opened automatically by ES 1 and 2.

76. ___ Verify <u>at least two</u> HPI pumps are operating.	1. ___ IF HPI has been intentionally throttled, THEN GO TO Step 77. 2. ___ Ensure <u>at least two</u> HPI pumps are operating.								
77. Verify open: ___ 1HP-26 ___ 1HP-27	1. ___ IF HPI has been intentionally throttled, THEN GO TO Step 78. 2. Open:								
78. ___ IAAT at least two HPI pumps are operating, AND HPI flow in <u>any</u> header that has NOT been <u>intentionally</u> throttled is in the Unacceptable Region of Figure 1, THEN open the following in the <u>affected</u> header: <table border="1"><tr><td>✓</td><td>1A Header</td><td>✓</td><td>1B Header</td></tr><tr><td></td><td>1HP-410</td><td></td><td>1HP-409</td></tr></table>	✓	1A Header	✓	1B Header		1HP-410		1HP-409	
✓	1A Header	✓	1B Header						
	1HP-410		1HP-409						

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
79. ☐ Verify <u>any</u> RCP operating.	☐ GO TO Step 81.
80. Open: ☒ 1HP-20 ☒ 1HP-21	
81. ☐ IAAT ES Channels 5 or 6 has actuated, THEN perform Steps 82 - 86.	☐ GO TO Step 87.
82. Perform for <u>actuated</u> channels: ☒ Place ES CH 5 in MANUAL. ☒ Place ES CH 6 in MANUAL.	NOTE • Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels. • In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch. 1. ☐ IF ES CH 5 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. ☐ IF ES CH 6 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.
83. ☐ Verify <u>any</u> RCP operating.	☐ GO TO Step 87.
84. Open: ☒ 1CC-7 ☒ 1CC-8 ☒ 1LPSW-15 ☒ 1LPSW-6	
85. ☒ Ensure <u>only one</u> CC pump operating.	
86. ☒ Ensure Standby CC pump in AUTO.	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
87. ☐ IAAT ES Channels 3 or 4 has actuated, THEN GO TO Step 88.	☐ GO TO Step 126.
88. ☒ Place Diverse LPI in BYPASS.	☐ Place Diverse LPI in OVERRIDE.
89. Perform for actuated channels: ☒ Place ES CH 3 in MANUAL. ☒ Place ES CH 4 in MANUAL.	NOTE • Voter OVERRIDE affects all channels of the affected ODD and/or EVEN channels. • In OVERRIDE, all components on the affected ODD and/or EVEN channels can be manually operated from the component switch. 1. ☐ IF ES CH 3 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. ☐ IF ES CH 4 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.
CAUTION LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. (6)	
90. ☐ IAAT any LPI pump is operating against a shutoff head, THEN at the CRS's discretion, stop affected LPI pumps. (6, 22)	
91. ☐ IAAT RCS pressure is < LPI pump shutoff head, THEN perform Steps 92 - 93.	☒ GO TO Step 94.
94. ☐ IAAT 1A and 1B LPI PUMPs are off / tripped, AND all exist: ☐ RCS pressure < LPI pump shutoff head	☒ GO TO Step 97.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
97. __ IAAT 1A LPI PUMP fails while operating, AND 1B LPI PUMP is operating, THEN close 1LP-17.	
98. __ IAAT 1B LPI PUMP fails while operating, AND 1A LPI PUMP is operating, THEN close 1LP-18.	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
99. Start: ☒ A OUTSIDE AIR BOOSTER FAN ☒ B OUTSIDE AIR BOOSTER FAN	
100. Notify Unit 3 to start: ___ 3A OUTSIDE AIR BOOSTER FAN ___ 3B OUTSIDE AIR BOOSTER FAN	
101. Verify open: ___ 1CF-1 ___ 1CF-2	___ IF CRS desires 1CF-1 and 1CF-2 open, THEN open: ___ 1CF-1 ___ 1CF-2
102. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
103. ___ Secure makeup to the LDST.	
104. ___ Verify <u>all</u> ES channel 1 - 4 components are in the ES position.	1. ___ IF 1HP-3 fails to close, THEN close 1HP-1. 2. ___ IF 1HP-4 fails to close, THEN close 1HP-2. 3. ___ IF 1HP-20 fails to close, AND NO RCPs operating, THEN close: ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ___ Notify CRS to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
105. ___ Verify Unit 2 turbine tripped.	☒ GO TO Step 108.
106. ___ Close 2LPSW-139.	
107. ___ Verify <u>total</u> LPSW flow to Unit 2 LPI coolers $\leq$ 6000 gpm.	___ Reduce LPSW to Unit 2 LPI coolers to obtain <u>total</u> LPSW flow $\leq$ 6000 gpm.
108. ☒ Close 1LPSW-139.	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
109. Place in FAIL OPEN: ☒ 1LPSW-251 FAIL SWITCH ☒ 1LPSW-252 FAIL SWITCH	
110. ___ Start <u>all available</u> LPSW pumps.	
111. Verify <u>either</u> : ___ Three LPSW pumps operating ___ Two LPSW pumps operating when Tech Specs only requires two operable	___ GO TO Step 113.
112. Open: ☒ 1LPSW-4 ☒ 1LPSW-5	___ IF <u>both</u> are closed: ___ 1LPSW-4 ___ 1LPSW-5 THEN notify CRS to initiate action to open <u>at least one</u> valve prior to BWST level $\leq 19'$.
113. ___ IAAT BWST level $\leq 19'$, THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).	1. ___ Display BWST level using OAC Turn-on Code "SHOWDIG O1P1600". 2. ___ Notify crew of BWST level IAAT step.
114. ___ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (PS)	
115. ☒ Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.	
116. ___ IAAT ES channels 5 <u>or</u> 6 has actuated, THEN perform Step 117.	___ GO TO Step 118.
NOTE RBCU transfer to low speed will NOT occur until 3 minute time delay is satisfied.	
117. ___ Verify <u>all</u> ES channel 5 & 6 components are in the ES position.	___ Notify CRS to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
118. __ IAAT ES channels 7 or 8 has actuated, THEN perform Step 119 - 120.	 GO TO Step 121.
119. Perform for <u>actuated</u> channels: __ Place ES CH 7 in MANUAL. __ Place ES CH 8 in MANUAL.	NOTE • Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels. • In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch. 1. __ IF ES CH 7 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. __ IF ES CH 8 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.
120. __ Verify <u>all</u> ES channel 7 & 8 components are in the ES position.	__ Notify CRS to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
121. __ Notify U2 CRS that SSF is inoperable due to OTS1-1 open.	
122. __ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
NOTE • Leakage from the RB atmosphere to adjacent buildings can occur when there is significant positive pressure in the RB. • AB/PR RIAs, RB pressure lowering, and/or PR Fire alarms due to steam could be indications of RCS leakage outside containment. • EALs may apply when RIA counts are elevated if indicates RCS leakage outside containment.	
123. __ Monitor AB <u>and</u> Unit Vent RIAs for elevated counts.	
124. __ IAAT conditions causing ES actuation have cleared, THEN initiate Encl 5.41 (ES Recovery).	
125. __ WHEN CRS approves, THEN EXIT.	

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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Event Description: **1A MSLB inside RB (M: ALL)**

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Extended EFDW Operation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
1. <u> </u> Monitor EFDW parameters on EFW graphic display.									
2. <u> </u> IAAT UST level is < 4', THEN GO TO Step 120.									
3. <u> </u> IAAT feeding <u>both</u> SGs with one MD EFDWP is desired, THEN perform Steps 4 - 7.	 GO TO Step 8.								
4. Place EFDW control valve on SG with NO EFDW flow to MANUAL <u>and</u> closed: <table border="1"><tr><td></td><td>1A SG</td><td></td><td>1B SG</td></tr><tr><td></td><td>1FDW-315</td><td></td><td>1FDW-316</td></tr></table>		1A SG		1B SG		1FDW-315		1FDW-316	
	1A SG		1B SG						
	1FDW-315		1FDW-316						
5. Locally open: <u> </u> 1FDW-313 (1A EFDW Line Disch To 1A S/G X-Conn) (T-1, 1' N of M-16, 18' up) <u> </u> 1FDW-314 (1B EFDW Line Disch To 1B S/G X-Conn) (T-1, 3' S of M-24, 10' up)									
6. <u> </u> Ensure a MD EFDWP is operating.									
7. Throttle EFDW control valve on SG with NO EFDW flow to establish appropriate level per Rule 7 (SG Feed Control): <table border="1"><tr><td></td><td>1A SG</td><td></td><td>1B SG</td></tr><tr><td></td><td>1FDW-315</td><td></td><td>1FDW-316</td></tr></table>		1A SG		1B SG		1FDW-315		1FDW-316	
	1A SG		1B SG						
	1FDW-315		1FDW-316						
8. Perform as required to maintain UST level > 7.5':  Makeup with demin water. <u> </u> Place CST pumps in AUTO.									
9. <u> </u> IAAT <u>all</u> exist: <u> </u> Rapid cooldown NOT in progress <u> </u> MD EFDWP operating for each <u>available</u> SG <u> </u> EFDW flow in <u>each</u> header < 600 gpm THEN place 1 TD EFDW PUMP switch in PULL TO LOCK.									

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

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Event Description: **1A MSLB inside RB (M: ALL)**

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Extended EFDW Operation**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. ☐ Verify 1 TD EFDW PUMP operating.	☐ GO TO Step 12.
11. ☒ Start TD EFDWP BEARING OIL COOLING PUMP.	
NOTE - Loss of the condensate system for ≥ 25 minutes results in cooling down to LPI using the ADVs. If NO HWPs are operating, continuing this enclosure to restore the condensate system is a priority <u>unless</u> the CRS deems EOP activities higher priority. The 25 minute criterion is satisfied when a HWP is started and 1C-10 is 10% open. - If the condensate system is operating, the remaining guidance establishes FDW recirc, monitors and maintains UST, and transfers EFDW suction to the hotwell if required.	
12. ☐ Notify CRS to set priority based on the NOTE above <u>and</u> EOP activities.	

Examiner Note: The CRS will have the RO put this procedure aside to continue in the EOP based upon Step 12.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EOP Encl. 5.16 Rev 01

Enclosure 5.16

SG Tube-to-Shell ΔT Control

EP/1/A/1800/001 ON

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

- SG tube-to-shell ΔT is calculated by the OAC with points displayed on Loop P/T displays as indicated below:

1A SG ΔT	1B SG ΔT
Bottom of Loop 'A' P/T display	Bottom of Loop 'B' P/T display
S/G TUBE/SHELL DT	S/G TUBE/SHELL DT

- SG tube-to-shell ΔT limits:

Stress	OAC Indication
Tensile Stress Limit (Tubes colder than shell)	+130 °F
Compressive Stress (Tubes hotter than shell)	-70 °F

1. IAAT any SG tube-to-shell ΔT approaches either limit, **THEN** take appropriate action per the following:

Limit Approached	Action
Tensile	GO TO Step 2
Compressive	GO TO Step 50

 GO TO Step 76.

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 1

Event No.: 7

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Event Description: **1A MSLB inside RB (M: ALL)**

Applicant's Actions or Behavior

EOP Encl. 5.16 Rev 01

Enclosure 5.16

EP/1/A/1800/001 0N

SG Tube-to-Shell ΔT Control

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
76. <u> </u> WHEN directed by CRS, THEN EXIT this enclosure.	

... END ...

This event is complete when the crew has transferred to the FCD tab, or as directed by the Lead Examiner.

CRITICAL TASKS

- CT-1** Close 1RC-3 to restore Safety Function 3 (Reactor Pressure Control) prior to requiring a change in the mitigation strategy resulting in a Mode 3 entry and shutdown of 3 RCPs (**CT-1 located on Event 6 page 2**)

Reference	AP/1/A/1700/044 (Abnormal Pressurizer Pressure Control)
Critical Task Methodology	Steps directly result in the restoration of a Safety Function (#3 Reactor Pressure Control)
Initiating Cue	1RC-1 fails open
Performance Feedback	If the crew fails to perform the required action, AP/44 will require the crew to enter MODE 3 and secure 3 RCPs
Success Path	The closure of 1RC-3 at step 3.3 prior to requiring 3 RCPs to be secured
Measurable Performance Standard	Observable actions taken by one crew member. The success/failure will be evident to the entire crew based upon whether the Reactor trips.
Preferred Boundary Condition	Threshold which results in a change to the mitigation strategy

- CT-2** Manually start TDEFWP to feed the 1B SG prior to meeting requirements for initiation of HPI Forced Cooling (**CT-2 located on Event 7 page 4**)

Reference	EOP Rule 5 (Main Steam Line Break)
Critical Task Methodology	EOP directed action essential to an event's overall mitigation strategy
Initiating Cue	MSLB occurs coincident with a failure of the TDEFWP to auto start
Performance Feedback	If the crew fails to perform the required action, RCS pressure will rise following isolation of the MSLB. This pressure rise will result in initiation of HPI Forced Cooling if the TDEFWP isn't manually started.
Success Path	The correct performance of EOP Rule 5 (Main Steam Line Break)
Measurable Performance Standard	Observable actions taken by one crew member. The success or failure will be evident to the entire crew based upon achieving SG feed prior to reaching an RCS pressure of 2300 psig
Preferred Boundary Condition	Threshold which results in a change to the mitigation strategy

SAFETY: Take a Minute			
UNIT 0 (CRS)			
SSF Operable: Yes PSW Operable: No	KHU's Operable: U1 - OH, U2 - UG	LCTs Functional: 0 (CT- 5 OOS)	Fuel Handling: No
UNIT STATUS (CRS)			
Unit 1 Simulator	Other Units		
Mode: 1	Unit 2	Unit 3	
Reactor Power: 100%	Mode: 1	Mode: 1	
Gross MWE: 875	100% Power	100% Power	
RCS Leakage: 0.01 gpm No WCAP Action	EFDW Backup: Yes	EFDW Backup: Yes	
RBNS Rate: 0.01 gpm			
Technical Specifications/SLC Items (CRS)			
Component/Train	OOS Date/Time	Restoration Required Date/Time	TS/SLC #
PSW	Today/0600	7 Days	TS 3.7.10
AMSAC/DSS	Today/0600	7 Days	SLC 16.7.2
Lee/Central Alt Pwr Path	Today/0500	N/A	SLC 16.8.6
Shift Turnover Items (CRS)			
Primary			
• 1RIA-3 and 5 removed from RB. • SASS is in Manual for calibration • After turnover, the SRO will direct the BOP to lower RBNS level to ~3 inches using OP/1/A/1104/007 Encl. 4.1 • AMSAC/DSS bypassed for maintenance			
Secondary			
• 1SSH-1, 1SSH-3, 1SD-2, 1SD-5, 1SD-140, 1SD-303, 1SD-355, 1SD-356 and 1SD-358 are closed with power supply breakers open per the Startup Procedure for SSF Overcooling Event. • U2 is supplying the AS Header • PSW Booster Pump is OOS for emergent issue. WCC preparing Protected Equipment package.			
Electrical			
• CT-5 OOS due to OCB-101 maintenance			
Reactivity Management (CRS)			
RCS Boron 43 ppmB	Gp 7 Rod Position: 91% Withdrawn	Batch additions as required for volume control (OATC)	

Facility: **Oconee**

Scenario No.: 2

Op-Test No.: 1

 Examiners: _____

 Operators: _____ **SRO**
 _____ **OATC**
 _____ **BOP**
Initial Conditions:

- Rx Power = 50%

Turnover:

- CT-5 OOS
- OTS1-1 unavailable
- AMSAC DSS Bypassed

Critical Tasks:

- CT-1:** Restore an AC Electrical Power Source (Safety Function 6: Electrical) prior to EAL escalation to General Emergency (SG1.2) (**Event 7 Page 14**)
- CT-2:** Close 1HP-21 within 15 minutes following Blackout to preclude a LOCA from the RCP seals (**Event 7 Page 4**)

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		CT-5 OOS
0b	Override		OTS1-1 unavailable
0c	Override		AMSAC/DSS Bypassed
1	Override	C: BOP, SRO	1B FWPT Auxiliary Oil Pump Trip
2	MPI040 MPI070	I: OATC, SRO (MC)	Loop 1A RC Flow fails low
3	Override	C: BOP, SRO (TS)	Recurring High Vibration on 1A RBCU
4	Override	C:OATC, SRO (TS)	Inadvertent ES Channel 3 Actuation
5	Override	R: OATC, SRO (MC)	High Vibration on Main Turbine Bearing 11 requiring a manual power reduction.
6		N: BOP, SRO	AP/29 support actions during manual power reduction due to Main Turbine Bearing vibration
7	MALF_ SG11	M: ALL	Switchyard Isolate (Blackout) (Failures: CT-1 LO, KHU-2 ELO with ACB-4 closed, 1FDW-315 failed closed in AUTO, PSW Switchgear LO (CT-1) (CT-2))

* (N)ormal / (R)eactivity / (I)nstrument / (C)omponent / (M)ajor / (TS) Tech Spec / (MC)Manual Control

SCENARIO 2 EVENT SUMMARY

- Event 1:** The Auxiliary Oil Pump for the 1B FWPT will trip causing the Emergency Oil Pump to start. Per the Alarm Response Guide (ARG), the BOP will attempt to start the Auxiliary Oil Pump, which will fail. Shortly afterwards, the alarm for FWPT 1B Emergency Oil Pump Overload will alarm. This will require the candidate to attempt to start the Auxiliary Oil Pump. Not being able to start the pump, the ARG will direct the BOP to stop the Turning Gear Motor to prevent damaging the Feedwater Pump.
- Event 2:** The 1A Loop RCS Flow instrument will fail low which will cause ICS to re-ratio Feedwater in an attempt to restore the primary to secondary heat balance. Once alarms are received, the crew will perform Plant Transient Response to stabilize the plant. The OATC will re-ratio Feedwater to restore the heat balance. Once the plant is stable, the SRO will enter AP/1/A/1700/028 (ICS Instrument Failures) and ensure the appropriate ICS stations are in manual and BOP will perform an instrument surveillance for the failed instrumentation.
- Event 3:** OAC alarm O1D1361 (RBCU Fan 1A Vib) will alarm and the BOP will refer to the OAC alarm response. The first time the alarm comes in, it will be reset using the OAC alarm response guidance. After the first alarm is reset, it will alarm again in ≈ 3 minutes. This time the alarm will not reset and the BOP must secure the 1A RBCU. The SRO will declare the 1A RBCU inoperable and enter **TS 3.6.5 Condition B**.
- Event 4:** Engineered Safeguards (ES) Channel 3 will inadvertently actuate which will cause the 1A LPI Pump to start and 1LP-17 to open. Once the crew determines that the ES actuation is not valid, the SRO will enter AP/1/A/1700/042 (Inadvertent ES Actuation) to restore the ES components to normal operation. The SRO will enter **TS 3.3.7 Condition A and TS 3.7.7 Condition B**.
- Event 5:** High vibration on Main Turbine Bearing 11 will alarm at ~ 5.1 mils. The SRO will enter AP/1/A/1700/054 (Abnormal Turbine Generator Operations). The crew will notify the SM to evaluate removing the Turbine Generator from service. The SM will notify the crew to use AP/1/A/1700/029 to shut down the Turbine Generator. The OATC will perform a manual power reduction per AP/29.
- Event 6:** The SRO will direct the BOP to perform AP/1/A/1700/029 Enclosure 5.1 (Support Actions During Rapid Unit Shutdown). The BOP will transfer the electrical auxiliaries from the Main Transformer (N Breakers) to CT-1 (E Breakers).
- Event 7:** A Switchyard Isolate (SYI) coincident with a CTI-1 lockout will occur. KHU-2 will emergency lockout with ACB-4 remaining closed. This will require the manual alignment of KHU-1 through ACB-3 to restore electrical power. The crew will perform Rule 3 for Loss of MFW and the EOP Blackout Tab. 1FDW-315 will fail closed in AUTO.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 1

Page 1 of 2

Event Description: **1B FWPT Auxiliary Oil Pump Trip (C: BOP, SRO)**

Applicant's Actions or Behavior

NRC Examiners: this guide highlights **Verifiable Action Steps in Green** and **RNO/Branching Steps in Yellow**.

Booth Cue: When directed by the Lead Examiner, fire **EVENT 1** to initiate the 1B FWPT Aux Oil Pump failure. ~3 minutes later fire **EVENT 1A** to trip the Emer Bng Oil Pump

Event 1 Crew/Plant Response:

- 1SA-8/B-7 FWPT 'B' HYDRAULIC PRESSURE LOW
- 1SA-8/C-6 FWPT 'B' EMERGENCY OIL PUMP RUN in alarm
- FWPT B Emergency Oil Pump starts
- **CRS** will direct the **BOP** to refer to 1SA-8/C-6

OP/1/A/6101/008 Rev 40

**ARG 1SA-8/C-6
FWPT 'B' EMERGENCY OIL PUMP RUN**

3. Manual Action

- 3.1 Verify 1B FWPT Emergency Oil Pump is running.
- 3.2 IF applicable, verify 1B FWPT is still on Turning Gear.
- 3.3** Try to restart 1B FWPT Auxiliary Oil Pump.
- 3.4 IF restart fails, notify Maintenance for repairs.

Examiner Note: At step 3.2 (above), the 1B FWPT is still on Turning Gear. At step 3.3, the restart attempt will fail. ~3 minutes later the Emergency Oil Pump will trip and cause 1SA-08/C-7, (FWPT "B" EMERGENCY OIL PUMP OVERLOAD) to alarm.

**ARG 1SA-8/C-7
FWPT 'B' EMERGENCY OIL PUMP OVERLOAD**

3. Manual Action

- 3.1 IF available, start Auxiliary Oil Pump and stop Emergency Oil Pump.
- 3.2** IF AOP is NOT available, stop Turning Gear Motor and Emergency Bearing Oil Pumps.
- 3.3 Notify Maintenance for repairs.
- 3.4 As soon as EBOP OR Auxiliary Oil Pump becomes available, start pump and place Turbine on Turning Gear.

This event is complete when Turning Gear Motor is secured, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 1

Page 2 of 2

Event Description: **1B FWPT Auxiliary Oil Pump Trip (C: BOP, SRO)**

Applicant's Actions or Behavior

Booth Cue: If dispatched as an AO or Maintenance to investigate 1B FWPT, once the EBOP has tripped, notify the crew that "all oil pumps are off and the FWPT is on the turning gear. The TG motor is much noisier than normal." Alter the status of the oil pumps and the TG based upon the timing of the phone call.

Examiner Note: Bearing temperature alarms (1SA-8/E-6) on the 1B FWPT are due to loss of cooling since the oil pumps are secured. The alarms will take several minutes to come in after all lube oil pumps are secured.

OP/1/A/6101/008 Rev 40

ARG 1SA-8/E-6
FWPT 'B' HP/LP BEARING DRAIN TEMPERATURE HIGH

3. Manual Action

- 3.1 Verify bearing drain temperature is high using a surface pyrometer OR by feeling drain piping.
- 3.2 Manually open 1RCW-64 (FWPT Oil Cooler 1B Temperature Control Bypass) and regulate to control bearing oil temperature less than 180°F, avoiding any rapid change of oil temperature. Do NOT exceed 50°F ΔT across the bearing.
- 3.3 Check 1B FWPT bearing for excessive vibration.
- 3.4 IF the automatic temperature controller appears to be malfunctioning, operate the manual bypass until repairs can be completed.
- 3.5 IF Cooler appears to be dirty, valve in Spare Cooler.
- 3.6 Ensure that the supplemental temporary cooler for FWPT Oil Cooler 1B is installed AND placed in service, as needed, to control oil cooler discharge temperature per MP/0/A/3007/088 (Temporary Cooling of FDWPT Oil with Air Cooled Cooler).
- 3.7 IF bearing oil temperature CANNOT be maintained below 180°F, remove 1B FWPT from service per OP/1/A/1106/002 B (FDWPT Operation) and repair system.
- 3.8 Refer to OP/1/A/1102/004 (Operation at Power).

This event is complete when Turning Gear Motor is secured, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **2**Event No.: **2**

Page 1 of 6

Event Description: **Loop 1A RC Flow fails low (I: OATC,SRO)**

Applicant's Actions or Behavior

EVENT 2

Booth Cue: When directed by the Lead Examiner, **fire EVENT 2** to initiate the Loop 1A RC Flow failure.

Plant response:

- 1SA-02/A-3 (RC Loop A Flow Low) (**next page**)
- 1SA-02/A-5 (RC Total Flow Low)
- 1SA-02/A-11 (ICS Runback)
- 1SA-02/A-12 (ICS Tracking)
- 1SA-02/B-1 (HP Letdown Tank Level High/Low) (**next page**)
- 1SA-05/B-5 (1B RPS Trouble)

Crew response:

When the Statalarms are received, the crew should utilize the PTR process to stabilize the plant

- Diagnose the Loop 1A RC Flow failure by observing the RCS Flow meter on 1UB1 and proper RCP amperage for all four (4) pumps.
- The **OATC** will place the **Feedwater Masters and the Diamond to MANUAL** and re-ratio feedwater using the Loop T_c meters and/or OAC (RCS01) to return actual ΔT_c to near zero.

AD-OP-ONS-0002 Att. 18 (PTR)

The **OATC** should:

- Communicate to the **CRS** the initial alarm (if applicable) followed by reactor power level and direction
- Monitor Reactor power throughout the transient
- **Place the appropriate ICS stations in manual (Diamond and both FDW Masters in this case)** in manual if any of the following occur:
 - NI power increasing above the pre-transient power level
 - Failed instrument is diagnosed
 - Invalid input exists and the **CRS** directs the ICS be placed in manual
- Remain focused on reactor power level and FDW response during the transient

The **BOP** should:

- Determine if a valid ICS runback exists and inform the **CRS**
- Monitor plant response and verify operating limits NOT exceeded
- Monitor control boards and diagnose any failed instruments
- If ICS is placed in Manual, remain focused on RCS pressure, SG outlet pressure and RCS inventory

Examiner Note: When 1A RC Flow fail low, 1A FDW flow will rapidly lower while 1B FDW flow will rapidly rise. The OATC will take manual control of the FDW Masters and re-ratio them 'towards each other' in an attempt to match FDW Flows which will establish and maintain ΔT_c within $0 \pm 2^\circ\text{F}$. An adjustment may also be required to get total FDW Flow < the pre-transient value.

This event is complete when AP/28 Section 4E step 5 is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 2

Page 2 of 6

Event Description: **Loop 1A RC Flow fails low (I: OATC,SRO)**

Applicant's Actions or Behavior

The **CRS** will:

- Direct the **BOP** to review Statalarms
- Enter AP/1/A/1700/028 (**next page**) (Rev 26)
- Ensure Maintenance is contacted to repair the failed instrument

OP/1/A/6101/002 Rev 37**ARG 1SA-02/A-3**
RC LOOP A FLOW LOW**1. Alarm Setpoint**

1.1 Median selected flow setpoint of 62.37 x E6 lbm/hr decreasing.

3. Manual Action

- 3.1 Ensure reactor power is reduced below the flux to flow minus imbalance trip ratio.
- 3.2 Ensure feedwater demand reratios properly.

Examiner Note: ICS will remain in Manual for the remainder of the scenario.**ARG 1SA-02/B-1**
HP LETDOWN TANK LEVEL HIGH/LOW**3. Manual Action**

- 3.1 Instrument Failed:
- 3.1.1 Compare alternate channels to verify alarm validity:
- O1A1042 LDST LEVEL 1
 - O1A1043 LDST LEVEL 2
- 3.2 Verify LDST pressure does not exceed LDST level/pressure operability requirement per OP/0/A/1108/001, (Curves And General Information).
- 3.3 **IF** High Level alarm is received:
- 3.3.1 Bleed as required by OP/1/A/1103/004 (Soluble Poison Concentration Control).

Examiner Note: If the LDST High Level alarm is received, the crew may choose to reduce LDST level using EOP Encl. 5.5**This event is complete when AP/28 Section 4E step 5 is complete, or as directed by the Lead Examiner.**

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 2

Page 3 of 6

Event Description: **Loop 1A RC Flow fails low (I: OATC,SRO)**

Applicant's Actions or Behavior

Duke Energy Oconee Nuclear Station ICS Instrument and Component Failures	Procedure No.
	AP/1/A/1700/028
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3. Immediate Manual Actions

None

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 ☐ Provide control bands as required.	
4.2 Initiate the following notifications: ☐ SM to reference: - AD-LS-ALL-0006 (Notification/Reportability Evaluation) - Emergency Plan ☐ STA	
4.3 ☐ Verify <u>both</u> : - A power transient $\geq 5\%$ has occurred. - Plant is stabilized.	☐ GO TO Step 4.5.
4.4 ☐ Notify Rx Engineering <u>and</u> discuss the need for a maneuvering plan.	

Examiner Note: At step 4.3, if the actions taken to stabilize the plant result in a power change $>5\%$ then Rx Engineering is notified to provide a maneuvering plan via the next step. If a 5% power move has not occurred, this path will be bypassed.

This event is complete when AP/28 Section 4E step 5 is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 2

Page 4 of 6

Event Description: **Loop 1A RC Flow fails low (I: OATC,SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/028

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED																																																									
4.5 Use the following, as necessary, to determine the applicable section from table in Step 4.6: • OAC alarm video • OAC display points • Control Board indications • Maintenance assistance, as needed																																																										
4.6 GO TO the applicable section per the following table: <table><tr><td>✓</td><td>Section</td><td>Failure</td></tr><tr><td></td><td>4A</td><td>RCS Temperature</td></tr><tr><td></td><td>4B</td><td>Turbine Header Pressure</td></tr><tr><td></td><td>4C</td><td>Controlling NI</td></tr><tr><td></td><td>4D</td><td>Feedwater Loop Flow</td></tr><tr><td></td><td>4E</td><td>RCS Flow</td></tr><tr><td></td><td>4F</td><td>Delta T_c</td></tr><tr><td></td><td>4G</td><td>NR RCS Pressure</td></tr><tr><td></td><td>4H</td><td>Feedwater Valve ΔP</td></tr><tr><td></td><td>4I</td><td>SG Startup Level</td></tr><tr><td></td><td>4J</td><td>Feedwater Temperature</td></tr><tr><td></td><td>4K</td><td>Core Thermal Power</td></tr><tr><td></td><td>4L</td><td>SG Operating Level</td></tr><tr><td></td><td>4M</td><td>ICS Star or Memory Module</td></tr><tr><td></td><td>4N</td><td>SG Outlet Pressure</td></tr><tr><td></td><td>4O</td><td>Turbine Master Trips to Hand for Unknown Reason (3)</td></tr><tr><td></td><td>4P</td><td>TBV Failure (5)</td></tr><tr><td></td><td>4Q</td><td>SG FDW Valves</td></tr><tr><td></td><td>4Q</td><td>MFDWPs</td></tr></table>	✓	Section	Failure		4A	RCS Temperature		4B	Turbine Header Pressure		4C	Controlling NI		4D	Feedwater Loop Flow		4E	RCS Flow		4F	Delta T _c		4G	NR RCS Pressure		4H	Feedwater Valve ΔP		4I	SG Startup Level		4J	Feedwater Temperature		4K	Core Thermal Power		4L	SG Operating Level		4M	ICS Star or Memory Module		4N	SG Outlet Pressure		4O	Turbine Master Trips to Hand for Unknown Reason (3)		4P	TBV Failure (5)		4Q	SG FDW Valves		4Q	MFDWPs	Examiner Note: The CRS will transfer to section 4E for RCS Flow failure.
✓	Section	Failure																																																								
	4A	RCS Temperature																																																								
	4B	Turbine Header Pressure																																																								
	4C	Controlling NI																																																								
	4D	Feedwater Loop Flow																																																								
	4E	RCS Flow																																																								
	4F	Delta T _c																																																								
	4G	NR RCS Pressure																																																								
	4H	Feedwater Valve ΔP																																																								
	4I	SG Startup Level																																																								
	4J	Feedwater Temperature																																																								
	4K	Core Thermal Power																																																								
	4L	SG Operating Level																																																								
	4M	ICS Star or Memory Module																																																								
	4N	SG Outlet Pressure																																																								
	4O	Turbine Master Trips to Hand for Unknown Reason (3)																																																								
	4P	TBV Failure (5)																																																								
	4Q	SG FDW Valves																																																								
	4Q	MFDWPs																																																								

This event is complete when AP/28 Section 4E step 5 is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 2

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 Event Description: **Loop 1A RC Flow fails low (I: OATC,SRO)**

Applicant's Actions or Behavior

Section 4E
RCS Flow Failure

AP/1/A/1700/028
Page 1 of 1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>Unit Status</u> The Controlling RCS Flow Instrument has failed. Any required Plant Transient Response actions have been taken and TPB is $\leq$ the pre-transient power level.	
<u>NOTE</u> The following will occur when an ICS RCS flow loop signal fails: • ICS RUNBACK • Controlling T_{ave} swaps to RCS loop with higher flow • Delta T_c station re-ratios loop feedwater flows	
1. Ensure in HAND: ___ 1A FDW MASTER ___ 1B FDW MASTER	Examiner Note: Steps 1 and 2 are Verifiable Action Steps that were completed during the PTR process.
2. ___ Ensure DIAMOND in MANUAL.	
3. Notify Maintenance to: ___ Select a valid RCS flow input to ICS per AM/1/A/0326/020 (Control of Unit 1 Star Module Signal Selection Function). ___ Investigate <u>and</u> repair the failed RCS flow instrumentation.	
4. ___ PERFORM an instrumentation surveillance using applicable table in Encl 5.2 (ICS Instrument Surveillances) for the failed instrument.	Booth Cue: Encl. 5.2 is located on the next page. If asked, Unit 2 will perform the Surveillance Evaluation.
5. ___ Verify instrumentation surveillance in Encl 5.2 (ICS Instrument Surveillances) was performed satisfactorily as written.	
6. ___ WHEN notified by Maintenance that a valid RCS flow input has been restored to ICS, THEN GO TO OP/1/A/1102/004 A Encl (Placing ICS Stations To Auto).	___ Initiate a Surveillance Evaluation in accordance with PT/1/A/0600/001 (Periodic Instrument Surveillance) <u>and</u> OP/1/A/1105/014 (Control Room Instrumentation Operation And Information).

This event is complete when AP/28 Section 4E step 5 is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 2

Page 6 of 6

Event Description: **Loop 1A RC Flow fails low (I: OATC,SRO)**

Applicant's Actions or Behavior

Enclosure 5.2
ICS Instrument Surveillances (4)

AP/1/A/1
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Table 3 - RCS Flow

	COMPONENT	✓	COMPUTER	REQUIRED CONDITIONS
SR 3.4.1.3 12 Hours	RCS Pressure, Temperature, and Flow DNB Limits		O1P1970	IF in MODE 1, Steady State Operation, verify RCS total flow within limits in COLR. Steady State Operation is defined as operation within a 4% (e.g., 88% - 92% RTP) power band for ≥ 4 hours.
SR 3.4.4.1 12 Hours	RCS Loops		N/A	Verify required RCPs (3 or 4) in operation with RCS flow indicated.

Examiner Note: The Required Conditions listed on Table 3 cannot be performed as written since RCS flow is not indicated on the Dixon meter. TS 3.4.4 bases allows other indications to be used to satisfy SR 3.4.4.1 ie. temperature, or pump status. The CRS may enter TS 3.4.4.B conservatively, however it is not required, until a surveillance evaluation is completed.

This event is complete when AP/28 Section 4E step 5 is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **2**Event No.: **3**

Page 1 of 6

Event Description: **Recurring Vibration on 1A RBCU (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

EVENT 3

Booth Cue: When directed by the Lead Examiner, **fire EVENT 3** to initiate the recurring vibration on 1A RBCU.

Plant response:

- OAC Alarm O1D1361 (RBCU Fan 1A Vib)

Crew response:

The CRS will direct the BOP to refer to the OAC ARG:

- The vibration alarm will clear the first time it is reset
- The vibration alarm will not clear after the second time which prompts an RBCU swap

**ARG OAC O1D1361
RBCU Fan 1A Vibration**

- 1) Depress the RBCU OAC Vibration alarm reset pushbutton
- 2) If the alarm doesn't clear, stop the RBCU
- 3) Notify Engineering for an evaluation

Examiner Note: The crew may stop the 1A RBCU using the OAC Alarm Response Guide or it may use OP/1/A/1104/015 Encl. 4.3. The CRS should enter TS 3.6.5 Condition B shown on **Event 3 Page 4**.

Enclosure 4.3
RBCU Operation {16}

OP/1/A/1104/015 Encl. 4.3 Rev 46

OP/**1**/A/1104/015
Page 1 of 5

Reference Use

2. Procedure

- **IF** required to stop RBCU(s), perform Section 3.
- **IF** required to start RBCU(s), perform Section 4.
- **IF** required to swap RBCU fan speed, perform Section 5.
- **IF** required to adjust RBCU LPSW flow, perform Section 6.

Examiner Note: The crew will stop the 1A RBCU and start the 1B RBCU using Sections 3 and 4. The swap can be made in any order.

Booth Cue: If needed, and with Lead Examiner consent, contact the crew as the SM and recommend starting the 1B RBCU per OP/1/A/1104/015.

This event is complete when 1A RBCU is secured and 1B RBCU is started, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **2**Event No.: **3**

Page 2 of 6

Event Description: **Recurring Vibration on 1A RBCU (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

*OP/1/A/1104/015 Encl. 4.3 Rev 46***Enclosure 4.3**
RBCU Operation {16}**OP/1/A/1104/015**
Page 2 of 5**3. Stopping RBCU(s)**

NOTE: When stopping RBCUs or changing LPSW flows, RB pressure will change as RB temperature changes. {8}

- 3.1 Verify RB pressure within limits of PT/1/A/0600/001 (Periodic Instrument Surveillance). {8}
- 3.2 Begin monitoring the following:
- RB absolute pressure (OAC Turn On Code: 1RBPA) {8}
 - RB temperature

NOTE: Stopping RBCUs can affect the following: RBCU bearing temperatures, RBCU vibration, RBNS level, 1RIA-47 level, RB pressure/temperature.

- 3.3 Place desired switch to "OFF":

- ☒ 1A RBCU
- ☐ 1B RBCU
- ☐ 1C RBCU

NOTE:

- When changing LPSW flows, RB pressure will change as RB temperature changes. {8}
- Each RBCU must have ≥ 550 gpm Inlet Flow or ≥ 750 gpm Outlet Flow to meet flow requirements of SLC 16.9.12. {2}

- 3.4 Position valves as required for RB cooling:

- ☐ 1LPSW-18 (1A RBCU OUTLET)
- ☐ 1LPSW-21 (1B RBCU OUTLET)
- ☐ 1LPSW-24 (1C RBCU OUTLET)

This event is complete when 1A RBCU is secured and 1B RBCU is started, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **2**Event No.: **3**

Page 3 of 6

Event Description: **Recurring Vibration on 1A RBCU (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

*OP/1/A/1104/015 Encl. 4.3 Rev 46***Enclosure 4.3**
RBCU Operation {16}**OP/1/A/1104/015**
Page 3 of 5**4. Starting RBCU(s)**

NOTE: When starting RBCUs or changing LPSW flows, RB pressure will change as RB temperature changes. {8}

- 4.1 Verify RB pressure within limits of PT/1/A/0600/001 (Periodic Instrument Surveillance). {8}
- 4.2 Begin monitoring RB absolute pressure. (OAC Turn On Code: 1RBPA) {8}
- 4.3 IF personnel inside containment, announce over plant page that starting RBCU(s). {11}

NOTE: Starting RBCUs can affect the following: RBCU bearing temperatures, RBCU vibration, RBNS level, 1RIA-47 level, RB pressure/temperature.

- 4.4 Place desired switch to "HIGH" or "LOW":

- ☐ 1A RBCU
- ☒ 1B RBCU
- ☐ 1C RBCU

NOTE:

- When changing LPSW flows, RB pressure will change as RB temperature changes. {8}
- Each RBCU must have ≥ 550 gpm Inlet Flow or ≥ 750 gpm Outlet Flow to meet flow requirements of SLC 16.9.12. {2}

- 4.5 Position valves as required for RB cooling:

- ☐ 1LPSW-18 (1A RBCU OUTLET)
- ☐ 1LPSW-21 (1B RBCU OUTLET)
- ☐ 1LPSW-24 (1C RBCU OUTLET)

This event is complete when 1A RBCU is secured and 1B RBCU is started, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **2**Event No.: **3**

Page 4 of 6

Event Description: **Recurring Vibration on 1A RBCU (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

Reactor Building Spray and Cooling Systems
3.6.5

3.6 CONTAINMENT SYSTEMS

3.6.5 Reactor Building Spray and Cooling Systems

LCO 3.6.5 Two reactor building spray trains and three reactor building cooling trains shall be OPERABLE.

NOTE

Only one train of reactor building spray and two trains of reactor building cooling are required to be OPERABLE during MODES 3 and 4.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One reactor building spray train inoperable in MODE 1 or 2.	A.1 Restore reactor building spray train to OPERABLE status.	7 days
B. One reactor building cooling train inoperable in MODE 1 or 2.	B.1 Restore reactor building cooling train to OPERABLE status.	7 days

(continued)

This event is complete when 1A RBCU is secured and 1B RBCU is started, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **2**Event No.: **3**

Page 5 of 6

Event Description: **Recurring Vibration on 1A RBCU (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

Reactor Building Spray and Cooling Systems
3.6.5ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One reactor building spray train and one reactor building cooling train inoperable in MODE 1 or 2.	C.1 Restore one train to OPERABLE status.	24 hours
D. Required Action and associated Completion Time of Condition A, B, or C are not met.	D.1 Be in MODE 3.	12 hours
E. One required reactor building cooling train inoperable in MODE 3 or 4.	E.1 Restore required reactor building cooling train to OPERABLE status.	24 hours
F. One required reactor building spray train inoperable in MODE 3 or 4.	F.1 Restore required reactor building spray train to OPERABLE status.	24 hours
G. Required Action and associated Completion Time of Condition E or F not met.	G.1 Be in MODE 5.	36 hours

(continued)

This event is complete when 1A RBCU is secured and 1B RBCU is started, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: **2**

Event No.: **3**

Page 6 of 6

Event Description: **Recurring Vibration on 1A RBCU (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

Reactor Building Spray and Cooling Systems
3.6.5

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. Two reactor building spray trains inoperable in MODE 1 or 2. <u>OR</u> Two reactor building cooling trains inoperable in MODE 1 or 2. <u>OR</u> Any combination of three or more trains inoperable in MODE 1 or 2. <u>OR</u> Any combination of two or more required trains inoperable in MODE 3 or 4.	H.1 Enter LCO 3.0.3.	Immediately

This event is complete when 1A RBCU is secured and 1B RBCU is started, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: **2**

Event No.: **4**

Page 1 of 7

Event Description: **Inadvertent ES Channel 3 (C: OATC, SRO) (TS)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, **CALL THE CR** as the WCC SRO, and state "This is the WCC SRO, please report the Amp readings from the back board for PCB-20 and PCB-21".

When the BOP is at the back board and when directed by the Lead Examiner, **fire EVENT 4** to initiate the inadvertent ES Channel 3 actuation.

Plant response:

- 1SA-1/C-10 (ES 3 TRIP)
- 1SA-3/C-8 (LP Injection Loop A Flow High/Low)
- 1A LPI Pump starts
- 1LP-1 (1A LPI INJECTION) opens

Crew response:

- The crew will determine that the ES actuation is not valid
- The CRS may direct the BOP to refer to ARG 1SA-1/C-10 (ES 3 TRIP)
- The CRS will enter AP/42 (Inadvertent ES Actuation)

OP/1/A/6101/001 Rev 16

**ARG 1SA-1/C-10
ES 3 TRIP**

3. Manual Action

- 3.1 Determine if ES condition exists (RCS pressure $\leq$ 550 psig **OR** RB pressure $\geq$ 3.0 psig).
- 3.2 **IF** RCS pressure is $\leq$ 550 psig **OR** RB pressure is $\geq$ 3.0 psig, **Go To** EP/1/A/1800/001 (Emergency Operating Procedure).
- 3.3 **IF** ES condition does **NOT** exist, **Initiate** AP/1/A/1700/042 (Inadvertent ES Actuation).
- 3.4 Refer to OP/1/A/1105/014 (Control Room Instrumentation Operation And Information).

AP/1/A/1700/042 Rev 05

Duke Energy Oconee Nuclear Station Inadvertent ES Actuation	Procedure No.
	AP/1/A/1700/042
	Revision No.
	005

This event is complete when Step 4.27 (TS/SLC evaluation) is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: **2**

Event No.: **4**

Page 2 of 7

Event Description: **Inadvertent ES Channel 3 (C: OATC, SRO) (TS)**

Applicant's Actions or Behavior

AP/1/A/1700/042

Page 1 of 29

1. Entry Conditions

Any of the following occur due to an invalid reason:

- Engineered Safeguards actuation
- Diverse HPI actuation
- Diverse LPI actuation

AP/1/A/1700/042

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3. Immediate Manual Actions

None

AP/1/A/1700/042

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 Verify <u>any</u> of the following have <u>inadvertently</u> actuated: ___ Diverse HPI ___ ES Channel 1 ___ ES Channel 2	 GO TO Step 4.4.

AP/1/A/1700/042

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.4 Verify <u>any</u> of the following have <u>inadvertently</u> actuated: ___ ES Channel 5 ___ ES Channel 6	1. ___ IF ES Channel 1, ES Channel 2, <u>or</u> Diverse HPI have <u>inadvertently</u> actuated, AND it is desired to restore letdown, THEN initiate AP/42 Encl 5.2 (Letdown Restoration).  GO TO Step 4.10.

This event is complete when Step 4.27 (TS/SLC evaluation) is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

 Scenario No.: **2**

 Event No.: **4**

Page 3 of 7

 Event Description: **Inadvertent ES Channel 3 (C: OATC, SRO) (TS)**

Applicant's Actions or Behavior

AP/1/A/1700/042

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.10 Close the following: ☐ 1HP-24 ☐ 1HP-25	
4.11 Verify <u>any</u> of the following have <u>inadvertently</u> actuated: ☐ Diverse HPI ☐ ES Channel 1 ☐ ES Channel 2 ☐ ES Channel 7 ☐ ES Channel 8	☒ GO TO Step 4.13.
4.13 ☐ Announce AP entry using PA system.	
4.14 Verify <u>any</u> of the following have <u>inadvertently</u> actuated: ☐ Diverse LPI ☐ ES Channel 3 ☐ ES Channel 4	☐ GO TO Step 4.19.
4.15 ☐ Verify Diverse LPI has <u>inadvertently</u> actuated.	☒ GO TO Step 4.17.
4.16 ☐ Ensure DIVERSE LPI BYPASS is in BYPASS	☐ Place DIVERSE LPI OVERRIDE in OVERRIDE.
4.17 Perform the following on <u>all</u> <u>inadvertently</u> actuated system(s): ☒ Ensure ES CH-3 is in MANUAL ☐ Ensure ES CH-4 is in MANUAL	☐ IF ES Channel 3 fails to go to MANUAL, THEN place ES ODD VOTER OVERRIDE in OVERRIDE. ☐ IF ES Channel 4 fails to go to MANUAL, THEN place ES EVEN VOTER OVERRIDE in OVERRIDE.
4.18 ☐ Verify LPI was aligned in <u>decay heat removal</u> mode prior to ES actuation.	1. Stop the following: ☒ 1A LPI PUMP ☐ 1B LPI PUMP 2. Simultaneously close the following: ☒ 1LP-17 ☐ 1LP-18

This event is complete when Step 4.27 (TS/SLC evaluation) is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: **2**

Event No.: **4**

Page 4 of 7

Event Description: **Inadvertent ES Channel 3 (C: OATC, SRO) (TS)**

Applicant's Actions or Behavior

AP/1/A/1700/042

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.19 ☐ Verify the Rx is critical.	☐ GO TO Step 4.23.
CAUTION Do NOT add demin water to counter the boration until RCS boron concentration stabilizes to prevent a positive reactivity event.	
NOTE ICS in Auto means ICS is in control of Tave and Rx power.	
4.20 ☐ Verify ICS in Auto.	1. ☐ IF <u>either</u> of the following exists: • Tave lowering outside control band • Rx Power lowering outside control band THEN GO TO Step 4.22. 2. ☒ GO TO Step 4.23.
4.21 ☐ Verify control rods are outside the desired control band.	☐ GO TO Step 4.23.
NOTE It is expected that the Control Room SRO will begin AP/39 (Unintentional Boration) and transfer completion of AP/42 (Inadvertent ES Actuation) to another licensed operator, however, priorities will depend on the specific situation.	
4.22 ☐ Initiate AP/39 (Unintentional Boration).	
4.23 Verify <u>any</u> of the following have <u>inadvertently actuated</u> :	☒ GO TO Step 4.26.
☐ ES Channel 1	
☐ Diverse HPI	
4.26 ☐ Notify Maintenance to investigate and repair the cause of the inadvertent ES actuation, as necessary.	
4.27 ☐ Initiate logging TS/SLC Entry/Exit, as applicable, in accordance with Encl 5.4 (TS/SLC Requirements).	

Examiner Note: AP/42 Encl. 5.4 is on the next page. The CRS is required to enter TS 3.3.7 Condition A which is shown on Event 4 Page 6. The CRS may have to enter TS 3.7.7 Condition B if the LPSW Leakage Accumulator alarms (Event 4 Page 7).

This event is complete when Step 4.27 (TS/SLC evaluation) is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: **2**

Event No.: **4**

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Event Description: **Inadvertent ES Channel 3 (C: OATC, SRO) (TS)**

Applicant's Actions or Behavior

AP/1/A/1700/042

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.28 <u>WHEN</u> <u>all</u> the following exist: <u>Reason for inadvertent ES Channel or Diverse HPI/LPI actuation has been resolved</u> <u>ES Channel or Diverse HPI/LPI reset is desired</u> <u>SM concurs</u> <u>THEN</u> continue.	

Enclosure 5.4
TS/SLC Requirements

AP/1/A/1700/042
Page 1 of 1

NOTE

TS/SLCs below are included as a reference. This list may NOT be complete based on the specific situation. Reference TS/SLC manuals.

Any ES Channel

- TS 3.3.7 (Engineered Safeguards Protective System (ESPS) Digital Automatic Actuation Logic Channels) due to the automatic actuation logic being blocked if any ES channel is in MANUAL or ES Voters in OVERRIDE
- TS 3.3.5 (Engineered Safeguards Protective System (ESPS) Analog Instrumentation) due to inoperable ES instrumentation
- TS 3.5.4 (Borated Water Storage Tank (BWST)) BWST level

ES Channel 1 or 2

- TS 3.4.15 (RCS Leakage Detection Instrumentation) due to Rx Bldg RIAs being out of service
- TS 3.10.1 (Standby Shutdown Facility(SSF)) for SSF inoperability due to the SSF power loss (ES Channel 1 only)
- TS 3.4.9 (Pressurizer) if PZR level is > 260"

ES Channel 3 or 4

- TS 3.7.7 (Low Pressure Service Water (LPSW) System) if LPSW leakage accumulator level is outside allowable band. Evaluate OAC point 01E0507 (LPSW LEAKAGE ACCUMULATOR LEVEL). Notify Unit 2 to evaluate OAC point 02E0507 (LPSW LEAKAGE ACCUMULATOR LEVEL).

Any Diverse Actuation System

- SLC 16.7.6 (Diverse Actuation Systems) due to the automatic actuation logic being blocked if any Diverse Actuation system in OVERRIDE or BYPASS.

This event is complete when Step 4.27 (TS/SLC evaluation) is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: **2**

Event No.: **4**

Page 6 of 7

Event Description: **Inadvertent ES Channel 3 (C: OATC, SRO) (TS)**

Applicant's Actions or Behavior

ESPS Automatic Actuation Output Logic Channels
3.3.7

3.3 INSTRUMENTATION

3.3.7 Engineered Safeguards Protective System (ESPS) Automatic Actuation Output Logic Channels

LCO 3.3.7 Eight ESPS Automatic Actuation Output Logic Channels shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODES 3 and 4 when associated engineered safeguard (ES)
equipment is required to be OPERABLE.

ACTIONS

NOTE

Separate Condition entry is allowed for each automatic actuation output logic channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more automatic actuation output logic channels inoperable.	A.1 Place associated component(s) in ES configuration.	1 hour
	OR A.2 Declare the associated component(s) inoperable.	1 hour

This event is complete when Step 4.27 (TS/SLC evaluation) is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: **2**

Event No.: **4**

Page 7 of 7

Event Description: **Inadvertent ES Channel 3 (C: OATC, SRO) (TS)**

Applicant's Actions or Behavior

3.7 PLANT SYSTEMS

3.7.7 Low Pressure Service Water (LPSW) System

LCO 3.7.7

For Unit 1 or Unit 2, three LPSW pumps and one flow path shall be OPERABLE.

For Unit 3, two LPSW pumps and one flow path shall be OPERABLE.

The LPSW Waterhammer Prevention System (WPS) shall be OPERABLE.

NOTE

With either Unit 1 or Unit 2 defueled and appropriate LPSW loads secured on the defueled Unit, such that one LPSW pump is capable of mitigating the consequences of a design basis accident on the remaining Unit, only two LPSW pumps for Unit 1 or Unit 2 are required.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required LPSW pump inoperable.		NOTE During Unit 2, Refuel 31 with Unit 2 defueled,

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. LPSW WPS inoperable.	B.1 Restore the LPSW WPS to OPERABLE status.	7 days
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 5.	12 hours 60 hours

This event is complete when Step 4.27 (TS/SLC evaluation) is complete, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: **2**

Event No.: **5&6**

Page 1 of 12

Event Description: **High Vibration on Main Turbine Bearing 11 (R: OATC, SRO)(N: BOP, SRO)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, fire **EVENT 5 to initiate the high vibration of Main Turbine Bearing 11.**

Plant response:

- OAC Alarm O1E2546 (MT VIBRATION BEARING #11) comes into HI alarm

Crew response:

- ARG for O1E2546 (MT VIBRATION BEARING #11) states 'refer to AP/1/A/1700/054 (Abnormal Turbine Generator Operations)
- The CRS will enter AP/1/A/1700/054 (Abnormal Turbine Generator Operations)

AP/1/A/1700/054 Rev 01

Duke Energy Oconee Nuclear Station Abnormal Turbine Generator Operations	Procedure No.
	AP/1/A/1700/054
	Revision No.
	001

AP/1/A/1700/054
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1. Entry Conditions

NOTE

- Vibration alarms can be validated by review of other bearing vibration readings, especially adjacent bearings.
- Momentary spikes are **NOT** necessarily valid turbine bearing vibration alarms requiring AP entry.
- Intentionally breaking vacuum does **NOT** require AP/27 (Loss of Condenser Vacuum) entry.

1.1 Main Turbine at Rated Speed with any of the associated bearings indicating the following:

- Journal Bearing (Bearings 1-10) Vibration > 6 mils
- Alterex Bearing (Bearing 11-12) Vibration > 5 mils

This event is complete when Reactor power is lowered by at least 10% and electrical auxiliaries have been transferred, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: **2**

Event No.: **5&6**

Page 2 of 12

Event Description: **High Vibration on Main Turbine Bearing 11 (R: OATC, SRO)(N: BOP, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/054 Rev 01

AP/1/A/1700/054

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 ☐ Verify AP entry was due to SC conductivity.	 GO TO Step 4.3.
4.2 ☐ GO TO Step 4.17.	
4.3 ☐ IAAT all apply: ☐ Turbine is tripped ☐ Turbine decelerating with speed > 1400 rpm ☐ <u>Any</u> Main Turbine Bearing > 20 mils <u>and rising</u> THEN: A. ☐ Ensure Rx tripped. B. ☐ <u>Immediately</u> open 1V-186 (VACUUM BREAKER). C. ☐ Initiate Unit 1 EOP.	

NOTE

"Operating" implies NOT tripped. TG could be online or RESET operating below rated speed.

- 4.4 ☐ **IAAT Turbine Generator operating AND any apply:**
☐ Any Main Turbine Bearing meets Immediate Trip Criteria in the table below
☐ Any Thrust Bearing temperature $\geq 190^{\circ}\text{F}$
☐ There is an immediate need to trip the Turbine Generator
THEN perform Steps 4.5 - 4.6.

 **GO TO Step 4.7.**

Examiner Note: Main Turbine Bearing #11 Vibration is just above the HI setpoint of 5 mils and slowly rising. An immediate trip of the TG isn't required until 8 mils. The direction to reduce power and secure the TG will come from the SM at step 4.8 on the next page.

Main Turbine Bearing Immediate Trip Criteria				
	< 800 rpm	800-1400 rpm	>1400 rpm	All Speeds
Journal Bearing (1-10) Vibration	> 8 mils	> 14 mils OR > 10 mils for 2 mins	> 12 mils OR > 10 mils for 15 mins	
Alterex Bearing (11-12) Vibration				> 8 mils

This event is complete when Reactor power is lowered by at least 10% and electrical auxiliaries have been transferred, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **2**Event No.: **5&6**

Page 3 of 12

Event Description: **High Vibration on Main Turbine Bearing 11 (R: OATC, SRO)(N: BOP, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/054 Rev 01**AP/1/A/1700/054**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.7 ☐ Announce AP entry using PA system.	
4.8 Notify SM to: ☐ Evaluate evacuating non-essential personnel from TB area. ☐ Evaluate removing Turbine Generator from service per OP/1/A/1106/001 (Turbine Generator).	Examiner Note: When step 4.8 is reached, the SM will report "Using time compression, I've evaluated Turbine Generator status. Remove the Main Turbine from service using AP/1/A/1700/029 (Rapid Unit Shutdown)."
4.9 Monitor the following for turbine bearing degraded performance: ☐ OAC Display (Turn-on Code "MT") • Oil Temperature • Metal Temperature • Vibration	
4.10 ☐ Dispatch an operator to the MT to locally check the following, as needed: • Vibration instruments • Bearing drain temperatures • Bearing oil flow	
4.11 ☐ Verify 1LPSW-51 automatic temperature controller is functioning properly.	☐ Notify Maintenance to investigate and repair, as needed. ☐ Refer to OP/1/A/1106/001 (Turbine Generator) until restored <u>or</u> repairs can be completed.
4.12 ☐ Notify Maintenance to investigate.	
4.13 ☐ Notify Engineering.	

This event is complete when Reactor power is lowered by at least 10% and electrical auxiliaries have been transferred, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **2**Event No.: **5&6**

Page 4 of 12

Event Description: **High Vibration on Main Turbine Bearing 11 (R: OATC, SRO)(N: BOP, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/054 Rev 01AP/**1**/A/1700/054

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.14 <u>IAAT</u> <u>both</u> apply: ___ Turbine <u>reached</u> rated speed ___ <u>Any</u> bearing (1-12) > 6 mils, THEN notify Engineering to contact Nuclear Mutual Limited.	
4.15 <u>IAAT</u> turbine <u>reached</u> rated speed <u>and</u> <u>either</u> apply: ___ Any Journal Bearing (1-10) > 7 mils ___ <u>Any</u> Alterex Bearing (11-12) > 5 mils THEN notify Mechanical Maintenance to analyze vibration data.	
4.16 <u>WHEN</u> conditions permit, THEN EXIT this procedure.	

Examiner Note: When step 4.16 is reached, the SM will direct the CRS to remove the Main Turbine from service to using AP/1/A/1700/029 (Rapid Unit Shutdown). AP/29 starts on the **next page**.

This event is complete when Reactor power is lowered by at least 10% and electrical auxiliaries have been transferred, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: **2**

Event No.: **5&6**

Page 5 of 12

Event Description: **High Vibration on Main Turbine Bearing 11 (R: OATC, SRO)(N: BOP, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/029 Rev 14

Duke Energy Oconee Nuclear Station Rapid Unit Shutdown	Procedure No.
	AP/1/A/1700/029
	Revision No. 014

AP/1/A/1700/029

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1. Entry Conditions

- 1.1 Use of this procedure is directed by another procedure.
- 1.2 Any abnormal condition requiring a rapid Unit runback.

2. Automatic Systems Actions

None

3. Immediate Manual Actions

None

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

The CRS should read this procedure and it should **NOT** be used when EOP entry conditions exist.

4.1 ☐ Initiate Encl 5.1 (Support Actions During Rapid Unit Shutdown).	Examiner Note: Encl. 5.1 is on Event 5 page 9.
4.2 ☐ Announce AP entry using the PA system.	
4.3 ☐ IAAT both of the following apply: ☐ It is desired to stop power reduction ☐ CTP > 18 % THEN perform Steps 4.4 - 4.7.	GO TO Step 4.8.

This event is complete when Reactor power is lowered by at least 10% and electrical auxiliaries have been transferred, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: **2**

Event No.: 5&6

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Event Description: **High Vibration on Main Turbine Bearing 11 (R: OATC, SRO)(N: BOP, SRO)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.8 __ Verify ICS in AUTO.	1. ☐ Initiate manual power reduction to desired power level. 2. ☐ GO TO Step 4.11.

Examiner Note: The CRS will direct the OATC to perform a manual power reduction to remove the TG from service. The OATC will reduce FDW Masters (to lower power) and will insert Control Rods (to control RCS Temperature). The CRS gives control bands for the power reduction from AD-OP-ONS-0002 Attachment 17 (see below).

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ATTACHMENT 17

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<< Initial Control Bands >>

2.0 During a Down Power Maneuver

1. The following guidance is to be established for manually controlled parameters during down power maneuvers. The CRS may adjust if required.
 - a. Provide a target power level of NI Power $\pm$ 2% not to exceed allowable power
 - b. If the Diamond, FDW, or Turbine is in manual, provide an average power reduction rate (i.e. 2% per minute) based on the plant condition
 - c. Tave 575-585°F
 - d. SG Outlet Pressure 850-925 PSIG
 - e. Delta Tc 0°F $\pm$ 5°F

This event is complete when Reactor power is lowered by at least 10% and electrical auxiliaries have been transferred, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: **2**

Event No.: **5&6**

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Event Description: **High Vibration on Main Turbine Bearing 11 (R: OATC, SRO)(N: BOP, SRO)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.11 ☐ Verify <u>both</u> Main FDW pumps running.	☒ GO TO Step 4.14.
4.14 ☐ <u>IAAT both</u> Main FDW pumps running, AND <u>both</u> of the following exist: ☐ 1B Main FDW Pump is first pump to be shut down ☐ Any of the following alarms actuate and remain in alarm: • FWP B FLOW MINIMUM (ISA-16/A-3) • FWP B FLOW BELOW MIN (ISA-16/A-4) THEN trip 1B Main FDW Pump.	
4.15 ☐ <u>IAAT both</u> Main FDW pumps running, AND <u>both</u> of the following exist: ☐ 1A Main FDW Pump is first pump to be shut down ☐ Any of the following alarms actuate and remain in alarm: • FWP A FLOW MINIMUM (ISA-16/A-1) • FWP A FLOW BELOW MIN (ISA-16/A-2) THEN trip 1A Main FDW Pump.	
4.16 ☐ Verify Turbine-Generator shutdown is required.	☐ GO TO Step 4.20.
4.17 ☒ Start the TURBINE TURNING GEAR OIL PUMP.	Examiner Note: The CRS will most likely direct the BOP to perform steps 4.17 through 4.19 while the power reduction is in progress.
4.18 ☒ Start 1A through 1E TURBINE BRNG OIL LIFT PUMPS.	
4.19 ☒ Start the TURBINE MOTOR SUCTION PUMP.	

This event is complete when Reactor power is lowered by at least 10% and electrical auxiliaries have been transferred, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **2**Event No.: **5&6**

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Event Description: **High Vibration on Main Turbine Bearing 11 (R: OATC, SRO)(N: BOP, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/029 Rev 14

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.20 ☐ IAAT <u>both</u> of the following apply: ☐ ICS in automatic ☐ NI power is $\leq 18\%$ THEN stop power reduction using <u>either</u> of the following, as necessary: ☐ Deselect MAXIMUM RUNBACK. ☐ Select HOLD.	
4.21 ☐ Verify Turbine-Generator shutdown is required.	<u>NOTE</u> Due to the power reduction initiated in this AP, the current plant configuration must be compared to the normal plant configuration in OP/1/A/1102/004 (Operation at Power) power reduction enclosure. Equivalent steps performed by this AP should be signed off as intent met. Any steps NOT performed by this AP must be evaluated in preparation for power escalation or continued shutdown. 1. ☐ Initiate OP/1/A/1102/004 (Operation at Power) power reduction enclosure. 2. ☐ WHEN conditions permit, THEN GO TO appropriate operating procedure for continued operation.

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.22 ☐ WHEN NI power $\leq 18\%$, THEN continue.	

This event is complete when Reactor power is lowered by at least 10% and electrical auxiliaries have been transferred, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **2**Event No.: **5&6**

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Event Description: **High Vibration on Main Turbine Bearing 11 (R: OATC, SRO)(N: BOP, SRO)**

Applicant's Actions or Behavior

*AP/1/A/1700/029 Encl. 5.1 Rev 14***Enclosure 5.1****AP/1/A/1700/029****Support Actions During Rapid Unit Shutdown** Page 1 of 7

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ Notify WCC SRO to initiate Encl 5.2 (WCC SRO Support During Rapid Unit Shutdown).	
2. Start the following pumps: ☐ 1A FDWP SEAL INJECTION PUMP ☐ 1A FDWP AUXILIARY OIL PUMP ☐ 1B FDWP AUXILIARY OIL PUMP ☐ 1B FDWP SEAL INJECTION PUMP	
3. ☐ WHEN CTP is $\leq$ 80%, THEN continue.	
4. ☐ Stop 1E1 HTR DRN PUMP.	
5. ☐ Place 1HD-254 switch to OPEN.	
6. ☐ Stop 1E2 HTR DRN PUMP.	
7. ☐ Place 1HD-276 switch to OPEN.	
8. ☐ Verify Turbine-Generator shutdown is required.	☐ GO TO Step 21.
<u>NOTE</u> Transferring unit auxiliaries to a dead bus will lead to a unit Blackout.	
9. ☐ Verify CT-1 indicates $\approx$ 4160 volts.	☐ GO TO Step 20.

This event is complete when Reactor power is lowered by at least 10% and electrical auxiliaries have been transferred, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: **2**

Event No.: **5&6**

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Event Description: **High Vibration on Main Turbine Bearing 11 (R: OATC, SRO)(N: BOP, SRO)**

Applicant's Actions or Behavior

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Enclosure 5.1

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Support Actions During Rapid Unit Shutdown Page 3 of 7

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. Place the following transfer switches to MAN: ☒ 1TA AUTO/MAN ☒ 1TB AUTO/MAN	
11. ☒ Close 1TA SU 6.9 KV FDR.	
12. ☐ Verify 1TA NORMAL 6.9 KV FDR opens.	☐ Open 1TA NORMAL 6.9 KV FDR.
13. ☒ Close 1TB SU 6.9 KV FDR.	
14. ☐ Verify 1TB NORMAL 6.9 KV FDR opens.	☐ Open 1TB NORMAL 6.9 KV FDR.
15. Place the following transfer switches to MAN: ☒ MFB1 AUTO/MAN ☒ MFB2 AUTO/MAN	
16. ☒ Close E1 ₁ MFB1 STARTUP FDR.	
17. ☐ Verify N1 ₁ MFB1 NORMAL FDR opens.	☐ Open N1 ₁ MFB1 NORMAL FDR.
18. ☒ Close E2 ₁ MFB2 STARTUP FDR.	
19. ☐ Verify N2 ₁ MFB2 NORMAL FDR opens.	☐ Open N2 ₁ MFB2 NORMAL FDR.
20. ☐ Notify CRS the status of Unit auxiliaries.	
21. ☐ IAAT 1SSH-9 is NOT closed, AND CTP is ≤ 75%, THEN throttle 1SSH-9 to maintain Steam Seal Header pressure 2.5 - 4.5 psig.	

Examiner Note: After the CRS is notified that auxiliaries are transferred (Step 20) and Reactor power has been reduced at least 10% then it's examiner's discretion to proceed to the major event.

This event is complete when Reactor power is lowered by at least 10% and electrical auxiliaries have been transferred, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **2**Event No.: **5&6**

Page 11 of 12

Event Description: **High Vibration on Main Turbine Bearing 11 (R: OATC, SRO)(N: BOP, SRO)**

Applicant's Actions or Behavior

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Enclosure 5.1

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Support Actions During Rapid Unit Shutdown Page 5 of 7

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22. <u> </u> WHEN CTP $\leq$ 65%, THEN place the following in MANUAL and close: <u> </u> 1FDW-53 <u> </u> 1FDW-65	
23. <u> </u> IAAT load is $\leq$ 550 MW _e , THEN perform Steps 24 - 25.	<u> </u> GO TO Step 26.
24. Ensure the following are stopped: <u> </u> 1A MSRH DRN PUMP <u> </u> 1B MSRH DRN PUMP	
25. Place the following in DUMP: <u> </u> 1HD-37 <u> </u> 1HD-52	
26. <u> </u> WHEN CTP is $\leq$ 60%, THEN ensure 1SSH-9 closed.	
27. <u> </u> IAAT load is $\leq$ 450 MW _e , THEN perform Steps 28 - 31.	<u> </u> GO TO Step 32.
28. <u> </u> Verify the 1C CBP operating. (3)	1. <u> </u> Ensure <u>only one</u> CBP is operating. 2. <u> </u> GO TO Step 30.
29. Stop the following:  1A CBP <u> </u> 1B CBP	
30. <u> </u> Place the control switch for one shutdown CBP in AUTO.	
31. <u> </u> Ensure CBP LOAD SHED DEFEAT switch is positioned to a running CBP.	

This event is complete when Reactor power is lowered by at least 10% and electrical auxiliaries have been transferred, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**Scenario No.: **2**Event No.: **5&6**

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Event Description: **High Vibration on Main Turbine Bearing 11 (R: OATC, SRO)(N: BOP, SRO)**

Applicant's Actions or Behavior

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Enclosure 5.1

AP/1/A/1700/029

Support Actions During Rapid Unit Shutdown Page 7 of 7

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32. ☐ WHEN $\leq 400 \text{ MW}_e$, {5} THEN stop the following pumps: ☐ 1D1 HTR DRN PUMP ☐ 1D2 HTR DRN PUMP	
33. ☐ WHEN $\leq 325 \text{ MW}_e$ THEN verify $\leq$ two HWP's operating.	1. ☒ Stop one HWP. 2. ☒ Place the idle HWP control switch in AUTO. 3. ☐ Ensure HWP LOAD SHED DEFEAT switch is positioned to a running HWP.
34. ☒ WHEN $\leq 225 \text{ MW}_e$ THEN stop all but one HWP.	
35. ☐ Place control switch for one idle HWP in AUTO.	
36. ☐ Ensure HWP LOAD SHED DEFEAT switch is positioned to a running HWP.	
37. ☐ WHEN CTP DEMAND is $< 20\%$, THEN close the following valves: ☐ 1MS-76 ☐ 1MS-79	
38. ☐ WHEN directed by CRS, THEN EXIT this enclosure	

... END ...

This event is complete when Reactor power is lowered by at least 10% and electrical auxiliaries have been transferred, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, **fire EVENT 7** to initiate a SYI.

CT-1: Restore an AC Electrical Power Source (Safety Function 6: Electrical) prior to escalation to General Emergency (SG1.2)

CT-1 Start Time: _____ **(Blackout)** (Stop Time is on Event 7 page 14)

CT-2: Close 1HP-21 within 15 minutes following Blackout to preclude a LOCA from the RCP seals

CT-2 Start Time: _____ **(Blackout)** (Stop Time is on Event 7 page 4)

Crew/Plant Response:

- Switchyard Isolation occurs
- Main Turbine will trip causing a Reactor trip
- When the Reactor trips, a loss of power will occur due to KHU-2 ELO and CT-1 lockout
- **CRS** will direct the **OATC** to perform IMAs (Rev 3)
- **CRS** will direct the **BOP** to perform a symptom check (**next page**)
- **CRS** will transfer to the Blackout tab (Rev 6) (**Event 7 page 3**)
- One RO will perform Rule 3 for a loss of Main Feedwater only (Rev 5) (**Event 7 page 9**)

3. Immediate Manual Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.1 ☐ Depress REACTOR TRIP pushbutton.	
3.2 ☐ Verify reactor power < 5% FP and lowering.	☐ GO TO Rule 1 (ATWS/Unanticipated Nuclear Power Production).
3.3 ☐ Depress turbine TRIP pushbutton.	
3.4 ☐ Verify <u>all</u> turbine stop valves closed.	☐ Place <u>both</u> EHC pumps in PULL TO LOCK.
3.5 ☐ Verify RCP seal injection available.	☒ IF CC is unavailable, THEN immediately: A. ☐ Stop <u>all</u> RCPs. {10} B. ☐ Notify CRS to initiate AP/25 (Standby Shutdown Facility Emergency Operating Procedure).

Examiner Note: The SSF is not available due to OTS1-1 being out of service.

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

SYMPTOM CHECKThe **CRS** will direct the **BOP** to perform a Symptom Check.

Power Range NIs NOT < 5% Power Range NIs NOT lowering	Rule 1, <i>ATWS/Unanticipated Nuclear Power Production</i>
Any SCM < 0°F	Rule 2, <i>Loss Of SCM</i>
Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, <i>Loss of Main or Emergency FDW</i> Rule 4, <i>Initiation of HPI Forced Cooling</i> (Inability to feed SGs and > 2300 psig, NDT limit reached, or PZR level > 375")
Uncontrolled Main steam line(s) pressure reduction	Rule 5, <i>Main Steam Line Break</i>
CSAE Off-gas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identified SG Tube Leakage > 25 gpm)

Examiner Note: Upon initiation of the Event, there will be a loss of Main Feedwater. After completion of the Symptom Check, the crew will perform Rule 3 due to Loss of MFW only.

The **BOP/OATC** will inform the **CRS** that "there are no symptoms to report, performing Rule 3 for Loss of Main Feedwater only" (**Event 7 page 9**)

The **CRS** will review the Subsequent Actions Tab Parallel Actions Page and transfer to the BO Tab. (**next page**)

Subsequent Actions

EP/1/A/1800/001 00

Parallel Actions

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CONDITION	ACTIONS	
1. PR NIs $\geq$ 5% FP OR NIs NOT lowering	GO TO UNPP tab.	UNPP
2. <u>All</u> 4160V SWGR de-energized {13}	GO TO Blackout tab.	BLACKOUT

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

**Blackout
Parallel Actions**

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CONDITION	ACTIONS	
1. Seal Injection <u>and</u> CC NOT available.	1. IF SSF is available, THEN initiate AP/25 (Standby Shutdown Facility Emergency Operating Procedure).	SSF
	2. Notify Unit 2 to immediately perform Encl 5.42 (PSW Power and Pump Alignment). (PS)	PSW

Examiner Note: When U2 is told to perform Enc. 5.42, a booth instructor will enter the Sim. Once step 3 is reached, a crew update is used to announce that "PSW power is NOT available".

2. CETCs > 1200°F	GO TO ICC tab.	ICC
3. RCS leakage > 160 gpm with letdown isolated OR SGTR > 25 gpm	Notify plant staff that Emergency Dose Limits are in affect using PA system.	EDL
4. Individual available to make notifications	- Announce plant conditions using PA system. - Notify SM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification/Reportability Evaluation).	NOTIFY
5. Within 56 minutes of the loss of power.	Ensure the following: — Turn off lights and open <u>both</u> doors to Unit 1 & 2 Unit board area. — Turn off lights and open <u>both</u> doors to Unit 1 Vertical board area. — Turn off lights and open <u>both</u> doors to Unit 2 Vertical board area. — Open OAC Room Doors.	CR COOLING

Booth Cue: If asked as U2 to perform Parallel Actions Page steps for turning off lights and opening doors in the control room, respond that "U2 will perform the parallel action steps regarding lights and doors."

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

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Blackout

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

- When SSF breaker transfer is performed, the following occurs in the Main Control Room:
 - Control Board WR Tc indication fails high.
 - Control Board WR Th indication remains unaffected.
 - WR Th indication feeding ICS fails high.
 - Statalarm 1SA-18/D-6 (RC System Approaching Saturation Conditions) will illuminate.
- Rule 4 (Initiation of HPI Forced Cooling) is suspended while in this tab.

1. ☐ Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete.

Examiner Note: One RO will perform Rule 3 following the Symptom Check. (page 9)

2. ☐ Verify EFDW feeding SG(s).

NOTE

The intent of this step is to ensure that if EFDW is lost after the SSF Operator left the Control Room he/she now knows both SSF ASW and RCMU are required.

☐ **IF** SSF is available,
THEN ensure SSF Operator is aware that SSF ASW feed and RCMU are needed.

3. ☐ Direct RO to perform Enc1 5.45 (PSW Feed and RCP Seals) to establish RCP seals.

Examiner Note: The RO not performing Rule 3 will perform Enc. 5.45 (page 12)

4. ☒ Ensure closed:
- ☐ 1RC-7
 - ☐ 1HP-5
 - ☐ 1HP-21

Close 1HP-21
CT-2 Stop Time: _____ (<15 min)

NOTE

The intent of this step is to allow progression through the Blackout tab. If an operator other than the one working with the CRS in the Blackout tab is available, then that operator should run Enc1 5.38 (Restoration of Power).

5. ☐ **IAAT** two ROs are available to perform Control Room actions,
THEN notify one RO to perform Enc1 5.38 (Restoration of Power).

Examiner Note: The RO that completes Rule 3 will perform Enc. 5.38 (page 13)

6. Verify both:
- ☐ Blackout exists on all three units.
 - ☐ PSW Power **NOT** available.

☐ **GO TO** Step 8.

Examiner Note: Blackout is only on Units 1 and 2

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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 Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

Blackout

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7. ☐ Dispatch <u>one</u> AO to perform Encl 5.32 (Load Shed of Inverters During SBO). (PS)	
8. ☐ Verify <u>any</u> SG being fed from Emergency FDW, SSF ASW or PSW.	☐ GO TO Step 10.
9. ☐ GO TO Step 13.	
13. ☐ IAAT both SSF ASW and EFDW are feeding SG(s), THEN coordinate with SSF Operator and close the following: ☐ 1FDW-315 ☐ 1FDW-316	
14. ☐ IAAT TBVs are needed for SG steaming, AND <u>either</u> of the following exists: ☐ PSW power unavailable AND blackout on <u>all</u> 3 units ☐ TBVs become unavailable THEN dispatch two operators to perform Encl 5.24 (Operation of the ADVs). (PS)	Booth Cue: acknowledge the request to perform Encl. 5.24

NOTE

- If feeding with PSW, Encl 5.45 (PSW Feed and RCP Seals) provides feed instructions.
- Both SSF ASW and PSW may be feeding at this point. If EFDW and SSF ASW are both feeding at this point, IAAT Step 13 should be performed first.

- | | |
|--|--|
| 15. ☐ Verify RCS temperature $\geq 550^{\circ}\text{F}$. | 1. ☐ IF feeding with EFDW,
THEN feed <u>and</u> steam available SGs, as necessary, to stabilize RCS P/T using TBVs <u>or</u> ADVs. |
| 16. ☐ Verify feeding SGs with EFDW. | 1. ☐ IF feeding with SSF ASW,
THEN perform the following: |

Examiner Note: The SG is being fed by the TD EFWP.

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

Blackout

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17. <u>Feed available</u> SGs as necessary to stabilize RCS P/T in bands prescribed by Rule 7 (SG Feed Control).	Examiner Note: Rule 7 starts on page 15.
18. Verify <u>any</u> : ___ PSW power available ___ Blackout on < 3 units	1. ___ Notify ADV operator to throttle ADVs to control <u>and</u> maintain SG pressure at 1010 psig. 2. ___ GO TO Step 20.

Booth Cue: If asked, acknowledge request to report to ADVs (will not be aligned)

19. ___ Verify TBVs available.	___ Notify ADV operator to throttle ADVs to control <u>and</u> maintain SG pressure at 1010 psig.
20. ___ Verify <u>both</u> SSF ASW <u>and</u> PSW Pumps are operating.	___ GO TO Step 24.

Blackout

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24. ___ IAAT <u>both</u> SSF RCMU, <u>AND</u> PSW HPI are supplying RCP seals, THEN perform Steps 25 - 26.	___ GO TO Step 27.

Booth Cue: If asked, Unit 2 can perform AP/35 (Loss of Spent Fuel Cooling)

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

Blackout

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27. <u>IAAT both:</u> <u>PSW Booster and/or Primary Pump(s) running</u> <u>Unit 1 is NOT using PSW for SG feed, PSW RCP seals, or HPI pump motor cooling</u> THEN notify Unit 2 that PSW Booster Pump and PSW Primary Pump are NO longer required in Unit 1.	
28. <u>IAAT EFDW is being used to feed SGs,</u> <u>AND both of the following:</u> <u>SSF is NOT available to feed SGs</u> <u>PSW is NOT available to feed SGs</u> THEN notify TSC (x-3715) to prepare for loss of EFDW as follows: <u>Dispatch personnel to perform Unit 1 EOP Encl 5.42 (Alignment of Portable Pump to Feed SGs).</u> <u>Notify personnel performing Unit 1 EOP Encl 5.42 to align to 2PSW-29.</u> <u>Dispatch personnel to perform Unit 1 EOP Encl 5.43 (Operation of Portable Pump to Feed SGs).</u> <u>Call in additional personnel to assist in performing the enclosures.</u>	

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

Blackout

EP/1/A/1800/001 0B

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE

If adequate SCM does **NOT** exist when power is restored and transition to Step 197 becomes applicable, transition should proceed without transfer to LOSCM tab, however, Rule 2 (Loss of SCM) becomes applicable.

29. **IAAT** all the following exist:

- Power is restored to any 4160V Bus (1TC, 1TD, or 1TE)
- SG feed is being supplied by an installed source (EFDW, PSW, SSF ASW)
- PSW cooldown is **NOT** in progress

THEN GO TO Step 197.

Examiner Note: Electrical power will be restored by performing Encl. 5.38 (page 13) utilizing KHU-1 manually aligned to CT-4. When power is restored, the lights will turn back on in the Control Room (simulator).

Examiner Note: The CRS may start over in the EOP when electrical power is restored and re-perform IMAs / Symptom Check and then transfer to Subsequent Actions. Either path is acceptable.

197. Initiate AP/11 (Recovery from Loss of Power).198. Verify SSF RCMU supplying RCP seals. **GO TO** Step 200.200. Verify EFDW supplying SG feed. **GO TO** Step 202.201. **GO TO** Step 211.211. Verify both SGs are intact. **GO TO** Step 221.212. Verify 1B SG was isolated for asymmetric cooldown. **GO TO** Step 221.

Examiner Note: The event is complete when the SRO transfers to the Subsequent Actions tab (page 21), at the discretion of the Lead Examiner.

221. **WHEN** SCM in both loops is $> 0^{\circ}\text{F}$, **THEN GO TO** Subsequent Actions tab.

Examiner Note: Subsequent Actions tab parallel actions page will direct the initiation of AP/11 (page 18).

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

Rule 3
Loss of Main or Emergency FDW

EP/1/A/1800/001 0L
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. Verify loss of MFDW and/or EFDW was due to <u>any</u> of the following: ___ Turbine Building Flooding ___ Actions taken to raise SG level due to Turbine Building Flooding	___ GO TO Step 3.
2. ___ EXIT this Rule.	
3. ___ IAAT NO SGs can be fed with FDW (Main/CBP/Emergency/PSW), AND <u>any</u> of the following exist: ___ RCS pressure reaches 2300 psig OR NDT limit ___ Pzr level reaches 375" [340" acc] THEN PERFORM Rule 4 (Initiation of HPI Forced Cooling).	
4. ___ Start operable EFDW pumps, as required, to feed <u>all intact</u> SGs.	
5. ___ Verify <u>any</u> EFDW pump operating.	___ GO TO Step 7.
6. ___ GO TO Step 38.	
NOTE	
Manual operation may be desired to maintain SG acc levels if degraded containment exists.	
38. ___ IAAT an EFDW valve CANNOT control in AUTO, OR manual operation of EFDW valve is desired to control flow/level, THEN perform Steps 39 - 43.	___ GO TO Step 44.
39. ___ Place EFDW valve in MANUAL.	___ GO TO Step 42.
40. ___ Control EFDW flow with EFDW valve in MANUAL.	___ GO TO Step 42.
41. ___ GO TO Step 44.	

Examiner Note: Steps 39 and 40 are Verifiable Action Steps which are required due to 1FDW-315 being failed closed while in AUTO.

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

Rule 3
Loss of Main or Emergency FDW

EP/I/A/1800/001 0L
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
44. __ Verify <u>any</u> SCM $\leq$ 0°F.	<u>CAUTION</u> ATWS events may initially require throttling to prevent exceeding pump limits and additional throttling once the Rx is shutdown to prevent overcooling.  IF overcooling, OR exceeding limits in Rule 7 (SG Feed Control), THEN throttle EFDW, as necessary.
45. __ IAAT Unit 1 EFDW is in operation, THEN initiate Encl 5.9 (Extended EFDW Operation).	Examiner Note: EOP Enc. 5.9 starts on the next page.
46. __ WHEN directed by CRS, THEN EXIT.	

... END ...

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

OP/1/A/1800/001 Encl. 5.9 Rev 02

**Enclosure 5.9
Extended EFDW Operation**

EP/1/A/1800/001 0M
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ Monitor EFDW parameters on EFW graphic display.	
2. ☐ IAAT UST level is < 4', THEN GO TO Step 120.	
3. ☐ IAAT feeding <u>both</u> SGs with one MD EFDWP is desired, THEN perform Steps 4 - 7.	☐ GO TO Step 8.
8. Perform as required to maintain UST level > 7.5': ☐ Makeup with demin water. ☐ Place CST pumps in AUTO.	
9. ☐ IAAT <u>all</u> exist: ☐ Rapid cooldown NOT in progress ☐ MD EFDWP operating for each <u>available</u> SG ☐ EFDW flow in <u>each</u> header < 600 gpm THEN place 1 TD EFDW PUMP switch in PULL TO LOCK.	
10. ☐ Verify 1 TD EFDW PUMP operating.	☐ GO TO Step 12.
11. ☐ Start TD EFDWP BEARING OIL COOLING PUMP.	

NOTE

- Loss of the condensate system for ≥ 25 minutes results in cooling down to LPI using the ADVs. If **NO** HWP's are operating, continuing this enclosure to restore the condensate system is a priority unless the CR SRO deems EOP activities higher priority. The 25 minute criterion is satisfied when a HWP is started and 1C-10 is 10% open.
- If the condensate system is operating, the remaining guidance establishes FDW recirc, monitors and maintains UST, and transfers EFDW suction to the hotwell if required.

12. ☐ Notify CR SRO to set priority based on the NOTE above and EOP activities.

Examiner Note: Based upon the Note above, the CRS will direct the RO to put this enclosure down for now. Condensate can't be restored within 25 minutes.

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.45

PSW Feed and RCP Seals

EP/1/A/1800/001 0Q (Rev 8)

EP/1/A/1800/001 0Q

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ Verify Unit 2 EOP Encl 5.42 (PSW Power and Pump Alignment) in progress <u>or</u> complete.	☐ Notify Unit 2 to perform Unit 2 EOP Encl 5.42 (PSW Power and Pump Alignment). (PS)
2. ☐ WHEN PSW 4KV POWER AVAILABLE light is lit, THEN continue.	☐ IF PSW power CANNOT be made available, THEN EXIT this enclosure.

Examiner Note: The PSW 4KV Power Available light will not be lit due to the lockout of PSW switchgear B6T and B7T.

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.38
Restoration of Power

EP/1/A/1800/001 OP (Rev 01)

EP/1/A/1800/001 OP

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ Verify power has been restored.	☐ GO TO Step 3.
2. ☐ EXIT this enclosure.	
3. ☒ Place 1HP-31 in HAND and reduce demand to 0.	
4. ☐ Close 1HP-21.	

Examiner Note: 1HP-21 was closed by step 4 of the Blackout Tab on page 4 of this guide.

5. Verify <u>any</u> of the following energized: ☐ MFB1 ☐ MFB2	☐ GO TO Step 8.
8. ☐ Verify CT-1 indicates ≈ 4160 volts.	☐ GO TO Step 18.
18. ☐ Verify <u>both</u> Standby Bus #1 and Standby Bus #2 are <u>de</u> -energized (0 volts).	1. ☐ IF Standby Bus #1 is energized, THEN notify Unit 1 CRS that Standby Bus #1 is energized. 2. ☐ Notify CRS in <u>all other units where a blackout exists</u> of the status of Standby Bus #1 and Standby Bus #2. 3. ☐ GO TO Step 32.
19. ☐ Verify <u>both</u> Keowee units operating.	1. Emergency start Keowee units: ☐ KEOWEE EMER START CHANNEL A ☐ KEOWEE EMER START CHANNEL B 2. ☐ IF NO Keowee units are operating, THEN perform the following:
20. Verify <u>both</u> Keowee units in Oconee Control (statalarms on): ☐ UNIT 1 OCONEE CONTROL (2SA-17/E-1) ☐ UNIT 2 OCONEE CONTROL (2SA-18/E-1)	☒ Notify Keowee Operator to place <u>both</u> Keowee units Master Transfer switches to remote.

Examiner Note: Only KHU-1 is operating.

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.38
Restoration of Power

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
21. __ Verify <u>both</u> Keowee units operating.	1. __ IF UNIT 1 EMER FDR ACB 3 is closed, AND Unit 1 Keowee is NOT operating, THEN open UNIT 1 EMER FDR ACB 3. 2. __ IF UNIT 2 EMER FDR ACB 4 is closed, AND Unit 2 Keowee is NOT operating, THEN open UNIT 2 EMER FDR ACB 4.								
22. Ensure <u>one</u> of the following is closed for an operating Keowee unit: <table><tr><td>✓</td><td>Unit 1</td><td>✓</td><td>Unit 2</td></tr><tr><td></td><td>UNIT 1 EMER FDR ACB 3</td><td></td><td>UNIT 2 EMER FDR ACB 4</td></tr></table>	✓	Unit 1	✓	Unit 2		UNIT 1 EMER FDR ACB 3		UNIT 2 EMER FDR ACB 4	Examiner Note: This step aligns overhead Keowee unit to the underground power path. CT-1 Stop Time: _____
✓	Unit 1	✓	Unit 2						
	UNIT 1 EMER FDR ACB 3		UNIT 2 EMER FDR ACB 4						
23. __ Verify 4160 volt power has been restored to the MFB.	__ GO TO Step 25.								
24.  GO TO Step 35.									
35. Verify <u>any</u> of the following energized: __ 1TC __ 1TD __ 1TE	__ GO TO Step 67.								
36. __ Notify Unit 1 CRS of status of 4160V SWGR.									
37. __ EXIT this enclosure.									

... END ...

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

Examiner Note: Rule 7 contains guidance for MFW/EFW feed rates as well as desired SG levels. This procedure doesn't contain signoffs.

Rule 7
SG Feed Control

EP/1/A/1800/001 0L
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NOTE

Feed Rates listed in Table 1 are maximum allowable feed rates. Manual control of feed rates may be required for plant stabilization and are dependent on decay heat, RCP operation, and other factors. Feed rates for low decay heat conditions will be much lower and are determined by observing RCS indications for overcooling.

Table 1
Maximum Feed Rates When All SCMs are > 0°F

SG Condition	Flow Instrument	Maximum Feed Rate
Dry SG w/o Heat Transfer	EFDW flow indicator	100 gpm to <u>affected</u> SG
	S/U FDW flow indicator	0.05 x 10 ⁶ lbm/hr to <u>affected</u> SG
	SSF ASW flow indicator	100 gpm <u>total</u> to Unit 1
	PSW Moore Controller process indication	190 gpm to <u>affected</u> SG
Non-dry SG OR Dry SG with Heat Transfer	EFDW flow indicator	1000 gpm per header
	S/U FDW flow indicator	0.5 x 10 ⁶ lbm/hr per header
	SSF ASW flow indicator	500 gpm <u>total</u> to Unit 1
	PSW Moore Controller process indication	225 gpm per SG maximum when feeding <u>both</u> SGs on Unit 1 425 gpm maximum when feeding a <u>single</u> SG on Unit 1
SSF Event* occurred while in MODE 1 <u>or</u> 2 with TD EFDWP OR alternate unit providing SG feed	EFDW flow indicator OR S/U FDW flow indicator	• Feed as needed to maintain RCS pressure band of 1950 - 2250 psig (1600 - 2200 psig if notified by SSF of PZR Solid Ops Control Band) • WHEN RCS pressure band is established, THEN feed to establish RCS Narrow Range T_c 550 - 555°F.

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

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SG Feed ControlEP/1/A/1800/001 0L
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Table 2
Feed Rates To Be Established When Any SCM is $\leq 0^\circ\text{F}$ and Rapid Cooldown NOT in Progress

NOTE

After initial feed rates are established, flow may be throttled to control cooldown but SG levels must continue to rise until LOSCM setpoint is reached. This note does **NOT** apply to SSF Event.

FDW source	Flow Instrument	Initial Feed Rates	
Emergency FDW	EFDW total flow indicator	1 SG	450 gpm
		2 SGs	300 gpm each
	S/U FDW flow indicator	1 SG	0.23×10^6 lbm/hr
		2 SGs	0.15×10^6 lbm/hr each
Main FDW	S/U FDW flow indicator	1 SG	0.33×10^6 lbm/hr
		2 SGs	0.22×10^6 lbm/hr each
SSF ASW AND NO SSF Event*	SSF ASW flow indicator	400 gpm <u>total</u> to Unit 1	

NOTE

SSF events, feeding with PSW, and LOCAs are **NOT** postulated at the same time. LOSCM during SSF event or when feeding with PSW is caused by overcooling. Cooldown while on SSF RC Makeup must be controlled due to capability of the SSF RC Makeup Pump. This note applies to SSF events and feeding from PSW.

EFDW AND SSF Event* that occurred while in MODE 1 or 2	EFDW flow indicator OR S/U FDW flow indicator	- Feed as needed to maintain RCS pressure band of 1950 - 2250 psig (1600 - 2200 psig if notified by SSF of PZR Solid Ops Control Band) WHEN RCS pressure band is established, THEN feed to establish RCS Narrow Range T_c 550 - 555°F.
PSW	PSW control valves Moore Controller process indication	PSW enclosure provides guidance on controlling RCS temperature and pressure.

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

Rule 7
SG Feed ControlEP/1/A/1800/001 0L
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Table 3 Emergency FDW Pump and Header Maximum Flow Limits			
		EFDW flow indicator	S/U FDW flow indicator
MDEFDWP	(suction from HW)	440 gpm/pump	0.22 x 10 ⁶ lbm/hr
	(suction from UST)	600 gpm/pump	0.30 x 10 ⁶ lbm/hr
TDEFDWP (any suction source)		950 gpm	0.45 x 10 ⁶ lbm/hr
Emergency FDW Header Flow		1000 gpm	0.5 x 10 ⁶ lbm/hr

Table 4 SG Level Control Points			
<u>NOTE</u>			
Flow may be throttled as necessary to control cooldown during the approach to the SG Level Control Point.			
Plant Condition	Main FDW Pump	EFDW Pump	SSF ASW Pump or PSW Pump
<u>All</u> SCMs > 0°F AND <u>any</u> RCP on	25" - 35" [55" - 65" acc] S/U level	30" [60" acc] XSUR (use MFDW setpoint if feeding via S/U CVs)	30" [60" acc] XSUR
<u>All</u> SCMs > 0°F AND <u>all</u> RCPs off	50% [50% acc] Operating Range	240" [270" acc] XSUR (use MFDW setpoint if feeding via S/U CVs)	240" [270" acc] XSUR
<u>Any</u> SCM = 0°F AND NO SSF Event*	95% [95% acc] Operating Range	LOSCM setpoint (Band: +9"/-6") (Turn-on code "EFW" or Per Table 5)	LOSCM setpoint (Band: +9"/-6") (Turn-on code "EFW" or Per Table 5)
<u>Any</u> SCM = 0°F AND SSF Event*	N/A	240" [270" acc] XSUR	Per AP/25
<u>Any</u> SCM = 0°F AND SSF Event AND feeding with PSW	N/A	N/A	Per PSW Enclosure
Superheated with CETCs ≤ 1200°F	95% [95% acc] Operating Range	LOSCM setpoint (Band: +9"/-6") (Turn-on code "EFW" or Per Table 5)	LOSCM setpoint (Band: +9"/-6") (Turn-on code "EFW" or Per Table 5)

SSF Event* - SSF activated per AP/25 with SSF RC Makeup required. (31)

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

SUBSEQUENT ACTIONS – PARALLEL ACTIONS PAGE

CONDITION	ACTIONS	
1. PR NIs $\geq$ 5% FP OR NIs NOT lowering	GO TO UNPP tab.	UNPP
2. <u>All</u> 4160V SWGR de-energized (13)	GO TO Blackout tab.	BLACKOUT
3. <u>Core</u> SCM indicates superheat	GO TO ICC tab.	ICC
4. <u>Any</u> SCM = 0°F	GO TO LOSCM tab.	LOSCM
5. <u>Both</u> SGs intentionally isolated to stop excessive heat transfer	GO TO EHT tab.	LOHT
6. Loss of heat transfer (including loss of all Main and Emergency FDW)	GO TO LOHT tab.	
7. Heat transfer is <u>or</u> has been excessive	GO TO EHT tab.	EHT
8. Indications of SGTR $\geq$ 25 gpm	GO TO SGTR tab.	SGTR
9. Turbine Building flooding NOT caused by rainfall event	GO TO TBF tab.	TBF
10. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	ES
11. Valid ES actuation has occurred <u>or</u> should have occurred	Initiate Encl 5.1 (ES Actuation).	ES
12. Power lost to <u>all</u> 4160V SWGR and <u>any</u> 4160V SWGR re-energized	- Initiate AP/11 (Recovery from Loss of Power). - IF Encl 5.1 (ES Actuation) has been initiated, THEN reinitiate Encl 5.1.	ROP
13. RCS leakage > 160 gpm with letdown isolated	Notify plant staff that Emergency Dose Limits are in affect using PA system.	EDL
14. Individual available to make notifications	- Announce plant conditions using PA system. - Notify SM to reference the Emergency Classification Procedure <u>and</u> AD-LS-ALL-0006 (Notification/Reportability Evaluation).	NOTIFY

Examiner Note: AP/11 is located on Event 7 Page 21.

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

SUBSEQUENT ACTIONS TAB

EP/1/A/1800/001 00

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 ☐ Verify <u>all</u> control rods in Groups 1 - 7 fully inserted.	1. Open: ☐ 1HP-24 ☐ 1HP-25 2. ☐ Secure makeup to LDST. ⁽⁸⁾ 3. ☐ IF CRDs are energized, THEN: A. ☐ Initiate regulating control rod insertion to the IN LIMIT. B. Dispatch <u>one</u> operator to open 600V CRD breakers: ☐ 1X9-5C (U-1 CRD Norm Fdr Bkr) (U1 Equipment Rm) ☐ 1X1-5C (U1 CRD Alt Fdr Bkr) (T-3/E-27)

EP/1/A/1800/001 00

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.2 ☐ Verify Main FDW in operation.	1. ☒ Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete. 2. ☐ GO TO Step 4.5
4.5 ☐ IAAT Main FDW is operating, AND level in <u>any</u> SG is > 96% on the Operating Range, THEN perform Steps 4.6 - 4.8.	☐ GO TO Step 4.9

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 00

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.9 ☐ IAAT TBVs CANNOT control SG pressure at desired setpoint, AND TBVs NOT intentionally isolated, THEN manually control pressure in <u>affected</u> SGs using <u>either</u> : ☐ TBVs ☐ Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs) (PS)	
4.10 ☐ Verify 1RIA-40 operable with CSAE OFF-GAS BLOWER operating.	☐ GO TO Step 4.12.
4.11 ☐ GO TO Step 4.14.	
4.12 ☐ Verify abnormal RCS leakage existed prior to reactor trip.	☐ GO TO Step 4.14.
4.13 Verify <u>one</u> of the following: ☐ RBNS rising or off-scale high ☐ Primary Waste Tank(s) level rising (Turn-on code "T6 Waste")	1. ☐ Determine if SGTR exists by evaluating: • Total Feedwater flow compared to time since Rx Trip per Encl 5.13 (Total Feedwater Flow Required to Match NSSS Heat) • SG level mis-match 2. ☐ IF SGTR identified ≥ 25 gpm, THEN GO TO SGTR tab. 3. ☐ IF SGTR identified < 25 gpm, THEN initiate AP/31 (Primary to Secondary Leakage).
4.14 Verify <u>both</u> are closed: ☐ 1MS-17 ☐ 1MS-26	☒ Dispatch an operator with Encl 5.29 (MSRV Locations) to verify <u>all</u> MSRVs have reseated.

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

Examiner Note: The CRS is notified to initiate AP/11 by the Subsequent Actions tab parallel actions page on **Event 7 Page 18.**

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	AP/ 1 /A/1700/011
	Revision No.
	065

AP/**1**/A/1700/011

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1. Entry ConditionsPower lost to 1TC, 1TD, and 1TE and any 4160V SWGR (1TC, 1TD, or 1TE) re-energized.**2. Automatic Systems Actions**

None

3. Immediate Manual Actions

None

4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 ☐ Announce AP entry using PA System.	
4.2 ☐ IAAT <u>all</u> exist: ☐ 1KI energized ☐ Pzr level > 80" [180" acc] ☐ Pzr heaters are desired THEN ensure Pzr heaters in AUTO.	
4.3 ☐ Verify load shed of inverters was performed per Unit 1 EOP Encl (Load Shed of Inverters During SBO). {25}	☐ GO TO Step 4.9.

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

AP/1/A/1700/011

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.9 Verify load shed has initiated as indicated by <u>either</u> of the following statalarms on: ___ 1SA-15/D-4 (EL LOAD SHED CHNL A LOGIC INITIATE) ___ 1SA-14/D-4 (EL LOAD SHED CHNL B LOGIC INITIATE)	___ GO TO Step 4.11.
4.10 ___ Verify load shed is complete as indicated by LOAD SHED COMPLETE on <u>any</u> ES Channel (Channel 1 or 2).	1. ___ Stop <u>all</u> HDPs. 2. ___ Stop RB Purge fan. 3. ___ IF Unit 1 MFB is receiving power through CT-4 <u>or</u> CT-5, THEN:

AP/1/A/1700/011

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.11 Verify closed: ___ 1TC INCOMING FDR BUS 1 ___ 1TC INCOMING FDR BUS 2 ___ 1TD INCOMING FDR BUS 1 ___ 1TD INCOMING FDR BUS 2 ___ 1TE INCOMING FDR BUS 1 ___ 1TE INCOMING FDR BUS 2	1. ___ Notify CRS to have Maintenance investigate and repair. 2. ___ Continue.
4.12 ___ Verify 1SA-15/E-6 (EL SWYD ISOLATION CONFIRMED CHNL A LOGIC) is <u>OFF</u> .	___ GO TO Step 4.15.
4.13 ___ Verify 1SA-14/E-6 (EL SWYD ISOLATION CONFIRMED CHNL B LOGIC) is <u>OFF</u> .	___ GO TO Step 4.15.
4.14 ___ GO TO Step 4.17.	

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 2

Event No.: 7

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Event Description: **SYI (MT trip, CT-1 LO, KHU-2 ELO) (M: ALL)**

Applicant's Actions or Behavior

AP/1/A/1700/011

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.15 ☐ Verify <u>any</u> Oconee unit receiving power from its normal source (1T, 2T, 3T).	☐ GO TO Step 4.17.

NOTE

Any Oconee unit receiving power from its normal source (1T, 2T, 3T) with the AUTO/MAN transfer switches for either 6900V or 4160V switchgear in AUTO could rapid transfer from the normal to the startup source out of sync.

4.16 Place transfer switches in MAN for all Oconee units receiving power from the normal source (1T, 2T, 3T):

✓ U1	✓ U2	✓ U3	Transfer Switch
☐	☐	☐	MFB1 AUTO/MAN
☐	☐	☐	MFB2 AUTO/MAN
☐	☐	☐	TA AUTO/MAN
☐	☐	☐	TB AUTO/MAN

4.17 Verify load shed was initiated as indicated by either of the following statalarms on:
☐ 1SA-15/D-4 (EL LOAD SHED CHNL A LOGIC INITIATE)
☐ 1SA-14/D-4 (EL LOAD SHED CHNL B LOGIC INITIATE)

☐ **GO TO** Step 4.22.

4.18 ☐ Verify ES has occurred.

☐ **GO TO** Step 4.20.

4.20 ☐ Simultaneously press RESET on both of the following pushbuttons to reset Main Feeder Bus Monitor Panel Load Shed Circuitry:

- MFB UNDERVOLTAGE CHANNEL 1 RESET
- MFB UNDERVOLTAGE CHANNEL 2 RESET

This event is complete when the SRO transfers to the Subsequent Actions tab, or as directed by the Lead Examiner.

CRITICAL TASKS

- CT-1** Restore an AC Electrical Power Source (Safety Function 6: Electrical) prior to EAL escalation to General Emergency (SG1.2) (**CT-1 Start Time Event 7 page 1 / Stop Time Event 7 page 14**)

Reference	EOP Enclosure 5.38 (Restoration of Power)
Critical Task Methodology	Steps directly result in the restoration of a Safety Function (#6 Electrical) prior to exceeding the criteria for GE (SG 1.2)
Initiating Cue	Blackout occurs
Performance Feedback	The Battery discharge voltage lowers constantly until power is restored. The Control Batteries have a 1-hr rating, and discharge volts will reach EAL SG 1.2 criteria in 1 hour, if power is not restored
Success Path	The correct performance of EOP Enclosure 5.38 (Restoration of Power)
Measurable Performance Standard	Observable action taken by one crew member. Success or failure is evident to the entire crew based upon reaching EAL upgrade to GE.
Preferred Boundary Condition	EAL SG 1.2 criteria not met. Conditions are failure to power SSF and PSW (met), and battery volts <105 VDC (will reach in 1 hour)

- CT-2** Close 1HP-21 within 15 minutes following Blackout to preclude a LOCA from the RCP seals. (**CT-2 Start Time Event 7 page 1 / Stop Time Event 7 page 4**)

Reference	EOP Blackout tab
Critical Task Methodology	EOP directed action that is essential to the event's overall mitigation strategy
Initiating Cue	Loss of Electrical Power causing loss of HPI SI and CC flow
Performance Feedback	If the crew fails to perform the required action, the RCPs will develop Upper Seal Failures resulting in a SB LOCA.
Success Path	The correct performance of EOP Blackout tab
Measurable Performance Standard	Observable action taken by one crew member. Success or failure is evident to the entire crew based on the development of RCP seal leaks.
Preferred Boundary Condition	Threshold which results in a change to the mitigation strategy by requiring a transition to the LOSCM tab instead of Subsequent Actions.

SAFETY: Take a Minute			
UNIT 0 (CRS)			
SSF Operable: No PSW Operable: Yes	KHU's Operable: U1 - OH, U2 - UG	LCTs Operable: 0 (CT-5 OOS)	Fuel Handling: No
UNIT STATUS (CRS)			
Unit 1 Simulator	Other Units		
Mode: 1	Unit 2	Unit 3	
Reactor Power: 50%	Mode: 1	Mode: 1	
Gross MWE: 426	100% Power	100% Power	
RCS Leakage: 0.01 gpm No WCAP Action	EFDW Backup: Yes	EFDW Backup: Yes	
RBNS Rate: 0.01 gpm			
Technical Specifications/SLC Items (CRS)			
Component/Train	OOS Date/Time	Restoration Required Date/Time	TS/SLC #
SSF	Today/0600	7 Days	TS 3.10.1
AMSAC/DSS	Today/0600	7 Days	SLC 16.7.2
Lee/Central Alt Pwr Path	Today/0500	N/A	SLC 16.8.6
Shift Turnover Items (CRS)			
Primary			
• 1RIA-3 and 5 removed from RB • AMSAC/DSS bypassed for maintenance			
Secondary			
• 1SSH-1, 1SSH-3, 1SD-2, 1SD-5, 1SD-140, 1SD-303, 1SD-355, 1SD-356 and 1SD-358 are closed with power supply breakers open per the Startup Procedure for SSF Overcooling Event • U2 is supplying the AS Header • SSF is OOS due to OTS1-1 failure. WCC preparing Protected Equipment package.			
Electrical			
• CT-5 OOS for line maintenance			
Reactivity Management (CRS)			
RCS Boron 43 ppmB	Gp 7 Rod Position: 58% Withdrawn	Batch additions as required for volume control (OATC)	

Facility: **Oconee**

Scenario No.: 3

Op-Test No.: 1

Examiners: _____

Operators: _____ **SRO**

_____ **OATC**

_____ **BOP****Initial Conditions:**

- Rx Power = 100%

Turnover:

- SSF inoperable due to OTS1-1 work
- SASS in Manual
- AMSAC DSS Bypassed

Critical Tasks:

- CT-1: Align the RBES to LPI prior to a loss of suction to the LPI pumps (**Event 8 Page 21**)
- CT-2: Start Control Room Outside Air Booster Fans within 30 minutes of LB LOCA for Control Room Habitability (**Event 8 Page 17**)

Event No.	Malfunction No.	Event Type*	Event Description
0a	EA46BKR_SSF_B2TTF_TRIP		SSF OOS
0b	SASS – TO_MANUAL 1		SASS in Manual
0c	AMSACB1/AMSACB2 1		AMSAC/DSS Bypassed
1	Override	N: BOP, SRO	Swap running CBPs
2	MPI241 MPI251	I: OATC, SRO (MC)	Loop 'B' Tcold Fails Low
3	MP5450	C: BOP, SRO (TS)	1B2 RCP Hi Vibration
4		R: OATC, SRO (MC)	Manual Power Reduction
5	MPS061 1.5	C: BOP, SRO (TS)	1A Letdown Cooler Leak
6	Override	SRO (TS)	BWST punctured at 28 feet by a crane
7	MEL220 MPI290	C: OATC, SRO	1TB Lockout causes a loss of 1A2 and 1B2 RCPs requiring a Manual Reactor Trip, MT fails to automatically trip
8	MPS400 100	M: ALL	LBLOCA: ES Channels 1&2 don't auto actuate, failure of Containment (CT-1) (CT-2)
* (N)ormal / (R)eactivity / (I)nstrument / (C)omponent / (M)ajor / (TS) Tech Spec / (MC)Manual Control			

SCENARIO 3 EVENT SUMMARY

- Event 1:** When the crew takes the shift, the SRO will direct the BOP to start the 1B CBP and secure the 1C CBP in accordance with OP/1/A/1106/002 C Enclosure 4.3 (Swapping CBPs).
- Event 2:** Loop B Tc will fail low causing control rods to withdraw and feedwater demand to lower. The crew should perform Plant Transient Response (PTR) and place the ICS Diamond and FDW Loop Masters in MANUAL. The crew will perform AP/28 (ICS Instrument Failures). ICS will remain in MANUAL for the rest of the scenario.
- Event 3:** The 1B2 RCP will experience high vibration that will require to entry into AP/1/A/1700/016 (RCP Malfunction) to remove the 1B2 RCP from service. **TS 3.4.4 Condition A** applies.
- Event 4:** The crew will perform a manual power reduction to below 70% to remove the 1B2 RCP from service.
- Event 5:** The 1A Letdown Cooler will develop a leak. The SRO will enter AP/1/A/1700/018 (Abnormal Release of Radioactivity) and AP/1/A/1700/002 (Excessive RCS Leakage). AP/02 will isolate the 1A Letdown Cooler. The SRO will enter **TS 3.4.13 Condition A B**.
- Event 6:** An emergency line call will be reported to the control room about a crane puncturing the BWST resulting in a level reduction to ~28 ft. BWST level low alarms will be received in the control room and the CRS will enter **TS 3.5.4 Condition B**.
- Event 7:** Switchgear 1TB will lockout which will cause the loss of two RCPs. The Reactor will fail to automatically trip which will require an operator to manually trip the Reactor. The manual trip will be successful therefore Rule 1 (ATWS/Unanticipated Nuclear Power Production) is not implemented. The Main Turbine fails to automatically trip on the Reactor trip.
- Event 8:** During the performance of the Subsequent Actions tab, a LB LOCA will occur. The Reactor will saturate, requiring the performance of Rule 2 (Loss of SCM). ES Channels 1 and 2 will fail to automatically actuate. Manual actuation is directed by EOP Enclosure 5.1 (ES Actuation). The crew will receive fire, humidity, and RIA alarms which indicate leakage through a RB Containment penetration into the East Pen Room. The SRO will enter either LOSCM or ICC Tab based upon applicability and will transfer to the LOCA CD Tab. The crew will perform EOP Encl. 5.12 to align LPI pump suction from the RBES.

Event 5 , pen and ink change due to Tech Spec revision change.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 1

Page 1 of 3

Event Description: **Swap running CBPs (N: BOP, SRO)**

Applicant's Actions or Behavior

NRC Examiners: this guide highlights **Verifiable Action Steps in Green** and **RNO/Branching Steps in Yellow**.

Event 1 Crew/Plant Response:

- After turnover, the **CRS** will direct the **BOP** to start the 1B CBP and secure the 1C CBP per OP/1/A/1106/002 C Enclosure 4.3 (Swapping CBPs) (Rev 18)

Enclosure 4.3
Swapping CBPs

OP/1/A/1106/002 C
Page 1 of 2

1. Initial Conditions

_____ 1.1 Review Limits and Precautions.

2. Procedure

2.1 Position any of the following:

_____ • **IF** desired ensure closed 1XGC-F1B (1A CBP Aux Oil Pump Bkr)

_____ • **IF** desired ensure closed 1XGC-F1C (1B CBP Aux Oil Pump Bkr)

_____ • **IF** desired ensure closed 1XGC-F1D (1C CBP Aux Oil Pump Bkr)

2.2 Position any of the following:

_____ • **IF** desired ensure Racked-In 1TC-7 (1A CBP Mtr)

_____ • **IF** desired ensure Racked-In 1TD-5 (1B CBP Mtr)

_____ • **IF** desired ensure Racked-In 1TE-5 (1C CBP Mtr)

_____ 2.3 **IF** desired bypass Powdex per OP/1/A/1106/002 (Condensate And FDW System).

Examiner Note: The crew may decide to bypass Powdex per step 2.3, however, it is not required. If they do choose to bypass Powdex, the procedure is located on **Event 1 page 3**.

This event is complete when the 1C CBP switch is in AUTO per Step 2.11, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 1

Page 2 of 3

Event Description: **Swap running CBPs (N: BOP, SRO)**

Applicant's Actions or Behavior

*OP/1/A/1106/002 C Enclosure 4.3***Enclosure 4.3
Swapping CBPs****OP/1/A/1106/002 C**
Page 1 of 2

- NOTE:**
- Number of operating HWP(s) is normally $\geq$ number of operating CBP(s).
 - During FDW system startup an additional HW pump is required prior to starting CBP until Condensate and FDW systems have been filled by high flow flushes.
 - During CBP swap, Main FDW Pump Seal D/P Low alarms may come in momentarily and clear. {10}

____ 2.4 **IF** desired, start standby ____ HWP.____ **2.5** Start desired ____ CBP.____ **2.6** Stop desired ____ CBP.____ 2.7 **IF** desired, stop standby ____ HWP.____ **2.8** Ensure CBP LOAD SHED DEFEAT switch is positioned to running CBP.

____ 2.9 Ensure HWP LOAD SHED DEFEAT switch is positioned to running HWP.

NOTE: If one or two HWP(s) are operating, standby HWP CR switch should be in "AUTO". Required pump maintenance may prevent having a standby pump available.

____ 2.10 **IF** desired, place standby ____ HWP switch in "AUTO"

NOTE: If one or two CBP(s) are operating, standby CBP CR switch should be in "AUTO". Required pump maintenance may prevent having a standby pump available.

____ **2.11** **IF** desired, place standby ____ CBP switch in "AUTO".____ 2.12 **IF** desired, place Powdex in service per OP/1/A/1106/002 (Condensate And FDW System).2.13 **IF** Unit 1 is in Mode 1, perform the following: (T-5-Heater Panel) {9}

- ____ • Ensure closed 1HD-298 (Htr 1F1 Drain Lvl Control Byp)
- ____ • Ensure closed 1HD-303 (Htr 1F2 Drain Lvl Control Byp)
- ____ • Ensure closed 1HD-308 (Htr 1F3 Drain Lvl Control Byp).

Booth Cue: If/When contacted as an AO, report normal starting/running conditions for the CBPs as appropriate.

This event is complete when the 1C CBP switch is in AUTO per Step 2.11, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 3 Event No.: 1 Page 3 of 3
 Event Description: **Swap running CBPs (N: BOP, SRO)**

Applicant's Actions or Behavior

OP/1/A/1106/002 Enclosure 4.19

Enclosure 4.19
 Placing Powdex In/Out Of Service

OP/1/A/1106/002
 Page 1 of 3

1. Initial Conditions

____ 1.1 Review Limits and Precautions.

2. Procedure

____ 2.1 **IF** Powdex must be removed from service perform Section 3 "Removing Powdex From Service".

____ 2.2 **IF** Powdex must be placed in service perform Section 4 "Placing Powdex In Service".

Enclosure 4.19
 Placing Powdex In/Out Of Service

OP/1/A/1106/002
 Page 2 of 3

3. Removing Powdex From Service

3.1 **IF** Powdex is to be removed from service for an extended period of time **AND** condensate system will **NOT** be shutdown, perform the following: {26}

____ 3.1.1 Ensure Moisture Separator Drain Demineralizer System in service. {26}

____ 3.1.2 Notify Chemist that Powdex will be removed from service for an extended period of time so they can evaluate Iron transport data for operation with Powdex bypassed. {26}

____ Person Notified ____ Date

____ **3.2** Ensure Open 1C-14/1C-15 (POL DEMIN BYPASS CONTROL).

____ 3.3 Place a note on Turnover sheet that Powdex has been removed from service.

____ 3.4 Notify Chemist that Powdex has been removed from service.

____ Person Notified ____ Date

Examiner Note: If Powdex is removed from service, it will not be placed back in service during the course of this scenario.

This event is complete when the 1C CBP switch is in AUTO per Step 2.11, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 2

Page 1 of 6

Event Description: **Loop B Tcold Fails Low (I: OATC, SRO)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, fire **EVENT 2 to initiate the Loop B Tcold failure.****Event 2 Plant Response:**

- Loop 1B Tc Dixon meter low at 520°F
- Loop 1B ΔT Dixon meter reads 70°F
- ΔTc meter reads low
- Controlling NR Tave digital display and Chessell read ~570°F
- 1SA-2/B-4 (RC Average Temperature High/Low) in alarm
- 1SA-2/B-5 (RC COLD LEG DIFF TEMP HIGH) in alarm
- 1SA-2/A-12 (ICS Tracking)

Event 2 Crew Response:

When the statalarms are received, the candidates should utilize the Plant Transient Response (PTR) process to stabilize the plant.

- Diagnose the 1B Loop Tcold failure by observing the Loop B Tc Dixon meter on 1UB1
- The OATC will place the Diamond and both FDW Masters in manual and re-ratio Feedwater to stabilize the plant
- The OATC will reduce 1A FDW Master and raise 1B FDW Master (re-ratio) to restore ΔTc within 0+/-2°F

The OATC should:

- Communicate to the CRS the initial alarm followed by reactor power level and direction
- Place the appropriate ICS stations in manual (FDW Masters and Diamond) based upon the failed instrument diagnosis or direction from the CRS

The BOP should:

- Determine if a valid ICS runback exists (it does not)
- Monitor plant response and verify operating limits not exceeded
- When ICS is in manual, remain focused on RCS pressure and inventory

The CRS should:

- Direct the crew to perform PTR
- Refer to AP/1/A/1700/28 (ICS Instrument Failures) (Rev 26) (**next page**)

This event is complete when the CRS reaches Step 6 of AP/28 Section 4A, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 2

Page 2 of 6

Event Description: **Loop B Tcold Fails Low (I: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/028

Duke Energy Oconee Nuclear Station ICS Instrument and Component Failures	Procedure No.
	AP/1/A/1700/028
	Revision No.
	026

AP/1/A/1700/028
Page 1 of 7

1. Entry Conditions

1.1 Both of the following:

- Rx Power > 3%
- Any required Plant Transient Response actions taken and TPB ≤ the pre-transient power level.

AND any of the following:

- A. Median Select or SASS fails to prevent a transient for any of the following controlling instrument failures:
- **RCS Temperature**

AP/1/A/1700/028
Page 5 of 7

4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 <u> </u> Provide control bands as required.	

Examiner Note: The CRS will give the control bands provided in AD-OP-ONS-0002 Attachment 17 (Initial Control Bands) on the **next page.**

This event is complete when the CRS reaches Step 6 of AP/28 Section 4A, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 3 Event No.: 2 Page 3 of 6
 Event Description: **Loop B Tcold Fails Low (I: OATC, SRO)**

Applicant's Actions or Behavior

OCONEE SPECIFIC ABNORMAL OPERATIONS
GUIDANCE

AD-OP-ONS-0002

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ATTACHMENT 17

Page 1 of 1

<< Initial Control Bands >>

NOTE

A Control Band shall be established for any parameters being controlled in manual. Use of Control Bands is governed by AD-OP-ALL-1000, CONDUCT OF OPERATIONS.

1.0 Plant Conditions Stable or TPB < Pre-transient Conditions

1. The following bands are to be established during manual control of plant conditions (as needed) but may be adjusted by the CRS if required:
 - a. NI Power $\pm 1\%$ not to exceed the pre-transient or allowable power. If at the pre-transient or allowable level, band is NI Power - 1%
 - b. Current Tave $\pm 2^\circ\text{F}$
 - c. Current SG Outlet Pressure ± 10 PSIG
 - d. Delta Tc $0^\circ\text{F} \pm 2^\circ\text{F}$

AP/1/A/1700/028

4.2 Initiate the following notifications:

- ___ SM to reference:
 - AD-LS-ALL-0006
(Notification/Reportability Evaluation)
 - Emergency Plan
- ___ STA

4.3 ___ Verify both:

- A power transient $\geq 5\%$ has occurred.
- Plant is stabilized.

___ GO TO Step 4.5.

4.4 ___ Notify Rx Engineering and discuss the need for a maneuvering plan.

Examiner Note: The crew will evaluate Reactor power following PTR. Step 4.3 is a comparison of pre-transient power to post stabilization power.

Booth Cue: If contacted as Rx Engineering to provide a maneuvering plan, acknowledge the request.

This event is complete when the CRS reaches Step 6 of AP/28 Section 4A, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 2

Page 4 of 6

Event Description: **Loop B Tcold Fails Low (I: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/028

AP/1/A/1700/028

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED																																																									
4.5 Use the following, as necessary, to determine the applicable section from table in Step 4.6: • OAC alarm video • OAC display points • Control Board indications • Maintenance assistance, as needed	Examiner Note: The crew identifies the failure using control board indications.																																																									
4.6 GO TO the applicable section per the following table: <table><tr><th>✓</th><th>Section</th><th>Failure</th></tr><tr><td></td><td>4A</td><td>RCS Temperature</td></tr><tr><td></td><td>4B</td><td>Turbine Header Pressure</td></tr><tr><td></td><td>4C</td><td>Controlling NI</td></tr><tr><td></td><td>4D</td><td>Feedwater Loop Flow</td></tr><tr><td></td><td>4E</td><td>RCS Flow</td></tr><tr><td></td><td>4F</td><td>Delta T_c</td></tr><tr><td></td><td>4G</td><td>NR RCS Pressure</td></tr><tr><td></td><td>4H</td><td>Feedwater Valve ΔP</td></tr><tr><td></td><td>4I</td><td>SG Startup Level</td></tr><tr><td></td><td>4J</td><td>Feedwater Temperature</td></tr><tr><td></td><td>4K</td><td>Core Thermal Power</td></tr><tr><td></td><td>4L</td><td>SG Operating Level</td></tr><tr><td></td><td>4M</td><td>ICS Star or Memory Module</td></tr><tr><td></td><td>4N</td><td>SG Outlet Pressure</td></tr><tr><td></td><td>4O</td><td>Turbine Master Trips to Hand for Unknown Reason (3)</td></tr><tr><td></td><td>4P</td><td>TBV Failure (5)</td></tr><tr><td></td><td>4Q</td><td>SG FDW Valves</td></tr><tr><td></td><td>4Q</td><td>MFDWPs</td></tr></table>	✓	Section	Failure		4A	RCS Temperature		4B	Turbine Header Pressure		4C	Controlling NI		4D	Feedwater Loop Flow		4E	RCS Flow		4F	Delta T _c		4G	NR RCS Pressure		4H	Feedwater Valve ΔP		4I	SG Startup Level		4J	Feedwater Temperature		4K	Core Thermal Power		4L	SG Operating Level		4M	ICS Star or Memory Module		4N	SG Outlet Pressure		4O	Turbine Master Trips to Hand for Unknown Reason (3)		4P	TBV Failure (5)		4Q	SG FDW Valves		4Q	MFDWPs	
✓	Section	Failure																																																								
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	4M	ICS Star or Memory Module																																																								
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	4P	TBV Failure (5)																																																								
	4Q	SG FDW Valves																																																								
	4Q	MFDWPs																																																								

This event is complete when the CRS reaches Step 6 of AP/28 Section 4A, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 2

Page 5 of 6

Event Description: **Loop B Tcold Fails Low (I: OATC, SRO)**

Applicant's Actions or Behavior

Section 4A

RCS Temperature Failure

AP/1/A/1700/028 Section 4A

AP/1/A/1700/028

Page 1 of 3

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>Unit Status</u> The controlling RCS Temperature Instrument has failed. Any required Plant Transient Response actions have been taken and TPB is $\leq$ the pre-transient power level.	
<u>NOTE</u> - If T_{ave} instrument circuit failed high, the following may have occurred depending on initial ICS station status: - Unit to TRACK due to Rx Cross Limits - Control Rod insertion - Feedwater flow rising - If T_{ave} instrument circuit failed low, the following may have occurred depending on initial ICS station status: - Unit to TRACK due to Rx Cross Limits - Control Rod withdrawal - Feedwater flow lowers - Feedwater re-ratio	
1. Ensure in HAND: ☒ 1A FDW MASTER ☒ 1B FDW MASTER	Examiner Note: Steps 1 and 2 are verifiable actions that are taken during the performance of PTR.
2. ☒ Ensure DIAMOND in MANUAL.	
3. Notify Maintenance to: ___ Select a valid RCS T_{ave} and Delta T_c input to ICS per AM/1/A/0326/020 (Control of Unit 1 Star Module Signal Selection Function). ___ Investigate and repair the failed RCS temperature instrumentation.	Examiner Note: Enclosure 5.2 is on the next page.
4. ___ PERFORM an instrumentation surveillance using applicable table in Encl 5.2 (ICS Instrument Surveillances) for the failed instrument.	
5. ___ Verify instrumentation surveillance in Encl 5.2 (ICS Instrument Surveillances) was performed satisfactorily as written.	___ Initiate a Surveillance Evaluation in accordance with PT/1/A/0600/001 (Periodic Instrument Surveillance) and

This event is complete when the CRS reaches Step 6 of AP/28 Section 4A, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 3 Event No.: 2 Page 6 of 6
 Event Description: **Loop B Tcold Fails Low (I: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/028 Encl. 5.2 (Table 1 – RCS Temperature)

	COMPONENT	✓	COMPUTER	REQUIRED ACTIONS
SR 3.4.1.2 12 Hours	RCS Pressure, Temperature, and Flow DNB Limits		O1P1888 O1P1889	IF in MODE 1 Steady State Operation, verify RCS loop average temperature: As read on OAC: $\Delta T_c, ^\circ F$ 4 RCP 3 RCP Op Op 0 <580.0 <580.0 1 <580.4 <580.2 2 <580.8 <580.4 3 <581.1 <580.7 4 <581.5 <580.9 5 <581.9 <581.1

Examiner Note: The temperature check requires MODE 1 Steady State conditions which will not be present following the PTR actions. This step would have to be re-evaluated after Steady State has been established for 4 hours.

Section 4A
 RCS Temperature Failure

AP/1/A/1700/028 Section 4A
AP/1/A/1700/028
 Page 3 of 3

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. <u>WHEN</u> notified by Maintenance that a valid RCS T_{ave} and ΔT_c input have been restored to ICS, THEN GO TO OP/1/A/1102/004 A Encl (Placing ICS Stations To Auto).	

• • • END • • •

Examiner Note: ICS will remain in manual for the remainder of the scenario.

This event is complete when the CRS reaches Step 6 of AP/28 Section 4A, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 3&4

Page 1 of 15

Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, fire **EVENT 3 to initiate the 1B2 RCP high vibration.****Event 3 Plant Response:**

- 1SA-9/D-2 (RC Pump Vibration High) will alarm
- OAC 1B2 RCP VIB Alarm

Event 3 Crew Response:

- The CRS will direct the BOP to refer to ARG 1SA-9/D-2
- The CRS will enter AP/1/A/1700/016 (Abnormal Reactor Coolant Pump Operation) (**next page**)

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Page 1 of 3

Alarm Response Guide 1SA-09

D-2

RC

PUMP VIBRATION HIGH

NOTE: This alarm will reflash.**1. Alarm Setpoint**

- 1.1 The PM-2 group sets alarm setpoints.

2. Automatic Action

None

3. Manual Action

- 3.1 Use one of the following means to verify RCP vibration conditions:
- Verify vibration reading on RCP OAC Display Group RCP.
 - **IF** the OAC is unavailable, verify the alarm by referring to RCP Vibration Monitoring Chart Recorder (ON1RCCR0430). (RCP Panel on 6th floor AHU Room)

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 3&4

Page 2 of 15

Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

OP/1/A/6101/009 Rev 52

Alarm Response Guide ISA-09

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D-2

NOTE: Vibration indication of both RCPs in a Loop trending up together without any changes to RCS conditions (Temp/Press) is a symptom of a Vibration Monitor power supply failure. {4}

3.2 **IF** indications of both RCPs in a Loop are trending up together without any changes to RCS conditions (Temp/Press), swap Vibration Monitor power supplies as follows: {4}

3.3 **IF** MODE 1 or 2, initiate AP/1/A/1700/016 (Abnormal Reactor Coolant Pump Operation).

Examiner Note: The CRS will enter AP/1/A/1700/016 (Abnormal RCP Operation)

Duke Energy Oconee Nuclear Station Abnormal Reactor Coolant Pump Operation	Procedure No.
	AP/1/A/1700/016
	Revision No. 038

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 3&4

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Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/016

AP/1/A/1700/016

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

If affected RCP has a seal failure, and immediate trip criteria is **NOT** met, then continue to Section 4A (Seal Failure) to ensure Seal Failure guidance steps are read. Section 4A (Seal Failure) contains steps to quickly secure affected RCP should the need arise.

4.1 ☐ **IAAT** either applies:

- ☐ Any RCP meets or approaches Immediate Trip Criteria of Encl 5.1 (RCP Immediate Trip Criteria)
- ☐ There is an immediate need to stop a RCP at this time

THEN perform Steps 4.2 - 4.12.

☐ **GO TO** Step 4.13.

Examiner Note: The CRS may decide to stop the 1B2 RCP using steps 4.2 – 4.12 which is located on **Event 3 page 9**. The CRS will most likely take the RNO to step 4.13 to go to Section 4B for high vibration. Either path acceptable.

4.13 ☐ Announce AP entry using the PA system.

4.14 ☐ Notify SM to request evaluation by RCP Component Engineer.

4.15 ☐ **IAAT** the failure is identified, **THEN GO TO** the applicable section per the following table:

✓	Section	Failure
☐	4A	Seal Failure
☐	4B	Abnormal Vibration
☐	4C	High <u>or</u> Low RCP Oil Pot Level
☐	4D	Loss of RCP Seal Return
☐	4E	Abnormal RCP Seal Inlet, Bearing <u>or</u> Stator Temperatures

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 3&4

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Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

Section 4B

AP/1/A/1700/016

Abnormal RCP Vibration

Page 1 of 17

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. <u>IAAT either</u> applies: — Any RCP meets Immediate Trip Criteria of Encl 5.1 (RCP Immediate Trip Criteria) — There is an immediate need to stop a RCP at this time THEN perform Steps 2 - 12.	GO TO Step 13. Examiner Note: The CRS may stop the 1B2 RCP via steps 2–12 located on Event 3 page 11. The CRS may take step 13 RNO to continue operation until hearing from SM or Eng. Either path acceptable.
13. <u>Verify</u> RCP vibration indication is available for monitoring in Control Room.	1. <u>Dispatch</u> operator to obtain vibration data from RCP Vibration Monitoring Chart Recorder (ON1RCCR0430) (A-6-602). 2. <u>IF</u> additional assistance is required, THEN contact Maintenance (PM2).
14. <u>Monitor</u> RCS flow for indication of degradation.	
15. <u>Verify all</u> CETCs < 630°F. (Turn-on code "ITC")	1. <u>Print</u> Incore Thermocouple Map using "F2" from OAC screen "ITC". 2. <u>Notify</u> Rx Engineering to analyze core map for potential flow blockage.
16. Monitor RCP parameters for operational abnormalities: — OAC Display: (Turn-on Code "RCP") • Motor bearing temperatures • Seal return temperature • Seal return flow • RCP motor input power	
17. <u>IAAT</u> high vibration exists per Statalarm 1SA-9/D-2 (RC PUMP VIBRATION HIGH), AND vibration continues to rise with the potential to exceed trip criteria, THEN perform Steps 18 - 28.	GO TO Step 29. Examiner Note: This step contains a judgement call regarding potential to exceed trip criteria which is subjective and beyond scope of this guide.

Examiner Note: If the CRS makes the decision to continue with operation by taking the RNO (GO TO Step 29), then the BOOTH will contact the CRS as the SM and report "I've conferred with the RCP Component Engineer and I recommend securing the 1B2 RCP due to potential for exceeding trip criteria".

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 3&4

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Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/016

Section 4B

AP/1/A/1700/016

Abnormal RCP Vibration

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18. __ Verify MODE 1 or 2.	1. __ IF time allows <u>and</u> plant conditions permit starting a previously secured RCP, THEN :

Section 4B

AP/1/A/1700/016

Abnormal RCP Vibration

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19. __ Verify three RCPs will remain operating after <u>affected</u> RCP is tripped.	1. __ IF time allows <u>and</u> plant conditions permit lowering power prior to securing the RCP, THEN :

Examiner Note: Three RCPS (1A1, 1A2, 1B1) will remain operating after the 1B2 RCP is tripped.

20. __ Verify Rx power is $\leq 70\%$ as indicated on <u>all</u> NIs.	1. ☐ Direct an RO to initiate Encl 5.2 (Rapid Power Reduction).
21. __ Verify <u>any</u> SG on Low Level Limits.	2. __ WHEN Rx power is $\leq 70\%$ on <u>all</u> NIs, THEN continue this procedure.
	☐ GO TO Step 24.

Examiner Note: Enclosure 5.2 (Rapid Power Reduction) is located on Event 3 page 7 of this guide.

24. __ Verify FDW masters in Auto.

CAUTION

Total feedwater flow should be maintained constant to prevent changes in core reactivity.

- ☐ Stop affected RCP.
- ☐ Manually adjust FDW masters to achieve desired ΔT_c .
- ☐ GO TO Step 27.

Examiner Note: After the 1B2 RCP is secured, the OATC will manually re-ratio FDW. The 1A FDW Master will be raised to two thirds of the total flow and the 1B FDW Master will be lowered to one third of the total flow to adjust ΔT_c .

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 3 Event No.: 3&4 Page 6 of 15
 Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/016

Section 4B
Abnormal RCP Vibration

AP/1/A/1700/016
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Tech Spec 3.4.4 requires setting a high flux trip $\leq 80.5\%$ within 10 hours. OP/1/A/1102/004 (Operation at Power) Encl 4.3 (Special Instructions for < 4 RCP Operation) will initiate this action. {11}	
27. ☐ Initiate Encl 4.3 (Special Instructions for < 4 RCP Operation) of OP/1/A/1102/004 (Operation at Power).	

Examiner Note: OP/1/A/1102/004 Encl. 4.3 is on Event 3 page 13. TS 3.4.4 Condition A applies and is on Event 3 page 8.

28. Initiate, as needed:
- ___ Notify SM to make required notifications per AD-LS-ALL-0006 (Notification/Reportability Evaluation).
 - ___ Notify Rx Engineering and request a power maneuver plan, if needed.
 - ___ Notify DEC ECC (BA) if load reduction was required.
 - ___ Notify Chemistry to take RCS boron samples on a 1 hour frequency.

NOTE

Operating experience has shown that failure of RC Pump components located internal to the RCS can create loose debris which can lead to fuel clad failures. These type RC Pump failures may cause a rise in RCS radioactivity. {9}

- | | |
|---|--|
| <p>29. ___ Verify 1RIA-57 or 1RIA-58 indications have risen. {9}</p> | <p>☐ GO TO Step 31.</p> |
| <p>31. ___ IAAT an RCP has been shut down for ≥ 3 hours, {8}
 THEN close the <u>associated</u> RCP motor cooler inlet/outlet valve:</p> <ul style="list-style-type: none"> ___ 1LPSW-7&8 (1A1 RCP) ___ 1LPSW-9&10 (1B1 RCP) ___ 1LPSW-13&14 (1A2 RCP) ___ 1LPSW-11&12 (1B2 RCP) | |

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 3&4

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Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/016 Encl. 5.2

Enclosure 5.2
Rapid Power Reduction

AP/1/A/1700/016
Page 1 of 3

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

- This enclosure should be performed by an RO.
- The step to verify ICS in AUTO means that the ICS is capable of responding to a MAXIMUM RUNBACK signal.

1. __ Verify ICS in AUTO.

Examiner Note: The control bands for a manual power reduction come from AD-OP-ONS-0002 Attachment 17 on **Event 3 page 15.**

The OATC will reduce the FDW Masters and insert Control Rods to establish the bands provided by the CRS.

1. ☐ Notify CRS to provide target power level, average power reduction rate, and control bands, as required.

2. ☐ Initiate manual power reduction to $\leq 70\%$.

3. __ WHEN Rx Power $\leq 70\%$ as indicated by all NIs, THEN notify CRS.

4. Stop:

☐ 1E1 HTR DRN PUMP

☐ 1E2 HTR DRN PUMP

5. ☐ GO TO Step 7.

7. __ Verify Rx Power was reduced $\geq 15\%$ within a 1 hour period.

__ GO TO Step 9.

Enclosure 5.2
Rapid Power Reduction

AP/1/A/1700/016
Page 3 of 3

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

8. __ Notify Primary Chemistry to perform Tech Spec SR 3.4.11.2, as required.

9. __ EXIT this enclosure.

... END ...

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 3&4

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Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

TS 3.4.4RCS Loops – MODES 1 and 2
3.4.4

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops – MODES 1 and 2

LCO 3.4.4

Two RCS Loops shall be in operation, with:

- a. Four reactor coolant pumps (RCPs) operating; or
- b. Three RCPs operating and:
 - 1. THERMAL POWER is $\leq$ 75% RTP*; and
 - 2. LCO 3.3.1, "Reactor Protection System (RPS) Instrumentation," Function 1.a (Nuclear Overpower – High Setpoint), Allowable Value of Table 3.3.1-1 is reset for 3 RCPs operating.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of LCO 3.4.4.b not met.	A.1 Reset the RPS to satisfy the requirements of LCO 3.4.4.b.2.	10 hours
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> Requirements of LCO not met for reasons other than Condition A.	B.1 Be in MODE 3.	12 hours

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 3 Event No.: 3&4 Page 9 of 15
 Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

Examiner Note: This is the path taken if the decision was made that there is an immediate need to secure the 1B2 RCP in the body of AP/16.

AP/1/A/1700/016

AP/1/A/1700/016

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.2 ☐ Verify MODE 1 <u>or</u> 2.	1. ☐ Stop <u>affected</u> RCP. 2. ☐ IF NO RCPs operating, AND LPI is providing heat removal, THEN:

AP/1/A/1700/016

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.3 ☐ Verify three RCPs will remain operating after <u>affected</u> RCP is tripped.	1. ☐ Trip Rx. 2. ☐ Stop <u>affected</u> RCPs. 3. ☐ GO TO Step 4.26.

Examiner Note: Three RCPS (1A1, 1A2, 1B1) will remain operating after the 1B2 RCP is tripped.

4.4 ☐ Verify Immediate Trip Criteria met.	1. ☐ IF Rx Power on <u>any</u> NI > 70%, AND time permits reducing power, THEN: A. ☒ Reduce Rx Power ≤ 70% using Encl 5.2 (Rapid Power Reduction). B. ☐ WHEN Rx Power ≤ 70%, THEN GO TO Step 4.6.
--	---

Examiner Note: Enclosure 5.2 (Rapid Power Reduction) is located on **Event 3 page 7 of this guide.**

4.6 ☐ Verify <u>any</u> SG on Low Level Limits.	☐ GO TO Step 4.9.
--	---

This event is complete when the 1B1 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 3 Event No.: 3&4 Page 10 of 15
 Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/016

AP/1/A/1700/016
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.9 ☐ Verify FDW masters in Auto.	CAUTION Total feedwater flow should be maintained constant to prevent changes in core reactivity. 1. ☐ Stop <u>affected</u> RCP. 2. ☐ Manually adjust FDW masters to achieve desired ΔT_c. 3. ☐ GO TO Step 4.26.

Examiner Note: After the 1B2 RCP is secured, the OATC will manually re-ratio FDW. The 1A FDW Master will be raised to two thirds of the total flow and the 1B FDW Master will be lowered to one third of the total flow to adjust ΔT_c .

4.26 ☐ **IAAT** any of the following indicate external RCP seal leakage:

- ☐ RB RIAs rising or in alarm
- ☐ RCS Tave constant with LDST level lowering more than normal
- ☐ Quench Tank level rate rising
- ☐ RB Normal Sump rate rising
- ☐ Visual confirmation

THEN initiate AP/02 (Excessive RCS Leakage).

NOTE

Tech Spec 3.4.4 requires setting a high flux trip $\leq 80.5\%$ within 10 hours. OP/1/A/1102/004 (Operation at Power) Encl 4.3 (Special Instructions for < 4 RCP Operation) will initiate this action. {11}

4.27 ☐ Initiate Encl 4.3 (Special Instructions for < 4 RCP Operation) of OP/1/A/1102/004 (Operation at Power).

Examiner Note: OP/1/A/1102/004 Encl. 4.3 is on Event 3 page 13. TS 3.4.4 Condition A applies and is on Event 3 page 8.

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 3 Event No.: 3&4 Page 11 of 15
 Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

Examiner Note: This is the path taken if the decision was made that there is an immediate need to secure the 1B2 RCP at step 1 in section 4B of AP/16.

AP/1/A/1700/016

Section 4B
 Abnormal RCP Vibration

AP/1/A/1700/016
 Page 1 of 17

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2. __ Verify MODE 1 or 2.	1. __ Stop <u>affected</u> RCP.
3. __ Verify three RCPs will remain operating after <u>affected</u> RCP is tripped.	2. __ IF NO RCPs operating, AND LPI is providing heat removal, THEN: 1. __ Trip Rx. 2. __ Stop <u>affected</u> RCP. 3. __ GO TO Step 13.

Examiner Note: Three RCPS (1A1, 1A2, 1B1) will remain operating after the 1B2 RCP is tripped.

4. __ Verify Immediate Trip Criteria met.	1. __ IF Rx Power on <u>any</u> NI > 70%, AND time permits reducing power, THEN: A. ☒ Reduce Rx Power ≤ 70% using Encl 5.2 (Rapid Power Reduction). B. ☐ WHEN Rx Power ≤ 70%, THEN GO TO Step 6.
---	---

Examiner Note: Enclosure 5.2 (Rapid Power Reduction) is located on Event 3 page 7 of this guide.

6. __ Verify <u>any</u> SG on Low Level Limits.	☐ GO TO Step 9.
---	--

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 3 Event No.: 3&4 Page 12 of 15
 Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/016

Section 4B
 Abnormal RCP Vibration

AP/1/A/1700/016
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9. __ Verify FDW masters in Auto.	CAUTION Total feedwater flow should be maintained constant to prevent changes in core reactivity. 1. ☐ Stop affected RCP. 2. ☐ Manually adjust FDW masters to achieve desired ΔT_c. 3. ☐ GO TO Step 12.

Examiner Note: After the 1B2 RCP is secured, the OATC will manually re-ratio FDW. The 1A FDW Master will be raised to two thirds of the total flow and the 1B FDW Master will be lowered to one third of the total flow to adjust ΔT_c .

NOTE

Tech Spec 3.4.4 requires setting a high flux trip $\leq 80.5\%$ within 10 hours. OP/1/A/1102/004 (Operation at Power) Encl 4.3 (Special Instructions for < 4 RCP Operation) will initiate this action. (11)

12. ☐ Initiate Encl 4.3 (Special Instructions for < 4 RCP Operation) of OP/1/A/1102/004 (Operation at Power).

Examiner Note: OP/1/A/1102/004 Encl. 4.3 is on Event 3 page 13. TS 3.4.4 Condition A applies and is on Event 3 page 8.

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 3&4

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Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

*OP/1/A/1102/004 Encl. 4.3 Rev 163***1. Initial Conditions**

____ 1.1 Review Limits and Precautions.

2. Procedure____ 2.1 **IF** conditions permit, log the current quadrant power tilt and the position of the ΔT_c controller prior to securing a RCP during power operations.____ 2.2 Perform one of the following: (Continue)

 • Ensure TS 3.4.4 Condition A entered when fourth RCP secured.

SRO

• Verify the following:

____ ◇ O1E4021 (1A RPS Var Flux Trip Value) set at 79.75%

____ ◇ O1E4022 (1B RPS Var Flux Trip Value) set at 79.75%

____ ◇ O1E4023 (1C RPS Var Flux Trip Value) set at 79.75%

____ ◇ O1E4024 (1D RPS Var Flux Trip Value) set at 79.75%

NOTE: • Instructions for performing OAC trends are located in Working With Trends enclosure of OP/0/A/1103/020 A (Operator Aid Computer Use).

• Only the first 6 points will be displayed initially; press "Page Down" key to see second 6 points.

____ 2.3 Using turn-on code T6 3RCP, digitally trend the following data at one minute intervals:

<u>Point ID</u>	<u>Description</u>
☐ O1P0889	CORE THERMAL POWER BEST
☐ O1P0877	INCORE IMBALANCE
☐ O1E3335	API GROUP AVE FOR GROUP 7
☐ O1E3336	API GROUP AVE FOR GROUP 8
☐ O1P0737	INCORE TILT QUADRANT W-X
☐ O1P0738	INCORE TILT QUADRANT X-Y
☐ O1P0739	INCORE TILT QUADRANT Y-Z
☐ O1P0740	INCORE TILT QUADRANT Z-W
☐ O1I0828	RC COLD LEG A1 TEMP
☐ O1I0829	RC COLD LEG A2 TEMP
☐ O1I0830	RC COLD LEG B1 TEMP
☐ O1I0831	RC COLD LEG B2 TEMP

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 3 Event No.: 3&4 Page 14 of 15
 Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

OP/1/A/1102/004 Encl. 4.3 Rev 163

Enclosure 4.3
 Special Instructions For < 4 RCP Operation

OP/1/A/1102/004
 Page 2 of 3

NOTE: The 100% Power Imbalance curves also apply for runs at reduced power.

2.4 Maintain Control Rod position and Power Imbalance within COLR limits.

2.5 **IF** NI calibration **NOT** within requirements of Limit and Precaution Step 2.2.6, calibrate NIs to Thermal Power Best. (R.M.)

2.6 Perform the following per AM/1/A/0315/017 (TXS RPS Channels A, B, C, And D Parameter Changes For Abnormal/Normal Operating Conditions): (R.M.)

2.6.1 Notify I&E to reset RPS Overpower High Trip Setpoint for three RCP Operation.

 Person Notified Date

2.6.2 **IF AT ANY TIME** Quadrant Power Tilt problems exist, notify I&E to adjust Flux/Imbalance/Flow trip setpoints as required to comply with TS 3.2.3.

 Person Notified Date

NOTE: The Maximum Allowed Power Setpoint (P_{max}) is reduced when operating for extended periods when only three RCPs operating as a conservative action.

2.6.3 **IF** expected to operate for an extended period of time with only three RCPs operating, notify I&E to adjust Flux/ Imbalance /Flow trip setpoints for three RCP operation.

 Person Notified Date

SRO 2.7 **IF AT ANY TIME** notified by I&E that RPS Overpower High Trip Setpoint adjusted for three RCP Operation, perform the following:

2.7.1 Verify the following:

 ◇ O1E4021 (1A RPS Var Flux Trip Value) set at 79.75%

 ◇ O1E4022 (1B RPS Var Flux Trip Value) set at 79.75%

 ◇ O1E4023 (1C RPS Var Flux Trip Value) set at 79.75%

 ◇ O1E4024 (1D RPS Var Flux Trip Value) set at 79.75%

2.7.2 Evaluate exiting TS 3.4.4, condition A.

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 3&4

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Event Description: **1B2 RCP Hi Vibration / Manual Power Reduction (C: BOP, SRO) (R: OATC, SRO)**

Applicant's Actions or Behavior

*AD-OP-ONS-0002 Attachment 17 Rev 07*ATTACHMENT 17

Page 1 of 1

<< Initial Control Bands >>

NOTE

A Control Band shall be established for any parameters being controlled in manual. Use of Control Bands is governed by AD-OP-ALL-1000, CONDUCT OF OPERATIONS.

1.0 Plant Conditions Stable or TPB < Pre-transient Conditions

1. The following bands are to be established during manual control of plant conditions (as needed) but may be adjusted by the CRS if required:
 - a. NI Power $\pm 1\%$ not to exceed the pre-transient or allowable power. If at the pre-transient or allowable level, band is NI Power - 1%
 - b. Current Tave $\pm 2^\circ\text{F}$
 - c. Current SG Outlet Pressure ± 10 PSIG
 - d. Delta Tc $0^\circ\text{F} \pm 2^\circ\text{F}$

2.0 During a Down Power Maneuver

1. The following guidance is to be established for manually controlled parameters during down power maneuvers. The CRS may adjust if required.
 - a. Provide a target power level of NI Power $\pm 2\%$ not to exceed allowable power
 - b. If the Diamond, FDW, or Turbine is in manual, provide an average power reduction rate (i.e. 2% per minute) based on the plant condition
 - c. Tave 575-585°F
 - d. SG Outlet Pressure 850-925 PSIG
 - e. Delta Tc $0^\circ\text{F} \pm 5^\circ\text{F}$

This event is complete when the 1B2 RCP is tripped, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 3 Event No.: 5 Page 1 of 22
 Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, fire TMR 5 to initiate the 1A Letdown Cooler leak.

Event 5 Plant Response:

- 1SA-8/B-9 (PROCESS MONITOR RADIATION HIGH)
- 1SA-9/D-1 (COMPONENT COOLING SURGE TANK HIGH/LOW)

Event 5 Crew Response:

- The **CRS** will direct the **BOP** to refer to ARG 1SA-8/B-9
- The **CRS** will enter AP/1/A/1700/002 (EXCESSIVE RCS LEAKAGE) Rev 17 (next page) **OP/1/A/6101/008 Rev 40**

RM
 PROCESS MONITOR RADIATION HIGH

3. Manual Action

3.1 Perform one of the following:

3.1.1 Determine radiation monitors in alarm.

3.1.2 **IF** Radiation Monitoring data from the PMC System is **NOT** in service, refer to OP/1/A/1103/026, (Loss of Sorrento Radiation Monitor).

NOTE: Loss of power to a process monitor skid actuates the Process Monitor Fault alarm, causes the associated RIA to activate the High alarm, and actuates any associated interlocks from the High alarm. The actual RIA readout may indicate magenta with readings of negative values.

3.2 **IF** 1SA-08/B-10 (Process Monitor Fault) has occurred for the same monitor, Go To the ARG for 1SA-08/B-10 (Process Monitor Fault). {3}

3.3 **IF** 1RIA-40 alarms, Go To the appropriate procedure:

- < 25 gpm (36,000 gpd) - AP/1/A/1700/031 (Primary To Secondary Leakage)
- ≥ 25 gpm (36,000 gpd) - EP/1/A/1800/001 (Emergency Operating Procedure)

3.4 **IF** any of the following RIAs have valid alarms, Go To AP/1/A/1700/018 (Abnormal Release of Radioactivity).

✓	RIA
	RIA-31
	1RIA-35
	1RIA-39
	1RIA-41
	1RIA-42
	1RIA-45, 46
	1RIA-49A
	1RIA-50

Examiner Note: The CRS will enter AP/1/A/1700/018 (Abnormal Release of Radioactivity) on Event 5 page 15.

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

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Duke Energy Oconee Nuclear Station Excessive RCS Leakage	Procedure No.
	AP/1/A/1700/002
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	017

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1. Entry Conditions

- 1.1 Primary leakage with fuel in the core (other than leakage through SG tubes) ≥ 1 gpm as indicated by one or more of the following: (FTC **NOT** flooded)
 - LDST/Pzr level lowered and potentially rising waste tank level/RBNS level/RIAs/CFT level
 - Leakage reported or detected from RCS, LPI, or HPI piping/components
- 1.2 1HP-14 failed in BLEED position causing lowering LDST level
- 1.3** Reactor Coolant leakage into CC system at ≥ 5 "/hour on CC Surge Tank (≈ 0.65 gpm) or CC Surge Tank level off-scale high
- 1.4 Fuel in the core with RCS loops vented and unexpected RV/Pzr level reduction > 2 " (FTC **NOT** flooded)
- 1.5 Fuel in the core with FTC flooded and Pzr level reduction as follows:
 - > 0.5 " over 1 hr or 10 gpm (1SF-1 and 1SF-2 closed)
 - > 0.5 " over 2 hr or 10 gpm (1SF-1 and/or 1SF-2 open)
- 1.6 As directed by another procedure

Examiner Note: Based upon the indications of RCS Leakage, TS 3.4.13 Condition A applies. TS is on **Event 5 page 14.**

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

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3. Immediate Manual Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.1 ☐ Verify HPI operating.	☐ GO TO Step 4.193.
3.2 ☐ IAAT RC makeup flow is > 100 gpm, AND Pzr level is lowering, THEN close 1HP-5.	
3.3 ☐ IAAT <u>all</u> exist: ☐ RCS leakage > NORMAL MAKEUP CAPABILITY (≈ 160 gpm) with letdown isolated ☐ Pzr level lowering ☐ SG Tube Leakage NOT indicated ☐ LPI DHR NOT providing core cooling THEN: A. ☐ Ensure Rx is tripped. B. ☐ Initiate Unit 1 EOP.	

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

Other than a SGTR, 1HP-26 should NOT need to be opened with the reactor critical.

- 4.1 Maintain PZR and LDST level using the following, as necessary:

- U1 EOP Encl 5.5 (PZR and LDST Level Control).
- OP/1/A/1103/004 (Soluble Poison Control).

Examiner Note: PZR and LDST level will be maintained using EOP Encl. 5.5 on Event 5 page 17.

- 4.2 — Announce AP entry using the PA system.

NOTE

"LPI DHR in service" means that prior to the event the unit was shut down with the decay heat drop line aligned for decay heat removal operation.

- 4.3 — IAAT LPI DHR in service,
AND RCS leakage > LDST makeup
capability (≈ 50 gpm),
THEN GO TO AP/26 (Loss of Decay
Heat Removal).

- 4.4 Initiate notifications:

- SM to reference:
 - Emergency Classification procedure
 - AD-LS-ALL-0006 (Notification/Reportability Notification)
 - Encl 5.9 (Oversight Guidelines)
- STA
- RP

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.5 Monitor trends to determine leak area (AB or RB) and trend for degradation: — "T6 AP02" — "T6 WASTE" — RIAs	
4.6 — Verify specific leak location is identified.	— Notify WCC SRO to initiate Encl 5.2 (Primary Leak Check) and of the leak area (AB or RB), if known.
4.7 — Initiate Encl 5.1 (Leak Rate Determination).	
4.8 — Initiate AP/18 (Abnormal Release of Radioactivity), as necessary.	

Examiner Note: AP/1/A/1700/018 (Abnormal Release of Radioactivity is on Event 5 page 15. Enclosure 5.1 from step 4.7 is located on Event 5 page 12.

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE

U1&2 MWHUT level will rise due to RO Unit reject flow if RO system in-service on any unit.

4.9 — **WHEN** leak area/failure is identified,
THEN GO TO applicable step that
best fits leak area/failure:

✓	Area/ Failure	Symptoms	Step
	Pzr RV leakage	↑ Tailpipe temperatures Acoustic Monitor indication	4.10
	CC System	↑ IRIA-50 ↑ CC Surge Tank level	4.17
	Rx Bldg	↑ RB RIAs ↑ RBNS rate NO RCP seal failure indications	4.55
	Aux. Bldg	↑ RIA 32, ↑ IRIA-45 ↑ Waste tank levels LPI Room sump level alarms	4.98
	RCP seal failure	↑ RB RIAs ↑ RBNS rate Alarms associated with RCP seal failure	4.148
	1HP-14 failure	1HP-14 failed in BLEED position ↓ LDST level ↑ 1A BHUT level	4.158
	LD path valve closed (LD RV lifting)	Letdown path valve closed. ↓ LDST level ↑ MWHUT or HAWT level	4.174
	CFT check valve leakage	↑ CFT level	4.191

**Examiner Note: The CRS will transfer to
step 4.17 due to the leak into the 1A
Letdown Cooler.**

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>Unit Status</u> Leak into CC System is indicated.	
4.17 Verify all: ☐ CC Surge Tank level rising at $\geq 5''$/ hour (≈ 0.65 gpm) <u>or</u> level is off-scale high ☐ 1RIA-50 in alarm <u>or</u> rising	1. ☐ IF CC surge tank is rising at $< 5''$/ hour, AND 1RIA-50 rising, THEN: A. ☐ Initiate 1RIA-50 Alarm Response of OP/1/A/1104/008 (Component Cooling System). B. ☐ EXIT this procedure. 2. ☐ GO TO Step 4.55.

Examiner Note: CC Surge Tank level is rising at a higher rate than 5" per hour and 1RIA-50 is in alarm.

NOTE

- CC Surge Tank is hard piped to overflow to LAWT.
- Chemicals from the CC system will rapidly exhaust demineralizers used to process LAWT water. Radwaste has limited storage capability and a Rx shutdown may be required if the leak CANNOT be isolated.

4.18 ☐ IAAT CC Surge Tank level is off-scale high, THEN notify Radwaste that the CC Surge Tank has overflowed to the LAWT.

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

- Closing 1CC-7 and 1CC-8 will contain the RCS leak in the RB. Relief valves on the CC system will lift inside the RB when 1CC-7 and 1CC-8 are closed.
- 1CC-7 and 1CC-8 should be closed prior to letting RC to CC system leak fill the LAWT above the Hi/Hi OAC alarm (72 " on O1A1352 (Low Activity Waste Tank Level)).
- Flashing of the CC system may be indicated by CRD flow low or fluctuating, CC flow low or fluctuating, and RB Sump Level rising.

4.19 ☐ **IAAT RCS leakage is flashing the CC system,
OR threatens to overflow the LAWT,
THEN:**

A. ☐ Trip Rx.

B. ☐ Close 1HP-5.

C. Close:

☐ 1CC-7

☐ 1CC-8

☐ 1CC-3

☐ 1CC-4

☐ 1CC-5

☐ 1CC-6

D. ☐ Initiate AP/32 (Loss of Letdown).

E. ☐ **GO TO Step 4.26.**

Examiner Note: Neither CC system flashing nor overflow of the LAWT is expected in this scenario.

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

A historical OAC temperature trend may be required to determine if leakage exists due to the leak affecting temperature indications on other coolers as well.

4.20 Monitor RCP and Letdown cooler outlet temperatures (Turn-on code "GD AP02"):

- O1A0044 (RCP 1A1 COOLER CC OUTLET TEMP)
- O1A0045 (RCP 1A2 COOLER CC OUTLET TEMP)
- O1A0046 (RCP 1B1 COOLER CC OUTLET TEMP)
- O1A0047 (RCP 1B2 COOLER CC OUTLET TEMP)
- O1A0065 (LETDOWN COOLER 1A CC OUTLET TEMP)
- O1A0066 (LETDOWN COOLER 1B CC OUTLET TEMP)

Examiner Note: The crew should detect abnormal temperature on the 1A Letdown Cooler (O1A0065)

NOTE

RCS to CC leakage may be indicated by one RCP cooler outlet temperature rising more than the others (indicated on historical temperature trend) near the time of elevated counts on 1RIA-50.

4.21 Verify leakage indicated by change in RCP cooler outlet temperatures (Turn-on code "GD AP02"):

- O1A0044 (RCP 1A1 COOLER CC OUTLET TEMP)
- O1A0045 (RCP 1A2 COOLER CC OUTLET TEMP)
- O1A0046 (RCP 1B1 COOLER CC OUTLET TEMP)
- O1A0047 (RCP 1B2 COOLER CC OUTLET TEMP)

 **GO TO Step 4.26.**

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

RCS leakage to CC in the letdown coolers may be indicated by a cooler outlet temperature rising more than the other cooler. Due to CC system setup, letdown cooler CC outlet temperatures may be different. A historical OAC temperature trend may be required to determine if leakage exists and if actions taken are successful in leak isolation. If leaking cooler CANNOT be identified, the coolers will be isolated one at a time starting with the 1A Letdown Cooler.

4.26 Monitor letdown cooler outlet temperatures to determine which cooler is leaking (Turn-on code "GD AP02"):

- ___ O1A0065 (LETDOWN COOLER 1A CC OUTLET TEMP)
- ___ O1A0066 (LETDOWN COOLER 1B CC OUTLET TEMP)

Examiner Note: The crew should detect abnormal temperature on the 1A Letdown Cooler (O1A0065)

4.27 GO TO the appropriate step to isolate affected cooler:

✓	Letdown Cooler to be Isolated	GO TO Step
	1A	4.28
	1B	4.35
	Unknown	4.28

4.28 ___ Verify 1B Letdown Cooler is isolated.

1. Isolate the 1A Letdown Cooler as follows:

- A. ☐ Close 1CC-1/1HP-1.
- B. ☐ Close 1HP-3.
- 2. ☐ GO TO Step 4.33.

4.33 ___ Verify the leak isolation was successful:

- CC Surge Tank level stable if 1CC-7 and 1CC-8 open
- Reduction in RCS leakage

1. Restore the 1A Letdown Cooler as follows:

- A. ___ Open 1HP-3.
- B. ___ Open 1CC-1/1HP-1.
- 2. ___ GO TO Step 4.35.

4.34 ☐ GO TO Step 4.46.

Examiner Note: At step 4.33, if the CC Surge Tank is already full, the crew will have to monitor RCS leak rate (makeup flow) to determine that the leak has stopped.

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.46 Verify <u>both</u> closed: — 1CC-7 — 1CC-8	 GO TO Step 4.48.
4.47 — Initiate AP/20 (Loss of Component Cooling).	
4.48 — WHEN conditions permit, THEN EXIT this procedure.	

... END ...

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

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Event No.: 5

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

AP/1/A/1700/002 Encl. 5.1

Enclosure 5.1

AP/1/A/1700/002

Leak Rate Determination

Page 1 of 3

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ___ Stabilize RCS Temperature.	
2. ___ Notify WCC to secure <u>all</u> primary draining/RB washdown evolutions if applicable.	

NOTE

Depending on leak location, leakage may **NOT** be detected by all the formulas. One or more of the following methods may be necessary to determine RCS leak rate.

3. ___ Calculate leak rate using the following, as required:

• Calculation of RCS Volume Loss:

$$\text{Leak Rate} = \frac{\text{MU}}{\text{MU}} + \frac{\text{SI}}{\text{SI}} - \frac{\text{LD}}{\text{LD}} - \frac{\text{TSR}}{\text{TSR}} = \underline{\hspace{2cm}}$$

Where: MU = makeup Flow
SI = Seal Inlet Hdr Flow
LD = Letdown Flow
TSR = Total Seal Return Flow

• LDST Level Change:

$$\text{Leak Rate} = \frac{(\text{LDST level change}) \times (31 \text{ gal/inch})}{(\text{minutes})} + \text{BTP Flowrate (gpm)}$$

$$\text{Leak Rate} = \left(\frac{\text{inches}}{\text{minutes}} \right) \times 31 \text{ gal/inch} + \text{gpm} = \underline{\hspace{2cm}} \text{ gpm}$$

• LAWT Level Change: (Turn-on code "LWD")

$$\text{Leak Rate} = \frac{(\text{Change in LAWT lvl}) \times (28 \text{ gal/inch})}{(\text{minutes})} = \left(\frac{\text{inches}}{\text{minutes}} \right) \times 28 \text{ gal/inch} = \underline{\hspace{2cm}} \text{ gpm}$$

• HAWT Level Change: (Turn-on code "LWD")

$$\text{Leak Rate} = \frac{(\text{Change in HAWT lvl}) \times (18 \text{ gal/inch})}{(\text{minutes})} = \left(\frac{\text{inches}}{\text{minutes}} \right) \times 18 \text{ gal/inch} = \underline{\hspace{2cm}} \text{ gpm}$$

• RBNS Level Change:

$$\text{Leak Rate} = \frac{(\text{Change in RBNS level}) \times (15 \text{ gal/inch})}{(\text{minutes})} = \left(\frac{\text{inches}}{\text{minutes}} \right) \times 15 \text{ gal/inch} = \underline{\hspace{2cm}} \text{ gpm}$$

• RCS Leakage Calculation per PT/1/A/0600/010 (Reactor Coolant Leakage)

(Continued on next page.....)

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

Enclosure 5.1

Leak Rate Determination

AP/1/A/1700/002 Encl. 5.1

AP/1/A/1700/002

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

- Calculation of RCS Volume Loss:

Leak Rate = Makeup Flow rate with stable level = _____ gpm

NOTE

Pressurizer:	23.94 gal/inch
Quench Tank:	34.94 gal/inch
BWST:	7608 gal/foot
SFP (Unit 1&2):	1512 gal/ 0.1 foot
SFP/FTC (Unit 1&2):	2300 gal/inch
FTC (1SF-1&2 closed)	1040 gal/in (with water level above shallow end floor)
Core Flood Tank:	5 gal/ 0.01 foot
RB Normal Sump:	15 gal/inch
LDST:	31.3 gal/inch
CC Surge Tank Level:	7.8 gal/inch
MWHUT:	See OP/0/A/1108/001 (Curves And General Information)

- Tank Level Change:

Leak Rate = $\frac{(\text{Change level}) \times (\text{Tank volume/height})}{(\text{minutes})} = \frac{(\quad) \times (\quad)}{\quad \text{minutes}} = \quad \text{gpm}$

4. ☐ Notify SM and CRS of calculated leak rate.

• • • END • • •

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 5

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

Examiner Note: TS 3.4.13 Condition A applies until the 1A Letdown Cooler is isolated.

TS 3.4.13 Rev 357

LCO 3.4.13

RCS operational LEAKAGE shall be limited to:

- a. No pressure boundary LEAKAGE;
- b. 1 gpm unidentified LEAKAGE;
- c. 10 gpm identified LEAKAGE; and
- d. 150 gallons per day primary to secondary LEAKAGE through any one steam generator (SG).

See next page for corrected
Technical Specification

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCS operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE.	A.1 Reduce LEAKAGE to within limits.	4 hours
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> Pressure boundary LEAKAGE exists. <u>OR</u> Primary to secondary LEAKAGE not within limit.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	12 hours 36 hours

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

3.4 REACTOR COOLANT SYSTEM (RCS)

Corrected scenario guide for Technical
Specification revision 428.

3.4.13 RCS Operational LEAKAGE

LCO 3.4.13 RCS operational LEAKAGE shall be limited to:

- a. No pressure boundary LEAKAGE;
- b. 1 gpm unidentified LEAKAGE;
- c. 10 gpm identified LEAKAGE; and
- d. 150 gallons per day primary to secondary LEAKAGE through any one steam generator (SG).

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Pressure boundary LEAKAGE exists.	A.1 Isolate affected component, pipe, or vessel from the RCS by use of a closed manual valve, closed and de-activated automatic valve, blind flange, or check valve.	4 hours
B. RCS operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE.	B.1 Reduce LEAKAGE to within limits.	4 hours

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Scenario No.: 3

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

AP/1/A/1700/018 Rev 25

Duke Energy Oconee Nuclear Station Abnormal Release of Radioactivity	Procedure No. AP/1/A/1700/018
	Revision No. 025

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE An abnormal release of radioactivity may be a Tech Spec or SLC violation.

4.1 Perform the following:

- ___ At the discretion of the CRS, make a PA announcement of the event including any necessary precautions to be observed.
- ___ Notify Shift Manager to reference:
 - Emergency Classification procedure
 - AD-LS-ALL-0006 (Notification/Reportability Evaluation)

4.2 ___ **GO TO** appropriate sections for any monitors in High or Alert alarm:

✓	Section	Monitor
	4A	RIA-31
	4B	1RIA-32
	4C	1RIA-35
	4D	1RIA-39
	4E	1RIA-41
	4F	1RIA-42
	4G	1RIA-45 or 1RIA-46
	4H	1RIA-47, 1RIA-48, 1RIA-49, or 1RIA-49A
	4I	1RIA-50
	4J	1RIA-54

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

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Scenario No.: 3

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

Section 4I
1RIA-50 (CC)AP/1/A/1700/018 Rev 25
AP/1/A/1700/018
Page 1 of 1

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ IAAT conditions causing AP entry have cleared OR NOT valid, THEN: A. ☐ Evaluate remaining steps in AP. B. ☐ Perform the following, as necessary: • Create/update recovery plan. • Restore systems to desired alignment using approved procedures or processes. C. ☐ EXIT this procedure.	☐ GO TO Step 2.
2. Verify <u>either</u> : ☐ CC SURGE TANK rising $\geq 5"/\text{hour}$ ☐ CC SURGE TANK off-scale high	☐ GO TO Step 5.
3. ☒ Initiate AP/02 (Excessive RCS Leakage).	
4. ☒ GO TO Step 6.	
6. ☐ Secure recirc of QT.	
7. ☐ Notify <u>all</u> units to place on the Turnover Sheet: • "CC Drain Tank has high activity. Avoid use until further notice."	
8. ☐ Contain/control CC leakage to avoid spread of contamination.	
9. ☐ Notify RP of elevated activity in the CC system.	
10. ☐ WHEN conditions permit, THEN EXIT .	

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

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Scenario No.: 3

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

EOP Encl. 5.5 Rev 02

Enclosure 5.5

EP/1/A/1800/001 0M

Pzr and LDST Level Control

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE • Maintaining Pzr level >100" [180" acc] will ensure Pzr heater bundles remain covered. • When Rx critical, use of 1HP-26 normally only necessary to mitigate SGTRs. • Auto-Start of Standby HPIP could occur if flow adjustments are made too rapidly. • Rule 8 and EALs may apply if 1HP-26 opened with all RCPs off.	
1. ☒ Utilize the following as necessary to maintain <u>desired</u> Pzr level: • 1A HPI Pump • 1B HPI Pump • 1HP-26 • 1HP-7 • 1HP-120 setpoint or valve demand • 1HP-5	— IF 1HP-26 will NOT open, THEN throttle 1HP-410 to maintain desired Pzr level. Examiner Note: During the 1A Letdown Cooler leak, the RO will adjust 1HP-5, 1HP-7, and 1HP-120 as necessary.
2. ☒ IAAT <u>makeup</u> to the <u>LDST</u> is desired, THEN makeup from 1A BHUT.	
3. ☒ IAAT it is desired to <u>secure makeup</u> to LDST, THEN secure makeup from 1A BHUT.	
4. — IAAT it is desired to <u>bleed</u> letdown flow to 1A BHUT, THEN perform the following: A. Open: — 1CS-26 — 1CS-41 B. — Position 1HP-14 to BLEED. C. — Notify CRS.	
5. — IAAT letdown <u>bleed</u> is NO longer desired, THEN position 1HP-14 to NORMAL.	

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

EOP Encl. 5.5 Rev 02

Enclosure 5.5
Pzr and LDST Level Control

EP/1/A/1800/001 OM
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. ☐ IAAT 1C HPI PUMP is required, THEN perform Steps 7 - 9.	☐ GO TO Step 10.

Enclosure 5.5
Pzr and LDST Level Control

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. ☐ IAAT LDST level CANNOT be maintained, THEN perform Step 11.	☐ GO TO Step 12.
11. ☐ Perform the following: • Open 1HP-24. • Open 1HP-25. • Close 1HP-16.	1. ☐ IF both BWST suction valves (1HP-24 and 1HP-25) are closed, THEN perform the following: A. ☐ Start 1A LPI PUMP. B. ☐ Start 1B LPI PUMP.

Examiner Note: Given the size of the Letdown Cooler leak, the crew will be able to maintain LDST without going onto the BWST on step 11.

NOTE

Maintaining Pzr level >100" [180" acc] will ensure Pzr heater bundles remain covered.

12. ☐ Operate Pzr heaters as required to maintain heater bundle integrity.

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 5

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

EOP Encl. 5.5 Rev 02

Enclosure 5.5
Pzr and LDST Level Control

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13. ☐ IAAT additional makeup flow to LDST is desired, AND 1A BLEED TRANSFER PUMP is operating, THEN dispatch an operator to close 1CS-48 (1A BHUT Recirc). (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.)	Examiner Note: Steps 13 and 14 may be performed, at the discretion of the crew. If Step 14 is performed, it is a verifiable action.
14. ☒ IAAT <u>two</u> Letdown Filters are desired, THEN perform the following: ☐ Open 1HP-17. ☐ Open 1HP-18	
15. ☐ IAAT <u>all</u> of the following exist: ☐ Letdown isolated ☐ LPSW available ☐ Letdown restoration desired THEN perform Steps 16 - 34. {41}	☒ GO TO Step 35.

Examiner Note: If the crew isolated Letdown, steps 16 – 34 of this procedure start on Event 5 Page 21. Letdown restoration isn't required to be completed prior to proceeding to the next event.

35. ☐ **IAAT** it is determined that letdown is unavailable due to equipment failures or letdown system leakage,
THEN notify CRS to initiate AP/32 (Loss of Letdown).
36. ☐ **IAAT** > 1 HPI pump is operating,
AND additional HPI pumps are **NO** longer needed,
THEN perform the following:
A. ☐ Obtain CRS concurrence to reduce running HPI pumps.
B. ☒ Secure the desired HPI pumps.
C. ☒ Place secured HPI pump switch in AUTO, if desired.

Examiner Note: If the crew makes the decision to start the Standby HPIP in Step 1, this step can be used to secure the additional pump, if desired.

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 5

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

EOP Encl. 5.5 Rev 02

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
37. <u> </u> IAAT all the following conditions exist: <u> </u> Makeup from BWST NOT required <u> </u> LDST level > 55" <u> </u> <u>All</u> control rods inserted <u> </u> Cooldown Plateau NOT being used THEN close: <u> </u> 1HP-24 <u> </u> 1HP-25	
38. <u> </u> Verify 1CS-48 (1A BHUT Recirc) has been closed to provide additional makeup flow to LDST.	<u> </u> GO TO Step 40.
39. <u> </u> WHEN 1CS-48 (1A BHUT Recirc) is NO longer needed to provide additional makeup flow to LDST, THEN perform the following: A. <u> </u> Stop 1A BLEED TRANSFER PUMP. B. <u> </u> Locally position 1CS-48 (1A BHUT Recirc) <u>one</u> turn open. (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.) C. <u> </u> Close 1CS-46. D. <u> </u> Start 1A BLEED TRANSFER PUMP. E. <u> </u> Locally throttle 1CS-48 (1A BHUT Recirc) to obtain 90 - 110 psig discharge pressure. F. <u> </u> Stop 1A BLEED TRANSFER PUMP.	
40. <u> </u> Verify two Letdown Filters in service, AND <u>only one</u> Letdown filter is desired.	<u> </u> GO TO Step 42.
41. Perform <u>one</u> of the following: <u> </u> Place 1HP-17 switch to CLOSE. <u> </u> Place 1HP-18 switch to CLOSE.	
42. <u> </u> WHEN directed by CRS, THEN EXIT this enclosure.	

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 5

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

Examiner Note: This picks up the procedure path if the crew decided to restore letdown using EOP Encl. 5.5.

EOP Encl. 5.5 Rev 02

Enclosure 5.5

Pzr and LDST Level Control

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. Open: ___ 1CC-7 ___ 1CC-8	1. ___ Notify CRS that letdown CANNOT be restored due to inability to restart the CC system. 2. ___ GO TO Step 35.
17. ___ Ensure only one CC pump running.	
18. ___ Place the non-running CC pump in AUTO.	
19. Verify <u>both</u> are open: ___ 1HP-1 ___ 1HP-2	1. ___ IF 1HP-1 is closed due to 1HP-3 failing to close, THEN GO TO Step 21. 2. ___ IF 1HP-2 is closed due to 1HP-4 failing to close, THEN GO TO Step 21.

Examiner Note: 1HP-1 is closed following isolation of the 1A Letdown Cooler.

20.  GO TO Step 23.	
23. ___ Monitor for unexpected conditions while restoring letdown.	
24. ___ Verify <u>both</u> letdown coolers to be placed in service.	1. ___ IF 1A letdown cooler is to be placed in service, THEN open: ___ 1HP-1 ___ 1HP-3 2. ___ IF 1B letdown cooler is to be placed in service, THEN open: ___ 1HP-2 ___ 1HP-4 3.  GO TO Step 26.

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 5

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Event Description: **1A Letdown Cooler Leak (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

EOP Encl. 5.5 Rev 02

Enclosure 5.5
Pzr and LDST Level Control

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26. ☐ Verify <u>at least one</u> letdown cooler is aligned.	Perform the following: A. ☐ Notify CRS of problem. B. ☐ GO TO Step 35.
27. ☒ Close 1HP-6.	
28. ☒ Close 1HP-7.	
29. ☐ Verify letdown temperature < 125°F.	1. ☐ Open 1HP-13. 2. Close:

Enclosure 5.5
Pzr and LDST Level Control

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. ☒ Open 1HP-5.	
31. ☒ Adjust 1HP-7 for ≈ 20 gpm letdown.	
32. ☐ WHEN letdown temperature is < 125°F, THEN place LETDOWN HI TEMP INTLK BYP switch to NORMAL.	
33. ☒ Open 1HP-6.	
34. ☒ Adjust 1HP-7 to control desired letdown flow.	

This event is complete when the 1A Letdown Cooler has been isolated, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 6

Page 1 of 2

Event Description: **BWST punctured at 28 feet by crane (SRO) (TS)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, **fire EVENT 6** to initiate the BWST leak.

Call Emergency Line 4911: and report "A crane operator has punctured the BWST a little over halfway up. There are no injured personnel. Water is pouring out of the hole."

Event 6 Plant Response:

- 1SA-3/D-8 (LP BWST LEVEL HIGH/LOW)

Event 6 Crew Response:

- The **CRS** will direct the **BOP** to refer to 1SA-3/D-8

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**1SA-03/D-8
LP BWST LEVEL HIGH/LOW**

1. Alarm Setpoint

1.1 47' H₂O decreasing (Low).

1.2 49' H₂O increasing (High).

2. Automatic Action

None

3. Manual Action

3.1 Take corrective action to stop level increase or decrease.

3.2 Fill BWST to proper level per OP/1/A/1104/004 A (BWST Operation).

3.3 Drain BWST to proper level per OP/1&2/A/1104/006 B (SFP And BWST Draining).

3.4 Maintain BWST boron concentration within the range specified in the COLR.

3.5 **IF** BWST Level decreases to less than 46 ft., refer to Technical Specification 3.5.4.

Examiner Note: The BWST can't be filled due to the hole. The crew will contact Maintenance regarding repair of the hole. TS 3.5.4 Condition B applies and is listed on the **next page**.

This event is complete when the CRS references TS 3.5.4, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 6

Page 2 of 2

 Event Description: **BWST punctured at 28 feet by crane (SRO) (TS)**

Applicant's Actions or Behavior

 BWST
3.5.4

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 Borated Water Storage Tank (BWST)

LCO 3.5.4 The BWST shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. BWST boron concentration not within limits. <u>OR</u> BWST water temperature not within limits.	A.1 Restore BWST to OPERABLE status.	8 hours
B. BWST inoperable for reasons other than Condition A.	B.1 Restore BWST to OPERABLE status.	1 hour
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 5.	12 hours 36 hours

This event is complete when the CRS references TS 3.5.4, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 3 Event No.: 7 Page 1 of 5
 Event Description: **1TB Lockout (Loss of 1A2 and 1B2 RCPs, MT fails to trip) (C: OATC, SRO)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, **fire EVENT 7** to initiate the 1TB Lockout.

Event 7 Plant Response:

- 1SA-1/A-1 through D-1 (RPS Trip) will alarm but the Reactor fails to Automatically trip
- 1SA-1/A-3 through D-3 (Flux/Flow/IMB Trip)
- 1SA-1/A-7 through D-7 (RCP/FLUX Trip)
- 1A2 and 1B2 RCPs trip

Event 7 Crew Response:

- The **CRS** will direct the **OATC** to trip the reactor and perform IMAs
- The **CRS** will direct the **BOP** to perform a Symptom Check (**next page**)

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3. Immediate Manual Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.1 ☒ Depress REACTOR TRIP pushbutton.	

Examiner Note: The Reactor and Main Turbine failed to automatically trip on the loss of 2 RCPs. The manual Reactor trip in Step 3.1 and the Main Turbine trip in Step 3.3 are successful.

3.2 ☐ Verify reactor power < 5% FP and lowering.	☐ GO TO Rule 1 (ATWS/Unanticipated Nuclear Power Production).
3.3 ☒ Depress turbine TRIP pushbutton.	
3.4 ☐ Verify <u>all</u> turbine stop valves closed.	☐ Place <u>both</u> EHC pumps in PULL TO LOCK.
3.5 ☐ Verify RCP seal injection available.	☐ IF CC is unavailable, THEN immediately: A. ☐ Stop <u>all</u> RCPs. (10) B. ☐ Notify CRS to initiate AP/25 (Standby Shutdown Facility Emergency Operating Procedure).

This event is complete when the CRS reaches Step 4.10 of the Subsequent Actions tab, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 7

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Event Description: **1TB Lockout (Loss of 1A2 and 1B2 RCPs) (C: OATC, SRO)**

Applicant's Actions or Behavior

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SYMPTOM CHECK GUIDELINES

Power Range NIs NOT < 5% Power Range NIs NOT lowering	Rule 1, <i>ATWS/Unanticipated Nuclear Power Production</i>
Any SCM < 0°F	Rule 2, <i>Loss Of SCM</i>
Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, <i>Loss of Main or Emergency FDW</i> Rule 4, <i>Initiation of HPI Forced Cooling</i> (Inability to feed SGs and > 2300 psig, NDT limit reached, or PZR level > 375")
Uncontrolled Main steam line(s) pressure reduction	Rule 5, <i>Main Steam Line Break</i>
CSAE Off-gas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identified SG Tube Leakage > 25 gpm)

Examiner Note: Following completion of the Symptom Check, the CRS will enter the Subsequent Actions tab (next page)

This event is complete when the CRS reaches Step 4.10 of the Subsequent Actions tab, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 7

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Event Description: **1TB Lockout (Loss of 1A2 and 1B2 RCPs) (C: OATC, SRO)**

Applicant's Actions or Behavior

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 ☐ Verify <u>all</u> control rods in Groups 1 - 7 fully inserted.	1. Open: ☐ 1HP-24 ☐ 1HP-25 2. ☐ Secure makeup to LDST. (8) 3. ☐ IF CRDs are energized, THEN: A. ☐ Initiate regulating control rod insertion to the IN LIMIT. B. Dispatch <u>one</u> operator to open 600V CRD breakers: ☐ 1X9-5C (U-1 CRD Norm Fdr Bkr) (U1 Equipment Rm) ☐ 1X1-5C (U1 CRD Alt Fdr Bkr) (T-3/E-27)
4.2 ☐ Verify Main FDW in operation.	1. ☐ Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete. 2. ☐ GO TO Step 4.5.
4.3 Verify either: ☐ Main FDW overfeeding causing excessive temperature lowering. ☐ Main FDW underfeeding causing SG level lowering below setpoint.	 GO TO Step 4.5.
4.4 ☐ Manually throttle Main FDW to control SG level and RCS temperature.	1. ☐ IF overfeeding, THEN: A. ☐ Ensure 1FDW-31 closed. B. ☐ Ensure 1FDW-40 closed.

Examiner Note: The SGs will automatically control at 25 inches on XSUR Level since Main FDW is available and a RCP is still running (1A1 RCP).

This event is complete when the CRS reaches Step 4.10 of the Subsequent Actions tab, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 7

Page 4 of 5

Event Description: **1TB Lockout (Loss of 1A2 and 1B2 RCPs) (C: OATC, SRO)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.5 ☐ IAAT Main FDW is operating, AND level in <u>any</u> SG is > 96% on the Operating Range, THEN perform Steps 4.6 - 4.8.	☒ GO TO Step 4.9.
4.6 ☐ Trip <u>all</u> Main FDW pumps.	
4.7 ☐ Initiate Rule 3 (Loss of Main or Emergency FDW).	
4.8 ☐ Stop steaming <u>affected</u> SGs.	
4.9 ☐ IAAT TBVs CANNOT control SG pressure at desired setpoint, AND TBVs NOT intentionally isolated, THEN manually control pressure in <u>affected</u> SGs using <u>either</u> : ☐ TBVs ☐ Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs) (PS)	
4.10 ☐ Verify 1RIA-40 operable with CSAE OFF-GAS BLOWER operating.	☐ GO TO Step 4.12.
4.11 ☒ GO TO Step 4.14.	
4.14 Verify <u>both</u> are closed: ☐ 1MS-17 ☐ 1MS-26	☐ Dispatch an operator with Encl 5.29 (MSRV Locations) to verify <u>all</u> MSRVs have reseated.

This event is complete when the CRS reaches Step 4.10 of the Subsequent Actions tab, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 7

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Event Description: **1TB Lockout (Loss of 1A2 and 1B2 RCPs) (C: OATC, SRO)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.15 __ Verify ES is required.	1. ☐ Initiate Encl 5.5 (Pzr and LDST Level Control). 2. ☐ GO TO Step 4.17.

Examiner Note: EOP Encl. 5.5 located on Event 5 Page 17.

4.17 Open: __ PCB 20 __ PCB 21	__ GO TO Step 4.20.
4.18 __ Verify Generator Field Breaker open.	__ Open Generator Field Breaker.
4.19 __ Verify EXCITATION is OFF.	__ Remove excitation by using EXCITATION switch.
4.20 __ Verify Aux Bldg and Turbine Bldg Instrument Air pressure $\geq$ 90 psig.	__ Initiate AP/22 (Loss of Instrument Air).
4.21 __ Verify ICS/NNI power available.	__ Initiate AP/23 (Loss of ICS Power).
4.22 __ Verify <u>all</u> 4160V switchgear (ITC, 1TD & 1TE) energized.	1. __ IF <u>all</u> 4160V switchgear are de-energized, THEN GO TO Blackout tab. 2. __ Notify Maintenance.
4.23 __ Verify <u>both</u> SGs > 550 psig.	1. __ IF SG pressures are normal for existing plant conditions, THEN GO TO Step 4.24. 2. __ Ensure Rule 5 (Main Steam Line Break) in progress <u>or</u> complete.

This event is complete when the CRS reaches Step 4.10 of the Subsequent Actions tab, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, fire **EVENT 8 to initiate the LB LOCA.****Event 8 Plant Response:**

- Rapidly lowering RCS Pressure
- RBNS level rising
- ES Channels 3 through 8 actuate (ES Channels 1&2 fail to auto actuate)
- The RCS saturates/superheats
- Fire, Humidity, and RIA alarms indicate Containment penetration leakage into the East Pen Rm

Event 8 Crew Response:

- The **CRS** will direct the **OATC/BOP** to perform a Symptom Check
- One **RO** will perform Rule 2 (Loss of SCM) (**next page**)
- One **RO** will perform EOP Encl. 5.1 (ES Actuation) (**Event 8 Page 14**)
- The **CRS** will review the Parallel Actions Page (**Event 8 Page 6**) of the Subsequent Actions Tab and transfer to either LOSCM (**Event 8 Page 12**) or ICC Tab (**Event 8 Page 7**)
- Fire Alarm (1SA-03/B-6) information and response located on **Event 8 Page 27**.

CT-2 Start Time: _____ (initiation of the LB LOCA)**CT-2 Stop Time located on Event 8 Page 17.****CT-1 Actions are located on Event 8 Page 21.****AD-OP-ONS-0002 ATT 13 Rev 07**

SYMPTOM CHECK GUIDELINES

Power Range NIs NOT < 5% Power Range NIs NOT lowering	Rule 1, <i>ATWS/Unanticipated Nuclear Power Production</i>
Any SCM < 0°F	Rule 2, Loss Of SCM
Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, <i>Loss of Main or Emergency FDW</i> Rule 4, <i>Initiation of HPI Forced Cooling</i> (Inability to feed SGs and > 2300 psig, NDT limit reached, or PZR level > 375")
Uncontrolled Main steam line(s) pressure reduction	Rule 5, <i>Main Steam Line Break</i>
CSAE Off-gas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identified SG Tube Leakage > 25 gpm)

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

EOP/1/A/1800/001 0L Rev 05

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	Revision No. 005

**Rule 2
Loss of SCM**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ IAAT <u>all</u> exist: ☐ <u>Any</u> SCM $\leq 0^{\circ}\text{F}$ ☐ Rx power $\leq 1\%$ ☐ ≤ 2 minutes elapsed since loss of SCM THEN perform Steps 2 and 3. (9)	1. ☐ IF <u>all</u> SCMs $> 0^{\circ}\text{F}$, THEN: A. ☐ Obtain CRS concurrence to exit Rule 2. B. ☐ EXIT Rule 2. 2. ☐ Notify CRS of RCP status. (9, 22) 3. ☐ GO TO Step 4.
2. ☒ Stop <u>all</u> RCPs.	1. ☐ Place 1TA AUTO/MAN switch in MAN. 2. ☐ Place 1TB AUTO/MAN switch in MAN. 3. ☐ Open 1TA SU 6.9 KV FDR. 4. ☐ Open 1TB SU 6.9 KV FDR.
3. ☐ Notify CRS of RCP status. (22)	
4. ☐ Verify Blackout exists.	☒ GO TO Step 6.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Rule 2
Loss of SCM

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. Open: ☒ 1HP-24 ☒ 1HP-25	1. <u>IF</u> both BWST suction valves (1HP-24 and 1HP-25) are closed, <u>THEN</u>: A. <u>Start</u> 1A LPI PUMP. B. <u>Start</u> 1B LPI PUMP. C. Open: <u>1LP-15</u> <u>1LP-16</u> <u>1LP-9</u> <u>1LP-10</u> <u>1LP-6</u> <u>1LP-7</u> D. <u>IF</u> two LPI Pumps are running <u>only</u> to provide HPI pump suction, <u>THEN</u> secure one LPI pump. E. <u>Dispatch</u> an operator to open 1HP-363 (Letdown Line To LPI Pump Suction Block) (A-1-119, U1 LPI Hatch Rm, N end). F. <u>GO TO</u> Step 7. 2. <u>GO TO</u> Step 9.
7. ☒ Start <u>all available</u> HPI pumps.	

Examiner Note: Steps 6 and 7 will be verifiable actions unless the other RO, which is performing EOP Enclosure 5.1 (ES Actuation), has manually actuated ES Channels 1 and 2.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Rule 2
Loss of SCM

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8. ☒ GO TO Step 13.	
13. Open: ☒ 1HP-26 ___ 1HP-27	Examiner Note: 1HP-26 is a verifiable action, unless ES Channel 1 was manually actuated.
14. ___ Verify <u>at least two</u> HPI pumps are operating using two diverse indications.	
	___ GO TO Step 27.

Rule 2
Loss of SCM

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED						
15. <u> </u> IAAT $\geq$ 2 HPI pumps operating, AND HPI flow in <u>any</u> header is in the Unacceptable Region of Figure 1 THEN perform Step 16.	 GO TO Step 17.						
17. <u> </u> IAAT flow limits are exceeded, <table border="1"><thead><tr><th>Pump Operation</th><th>Limit</th></tr></thead><tbody><tr><td>1 HPI pump/hdr</td><td>475 gpm (incl. seal injection for <u>A</u> hdr)</td></tr><tr><td>1A & 1B HPI pumps operating with 1HP-409 open</td><td>Total flow of 950 gpm (incl. seal injection)</td></tr></tbody></table> THEN perform Steps 18 - 20.	Pump Operation	Limit	1 HPI pump/hdr	475 gpm (incl. seal injection for <u>A</u> hdr)	1A & 1B HPI pumps operating with 1HP-409 open	Total flow of 950 gpm (incl. seal injection)	<u> </u> GO TO Step 21.
Pump Operation	Limit						
1 HPI pump/hdr	475 gpm (incl. seal injection for <u>A</u> hdr)						
1A & 1B HPI pumps operating with 1HP-409 open	Total flow of 950 gpm (incl. seal injection)						
18.  Place Diverse HPI in BYPASS.	<u> </u> Place Diverse HPI in OVERRIDE.						
19. Perform <u>both</u> :  Place ES CH 1 in MANUAL.  Place ES CH 2 in MANUAL.	1. <u> </u> IF ES CH 1 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. <u> </u> IF ES CH 2 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.						
20.  Throttle HPI to maximize flow $\leq$ flow limit.	Examiner Note: The 1B HPI Header will have to be throttled <475 gpm as the RCS depressurizes.						
21. <u> </u> Notify CRS of HPI status. (22)							
22. <u> </u> Verify RCS pressure > 550 psig.	 Ensure ES Channels 3 <u>and</u> 4 actuated.						

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Rule 2
Loss of SCM

EOP/1/A/1800/001 0L Rev 05
EP/1/A/1800/001 0L
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. ☐ IAAT either exists: ☐ LPI FLOW TRAIN A plus ☐ LPI FLOW TRAIN B ≥ 3400 gpm ☐ <u>Only one</u> LPI header in operation with header flow ≥ 2900 gpm THEN GO TO Step 24.	☐ GO TO Step 35.
24. Perform the following: ☒ Place 1FDW-315 in MANUAL and close. ☒ Place 1FDW-316 in MANUAL and close. ☒ Place 1FDW-35 in HAND and close. ☒ Place 1FDW-44 in HAND and close.	1. ☐ IF 1FDW-315 will NOT close, THEN stop 1A MD EFDWP. 2. ☐ IF 1FDW-316 will NOT close, THEN stop 1B MD EFDWP. 3. ☐ Place 1 TD EFDW PUMP in PULL TO LOCK.
25. ☐ Notify crew that performance of Rule 3 is NOT required due to LB LOCA.	
26. ☐ WHEN directed by CRS, THEN EXIT.	

... END ...

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 00 Rev 03

Subsequent Actions

EP/1/A/1800/001 00

Parallel Actions

Page 1 of 1

CONDITION	ACTIONS	
1. PR NIs $\geq$ 5% FP OR NIs NOT lowering	GO TO UNPP tab.	UNPP
2. <u>All</u> 4160V SWGR de-energized {13}	GO TO Blackout tab.	BLACKOUT
3. <u>Core</u> SCM indicates superheat	GO TO ICC tab.	ICC
4. <u>Any</u> SCM = 0°F	GO TO LOSCM tab.	LOSCM
5. <u>Both</u> SGs intentionally isolated to stop excessive heat transfer	GO TO EHT tab.	LOHT
6. Loss of heat transfer (including loss of all Main and Emergency FDW)	GO TO LOHT tab.	

Examiner Note: The CRS will transfer to the ICC Tab, if any Core SCM is negative (next page), or the LOSCM Tab (Event 8 Page 12), when the transfer from Subsequent Actions is made.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0C Rev 03

Duke Energy Oconee Nuclear Station Unit 1 EOP Inadequate Core Cooling	Procedure No. EP/1/A/1800/001 0C
	Revision No. 003

ICC
Parallel Actions

EP/1/A/1800/001 0C
Page 1 of 1

CONDITION	ACTIONS	
1. <u>All</u> 4160V SWGR de-energized after ICC tab is entered (13)	GO TO Blackout tab.	BLACKOUT
2. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation)	ES
3. Valid ES actuation has occurred <u>or</u> should have occurred	Initiate Encl 5.1 (ES Actuation).	ES
4. Power lost to <u>all</u> 4160V SWGR and <u>any</u> 4160V SWGR re-energized	- Initiate AP/11 (Recovery from Loss of Power). IF Encl 5.1 (ES Actuation) has been initiated, THEN reinitiate Encl 5.1.	ROP
5. Individual available to make notifications	- Announce plant conditions using PA system. - Notify SM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification/Reportability Evaluation). - Notify plant staff that Emergency Dose Limits are in affect using PA system.	NOTIFY and EDL

Examiner Note: The CRS will direct the RO not performing Rule 2 to perform EOP Encl. 5.1 (ES Actuation) on **Event 8 Page 14.**

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

ICC

EP/1/A/1800/001 0C

Inadequate Core Cooling

Page 1 of 13

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE - ICC conditions should not exist unless multiple equipment and system failures have occurred. Some of the equipment used in this section may be the same equipment that has failed. It is expected that attempts to restore equipment operation will continue throughout this section. - It is also expected that transition to EG/1/A/OSAM/SAG-1 will occur whenever conditions requiring the transition exist. - Upon entry into EG/1/A/OSAM/SAG-1 (Main Control Room Severe Accident Guideline Initial Response), this procedure will be discontinued.	
1. ☐ IAAT CETCs > 1200°F, THEN GO TO EG/1/A/OSAM/SAG-1 (Main Control Room Severe Accident Guideline Initial Response).	
2. ☐ Ensure full HPI and control per Rule 6 (HPI).	
3. ☐ IAAT RCS pressure is ≤ 550 psig, OR RB pressure is ≥ 3 psig, THEN perform Steps 4 - 8.	☐ GO TO Step 9.
4. Open: ☐ 1LP-21 ☐ 1LP-17	1. ☐ Stop 1A LPI Pump. 2. ☐ IF 1C LPI Pump is operating, THEN GO TO Step 8. 3. ☐ Close 1LP-17 4. ☐ GO TO Step 6.
5. ☐ Start 1A LPI Pump.	1. ☐ IF 1C LPI Pump is operating, THEN GO TO Step 8. 2. ☐ Close 1LP-17.
6. Open: ☐ 1LP-22 ☐ 1LP-18	1. ☐ Stop 1B LPI Pump. 2. ☐ IF 1C LPI Pump is operating, THEN GO TO Step 8. 3. ☐ Close 1LP-18. 4. ☐ GO TO Step 8.

Examiner Note: Steps 4 – 6 are accomplished automatically by the initiation ES and Diverse LPI.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

ICC
Inadequate Core Cooling

EP/1/A/1800/001 0C
 Page 3 of 13

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7. ☐ Start 1B LPI Pump.	1. ☐ IF 1C LPI Pump is operating, THEN GO TO Step 8. 2. ☐ Close 1LP-18.
8. ☐ Verify two LPI pumps operating.	☐ IF LPI/HPI piggyback is aligned, THEN maximize total LPI flow by throttling HPI flow as follows: • 1C LPI pump only- < 2900 gpm • 1A or 1B LPI pump only- < 3100 gpm
9. ☐ IAAT all exist: ☐ 1C LPI Pump off ☐ 1C LPI Pump available ☐ LPI required ☐ ECCS pump suction aligned to BWST ☐ 1A LPI Pump unavailable ☐ 1B LPI Pump unavailable THEN perform Steps 10 - 13.	☒ GO TO Step 14.
14. Verify open: ☐ 1CF-1 ☐ 1CF-2	☐ IF CFTs NOT isolated for nitrogen injection considerations, THEN open: ☐ 1CF-1 ☐ 1CF-2
15. ☐ IAAT core SCM is $\geq 0^{\circ}\text{F}$, THEN GO TO LOCA CD tab.	

Examiner Note: The CRS will transfer to the LOCA CD tab once the Core Superheat condition has cleared. This step may initially be bypassed (RNO) when it is first reached. The LOCA CD tab is on **Event 8 Page 24**.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

ICC

EP/1/A/1800/001 0C

Inadequate Core Cooling

Page 7 of 13

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Full flow from at least one HPI pump is intended to mean that the HPI flow rate appears to approximate the flow that would be expected from one HPI pump at the existing RCS pressure.	
16. ☐ IAAT any injection sources available: ☐ Full flow from <u>at least one</u> HPI pump exists ☐ LPI available ☐ CFTs available THEN perform Steps 17 - 19.	1. ☐ IF HPI forced cooling is in progress, THEN GO TO Step 20. 2. ☐ Close 1RC-4. 3. ☐ GO TO Step 20.
17. Open: ☐ 1RC-4 ☒ PORV	
18. Locally close breakers (Unit 1 Cable Rm): ☐ 1SKJ-08 (1RC-155/1RC-156) ☐ 1SKK-08 (1RC-157/1RC-158) ☐ 1SKL-08 (1RC-159/1RC-160)	
19. Open: ☒ 1RC-155 ☒ 1RC-156 ☒ 1RC-157 ☒ 1RC-158 ☒ 1RC-159 ☒ 1RC-160	
20. Close: ☐ 1GWD-17 ☒ 1HP-1 ☒ 1HP-2 ☒ 1RC-3	
21. ☐ IAAT SSF-ASW is the only source available to feed SGs, THEN coordinate with SSF-ASW operator to throttle 1CCW-268 (SSF ASWP TO SG SUPPLY) to establish a feed rate per Rule 7 (SG Feed Control).	Examiner Note: SSF-ASW is unavailable due to OTS1-1 OSS.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

Page 11 of 28

Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

ICC

Inadequate Core Cooling

EP/1/A/1800/001 0C

Page 9 of 13

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22. ☐ IAAT NO SG is being fed with feedwater (Main or Emergency FDW), AND <u>any</u> of the following exists: ☐ Unit 1 EFDW available ☐ EFDW aligned from another unit ☐ Main FDW available THEN perform Steps 23 - 27.	☒ GO TO Step 28.
28. ☐ Verify TBVs available.	☐ Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs). (PS)
NOTE Cooldown rates do NOT apply when reducing SG pressure in the following steps.	
29. Verify Unit 1 TDEFDWP is the <u>only</u> operating EFDWP.	☒ GO TO Step 32.
32. Fully depressurize <u>both</u> SGs <u>as rapidly as possible</u> using <u>either</u> : ☒ TBVs ☐ ADVs	
33. ☐ IAAT BWST level is $\leq 19'$, THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).	Examiner Note: EOP Encl. 5.12 is on Event 8 Page 21.
34. Perform the following: ☐ Ensure <u>all</u> RBCUs in low speed. ☐ Open 1LPSW-18. ☐ Open 1LPSW-21. ☐ Open 1LPSW-24.	
35. ☐ Initiate Encl 5.35 (Containment Isolation).	

Examiner Note: EOP Encl. 5.35 is on Event 8 Page 28.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

*EP/1/A/1800/001 0D Rev 02***LOSCM
Parallel Actions**

CONDITION	ACTIONS	
1. PR NIs $\geq$ 5% FP OR NIs NOT lowering	GO TO UNPP tab.	UNPP
2. <u>All</u> 4160V SWGR de-energized (13)	GO TO Blackout tab.	BLACKOUT
3. <u>Core</u> SCM indicates superheat	GO TO ICC tab.	ICC
4. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	ES
5. Valid ES actuation has occurred or should have occurred	Initiate Encl 5.1 (ES Actuation).	ES
6. Power lost to <u>all</u> 4160V SWGR and <u>any</u> 4160V SWGR re-energized	- Initiate AP/11 (Recovery from Loss of Power). - IF Encl 5.1 (ES Actuation) has been initiated, THEN reinitiate Encl 5.1.	ROP
7. RCS leakage > 160 gpm with letdown isolated OR SGTR > 25 gpm	Notify plant staff that Emergency Dose Limits are in affect using PA system.	EDL
8. Individual available to make notifications	- Announce plant conditions using PA system. - Notify SM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification/Reportability Evaluation).	NOTIFY

Examiner Note: The CRS will direct the RO not performing Rule 2 to perform EOP Encl. 5.1 (ES Actuation) on Event 8 Page 14.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

LOSCM

Loss Of Subcooling Margin

EP/1/A/1800/001 0D Rev 02

EP/1/A/1800/001 0D

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. Ensure Rule 2 (Loss of SCM) is in progress <u>or</u> complete.	
2. <u> </u> Verify LOSCM caused by excessive heat transfer.	 GO TO Step 4.
3. <u> </u> Verify EHT tab has been performed.	<u> </u> GO TO EHT tab.
4. <u> </u> IAAT <u>either</u> exists: <u> </u> LPI FLOW TRAIN A <u>plus</u> LPI FLOW TRAIN B ≥ 3400 gpm <u>Only one</u> LPI header in operation with header flow ≥ 2900 gpm THEN GO TO LOCA CD tab.	
5. <u> </u> Verify SSF activated per AP/25 with SSF RC Makeup required. {31}	<u> </u> GO TO Step 7.
6. WHEN all SCMs $> 0^{\circ}\text{F}$, THEN GO TO Subsequent Actions.	

Examiner Note: The CRS will transfer to the LOCA CD tab once LPI flows are verified >3400 gpm. The LOCA CD tab is on **Event 8 Page 24**.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: ILT 24-1

Scenario No.: 3

Event No.: 8

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Event Description: LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)

Applicant's Actions or Behavior

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Enclosure 5.1

EP/1/A/1800/001 0M

ES Actuation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED															
1. ☐ Determine <u>all</u> ES channels that <u>should</u> have actuated based on <u>RCS pressure and RB pressure</u>: <table border="1"> <thead> <tr> <th>✓</th> <th>Actuation Setpoint (psig)</th> <th>Associated ES Channel</th> </tr> </thead> <tbody> <tr> <td></td> <td>1600 (RCS)</td> <td>1 & 2</td> </tr> <tr> <td></td> <td>550 (RCS)</td> <td>3 & 4</td> </tr> <tr> <td></td> <td>3 (RB)</td> <td>1, 2, 3, 4, 5, & 6</td> </tr> <tr> <td></td> <td>10 (RB)</td> <td>7 & 8</td> </tr> </tbody> </table>	✓	Actuation Setpoint (psig)	Associated ES Channel		1600 (RCS)	1 & 2		550 (RCS)	3 & 4		3 (RB)	1, 2, 3, 4, 5, & 6		10 (RB)	7 & 8	Examiner Note: The setpoints will be exceeded for all 8 ES Channels.
✓	Actuation Setpoint (psig)	Associated ES Channel														
	1600 (RCS)	1 & 2														
	550 (RCS)	3 & 4														
	3 (RB)	1, 2, 3, 4, 5, & 6														
	10 (RB)	7 & 8														
2. ☐ Verify <u>all</u> ES channels associated with actuation setpoints have actuated. Examiner Note: ES Channels 1 and 2 will not automatically actuate. A member of the crew will be required to depress TRIP for each channel.	<u>NOTE</u> Voter OVERRIDE extinguishes the TRIPPED light on the associated channels that have <u>auto</u> actuated. Pressing TRIP on channels previously actuated will reposition components that may have been throttled or secured by this Enclosure. ☐ Depress TRIP on <u>affected</u> ES logic channels that have <u>NOT</u> previously been actuated.															
3. ☐ <u>IAAT additional</u> ES actuation setpoints are exceeded, <u>THEN</u> perform Steps 1 - 2.																
4. ☐ Place Diverse HPI in BYPASS.	☐ Place Diverse HPI in OVERRIDE.															
5. Perform for <u>actuated</u> channels: ☐ Place ES CH 1 in MANUAL. ☐ Place ES CH 2 in MANUAL. Examiner Note: Steps 4 and 5 are also in Rule 2 (Loss of SCM) and will be verifiable actions for whichever operator reaches them first.	<u>NOTE</u> - Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels. - In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.															

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.1

ES Actuation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. ☐ IAAT <u>all</u> exist: ☐ Voter associated with ES channel is in OVERRIDE ☐ An ES channel is <u>manually</u> actuated ☐ Components on that channel require manipulation THEN depress RESET on the required channel.	
7. ☐ Verify Rule 2 in progress <u>or</u> complete.	☐ GO TO Step 75.
8. ☐ Verify <u>any</u> RCP operating.	☒ GO TO Step 10.

Examiner Note: All RCPs will be secured by Rule 2 (Loss of SCM).

10. ☐ IAAT ES Channels 5 <u>or</u> 6 has actuated, THEN perform Steps 11 - 15.	☐ GO TO Step 16.
11. Perform for <u>actuated</u> channels: ☒ Place ES CH 5 in MANUAL . ☒ Place ES CH 6 in MANUAL .	NOTE • Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels. • In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch.
12. ☐ Verify <u>any</u> RCP is operating.	☒ GO TO Step 16.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.1

ES Actuation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. ☐ IAAT ES Channels 3 or 4 has actuated, THEN GO TO Step 17	☐ GO TO Step 55.
17. ☒ Place Diverse LPI in BYPASS.	☐ Place Diverse LPI in OVERRIDE.
18. Perform for <u>actuated</u> channels: ☒ Place ES CH 3 in MANUAL. ☒ Place ES CH 4 in MANUAL.	NOTE • Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels. • In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch. 1. ☐ IF ES CH 3 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. ☐ IF ES CH 4 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.
CAUTION LPI pump damage may occur if operated in excess of 30 minutes against a shutoff head. (6)	
19. ☐ IAAT <u>any</u> LPI pump is operating against a shutoff head, THEN at the CRS's discretion, stop <u>affected</u> LPI pumps. (6, 22)	
20. ☐ IAAT RCS pressure is < LPI pump shutoff head, THEN perform Steps 21 - 22.	☐ GO TO Step 23.
21. Perform the following: ☐ Open 1LP-17. ☐ Start 1A LPI PUMP.	1. ☐ Stop 1A LPI PUMP. 2. ☐ Close 1LP-17.
22. Perform the following: ☐ Open 1LP-18. ☐ Start 1B LPI PUMP.	1. ☐ Stop 1B LPI PUMP. 2. ☐ Close 1LP-18.

Examiner Note: ES Channels 3 and 4 start the 1A/1B LPI pumps and open 1LP-17/18.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.1

EP/1/A/1800/001 0M

ES Actuation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23. ☐ IAAT 1A and 1B LPI PUMPs are off / tripped, AND all exist: ☐ RCS pressure < LPI pump shutoff head ☐ 1LP-19 closed ☐ 1LP-20 closed THEN perform Steps 24 - 25.	 GO TO Step 26.
24. Open: ☐ 1LP-9 ☐ 1LP-10 ☐ 1LP-6 ☐ 1LP-7 ☐ 1LP-17 ☐ 1LP-18 ☐ 1LP-21 ☐ 1LP-22	
25. ☐ Start 1C LPI PUMP.	
26. ☐ IAAT 1A LPI PUMP fails while operating, AND 1B LPI PUMP is operating, THEN close 1LP-17.	
27. ☐ IAAT 1B LPI PUMP fails while operating, AND 1A LPI PUMP is operating, THEN close 1LP-18.	
28. Start: ☒ A OUTSIDE AIR BOOSTER FAN ☒ B OUTSIDE AIR BOOSTER FAN	CT-2 Stop Time: _____ (<30 minutes from initiation of LB LOCA)
29. Notify Unit 3 to start: ☐ 3A OUTSIDE AIR BOOSTER FAN ☐ 3B OUTSIDE AIR BOOSTER FAN	

Examiner Note: Once the A and B Outside Air Booster Fans are started in step 28, the Control Room Gas monitor (RIA-39) will begin to lower.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.1
ES Actuation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30. Verify open: ___ 1CF-1 ___ 1CF-2	___ IF CRS desires 1CF-1 and 1CF-2 open, THEN open: ___ 1CF-1 ___ 1CF-2
31. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
32. ☒ Secure makeup to the LDST.	

Examiner Note: If makeup in progress then verifiable action to close 1HP-16.

33. ___ Verify <u>all</u> ES channel 1 - 4 components are in the ES position.	1. ___ IF 1HP-3 fails to close, THEN close 1HP-1. 2. ___ IF 1HP-4 fails to close, THEN close 1HP-2. 3. ___ IF 1HP-20 fails to close, AND NO RCPs operating, THEN close: ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ___ Notify CRS to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
34. ___ Verify Unit <u>2</u> turbine tripped.	☒ GO TO Step 37.
37. ☒ Close 1LPSW-139.	
38. Place in FAIL OPEN: ☒ 1LPSW-251 FAIL SWITCH ☒ 1LPSW-252 FAIL SWITCH	
39. ___ Start <u>all available</u> LPSW pumps.	

Examiner Note: All three LPSW pumps already operating due to ES actuation.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.1

ES Actuation

EP/1/A/1800/001 0M Rev 02

EP/1/A/1800/001 0M

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40. Verify <u>either</u> : ☐ Three LPSW pumps operating ☐ Two LPSW pumps operating when Tech Specs only requires two operable	☐ GO TO Step 42.
41. Open: ☒ 1LPSW-4 ☒ 1LPSW-5	☐ IF <u>both</u> are closed: ☐ 1LPSW-4 ☐ 1LPSW-5 THEN notify CRS to initiate action to open <u>at least one</u> valve prior to BWST level $\leq 19'$.
42. ☐ IAAT BWST level $\leq 19'$, THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).	1. ☒ Display BWST level using OAC Turn-on Code "SHOWDIG O1P1600". 2. ☐ Notify crew of BWST level IAAT step.

Examiner Note: EOP Encl. 5.12 contains the actions necessary to satisfy CT-1. Encl. 5.12 is located on Event 8 Page 21.

43. ☐ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (PS)	
44. ☒ Select DECAY HEAT LOW FLOW ALARM SELECT switch to ON.	
45. ☐ IAAT ES channels 5 or 6 has actuated, THEN perform Step 46 .	☐ GO TO Step 47.
NOTE RBCU transfer to low speed will NOT occur until 3 minute time delay is satisfied.	
46. ☐ Verify <u>all</u> ES channel 5 & 6 components are in the ES position.	☐ Notify CRS to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.1

ES Actuation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
47. <u>IAAT ES channels 7 or 8 has actuated, THEN perform Steps 48 - 49.</u>	<u>GO TO Step 50.</u>
48. Perform for <u>actuated</u> channels: Place ES CH 7 in MANUAL. Place ES CH 8 in MANUAL.	<u>NOTE</u> • Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels. • In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch. 1. <u>IF ES CH 7 fails to go to MANUAL, THEN place ODD voter in OVERRIDE.</u> 2. <u>IF ES CH 8 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.</u>
49. <u>Verify all ES channel 7 & 8 components are in the ES position.</u>	<u>Notify CRS to evaluate components NOT in ES position and initiate action to place in ES position if desired.</u>
50. <u>Notify U2 CRS that SSF is inoperable due to OTS1-1 open.</u>	
51. <u>Ensure any turnover sheet compensatory measures for ES actuation are complete as necessary.</u>	
<u>NOTE</u> • Leakage from the RB atmosphere to adjacent buildings can occur when there is significant positive pressure in the RB. • AB/PR RIAs, RB pressure lowering, and/or PR Fire alarms due to steam could be indications of RCS leakage outside containment. • EALs may apply when RIA counts are elevated if indicates RCS leakage outside containment.	
52. <u>Monitor AB and Unit Vent RIAs for elevated counts.</u>	
53. <u>IAAT conditions causing ES actuation have cleared, THEN initiate Encl 5.41 (ES Recovery).</u>	
54. <u>WHEN CRS approves, THEN EXIT.</u>	

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.12

EP/1/A/1800/001 0N

ECCS Suction Swap to RBES

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. Start: ___ 1A LPI PUMP ___ 1B LPI PUMP	1. ___ IF NO LPI pumps are operating, THEN GO TO Step 85. 2. ___ IF 1C LPI PUMP is operating, THEN GO TO Step 87.
2. Verify <u>either</u> : ___ LPI FLOW TRAIN A <u>plus</u> ___ LPI FLOW TRAIN B ≥ 3400 gpm ___ <u>Only one</u> LPI header is operating, AND flow in that header is ≥ 2900 gpm	___ GO TO Step 4.
3. ___ GO TO Step 52.	
<u>Unit Status</u> LPI FLOW TRAIN A <u>plus</u> LPI FLOW TRAIN B ≥ 3400 gpm OR <u>Only one</u> LPI header in operation with header flow ≥ 2900 gpm.	
52. ☒ WHEN BWST level is $\leq 15'$, THEN stop <u>all</u> HPI pumps.	
<u>NOTE</u> RB level of $\geq 2'$ is expected when BWST level reaches $9'$.	
53. ___ WHEN BWST level $\leq 9'$, AND RB level is rising, THEN continue procedure.	
54. Simultaneously open: ☒ 1LP-19 ☒ 1LP-20 (4)	1. ___ IF 1LP-19 fails to open, THEN stop the 1A RBS PUMP. 2. ___ IF 1LP-20 fails to open, THEN stop the 1B RBS PUMP.

CT-1 satisfied when 1LP-19 and 1LP-20 are open. If the crew fails to open 1LP-19 and 1LP-20, the BWST will continue to lower until the LPI pumps and Reactor Building Spray pumps lose suction.

55. ___ IAAT BWST level is $\leq 6'$, THEN perform Steps 56 - 59.	___ GO TO Step 60.
56. ___ Verify 1LP-19 open.	___ Stop the 1A LPI PUMP.
57. ___ Verify 1LP-20 open.	___ Stop the 1B LPI PUMP.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.12

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ECCS Suction Swap to RBES

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
58. <u>Simultaneously</u> close: ☐ 1LP-21 ☐ 1LP-22	1. ☐ IF 1LP-21 fails to close, THEN: A. ☐ Stop 1A LPI PUMP. B. ☐ Stop 1A RBS PUMP. C. ☐ Close 1LP-19. 2. ☐ IF 1LP-22 fails to close, THEN: A. ☐ Stop 1B LPI PUMP. B. ☐ Stop 1B RBS PUMP. C. ☐ Close 1LP-20.
59. ☐ Dispatch an operator to close 1LP-28 (BWST Outlet). (East of Unit 1 BWST)	

Enclosure 5.12

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ECCS Suction Swap to RBES

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
60. Verify <u>any</u> are open: ☐ 1LPSW-4 ☐ 1LPSW-5	☐ GO TO Step 63.
61. Verify <u>both</u> are open: ☐ 1LPSW-4 ☐ 1LPSW-5	1. ☐ IF 1LPSW-4 is closed, AND flow exists on LPI FLOW TRAIN B, THEN: A. ☐ Open 1LPSW-5. B. ☐ Stop 1A LPI PUMP. C. ☐ Close 1LP-17. D. ☐ GO TO Step 67. 2. ☐ IF 1LPSW-5 is closed, AND flow exists on LPI FLOW TRAIN A, THEN: A. ☐ Open 1LPSW-4. B. ☐ Stop 1B LPI PUMP. C. ☐ Close 1LP-18. D. ☐ GO TO Step 67.
62. ☒ GO TO Step 67.	
67. ☐ IAAT an operating LPI Pump (1A OR 1B) fails,	☒ GO TO Step 75.

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0N Rev 01**Enclosure 5.12****EP/1/A/1800/001 0N****ECCS Suction Swap to RBES**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
75. Open: ☒ 1HP-939 ☒ 1HP-940	☐ Continue procedure.
76. ☐ Notify Chemistry to periodically sample LPI discharge for boron concentration.	
77. Close: ☐ 1LP-15 ☐ 1LP-16	☐ Continue procedure.
78. ☐ WHEN 1LP-28 is closed, THEN continue in this enclosure.	
79. ☐ Verify 1LP-19 open.	☐ GO TO Step 83.
80. ☐ Verify 1A LPI PUMP operating.	☐ IF TSC approves restart, THEN : A. ☐ Start 1A LPI PUMP. B. ☐ GO TO Step 83.
81. ☐ Verify 1LP-20 open.	☐ GO TO Step 83.
82. ☐ Verify 1B LPI PUMP operating.	☐ IF TSC approves restart, THEN start 1B LPI PUMP.
83. ☐ Initiate Encl 5.4 (Makeup to the BWST) to replenish inventory for subsequent use if needed.	
84. ☐ WHEN directed by CRS, THEN EXIT this enclosure.	

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

LOCA CD
LOCA Ccooldown

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ IAAT BWST level is $\leq 19'$, THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).	Examiner Note: EOP Encl. 5.12 is located on Event 8 Page 21.
2. ☐ Verify ES actuated.	☐ GO TO Step 4.
3. ☐ GO TO Step 7.	
7. Perform the following: ☐ Ensure <u>all</u> RBCUs in low speed. ☐ Open 1LPSW-18. ☐ Open 1LPSW-21. ☐ Open 1LPSW-24.	Examiner Note: Step 7 components were automatically positioned by ES actuation.
CREW BRIEF OPPORTUNITY	
8. ☐ Initiate Encl 5.35 (Containment Isolation).	
9. ☐ Start <u>all</u> RB Aux fans.	
10. ☐ IAAT <u>either</u> exists: ☐ LPI FLOW TRAIN A <u>plus</u> LPI FLOW TRAIN B ≥ 3400 gpm ☐ <u>Only one</u> LPI header in operation with header flow ≥ 2900 gpm THEN GO TO Step 11.	☐ GO TO Step 39.
11. ☐ Stop <u>all</u> RCPs.	

Examiner Note: The RCPs have been secured by Rule 2 (Loss of SCM).

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

LOCA CD
LOCA Cooldown

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12. Dispatch an operator to: (Unit 1 Equip Rm) ___ Remove tag and close 1XO-F5C (1CF-1 Bkr (1A CFT Outlet)) ___ Remove tag and close 1XP-F5C (1CF-2 Bkr (1B CFT Outlet)) ___ Close 1XS2-F3D (1LP-104 Bkr (Post LOCA Boron Dilute))	Booth Cue: When contacted as AO, acknowledge request to close Equipment Room breakers. Wait 5 minutes then Fire TMR 8A. Call CR to report breakers closed.
13. ___ IAAT breakers for 1CF-1, AND 1CF-2 are closed, THEN close: ___ 1CF-1 ___ 1CF-2	
14. ___ Dispatch an operator to perform Encl 5.28 (Local SG Isolation) to isolate <u>both</u> SGs.	
15. ___ IAAT Spent Fuel Cooling indicates: ___ Abnormal temperature rise ___ Abnormal level change ___ Abnormal SFC flow THEN initiate AP/35 (Loss of SFP Cooling and/or Level). {42}	
16. Verify <u>both</u> closed: ___ 1MS-24 ___ 1MS-33	___ Initiate Encl 5.33 (Swapping Aux Steam Header to Another Unit).
17. ___ Initiate Encl 5.25 (SG Isolation) to isolate <u>both</u> SGs.	
18. ___ Initiate Encl 5.36 (Equipment Alignment For Plant Shutdown).	
19. ___ Verify <u>core</u> SCM $\leq 0^{\circ}\text{F}$.	___ GO TO Step 32.
20. ___ WHEN CETCs are $\leq 400^{\circ}\text{F}$, THEN continue in this procedure.	

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

LOCA CD
LOCA Cutdown

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21. Dispatch an operator to SSF to: A. ___ Close 1XSF-F6D (1LP-103 (LOCA Boron Dilution Valve)). B. ___ Stand by in SSF Control Room for operating 1LP-103.	Booth Cue: When contacted as AO, acknowledge request to close 1XSF-F6D. Wait 5 minutes then Fire TMR 8C. Call CR to report "1XSF-F6D is closed and I'm standing by in the SSF Control Room".
22. ■ WHEN breaker for 1LP-104 is closed, THEN open 1LP-104. {24}	1. ___ Notify TSC to refer to EM5.1 <u>and</u> that EOP Encl 5.47 (Alternate Methods of Post LOCA Boron Dilute Flow) will be initiated. 2. ___ Initiate EOP Encl 5.47 (Alternate Methods of Post LOCA Boron Dilute Flow). 3. ___ GO TO Step 25.
23. ___ Notify operator at SSF to open 1LP-103 (Post LOCA Boron Dilute). {24}	
24. Verify <u>both</u>: ___ 1LP-103 (Post LOCA Boron Dilute) is open ___ Post LOCA Boron Dilution flow switch indicates flow (light lit)	1. ___ Notify TSC to refer to EM5.1 <u>and</u> that EOP Encl 5.47 (Alternate Methods of Post LOCA Boron Dilute Flow) will be initiated. 2. ___ Initiate EOP Encl 5.47 (Alternate Methods of Post LOCA Boron Dilute Flow).
25. ___ IAAT <u>all</u> exist: ___ <u>Any</u> RBS pump operating ___ RB pressure < 3 psig ___ < 24 hours into event ___ Reactor Engineering confirms Condition Zero <u>or</u> Condition One per RP/0/B/1000/018 (Core Damage Assessment) THEN stop <u>all</u> RBS pumps.	
26. ___ WHEN ECCS suction swap to the RBES is complete, THEN ensure <u>all</u> HPI pumps off.	

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Booth Cue: If asked, Unit 2 will respond and take actions as required for the Fire Alarm 1SA-3/B-6

If asked the status of Fire Alarm Response inform the crew "There is not a fire in the U1 East Pen Rm but there is a lot of steam coming from an Electrical Penetration in the Reactor Building Wall."

3.1 Monitor fire alarm cabinet in rear of control room to determine cause of alarm.

- Refer to Section 5 for list of alarm points and Fire Zone determination.

Examiner Note: The following points are in alarm on the Fire Cabinet (not modelled) and are required to be given to the RO: 0204030, 0204031, 0204032, 0204033

When the RO pushes ACKNOWLEDGE at the Fire Cabinet, the alarm is silenced.

3.2 Push ACKNOWLEDGE Switch at fire alarm cabinet to silence audible alarm.

3.3 **IF** more than one alarm or trouble condition exists, press PREVIOUS/NEXT Switch to scroll through all alarms on display unit to determine affected areas or detectors.

3.4 **IF** any RB detector is in alarm, **GO TO** Step 3.9.

3.5 **IF AT ANY TIME**, two or more detectors are in alarm in the same zone:

3.5.1 Dispatch Fire Brigade and MERT per pre-staged AP/43 Encl 5.5 (Fire Brigade Activation Inside Protected Area). (CR Desk)

3.5.2 Notify AP/EOP AO to report to the affected CR.

3.5.3 **GO TO** AP/0/A/1700/043, Fire Brigade Response Procedure.

**Examiner Note: (FYI) The points given above represent the following:
0204030 – U1 East Pen Rm SE Corner, 0204031 – U1 East Pen Rm Col R70, 0204032 – U1 East Pen Rm SE, 0204033 – U1 East Pen Rm Lobby**

Booth Cue: When dispatched as AO/Fire Brigade, wait 2 minutes then call CR to report "There is not a fire in the U1 East Pen Rm but there is a lot of steam coming from an Electrical Penetration in the Reactor Building Wall".

Booth Cue: If requested, Unit 2 will perform AP/0/A/1700/043 (Fire Brigade Response Procedure)

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 3

Event No.: 8

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Event Description: **LB LOCA (Failure of Containment and ES Channels 1 and 2) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.35
Containment Isolation

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EP/1/A/1800/001 0P
Page 1 of 3

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
1. ☐ Verify Encl 5.1 (ES Actuation) is in progress or complete.	1. Close the following ES operated RB isolation valves:								
2. ☐ Verify <u>all</u> RCPs off.	☐ GO TO Step 5.								
3. ☐ Stop <u>both</u> CC pumps.									
4. Close the following ES operated RB isolation valves:	☐ IF 1HP-20 fails to close, THEN close <u>all</u> the following:								
<table border="1"> <tr> <td>☒ ES Chan 1</td><td>☒ ES Chan 2</td></tr> <tr> <td>☐ 1HP-20</td><td>☐ 1HP-21</td></tr> </table>	☒ ES Chan 1	☒ ES Chan 2	☐ 1HP-20	☐ 1HP-21	☐ 1HP-228				
☒ ES Chan 1	☒ ES Chan 2								
☐ 1HP-20	☐ 1HP-21								
	☐ 1HP-226								
	☐ 1HP-232								
	☐ 1HP-230								
<table border="1"> <tr> <td>☒ ES Chan 5</td><td>☒ ES Chan 6</td></tr> <tr> <td>☐ 1CC-7</td><td>☐ 1CC-8</td></tr> <tr> <td>☐ 1LPSW-15</td><td>☐ 1LPSW-15</td></tr> <tr> <td>☐ 1LPSW-6</td><td>☐ 1LPSW-6</td></tr> </table>	☒ ES Chan 5	☒ ES Chan 6	☐ 1CC-7	☐ 1CC-8	☐ 1LPSW-15	☐ 1LPSW-15	☐ 1LPSW-6	☐ 1LPSW-6	
☒ ES Chan 5	☒ ES Chan 6								
☐ 1CC-7	☐ 1CC-8								
☐ 1LPSW-15	☐ 1LPSW-15								
☐ 1LPSW-6	☐ 1LPSW-6								
5. Rotate switches to the closed position for the following components:									
☐ 1LPSW-1054									
☐ 1LPSW-1055									
☐ 1LPSW-1061									
☐ 1LPSW-1062									
6. Verify the following components indicate closed:	☐ Notify CRS of <u>all</u> valves that fail to position.								
☐ 1LPSW-1054									
☐ 1LPSW-1055									
☐ 1LPSW-1061									
☐ 1LPSW-1062									
7. ☐ EXIT this enclosure.									

This event is complete when the crew has performed Step 54 of EOP Encl. 5.12 (ECCS Suction Swap to RBES), or when directed by the Lead Examiner.

CRITICAL TASKS

- CT-1** Align the RBES to LPI pump by opening 1LP-19 and 1LP-20 prior to a loss of suction to the LPI pumps (**CT-1 located on Event 8 Page 21**)

Reference	EOP Enclosure 5.12 (ECCS Suction Swap to RBES)
Critical Task Methodology	Completion of EOP steps required to align suction to equipment essential to the EOP mitigation strategy (LPI and BS Pumps)
Initiating Cue	BWST Level <19 feet during a LB LOCA
Performance Feedback	If the crew fails to perform the required action, the LPI pumps lose suction and stop adding inventory to the Reactor core.
Success Path	The correct performance of EOP Enclosure 5.12 (ECCS Suction Swap to RBES)
Measurable Performance Standard	Observable actions taken by one crew member. The success or failure will be evident to the entire crew based upon the ability of LPI to flow water into the Reactor core.
Preferred Boundary Condition	Threshold at which Safety Function #2 (Reactor Coolant System Inventory Control) is severely challenged

- CT-2** Start Control Room Outside Air Booster Fans within 30 minutes of LB LOCA for Control Room Habitability (**CT-2 Stop Time located on Event 8 Page 17**)

Reference	EOP Encl. 5.1 (ES Actuation) / TCA #20
Critical Task Methodology	Completion of EOP steps required to align OABFs to maintain Control Room habitability in the event of a LOCA with leakage outside of Containment
Initiating Cue	Initiation of the LB LOCA
Performance Feedback	If the crew fails to perform the required action, 1RIA-39 (Control Room Gas) goes into alarm
Success Path	The correct performance of EOP Encl. 5.1 (ES Actuation)
Measurable Performance Standard	Observable actions taken by one crew member. The success or failure will be evident to the entire crew based upon the receipt of the Control Room Gas RIA alarm.
Preferred Boundary Condition	Actions that are applicable to the facility and necessary to mitigate the event

SAFETY: Take a Minute			
UNIT 0 (CRS)			
SSF Operable: No PSW Operable: Yes	KHU's Operable: U1 - OH, U2 - UG	LCTs Operable: 2	Fuel Handling: No
UNIT STATUS (CRS)			
Unit 1 Simulator	Other Units		
Mode: 1	Unit 2	Unit 3	
Reactor Power: 100%	Mode: 1	Mode: 1	
Gross MWE: 890	100% Power	100% Power	
RCS Leakage: 0.01 gpm No WCAP Action	EFDW Backup: Yes	EFDW Backup: Yes	
RBNS Rate: 0.01 gpm			
Technical Specifications/SLC Items (CRS)			
Component/Train	OOS Date/Time	Restoration Required Date/Time	TS/SLC #
SSF	Today/0600	7 Days	TS 3.10.1
AMSAC/DSS	Today/0600	7 Days	SLC 16.7.2
Shift Turnover Items (CRS)			
Primary			
• 1RIA-3 and 5 removed from RB. • SASS is in Manual for maintenance calibration per OP/1/A/1105/014 • AMSAC/DSS Bypassed for maintenance			
Secondary			
• 1SSH-1, 1SSH-3, 1SD-2, 1SD-5, 1SD-140, 1SD-303, 1SD-355, 1SD-356 and 1SD-358 are closed with power supply breakers open per the Startup Procedure for SSF Overcooling Event. • U2 is supplying the AS Header • After turnover, the SRO will direct the BOP to start the 1B CBP and secure the 1C CBP per OP/1/A/1106/002 C Enclosure 4.3 (Swapping CPBs)			
Electrical			
• SSF OOS due to OTS1-1 tripping open. WCC preparing protected equipment package.			
Reactivity Management (CRS)			
RCS Boron 43 ppmB	Gp 7 Rod Position: 92% Withdrawn	Batch additions as required for volume control (OATC)	

Facility: **Oconee**

Scenario No.: 4

Op-Test No.: 1

Examiners: _____

Operators: _____ **SRO**
 _____ **OATC**
 _____ **BOP**

Initial Conditions:

- Rx Power = 80%

Turnover:

- SASS in Manual
- PSW Booster Pump OOS

Critical Tasks:

- CT-1: Manually open 1HP-5 to restore letdown prior to requiring a change in the mitigation strategy resulting in a shutdown and cool down to LPI (**Event 4 Page 4**)
- CT-2: Open 1HP-26 and the PORV and start 1C HPIP prior to reaching Step 5 of the LOHT tab which evaluates the status of HPI FC. Degraded HPI FC results in a change to the mitigation strategy. (**Event 8 Page 12**)

Event No.	Malfunction No.	Event Type*	Event Description
0a	Override		SASS in Manual
0b	Override		PSW Booster Pump OOS
1	Override O1A1245	N: BOP, SRO (TS)	Swap HPI Pumps for runtime – swap back due to High Motor Stator temperature
2	MSI231	I: OATC, SRO (TS) (MC)	PZR RTD A fails low
3	MCS004	I: OATC, SRO (MC)	Controlling Tave fails high
4	MPS110	C: BOP, SRO (TS)	1HP-5 fails closed (restore letdown) (CT-1)
5	Override	I: BOP, SRO	1NI-5 Fails High
6	Override	R: OATC, SRO (MC)	1A MFW Pump Active Thrust Bearing temperature high
7	MALF	M: ALL	Loss of Main Feedwater (Failure of TD and 1B MD EFWPs, 1A MDEFWP requires manual start)
8	MALF	M: ALL	LOHT requiring CBP feed, Rule 4 (failures of EFDW, CBPs, 1B HPIP) (CT-2)

* (N)ormal / (R)eactivity / (I)nstrument / (C)omponent / (M)ajor / (TS) Tech Spec / (MC)Manual Control

SCENARIO 4 EVENT SUMMARY

- Event 1:** When the crew takes the shift, the SRO will direct the BOP to start the 1B HPI pump and secure the 1A HPI pump using OP/1/A/1104/002 Enclosure 4.24 (Swapping 1A and 1B HPI Pumps). Following start, the 1B HPI pump will experience High Motor Stator temperatures requiring crew to secure the 1B HPI pump. This will require the SRO to enter **TS 3.5.2 Condition A**.
- Event 2:** The 'A' PZR RTD will fail low causing PZR levels 1 & 2 to indicate low. With SASS in manual, this will cause 1HP-120 to begin throttling open in an attempt to restore the indicated PZR level. Actual PZR level will start to rise and LDST level will begin to lower. The OATC may place 1HP-120 in Hand and stabilize PZR level. The crew will refer to OP/1/A/1105/014 which will direct them to select PZR Level Channel 3 as the controlling channel. The OATC should then return 1HP-120 to AUTO. The SRO will enter **TS 3.3.8 Condition A**.
- Event 3:** Controlling Tave will fail High causing ICS to insert control rods and raise feedwater flow. The crew should perform Plant Transient Response and take the ICS Diamond and Feedwater Loop Masters to MANUAL and stabilize the plant before the reactor trips. The crew will enter AP/1/A/1700/028 (ICS Instrument Failures). ICS will remain in Hand.
- Event 4:** 1HP-5 will fail closed causing a loss of RCS letdown. The crew will enter AP/1/A/1700/032 for a Loss of Letdown and minimize charging flow and seal injection to help control RCS inventory. The crew will restore letdown by dispatching an operator to manually open 1HP-5 locally. 1HP-5 is a containment isolation valve. This requires an operator stationed locally at the valve in communication with the control room. This will require the SRO to evaluate Tech Specs and enter **TS 3.6.3 Condition A**, at a minimum.
- Event 5:** 1NI-5 will fail high to 125% power. The BOP will reference an Alarm Response Guide which will direct the crew to bypass the 1A RPS channel in accordance with OP/1/A/1105/014 (Control Room Instrumentation Operation and Information).
- Event 6:** 1A MFW Pump Active Thrust Bearing Temperature will go into HIGH alarm. The SRO will enter AP/1/A/1700/029 (Rapid Unit Shutdown) to reduce power and secure the 1A MFW Pump. The OATC will perform a manual power reduction.
- Event 7:** A Loss of the Main Feedwater Pumps, the TD, and the 1B MDEFWP will occur requiring manual start of the 1A MDEFWP. Rule 3 (Loss of Main FDW) and EOP Encl. 5.9 (Extended EFDW Operation) will be performed to align the 1A MDEFWP to feed both SGs.
- Event 8:** A Loss of Heat Transfer will occur which will require alignment of CBP feed. After some time, CBP feed will fail requiring the performance of Rule 4. The 1B HPIP, which had high motor stator temperature in Event 1, will fail to start.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 1

Page 1 of 6

Event Description: **Swap HPI pumps for runtime (N: BOP, SRO) (TS)**

Applicant's Actions or Behavior

NRC Examiners: this guide highlights **Verifiable Action Steps in Green** and **RNO/Branching Steps in Yellow**.

Event 1 Crew/Plant Response:

- After turnover, the **CRS** will direct the **BOP** to swap running HPI pumps per OP/1/A/1104/002, Encl. 4.24. (Rev 182)
- 1B HPI pump motor stator temperature will come into alarm. The ARG is located on **Event 1 Page 3**.
- The CRS will direct the BOP to swap back to the 1A HPI pump and enter TS 3.5.2 Condition A (**Event 1 page 3**)

OP/1/A/1104/002 Encl. 4.24 Rev 182

2. Procedure

NOTE: Placing an idle HPI Pump in service can affect core reactivity by adding 75 gallons of water to RCS with a different boron concentration. (R.M.) {27}

2.1 **IF** Unit 1 in MODE 1, MODE 2, or MODE 3, perform the following: (R.M.)

____ 2.1.1 Review Component Boron Log for Standby HPI Pump boron. {27}

____ 2.1.2 Determine RCS boron based on placing Standby HPI Pump in service.
RCS boron _____ ppm

Examiner Note: Current RCS Boron is 43 ppm. The 1B HPI Pump piping contains 46 ppmB. When added to the 60k gallon RCS there is no change in Boron concentration so makeup is not required.

____ 2.1.3 **IF** RCS makeup required to achieve acceptable boron, determine RCS makeup plans per OP/1/A/1103/004 (Soluble Poison Control).

2.1.4 Perform one of the following:

____ A. Verify final RCS boron acceptable.

SRO

____ B. Ensure appropriate RCS makeup plans determined to ensure acceptable boron.

SRO

____ 2.1.5 Ensure R2 reactivity management controls established in Control Room per AD-OP-ALL-0203 (Reactivity Management). (R.M.) {37}

Examiner Note: For R2 reactivity controls the crew will pull the ropes to limit access to the Control Room.

This event is complete when crew has secured the 1B HPI and referenced TS 3.5.2, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 1

Page 2 of 6

Event Description: **Swap HPI pumps for runtime (N: BOP, SRO) (TS)**

Applicant's Actions or Behavior

Booth Cue: When/If contacted as an AO to perform pre-start checks for the HPI pump swap, report as required "HPI pump oil levels are satisfactory for pump start", "4160V breaker area is clear", "HPI pump room is clear". Once 1B HPI pump is started, report "1B HPI pump is operating satisfactory".

OP/1/A/1104/002 Encl. 4.24 Rev 182

2.1.6 WHILE swapping of HPI Pumps is in progress, monitor the following indications: (R.M.) {53}

- Appropriate ranged NIs
- Primary tank levels
- IF applicable, Neutron error
- IF applicable, CRD position

Enclosure 4.24

Swapping 1A and 1B HPI Pumps

OP/1/A/1104/002

Page 2 of 2

2.2 IF required to start 1A HPI Pump, perform the following:

- _____ 2.2.1 Start 1A HPI Pump.
- _____ 2.2.2 Stop 1B HPI Pump.
- _____ 2.2.3 Place 1B HPI Pump switch in "AUTO".

Examiner Note: Step 2.2 will be a verifiable action when the crew swaps back to the 1A HPI.

2.3 IF required to start 1B HPI Pump, perform the following:

- ☒ 2.3.1 Start 1B HPI Pump.
- ☒ 2.3.2 Stop 1A HPI Pump.
- _____ ☒ 2.3.3 Place 1A HPI Pump switch in "AUTO".

Examiner Note: Once the 1A HPI is secured, the 1B HPI motor stator temperature will alarm in less than 30 seconds. The CRS will direct the crew to swap back to the 1A HPI. The crew may start a new procedure or just use Step 2.2 above. Either method is acceptable.

_____ 2.4 IF RCS makeup is required to compensate for final RCS boron change, makeup per OP/1/A/1103/004 (Soluble Poison Control). (R.M.)

2.5 Perform the following: {27}

- _____ • Record boron in Component Boron Concentration Log for Standby HPI Pump. (R.M.)
- _____ • Update Component Boron Concentration Log for HPI Pump placed in service. (R.M.)

This event is complete when crew has secured the 1B HPI and referenced TS 3.5.2, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 1

Page 3 of 6

Event Description: **Swap HPI pumps for runtime (N: BOP, SRO) (TS)**

Applicant's Actions or Behavior

O1A1245 (1B HPIP MTR STATOR)

O1A1245 ARG
1B HPIP MTR STATOR TEMP

HI-HI (311°F):

- Evaluate continued HPIP Operation
- Notify Engineering

Examiner Note: If the crew asks, Engineering recommends securing the 1B HPIP. The crew may elect to place the 1B HPIP switch in OFF until a Tagout can be prepared by Work Control.

HI (210°F):

- Monitor HPI Pump Graphic
- Send AO to check motor
- Consider swapping/stopping pump

Examiner Note: If the 1B HPIP is used later in the scenario during HPI Forced Cooling (Rule 4) it will trip after running for 5 minutes.

HPI
3.5.2

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 High Pressure Injection (HPI)

LCO 3.5.2

The HPI System shall be OPERABLE with:

- a. Two HPI trains OPERABLE;
- b. An additional HPI pump OPERABLE;
- c. Two LPI-HPI flow paths OPERABLE;
- d. Two HPI discharge crossover valves OPERABLE;
- e. HPI suction headers cross-connected; and
- f. HPI discharge headers separated.

APPLICABILITY: MODES 1 and 2,
MODE 3 with Reactor Coolant System (RCS) temperature
> 350°F.

This event is complete when crew has secured the 1B HPIP and referenced TS 3.5.2, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 1

Page 4 of 6

Event Description: **Swap HPI pumps for runtime (N: BOP, SRO) (TS)**

Applicant's Actions or Behavior

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One HPI pump inoperable. <u>OR</u> One or more HPI discharge crossover valve(s) inoperable.	A.1	Restore HPI pump to OPERABLE status.	72 hours
	<u>AND</u>		
	A.2	Restore HPI discharge crossover valve(s) to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1	Reduce THERMAL POWER to $\leq 50\%$ RTP.	12 hours
	<u>AND</u>		
	B.2	Verify by administrative means that the ADV flow path for each steam generator is OPERABLE.	12 hours
	<u>AND</u>		
	B.3	Restore HPI pump to OPERABLE status.	30 days from initial entry into Condition A
	<u>AND</u>		
	B.4	Restore HPI discharge crossover valve(s) to OPERABLE status.	30 days from initial entry into Condition A

(continued)

This event is complete when crew has secured the 1B HPIP and referenced TS 3.5.2, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 1

Page 5 of 6

 Event Description: **Swap HPI pumps for runtime (N: BOP, SRO) (TS)**

Applicant's Actions or Behavior

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One HPI train inoperable.	C.1 <u>NOTE</u> Only required when inoperable HPI train is incapable of automatic actuation and incapable of actuation through remote manual alignment. Reduce THERMAL POWER to $\leq 50\%$ RTP.	3 hours
	<u>AND</u> C.2 <u>NOTE</u> Only required when THERMAL POWER $\leq 50\%$ RTP. Verify by administrative means that the ADV flow path for each steam generator is OPERABLE.	3 hours
	<u>AND</u> C.3 Restore HPI train to OPERABLE status.	72 hours
D. HPI suction headers not cross-connected.	D.1 Cross-connect HPI suction headers.	72 hours
E. HPI discharge headers cross-connected.	E.1 Hydraulically separate HPI discharge headers.	72 hours

(continued)

This event is complete when crew has secured the 1B HPIP and referenced TS 3.5.2, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 1

Page 6 of 6

Event Description: **Swap HPI pumps for runtime (N: BOP, SRO) (TS)**

Applicant's Actions or Behavior

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One LPI-HPI flow path inoperable.	F.1 Restore LPI-HPI flow path to OPERABLE status.	72 hours
G. Required Action and associated Completion Time of Condition B, C, D, E, or F not met.	G.1 Be in MODE 3. <u>AND</u> G.2 Reduce RCS temperature to $\leq 350^{\circ}\text{F}$.	12 hours 60 hours
H. Two HPI trains inoperable. <u>OR</u> Two LPI-HPI flow paths inoperable.	H.1 Enter LCO 3.0.3.	Immediately

This event is complete when crew has secured the 1B HPIP and referenced TS 3.5.2, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 2

Page 1 of 7

Event Description: **PZR 'A' RTD Fails Low (I: OATC, SRO) (TS)**

Applicant's Actions or Behavior

Booth Cue: Per Lead Evaluator's direction, **ACTIVATE EVENT 2** which will cause 2SA-17/A-5 (KEOWEE STATALARM PANEL TROUBLE) as a distraction alarm for the BOP. When the BOP acknowledges the statalarm it will clear, however, **EVENT 2A** will auto actuate inserting the PZR 'A' RTD failure for the OATC. If contacted as KEOWEE operator report "performed a lamp test and forgot to notify the Control Room first".

Event 2 Plant Response:

- OAC alarms for PZR level mismatch between level 1&3 and 2&3
- PZR level 1 and 2 indications will lower due to temperature compensation while PZR level 3 will stay at the original level
- All 3 PZR level indications will begin to rise as 1HP-120 opens in response to PZR level 1 (controlling channel) being below setpoint

Event 2 Crew Response:

- Refer to ARG 1SA-2/C-3
- The CRS may direct the OATC to select a valid PZR level signal (Channel 3) prior to reviewing the ARG or OP/1/A/1105/014

OP/1/A/6101/002 C-3 Rev 37

1SA-2/C-3

RC PRESSURIZER LEVEL HIGH/LOW

3. Manual Action

3.1 Check alternate PZR level indications.

3.2 Check for proper Makeup/Letdown flows and adjust to restore proper level.

Examiner Note: The RO may take 1HP-120 to MANUAL to control PZR level. If so, they should place it in AUTO after the failure is addressed.

3.3 Refer to the following procedures as required:

- AP/1/A/1700/002 (Excessive RCS Leakage)
- AP/1/A/1700/014 (Loss of Normal HPI Makeup and/or RCP Seal Injection)
- AP/1/A/1700/032 (Loss of Letdown).

3.4 Refer to Technical Specification 3.4.9.

3.5 Refer to Technical Specification 3.3.8.

3.6 Refer to OP/1/A/1105/014 (Control Room Instrumentation Operation And Information).

Examiner Note: OP/1/A/1105/014 is on the **next page** and TS 3.3.8 starts on **Event 2 Page 3**.

This event is complete when PZR level 3 is selected and the CRS has referenced TS 3.3.8, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 2

Page 2 of 7

Event Description: **PZR 'A' RTD Fails Low (I: OATC, SRO) (TS)**

Applicant's Actions or Behavior

Duke Energy Oconee Nuclear Station Control Room Instrumentation Operation And Information Multiple Use	Procedure No. OP/1/A/1105/014
	Revision No. 056
	Electronic Reference No. OP0098RH

**Enclosure 4.12
SASS Information
(Information Use)**

NOTE: An instantaneous mismatch (rapid mismatch >6%) can occur and clear immediately. This will cause only a red "Trip" light to illuminate without an amber "Mismatch" light or OAC mismatch alarm. The green "Auto" light will also be off.

3.2 SASS (Smart Automatic Signal Selector) Manual Operation

- 3.2.1** **IF** "MISMATCH" light is on and "TRIP 'A'" or "TRIP 'B'" light is on, a SASS trip has occurred.
- A. Controlling signal will be signal selected from CR keyswitch (for parameters in ICS Cabinet #8).
 - B. Select valid signal as controlling signal by positioning CR keyswitch or pushbutton for Pzr level to valid signal (for parameters in ICS Cabinet #8).
- 3.2.2** **IF** "MISMATCH" light is on, a mismatch has occurred.:
- A. Controlling signal will be signal selected from CR keyswitch (for parameters in ICS Cabinet #8).
 - B.** Select valid signal as controlling signal by positioning CR keyswitch or pushbutton for Pzr level to valid signal (for parameters in ICS Cabinet #8).
- 3.2.3** Initiate a Work Request to repair faulty signal.

Examiner Note: Once PZR level 3 pushbutton is selected as the controlling signal, 1HP-120 will restore level to 120 inches. TS 3.4.1 may apply based on RCS pressure during the transient which is located on **Event 2 page 7**.

This event is complete when PZR level 3 is selected and the CRS has referenced TS 3.3.8, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 2

Page 3 of 7

Event Description: **PZR 'A' RTD Fails Low (I: OATC, SRO) (TS)**

Applicant's Actions or Behavior

PAM Instrumentation
3.3.8

3.3 INSTRUMENTATION

3.3.8 Post Accident Monitoring (PAM) Instrumentation

LCO 3.3.8 The PAM instrumentation for each Function in Table 3.3.8-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. -----NOTE----- Not applicable to Functions 14, 18, 19, and 22. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.6.	Immediately

(continued)

Examiner Note: PZR level is listed as Function 11 on the TS 3.3.8 Table on Event 2 Page 6.

This event is complete when PZR level 3 is selected and the CRS has referenced TS 3.3.8, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 2

Page 4 of 7

Event Description: **PZR 'A' RTD Fails Low (I: OATC, SRO) (TS)**

Applicant's Actions or Behavior

PAM Instrumentation
3.3.8

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. -----NOTE----- Not applicable to Functions 14, 18, 19, and 22. One or more Functions with two required channels inoperable.	C.1 Restore one channel to OPERABLE status.	7 days
D. Not Used	D.1 Not Used	Not Used
E. -----NOTE----- Only applicable to Function 14. One required channel inoperable.	E.1 Restore required channel to OPERABLE status.	24 hours

(continued)

This event is complete when PZR level 3 is selected and the CRS has referenced TS 3.3.8, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 2

Page 5 of 7

Event Description: **PZR 'A' RTD Fails Low (I: OATC, SRO) (TS)**

Applicant's Actions or Behavior

PAM Instrumentation
3.3.8

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. ~~NOTE~~ Only applicable to Functions 18, 19, and 22. One or more Functions with required channel inoperable.	F.1 Declare the affected train inoperable.	Immediately
G. Required Action and associated Completion Time of Condition C or E not met.	G.1 Enter the Condition referenced in Table 3.3.8-1 for the channel.	Immediately
H. As required by Required Action G.1 and referenced in Table 3.3.8-1.	H.1 Be in MODE 3. <u>AND</u> H.2 Be in MODE 4.	12 hours 18 hours
I. As required by Required Action G.1 and referenced in Table 3.3.8-1.	I.1 Initiate action in accordance with Specification 5.6.6.	Immediately

This event is complete when PZR level 3 is selected and the CRS has referenced TS 3.3.8, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 2

Page 6 of 7

Event Description: **PZR 'A' RTD Fails Low (I: OATC, SRO) (TS)**

Applicant's Actions or Behavior

PAM Instrumentation
3.3.8Table 3.3.8-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

FUNCTION	REQUIRED CHANNELS	CONDITIONS REFERENCED FROM REQUIRED ACTION G.1
1. Wide Range Neutron Flux	2	H
2. RCS Hot Leg Temperature	2	H
3. RCS Hot Leg Level	2	I
4. RCS Pressure (Wide Range)	2	H
5. Reactor Vessel Head Level	2	I
6. Containment Sump Water Level (Wide Range)	2	H
7. Containment Pressure (Wide Range)	2	H
8. Containment Isolation Valve Position	2 per penetration flow path ^{(a)(b)(c)}	H
9. Containment Area Radiation (High Range)	2	I
10. Not Used		
11. Pressurizer Level	2	H
12. Steam Generator Water Level	2 per SG	H
13. Steam Generator Pressure	2 per SG	H
14. Borated Water Storage Tank Water Level	2	H
15. Upper Surge Tank Level	2	H
16. Core Exit Temperature	2 independent sets of 5 ^(d)	H
17. Subcooling Monitor	2	H
18. HPI System Flow	1 per train	NA
19. LPI System Flow	1 per train	NA
20. Not used		
21. Emergency Feedwater Flow	2 per SG	H
22. Low Pressure Service Water Flow to LPI Coolers	1 per train	NA

Examiner Note: PZR level 3 is supplied through ICCM B and is one of the required channels. PZR level 1 or 2, both of which are supplied through ICCM A, would be the other required channel, however, both are OOS due to the PZR RTD A failure.

This event is complete when PZR level 3 is selected and the CRS has referenced TS 3.3.8, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 2

Page 7 of 7

Event Description: **PZR 'A' RTD Fails Low (I: OATC, SRO) (TS)**

Applicant's Actions or Behavior

Examiner Note: Depending on the timing of operator actions, the transient could cause RCS pressure to lower below 2125 psig, **COLR setpoint below**. While the unit is at Steady State Operation (with a 4% power band for 4 hours) TS 3.4.1.A would apply is RCS pressure lowers below 2125 psig RCS NR Pressure.

Per COLR

Departure from Nucleate Boiling (DNB) parameter for RCS loop pressure shall be
Referred to by TS 3.4.1.

4 RCP: measured hot leg pressure > 2125 psig

3 RCP: measured hot leg pressure > 2125 psig

RCS Pressure, Temperature, and Flow DNB Limits
3.4.1

3.4 REACTOR COOLANT SYSTEM (RCS)**3.4.1 RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits**

LCO 3.4.1 RCS DNB parameters for loop pressure, loop average temperature, and RCS total flow rate shall be within the limits specified in the COLR.

APPLICABILITY: MODE 1 during steady state operation.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more RCS DNB parameters not within limits.	A.1 Restore RCS DNB parameter(s) to within limit.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 2.	12 hours

This event is complete when PZR level 3 is selected and the CRS has referenced TS 3.3.8, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 3

Page 1 of 6

Event Description: **Controlling NR Tave Fails High (I: OATC, SRO) (TS)**

Applicant's Actions or Behavior

Booth Cue: Per Lead Evaluator's direction, **ACTIVATE EVENT 3 which will cause the Controlling NR Tave signal to fail High.**

Event 3 Plant Response:

- Controlling NR Tave digital display reads $\approx 587^{\circ}\text{F}$
- Controlling Tave Chessell display reads $\approx 587^{\circ}\text{F}$
- 1SA-2/A-12 (ICS Tracking)
- 1SA-2/C-11 (ICS Loss of OAC CTP Signal)
- Control Rods will insert and FDW flow will rise
- RCS pressure will lower

Event 3 Crew Response:

- The **CRS** will direct the crew to perform PTR (Plant Transient Response)
- The OATC should:
 - Communicate the initial alarm/indication to the CRS followed by Reactor power and trend
 - Place appropriate ICS stations in manual (**Verifiable Action**: Both FDW Masters and Diamond) when the failure is identified or when directed by the CRS
 - Remain focused on Reactor power and FDW response

Examiner Note: The OATC will have to reduce FDW manually to stabilize Reactor power at/below the pre-transient value.

- The BOP should:
 - Determine if a valid runback exists and inform the CRS
 - Monitor plant response and verify operating limits NOT exceeded
 - Once ICS is in manual, remain focused on RCS pressure, SG Outlet pressure and RCS inventory
- The CRS should:
 - Refer to AP/1/A/1700/028 (ICS Instrument Failures) (**next page**)
 - Ensure Maintenance is contacted regarding the failed instrument

This event is complete when the CRS reaches Step 6 of Section 4A, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 3

Page 2 of 6

Event Description: **Controlling NR Tave Fails High (I: OATC, SRO) (TS)**

Applicant's Actions or Behavior

Duke Energy Oconee Nuclear Station ICS Instrument and Component Failures	Procedure No.
	AP/1/A/1700/028
	Revision No.
	026

1. Entry Conditions

1.1 Both of the following:

- Rx Power > 3%
- Any required Plant Transient Response actions taken and TPB ≤ the pre-transient power level.

AND any of the following:

A. Median Select or SASS fails to prevent a transient for any of the following controlling instrument failures:

- **RCS Temperature**

4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 <u> </u> Provide control bands as required.	

Examiner Note: The CRS will give the control bands provided in AD-OP-ONS-0002 Attachment 17 (Initial Control Bands) on the **next page.**

This event is complete when the CRS reaches Step 6 of Section 4A, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 3

Page 3 of 6

Event Description: **Controlling NR Tave Fails High (I: OATC, SRO) (TS)**

Applicant's Actions or Behavior

OCONEE SPECIFIC ABNORMAL OPERATIONS
GUIDANCE

AD-OP-ONS-0002

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ATTACHMENT 17

Page 1 of 1

<< Initial Control Bands >>

NOTE

A Control Band shall be established for any parameters being controlled in manual. Use of Control Bands is governed by AD-OP-ALL-1000, CONDUCT OF OPERATIONS.

1.0 Plant Conditions Stable or TPB < Pre-transient Conditions

1. The following bands are to be established during manual control of plant conditions (as needed) but may be adjusted by the CRS if required:
 - a. NI Power $\pm 1\%$ not to exceed the pre-transient or allowable power. If at the pre-transient or allowable level, band is NI Power - 1%
 - b. Current Tave $\pm 2^\circ\text{F}$
 - c. Current SG Outlet Pressure ± 10 PSIG
 - d. Delta Tc $0^\circ\text{F} \pm 2^\circ\text{F}$

AP/1/A/1700/028

4.2 Initiate the following notifications:

- ___ SM to reference:
 - AD-LS-ALL-0006
(Notification/Reportability Evaluation)
 - Emergency Plan
- ___ STA

4.3 ___ Verify both:

- A power transient $\geq 5\%$ has occurred.
- Plant is stabilized.

___ GO TO Step 4.5.

4.4 ___ Notify Rx Engineering and discuss the need for a maneuvering plan.

Examiner Note: The crew will evaluate Reactor power following PTR. Step 4.3 is a comparison of pre-transient power to post stabilization power.

This event is complete when the CRS reaches Step 6 of Section 4A, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 3

Page 4 of 6

Event Description: **Controlling NR Tave Fails High (I: OATC, SRO) (TS)**

Applicant's Actions or Behavior

AP/1/A/1700/028

AP/1/A/1700/028

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED																																						
4.5 Use the following, as necessary, to determine the applicable section from table in Step 4.6: • OAC alarm video • OAC display points • Control Board indications • Maintenance assistance, as needed	Examiner Note: The crew identifies the failure using control board indications.																																						
4.6 GO TO the applicable section per the following table: <table border="1"> <thead> <tr> <th>✓ Section</th><th>Failure</th></tr> </thead> <tbody> <tr> <td>4A</td><td>RCS Temperature</td></tr> <tr> <td>4B</td><td>Turbine Header Pressure</td></tr> <tr> <td>4C</td><td>Controlling NI</td></tr> <tr> <td>4D</td><td>Feedwater Loop Flow</td></tr> <tr> <td>4E</td><td>RCS Flow</td></tr> <tr> <td>4F</td><td>Delta T_c</td></tr> <tr> <td>4G</td><td>NR RCS Pressure</td></tr> <tr> <td>4H</td><td>Feedwater Valve ΔP</td></tr> <tr> <td>4I</td><td>SG Startup Level</td></tr> <tr> <td>4J</td><td>Feedwater Temperature</td></tr> <tr> <td>4K</td><td>Core Thermal Power</td></tr> <tr> <td>4L</td><td>SG Operating Level</td></tr> <tr> <td>4M</td><td>ICS Star or Memory Module</td></tr> <tr> <td>4N</td><td>SG Outlet Pressure</td></tr> <tr> <td>4O</td><td>Turbine Master Trips to Hand for Unknown Reason (3)</td></tr> <tr> <td>4P</td><td>TBV Failure (5)</td></tr> <tr> <td>4Q</td><td>SG FDW Valves</td></tr> <tr> <td>4Q</td><td>MFDWPs</td></tr> </tbody> </table>	✓ Section	Failure	4A	RCS Temperature	4B	Turbine Header Pressure	4C	Controlling NI	4D	Feedwater Loop Flow	4E	RCS Flow	4F	Delta T _c	4G	NR RCS Pressure	4H	Feedwater Valve ΔP	4I	SG Startup Level	4J	Feedwater Temperature	4K	Core Thermal Power	4L	SG Operating Level	4M	ICS Star or Memory Module	4N	SG Outlet Pressure	4O	Turbine Master Trips to Hand for Unknown Reason (3)	4P	TBV Failure (5)	4Q	SG FDW Valves	4Q	MFDWPs	
✓ Section	Failure																																						
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4O	Turbine Master Trips to Hand for Unknown Reason (3)																																						
4P	TBV Failure (5)																																						
4Q	SG FDW Valves																																						
4Q	MFDWPs																																						

This event is complete when the CRS reaches Step 6 of Section 4A, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 3

Page 5 of 6

Event Description: **Controlling NR Tave Fails High (I: OATC, SRO) (TS)**

Applicant's Actions or Behavior

Section 4A

RCS Temperature Failure

AP/1/A/1700/028 Section 4A

AP/1/A/1700/028

Page 1 of 3

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>Unit Status</u> The controlling RCS Temperature Instrument has failed. Any required Plant Transient Response actions have been taken and TPB is $\leq$ the pre-transient power level.	
<u>NOTE</u> - If T_{ave} instrument circuit failed high, the following may have occurred depending on initial ICS station status: - Unit to TRACK due to Rx Cross Limits - Control Rod insertion - Feedwater flow rising - If T_{ave} instrument circuit failed low, the following may have occurred depending on initial ICS station status: - Unit to TRACK due to Rx Cross Limits - Control Rod withdrawal - Feedwater flow lowers - Feedwater re-ratio	
1. Ensure in HAND: ☒ 1A FDW MASTER ☒ 1B FDW MASTER	Examiner Note: Steps 1 and 2 are verifiable actions that are taken during the performance of PTR.
2. ☒ Ensure DIAMOND in MANUAL.	
3. Notify Maintenance to: — Select a valid RCS T_{ave} and Delta T_c input to ICS per AM/1/A/0326/020 (Control of Unit 1 Star Module Signal Selection Function). — Investigate and repair the failed RCS temperature instrumentation.	
4. — PERFORM an instrumentation surveillance using applicable table in Encl 5.2 (ICS Instrument Surveillances) for the failed instrument.	Examiner Note: Enclosure 5.2 is on the next page.
5. — Verify instrumentation surveillance in Encl 5.2 (ICS Instrument Surveillances) was performed satisfactorily as written.	— Initiate a Surveillance Evaluation in accordance with PT/1/A/0600/001 (Periodic Instrument Surveillance) and

This event is complete when the CRS reaches Step 6 of Section 4A, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 4 Event No.: 3 Page 6 of 6
 Event Description: **Controlling NR Tave Fails High (I: OATC, SRO) (TS)**

Applicant's Actions or Behavior

AP/1/A/1700/028 Encl. 5.2 (Table 1 – RCS Temperature)

	COMPONENT	✓	COMPUTER	REQUIRED ACTIONS
SR 3.4.1.2 12 Hours	RCS Pressure, Temperature, and Flow DNB Limits		O1P1888 O1P1889	IF in MODE 1 Steady State Operation, verify RCS loop average temperature: As read on OAC: $\Delta T_c, ^\circ F$ 4 RCP 3 RCP Op Op 0 <580.0 <580.0 1 <580.4 <580.2 2 <580.8 <580.4 3 <581.1 <580.7 4 <581.5 <580.9 5 <581.9 <581.1

Examiner Note: The temperature check requires MODE 1 Steady State conditions which will not be present following the PTR actions. This step would have to be re-evaluated after Steady State has been established for 4 hours.

Section 4A
RCS Temperature Failure

AP/1/A/1700/028 Section 4A
AP/1/A/1700/028
 Page 3 of 3

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. WHEN notified by Maintenance that a valid RCS T_{ave} and Delta T_c input have been restored to ICS, THEN GO TO OP/1/A/1102/004 A Encl (Placing ICS Stations To Auto).	

... END ...

Examiner Note: ICS will remain in manual for the remainder of the scenario.

This event is complete when the CRS reaches Step 6 of Section 4A, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 4 Event No.: 4 Page 1 of 8
 Event Description: **1HP-5 Fails Closed (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

CT-1 action to restore letdown is located on Event 4 Page 4.

Booth Cue: Per Lead Evaluator's direction, **ACTIVATE EVENT 4 which will cause 1HP-5 to fail closed.**

Event 4 Plant Response:

- Letdown flow = 0 gpm
- 1HP-5 indicates closed on control board
- OAC Alarm for HPI LETDOWN FLOW

Event 4 Crew Response:

- The **CRS** should enter AP/1/A/1700/032 (Loss of Letdown)

Duke Energy Oconee Nuclear Station Loss of Letdown	Procedure No.
	AP/1/A/1700/032
	Revision No.
	010

AP/1/A/1700/032

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1. Entry Conditions

NOTE

For loss of power, AP/11 will restore letdown, therefore, AP entry would only be necessary if the loss of function remains.

1.1 A loss of RCS letdown flow as indicated by one or more of the following:

- 1HP-5 closed when letdown flow is desired.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

This AP may be performed by an RO if the EOP is also in progress. The Procedure Director should resume directing the actions of this AP as soon as EOP actions allow.

4.1 ☐ Verify a total loss of letdown exists.	☐ GO TO Step 4.130.
4.2 ☒ Place 1HP-120 in HAND and reduce demand to zero.	
4.3 ☒ Position the standby HPI pump switch to OFF.	

Examiner Note: The 1B HPIP switch may already be in OFF due to Event 1.

This event is complete when the CRS reaches Step 4.27 of AP/32 and has evaluated TS 3.6.3, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 4

Page 2 of 8

Event Description: **1HP-5 Fails Closed (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

AP/1/A/1700/032 Rev 10

AP/1/A/1700/032

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED									
CAUTION										
RCP individual seal return valves will close if seal injection is < 22 gpm with CC flow < 575 gpm.										
4.4 Throttle 1HP-31, preferably in AUTO, to establish SEAL INLET HDR FLOW to the appropriate value: <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>✓</th> <th>CC TOTAL FLOW</th> <th>Throttle HPI seal flow to:</th> </tr> </thead> <tbody> <tr> <td></td> <td>> 575 gpm</td> <td>12 - 15 gpm</td> </tr> <tr> <td></td> <td>≤ 575 gpm</td> <td>24 - 25 gpm</td> </tr> </tbody> </table>	✓	CC TOTAL FLOW	Throttle HPI seal flow to:		> 575 gpm	12 - 15 gpm		≤ 575 gpm	24 - 25 gpm	
✓	CC TOTAL FLOW	Throttle HPI seal flow to:								
	> 575 gpm	12 - 15 gpm								
	≤ 575 gpm	24 - 25 gpm								
NOTE										
The running HPI pump may operate below 65 gpm for up to 4 hours. HPI pump time of operation below minimum flow is cumulative.										
4.5 ☐ Verify HPI pump flow ≥ 65 gpm. <u>30</u> + <u> </u> + <u> </u> = <u> </u> gpm Recirc SI MU	☐ Log time for HPI pump flow below minimum.									

Examiner Note: Recirc (30 gpm) + SI (~15 gpm) + MU (~9 gpm) won't exceed 65 gpm.

4.6 ☐ Initiate makeup to LDST as required.	
4.7 Initiate notification of the following: ☐ SM to reference: • AD-LS-ALL-0006 (Notifications/Reportability Evaluation) • Emergency Classification Procedure ☐ STA	

This event is complete when the CRS reaches Step 4.27 of AP/32 and has evaluated TS 3.6.3, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 4

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Event Description: **1HP-5 Fails Closed (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

AP/1/A/1700/032 Rev 10

AP/1/A/1700/032

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.8 ☐ Verify 1HP-5 closed.	☐ GO TO Step 4.10.
4.9 ☐ Dispatch an operator to 1HP-5 (Letdown Isolation) to establish communication with Control Room. (East Pen Rm)	

NOTE

- Tech Spec 3.4.9 applies when indicated Pzr level > 260" (corrected value for 285").
- Conditions where it is known that letdown CANNOT be restored do not require waiting until 260" to begin a Rapid Shutdown.

4.10 ☐ IAAT either exist:
☐ Pzr level > 260",
AND letdown CANNOT be established
☐ Plant conditions exist such that letdown will NOT be restored
THEN initiate unit shutdown per AP/29 (Rapid Unit Shutdown).

Examiner Note: The crew should not enter AP/29 without attempting to manually open 1HP-5.

4.11 ☐ IAAT Pzr level $\geq$ 375",
THEN trip Rx.

4.12 Determine the cause of loss of letdown
AND GO TO designated mitigation Step:

☒	Reason for Loss of Letdown	GO TO Step
☐	1HP-5 failed closed	4.13
☐	• Actual LD Temp high • Either LD interlock failure • LD line leak • Both LD Coolers isolated • Other	4.31

This event is complete when the CRS reaches Step 4.27 of AP/32 and has evaluated TS 3.6.3, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 4

Page 4 of 8

Event Description: **1HP-5 Fails Closed (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

AP/1/A/1700/032 Rev 10

AP/1/A/1700/032

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.13 ☒ Close 1HP-6.	
4.14 ☒ Close 1HP-7.	
4.15 ☐ Ensure 1-HPI-CS-0090 (Alternate Letdown Isolation System Switch) in BYPASS. (A-3-306-CRD Filter Rm E wall) (O1D3563)	Booth Cue: When contacted as an AO to BYPASS CS-90, ACTIVATE TIMER 4A, wait 2 minutes and report "1-HPI-CS-90 is in BYPASS"
4.16 ☐ Open 1HP-5.	
Booth Cue: When contacted as an AO to manually open 1HP-5, ACTIVATE TIMER 4B and report "1HP-5 has been manually opened" Examiner Note: TS 3.6.3 Condition A applies and is located on Event 4 Page 6.	1. Notify operator dispatched to 1HP-5 to: A. ☐ Manually open 1HP-5 (Letdown Isolation). (East Pen Rm) B. ☐ Maintain continuous communication with Control Room. 2. ☐ Notify SM to consult TS 3.6.3 (Containment Isolation Valves) to determine applicability. 3. ☐ IF 1HP-5 CANNOT be manually opened, THEN GO TO Step 4.31.
	☐ IF the CC system CANNOT be restored, THEN GO TO Step 4.31.
4.17 ☐ Place the CC system in operation.	
4.18 ☐ Verify letdown temperature < 135°F.	1. ☐ Open 1HP-13.

Examiner Note: CT-1 Boundary – If the crew does not manually open 1HP-5 at Step 4.16 RNO 1, Step 4.16 RNO 3 will begin the transition to a new mitigation strategy (step 4.54) to initiate a shutdown and subsequent cool down to LPI conditions.

CT-2 (4.16 RNO Step 1): Manually open 1HP-5 to restore letdown prior to requiring a change in the mitigation strategy resulting in a shutdown and cool down to LPI Select

This event is complete when the CRS reaches Step 4.27 of AP/32 and has evaluated TS 3.6.3, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 4

Page 5 of 8

Event Description: **1HP-5 Fails Closed (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

AP/1/A/1700/032 Rev 10

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.19 ☒ Throttle open 1HP-7 to establish ≈ 20 gpm.	1. ☐ Monitor waste tanks for indications of lifted relief valves during opening of 1HP-6. 2. ☐ Open 1HP-6. 3. ☐ IF waste tanks indicate relief valves lifting and staying open, THEN: A. ☐ Close 1HP-6. B. ☐ Consult Engineering. 4. ☐ WHEN it is determined that letdown can be re-established, THEN open 1HP-6.
4.20 ☐ WHEN letdown temperature $< 130^{\circ}\text{F}$, THEN place LETDOWN HI TEMP INTLK BYP switch in NORMAL.	
4.21 ☒ Open 1HP-6.	
4.22 ☒ Adjust 1HP-7 to control desired letdown flow.	☐ Ensure Maintenance aware of issues.
4.23 ☒ Re-establish normal makeup through 1HP-120.	
4.24 ☐ Verify <u>any</u> purification IX in service.	☐ IF purification IX operation is desired, THEN initiate OP/1/A/1103/004 B (Purification IXs) to establish desired IX operation.
4.25 ☐ Notify Maintenance to initiate repairs on 1HP-5.	
4.26 ☒ Re-establish normal RCP seal injection flow.	
4.27 ☐ Position the standby HPI pump switch to AUTO.	

Examiner Note: The CRS may elect to leave the 1B HPIP switch in OFF due to Event 1.

4.28 ☐ WHEN repairs are complete on 1HP-5 (Letdown Isolation),
 THEN:

Examiner Note: 1HP-5 will not be repaired during this scenario.

This event is complete when the CRS reaches Step 4.27 of AP/32 and has evaluated TS 3.6.3, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 4

Page 6 of 8

Event Description: **1HP-5 Fails Closed (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

TS 3.6.3 Rev 300

3.6 CONTAINMENT SYSTEMS

3.6.3 Containment Isolation Valves

LCO 3.6.3 Each containment isolation valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

NOTES

1. Penetration flow paths except for 48 inch purge valve penetration flow paths may be unisolated intermittently under administrative controls.
2. Separate Condition entry is allowed for each penetration flow path.
3. Enter applicable Conditions and Required Actions for system(s) made inoperable by containment isolation valves.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. NOTE Only applicable to penetration flow paths with two containment isolation valves. One or more penetration flow paths with one containment isolation valve inoperable.	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, one closed and de-activated non-automatic power operated valve, closed manual valve, blind flange, or check valve with flow through the valve secured. <u>AND</u>	4 hours (continued)

Examiner Note: 1HP-5 can be left open using administrative controls (e.g. AO standing by to operate the valve)

This event is complete when the CRS reaches Step 4.27 of AP/32 and has evaluated TS 3.6.3, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 4

Page 7 of 8

Event Description: **1HP-5 Fails Closed (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

TS 3.6.3 Rev 300

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2 -----NOTE----- Isolation devices in high radiation areas may be verified by use of administrative means. ----- Verify the affected penetration flow path is isolated.	Once per 31 days for isolation devices outside containment <u>AND</u> Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment
B. -----NOTE----- Only applicable to penetration flow paths with two containment isolation valves. ----- One or more penetration flow paths with two containment isolation valves inoperable.	B.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, one closed and de-activated non-automatic power operated valve, closed manual valve, or blind flange.	1 hour

(continued)

This event is complete when the CRS reaches Step 4.27 of AP/32 and has evaluated TS 3.6.3, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 4

Page 8 of 8

Event Description: **1HP-5 Fails Closed (C: BOP, SRO) (TS)**

Applicant's Actions or Behavior

TS 3.6.3 Rev 300ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. -----NOTE----- Only applicable to penetration flow paths with only one containment isolation valve and a closed system. One or more penetration flow paths with one containment isolation valve inoperable.	C.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, one closed and de-activated non-automatic power operated valve, closed manual valve, or blind flange. <u>AND</u> C.2 -----NOTE----- Isolation devices in high radiation areas may be verified by use of administrative means. Verify the affected penetration flow path is isolated.	4 hours Once per 31 days
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3. <u>AND</u> D.2 Be in MODE 5.	12 hours 36 hours

This event is complete when the CRS reaches Step 4.27 of AP/32 and has evaluated TS 3.6.3, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 5

Page 1 of 3

Event Description: **1NI-5 Fails High (I: BOP, SRO)**

Applicant's Actions or Behavior

Booth Cue: Per Lead Evaluator's direction, **ACTIVATE EVENT 5 which will cause 1NI-5 to fail high.****Event 5 Plant Response:**

- 1NI-5 fails to 125%
- 1SA-1/A-3 (1A FLUX/FLOW/IMB TRIP) comes into alarm
- 1SA-1/A-8 (1NI-5 HI/FLUX TRIP) comes into alarm
- 1SA-5/A-5 (1A RPS TROUBLE) comes into alarm

Event 5 Crew Response:

- The **CRS** will direct the **BOP** to refer to any of the above alarms

OP/1/A/6101/001 Rev 16**1SA-1/A-3****1A FLUX/FLOW/IMB TRIP****3. Manual Action**

- 3.1 Check instrumentation to verify high flux OR low flow OR power imbalance exists.
- 3.2 Refer to OP/1/A/1105/014 (Control Room Instrumentation Operation And Information).

1SA-1/A-8**1NI-5 HI FLUX TRIP****3. Manual Action**

- 3.1 Check instrumentation to verify high flux.
- 3.2 Refer to OP/1/A/1105/014 (Control Room Instrumentation Operation And Information).

OP/1/A/6101/005 Rev 21**1SA-5/A-5****1A RPS TROUBLE****3. Manual Action**

- 3.1 IF Reactor trips, Go To EP/1/A/1800/001 (Emergency Operating Procedure).
- 3.2 Have SRO determine if RPS Channel 1A is desired to be placed in Bypass per OP/1/A/1105/014 (Control Room Instrumentation Operation and Information).
- 3.3 Initiate Work Request for I&E to investigate cause.

Examiner Note: All three ARGs refer to OP/1/A/1105/014 located on the next page.**This event is complete when the 1A RPS Channel is placed in Manual Bypass, or when directed by the Lead Examiner.**

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 5

Page 2 of 3

Event Description: **1NI-5 Fails High (I: BOP, SRO)**

Applicant's Actions or Behavior

OP/1/A/1105/014 Rev 56

Duke Energy Oconee Nuclear Station Control Room Instrumentation Operation And Information Multiple Use	Procedure No.
	OP/ 1 /A/1105/014
	Revision No. 056
	Electronic Reference No. OP0098RH

Enclosure 4.8
Removal and Restoration of RPS Channels

OP/1/A/1105/014
Page 1 of 9

1. Limits and Precautions

None

2. Initial Conditions

NOTE: Equipment failure can be indicated by deviation alarm, fault alarm, hardware fail, etc... or notification by Maintenance.

2.1 Verify one of the following:

_____ 2.1.1 A procedure requires RPS Channel to be placed in Trip or Bypass.

_____ 2.1.2 Equipment failure requires RPS Channel to be placed in Trip or Bypass.

3. Procedure3.1 To place RPS Channel 1A in Trip or Bypass, **perform Section 4.**

3.2 To place RPS Channel 1B in Trip or Bypass, perform Section 5.

3.3 To place RPS Channel 1C in Trip or Bypass, perform Section 6.

3.4 To place RPS Channel 1D in Trip or Bypass, perform Section 7.

This event is complete when the 1A RPS Channel is placed in Manual Bypass, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 5

Page 3 of 3

Event Description: **1NI-5 Fails High (I: BOP, SRO)**

Applicant's Actions or Behavior

OP/1/A/1105/014 Rev 55Enclosure 4.8
Removal and Restoration of RPS ChannelsOP/1/A/1105/014
Page 2 of 9**4. Placing RPS Channel 1A in Trip or Bypass****NOTE:** Placing RPS channel in Manual Bypass is preferred to minimize risk of Reactor trip.4.1 **IF** RPS Channel 1A is **NOT** required per TS 3.3.1, perform **one** of the following:4.1.1 **IF** Manual Bypass of RPS Channel 1A is desired, perform the following:☒ A. Obtain Key #314.☐ B. Declare RPS Channel 1A inoperable.☒ C. Place RPS Channel 1A MANUAL BYPASS keyswitch in "BYP".
CRS (Cab. ON1PPSCA0002)4.1.2 **IF** Manual Trip of RPS Channel 1A is desired, perform the following:☐ A. Obtain Key #312.☐ B. Declare RPS Channel 1A inoperable.

Examiner Note: The BOP will come to the Simulator Booth to get Key #314 (Manual Bypass Key). The RPS door key is located on the floor.
TS 3.3.1 only requires three channels of RPS so 1A RPS Channel isn't required.

4.3 **IF** RPS Channel 1A removed from service due to equipment failure, perform the following:☐ • Initiate Work Request.☐ • **IF** required per OMP 1-14 (Notifications), perform appropriate notifications.CRS**NOTE:** This section may be used to reset bypassed or tripped channel after maintenance or after I&E has bypassed individual functions to restore the other functions.4.4 **WHEN** notified by I&E, restore RPS Channel 1A as follows:

Examiner Note: 1NI-5 will not be repaired in this scenario.

This event is complete when the 1A RPS Channel is placed in Manual Bypass, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 6

Page 1 of 6

Event Description: **1A MFWP Active Thrust Bearing High Temperature (R: OATC, SRO)**

Applicant's Actions or Behavior

Booth Cue: Per Lead Evaluator's direction, **ACTIVATE EVENT 6 which will cause 1A MFWP Active Thrust Bearing high temperature.**

Event 6 Plant Response:

- O1A0862 (FWPT 1A ACTIVE THRUST BEARING TEMP) comes into alarm
- O1A0929 (FWPT 1A THRUST BEARING DRAIN TEMP) elevated

Event 6 Crew Response:

- The **CRS** will direct the **BOP** to refer to the ARG for O1A0862

O1A0862**FWPT 1A ACTIVE THRUST BEARING TEMP**

Booth Cue: If crew dispatches an AO to investigate local bearing temperatures, call back and notify the crew "the 1A MFWP Active thrust bearing temperature is ~205 F using a pyrometer and is elevated above the other bearings."

- HI-HI: 1) If temperature cannot be maintained below HI-HI setpoint, refer to OP/1/A/1106/002 B (FWPT Operation) to remove FDWP from service
- 2) Refer to OP/1/A/1102/004 (Operation at Power)
- 3) Notify Component Engineer

Examiner Note: The SM or Component Engineer will recommend shutting down the 1A FWP using AP/1/A/1700/029 (Rapid Unit Shutdown) starting on the **next page.**

- HI: 1) Verify Bearing Drain Temperature is high
- 2) Check the FWPT for excessive vibration
- 3) Refer to OP/1/A/1106/002 B (FWPT Operation) to swap oil coolers

Booth Cue: If crew does not initiate AP/29 based on CRS discretion; once notification has been made to the component engineer, call back as the Shift Manager and report "using Time Compression, after discussion with engineering utilize AP/29 to remove the 1A MFDW pump from service".

This event is complete when Reactor power has been reduced by >10%, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 6

Page 2 of 6

Event Description: **1A MFWP Active Thrust Bearing High Temperature (R: OATC, SRO)**

Applicant's Actions or Behavior

Duke Energy Oconee Nuclear Station Rapid Unit Shutdown	Procedure No.
	AP/1/A/1700/029 Revision No. 014

4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

The CRS should read this procedure and it should **NOT** be used when EOP entry conditions exist.

4.1 ☐ Initiate Encl 5.1 (Support Actions During Rapid Unit Shutdown).	Examiner Note: AP/29 Encl 5.1 beginning on Event 6 Page 6.
4.2 ☐ Announce AP entry using the PA system.	
4.3 ☐ IAAT <u>both</u> of the following apply: ☐ It is desired to stop power reduction ☐ CTP > 18 % THEN perform Steps 4.4 - 4.7.	

☐ **GO TO Step 4.8.**

Examiner Note: OATC reduces power by reducing the MFW Masters and inserting control rods as necessary.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.8 ☐ Verify ICS in AUTO.	1. ☐ Initiate manual power reduction to desired power level. 2. ☐ GO TO Step 4.11.

Examiner Note: The CRS will provide control bands for the power reduction.

This event is complete when Reactor power has been reduced by >10%, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 6

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Event Description: **1A MFWP Active Thrust Bearing High Temperature (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/029
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.11 __ Verify <u>both</u> Main FDW pumps running.	__ GO TO Step 4.14.
NOTE 1B Main FDW Pump is the preferred pump to be shutdown first. - To lower 1B Main FDW Pump suction flow, bias is adjusted counter-clockwise. - To lower 1A Main FDW Pump suction flow, bias is adjusted clockwise.	
4.12 __ Adjust bias for first Main FDW pump desired to be shutdown until suction flow is $\approx 1 \times 10^6$ lbm/hr less than remaining Main FDW pump suction flow.	Examiner Note: The RO will reduce 1A MFWP suction flow since this is the pump that is being secured.
4.13 __ WHEN core thermal power is < 65% FP, THEN continue.	

This event is complete when Reactor power has been reduced by >10%, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 6

Page 4 of 6

Event Description: **1A MFWP Active Thrust Bearing High Temperature (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/029

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.14 ☐ <u>IAAT both</u> Main FDW pumps running, AND <u>both</u> of the following exist: ☐ 1B Main FDW Pump is first pump to be shut down ☐ Any of the following alarms actuate and remain in alarm: • FWP B FLOW MINIMUM (1SA-16/A-3) • FWP B FLOW BELOW MIN (1SA-16/A-4) THEN trip 1B Main FDW Pump.	
4.15 ☒ <u>IAAT both</u> Main FDW pumps running, AND <u>both</u> of the following exist: ☐ 1A Main FDW Pump is first pump to be shut down ☐ Any of the following alarms actuate and remain in alarm: • FWP A FLOW MINIMUM (1SA-16/A-1) • FWP A FLOW BELOW MIN (1SA-16/A-2) THEN trip 1A Main FDW Pump.	Examiner Note: If the crew reduces Reactor power to the amount that they receive the FWP minimum flow alarms, then this step is a verifiable action. The crew will probably reduce power to ~60% and remove the 1A MFWP by CRS direction.
4.16 ☐ Verify Turbine-Generator shutdown is required.	☒ GO TO Step 4.20.

This event is complete when Reactor power has been reduced by >10%, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 6

Page 5 of 6

Event Description: **1A MFWP Active Thrust Bearing High Temperature (R: OATC, SRO)**

Applicant's Actions or Behavior

AP/1/A/1700/029

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.20 <u>IAAT both</u> of the following apply: <u>ICS in automatic</u> <u>NI power is $\leq 18\%$</u> THEN stop power reduction using <u>either</u> of the following, as necessary: <u>Deselect MAXIMUM RUNBACK.</u> <u>Select HOLD.</u>	<u>NOTE</u> Due to the power reduction initiated in this AP, the current plant configuration must be compared to the normal plant configuration in OP/1/A/1102/004 (Operation at Power) power reduction enclosure. Equivalent steps performed by this AP should be signed off as intent met. Any steps NOT performed by this AP must be evaluated in preparation for power escalation or continued shutdown. 1. <u>Initiate OP/1/A/1102/004 (Operation at Power) power reduction enclosure.</u> 2. <u>WHEN conditions permit, THEN GO TO appropriate operating procedure for continued operation.</u>
4.21 <u>Verify Turbine-Generator shutdown is required.</u>	

Examiner Note: The Reactor will trip on a Loss of Heat Transfer (next event) prior to initiation of the Operation at Power procedure.

This event is complete when Reactor power has been reduced by >10%, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 6

Page 6 of 6

Event Description: **1A MFWP Active Thrust Bearing High Temperature (R: OATC, SRO)**

Applicant's Actions or Behavior

Enclosure 5.1

AP/1/A/1700/029

Support Actions During Rapid Unit Shutdown Page 1 of 7

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ___ Notify WCC SRO to initiate Encl 5.2 (WCC SRO Support During Rapid Unit Shutdown).	Examiner Note: Based on the pace of the power reduction, some of the verifiable action steps highlighted below may not be completed prior to transitioning to Event 7
2. Start the following pumps: ☒ 1A FDWP SEAL INJECTION PUMP ☒ 1A FDWP AUXILIARY OIL PUMP ☒ 1B FDWP AUXILIARY OIL PUMP ☒ 1B FDWP SEAL INJECTION PUMP	
3. ___ WHEN CTP is $\leq 80\%$, THEN continue.	
4. ☒ Stop 1E1 HTR DRN PUMP.	
5. ☒ Place 1HD-254 switch to OPEN.	
6. ☒ Stop 1E2 HTR DRN PUMP.	
7. ☒ Place 1HD-276 switch to OPEN.	
8. ___ Verify Turbine-Generator shutdown is required.	☒ GO TO Step 21.
21. ___ IAAT 1SSH-9 is NOT closed, AND CTP is $\leq 75\%$, THEN throttle 1SSH-9 to maintain Steam Seal Header pressure 2.5 - 4.5 psig.	
22. ___ WHEN CTP $\leq 65\%$, THEN place the following in MANUAL and close: ☒ 1FDW-53 ☒ 1FDW-65	
23. ___ IAAT load is $\leq 550 \text{ MW}_e$, THEN perform Steps 24 - 25.	___ GO TO Step 26.
24. Ensure the following are stopped: ☒ 1A MSRHR DRN PUMP ☒ 1B MSRHR DRN PUMP	

This event is complete when Reactor power has been reduced by $>10\%$, or when directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 7

Page 1 of 10

Event Description: **LOMF (Both MFWPs, TD, 1B MDEFWP fail / 1A MD fails to auto start) (M: ALL)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, **ACTIVATE EVENT 7 to initiate the LOMF.**

Event 7 Plant response:

- Loss of Main Feedwater occurs (the 1A MDEFWP will start manually)
- The Reactor will trip

Event 7 Crew response:

- The **CRS** will direct the **OATC** to trip the Reactor and perform IMAs. (IMAs listed below)
- The **CRS** will direct the **BOP** to perform a Symptom Check (next page)
- The **BOP** will perform Rule 3 for Loss of MFW (Event 7 Page 3)
- The **OATC** will perform EOP Encl. 5.5 (PZR and LDST Level Control) (Event 7 Page 10)

EP/1/A/1800/001 00 (Rev 03)

3. Immediate Manual Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.1 ☐ Depress REACTOR TRIP pushbutton.	
3.2 ☐ Verify reactor power < 5% FP and lowering.	☐ GO TO Rule 1 (ATWS/Unanticipated Nuclear Power Production).
3.3 ☐ Depress turbine TRIP pushbutton.	
3.4 ☐ Verify <u>all</u> turbine stop valves closed.	☐ Place <u>both</u> EHC pumps in PULL TO LOCK.
3.5 ☐ Verify RCP seal injection available.	☐ IF CC is unavailable, THEN immediately: A. ☐ Stop <u>all</u> RCPs. (10) B. ☐ Notify CRS to initiate AP/25 (Standby Shutdown Facility Emergency Operating Procedure).

Examiner Note: The OATC will perform the steps above, then announce each of them to the CRS. Upon completion, the CRS will direct the OATC to perform a Symptom Check. Symptom Check actions on next page.

This event is complete when the crew has performed EOP Enclosure 5.9 Step 7 to feed both SGs, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 7

Page 2 of 10

Event Description: **LOMF (Both MFWPs, TD, 1B MDEFWP fail / 1A MD fails to auto start) (M: ALL)**

Applicant's Actions or Behavior

AD-OP-ONS-0002 ATT 13 Rev 07

SYMPTOM CHECK GUIDELINES

Power Range NIs NOT < 5% Power Range NIs NOT lowering	Rule 1, <i>ATWS/Unanticipated Nuclear Power Production</i>
Any SCM < 0°F	Rule 2, <i>Loss Of SCM</i>
Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, Loss of Main or Emergency FDW Rule 4, <i>Initiation of HPI Forced Cooling</i> (Inability to feed SGs and > 2300 psig, NDT limit reached, or PZR level > 375")
Uncontrolled Main steam line(s) pressure reduction	Rule 5, <i>Main Steam Line Break</i>
CSAE Off-gas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identified SG Tube Leakage > 25 gpm)

Examiner Note:

The BOP will start the 1A MDEFWP on the symptom check. The 1B MDEFWP and the TD EFWP have failed.

The CRS will direct the BOP to perform Rule 3 (Loss of Main FDW) which starts on the **next page**.

The CRS will refer to the Parallel Action Page for the Subsequent Actions tab which starts on **Event 7 Page 7**.

Following completion of IMAs and Symptom Check, the OATC will perform EOP Encl. 5.5 to change 1HP-120 setpoint for PZR level control located on **Event 7 Page 10**.

This event is complete when the crew has performed EOP Enclosure 5.9 Step 7 to feed both SGs, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 7

Page 3 of 10

Event Description: **LOMF (Both MFWPs, TD, 1B MDEFWP fail / 1A MD fails to auto start) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0L Rev 05

Rule 3
Loss of Main or Emergency FDW

EP/1/A/1800/001 0L
 Page 1 of 13

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. Verify loss of MFDW and/or EFDW was due to <u>any</u> of the following: ___ Turbine Building Flooding ___ Actions taken to raise SG level due to Turbine Building Flooding	___ GO TO Step 3.
2. ___ EXIT this Rule.	
3. ___ IAAT NO SGs can be fed with FDW (Main/CBP/Emergency/PSW), AND <u>any</u> of the following exist: ___ RCS pressure reaches 2300 psig OR NDT limit ___ Pzr level reaches 375" [340" acc] THEN PERFORM Rule 4 (Initiation of HPI Forced Cooling).	
4. ___ Start <u>operable</u> EFDW pumps, as required, to feed <u>all intact</u> SGs.	Examiner Note: 1A MDEFWP is started at Step 4 or during Symptom Check.
5. ___ Verify <u>any</u> EFDW pump operating.	___ GO TO Step 7.
6. ___ GO TO Step 38.	
NOTE	
Manual operation may be desired to maintain SG acc levels if degraded containment exists.	
38. ___ IAAT an EFDW valve CANNOT control in AUTO, OR manual operation of EFDW valve is desired to control flow/level, THEN perform Steps 39 - 43.	___ GO TO Step 44.
39. ___ Place EFDW valve in MANUAL.	___ GO TO Step 42.
40. ___ Control EFDW flow with EFDW valve in MANUAL.	___ GO TO Step 42.
41. ___ GO TO Step 44.	

This event is complete when the crew has performed EOP Enclosure 5.9 Step 7 to feed both SGs, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 4 Event No.: 7 Page 4 of 10
 Event Description: **LOMF (Both MFWPs, TD, 1B MDEFWP fail / 1A MD fails to auto start) (M: ALL)**

Applicant's Actions or Behavior

Rule 3
 Loss of Main or Emergency FDW

EP/1/A/1800/001 0L Rev 05
 EP/1/A/1800/001 0L
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
44. __ Verify <u>any</u> SCM $\leq$ 0°F.	CAUTION ATWS events may initially require throttling to prevent exceeding pump limits and additional throttling once the Rx is shutdown to prevent overcooling. __ IF overcooling, OR exceeding limits in Rule 7 (SG Feed Control), THEN throttle EFDW, as necessary.
45. __ IAAT Unit 1 EFDW is in operation, THEN initiate Encl 5.9 (Extended EFDW Operation).	Examiner Note: Enclosure 5.9 is on the next page and will be used to align the 1A MD to feed both SGs.
46. __ WHEN directed by CRS, THEN EXIT.	

This event is complete when the crew has performed EOP Enclosure 5.9 Step 7 to feed both SGs, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 7

Page 5 of 10

Event Description: **LOMF (Both MFWPs, TD, 1B MDEFWP fail / 1A MD fails to auto start) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0M Rev 02

Enclosure 5.9
Extended EFDW OperationEP/1/A/1800/001 0M
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
1. ___ Monitor EFDW parameters on EFW graphic display.									
2. ___ IAAT UST level is < 4', THEN GO TO Step 120.									
3. ___ IAAT feeding <u>both</u> SGs with one MD EFDWP is desired, THEN perform Steps 4 - 7.	___ GO TO Step 8.								
4. Place EFDW control valve on SG with NO EFDW flow to MANUAL <u>and</u> closed: <table><tr><td>✓</td><td>1A SG</td><td>✓</td><td>1B SG</td></tr><tr><td></td><td>1FDW-315</td><td></td><td>1FDW-316</td></tr></table>	✓	1A SG	✓	1B SG		1FDW-315		1FDW-316	
✓	1A SG	✓	1B SG						
	1FDW-315		1FDW-316						
5. Locally open: ___ 1FDW-313 (1A EFDW Line Disch To 1A S/G X-Conn) (T-1, 1' N of M-16, 18' up) ___ 1FDW-314 (1B EFDW Line Disch To 1B S/G X-Conn) (T-1, 3' S of M-24, 10' up)	Booth Cue: When directed to open 1FDW-313/314, ACTIVATE EVENT 7a and notify operator “<i>using Time Compression 1FDW-313/314 have been opened</i>”.								
6. ___ Ensure a MD EFDWP is operating.									
7. Throttle EFDW control valve on SG with NO EFDW flow to establish appropriate level per Rule 7 (SG Feed Control): <table><tr><td>✓</td><td>1A SG</td><td>✓</td><td>1B SG</td></tr><tr><td></td><td>1FDW-315</td><td></td><td>1FDW-316</td></tr></table>	✓	1A SG	✓	1B SG		1FDW-315		1FDW-316	Examiner Note: At your discretion, Event 7 is complete once the 1A MD has been aligned to feed both SGs at Step 7.
✓	1A SG	✓	1B SG						
	1FDW-315		1FDW-316						
8. Perform as required to maintain UST level > 7.5': ___ Makeup with demin water. ___ Place CST pumps in AUTO.									

This event is complete when the crew has performed EOP Enclosure 5.9 Step 7 to feed both SGs, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 7

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Event Description: **LOMF (Both MFWPs, TD, 1B MDEFWP fail / 1A MD fails to auto start) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.9

Extended EFDW Operation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9. <u>IAAT all</u> exist: <u> </u> Rapid cooldown NOT in progress <u> </u> MD EFDWP operating for each available SG <u> </u> EFDW flow in <u>each</u> header < 600 gpm THEN place 1 TD EFDW PUMP switch in PULL TO LOCK.	

Enclosure 5.9

Extended EFDW Operation

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. <u> </u> Verify 1 TD EFDW PUMP operating.	<u> </u> GO TO Step 12.
11. <u> </u> Start TD EFDWP BEARING OIL COOLING PUMP.	

NOTE

- Loss of the condensate system for ≥ 25 minutes results in cooling down to LPI using the ADVs. If **NO** HWP's are operating, continuing this enclosure to restore the condensate system is a priority unless the CRS deems EOP activities higher priority. The 25 minute criterion is satisfied when a HWP is started and 1C-10 is 10% open.
- If the condensate system is operating, the remaining guidance establishes FDW recirc, monitors and maintains UST, and transfers EFDW suction to the hotwell if required.

12. Notify CRS to set priority based on the NOTE above and EOP activities.

Examiner Note: Based upon the Note above, the CRS will have the RO set down this enclosure since at least one Hotwell pump is still operating.

This event is complete when the crew has performed EOP Enclosure 5.9 Step 7 to feed both SGs, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 7

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Event Description: **LOMF (Both MFWPs, TD, 1B MDEFWP fail / 1A MD fails to auto start) (M: ALL)**

Applicant's Actions or Behavior

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Subsequent Actions

EP/1/A/1800/001 00

Parallel Actions

Page 1 of 1

CONDITION	ACTIONS	
1. PR NIs $\geq$ 5% FP OR NIs NOT lowering	GO TO UNPP tab.	UNPP
2. All 4160V SWGR de-energized (13)	GO TO Blackout tab.	BLACKOUT
3. Core SCM indicates superheat	GO TO ICC tab.	ICC
4. Any SCM = 0°F	GO TO LOSCM tab.	LOSCM
5. Both SGs intentionally isolated to stop excessive heat transfer	GO TO EHT tab.	LOHT
6. Loss of heat transfer (including loss of all Main and Emergency FDW)	GO TO LOHT tab.	
7. Heat transfer is or has been excessive	GO TO EHT tab.	EHT
8. Indications of SGTR $\geq$ 25 gpm	GO TO SGTR tab.	SGTR
9. Turbine Building flooding NOT caused by rainfall event	GO TO TBF tab.	TBF
10. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	ES
11. Valid ES actuation has occurred or should have occurred	Initiate Encl 5.1 (ES Actuation).	ES
12. Power lost to all 4160V SWGR and any 4160V SWGR re-energized	- Initiate AP/11 (Recovery from Loss of Power). - IF Encl 5.1 (ES Actuation) has been initiated, THEN reinitiate Encl 5.1.	ROP
13. RCS leakage > 160 gpm with letdown isolated	Notify plant staff that Emergency Dose Limits are in affect using PA system.	EDL
14. Individual available to make notifications	- Announce plant conditions using PA system. - Notify SM to reference the Emergency Classification Procedure and AD-LS-ALL-0006 (Notification/Reportability Evaluation).	NOTIFY

Examiner Note: The CRS will then direct the announcing/notification steps to the right, then proceed to the Subsequent Actions tab on next page.

This event is complete when the crew has performed EOP Enclosure 5.9 Step 7 to feed both SGs, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 7

Page 8 of 10

Event Description: **LOMF (Both MFWPs, TD, 1B MDEFWP fail / 1A MD fails to auto start) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 Rev 03**Examiner Note: The CRS will direct the OATC using the Subsequent Actions Tab**

EP/1/A/1800/001 00

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4. Subsequent Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.1 ☐ Verify <u>all</u> control rods in Groups 1 - 7 fully inserted.	1. Open: ☐ 1HP-24 ☐ 1HP-25 2. ☐ Secure makeup to LDST. ^{8} 3. ☐ IF CRDs are energized, THEN: A. ☐ Initiate regulating control rod insertion to the IN LIMIT. B. Dispatch <u>one</u> operator to open 600V CRD breakers: ☐ 1X9-5C (U-1 CRD Norm Fdr Bkr) (U1 Equipment Rm) ☐ 1X1-5C (U1 CRD Alt Fdr Bkr) (T-3/E-27)
4.2 ☐ Verify Main FDW in operation.	1. ☐ Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete. 2. ☐ GO TO Step 4.5.
4.5 ☐ IAAT Main FDW is operating, AND level in <u>any</u> SG is > 96% on the Operating Range, THEN perform Steps 4.6 - 4.8.	☐ GO TO Step 4.9.

This event is complete when the crew has performed EOP Enclosure 5.9 Step 7 to feed both SGs, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 7

Page 9 of 10

Event Description: **LOMF (Both MFWPs, TD, 1B MDEFWP fail / 1A MD fails to auto start) (M: ALL)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.9 ☐ IAAT TBVs CANNOT control SG pressure at desired setpoint, AND TBVs NOT intentionally isolated, THEN manually control pressure in <u>affected</u> SGs using <u>either</u> : ☐ TBVs ☐ Dispatch <u>two</u> operators to perform Encl 5.24 (Operation of the ADVs) (PS)	
4.10 ☐ Verify 1RIA-40 operable with CSAE OFF-GAS BLOWER operating.	☐ GO TO Step 4.12.
4.11 ☐ GO TO Step 4.14.	
4.14 Verify <u>both</u> are closed: ☐ 1MS-17 ☐ 1MS-26	☒ Dispatch an operator with Encl 5.29 (MSRV Locations) to verify <u>all</u> MSRVs have reseated.

This event is complete when the crew has performed EOP Enclosure 5.9 Step 7 to feed both SGs, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 4 Event No.: 7 Page 10 of 10
 Event Description: **LOMF (Both MFWPs, TD, 1B MDEFWP fail / 1A MD fails to auto start) (M: ALL)**

Applicant's Actions or Behavior

Examiner Note: The OATC will perform Enclosure 5.5 following completion of IMAs and Symptom Check. The CRS will also read to the OATC from the Subsequent Actions tab.

EP/1/A/1800/001 OM Rev 02

Enclosure 5.5
Pzr and LDST Level Control

EP/1/A/1800/001 OM
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE • Maintaining Pzr level >100" [180" acc] will ensure Pzr heater bundles remain covered. • When Rx critical, use of 1HP-26 normally only necessary to mitigate SGTRs. • Auto-Start of Standby HPIP could occur if flow adjustments are made too rapidly. • Rule 8 and EALs may apply if 1HP-26 opened with all RCPs off.	
1. ☒ Utilize the following as necessary to maintain <u>desired</u> Pzr level: • 1A HPI Pump • 1B HPI Pump • 1HP-26 • 1HP-7 • 1HP-120 setpoint or valve demand • 1HP-5	— IF 1HP-26 will NOT open, THEN throttle 1HP-410 to maintain desired Pzr level.
2. ☐ IAAT <u>makeup</u> to the <u>LDST</u> is desired, THEN makeup from 1A BHUT.	
3. ☐ IAAT it is desired to <u>secure</u> <u>makeup</u> to LDST, THEN secure makeup from 1A BHUT.	
4. ☐ IAAT it is desired to <u>bleed</u> letdown flow to 1A BHUT, THEN perform the following: A. Open: — 1CS-26 — 1CS-41 B. ☐ Position 1HP-14 to BLEED. C. ☐ Notify CRS.	Examiner Note: The OATC will adjust 1HP-120 setpoint to control at >100 inches (minimum of 25% on dial)
5. ☐ IAAT letdown <u>bleed</u> is NO longer desired, THEN position 1HP-14 to NORMAL.	Examiner Note: If the crew decides to bleed letdown flow to 1A BHUT, then Step B is a verifiable action. Step 5 would then be a verifiable action when they secure from bleed.

This event is complete when the crew has performed EOP Enclosure 5.9 Step 7 to feed both SGs, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 4 Event No.: 8 Page 1 of 35
 Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

Booth Cue: When directed by the Lead Examiner, **ACTIVATE EVENT 8** to initiate the LOHT by tripping the 1A MDEFWP.

CT-2: Open 1HP-26 (part 1) and the PORV (part 2) and start the 1C HPIP (part 3) prior to reaching Step 5 of the LOHT tab which evaluates HPI FC status Event 8 Page 12.

Event 8 Plant response:

- LOHT (Both MFWPs and all EFWPs trip)
- CBP feed will be established for a time
- Loss of CBP results in RCS pressure exceeding 2300 psig

Event 8 Crew response:

- The **CRS** will direct the **OATC** to trip the Reactor and perform IMAs. (IMAs listed below)
- The **CRS** will direct the **BOP** to perform a Symptom Check (next page)

EP/1/A/1800/001 00 (Rev 03)

3. Immediate Manual Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.1 ☐ Depress REACTOR TRIP pushbutton.	
3.2 ☐ Verify reactor power < 5% FP and lowering.	☐ GO TO Rule 1 (ATWS/Unanticipated Nuclear Power Production).
3.3 ☐ Depress turbine TRIP pushbutton.	
3.4 ☐ Verify <u>all</u> turbine stop valves closed.	☐ Place <u>both</u> EHC pumps in PULL TO LOCK.
3.5 ☐ Verify RCP seal injection available.	☐ IF CC is unavailable, THEN immediately: A. ☐ Stop <u>all</u> RCPs. (10) B. ☐ Notify CRS to initiate AP/25 (Standby Shutdown Facility Emergency Operating Procedure).

Examiner Note: Since conditions have changed, the crew may start the EOP over at IMA's or the CRS may direct each RO to perform a Symptom Check. If IMAs are directed, the OATC will perform the steps above, then announce each of them to the CRS while the BOP performs a Symptom Check. Upon completion, the CRS will direct the OATC to perform a Symptom Check. Symptom Check actions on next page.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

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SYMPTOM CHECK GUIDELINES

Power Range NIs NOT < 5% Power Range NIs NOT lowering	Rule 1, <i>ATWS/Unanticipated Nuclear Power Production</i>
Any SCM < 0°F	Rule 2, <i>Loss Of SCM</i>
Loss of Main and Emergency FDW (including unsuccessful manual initiation of EFDW)	Rule 3, Loss of Main or Emergency FDW Rule 4, <i>Initiation of HPI Forced Cooling</i> (Inability to feed SGs and > 2300 psig, NDT limit reached, or PZR level > 375")
Uncontrolled Main steam line(s) pressure reduction	Rule 5, <i>Main Steam Line Break</i>
CSAE Off-gas alarms Process monitor alarms (RIA-40, 59,60), Area monitor alarms (RIA-16/17)	None (SGTR Tab is entered when identified SG Tube Leakage > 25 gpm)

Examiner Note:

The CRS will direct the BOP to perform Rule 3 (Loss of Main or Emergency FDW) which starts on the **next page**.

The CRS will refer to the Parallel Action Page for the Subsequent Actions tab on **Event 8 Page 8**.

The CRS will then transfer to the LOHT tab starting on **Event 8 Page 9**.

The OATC will complete a Symptom Check and perform actions directed by the CRS including the performance of EOP Encl. 5.5 (PZR and LDST Level Control) which starts on **Event 8 Page 33**.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

Rule 3
Loss of Main or Emergency FDW

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Page 1 of 13

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
1. Verify loss of MFDW and/or EFDW was due to <u>any</u> of the following: ___ Turbine Building Flooding ___ Actions taken to raise SG level due to Turbine Building Flooding	 GO TO Step 3.								
2. ___ EXIT this Rule.	Examiner Note: Based on SGs being controlled at 30" XSUR when the MDEFWP is lost, Rule 4 criteria could be met prior to establishing CBP feed at step 14 RNO on the next page. If CBP feed is established prior to Rule 4 criteria, once CBP feed is lost and pressure reaches 2300 psig, the RO will perform Rule 4 starting on Event 8 Page 12.								
3. ___ IAAT NO SGs can be fed with FDW (Main/CBP/Emergency/PSW), AND <u>any</u> of the following exist: ___ RCS pressure reaches 2300 psig OR NDT limit ___ Pzr level reaches 375" [340" acc] THEN PERFORM Rule 4 (Initiation of HPI Forced Cooling).									
4. ___ Start <u>operable</u> EFDW pumps, as required, to feed <u>all intact</u> SGs.									
5. ___ Verify <u>any</u> EFDW pump operating.									
6. ___ GO TO Step 38.	 GO TO Step 7.								
7. Place in MANUAL and close:  1FDW-315  1FDW-316	___ Notify CRS of failure.								
8. Verify <u>both</u> : ___ <u>Any</u> CBP operating ___ TBVs available on an <u>intact</u> SG	___ GO TO Step 16.								
9.  Select OFF for <u>both</u> digital channels on AFIS HEADER A.									
10.  Select OFF for <u>both</u> digital channels on AFIS HEADER B.									
11. Place Startup Block valve control switch for <u>all intact</u> SGs in OPEN : <table><tr><td></td><td>1A SG</td><td></td><td>1B SG</td></tr><tr><td></td><td>1FDW-33</td><td></td><td>1FDW-42</td></tr></table>		1A SG		1B SG		1FDW-33		1FDW-42	Examiner Note: Both SGs are intact.
	1A SG		1B SG						
	1FDW-33		1FDW-42						

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

Rule 3
Loss of Main or Emergency FDW

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
12. Simultaneously position Startup Control valves 10 - 20% open on <u>all intact</u> SGs: <table><tr><td>✓</td><td>1A SG</td><td>✓</td><td>1B SG</td></tr><tr><td></td><td>1FDW-35</td><td></td><td>1FDW-44</td></tr></table>	✓	1A SG	✓	1B SG		1FDW-35		1FDW-44	
✓	1A SG	✓	1B SG						
	1FDW-35		1FDW-44						
13. Perform the following: ☐ Place 1FDW-31 switch in CLOSE. ☐ Place 1FDW-40 switch in CLOSE. ☐ Close 1FDW-32. ☐ Close 1FDW-41.									
14. ___ Verify Rule 4 (Initiation of HPI Forced Cooling) in progress.	CAUTION Until SGs are dry, lower SG pressure slowly to								

Examiner Note: The RO will reduce SG pressure by opening the TBVs in Manual. The RO will throttle down to between 10 and 20% open to stabilize SG pressure at approximately 500 psig.

Once the Lead Examiner is satisfied that the crew has had the opportunity to stabilize the plant, the CBPs will be tripped to move on to Rule 4 and HPI FC. Rule 4 starts on **Event 8 Page 12**.

Booth Cue: When directed by Lead Examiner, **ACTIVATE EVENT 8a** to trip the CBPs and fail closed 1RC-1.

1. ☐ Lower SG pressure in available SGs to $\approx$ 500 psig.
2. ☐ Control FDW flow to stabilize RCS P/T by throttling the following as necessary:
 - Startup Control valves
 - TBVs
3. ___ Notify CRS that CBP feed is in progress. (22)
4. Place switches to OPEN:
 - ☐ 1FDW-38
 - ☐ 1FDW-47
5. Place switches to CLOSE:
 - ☐ 1FDW-36
 - ☐ 1FDW-45
6. ☐ GO TO Step 16.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

Page 5 of 35

Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

Rule 3
Loss of Main or Emergency FDW

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. ☐ Verify 1 TD EFDW PUMP is <u>operable</u> and available for manual start.	☐ GO TO Step 18.
17. ☐ Dispatch an operator to perform Encl 5.26 (Manual Start of TDEFDWP). (PS)	Examiner Note: The Manual start of the TD is NOT successful for this scenario.
18. ☐ Verify cross-tie with Unit 2 is desired.	1. ☐ IF Unit 3 NOT available, THEN GO TO Step 22. 2. Dispatch an operator to open: ☐ 3FDW-313 (3A EFDW Line Disch To 3A S/G X-Conn) ☐ 3FDW-314 (3B EFDW Line Disch To 3B S/G X-Conn) 3. ☐ GO TO Step 20.
19. Dispatch an operator to open: ☐ 2FDW-313 (2A EFDW Line Disch To 2A S/G X-Conn) ☐ 2FDW-314 (2B EFDW Line Disch To 2B S/G X-Conn)	Examiner Note: The alternate unit feedwater valves (2FDW-313 and 2FDW-314) will not be opened in this scenario.
20. ☐ Dispatch an operator to 1FDW-313 <u>and</u> have them notify the CR when in vicinity.	
21. Notify alternate unit to: A. ☐ Place <u>both</u> EFDW control valves in manual and closed. B. ☐ Start their TD EFDW PUMP.	Notify alternate unit to: A. ☐ Place <u>both</u> EFDW control valves in manual and closed. B. ☐ Start <u>both</u> MD EFDW pumps.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

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**Rule 3
Loss of Main or Emergency FDW**

**EP/1/A/1800/001 0L
Page 7 of 13**

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE

Intent of this step is to lineup alternate feed source and allow progression to support TCAs while field operators are attempting to align SG Feed from any source of EFW. EFW is the preferred source of SG Feed.

22. IAAT SGs are NOT being fed from any source (Main/CBP/Emergency), AND PSW SG feed available, THEN initiate Encl 5.45 (PSW Feed and RCP Seals). (continue)

Examiner Note: PSW is OOS for this scenario.

23. WHEN either exists:
Operator is in vicinity of 1FDW-313.
Unit 1 TD EFDW PUMP has been manually started.
 THEN continue.

NOTE

Procedure must continue while cross connects are being opened.

24. IAAT an operator is in vicinity of 1FDW-313, AND Unit 1 TD EFDW PUMP is NOT operating, THEN notify the operator to open:
1FDW-313 (1A EFDW Line Disch To 1A S/G X-Conn)
1FDW-314 (1B EFDW Line Disch To 1B S/G X-Conn)

GO TO Step 25.

Examiner Note: 1FDW-313 and 1FDW-314 were already opened in Event 7.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

Rule 3
Loss of Main or Emergency FDW

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25. Verify <u>either</u> exists: ___ HPI Forced Cooling is maintaining core cooling ___ CBP feed providing SG feed	NOTE - Begin opening EFDW control valve when this step is reached. Flow to the SG will begin as soon as alternate unit valve is off closed seat <u>or</u> immediately if 1 TD EFDWP is operating. 100 gpm could cause overcooling if adequate decay heat levels do NOT exist. 1. Establish a <u>maximum</u> of 100 gpm to each available <u>intact</u> SG using: ___ 1FDW-315 (1A SG) ___ 1FDW-316 (1B SG) 2. ___ WHEN heat transfer is observed, THEN feed <u>and</u> steam SGs as necessary to stabilize T_c. 3. ___ IF SSF event in progress, AND SSF event occurred while in MODE 1 <u>or</u> 2, THEN feed SGs per Rule 7 (SG Feed Control) Table 1 guidance. 4. ___ IF SSF event NOT in progress, AND $T_c > 550^\circ\text{F}$, THEN <u>initiate</u> cool down to $\leq 550^\circ\text{F}$ by feeding <u>and</u> steaming <u>intact</u> SGs at a rate that prevents RCS saturation using <u>either</u>: ___ TBVs ___ ADVs 5. Notify CRS of the following: ___ SG feed status. ___ Rule 3 actions are continuing. 6. ___ GO TO Step 27.
26. ___ WHEN <u>either</u> exists: ___ Unit 1 TD EFDW PUMP running ___ Alignment complete from alternate unit. (22) THEN notify CRS of the following: A. ___ Source of EFDW availability. B. ___ Rule 3 actions are continuing.	

Examiner Note: When the RO reaches step 25 (for the first time) CBP feed will be in progress. Once CBP feed is established and then lost, the RO may re-perform Rule 3. If Rule 3 is re-performed, upon reaching this step, the RO will proceed to the RNO. No attempts to establish flow will be successful and the RO will have to perform Rule 4 per step 3 of this procedure. Rule 4 starts on **Event 8 Page 12**.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 Rev 03

Subsequent Actions

EP/1/A/1800/001 00

Parallel Actions

Page 1 of 1

CONDITION	ACTIONS	
1. PR NIs $\geq$ 5% FP OR NIs NOT lowering	GO TO UNPP tab.	UNPP
2. <u>All</u> 4160V SWGR de-energized {13}	GO TO Blackout tab.	BLACKOUT
3. <u>Core</u> SCM indicates superheat	GO TO ICC tab.	ICC
4. <u>Any</u> SCM = 0°F	GO TO LOSCM tab.	LOSCM
5. <u>Both</u> SGs intentionally isolated to stop excessive heat transfer	GO TO EHT tab.	LOHT
6. Loss of heat transfer (including loss of all Main and Emergency FDW)	GO TO LOHT tab.	

Examiner Note: The CRS will then transfer to the LOHT tab starting on the next page.**This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.**

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

LOHT
Parallel Actions

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Page 1 of 1

CONDITION	ACTIONS	
1. PR NIs $\geq$ 5% FP OR NIs NOT decreasing	GO TO UNPP tab.	UNPP
2. <u>All</u> 4160V SWGR de-energized (13)	GO TO Blackout tab.	BLACKOUT
3. <u>Core</u> SCM indicates superheat	GO TO ICC tab.	ICC
4. <u>All</u> of the following exist: • <u>Any</u> SCM = 0°F • HPI forced cooling NOT in progress • Condition other than RCS heat-up is the cause of loss of subcooling	GO TO LOSCM tab.	LOSCM
5. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	ES
6. Valid ES actuation has occurred or should have occurred	Initiate Encl 5.1 (ES Actuation).	ES
7. Power lost to <u>all</u> 4160V SWGR and <u>any</u> 4160V SWGR re-energized	• Initiate AP/11 (Recovery from Loss of Power). • IF Encl 5.1 (ES Actuation) has been initiated, THEN reinitiate Encl 5.1.	ROP
8. RCS leakage > 160 gpm with letdown isolated OR SGTR > 25 gpm	Notify plant staff that Emergency Dose Limits are in affect using PA system.	EDL
9. Individual available to make notifications	• Announce plant conditions using PA system. • Notify OSM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification/Reportability Evaluation).	NOTIFY

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 4 Event No.: 8 Page 10 of 35
 Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0E Rev 00

LOHT
Loss Of Heat Transfer

EP/1/A/1800/001 0E
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ Ensure Rule 3 (Loss of Main or Emergency FDW) is in progress or complete.	
NOTE Transfer to LOSCM tab is NOT required if RCS heats to the point where <u>core</u> SCM = 0°F.	
2. ☐ IAAT the RCS heats to the point where <u>core</u> SCM = 0°F, THEN GO TO Step 4.	
3. ☐ IAAT NO SGs can be fed with FDW (Main/CBP/Emergency/PSW), AND <u>any</u> of the following exists: ☐ RCS pressure reaches 2300 psig OR NDT limit ☐ Pzr level reaches 375" [340" acc] THEN GO TO Step 4.	NOTE 1A1 RCP provides the best Pzr spray. 1. ☒ Reduce operating RCPs to one pump/loop. 2. ☐ WHEN <u>any</u> exists: ☐ EFDW <u>or</u> PSW SG feed flow has been re-established by existing Rules/Enclosures ☐ EFDW aligned from another unit ☐ Operator performing Rule 3 (Loss of Main or Emergency FDW) <u>or</u> Encl 5.27 (Alternate Methods for Controlling EFDW Flow) reports EFDW available THEN GO TO Step 50.

Examiner Note: The CRS will reach Step 3 of the LOHT Tab with CBP feed established. The RNO step will secure two of the RCPs to leave them in a 1/1 configuration. Once CBP feed is lost and RCS pressure reaches 2300 psig, the CRS will GO TO Step 4 (next page) which initiates Rule 4 (Initiation of HPI Forced Cooling).

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

LOHT
Loss Of Heat Transfer

EP/1/A/1800/001 0E Rev 00
EP/1/A/1800/001 0E
Page 1 of 23

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE SCM may be lost when the PORV is opened. Transition to LOSCM tab is NOT required.	
4. ☐ PERFORM Rule 4 (Initiation of HPI Forced Cooling).	
5. Verify <u>all</u> :	1. ☐ IF <u>any</u> HPI pump is providing injection flow, THEN GO TO Step 7.
☐ At least two HPI pumps operating	2. ☐ GO TO Step 12.
☐ Acceptable HPI flow exists in <u>both</u> HPI headers per Rule 4 (Initiation of HPI Forced Cooling)	
☐ PORV open	
☐ 1RC-4 open	

Examiner Note: Rule 4 starts on the **next page**. Following the completion of Rule 4, the CRS will verify the status of HPI Forced Cooling at Step 5.

LOHT
Loss Of Heat Transfer

EP/1/A/1800/001 0E
Page 3 of 23

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. ☒ GO TO HPI CD tab.	

Examiner Note: The HPI CD tab starts on **Event 8 Page 30**.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

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**Rule 4
Initiation of HPI Forced Cooling**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ Verify <u>any</u> HPI pump powered from 1TC, 1TD, <u>or</u> 1TE can be operated.	1. ☐ Stop <u>all</u> RCPs. 2. ☐ Position 1RC-66 SETPOINT SELECTOR to HIGH. 3. ☐ IF HPI lost because of Blackout, THEN GO TO Step 20. 4. ☐ GO TO Step 14.
2. Open: ☒ 1HP-24 ☒ 1HP-25	1. ☐ IF both BWST suction valves (1HP-24 <u>and</u> 1HP-25) are closed, THEN: A. ☐ Start 1A LPI PUMP. B. ☐ Start 1B LPI PUMP.
3. ☐ Start <u>all available</u> HPI pumps.	CT-2: Step 3 start 1C HPIP (part 3) CT-2: Step 4 open 1HP-26 (part 1)
4. Open: ☒ 1HP-26 ☒ 1HP-27	
5. ☒ Open 1RC-4.	
6. ☐ Verify flow exists in <u>any</u> HPI header.	☐ GO TO Step 8.

NOTE

When approaching 2450 psig, allowing PORV to cycle will prevent lifting Safety Relief valves.

7. Perform the following:
- A. ☒ Place 1RC-66 SETPOINT SELECTOR to OPEN.
- B. ☒ Depress 1RC-66 OPEN PERMIT pushbutton.
8. ☐ Verify at least two HPI pumps operating.

CT-2: Select 1RC-66 to OPEN and depress OPEN PERMIT. (part 2)

1. ☐ **IF NO** HPI pumps are operating, **THEN:**

Examiner Note: RCS will begin to depressurize when the PORV is opened until the PZR becomes solid and pressure begins to rise. Based on PZR fill rate, RCS may saturate requiring Rule 2 to be performed **EVENT 8 page 15**, and EOP Encl 5.1 performed for ES actuation **EVENT 8 page 20**.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

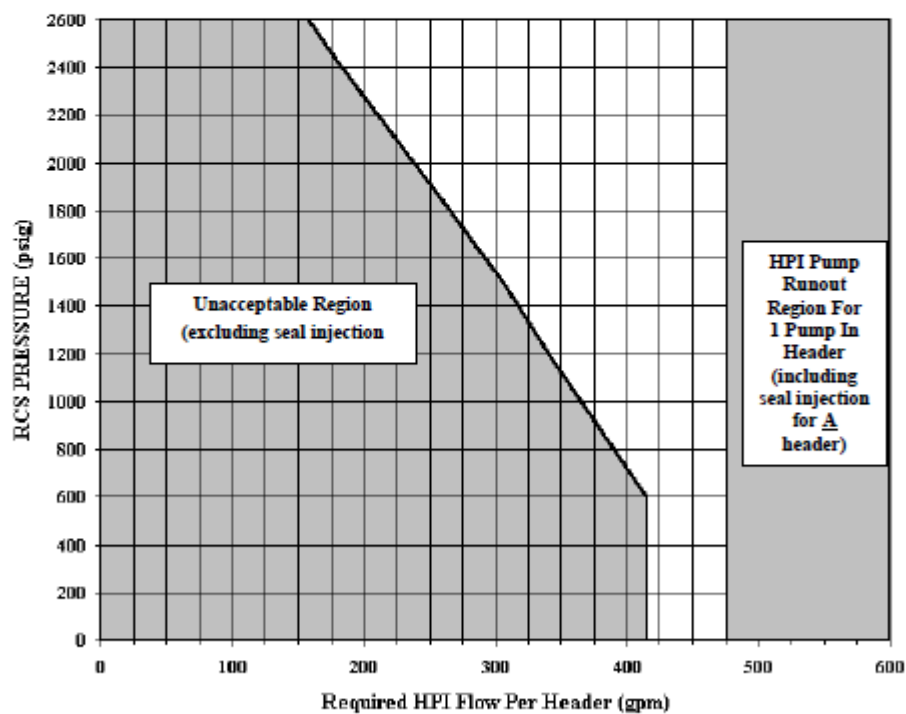
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**Rule 4
Initiation of HPI Forced Cooling**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9. <u> </u> Verify flow in <u>both</u> HPI headers is in the acceptable region of Figure 1 (Required HPI Flow Per Header).	1. <u> </u> IF 1A HPI header flow is unacceptable, THEN open 1HP-410. 2. <u> </u> IF 1B HPI header flow is unacceptable, THEN open 1HP-409.

**Figure 1
Required HPI Flow Per Header**



- | | |
|--|--------------------------------------|
| 10. <u> </u> Verify flow exists in <u>any</u> HPI header. | 1. <u> </u> Stop <u>all</u> RCPs. |
|--|--------------------------------------|

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
--------------------------	-----------------------

NOTE

When approaching 2450 psig, allowing PORV to cycle will prevent lifting Safety Relief valves.

11. Perform the following:

- A. ☐ Place 1RC-66 SETPOINT SELECTOR to OPEN.
- B. ☐ Depress 1RC-66 OPEN PERMIT pushbutton.

Examiner Note: If the RO incorrectly performed Step 6 (took the RNO) then this step will contain verifiable actions.

12. ☐ Verify > one RCP operating.

☐ GO TO Step 14.

NOTE

1A1 RCP provides the best Pzr spray and is preferred to be left running in case recovery from HPI forced cooling is performed and a Pzr bubble drawn.

13. ☒ Stop all but one RCP.

Examiner Note: The CRS should leave the 1A1 RCP operating.

14. ☐ IAAT the following limits are exceeded,

Pump Operation	Limit
1 HPI pump/hdr	475 gpm (incl. seal injection for <u>A</u> hdr)
1A & 1B HPI pumps operating with 1HP-409 open	Total flow of 950 gpm (incl. seal injection)

THEN throttle HPI to maximize flow $\leq$ flow limit.

Examiner Note: The crew will direct an AO to manually close 1HP-5 due to its failure in Event 6.

15. ☒ De-energize all Pzr heaters.

16. ☐ Close 1HP-5.

17. Close:

- ☒ TBVs
- ☒ 1FDW-35
- ☒ 1FDW-44

Booth Cue: When directed to close 1HP-5, **ACTIVATE EVENT 8b and notify the operator using time compression that 1HP-5 has been manually closed.**

18. ☐ IAAT all HPI is lost, THEN:

- A. ☐ Stop all RCPs.
- B. ☐ Position 1RC-66 SETPOINT SELECTOR to HIGH.

Examiner Note: Once the PZR is solid, RCS pressure will rise. The crew may throttle HPI FC to control RCS pressure utilizing Rule 6 located on **EVENT 8 Page 29.**

19. ☐ WHEN directed by CRS, THEN EXIT.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0L Rev 05

Examiner Note: When subcooling margin is regained following a solid Pressurizer, the CRS may direct, or RO may request, to re-initiate Rule 2 beginning at step 1 due to a change in plant conditions. Step 1 RNO will allow exiting Rule 2.

**Rule 2
Loss of SCM**

EP/1/A/1800/001 0L
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ IAAT <u>all</u> exist: ☐ <u>Any</u> SCM $\leq 0^{\circ}\text{F}$ ☐ Rx power $\leq 1\%$ ☐ ≤ 2 minutes elapsed since loss of SCM THEN perform Steps 2 and 3. {9}	1. ☐ IF <u>all</u> SCMs $> 0^{\circ}\text{F}$, THEN : A. ☐ Obtain CRS concurrence to exit Rule 2. B. ☐ EXIT Rule 2. 2. ☐ Notify CRS of RCP status. {9, 22} 3. ☐ GO TO Step 4.
2. ☒ Stop <u>all</u> RCPs.	1. ☐ Place 1TA AUTO/MAN switch in MAN. 2. ☐ Place 1TB AUTO/MAN switch in MAN. 3. ☐ Open 1TA SU 6.9 KV FDR. 4. ☐ Open 1TB SU 6.9 KV FDR.
3. ☐ Notify CRS of RCP status. {22}	
4. ☐ Verify Blackout exists.	☒ GO TO Step 6.
5. ☐ WHEN power has been restored, THEN continue.	

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0L Rev 05

**Rule 2
Loss of SCM**

EP/1/A/1800/001 0L
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. Open: ☐ 1HP-24 ☐ 1HP-25 Examiner Note: 1HP-24/25 may already be opened by Rule 4.	1. <u>IF both</u> BWST suction valves (1HP-24 and 1HP-25) are closed, THEN: A. <u>Start 1A LPI PUMP.</u> B. <u>Start 1B LPI PUMP.</u> C. Open: <u>1LP-15</u> <u>1LP-16</u> <u>1LP-9</u> <u>1LP-10</u> <u>1LP-6</u> <u>1LP-7</u> D. <u>IF two LPI Pumps are running only</u> to provide HPI pump suction, THEN secure one LPI pump. E. <u>Dispatch an operator to open 1HP-363 (Letdown Line To LPI Pump Suction Block) (A-1-119, U1 LPI Hatch Rm, N end).</u> F. <u>GO TO Step 7.</u> 2. <u>GO TO Step 9.</u>
7. ☐ Start <u>all available</u> HPI pumps.	

Examiner Note: Only 2 HPI pumps will be available.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0L Rev 05**Rule 2
Loss of SCM**EP/1/A/1800/001 0L
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8. <u>GO TO Step 13.</u>	
9. <u>Verify all (3) HPI pumps operating.</u>	1. <u>IF < 2 HPI pumps operating,</u> <u>THEN start HPI pumps to obtain two HPI</u> <u>pump operation, preferably in opposite</u> <u>headers.</u> 2. <u>GO TO Step 13.</u>
10. <u>Place Diverse HPI in BYPASS.</u>	<u>Place Diverse HPI in OVERRIDE.</u>
11. <u>Perform both:</u> <u>Place ES CH 1 in MANUAL.</u> <u>Place ES CH 2 in MANUAL.</u>	1. <u>IF ES CH 1 fails to go to MANUAL,</u> <u>THEN place ODD voter in OVERRIDE.</u> 2. <u>IF ES CH 2 fails to go to MANUAL,</u> <u>THEN place EVEN voter in OVERRIDE.</u>
12. <u>Secure 1B HPI PUMP.</u>	
13. <u>Open:</u> <u>1HP-26</u> <u>1HP-27</u>	Examiner Note: 1HP-26/27 will already be opened by Rule 4.
14. <u>Verify at least two HPI pumps are</u> <u>operating using two diverse indications.</u>	
	<u>GO TO Step 27.</u>

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

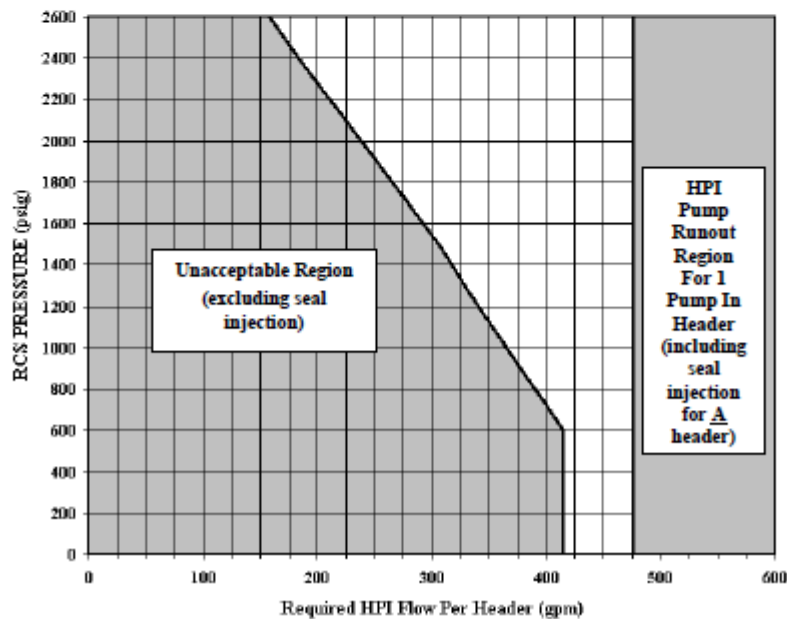
EP/1/A/1800/001 0L Rev 05

**Rule 2
Loss of SCM**

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
15. __ IAAT $\geq$ 2 HPI pumps operating, AND HPI flow in <u>any</u> header is in the Unacceptable Region of Figure 1 THEN perform Step 16.	__ GO TO Step 17.								
16. __ Open in the <u>affected</u> header: <table><tr><td>☒</td><td>1A Header</td><td>☒</td><td>1B Header</td></tr><tr><td></td><td>1HP-410</td><td></td><td>1HP-409</td></tr></table>	☒	1A Header	☒	1B Header		1HP-410		1HP-409	1. __ Notify CRS to consider manual operation of the failed valve. 2. __ IF HPI flow exists in <u>only one</u> header, THEN GO TO Step 27.
☒	1A Header	☒	1B Header						
	1HP-410		1HP-409						

**Figure 1
Required HPI Flow Per Header**



This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0L Rev 05

ACTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED						
17. <u> </u> IAAT flow limits are exceeded, <table><tr><th>Pump Operation</th><th>Limit</th></tr><tr><td>1 HPI pump/hdr</td><td>475 gpm (incl. seal injection for <u>A</u> hdr)</td></tr><tr><td>1A & 1B HPI pumps operating with 1HP-409 open</td><td>Total flow of 950 gpm (incl. seal injection)</td></tr></table> THEN perform Steps 18 - 20.		Pump Operation	Limit	1 HPI pump/hdr	475 gpm (incl. seal injection for <u>A</u> hdr)	1A & 1B HPI pumps operating with 1HP-409 open	Total flow of 950 gpm (incl. seal injection)	 GO TO Step 21.
Pump Operation	Limit							
1 HPI pump/hdr	475 gpm (incl. seal injection for <u>A</u> hdr)							
1A & 1B HPI pumps operating with 1HP-409 open	Total flow of 950 gpm (incl. seal injection)							
18. <u> </u> Place Diverse HPI in BYPASS.		<u> </u> Place Diverse HPI in OVERRIDE.						
19. Perform <u>both</u> : <u> </u> Place ES CH 1 in MANUAL. <u> </u> Place ES CH 2 in MANUAL.		1. <u> </u> IF ES CH 1 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. <u> </u> IF ES CH 2 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.						
20. <u> </u> Throttle HPI to maximize flow ≤ flow limit.								
21. <u> </u> Notify CRS of HPI status. (22)								
22. <u> </u> Verify RCS pressure > 550 psig.		<u> </u> Ensure ES Channels 3 <u>and</u> 4 actuated.						
ACTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED						
23. <u> </u> IAAT <u>either</u> exists: <u> </u> LPI FLOW TRAIN A <u>plus</u> <u> </u> LPI FLOW TRAIN B ≥ 3400 gpm <u> </u> <u>Only one</u> LPI header in operation with header flow ≥ 2900 gpm THEN GO TO Step 24.		 GO TO Step 35. Examiner Note: Rule 2 mitigation at step 35 includes feeding to the Loss of SCM setpoint using EFW, which is not available.						

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.1

ES Actuation

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EP/1/A/1800/001 0M

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED															
1. ☐ Determine <u>all</u> ES channels that <u>should</u> have actuated based on <u>RCS pressure and RB pressure</u>: <table><thead><tr><th>✓</th><th>Actuation Setpoint (psig)</th><th>Associated ES Channel</th></tr></thead><tbody><tr><td></td><td>1600 (RCS)</td><td>1 & 2</td></tr><tr><td></td><td>550 (RCS)</td><td>3 & 4</td></tr><tr><td></td><td>3 (RB)</td><td>1, 2, 3, 4, 5, & 6</td></tr><tr><td></td><td>10 (RB)</td><td>7 & 8</td></tr></tbody></table>	✓	Actuation Setpoint (psig)	Associated ES Channel		1600 (RCS)	1 & 2		550 (RCS)	3 & 4		3 (RB)	1, 2, 3, 4, 5, & 6		10 (RB)	7 & 8	Examiner Note: RCS pressure may lower to ES-1/2 set point prior to following opening of the PORV, but not occur until Rule 4 is complete. If Rule 2 and Rule 4 are in progress, they take priority over this enclosure. This enclosure will be performed, if ES actuates, by the first available operator.
✓	Actuation Setpoint (psig)	Associated ES Channel														
	1600 (RCS)	1 & 2														
	550 (RCS)	3 & 4														
	3 (RB)	1, 2, 3, 4, 5, & 6														
	10 (RB)	7 & 8														
2. ☐ Verify <u>all</u> ES channels associated with actuation setpoints have actuated.	NOTE Voter OVERRIDE extinguishes the TRIPPED light on the associated channels that have <u>auto</u> actuated. Pressing TRIP on channels previously actuated will reposition components that may have been throttled or secured by this Enclosure. ☐ Depress TRIP on affected ES logic channels that have NOT previously been actuated.															
3. ☐ IAAT <u>additional</u> ES actuation setpoints are exceeded, THEN perform Steps 1 - 2.																
4. ☒ Place Diverse HPI in BYPASS.	☐ Place Diverse HPI in OVERRIDE.															
5. Perform for actuated channels: ☒ Place ES CH 1 in MANUAL. ☒ Place ES CH 2 in MANUAL.	NOTE • Voter OVERRIDE affects all channels of the <u>affected</u> ODD and/or EVEN channels. • In OVERRIDE, all components on the <u>affected</u> ODD and/or EVEN channels can be manually operated from the component switch. 1. ☐ IF ES CH 1 fails to go to MANUAL, THEN place ODD voter in OVERRIDE. 2. ☐ IF ES CH 2 fails to go to MANUAL, THEN place EVEN voter in OVERRIDE.															

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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 Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. ☐ IAAT <u>all</u> exist: ☐ Voter associated with ES channel is in OVERRIDE ☐ An ES channel is <u>manually</u> actuated ☐ Components on that channel require manipulation THEN depress RESET on the required channel.	Examiner Note: If Rule 2 is not in progress, actions Rule 2 would perform begin at step 75 located on EVENT 8 Page 24.
7. ☐ Verify Rule 2 in progress <u>or</u> complete.	☐ GO TO Step 75.
8. ☐ Verify <u>any</u> RCP operating.	☐ GO TO Step 10.
9. Open: ☐ 1HP-20 ☐ 1HP-21	
10. ☐ IAAT ES Channels 5 <u>or</u> 6 has actuated, THEN perform Steps 11 - 15.	☐ GO TO Step 16.
ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. ☐ IAAT ES Channels 3 <u>or</u> 4 has actuated, THEN GO TO Step 17.	☐ GO TO Step 55.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0M Rev 02

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Unit Status ES Channels 3 and 4 have NOT actuated.	
55. Start: ☒ A OUTSIDE AIR BOOSTER FAN ☒ B OUTSIDE AIR BOOSTER FAN	
56. Notify Unit 3 to start: ___ 3A OUTSIDE AIR BOOSTER FAN ___ 3B OUTSIDE AIR BOOSTER FAN	
57. Verify open: ___ 1CF-1 ___ 1CF-2	___ IF CRS desires 1CF-1 and 1CF-2 open, THEN open: ___ 1CF-1 ___ 1CF-2
58. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
59. ___ Secure makeup to the LDST.	
60. ___ Verify <u>all</u> ES channel 1 & 2 components are in the ES position.	1. ___ IF 1HP-3 fails to close, THEN close 1HP-1. 2. ___ IF 1HP-4 fails to close, THEN close 1HP-2. 3. ___ IF 1HP-20 fails to close, AND NO RCPs operating, THEN close: ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ☒ Notify CRS to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
61. ___ Verify Unit <u>2</u> turbine tripped.	☒ GO TO Step 64.
62. ___ Close <u>2</u> LPSW-139.	
63. ___ Verify <u>total</u> LPSW flow to Unit <u>2</u> LPI coolers $\leq$ 6000 gpm.	___ Reduce LPSW to Unit <u>2</u> LPI coolers to obtain <u>total</u> LPSW flow $\leq$ 6000 gpm.
64. ☒ Close 1LPSW-139.	

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0M Rev 02

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
65. Place in FAIL OPEN: ☐ 1LPSW-251 FAIL SWITCH ☐ 1LPSW-252 FAIL SWITCH	
66. <u>Start all available LPSW pumps.</u>	
67. Verify either: <u>Three LPSW pumps operating</u> <u>Two LPSW pumps operating when</u> <u>Tech Specs only requires two operable</u>	<u>GO TO</u> Step 69.
68. Open: ☐ 1LPSW-4 ☐ 1LPSW-5	<u>IF both are closed:</u> <u>1LPSW-4</u> <u>1LPSW-5</u> THEN notify CRS to initiate action to open <u>at least one</u> valve prior to BWST level $\leq 19'$.
69. <u>IAAT BWST level $\leq 19'$, THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).</u>	1. ☐ Display BWST level using OAC Turn-on Code "SHOWDIG O1P1600". 2. ☐ Notify crew of BWST level IAAT step.
70. <u>Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (PS)</u>	
71. <u>Notify U2 CRS that SSF is inoperable due to OTS1-1 open.</u>	
72. <u>Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.</u>	
73. <u>IAAT conditions causing ES actuation have cleared, THEN initiate Encl 5.41 (ES Recovery).</u>	
74. <u>WHEN CRS approves, THEN EXIT.</u>	

... END ...

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
75. Open: ☒ 1HP-24 ☒ 1HP-25	1. <u>IF both</u> BWST suction valves (1HP-24 and 1HP-25) are closed, THEN: A. <u>Start 1A LPI PUMP.</u> B. <u>Start 1B LPI PUMP.</u> C. Open: <u>1LP-15</u> <u>1LP-16</u> <u>1LP-9</u> <u>1LP-10</u> <u>1LP-6</u> <u>1LP-7</u> D. <u>IF two LPI Pumps are running only</u> to provide HPI pump suction, THEN secure one LPI pump. E. <u>Dispatch an operator to open</u> 1HP-363 (Letdown Line To LPI Pump Suction Block). (A-1-119, U1 LPI Hatch Rm, N end) F. <u>GO TO Step 76.</u> 2. <u>IF only one</u> BWST suction valve (1HP-24 or 1HP-25) is open, THEN: A. <u>IF three HPI pumps are operating,</u> THEN secure 1B HPI PUMP. B. <u>IF < 2 HPI pumps are operating,</u> THEN start HPI pumps to obtain two HPI pump operation, preferably in opposite headers. C. <u>GO TO Step 77.</u>

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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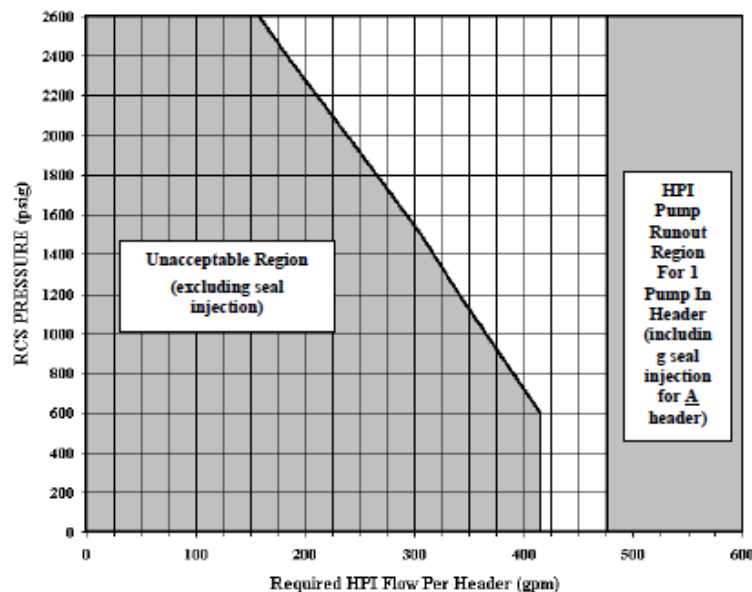
Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED				
76. ☐ Verify <u>at least two</u> HPI pumps are operating.	1. ☐ IF HPI has been intentionally throttled, THEN GO TO Step 77. 2. ☐ Ensure <u>at least two</u> HPI pumps are operating.				
77. Verify open: ☐ 1HP-26 ☐ 1HP-27	1. ☐ IF HPI has been intentionally throttled, THEN GO TO Step 78. 2. Open: ☐ 1HP-26 ☐ 1HP-27				
78. ☐ IAAT at least two HPI pumps are operating, AND HPI flow in <u>any</u> header that has NOT been <u>intentionally</u> throttled is in the Unacceptable Region of Figure 1, THEN open the following in the <u>affected</u> header: <table border="1"> <tr> <td>☒ 1A Header</td><td>☒ 1B Header</td></tr> <tr> <td>☐ 1HP-410</td><td>☐ 1HP-409</td></tr> </table>	☒ 1A Header	☒ 1B Header	☐ 1HP-410	☐ 1HP-409	
☒ 1A Header	☒ 1B Header				
☐ 1HP-410	☐ 1HP-409				

Figure 1
Required HPI Flow Per Header



This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
79. ☐ Verify <u>any</u> RCP operating.	☐ GO TO Step 81.
80. Open: ☒ 1HP-20 ☒ 1HP-21	
81. ☐ IAAT ES Channels 5 <u>or</u> 6 has actuated, THEN perform Steps 82 - 86.	☒ GO TO Step 87.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
87. ☐ IAAT ES Channels 3 <u>or</u> 4 has actuated, THEN GO TO Step 88.	☒ GO TO Step 126.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0M Rev 02

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>Unit Status</u> ES Channels 3 and 4 have NOT actuated.	
126. Start: ☒ A OUTSIDE AIR BOOSTER FAN ☒ B OUTSIDE AIR BOOSTER FAN	
127. Notify Unit 3 to start: ___ 3A OUTSIDE AIR BOOSTER FAN ___ 3B OUTSIDE AIR BOOSTER FAN	
128. Verify open: ___ 1CF-1 ___ 1CF-2	___ IF CRS desires 1CF-1 and 1CF-2 open, THEN open: ___ 1CF-1 ___ 1CF-2
129. ___ Verify 1HP-410 closed.	1. ___ Place 1HP-120 in HAND. 2. ___ Close 1HP-120.
130. ___ Secure makeup to the LDST.	
131. ___ Verify all ES channel 1 & 2 components are in the ES position.	1. ___ IF 1HP-3 fails to close, THEN close 1HP-1. 2. ___ IF 1HP-4 fails to close, THEN close 1HP-2. 3. ___ IF 1HP-20 fails to close, AND NO RCPs operating, THEN close: ___ 1HP-228 ___ 1HP-226 ___ 1HP-232 ___ 1HP-230 4. ☒ Notify CRS to evaluate components NOT in ES position <u>and</u> initiate action to place in ES position if desired.
132. ___ Verify Unit 2 turbine tripped.	☒ GO TO Step 135.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0M Rev 02

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
135. ☒ Close 1LPSW-139.	
136. Place in FAIL OPEN: ☒ 1LPSW-251 FAIL SWITCH ☒ 1LPSW-252 FAIL SWITCH	
137. ☒ Start <u>all available</u> LPSW pumps.	
138. Verify <u>either</u> : ___ Three LPSW pumps operating ___ Two LPSW pumps operating when Tech Specs only requires two operable	___ GO TO Step 140.
139. Open: ☒ 1LPSW-4 ☒ 1LPSW-5	___ IF <u>both</u> are closed: ___ 1LPSW-4 ___ 1LPSW-5 THEN notify CRS to initiate action to open <u>at least one</u> valve prior to BWST level $\leq 19'$.
140. ___ IAAT BWST level $\leq 19'$, THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).	1. ☒ Display BWST level using OAC Turn-on Code "SHOWDIG O1P1600". 2. ☒ Notify crew of BWST level IAAT step.
141. ___ Dispatch an operator to perform Encl 5.2 (Placing RB Hydrogen Analyzers In Service). (PS)	
142. ___ Notify U2 CRS that SSF is inoperable due to OTS1-1 open.	
143. ___ Ensure <u>any</u> turnover sheet compensatory measures for ES actuation are complete as necessary.	
144. ___ IAAT conditions causing ES actuation have cleared, THEN initiate Encl 5.41 (ES Recovery).	
145. ___ WHEN CRS approves, THEN EXIT.	

... END ...

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

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Rule 6
HPI

EP/1/A/1800/001 0L
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HPI Pump Throttling Limits

- HPI must be throttled to prevent violating the RV-P/T limit.
- HPI pump operation must be limited to two HPIPs when only one BWST suction valve (1HP-24 or 1HP-25) is open.
- HPI must be throttled ≤ 475 gpm/pump (including seal injection for A header) when only one HPI pump is operating in a header.
- Total HPI flow must be throttled ≤ 950 gpm including seal injection when 1A and 1B HPI pumps are operating with 1HP-409 open.
- Total HPI flow must be throttled < 750 gpm when all the following exist:
 - LPI suction is from the RBES
 - piggyback is aligned
 - either of the following exist:
 - only one piggyback valve is open (1LP-15 or 1LP-16)
 - only one LPI pump operating
- HPI may be throttled under the following conditions:

HPI Forced Cooling in Progress:	HPI Forced Cooling NOT in Progress:
<u>All</u> the following conditions must exist: ● <u>Core</u> SCM > 0 ● CETCs lowering	<u>All</u> the following conditions must exist: ● <u>All</u> WR NIs $\leq 1\%$ ● <u>Core</u> SCM > 0 ● Pzr level rising ● CRS concurrence required if throttling following emergency boration

HPI Pump Minimum Flow Limit

- Maintain ≥ 170 gpm indicated/pump. This is an instrument error adjusted value that ensures a real value of ≥ 65 gpm/pump is maintained. HPI pump flow less than minimum is allowed for up to 4 hours.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0J Rev 02**HPI CD**
Parallel Actions**EP/1/A/1800/001 0J**
Page 1 of 1

CONDITION	ACTIONS	
1. PR NIs $\geq$ 5% FP OR NIs NOT lowering	GO TO UNPP tab.	UNPP
2. <u>All</u> 4160V SWGR de-energized (13)	GO TO Blackout tab.	BLACKOUT
3. <u>Core</u> SCM indicates superheat	GO TO ICC tab.	ICC
4. <u>Any</u> SCM = 0°F AND LOSCM was NOT due to initiation of HPI forced cooling	GO TO LOSCM tab.	LOSCM
5. Inadvertent ES actuation occurred	Initiate AP/1/A/1700/042 (Inadvertent ES Actuation).	ES
6. Valid ES actuation has occurred <u>or</u> should have occurred	Initiate Encl 5.1 (ES Actuation).	ES
7. Power lost to <u>all</u> 4160V SWGR and <u>any</u> 4160V SWGR re-energized	- Initiate AP/11 (Recovery from Loss of Power). IF Encl 5.1 (ES Actuation) has been initiated, THEN reinitiate Encl 5.1.	ROP
8. Individual available to make notifications	- Notify SM to reference the Emergency Plan and AD-LS-ALL-0006 (Notification/Reportability Evaluation). - Notify plant staff that Emergency Dose Limits are in affect using PA system.	NOTIFY and EDL

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

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Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

HPI CD
HPI Cooledown

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EP/1/A/1800/001 0J
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1. ☐ IAAT BWST level is $\leq 19'$, THEN initiate Encl 5.12 (ECCS Suction Swap to RBES).	
2. ☐ IAAT <u>either</u> exists: ☐ LPI FLOW TRAIN A <u>plus</u> LPI FLOW TRAIN B ≥ 3400 gpm ☐ <u>Only one</u> LPI header in operation with header flow ≥ 2900 gpm THEN GO TO LOCA CD tab.	
3. Verify <u>all</u> : ☐ PORV open ☐ 1RC-4 open ☐ Two HPI trains injecting ☐ CETCs $\leq 640^\circ\text{F}$	1. ☐ IF RCS vents (hot leg <u>and</u> vessel head) are open, THEN GO TO Step 4. 2. Locally close: (Unit 1 Cable Rm) ☐ 1SKJ-08 (1RC-155/1RC-156) ☐ 1SKK-08 (1RC-157/1RC-158) ☐ 1SKL-08 (1RC-159/1RC-160) 3. Open: ☐ 1RC-155 ☐ 1RC-156 ☐ 1RC-157 ☐ 1RC-158 ☐ 1RC-159 ☐ 1RC-160

CREW BRIEF OPPORTUNITY

4. Perform the following:
- ☒ Ensure all RBCUs in low speed.
 - ☒ Open 1LPSW-18.
 - ☒ Open 1LPSW-21.
 - ☒ Open 1LPSW-24.

Examiner Note: RBCUs and 1LPSW-18/21/24 will already be in required position if ES actuation occurs.

5. ☐ **Initiate Encl 5.35 (Containment Isolation).**

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

Page 32 of 35

Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

HPI CD
HPI Cooldown

EP/1/A/1800/001 0J Rev 02
EP/1/A/1800/001 0J
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. <u>IAAT</u> <u>all</u> exist: <u>Any</u> RBS pump operating - RB pressure < 3 psig < 24 hours into event - Reactor Engineering confirms Condition Zero <u>or</u> Condition One per RP/0/B/1000/018 (Core Damage Assessment) THEN stop <u>all</u> RBS pumps.	
7. Start: ☒ A Outside Air Booster Fan ☒ B Outside Air Booster Fan	Examiner Note: Outside Air Booster fan may have already been started by Encl. 5.1 ES Actuation.
8. Notify Unit 3 to start: <u>3A</u> Outside Air Booster Fan <u>3B</u> Outside Air Booster Fan	
9. <u>Verify</u> 1SA-2/C-8 (AFIS HEADER A INITIATED) lit.	<u>Select OFF</u> for <u>both</u> digital channels on AFIS HEADER A.
10. <u>Verify</u> 1SA-2/D-8 (AFIS HEADER B INITIATED) lit.	<u>Select OFF</u> for <u>both</u> digital channels on AFIS HEADER B.
11. <u>Verify</u> indications of SGTR ≥ 25 gpm.	☒ GO TO Step 17.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

Page 33 of 35

Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.5

Pzr and LDST Level Control

EP/1/A/1800/001 0M Rev 02

EP/1/A/1800/001 0M

Page 1 of 15

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE • Maintaining Pzr level >100" [180" acc] will ensure Pzr heater bundles remain covered. • When Rx critical, use of 1HP-26 normally only necessary to mitigate SGTRs. • Auto-Start of Standby HPIP could occur if flow adjustments are made too rapidly. • Rule 8 and EALs may apply if 1HP-26 opened with all RCPs off.	
1. ☒ Utilize the following as necessary to maintain <u>desired</u> Pzr level: • 1A HPI Pump • 1B HPI Pump • 1HP-26 • 1HP-7 • 1HP-120 setpoint or valve demand • 1HP-5	— IF 1HP-26 will NOT open, THEN throttle 1HP-410 to maintain desired Pzr level. Examiner Note: The OATC will adjust 1HP-120 setpoint to control at >100 inches (minimum of 25% on dial). Most likely this was completed during Event 7.
2. — IAAT <u>makeup</u> to the <u>LDST</u> is desired, THEN makeup from 1A BHUT.	
3. — IAAT it is desired to <u>secure</u> <u>makeup</u> to LDST, THEN secure makeup from 1A BHUT.	
4. — IAAT it is desired to <u>bleed</u> letdown flow to 1A BHUT, THEN perform the following: A. Open: — 1CS-26 — 1CS-41 B. — Position 1HP-14 to BLEED. C. — Notify CRS.	Examiner Note: If the crew decides to bleed letdown flow to 1A BHUT, then Steps A and B are verifiable actions. Step 5 would then be a verifiable action when they secure from bleed.
5. — IAAT letdown <u>bleed</u> is NO longer desired, THEN position 1HP-14 to NORMAL.	

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1** Scenario No.: 4 Event No.: 8 Page 34 of 35
 Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

EP/1/A/1800/001 0M Rev 02

Enclosure 5.5
 Pzr and LDST Level Control

EP/1/A/1800/001 0M
 Page 3 of 15

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6. <u>IAAT 1C HPI PUMP</u> is required, THEN perform Steps 7 - 9.	 GO TO Step 10.

Enclosure 5.5
 Pzr and LDST Level Control

EP/1/A/1800/001 0M
 Page 7 of 15

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10. <u>IAAT LDST level</u> CANNOT be maintained, THEN perform Step 11.	 GO TO Step 12.

NOTE

Maintaining Pzr level >100" [180" acc] will ensure Pzr heater bundles remain covered.

12. <u>Operate Pzr heaters</u> as required to maintain heater bundle integrity.	Examiner Note: Rule 4 will secure the PZR Heaters.
13. <u>IAAT additional makeup flow to LDST</u> is desired, AND 1A BLEED TRANSFER PUMP is operating, THEN dispatch an operator to close 1CS-48 (1A BHUT Recirc). (A-1-107, Unit 1 RC Bleed Transfer Pump Rm.)	
14. <u>IAAT two Letdown Filters</u> are desired, THEN perform the following: <u>Open 1HP-17.</u> <u>Open 1HP-18</u>	
15. <u>IAAT all</u> of the following exist: <u>Letdown isolated</u> <u>LPSW available</u> <u>Letdown restoration desired</u> THEN perform Steps 16 - 34. {41}	 GO TO Step 35. Examiner Note: Rule 4 will isolate letdown.

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

Op-Test No.: **ILT 24-1**

Scenario No.: 4

Event No.: 8

Page 35 of 35

 Event Description: **LOHT (CBP feed, followed by Rule 4 and HPI FC) (M: ALL)**

Applicant's Actions or Behavior

Enclosure 5.5

Pzr and LDST Level Control

EP/1/A/1800/001 OM Rev 02

EP/1/A/1800/001 OM

Page 13 of 15

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE AP/32 (Loss of Letdown) provides direction to cool down the RCS to offset rising pressurizer level.	
35. <u>IAAT</u> it is determined that letdown is unavailable due to equipment failures or letdown system leakage, THEN notify CRS to initiate AP/32 (Loss of Letdown).	
36. <u>IAAT</u> > 1 HPI pump is operating, AND additional HPI pumps are NO longer needed, THEN perform the following: A. <u>Obtain</u> CRS concurrence to reduce running HPI pumps. B. <u>Secure</u> the desired HPI pumps. C. <u>Place</u> secured HPI pump switch in AUTO, if desired.	
37. <u>IAAT</u> <u>all</u> the following conditions exist: <u>Makeup</u> from BWST NOT required <u>LDST</u> level > 55" <u>All</u> control rods inserted <u>Cooldown Plateau</u> NOT being used THEN close: <u>1HP-24</u> <u>1HP-25</u>	
38. <u>Verify</u> 1CS-48 (1A BHUT Recirc) has been closed to provide additional makeup flow to LDST.	 GO TO Step 40.
40. <u>Verify</u> two Letdown Filters in service, AND <u>only one</u> Letdown filter is desired.	 GO TO Step 42.
42. WHEN directed by CRS, THEN EXIT this enclosure.	

This event is complete when the crew has transferred to the HPI CD tab, or as directed by the Lead Examiner.

CRITICAL TASKS

CT-1 Manually open 1HP-5 and restore letdown. (**CT-1 located on Event 4 Page 4**)

Reference	AP/1/A/1700/032 (Loss of Letdown)
Critical Task Methodology	Completion of AP steps manually open 1HP-5 and restore letdown flow
Initiating Cue	Loss of letdown based on 1HP-5 failing closed and associated Control Room alarms
Performance Feedback	If the crew fails to perform the required action, the AP directs a shutdown and cool down to LPI conditions.
Success Path	The correct performance of AP/32 step 4.16 through 4.22 which manually opens 1HP-5 to restore letdown
Measurable Performance Standard	Observable actions taken by one crew member. The success or failure will be evident to the entire crew based upon the initiation of AP/29 at step 4.54 to begin shutdown and cool down the prevent PZR fill.
Preferred Boundary Condition	Threshold that results in changes to the mitigative strategy for the event

CT-2 Open 1HP-26 and the PORV and start 1C HPIP prior to reaching Step 5 of the LOHT tab which evaluates the status of HPI FC. Degraded HPI FC results in a change to the mitigation strategy. (**CT-2 Stop Time located on Event 8 Page 12**)

Reference	Rule 4 (Initiation of HPI Forced Cooling)
Critical Task Methodology	Completion of Rule 4 steps to open 1HP-26 and the PORV and to start 1C HPIP which provides adequate HPI flow down both Headers
Initiating Cue	RCS pressure reaches 2300 psig prompting performance of Rule 4
Performance Feedback	If the crew fails to perform the required action, the EOP directs the alignment of SSF-ASW and the opening of RB Head and Loop Vents for degraded HPI FC
Success Path	The correct performance of Rule 4 steps 3, 4, and 7
Measurable Performance Standard	Observable actions taken by one crew member. The success or failure will be evident to the entire crew based upon the cycling of the PORV and intermittent receipt of 1SA-18/A-1 (PZR Relief Valve Flow) and lack of HPI flow down the 1A or 1B HPI Header.
Preferred Boundary Condition	Threshold that results in changes to the mitigative strategy for the event

SAFETY: Take a Minute			
UNIT 0 (CRS)			
SSF Operable: Yes PSW Operable: No	KHU's Operable: U1 - OH, U2 - UG	LCTs Operable: 2	Fuel Handling: No
UNIT STATUS (CRS)			
Unit 1 Simulator	Other Units		
Mode: 1	Unit 2	Unit 3	
Reactor Power: 80%	Mode: 1	Mode: 1	
Gross MWE: 710	100% Power	100% Power	
RCS Leakage: 0.01 gpm No WCAP Action	EFDW Backup: Yes	EFDW Backup: Yes	
RBNS Rate: 0.01 gpm			
Technical Specifications/SLC Items (CRS)			
Component/Train	OOS Date/Time	Restoration Required Date/Time	TS/SLC #
PSW	Today/0600	7 Days	TS 3.7.10
Shift Turnover Items (CRS)			
Primary			
• 1RIA-3 and 5 removed from RB. • SASS is in Manual for calibration • After turnover, the SRO will direct the BOP to swap HPI Pumps utilizing OP/1/A/1104/002 Encl. 4.24 (Swapping 1A and 1B HPI Pumps)			
Secondary			
• 1SSH-1, 1SSH-3, 1SD-2, 1SD-5, 1SD-140, 1SD-303, 1SD-355, 1SD-356 and 1SD-358 are closed with power supply breakers open per the Startup Procedure for SSF Overcooling Event. • U2 is supplying the AS Header • PSW Booster Pump is OOS due to equipment failure. WCC preparing Protected Equipment package. • 1MS-82, 1MS-84, 1MS-47, 1MS-45, 1MS-24, 1MS-33 tagged closed per OP/1/A/1102/004 Encl. 4.11 (Isolation and Restoration of MS Load) due to power < 98% • 1TDEFWP only operable on AS			
Electrical			
•			
•			
Reactivity Management (CRS)			
RCS Boron 43 ppmB	Gp 7 Rod Position: 58% Withdrawn	Batch additions as required for volume control (OATC)	

REGION II

JOB PERFORMANCE MEASURE

AO-101

Swap Control Rod Drive Filters

Administrative: No

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

REGION II JOB PERFORMANCE MEASURE

Task Title: Swap Control Rod Drive Filters

Task Number: N/A

Alternate Path: No

Time Critical: No

Validation Time: 15 Min

K/A Rating(s):

System: 001

K/A: A2.01

Rating: 3.3/3.3

Task Standard:

Place standby CRD filter in service and remove other CRD filter from service by performing the following:

- Open 1CC-72
- Close 1CC-73 and 1CC-136 following vent
- Open 1CC-74
- Close 1CC-92
- Close 1CC-93

References:

OP/1/A/1104/008 Component Cooling System Rev 78

Tools/Equipment/Procedures Needed:

OP/1/A/1104/008 Component Cooling System, Encl. 4.19 Placing 1A OR 1B CRD Filter In Service

(Printed blank copy) Rev 78

(Note: Below this line is used only for Initial NRC Exams)

Candidate: _____

NAME

Time Start: _____

Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____

NAME

SIGNATURE

/ DATE

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

N/A

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

The 1B CRD filter ΔP is 11 psid

It has been determined that the operating CRD filters have to be swapped

INITIATING CUES

The CRS directs you to place the 1A CRD filter in service and remove the 1B CRD filter from service using OP/1/A/1104/008 (Component Cooling System) Encl. 4.19 (Placing 1A OR 1B CRD Filter In Service)

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	2.1	NOTE: CRD Filter maximum ΔP 12 psid. IF required, place 1A CRD Filter in service: STANDARD: Per the cue sheet, the 1A CRD Filter will be placed in service. COMMENTS:	___ SAT ___ UNSAT
2	2.1.1	Ensure open 1CC-72 (1A CRD Filter Inlet). STANDARD: Candidate opens 1CC-72 by turning the hand wheel in the counter clockwise direction until it comes to a hard stop. COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT
3	2.1.2	Open 1CC-136 (1A CRD Filter Sightglass Outlet). STANDARD: Candidate opens 1CC-136 by turning hand wheel in the counter clockwise direction until it comes to a hard stop. COMMENTS:	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
4	2.1.3	Throttle 1CC-73 (1A CRD Filter Vent) to vent 1A CRD Filter. <u>STANDARD:</u> Candidate throttles open 1CC-73 by turning the hand wheel in the counter clockwise direction until flow is noticed in the sight glass. Examiner Cue: Several seconds after 1CC-73 is throttled open, inform the candidate that a solid stream is noticed in the sight glass. <u>COMMENTS:</u>	___ SAT ___ UNSAT
5	2.1.4	WHEN vented, position the following: • Close 1CC-73 (1A CRD Filter Vent) • Close 1CC-136 (1A CRD Filter Sightglass Outlet) <u>STANDARD:</u> When the candidate notices a solid stream of water in the sightglass, they close 1CC-73 and 1CC-136 by turning the hand wheels in the clockwise direction until they come to a hard stop. <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
6	2.1.5	Open 1CC-74 (1A CRD Filter Outlet). <u>STANDARD:</u> Candidate opens 1CC-74 by turning the valve in the counter clockwise direction until the handwheel comes to a hard stop. <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
7	2.1.6	IF desired, remove 1B CRD Filter from service: • Close 1CC-92 (1B CRD Filter Inlet) • Close 1CC-93 (1B CRD Filter Outlet) <u>STANDARD:</u> Candidate closes 1CC-92 and 1CC-93 by turning the hand wheels in the clockwise direction until they come to a hard stop. <u>COMMENTS:</u> END TASK	CRITICAL STEP ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
2	This step is required to allow flow into the CRD filter.
5	This step is required to prevent draining the CC system.
6	This step is required to place the 1A CRD filter in the fluid stream.
7	This step is required to remove the 1B CRD filter from service

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

The 1B CRD filter ΔP is 11 psid

It has been determined that the operating CRD filters have to be swapped

INITIATING CUES

The CRS directs you to place the 1A CRD filter in service and remove the 1B CRD filter from service using OP/1/A/1104/008 (Component Cooling System) Encl. 4.19 (Placing 1A OR 1B CRD Filter In Service)

REGION II
JOB PERFORMANCE MEASURE

AO-509

Alignment of Alternate Source of Electrical Power to 3A
RBCU IAW AP/0/A/1700/051

Administrative: No

Alternate Path: Yes

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

**REGION II - ONS
JOB PERFORMANCE MEASURE**

Task Title : Alignment of Alternate Source of Electrical Power to 3A RBCU IAW AP/0/A/1700/051

Task Number : N/A

Alternate Path: No

Time Critical: No

Validation Time: 15 minutes

K/A Rating(s):

System: SYS022

K/A: G2.1.19

Rating: 3.9/3.8

Task Standard:

Align the alternate power source to 3A RBCU IAW AP/0/A/1700/051 by performing the following:

- Open 3A RBCU Supply Bkr on 3X8
- Open 3XS1-F1A
- Close 3EL-BK-RBCU3A

References:

AP/0/A/1700/051 (Alternate Reactor Building Cooling) (Rev. 04)

Tools/Equipment/Procedures Needed:

AP/0/A/1700/051 (Alternate Reactor Building Cooling) (**Printed in progress procedure**) (Rev. 04)

(Note: Below this line is used only for Initial NRC Exams)

Candidate: _____

NAME

Time Start: _____

Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____

NAME

SIGNATURE

DATE

Comments

None

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Unit 3 has entered AP/3/A/1700/013 (Dam Failure)

Unit 3 Reactor tripped from 100%

Unit 3 LPSW unavailable

Units 1&2 have one LPSW pump operating

Unit 3 has entered AP/0/A/1700/051 (Alternate Reactor Building Cooling)

Maintenance has been notified to install Alternate RBCU Cooling for Unit 3

3A RBCU switch is in OFF

Unit 3 Secondary AO has been dispatched with Encl. 5.3 (Unit 3 Alternate RB Cooling Valve Checklist)

INITIATING CUE

The Unit 3 Control Room SRO directs you to continue in AP/0/A/1700/051 (Alternate Reactor Building Cooling), beginning at Step 4.7, performing actions for Unit 3.

START TIME: _____

1	4.7	<u>NOTE</u> Steps 4.8, 4.10, and 4.12 can be performed in any order or concurrently depending on available staffing resources in the event multiple units are affected. Verify Unit 3 <u>affected</u>. <u>STANDARD:</u> Candidate determines from the cue sheet that Unit 3 is affected. <u>COMMENTS:</u>	____ SAT ____ UNSAT
2	4.8	Perform the following in Unit 3 Equipment Rooms: A. ____ Using switch on 3X8, open 3A RBCU Supply Bkr <u>STANDARD:</u> Candidate locates the switch on the left side of 3X8, in the bottom row of switches for 3A RBCU. Candidate rotates 3A RBCU switch to the open position. <i>Examiner Cue: If asked, after the candidate has rotated the 3A RBCU switch to TRIP, state “Green light is on and the Red light is off”.</i> <u>COMMENTS:</u>	CRITICAL STEP ____ SAT ____ UNSAT

3	4.8 cont	Perform the following in Unit 3 Equipment Rooms: B. ___ Rack out 3X8-6C (3A RBCU Bkr (ES-5)) <u>STANDARD:</u> Candidate locates 3X8-6C and determines that the breaker needs to be racked out. <i>Examiner Cue: <u>WHEN</u> candidate determines that 3X8-6C needs to be racked out, notify them “using time compression, 3X8-6C has been racked out”.</i> <u>COMMENTS:</u>	___ SAT ___ UNSAT
4	4.8 cont	Perform the following in Unit 3 Equipment Rooms: C. ___ Open 3XS1-F1A (3A RBCU Fan Bkr (ES-5)) <u>STANDARD:</u> Candidate locates the switch 3XS1 MCC for 3A RBCU. Candidate locates 3XS1-F1A and rotates the breaker from closed to open <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
5	4.8 cont	Perform the following in Unit 3 Equipment Rooms: D. ___ Close 3EL-BK-RBCU3A (3A RBCU Alt Feed From PSW) (col N89) <u>STANDARD:</u> Candidate locates the switch at panel on col N89 for 3A RBCU alternate electrical supply. Candidate closes the breaker for 3EL-BK-RBCU3A <u>COMMENTS:</u> END OF TASK	CRITICAL STEP ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

**SEQ
STEP #**

Explanation

- | | |
|---|---|
| 2 | Step is required to ensure correct alignment of power to the 3A RBCU. |
| 4 | Step is required to ensure correct alignment of power to the 3A RBCU. |
| 5 | Step is required to ensure correct alignment of power to the 3A RBCU. |

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 3 has entered AP/3/A/1700/013 (Dam Failure)

Unit 3 Reactor tripped from 100%

Unit 3 LPSW unavailable

Units 1&2 have one LPSW pump operating

Unit 3 has entered AP/0/A/1700/051 (Alternate Reactor Building Cooling)

Maintenance has been notified to install Alternate RBCU Cooling for Unit 3

3A RBCU switch is in OFF

Unit 3 Secondary AO has been dispatched with Encl. 5.3 (Unit 3 Alternate RB Cooling Valve Checklist)

INITIATING CUE

The Unit 3 Control Room SRO directs you to continue in AP/0/A/1700/051 (Alternate Reactor Building Cooling), beginning at Step 4.7, performing actions for Unit 3.

REGION II JOB PERFORMANCE MEASURE

AO-S401a

Align Main Vacuum Pumps

Administrative: No

Alternate Path: Yes

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

**REGION II - ONS
JOB PERFORMANCE MEASURE**

Task Title : Align Main Vacuum Pumps

Task Number : N/A

Alternate Path: Yes

Time Critical: No

Validation Time: 15 minutes

K/A Rating(s):

System: APE051

K/A: AA1.01

Rating: 3.1

Task Standard:

Align Main Vacuum Pumps to Unit 2 in accordance with AP/1/A/1700/027 by performing the following:

- Throttle LPSW-269 to establish ≥ 10 psig seal water pressure
- Close MVP drain valves V-187 and V-188
- Open MVP inlet valves V-26 and V-28
- Open MVP to Unit 2 alignment valves V-25, 2V-22, 2V-24

References:

AP/1/A/1700/027 (Loss of Condensor Vacuum) (Rev. 08)

AP/2/A/1700/027 (Loss of Condensor Vacuum) (Rev. 06)

Tools/Equipment/Procedures Needed:

AP/1/A/1700/027 Encl 5.1 (Loss of Condensor Vacuum) (printed blank copy) (Rev. 08)

(Note: Below this line is used only for Initial NRC Exams)

=====

Candidate: _____

NAME

Time Start: _____

Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____

NAME

SIGNATURE

DATE

=====

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

None

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

All three units are operating at 100% power

Unit 2 experiences a loss of vacuum

AP/2/A/1700/027 (Loss of Condenser Vacuum) is in progress

Main Vacuum Pump status:

- A Main Vacuum Pump operating
- B Main Vacuum Pump operating
- C Main Vacuum Pump OOS

INITIATING CUE

The CRS directs you to perform Encl. 5.1 (Main Vacuum Pump Alignment) of Unit 1 AP/27 (Loss of Condenser Vacuum) to align the A and B Main Vacuum Pumps to Unit 2

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	Encl 5.1 Step 1	Verify <u>any</u> Main Vacuum Pump is operating. <u>STANDARD:</u> A or B Main Vacuum Pump is verified to be operating. <i>EXAMINER CUE: Once candidate locates pre-staged Encl. 5.1, provide attached copy to use for the JPM.</i> <i>EXAMINER CUE: Once the candidate locates the pumps, indicate that each A and/or B Main Vacuum Pump(s) is/are operating. C Main Vacuum Pump is OFF.</i> <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION																	
2	2	<u>ALTERNATE PATH</u> Verify <u>all</u> operating Main Vacuum Pumps seal water pressure $\geq$ 10 psig: <table><tr><td>Pump</td><td>✓</td><td>Gauge</td><td>Location</td></tr><tr><td>A</td><td></td><td>0LPS PG 1053</td><td>T-1/K25, SE</td></tr><tr><td>B</td><td></td><td>0LPS PG 1054</td><td>T-1/K26, SE</td></tr><tr><td>C</td><td></td><td>0LPS PG 1055</td><td>T-1/K28, SE</td></tr></table> <u>STANDARD:</u> Seal water pressure verified $\geq$10 psig for each <u>operating</u> Main Vacuum Pump. (A and B running) Pump A GAUGE LOCATION T-1/K25, SE (0 psig) Pump B GAUGE LOCATION T-1/K26, SE (14 psig) Pump C GAUGE LOCATION T-1/K28, SE (0 psig) Determine Pump A is < 10 psig and proceed to the RNO step. Seal water pressure should be in the normal band, operator action is required due to a failure. <i>EXAMINER CUE: Indicate seal water pressure as listed above (A pump 0 psig / B pump 14 psig / (if C pump checked 0 psig)</i> <u>COMMENTS:</u>	Pump	✓	Gauge	Location	A		0LPS PG 1053	T-1/K25, SE	B		0LPS PG 1054	T-1/K26, SE	C		0LPS PG 1055	T-1/K28, SE	___ SAT ___ UNSAT
Pump	✓	Gauge	Location																
A		0LPS PG 1053	T-1/K25, SE																
B		0LPS PG 1054	T-1/K26, SE																
C		0LPS PG 1055	T-1/K28, SE																

SEQ STEP	PROC STEP	DESCRIPTION	
3	2 RNO	*IF Main Vacuum Pump A seal water pressure is <10 psig, (0 psig) THEN throttle LPSW-269 (A MAIN VACUUM PUMP SOLENOID OUTLET) as necessary to establish ≥ 10 psig (T-1/J25/K25). IF Main Vacuum Pump B seal water pressure is <10 psig, (14 psig) THEN throttle LPSW-273 (B MAIN VACUUM PUMP SOLENOID OUTLET) as necessary to establish ≥ 10 psig (T-1/J26/K26). IF Main Vacuum Pump C seal water pressure is <10 psig, (0 psig) THEN throttle LPSW-277 (C MAIN VACUUM PUMP SOLENOID OUTLET) as necessary to establish ≥ 10 psig (T-1/J28/K28). <u>STANDARD:</u> Locates and rotates counterclockwise the handwheel for LPSW-269 (A MAIN VACUUM PUMP SOLENOID OUTLET) as necessary to establish ≥ 10 psig (T- 1/J25/K25). <i>EXAMINER CUE: After candidate has throttled open on LPSW- 269 indicate that Main Vacuum Pump A seal water pressure is 14 psig.</i> <i>If candidate adjusts LPSW-277, indicate that Main Vacuum Pump C seal pressure remains at 0 psig.</i> <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
4	3	Close the drain valve on <u>all</u> operating Main Vacuum Pumps: • V-187 (A MAIN VACUUM PUMP DRAIN) (T-1/K25 SE)* • V-188 (B MAIN VACUUM PUMP DRAIN) (T-1/K26 SE)* • V-189 (C MAIN VACUUM PUMP DRAIN) (T-1/K28 E) (N/A) <u>STANDARD:</u> The candidate locates and closes the following drain valves on the <u>operating</u> Main Vacuum Pumps by rotating the handwheels in the clockwise direction. • V-187 (MVP 'A' Drain) • V-188 (MVP 'B' Drain) <i>EXAMINER CUE: As each valve is rotated, indicate the valve reaches a hard stop.</i> <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT
5	4	CAUTION Valving in a Main Vacuum Pump that is NOT pulling ≥ 24" Hg may increase the loss of vacuum. IAAT a Main Vacuum Pump is pulling ≥ 24" Hg vacuum (gauges at T-1/K26), THEN open the associated inlet valve: • V-26 (A MAIN VACUUM PUMP INLET) (T-1/K26 E)* • V-28 (B MAIN VACUUM PUMP INLET) (T-1/K27 NE)* • V-30 (C MAIN VACUUM PUMP INLET) (T-1/K28/K29 E) <u>STANDARD:</u> The candidate locates and opens the following inlet valves on the operating Main Vacuum Pumps by rotating the handwheels counter-clockwise. • V-26 (Main Vacuum Pump A Inlet) • V-28 (Main Vacuum Pump B Inlet) <i>EXAMINER CUE: When candidate locates pressure gauges, indicate a pressure reading of ≈ 26" Hg for the A and B Main Vacuum Pumps.</i> <i>EXAMINER CUE: As each valve is rotated, indicate the valve reaches a hard stop.</i> <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
6	5	NOTE This enclosure is used to support loss of condenser vacuum on any Ocone unit. Main Vacuum Pumps may already be aligned to another unit or need to be coordinated and aligned to more than one unit. IAAT <u>any</u> Main Vacuum Pump is pulling > 24" Hg vacuum, AND Unit 1 requires alignment.... STANDARD: Determines from the cue sheet that Unit 1 does not need to be aligned and continues to step 6. COMMENTS:	___ SAT ___ UNSAT
7	6	IAAT <u>any</u> Main Vacuum Pump is pulling $\geq$ 24" Hg vacuum, AND Unit 2 requires alignment, THEN ensure the following are open: • V-25 (VACUUM PUMP HDR TIE TO UNITS 2/3) (T-1/J29 W) • 2V-22 (UNIT 2 VACUUM HDR TIE TO VACUUM PUMP) (T-1/J29 S) • 2V-24 (UNIT 2 VACUUM HDR TIE TO VACUUM PUMP) (T-1/J29 S) STANDARD: Candidate indicates they will: • Rotate V-25 in the counterclockwise direction • Rotate 2V-22 in the counterclockwise direction • Rotate 2V-24 in the counterclockwise direction EXAMINER CUE: <i>As each valve is rotated, indicate the valve reaches a hard stop.</i> COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
8	7	IAAT <u>any</u> Main Vacuum Pump is pulling > 24" Hg vacuum, AND Unit 3 requires alignment.... <u>STANDARD:</u> Determines from the cue sheet that Unit 3 does not need to be aligned. <u>COMMENTS:</u> END OF TASK	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
3	Step is required to ensure proper operation of vacuum pumps
4	Step is required to ensure proper operation of vacuum pumps
5	Step is required to ensure proper operation of vacuum pumps
7	Step is required to ensure proper operation of vacuum pumps

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

All three units are operating at 100% power

Unit 2 experiences a loss of vacuum

AP/2/A/1700/027 (Loss of Condenser Vacuum) is in progress

Main Vacuum Pump status:

- A Main Vacuum Pump operating
- B Main Vacuum Pump operating
- C Main Vacuum Pump OOS

INITIATING CUE

The CRS directs you to perform Encl. 5.1 (Main Vacuum Pump Alignment) of Unit 1 AP/27 (Loss of Condenser Vacuum) to align the A and B Main Vacuum Pumps to Unit 2

**REGION II
JOB PERFORMANCE MEASURE
OCONEE**

RO-105

Perform Control Rod Movement PT for Group 1

Administrative: No

Classroom/Simulator/Plant: Simulator

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

REGION II JOB PERFORMANCE MEASURE

Task Title : Perform Control Rod Movement PT for Group 1

Task Number :

Alternate Path: No

Time Critical: No

Validation Time: 10 minutes

K/A Rating(s):

System: 001

K/A: A4.08

Rating: 3.3

Task Standard:

Perform Control Rod Movement PT for Group 1 in accordance with PT/1/A/0600/015 Enc. 13.2 (Control Rod Movement at Power) by:

- Ensure SEQ OR is ON
- Ensure SAFETY RODS OUT BYPASS is ON
- Ensure GROUP SELECT SWITCH to 1
- Insert Group 1 until all 100% Out lights are OFF
- Withdraw Group 1 to 100% until CRD TRAVEL "Out" light is OFF
- Ensure SEQ is ON
- Ensure SAFETY RODS OUT BYPASS is OFF.

References:

PT/1/A/0600/015 Control Rod Movement Rev 31

OP/1/A/1102/004 A ICS Operation Rev 15

Tools/Equipment/Procedures Needed:

PT/1/A/0600/015 Control Rod Movement (In progress procedure) Rev 31

OP/1/A/1102/004 A ICS Operation Rev 15

Allow candidate to pre-brief

(Note: Below this line is used only for Initial NRC Exams)

=====

Candidate: _____

NAME

Time Start: _____

Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____

NAME

SIGNATURE

DATE

=====

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

Directions with IC:

1. **RECALL** IC-384 (ILT24 NRC Exam JPM D)
2. **ENSURE** Control Room reactivity rope in place
3. **ENSURE** clean copy of Rod Movement PT Enc. 13.2 available for candidate
4. Place the simulator in RUN and acknowledge alarms then go to **FREEZE**
5. Go to **RUN** when directed by the Lead Examiner

=====

Directions without an IC:

1. Recall IC-1
2. Place FDW Masters and Diamond in HAND
3. Perform PT/1/A/0600/015 up through Step 3.2 of Enc. 13.2
4. Acknowledge statalarms and place simulator in FREEZE

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Unit 1 at 100% power

PT/1/A/0600/015 (Control Rod Movement) in progress for Group 1 ONLY

Enclosure 13.2 (Control Rod Movement at Power) complete up to Step 3.3

INITIATING CUE

The CRS directs you to complete Enc. 13.2 (Control Rod Movement PT) for Group 1 beginning at Step 3.3

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	Enc. 13.2 Step 3.3	<u>IF AT ANY TIME</u> contingency actions directed by CRS, perform Section 4 (Contingency Actions) <u>STANDARD:</u> Candidate circles the IAAT step and moves on to Step 3.4 <u>COMMENTS:</u>	___ SAT ___ UNSAT
2	3.4	<u>NOTE:</u> When operating switches on Diamond, maintain switch depressed until light indication changes state. Perform the following: (R.M.) • Ensure SEQ OR is ON.* • Ensure SAFETY RODS OUT BYPASS is ON.* • Ensure RUN is ON. • Ensure SINGLE SELECT SWITCH selected to ALL. <u>STANDARD:</u> Candidate will select the pushbuttons on the Rod Control panel until the indication is lit for SEQ OR and SAFETY RODS OUT BYPASS. RUN is verified ON. The SINGLE SELECT SWITCH is verified in ALL. <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
3	3.5	NOTE: CRD Groups 1-6 are required to be $\geq 95\%$ withdrawn for Shutdown Margin Calculation at Power enclosure of PT/1/A/1103/015 (Reactivity Balance Procedure) to be valid. <u>IF AT ANY TIME</u> any CRD Group 1-6 reaches 95% during insertion, stop inserting associated group. <u>STANDARD:</u> Candidate monitors Group 1 rods for 95% and stops inserting as necessary <u>COMMENTS:</u>	___ SAT ___ UNSAT
4	3.6.1	Perform the following to test CRD Group 1: Ensure GROUP SELECT SWITCH to 1. <u>STANDARD:</u> Candidate rotates GROUP SELECT SWITCH to 1. <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
5	3.6.2	Ensure Group 1 CONTROL ON lights are ON. (PI panel) <u>STANDARD:</u> Candidate determines that the Group 1 CONTROL ON lights are ON (PI panel). <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
6	3.6.3	NOTE: 1SA-2/C/10 “CRD Safety Rods Not at Upper Limit” will alarm when Safety Groups are inserted. Control rods should <u>NOT</u> be left inserted. Rod withdrawal should commence immediately after insertion is complete. Perform the following: A. Insert CRD Group 1. B. <u>WHEN</u> <u>all</u> 100% lights OFF, stop insertion. C. Withdraw Group 1 to 100% <u>until</u> CRD TRAVEL "Out" light OFF. <u>STANDARD:</u> Candidate inserts CRD Group 1 using the “Joy Stick” on the Diamond. Monitor the 100% lights on the PI Panel and when they are OFF (or any rod reaches 95%), stop inserting. Withdraw Group 1 to 100% using “Joy Stick” until the CRD TRAVEL “Out” light is OFF. <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
7	3.6.4	Verify <u>all</u> 100% lights are ON for Group 1. (PI Panel) <u>STANDARD:</u> Candidate determines that all 100% lights are ON for Group 1 (PI Panel) <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
8	3.6.5	Verify unit is stable <u>STANDARD:</u> Monitor reactor power, Tave, and RCS pressure to determine that the unit is stable. Steps 3.7 through 3.13 are N/A. Candidate proceeds to Step 3.14 <u>COMMENTS:</u>	___ SAT ___ UNSAT
9	3.14	NOTE: When operating switches on Diamond, maintain switch depressed until light indication changes state. Perform the following: (R.M.) • Ensure SEQ is ON*. • Ensure GROUP SELECT SWITCH to OFF. • Ensure SAFETY RODS OUT BYPASS is OFF*. <u>STANDARD:</u> Depress the SEQ/SEQ OR pushbutton and verify the SEQ light is lit*. Rotate the GROUP SELECT SWITCH to OFF (Once in sequence, the group select switch is not critical to the lineup) Depress the SRO BYPASS switch and verify the light is OFF*. <i>Examiner Cue: Another RO will complete this procedure.</i> <u>COMMENTS:</u> END TASK	*CRITICAL STEP ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
2	Step is required to test Group 1
4	Step is required to test Group 1
6	Step is required to test Group 1
9	Step is required to return the system to Normal operation

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 at 100% power

PT/1/A/0600/015 (Control Rod Movement) in progress for Group 1 ONLY

Enclosure 13.2 (Control Rod Movement at Power) complete up to Step 3.3

INITIATING CUE

The CRS directs you to complete Enc. 13.2 (Control Rod Movement PT) for Group 1 beginning at Step 3.3

REGION II JOB PERFORMANCE MEASURE

RO-225

Align letdown with 1HP-14 failed in Bleed

Alternate Path: No

Alt Path Failure: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:	_____	Date:	_____
EP Review By:	N/A	Date:	_____
Reviewed By:	_____	Date:	_____
Approved By:	_____	Date:	_____

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **LOAD** scenario file **ILT24 NRC Exam JPM C**
2. Go to **RUN** and acknowledge alarms
3. Go to **FREEZE**
4. **ENSURE** clean procedures (AP/02) in place for candidate
5. Go to **RUN** when directed by Lead Examiner

=====

Directions without an IC:

1. **RECALL** IC-1
2. Place 1HP-14 in Bleed
3. **INSERT** MPS220 1 (fail as is)
4. Perform AP/2 up to step 4.158
5. Save IC

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Reactor power is 100%

AP/1/A/1700/002 is in progress due to 1HP-14 failing in BLEED position

Another RO is making up to the LDST per Encl. 5.5 of the EOP

INITIATING CUES

The CRS directs you to continue with AP/1/A/1700/002 (Excessive RCS Leakage) beginning at step 4.158

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	AP/02 4.158	Verify 1A LD Filter in service <u>STANDARD:</u> Candidate observes 1B LD Filter in service and 1A LD Filter is NOT in service using either OAC or Control Board indications. Proceed to the RNO. <u>COMMENTS:</u>	___SAT ___UNSAT
2	4.158 RNO	1. IF 1A LD Filter is out of service for maintenance, THEN restore 1A LD Filter per in-progress procedure 2. Open 1HP-17 <u>STANDARD:</u> Determine that 1A LD Filter is available and opens 1HP-17 <i>EXAMINER NOTE: If asked, notify the candidate that 1A LD filter is NOT OOS for maintenance.</i> <u>COMMENTS:</u>	___SAT ___UNSAT
3	4.159	Close 1HP-6 <u>STANDARD:</u> Candidate closes 1HP-6 as indicated by Red light off and Green light on <u>COMMENTS:</u>	CRITICAL STEP ___SAT ___UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
4	4.160	<u>NOTE</u> Tech Spec 3.4.9 applies when indicated PZR Level >260" (corrected value for 285") Adjust 1HP-7, as needed, to control: • BLEED flow out of failed 1HP-14 • PZR Level <u>STANDARD:</u> Candidate adjusts 1HP-7 as necessary to control PZR level. If any adjustment is made, it will be to throttle in the closed direction, but is not necessary <u>COMMENTS:</u>	___ SAT ___ UNSAT
5	4.161	Dispatch an operator to open 1HP-196 (Filter Diversion Inlet) (A-2-LDST Hatch Area) <u>STANDARD:</u> Candidate dispatches operator to open 1HP-196. This valve is in the required flowpath to re-establish letdown flow. <i>BOOTH CUE: Activate TMR 1 to open 1HP-196.</i> <i>NOTE: Communication that 1HP-196 is open will occur at SEQ STEP 9.</i> <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
6	4.162	Verify CC System is in operation <u>STANDARD:</u> Candidate observes at least one CC Pump operating with Flow > 575 gpm <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
7	4.163	Position the STBY HPI pump switch to OFF <u>STANDARD:</u> Candidate places the 1B HPIP switch in OFF <u>COMMENTS:</u>	___SAT ___UNSAT
8	4.164	Initiate monitoring RCP parameters <u>STANDARD:</u> Candidate refers to OAC or to control board indications to monitor RCP parameters <u>COMMENTS:</u>	___SAT ___UNSAT
9	4.165	Throttle 1HP-31 to establish 12 – 15 gpm SEAL INLET HDR FLOW <u>STANDARD:</u> Candidate throttles 1HP-31 to establish 12 – 15 gpm on the flow Dixon. <i>BOOTH CUE: Contact the control room as the AO and report that “1HP-196 is open”.</i> <u>COMMENTS:</u>	___SAT ___UNSAT
10	4.166	WHEN 1HP-196 (Filter Diversion Inlet) is open, THEN close 1CS-26 <u>STANDARD:</u> Candidate closes 1CS-26 <u>COMMENTS:</u>	CRITICAL STEP ___SAT ___UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
11	4.167	Close: ___ 1CS-27 ___ 1CS-32 and ~~1CS-27~~ (1CS-37) <u>STANDARD:</u> Determine that the above valves are already closed using OAC and control board indications. <u>COMMENTS:</u>	___SAT ___UNSAT
12	4.168	Open 1HP-6 <u>STANDARD:</u> Candidate places the switch for 1HP-6 in the open position and observes Red light on and Green light off. <u>COMMENTS:</u>	CRITICAL STEP ___SAT ___UNSAT
13	4.169	Throttle 1HP-31 to establish ~32 gpm SEAL INLET HDR FLOW <u>STANDARD:</u> Candidate adjusts the setpoint knob on 1HP-31 to establish approximately 32 gpm on the Dixon. <u>COMMENTS:</u>	___SAT ___UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
14	4.170	Adjust 1HP-7 to establish desired letdown flow <u>STANDARD:</u> Candidate throttles open on 1HP-7 to establish desired letdown flow. <i>EXAMINER NOTE: If the candidate requests a band for letdown flow from the CRS, report “68 to 80 gpm”.</i> <u>COMMENTS:</u>	___ SAT ___ UNSAT
15	4.171	Position the STBY HPI Pump switch to AUTO. <u>STANDARD:</u> Candidate positions the 1B HPI Pump switch to AUTO <u>COMMENTS:</u> <u>END OF TASK</u>	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
3	This step is required to reduce the amount of leakage lost through failed valve (1HP-14)
5	This step is required to align the letdown flowpath around the failed valve (1HP-14)
10	This step is required to prevent letdown flow from entering the 1A BHUT
12	This step restores letdown flow

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Reactor power is 100%

AP/1/A/1700/002 is in progress due to 1HP-14 failing in BLEED position

Another RO is making up to the LDST per Encl. 5.5 of the EOP

INITIATING CUES

The CRS directs you to continue with AP/1/A/1700/002 (Excessive RCS Leakage) beginning at step 4.158

REGION II
JOB PERFORMANCE MEASURE

RO-302a
Perform 1RC-66 (PORV) Stroke Test

Administrative: No

Alternate Path: Yes

Alt Path Description: 1RC-66 fails to close

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

REGION II
JOB PERFORMANCE MEASURE

Task Title: Perform 1RC-66 (PORV) Stroke Test

Task Number:

Alternate Path: Yes

Time Critical: No

Validation Time: 10 minutes

K/A Rating(s):

System: 010
K/A: A4.01
Rating: 3.8

Task Standard:

Perform the 1RC-66 (PORV) Stroke Test, in accordance with PT/1/A/0201/004, by:

- Positioning the 1RC-66 selector switch to OPEN
- Depressing 1RC-66 OPEN PERMIT pushbutton
- Positioning 1RC-66 selector switch to LOW
- Closing 1RC-4

References:

OP/1/A/1103/002 Encl. 4.12 (Raising RCS Loops By Establishing Pzr Steam Bubble and Final RCS Vent)
Rev 128
PT/1/A/0201/004 (1RC-66 Stroke Test) Rev 09

Tools/Equipment/Procedures Needed:

PT/1/A/0201/004 (1RC-66 Stroke Test) (In progress procedure) Rev 09
Ideal Data Sheet for PT/1/A/0201/004 (1RC-66 Stroke Test) (paper)
Allow candidate to pre-brief

(Note: Below this line is used only for Initial NRC Exams)

Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____
NAME

SIGNATURE / DATE

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

Directions with Files:

1. **LOAD** scenario file **ILT24 NRC Exam JPM F (RO-302a)**
2. **ENSURE** clean in-progress procedure in place for candidate
3. **PLACE** "T/O Sheet CR Tags" on Component Drain and QT pump switches
4. Go To **RUN** when directed by Lead Examiner

=====

Directions without a FILES:

1. Recall IC from SNO-LSU for Event to perform PT/1/A/0201/004
2. Ensure RCS Low Range Cooldown Pressure in the band of 38-45 psig
3. Save IC

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Unit 1 RCS pressure is being maintained in the control band of 38-45 psig Low Range Cooldown Pressure as directed by OP/1/A/1103/002 Encl 4.12 (Raising RCS Loops By Establishing Pzr Steam Bubble and Final RCS Vent)

The Quench Tank is aligned in recirc per OP/1/A/1104/017 (QT Operation)

A steam bubble has been established in the Pressurizer

PT/1/A/0201/004, 1RC-66 Stroke Test is in progress

Assume all stopwatch manipulations and data sheet entries are performed by another operator in accordance with procedure.

INITIATING CUE

The CRS directs you to perform PT/1/A/0201/004 (1RC-66 Stroke Test) beginning at Step 12.4

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	12.4	Verify operability of 1RC-4 (PZR RELIEF BLOCK) as follows: • Close 1RC-4 (PZR RELIEF BLOCK) • Open 1RC-4 (PZR RELIEF BLOCK) <u>STANDARD:</u> Close 1RC-4 by rotating the switch to close and verifying that the Green close light is lit and the Red open light is out. Open 1RC-4 by rotating the switch to open and verifying that the Green close light is out and the Red open light is lit. Continue to Step 12.5 <i>Examiner Note: If asked about Concurrent Verification, state that the verifier agrees with whatever actions you decide to take.</i> <u>COMMENTS:</u>	___ SAT ___ UNSAT
2	12.5	<u>NOTE:</u> • Quench Tank pressure change should be minimal during PORV operation. • If Quench Tank High Pressure alarm is received, Pressurizer Steam Bubble may be inadequate. Open 1RC-66 (PORV) as follows: ___ Record O1A1568 (RC-6 RELIEF OUTLET TEMP): _____°F <u>STANDARD:</u> Refer to the OAC and record O1A1568 temperature Continue to Step 12.5.2 <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
3	12.5.2	Position 1RC-66 SETPOINT SELECTOR to 'OPEN' <u>STANDARD:</u> Candidate rotates the 1RC-66 SETPOINT SELECTOR to the OPEN position Continue to Step 12.5.3 <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
4	12.5.3	<u>NOTE:</u> 1RC-66 remains open when the 'OPEN PERMIT' pushbutton is released until 1RC-66 SETPOINT SELECTOR position is changed to 'LOW' - It is permissible to leave 1RC-66 open while recording stroke data time on Valve Data Sheet Simultaneously perform the following: *Depress the 1RC-66 'OPEN PERMIT' pushbutton - Start stopwatch <u>STANDARD:</u> Candidate depresses the 'OPEN PERMIT' pushbutton for 1RC-66. Continue to Step 12.5.4 <i>Examiner Note: The 'extra RO' will operate the stopwatch</i> <u>COMMENTS:</u>	CRITICAL STEP* ___ SAT ___ UNSAT
5	12.5.4	When PORV flow monitor indicates flow, stop stopwatch. <u>STANDARD:</u> The 'extra RO' will operate the stopwatch. Continue to Step 12.5.5 <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
6	12.5.5	Record open stroke time on Valve Data Sheet. <u>STANDARD:</u> The 'extra RO' will record the stroke time on the Valve Data Sheet. Continue to Step 12.5.6 <u>COMMENTS:</u>	___ SAT ___ UNSAT
7	12.5.6	Simultaneously perform the following: • *Select 'LOW' on 1RC-66 SETPOINT SELECTOR • Start stopwatch <u>STANDARD:</u> Candidate selects 'LOW' on 1RC-66 SETPOINT SELECTOR Continue to Step 12.5.7 <i>Examiner Note: The 'extra RO' will operate the stopwatch</i> <u>COMMENTS:</u>	CRITICAL STEP* ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
8	12.5.7	<u>ALTERNATE PATH</u> Perform EITHER: • WHEN PORV flow monitor indicates no flow, stop stopwatch (N/A – PORV fails OPEN) • *IF 1RC-66 (PORV) fails to close, immediately close 1RC-4 (PZR RELIEF BLOCK) <u>STANDARD:</u> Candidate determines that 1RC-66 did NOT close and closes 1RC-4 by rotating the switch to the closed position and verifying that the Red open light is out and the Green close light is lit. <u>COMMENTS:</u> <u>END OF TASK</u>	CRITICAL STEP* ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
3	This step is required to open 1RC-66.
4	This step is required to open 1RC-66.
7	This step is required to attempt to close 1RC-66.
8	This step is required to close the 1RC-66 block valve 1RC-4.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 RCS pressure is being maintained in the control band of 38-45 psig Low Range Cooldown Pressure as directed by OP/1/A/1103/002 Encl 4.12 (Raising RCS Loops By Establishing Pzr Steam Bubble and Final RCS Vent)

The Quench Tank is aligned in recirc per OP/1/A/1104/017 (QT Operation)

A steam bubble has been established in the Pressurizer

PT/1/A/0201/004, 1RC-66 Stroke Test is in progress

Assume all stopwatch manipulations and data sheet entries are performed by another operator in accordance with procedure.

INITIATING CUE

The CRS directs you to perform PT/1/A/0201/004 (1RC-66 Stroke Test) beginning at Step 12.4

REGION II JOB PERFORMANCE MEASURE

RO-503

Pump the Quench Tank to 1A BHUT

Alternate Path: No

Alt Path Failure: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By: _____ Date: _____

EP Review By: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

REGION II JOB PERFORMANCE MEASURE

Task Title: Pump the Quench Tank to 1A BHUT

Task Number: N/A

Alternate Path: No

Time Critical: No

Validation Time: 10 minutes

K/A Rating(s):

System: 007

K/A: A1.01

Rating: 3.0

Task Standard:

Utilize OP/1/A/1104/017 Enclosure 4.1 to lower Quench Tank level to a band of 75 to 78 inches and isolate the flowpath to 1A Bleed Holdup Tank by:

- Opening 1CS-5
- Opening 1CS-6
- Place either Component Drain Pump or QT Drain Pump in BYPASS
- Secure pumps to maintain QT level between 75 and 78 inches
- Closing 1CS-6 to isolate flowpath

References:

OP/1/A/1104/017 (Quench Tank Operation) Rev 52

Tools/Equipment/Procedures Needed:

OP/1/A/1104/017 Limits & Precautions (In progress procedure)

OP/1/A/1104/017 Enclosure 4.1 (Pumping QT)

Allow the candidate to pre-brief

=====

Candidate: _____

NAME

Time Start: _____

Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____

NAME

SIGNATURE

DATE

=====

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **RECALL IC-387** (ILT24 NRC Exam JPM G) (RO-503)
2. Place T/O sheet tags on QT Drain Pump and Component Drain Pump
3. Update Boron Status board to show:
 - Last 1A BHUT boron sample as being > 24 hours old
 - 1A BHUT Boron = 2553 ppm
 - RCS Boron = 2414 ppm
4. Provide a copy of OP/1/A/1104/017 Enclosure 4.1 with the following:
 - Limits & Precautions
 - Steps 1.1 through 1.4 signed off
5. Go to **RUN** when directed by the Lead Examiner

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Unit 1 is Shutdown

Unit 1 Quench Tank level is $\approx$ 86 inches

Quench Tank is aligned to 1A BHUT

1CS-48 is throttled one turn open

Enclosure 4.1 (Pumping QT) of OP/1/A/1104/017 (Quench Tank Operation) is in progress and complete up to Step 2.1

In preparation for an upcoming test, Unit 1 Quench Tank level is required to be within a band of 75 to 78 inches

INITIATING CUE

The CRS directs you to use the COMPONENT DRAIN PUMP and the QUENCH TANK DRAIN PUMP to pump the Quench Tank to 1A BHUT beginning at Step 2.1 of Enclosure 4.1 of OP/1/A/1104/017 to a Quench Tank level of $\sim$ 77 inches.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	2.1	Ensure open: ___ 1CS-5 (COMPONENT DRN PUMP SUCTION) ___ 1CS-6 (COMPONENT DRN PUMP SUCTION) <u>STANDARD:</u> Ensure 1CS-5 and 1CS-6 are open by taking the control switches located on 1AB1 to the open position and verifying red open light illuminated and green closed light OFF. Candidate continues to Step 2.2. <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
2	2.2	<u>IF</u> QT level will be maintained in normal operating band: 2.2.1 <u>IF</u> desired, start COMPONENT DRAIN PUMP. 2.2.2 <u>IF</u> desired, start QUENCH TANK DRAIN PUMP. 2.2.3 At desired level, perform the following: • Ensure stopped COMPONENT DRAIN PUMP • Ensure stopped QUENCH TANK DRAIN PUMP 2.2.4 <u>IF</u> pump(s) automatically stop, ensure QT level ≈ 80 inches. <u>STANDARD:</u> Recognize from the Initial Conditions that this step is not applicable due to pumping the QT below 80 inches. Marks this step as Not Applicable (N/A). Candidate continues to Step 2.3 <u>COMMENTS:</u>	___ SAT ___ UNSAT

3	2.3	<u>IF</u> QT level is to be reduced below low level setpoint of 80 inches, perform the following: 2.3.1 Ensure RCS pressure < 45 psig. 2.3.2 <u>*IF</u> desired, place COMPONENT DRAIN PUMP to BYPASS 2.3.3 <u>*IF</u> desired, place QUENCH TANK DRAIN PUMP to BYPASS 2.3.4 <u>*At</u> desired level (75 to 78 inches), perform the following: • Ensure stopped COMPONENT DRAIN PUMP • Ensure stopped QUENCH TANK DRAIN PUMP <u>STANDARD:</u> Determine from the Initial Conditions that QT level will be reduced below 80 inches Locate RCS pressure from the Low Range Cooldown Pressure indication on 1UB2 and ensures that RCS pressure is < 45 psig. *Place the COMPONENT DRAIN PUMP switch in the BYPASS position AND Pull the switch up. *Place the QUENCH TANK DRAIN PUMP switch in the BYPASS position AND Pull the switch up. *Stop the COMPONENT DRAIN PUMP and the QUENCH TANK DRAIN PUMP by rotating the switch to STOP when QT level reaches 75 inches. Note: <i>The low level cut-off for the Component Drain Pump and Quench Tank Drain Pump will trip the pumps at ≈ 80 inches if the pump switches are not taken to BYPASS and pulled up (similar to a PTL position).</i> Note: <i>The candidate must start <u>either</u> the COMPONENT DRAIN PUMP or the QUENCH TANK DRAIN PUMP in the bypass position to complete the task. The candidate's instructions were to use both pumps.</i> Examiner Note: <i>If the candidate rotates the switch too quickly to BYPASS, the simulator will not see the start position on the component scan resulting in the pump not starting. This is a simulator anomaly and would not occur in the plant. If candidate contacts WCC/MNT, advise candidate to rotate the switch slower.</i> Candidate continues to Step 2.4 <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT
---	-----	--	--

SEQ STEP	PROC STEP	DESCRIPTION	
4	2.4	NOTE: Due to excessive cycling of valve actuator, it is recommended to leave 1CS-5 (COMPONENT DRN PUMP SUCTION) open. NCR: 02221595 Perform the following: ___ IF desired, Close 1CS-5 (COMPONENT DRN PUMP SUCTION) ___ *Close 1CS-6 (COMPONENT DRN PUMP SUCTION) <u>STANDARD:</u> 1CS-5 may be left open based on the NOTE. 1CS-6 will be closed by placing the control switch in the closed position. The green closed light illuminates and the red open light extinguishes. Candidate continues to Step 2.5 Note: <i>Closing 1CS-6 satisfies the Critical Step.</i> <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
5	2.5	<u>IF</u> 1A BHUT boron sample > 24 hours old <u>AND</u> QT pumped to 1A BHUT, perform the following: 2.5.1 Verify closed 1CS-46 (1A RC BLEED XFER PUMP DISCHARGE). 2.5.2 Perform <u>one</u> of the following: ___ Verify 1CS-48 is one turn open, from turnover sheet, previous operation or local observation ___ THROTTLE 1CS-48 one turn open (U1 BTP Room) 2.5.3 Start 1A BLEED TRANSFER PUMP. <u>STANDARD:</u> Verifies 1CS-46 (1A RC BLEED XFER PUMP DISCHARGE) is closed by observing green closed light illuminated and red open light off. Candidate observes from the cue sheet that 1CS-48 is one turn open. Candidate starts 1A BLEED TRANSFER PUMP and observes red light illuminated and green light off. <i>Examiner Cue: When 1A BLEED TRANSFER PUMP is started inform the candidate that another operator will continue this procedure.</i> <u>COMMENTS:</u> <u>END OF TASK</u>	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	Step is required to align the flow path from the QT to 1A BHUT.
3	This step is required to begin the level decrease in the Quench Tank. Placing the switch in the BYPASS position is required to decrease QT level below 80 inches. Ensuring both pumps are secured is required to prevent pumping the QT below 75 inches.
4	This step isolates the flow path from the QT to 1A BHUT

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 is Shutdown

Unit 1 Quench Tank level is $\approx$ 86 inches

Quench Tank is aligned to 1A BHUT

1CS-48 is throttled one turn open

Enclosure 4.1 (Pumping QT) of OP/1/A/1104/017 (Quench Tank Operation) is in progress and complete up to Step 2.1

In preparation for an upcoming test, Unit 1 Quench Tank level is required to be within a band of 75 to 78 inches

INITIATING CUE

The CRS directs you to use the COMPONENT DRAIN PUMP and the QUENCH TANK DRAIN PUMP to pump the Quench Tank to 1A BHUT beginning at Step 2.1 of Enclosure 4.1 of OP/1/A/1104/017 to a Quench Tank level of $\sim$ 77 inches.

REGION II JOB PERFORMANCE MEASURE

RO-605 FUNCTIONAL VERIFICATION OF SK1 BREAKER

Administrative: No

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

REGION II JOB PERFORMANCE MEASURE

Task Title: Functional Verification of SK1 Breaker

Task Number:

Alternate Path: No

Time Critical: No

Validation Time: 15 minutes

K/A Rating(s):

System: 062

K/A: A4.01

Rating: 3.5

Task Standard:

The functional verification of SK1 Breaker is performed by completing the following in accordance with PT/0/A/0610/017 Encl. 13.12:

- Ensure CT-4 BUS 1 AUTO/MAN transfer switch in MAN
- Ensure STBY BUS 1 SYNCHRONIZING switch in ON
- Close SK1 CT4 STBY BUS 1 FEEDER
- Open SK1 CT4 STBY BUS 1 FEEDER
- Ensure CT-4 BUS 1 AUTO/MAN transfer switch in AUTO

References:

PT/0/A/0610/017 (Operability Test of 4160V Breakers)

Tools/Equipment/Procedures Needed:

PT/0/A/0610/017 Enclosure 13.12 (Functional Verification Of SK Breaker(s)) (In progress) Rev 31

Allow candidate to pre-brief

(Note: Below this line is used only for Initial NRC Exams)

Candidate: _____

NAME

Time Start: _____

Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____

NAME

SIGNATURE

DATE

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

Directions with Files:

1. **RECALL IC-385** (ILT24 NRC Exam JPM E) (**RO-605**)
2. **ENSURE** clean in-progress procedure in place for candidate
3. Go To **RUN** when directed by Lead Examiner

=====

Directions without a FILES:

1. **RECALL IC-1**
2. Place both KHUs in Remote
3. Auto start both KHUs and load both units to ≈ 70 MWe
4. Place both KHUs back in Local

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Both Keowee Hydro Units are generating to the grid

The Underground Power Path was removed from service to perform maintenance on SK1 breaker

All maintenance work is complete

PT/0/A/0610/017 (Operability Test of 4160V Breakers) Enclosure 13.12 (Functional Verification of SK Breakers) is in progress to perform a functional verification of SK1 breaker.

INITIATING CUE

The Control Room SRO directs you to continue with PT/0/A/0610/017 (Operability Test of 4160V Breakers) Enclosure 13.12 (Functional Verification of SK Breakers) beginning at Step 4.1 to perform functional verification of SK1 Breaker.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	4.1	<u>IF</u> functional verification of SK1 CT4 STBY BUS 1 FEEDER required, perform the following: 4.1.1 Verify $\approx$ 4.16 KV on CT4 Volts (2AB3) 4.1.2 Ensure CT5 BUS 1 AUTO/MAN transfer switch in "MAN" 4.1.3 *Ensure CT4 BUS 1 AUTO/MAN transfer switch in "MAN" 4.1.4 *Ensure STBY BUS 1 SYNCHRONIZING switch in "ON" 4.1.5 *Close SK1 CT4 STBY BUS 1 FEEDER 4.1.6 Verify $\approx$ 4.16 KV on Standby Bus 1 Volts (2AB3) 4.1.7 *Open SK1 CT4 STBY BUS 1 FEEDER 4.1.8 Ensure STBY BUS 1 SYNCHRONIZING switch in "OFF" 4.1.9 *Ensure CT4 BUS 1 AUTO/MAN transfer switch in "AUTO" <u>STANDARD:</u> Verifies $\approx$ 4.16 KV on CT4 Volts (2AB3) Verifies the CT5 BUS 1 AUTO/MAN transfer switch in MAN *Places the CT4 BUS 1 AUTO/MAN transfer switch in MAN *Rotates the STBY BUS 1 SYNCHRONIZING switch to ON *Closes SK1 CT4 STBY BUS 1 FEEDER Verifies $\approx$ 4.16 KV on Standby Bus 1 Volts (2AB3) *Opens SK1 CT4 STBY BUS 1 FEEDER Places the STBY BUS 1 SYNCHRONIZING switch in OFF *Places CT4 BUS 1 AUTO/MAN transfer switch in AUTO <i>Examiner Note: If asked about Concurrent Verification, state that the verifier agrees with whatever actions you decide to take.</i> <u>COMMENTS:</u> END TASK	*CRITICAL STEP ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS**SEQ
STEP #****Explanation**

- | | |
|---|---|
| 1 | This step is required to complete functional verification of SK1 breaker. |
|---|---|

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Both Keowee Hydro Units are generating to the grid

The Underground Power Path was removed from service to perform maintenance on SK1 breaker

All maintenance work is complete

PT/0/A/0610/017 (Operability Test of 4160V Breakers) Enclosure 13.12 (Functional Verification of SK Breakers) is in progress to perform a functional verification of SK1 breaker.

INITIATING CUE

The Control Room SRO directs you to continue with PT/0/A/0610/017 (Operability Test of 4160V Breakers) Enclosure 13.12 (Functional Verification of SK Breakers) beginning at Step 4.1 to perform functional verification of SK1 Breaker.

REGION II JOB PERFORMANCE MEASURE OCONEE

RO-702

Adjust Radiation Monitor Setpoints

(MUST BE PERFORMED SAME DAY AS ADM-S301)

Administrative: No

Classroom/Simulator/Plant: Simulator

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

REGION II JOB PERFORMANCE MEASURE

Task Title : Adjust Radiation Monitor Setpoints

Task Number:

Alternate Path: No

Time Critical: No

Validation Time: 20 minutes (with pre-brief)

K/A Rating(s):

System: 073

K/A: A4.04

Rating: 3.2

Task Standard:

Adjust 1RIA-37 and 1RIA-38 for a GWD release per procedure by:

- Calculating the setpoints for 1RIA-37 and 1RIA-38
- Documenting the setpoints for 1RIA-37 and 1RIA-38
- Entering the setpoints for 1RIA-37 and 1RIA-38

References:

OP/1-2/A/1104/018, GWD system, Encl. 4.9 and 4.10 (Rev. 79)

PT/0/A/230/01, Radiation Monitor Check, Encl. 13.6 (Rev. 178)

PT/1-2/A/0230/002, GWD Tank Release (Rev. 7)

OP/0/A/1108/001, Curves and General Information, Encl. 4.3 (Rev. 118)

Tools/Equipment/Procedures Needed:

OP/1-2/A/1104/018, GWD system, Encl. 4.9 and 4.10 (In progress signed) (Rev. 79)

PT/0/A/230/01, Radiation Monitor Check, Encl. 13.6 (In progress signed) (Rev. 178)

PT/1-2/A/0230/002, GWD Tank Release (In progress signed) (Rev. 7)

OP/0/A/1108/001, Curves and General Information, Encl. 4.3 (Electronic) (Rev. 118)

Allow candidate to pre-brief

(Note: Below this line is used only for Initial NRC Exams)

=====

Candidate: _____

NAME

Time Start: _____

Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____

NAME

SIGNATURE

DATE

=====

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

Directions with IC:

1. **LOAD** scenario file **ILT 24 NRC Exam JPM H (RO-702)** (*Allow Simulator to run long enough for GWD Tank B on OAC to update to approximately 65 psig and then go to FREEZE.*)
2. **ENSURE** OP/0/A/1108/001 Enc. 4.3 is clean
3. **Ensure** all breaker flags are set to current plant conditions
4. Select plant HMI screen to GWD system
5. **ENSURE** T/O Sheet tag in place on GWD DISCH FLOW CONTROLLER to indicate that GWD piping has been purged.
6. Place the simulator in RUN and acknowledge alarms then go to **FREEZE**
7. Go to **RUN** when directed by the Lead Examiner

=====

Directions without an IC:

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Release of 'B' GWD tank is desired

GWD Piping has been purged

No other GWRs are in progress

OP/1-2/A/1104/018, Enclosure 4.9 (GWD Tank Release) is in progress and completed up to Step 3.4

INITIATING CUES:

The SRO directs you to continue the release of the 'B' GWD tank beginning at Step 3.4 of Enclosure 4.9.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	3.4	Perform the following on Enclosure 4.10 (GWD Tank Sample Request): 3.4.1 Record Initial GWD Tank Pressure AND GWD Tank Volume. 3.4.2 Record Start Date AND Time. 3.4.3 Record background readings for 1RIA-37 AND 1RIA-38. <u>STANDARD:</u> Determine B GWD tank pressure is 65.3 psig by looking on either the OAC or the chart on 1VB1 and record on Enclosure 4.10. Determine GWD Tank Volume is $\approx$ 6000 Ft³ by using the curve in OP/1108/001 (General Curves and Information) and record on Enclosure 4.10. Determine background readings for 1RIA-37 & 1RIA-38 by observing the RIA readings on the RIA View Node and record on Enclosure 4.10. Note: The background readings should be as follows: • 1RIA-37 Background reading is: $\approx$ 217 or 2.172 E2 cps • 1RIA-38 Background reading is: $\approx$ 11 or 1.110 E1 cps Continue to Step 3.5 <u>COMMENTS:</u>	___ SAT ___ UNSAT
2	3.5	Record recommended 1RIA-37 and 1RIA-38 Alert and High setpoints from Enclosure 4.10 (GWD Tank Sample Request): • 1RIA-37 _____ cpm above background • 1RIA-38 _____ cpm above background <u>STANDARD:</u> Obtain this information from the sample request and record in the procedure. • 1RIA-37 3.47 E5 cpm above background • 1RIA-38 2.78 E2 cpm above background Continue to step 3.6 <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
3	3.6	NOTE: If N2 was added to the most recently released GWD tank until 1RIA-37 indicated < 700 cpm, OR if the tanks' radioactivity was < 2.1E-05 µCi / ml when it was released, the GWD piping is considered "purged". IF 1RIA-37 is out-of-service OR GWD piping NOT purged, verify the following per Enclosure 4.10 (GWD Tank Sample Request): {15} - Independent Data Entry Checks completed - Independent Sample agrees with initial sample STANDARD: Determine step does not apply and N/A the step. Continue to Step 3.7 Examiner Cue: If asked, inform the candidate that the GWD piping is purged. COMMENTS:	___ SAT ___ UNSAT
4	3.7	NOTE: If N2 was added to the most recently released GWD tank until 1RIA-37 indicated < 700 cpm, OR if the tanks' radioactivity was < 2.1E-05 µCi / ml when it was released, the GWD piping is considered "purged". IF GWD piping purged, calculate actual setpoints as follows: 3.7.1 IF 1RIA-37 Operable, calculate Alert and High setpoints as follows: $\frac{2.172E2}{1RIA-37 \text{ background}} \text{ cpm} + \frac{3.47E5}{\text{'Add to background' value from Step 3.5}} = \frac{3.47E5}{1RIA-37 \text{ Alert and High alarm setpoints}} \text{ cpm}$ STANDARD: Calculate set points using formula above. (3.47E5 to 3.48E5) Continue to Step 3.8 COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
5	3.8	<u>IF</u> 1RIA-38 Operable, calculate Alert and High setpoints as follows: $\frac{1.110E1}{\text{cpm}} + \frac{2.78E2}{\text{'Add to background' value from Step 3.5}} = \frac{2.891E2}{\text{1RIA-38 Alert and High alarm setpoints}}$ <u>STANDARD:</u> Calculate set points using formula above. (2.891E2) Continue to Step 3.9 <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
6	3.9	NOTE: If N2 was added to the most recently released GWD tank until 1RIA-37 indicated < 700 cpm, OR if the tanks' radioactivity was < 2.1E-05 µCi / ml when it was released, the GWD piping is considered "purged". Adjust 1RIA-37 setpoints for release as follows: 3.9.1 Perform one of the following: A. IF all of the following: - Calculated setpoints are < 1E+07 CPM 1RIA-37 operable - GWD piping purged {15} set alarms as follows: - Set 1RIA-37 Alert setpoint at <u>3.47E5</u> cpm per PT/0/A/0230/001 (Radiation Monitor Check). (from Step 3.7.1) - Set 1RIA-37 High setpoint at <u>3.47E5</u> cpm per PT/0/A/0230/001 (Radiation Monitor Check). (from Step 3.7.1)	___ SAT
		NOTE: If GWD piping NOT purged on most recent release, RP independently verifies release data and 1RIA-37 setpoint is set at zero to allow the tank to be released. {15} B. IF any of the following: (N/A) - Calculated setpoints are > 1E+07 CPM 1RIA-37 out-of-service - GWD piping NOT purged {15} STANDARD: Determine that calculated setpoints are < 1E+07 CPM, 1RIA-37 is operable, and GWD piping is purged and set 1RIA-37 alert and high setpoints at 3.47E5 per PT/0/A/0230/001 (see Step 7). (3.47E5 to 3.48E5) COMMENTS:	___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
7	ENC 13.6	PT/0/A/0230/001 Enclosure 13.6 (1RIA-37 and 1RIA-38 Setpoints) 1.1 Verify Unit 1&2 GWD Tank release planned per OP/1-2/A/1104/018 (GWD System) NOTE: Each RIA procedure section may be performed in any sequence. 2.1 Set process monitor setpoints as required 3.1 Document 1RIA-37 Alert setpoint per OP/1-2/A/1104/018: <u>3.47E5</u> CPM 3.2 Insert 1RIA-37 Alert setpoint from Step 3.1 3.3 Document 1RIA-37 High setpoint per OP/1-2/A/1104/018: <u>3.47E5</u> CPM 3.4 Insert 1RIA-37 High setpoint from Step 3.3 <u>STANDARD:</u> Candidate documents the Alert and High setpoints for 1RIA-37 per OP/1-2/A/1104/018 (3.47E5 to 3.48E5) Candidate inserts the Alert and High setpoints into 1RIA-37 (3.47E5 to 3.48E5) Continue to Step 3.10. <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
8	3.10	Adjust 1RIA-38 setpoints for release as follows: 3.10.1 Perform one of the following: A. IF calculated setpoints are < 1E+06 CPM AND 1RIA-38 operable, set alarms as follows: - Set 1RIA-38 Alert setpoint at <u>2.891E2</u> cpm per PT/0/A/0230/001 (Radiation Monitor Check). (from Step 3.8) - Set 1RIA-38 High setpoint at <u>2.891E2</u> cpm per PT/0/A/0230/001 (Radiation Monitor Check). (from Step 3.8) NOTE: Due to type of radiation 1RIA-38 monitors, it is NOT sensitive enough to perform an adequate N2 purge. B. IF calculated setpoints are > 1E+06 CPM OR 1RIA-38 out of service, perform the following: (N/A) STANDARD: Candidate documents the Alert and High setpoints for 1RIA-38 per OP/1-2/A/1104/018 (2.891E2) Candidate inserts the Alert and High setpoints into 1RIA-38 (2.891E2) per PT/0/A/0230/001 (per Step 9) COMMENTS:	___ SAT ___ UNSAT
9	ENC 13.6	4.1 Document 1RIA-38 Alert setpoint per OP/1-2/A/1104/018 (GWD System): <u>2.891E2</u> CPM 4.2 Insert 1RIA-38 Alert setpoint from Step 4.1. 4.3 Document 1RIA-38 High setpoint per OP/1-2/A/1104/018 (GWD System): <u>2.891E2</u> CPM 4.4 Insert 1RIA-38 High setpoint from Step 4.3. STANDARD: Candidate documents the Alert and High setpoints for 1RIA-38 per OP/1-2/A/1104/018 (2.891E2) Candidate inserts the Alert and High setpoints into 1RIA-38 (2.891E2) Examiner Cue: "Another operator will continue from here, the JPM is complete" COMMENTS: END TASK	CRITICAL STEP ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
4	Required to ensure proper setpoint is calculated.
5	Required to ensure proper setpoint is calculated.
7	Required to set RIA to prevent station release above limits.
9	Required to set RIA to prevent station release above limits.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Release of 'B' GWD tank is desired

GWD Piping has been purged

No other GWRs are in progress

OP/1-2/A/1104/018, Enclosure 4.9 (GWD Tank Release) is in progress and completed up to Step 3.4

INITIATING CUES:

The SRO directs you to continue the release of the 'B' GWD tank beginning at Step 3.4 of Enclosure 4.9.

REGION II JOB PERFORMANCE MEASURE

RO-806a

Restore CC System Operation in Accordance with EOP Enclosure 5.41 (ES Recovery)

Alternate Path: Yes

Alt Path Failure: 1CC-8 (AP/20)

Time Critical: No

Time Critical Criteria: _____

Prepared By:	_____	Date:	_____
EP Review By:	N/A	Date:	_____
Reviewed By:	_____	Date:	_____
Approved By:	_____	Date:	_____

REGION II
JOB PERFORMANCE MEASURE

Task Title: Restore CC System Operation in Accordance with EOP Enclosure 5.41 (ES Recovery)

Task Number:

Alternate Path: Yes

Time Critical: No

Validation Time: 15 minutes

K/A Rating(s):

System: SYS008

K/A: A4.01

Rating: 3.7

Task Standard:

During the performance of EOP Enclosure 5.41 (ES Recovery), restore CC System to operation, with both CC Pumps running, CC total flow >575 gpm, and CRD outlet flow >138 gpm, in accordance with AP/1/A/1700/020 (Loss of Component Cooling) by accomplishing the following critical steps:

- Open 1CC-7 (sequence step 5 or alternately at sequence step 11)
- Once 1CC-8 fails to operate by switch, dispatch AO to manually open 1CC-8 (sequence step 12)

References:

EOP Encl. 5.41 (ES Recovery)

AP/1/A/1700/020 (Loss of Component Cooling)

Tools/Equipment/Procedures Needed:

EOP Encl. 5.41 (ES Recovery) (**In progress signed**) (Rev. 08)

AP/1/A/1700/020 (Loss of Component Cooling) (**Paper replacements for SRO/RO**) (Rev. 14)

=====

Candidate: _____
NAME

Time Start: _____

Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____
NAME

SIGNATURE

DATE

=====

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **LOAD** scenario file **ILT24 NRC Exam JPM A**
2. Go to **RUN** and acknowledge alarms
3. Go to **FREEZE**
4. **ENSURE** clean procedures (EOP Encl. 5.41 and AP/20) in place for candidate
5. Go to **RUN** when directed by Lead Examiner

=====

Directions without an IC:

1. Recall IC-1
2. Insert MPS400 1 and allow ES 1-6 to actuate.
3. Remove the leak by resetting MPS400 to 0
4. Run Rule 2,3, AND Encl. 5.1
5. Run Encl. 5.41 through step 40
6. Fail 1CC-8 closed (fail to specified position)
7. Store IC

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

A LOCA has occurred

ES Channels 1 - 6 have actuated

EOP Encl. 5.1 (ES Actuation) is complete

The RCS leak is isolated and RCS pressure is being maintained by the PORV (1RC-66)

ALL ES Channels are being reset

EOP Encl. 5.41 (ES Recovery) is complete through step 40

INITIATING CUES

The CRS directs you to continue in EOP Encl. 5.41 (ES Recovery) beginning at step 41 to reset ES Channels 5 and 6

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	41	Verify reset of <u>any</u> is desired: • ES Channel 5 • ES Channel 6 <u>STANDARD:</u> Determines, from Initiating Cue, that reset of ES Channels 5 and 6 is desired. <u>COMMENTS:</u>	___ SAT ___ UNSAT
2	42	Verify Stat Alarms have cleared: • 1SA-7/A-1 (1A1 ES TRIP) • 1SA-7/B-1 (1B1 ES TRIP) • 1SA-7/C-1 (1C1 ES TRIP) • 1SA-7/A-2 (1A2 ES TRIP) • 1SA-7/B-2 (1B2 ES TRIP) • 1SA-7/C-2 (1C2 ES TRIP) <u>STANDARD:</u> Determine that all of the above statalarms on 1SA-7 are clear by observing that their respective window lights are NOT illuminated. <u>COMMENTS:</u>	___ SAT ___ UNSAT
3	43	Perform the following to reset ES (1UB1): • Depress RESET for CH 5. • Depress RESET for CH 6. <u>STANDARD:</u> Candidate depresses the RESET pushbuttons for Channels 5 and 6 located on 1UB1 <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
4	44	Verify: • CH 5 TRIPPED light off • CH 6 TRIPPED light off <u>STANDARD:</u> Verifies white tripped lights OFF for ES Channels 5 and 6 <u>COMMENTS:</u>	___SAT ___UNSAT
5	45	<u>ALTERNATE PATH</u> Open: • 1CC-7* • 1CC-8 <u>STANDARD:</u> Candidate rotates the switches to OPEN for 1CC-7 and 1CC-8. Verifies that 1CC-7 RED open light is lit and GREEN closed light OFF. Candidate goes to Step 45 RNO since 1CC-8 remains closed. <i>EXAMINER NOTE: 1CC-8 fails to OPEN / *The Critical Step of opening 1CC-7 is either accomplished at SEQ 5 OR 11)</i> <u>COMMENTS:</u>	CRITICAL STEP* ___SAT ___UNSAT
6	45 RNO	Initiate AP/20 (Loss of Component Cooling) <u>STANDARD:</u> Candidate initiates AP/20. <i>EXAMINER NOTE: If candidate requests that another Operator initiate AP/20 then state the CRS directs you to perform AP/20</i> <u>COMMENTS:</u>	___SAT ___UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
7	AP/20 3.1	IAAT <u>both</u> of the following are lost: • CC to RCPs • RCP seal injection THEN perform the following: A. Trip Rx B. Stop all RCPs C. Initiate AP/25 (SSF EOP) <u>STANDARD:</u> Determine RCP seal injection is available (~32 gpm) and proceed to step 3.2. <u>COMMENTS:</u>	___ SAT ___ UNSAT
8	3.2	<u>NOTE</u> If CRD stator cooling is lost, stator temperatures will reach 180°F in ≈ 4 minutes. CRD stator temperatures can be read on the OAC, turn-on code "1CRDTP". IAAT ≥ two CRD stator temperatures ≥ 180°F, THEN trip Rx. <u>STANDARD:</u> Determine Rx is already tripped and proceed to step 4.1. <i>EXAMINER NOTE: If candidate sets down AP/20 to perform IMAs, notify them that another RO will complete IMAs.</i> <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
9	4.1	Verify <u>at least one</u> CC Pump operating. <u>STANDARD:</u> Determine NO CC Pumps are operating. Proceed to RNO. <u>COMMENTS:</u>	___SAT ___UNSAT
10	4.1 RNO	1. IF <u>either</u> of the following: • CC Pumps have been manually secured due to CC system leakage • AP/2 directed initiation of AP/20 THEN GO TO step 4.12. 2. GO TO step 4.3 <u>STANDARD:</u> Determine CC Pumps were NOT secured due to system leakage and AP/2 did NOT direct initiation of AP/20. GO TO step 4.3. <u>COMMENTS:</u>	___SAT ___UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
11	4.3	<u>ALTERNATE PATH</u> Open: • 1CC-7* • 1CC-8 <u>STANDARD:</u> Candidate rotates the switches to OPEN for 1CC-8. Verifies that 1CC-7 RED open light is lit and GREEN closed light OFF. Candidate goes to RNO since 1CC-8 remains closed. <i>EXAMINER NOTE: 1CC-8 fails to OPEN / *The Critical Step of opening 1CC-7 is either accomplished at SEQ 5 OR 11)</i> <u>COMMENTS:</u>	CRITICAL STEP* ___ SAT ___ UNSAT
12	4.3 RNO	NOTE: If manually opened, 1CC-8 CANNOT be operated from the Control Room. 1. *IF 1CC-8 CANNOT be opened from the Control Room, THEN dispatch an operator with continuous communications with the Control Room to manually open 1CC-8 (CC Return Outside Block). (A-4-409 West Pen Rm (Pen 54)). 2. WHEN 1CC-8 is open, THEN continue. <u>STANDARD:</u> Operator dispatches AO to open 1CC-8. Continuous communication can be achieved by phone or radio. Verifies that 1CC-8 Red open light lit and Green closed light off following operation by the AO. <i>BOOTH CUE: WHEN AO is dispatched, Activate Timer 1 and report “using time compression I’ve manually opened 1CC-8 and I’m standing by with my radio”.</i> <u>COMMENTS:</u>	CRITICAL STEP* ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
13	4.4	Verify $\geq$ one CC Pump operating. <u>STANDARD:</u> Determine that BOTH CC Pumps are running as indicated by Red light on and Green light off. <i>EXAMINER NOTE: BOTH CC Pumps start (1 in auto / 1 in stby) when CC-7 and CC-8 are open</i> <u>COMMENTS:</u>	___SAT ___UNSAT
14	4.5	Verify CC TOTAL FLOW > 575 gpm. <u>STANDARD:</u> Determine that total CC Flow is > 575 gpm. <i>EXAMINER NOTE: State “another operator will continue the task”</i> <u>COMMENTS:</u> <u>END OF TASK</u>	___SAT ___UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
5	This step (or SEQ 11) is required to provide a flow path for CC by opening 1CC-7
11	This step (or SEQ 11) is required to provide a flow path for CC by opening 1CC-7
12	This step is required to provide a flow path for CC by opening 1CC-8

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

A LOCA has occurred

ES Channels 1 - 6 have actuated

EOP Encl. 5.1 (ES Actuation) is complete

The RCS leak is isolated and RCS pressure is being maintained by the PORV (1RC-66)

ALL ES Channels are being reset

EOP Encl. 5.41 (ES Recovery) is complete through step 40

INITIATING CUES

The CRS directs you to continue in EOP Encl. 5.41 (ES Recovery) beginning at step 41 to reset ES Channels 5 and 6

REGION II JOB PERFORMANCE MEASURE

RO-P402a START FOURTH REACTOR COOLANT PUMP

Alternate Path: Yes

Alt Path Failure: AC OIL Lift Pump Trips

Time Critical: No

Time Critical Criteria: _____

Prepared By: _____ Date: _____

EP Review By: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

REGION II
JOB PERFORMANCE MEASURE

Task Title: Start the fourth Reactor Coolant Pump

Task Number: N/A

Alternate Path: Yes

Time Critical: No

Validation Time: 10 minutes

K/A Rating(s):

System: 003
K/A: A4.03
Rating: 3.2

Task Standard:

1A2 RCP is started in accordance with OP/1/A/1103/006 Encl. 4.2 (Starting 1A2 RCP) and remains running through the completion of the task by performing the following:

- Place 1A2 RCP AC Oil Lift Pump switch in start
- Place 1A2 RCP DC Oil Lift Pump switch in start
- Place 1A2 RCP switch in start

References:

OP/1/A/1102/001 (Controlling Procedure for Unit Startup)
OP/1/A/1103/006 (RCP Operation) Rev 90

Tools/Equipment/Procedures Needed:

OP/1/A/1103/006 Encl. 4.2 (Starting 1A2 RCP) (**In progress procedure**)
Allow candidate to pre-brief

=====

Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____
NAME

SIGNATURE / DATE

=====

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **LOAD** scenario file **ILT24 NRC EXAM JPM B** (RO-P402A)
2. **ENSURE** all breaker flags are set to current plant conditions
3. **ENSURE** reset 1A2 RCP AC Lift pump flag to OFF
4. **ENSURE** a marked up copy of Enclosure 4.2 is provided to Examiner for candidate
5. Go to **RUN** when directed by the Lead Examiner

=====

Directions without an IC:

1. **RECALL** IC-29 (startup below power range)
2. Turnoff 1A2 RCP and allow plant to stabilize
3. Save IC

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

OP/1/A/1102/001 (Controlling Procedure for Unit Startup) Enclosure 4.6 (Unit Startup from 335°F/540 psig (MODE 3) To 532°F/2155 psig (MODE 3)) in progress and completed up to Step 6.1 which directs starting the fourth RCP

RCS Pressure = 2155 psig slowly rising in accordance with OP/1/A/1102/001

RCS Temperature = 532°F slowly rising in accordance with OP/1/A/1102/001

INITIATING CUE

The CRS directs you to start the 1A2 RCP per OP/1/A/1103/006 Encl. 4.2 beginning with Step 2.2.1.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	2.2.1	NOTE: • No more than two RCP(s) may be operated when RCS is < 300°F. • AC and DC Oil Lift Pumps will automatically trip after 3 minutes. Oil Lift Pump may NOT start unless switch has been placed to "OFF" after last start. Announce "Starting 1A2 RCP" via plant page. STANDARD: Announces "Starting 1A2 RCP" via plant page. Candidate continues to step 2.2.2. COMMENTS:	___ SAT ___ UNSAT
2	2.2.2	IF AT ANY TIME Oil Lift Pump low discharge pressure clears, <u>Go To</u> Step 2.2.6 STANDARD: Reads IAAT step and determines that it does not currently apply Candidate continues to step 2.2.3. COMMENTS:	___ SAT ___ UNSAT

3	2.2.3	NOTE: AC Oil Lift Pump may take > 2 minutes to develop adequate discharge pressure. <u>IF</u> available, start AC Oil Lift Pump on 1A2 RCP. <u>STANDARD:</u> Determines AC Oil Lift Pump is available and: • *Rotates AC Oil Lift Pump switch to start • Observes red light on and green light off • Monitors discharge pressure status on OAC Candidate continues to step 2.2.4. <i>Examiner Note: The 1A2 AC Oil Lift Pump trips 1 second after it starts. The low discharge pressure alarm will not clear during this 1 second run.</i> <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT
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4	2.2.4	NOTE: Operating either AC or DC Oil Lift Pump is adequate to start RCP. <u>IF</u> AC Oil Lift Pump is unavailable, start DC Oil Lift Pump* <u>STANDARD:</u> Determines AC Oil Lift Pump is available since it started, N/As this step and proceeds to step 2.2.5 (which is then a critical step) OR *Determines that the AC Oil Lift Pump is unavailable since it tripped after 1 second and starts the DC Oil Lift Pump (which makes this step critical) (if applicable) Time DC OLP started: _____ <i>Examiner Note: Either step 2.2.4 OR 2.2.5 will be CRITICAL. If the candidate determines that the AC Oil Lift Pump is unavailable since it tripped after 1 second, then this step is critical. If the candidate determines that the AC Oil Lift Pump was available and proceeds to step 2.2.5 then that step will become critical.</i> <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT
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5	2.2.5	[ALTERNATE PATH] <u>IF</u> AC Oil Lift Pump automatically trips prior to Oil Lift Pump low discharge pressure clearing, start DC Oil Lift Pump. <u>STANDARD:</u> Determines the AC Oil Lift Pump has tripped and starts the DC Oil Lift Pump by performing the following: • *Rotates DC Oil Lift Pump switch to start • Observes red light on and green light off • Monitors discharge pressure status on OAC Time DC OLP started: _____ Candidate continues to step 2.2.6. <i>Examiner Note: Either step 2.2.4 OR 2.2.5 will be CRITICAL. If the candidate determines that the AC Oil Lift Pump is unavailable since it tripped after 1 second, then step 2.2.4 is critical. If the candidate determines that the AC Oil Lift Pump was available and proceeds to step 2.2.5 then this step will become critical since it will start the DC OLP.</i> <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT
6	2.2.6	<u>WHEN</u> Oil Lift Pump low discharge pressure clears <u>AND</u> > 60 seconds has elapsed since starting oil lift pumps, start 1A2 RCP. <u>STANDARD:</u> Once the DC Oil Lift Pump low discharge pressure has cleared, start the 1A2 RCP as follows: • *Rotate 1A2 RCP switch to START • Verify red lights on and white light off • Verify starting current • Verify OAC indications support pump start Candidate continues to step 2.2.7. <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT

7	2.2.7	After 1A2 RCP is at full speed, perform the following: A. Ensure the following stopped: • AC Oil Lift Pump • DC Oil Lift Pump B. <u>IF</u> AC Oil Lift Pump was operated, position AC Oil Lift Pump switch to "OFF". C. <u>IF</u> DC Oil Lift Pump was operated, position DC Oil Lift Pump switch to "OFF" <u>STANDARD:</u> Once 1A2 RCP is at rated speed, • Rotates AC Oil Lift Pump switch to OFF • Rotates the DC Oil Lift Pump Switch to OFF <i>Examiner Cue: Inform the candidate that another operator will complete the procedure.</i> <u>COMMENTS:</u> END TASK	___ SAT ___ UNSAT
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TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
3	This step is required by procedure
4 or 5	This step is required to be able to start the 1A2 RCP.
6	This step is required to actually start the 1A2 RCP.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

OP/1/A/1102/001 (Controlling Procedure for Unit Startup) Enclosure 4.6 (Unit Startup from 335°F/540 psig (MODE 3) To 532°F/2155 psig (MODE 3)) in progress and completed up to Step 6.1 which directs starting the fourth RCP

RCS Pressure = 2155 psig slowly rising in accordance with OP/1/A/1102/001

RCS Temperature = 532°F slowly rising in accordance with OP/1/A/1102/001

INITIATING CUE

The CRS directs you to start the 1A2 RCP per OP/1/A/1103/006 Encl. 4.2 beginning with Step 2.2.1.

REGION II
JOB PERFORMANCE MEASURE
OCONEE

ADM-117

**PERFORM A REACTOR POWER IMBALANCE
VERIFICATION AND INCORE DETECTOR
OPERABILITY**

Perform on the same day as ADM-S140

Administrative: Yes

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **NONE**

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Unit 1 is at 100% power for seven days

The Reactor Calculation package is NOT running

PT/1/A/0600/001 (Periodic Instrument Surveillance), Enclosure 13.1 (Mode 1 & 2) has been completed up to page 7, Axial Power Imbalance Operating Limits

All other equipment is operable

INITIATING CUE

The SRO directs you to:

1. Determine Axial Power Imbalance and evaluate against the operational alarm limits in the COLR in accordance with PT/1/A/0600/001 (Periodic Instrument Surveillance)
2. Verify the minimum Backup Incore Detector points are operable per PT/0/A/1103/019 (Backup Incore Detector System) and determine any required actions

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	Encl. 13.1 Pg7	PT/1/A/0600/001, SR 3.2.2.1 Axial Power Imbalance Operating Limits: IF > 40% RTP, verify Power imbalance within operational alarm limits in COLR. IF Reactor Calculations package is <u>NOT</u> running on computer, refer to OP/1/A/1105/014 (Control Room Instrumentation Operation And Information). <u>STANDARD:</u> Determine reactor power is greater than 40%. Determine Reactor Calculation package is <u>NOT</u> running per Initial Conditions and refer to OP/1/A/1105/014 (Control Room Instrumentation Operation and Information). <u>COMMENTS:</u>	___ SAT ___ UNSAT
2	Encl. 4.14 3.2.3	OP/1/A/1105/014 Encl. 4.14 (Reactor Parameter Information) IF Reactor Calculations package is <u>NOT</u> running, verify minimum incore detector operability requirements are met. Refer to PT/0/A/1103/019 (Backup Incore Detector System). <u>STANDARD:</u> Determine Reactor Calculations package is NOT running per initial conditions. Candidate refers to PT/0/A/1103/019 (Backup Incore Detector System) to verify the minimum Incore detector operability requirements are met. <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
3	12.2	<u>IF</u> backup Incore recorders are operable, on Enclosure 13.1 (Required Backup Recorder Points for Calculating Axial Power Imbalance) and 13.2 (Required Backup Recorder Points for Calculating Quadrant Power Tilt) place an 'X' next to the backup recorder points which are inoperable as indicated by off-scale readings <u>OR</u> notes attached to the recorders. <u>STANDARD:</u> Perform Enclosure 13.1 and determine that there are <u>not sufficient</u> recorder points for calculating Axial Imbalance. Perform Enclosure 13.2 and determine that there are not sufficient recorder points for calculating Quadrant Power Tilt. <i>Examiner Note: Candidate is directed to verify Axial Imbalance on the cue sheet, and is not required to perform the steps associated with Tilt.</i> <u>COMMENTS:</u>	___ SAT ___ UNSAT
4	12.3	Perform <u>ONE</u> of the following: ___ 12.3.1 Verify required backup recorder points are operable (acceptance criteria 11.1.1 and 11.1.2) • *All three required points on at least three detector strings are operable per instructions on Enclosure 13.1 (Required Backup Recorder Points for Calculating Axial Power Imbalance) • All four required points on at least four groupings (two groupings in each axial core half) are operable per instructions on Enclosure 13.2 (Required Backup Recorder Points for Calculating Quadrant Power Tilt) <u>STANDARD:</u> *Determine the minimum Incore detector operability requirements are NOT met on Enclosure 13.1 (Acceptance Criteria 11.1.1 NOT met). Determine the minimum Incore detector operability requirements are NOT met on Enclosure 13.2 (Acceptance Criteria 11.1.2 NOT met). <i>Examiner Note: Candidate is directed to verify Axial Imbalance on the cue sheet, and is not required to perform the steps associated with Tilt.</i> <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
5	12.3 cont	Perform <u>ONE</u> of the following: ___ 12.3.2 IF 12.3.1 CANNOT be verified, A. *Enter SLC 16.7.8 (CRS) B. IF AT ANY TIME backup recorder points restored... C. *IF four RCPs are operating AND SLC 16.7.8 is entered, reduce power below 80% FP within eight hours of entering SLC 16.7.8. D. IF three RCPs are operating AND SLC 16.7.8 is entered, reduce power below 61.5% FP within eight hours of entering SLC 16.7.8. <u>STANDARD:</u> Candidate should notify the CRS to enter SLC 16.7.8 and to reduce power below 80% FP within eight hours of entering SLC 16.7.8. <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT
6	3.2.4	Order of preference of measurement systems to determine axial imbalance and quadrant power tilt is as follows: A. Incore Detectors (Computer Reactor Calculation Package). B. Outcore Detectors (Power Range Outcore Detectors). C. Backup Incore Detectors. Refer to PT/0/A/1103/019 (Backup Incore Detector System). <u>STANDARD:</u> Candidate reviews step and determines Outcore Detectors should be used. Continues to Step 3.2.5. <u>COMMENTS:</u>	___ SAT ___ UNSAT
7	3.2.5	IF at least one power range outcore detector is NOT operable in each quadrant (NI-5 thru NI-8), outcore detectors shall NOT be used to measure axial imbalance or quadrant power tilt. <u>STANDARD:</u> Candidate determines NI-5 thru NI-8 are operable and can be used to measure axial imbalance. Continues to Step 3.2.6. <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
8	3.2.6	<u>IF</u> Outcore Detectors (Power Range Outcore Detectors) are needed for tilt calculations, contact Rx Engineering group to perform PT/0/A/1103/018 (Excore Tilt Calculations). <u>STANDARD:</u> Determine this step does not apply because they are not determining tilt calculation at this time. <i>EXAMINER CUE: If asked, notify the candidate that tilt calculations are not required.</i> <u>COMMENTS:</u>	___ SAT ___ UNSAT
9	3.2.7	<u>IF</u> Outcore Detectors (Power Range Outcore Detectors) are needed for imbalance calculations, refer to the following alternate method for determining (%) Reactor Power Axial Imbalance: $\frac{NI-5^* + NI-6^* + NI-7^* + NI-8^*}{4} = \% \text{ Imbalance (Avg.)}$ * Use Imbalance CR gauges reading for each NI. <u>STANDARD:</u> Using the attached NI graphic determine that % Imbalance (Avg.) is: $\frac{(-)13.2 + (-)13.1 + (-)13.1 + (-)13.2}{4} = \mathbf{(-)13.15\%}$ *Acceptance Range: (-)13.10% to (-)13.20% <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
10		Refer to the Unit 1 COLR to determine if the calculated outcore imbalance is within the limit for current plant conditions. <u>STANDARD:</u> Candidate determines that the calculated outcore imbalance (-13.15%) is within the limit (-17.7%) for current plant conditions. <u>COMMENTS:</u> END TASK	CRITICAL STEP ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
4	This step is required to determine backup recorder operability
5	This step is required to required actions for recorder inoperability (SLC)
9	This step is required to determine average imbalance
10	This step is required to determine if average imbalance is within limits

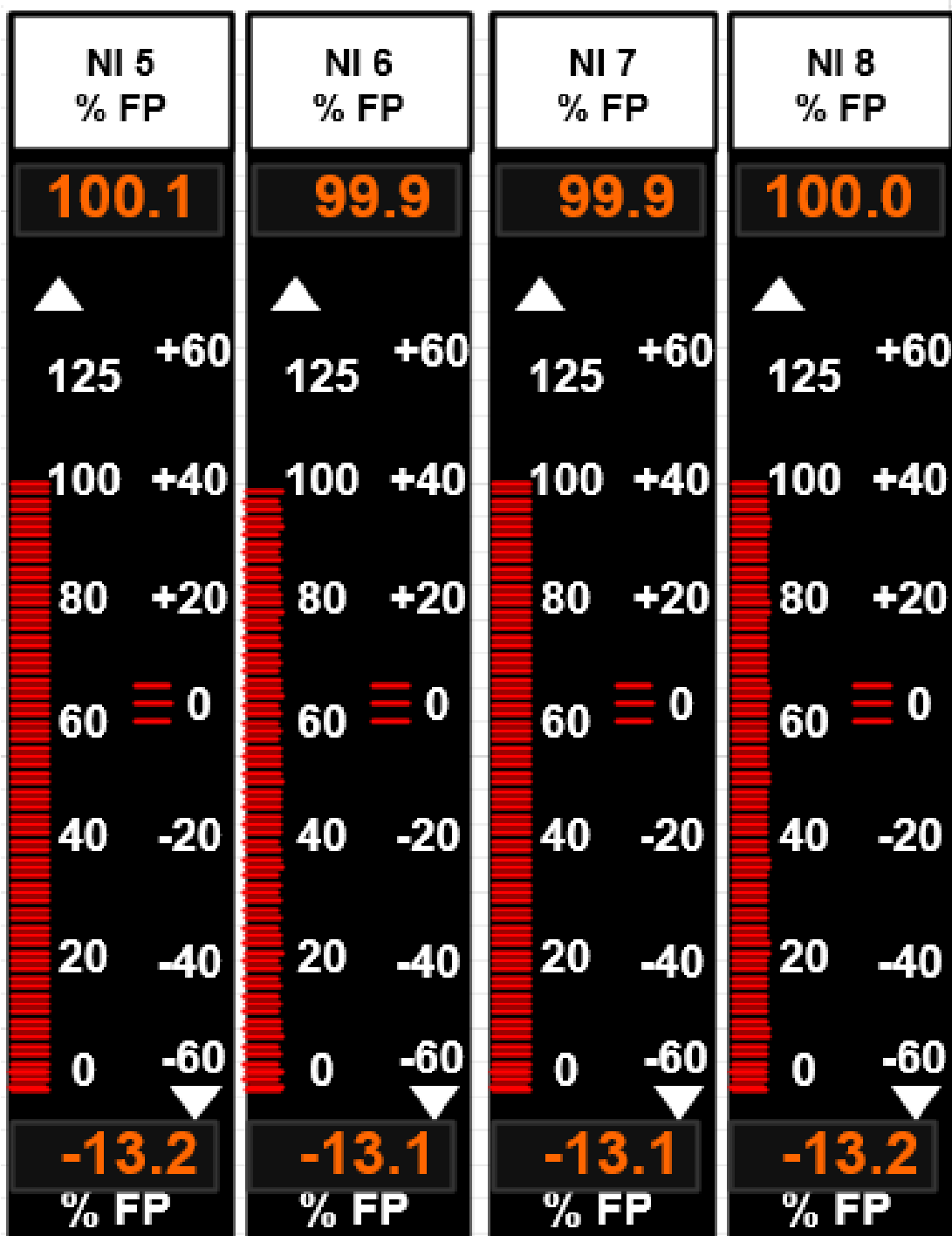
BACKUP INCORE CHART "A"		
POINT #	%	Location
1	132.7	G09-L2
2	*OOS	G09-L4
3	138.0	G09-L6
4	143.1	E09-L2
5	133.3	E09-L4
6	*OOS	E09-L6
7	128.8	G05-L2
8	154.1	G05-L6
9	133.8	M07-L2
10	*OOS	M07-L6
11	133.8	K11-L2
12	145.6	K11-L6
13	142.5	F13-L2
14	144.4	D05-L2
15	133.8	F13-L4
16	*OOS	C06-L2
17	*OOS	C06-L6
18	144.5	F13-L6
19	*OOS	O10-L6
20	*OOS	L03-L6
21	*OOS	L03-L2
22	*OOS	D05-L6
23	*OOS	O10-L2
24	122.9	D05-L4

BACKUP INCORE CHART "B"		
POINT #	%	Location
1	*OOS	E-07-L6
2	142.5	G11-L6
3	128.8	M09-L6
4	132.7	K05-L6
5	133.3	K05-L4
6	*OOS	L06-L2
7	*OOS	L06-L4
8	*OOS	L06-L6
9	*OOS	M09-L2
10	154.1	K05-L2
11	138.0	G11-L2
12	*OOS	E07-L2
13	133.8	C10-L2
14	145.6	C10-L6
15	*OOS	F03-L2
16	122.9	F03-L6
17	*OOS	N04-L2
18	144.4	N04-L4
19	*OOS	N04-L6
20	145.0	O06-L2
21	136.1	O06-L4
22	133.8	O06-L6
23	*OOS	L13-L2
24	133.8	L13-L6

Note: Listed points with values are "in calibration".

* Work Request written

POWER RANGE NI'S



CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 is at 100% power for seven days

The Reactor Calculation package is NOT running

PT/1/A/0600/001 (Periodic Instrument Surveillance), Enclosure 13.1 (Mode 1 & 2) has been completed up to page 7, Axial Power Imbalance Operating Limits

All other equipment is operable

INITIATING CUE

The SRO directs you to:

1. Determine Axial Power Imbalance and evaluate against the operational alarm limits in the COLR in accordance with PT/1/A/0600/001 (Periodic Instrument Surveillance)
2. Verify the minimum Backup Incore Detector points are operable per PT/0/A/1103/019 (Backup Incore Detector System) and determine any required actions

REGION II
JOB PERFORMANCE MEASURE
OCONEE

ADM-148

**PERFORM A PZR RELIEF VALVE LEAKAGE
CALCULATION IAW PT/2/A/0600/010**

Administrative: Yes

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **NONE**

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

A follow up RCS Leakage calculation is being performed due to an elevated leak rate

Unit 2 parameters:

- RCS Pressure = 2155 psig stable
- RCS Temperature = 579°F stable
- Reactor power = 100% stable

Unit 2 Quench Tank Level:

- At Time = 1800 QT level = 81.41 inches
- At Time = 1900 QT level = 82.50 inches

Unit 2 RCP Seal Leakage Flows:

- O2A1938 = 0.01 gpm
- O2A1939 = 0.01 gpm
- O2A1940 = 0.05 gpm
- O2A1941 = 0.31 gpm

Primary Chemistry requested to perform weekly PZR Boron sample

Maintenance reports that 17 SSF Pressurizer Heaters are available for Unit 2

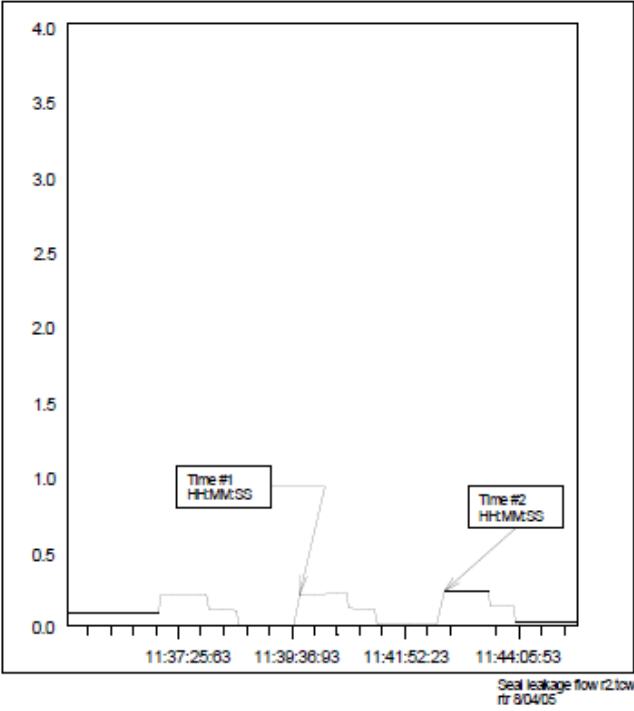
Unit 2 PZR Steam Space Leakage Excel Calculation is NOT available

INITIATING CUE

The CRS directs you to perform PT/2/A/0600/010 Enclosure 13.5 (PZR Relief Valve Leakage Calculation) up to step 5.9 and document results below.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	Encl. 13.5 Step 1.1	Verify RCS Temperature <u>AND</u> Pressure stable <u>STANDARD:</u> Candidate determines that RCS Temperature and Pressure are stable from the cue sheet. <u>COMMENTS:</u>	___ SAT ___ UNSAT
2	2.1	<u>IF any</u> RCP Seal Leakage Flow indicator is out of service, perform the following: (N/A) <u>STANDARD:</u> Candidate determines that all seal flow indicators are available from the cue sheet and N/As the step. <u>COMMENTS:</u>	___ SAT ___ UNSAT
3	2.2	Ensure weekly pressurizer boron sample has been requested. <u>STANDARD:</u> Candidate determines that weekly pressurizer boron sample has been requested from the cue sheet. <u>COMMENTS:</u>	___ SAT ___ UNSAT
4	2.3	<u>IF</u> Unit 2 PZR Steam Space Leakage Excel Calculation available, perform Section 3... (N/A) <u>STANDARD:</u> Candidate determines that the PZR Leakage Calculation from Excel is unavailable from the cue sheet and N/As step 2.3. <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
5	2.4	<u>IF</u> Unit 2 PZR Steam Space Leakage Excel Calculation NOT available, perform the following: ____ 2.4.1 Refer to Section 4 (Example of RCP Seal Leakage Flow Trend History) [SEE BELOW] 4. Example Of RCP Seal Leakage Flow Trend History ** HISTORY ** GROUP TREND ** HISTORY **  RCP SEAL LEAKAGE FLOW <u>STANDARD:</u> Candidate refers to Section 4 which provides guidance on how to determine start times from the plot of seal leakage flow. <u>COMMENTS:</u>	____ SAT ____ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
6	2.4 cont	<u>IF</u> Unit 2 PZR Steam Space Leakage Excel Calculation NOT available, perform the following: (continued) ____ 2.4.2 Perform Section 5 (Unit 2 PZR Steam Space Leakage Excel Calculation NOT Available). <u>STANDARD:</u> Candidate should proceed to Section 5 to perform the manual calculation. <u>COMMENTS:</u>	____ SAT ____ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
7	5.1	Perform one of the following to obtain 2A1 RCP Seal Leakage Flow: IF 2A1 RCP Seal Leakage Flow (CP O2A1938) $\geq$.3 gpm, record indicated value below and in Step 5.5: 2A1 RCP Seal Leakage Flow: _____ gpm *IF 2A1 RCP Seal Leakage Flow (CP O2A1938) $<$.3 gpm AND Time Trend/History for 2A1 RCP Seal Leakage Flow indicates $<$ 2 dumps in the past hour, record 0.0 gpm for 2A1 RCP Seal Leakage Flow in Step 5.5: 2A1 RCP Seal Leakage Flow: <u>0.0</u> gpm IF 2A1 RCP Seal Leakage Flow (CP O2A1938) $<$.3 gpm AND Time Trend/History for 2A1 RCP Seal Leakage Flow indicates $\geq$ 2 dumps in the past hour, perform the following: A. Calculate flow rate using Time Trend/History - Record Time #1 2A1 RCP Seal Leakage Flow (CP O2A1938): _____(HH:MM:SS) - Record Time #2 2A1 RCP Seal Leakage Flow (CP O2A1938): _____(HH:MM:SS) - Record Time #1 to Time #2 Duration: _____seconds - Calculate 2A1 RCP Seal Leakage Flow: $(0.29 \div \frac{\text{_____ sec}}{\text{(Duration)}}) (60) = \frac{\text{_____}}{\text{(2A1 RCP Seal Leakage Flow)}} \text{ gpm}$ B. Record indicated value below and in Step 5.5: 2A1 RCP Seal Leakage Flow: _____ gpm <u>STANDARD:</u> Candidate determines the 2nd bulleted step applies since 2A1 RCP Seal Leakage Flow (CP O2A1938) is $<$.3 gpm (.01 gpm) AND $<$ 2 dumps in past hour so 0.0 gpm is recorded in Step 5.5 (SEQ STEP 11) <u>COMMENTS:</u>	CRITICAL STEP* ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
8	5.2	Perform one of the following to obtain 2A2 RCP Seal Leakage Flow: IF 2A2 RCP Seal Leakage Flow (CP O2A1940) $\geq$.3 gpm, record indicated value below and in Step 5.5: 2A2 RCP Seal Leakage Flow: _____ gpm IF 2A2 RCP Seal Leakage Flow (CP O2A1940) $<$.3 gpm AND Time Trend/History for 2A2 RCP Seal Leakage Flow indicates $<$ 2 dumps in the past hour, record 0.0 gpm for 2A2 RCP Seal Leakage Flow in Step 5.5: 2A2 RCP Seal Leakage Flow: <u>0.0</u> gpm *IF 2A2 RCP Seal Leakage Flow (CP O2A1940) $<$.3 gpm AND Time Trend/History for 2A2 RCP Seal Leakage Flow indicates $\geq$ 2 dumps in the past hour, perform the following: A. Calculate flow rate using Time Trend/History - Record Time #1 2A2 RCP Seal Leakage Flow (CP O2A1940): _____(HH:MM:SS) - Record Time #2 2A2 RCP Seal Leakage Flow (CP O2A1940): _____(HH:MM:SS) - Record Time #1 to Time #2 Duration: _____seconds - Calculate 2A2 RCP Seal Leakage Flow: $(0.29 \div \frac{\text{Duration}}{\text{sec}}) (60) = \frac{\text{2A2 RCP Seal Leakage Flow}}{\text{2A2 RCP Seal Leakage Flow}} \text{ gpm}$ B. Record indicated value below and in Step 5.5: 2A2 RCP Seal Leakage Flow: _____ gpm <u>STANDARD:</u> Candidate determines the 3rd bulleted step applies since 2A2 RCP Seal Leakage Flow (CP O2A1940) is $<$.3 gpm (.05 gpm) AND $\geq$ 2 dumps in past hour so the calculation is performed and recorded in Step 5.5 (SEQ STEP 11). The duration between step Time #1 and #2 is 2376 seconds. Calculation: $(0.29/2376)*60 = .00732 \rightarrow .01$ gpm (.007 to .01 acceptance band) 0.01 gpm is recorded in Step 5.5 <u>COMMENTS:</u>	CRITICAL STEP* ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
9	5.3	Perform one of the following to obtain 2B1 RCP Seal Leakage Flow: • IF 2B1 RCP Seal Leakage Flow (CP O2A1939) $\geq$.3 gpm, record indicated value below and in Step 5.5: 2B1 RCP Seal Leakage Flow: _____ gpm • *IF 2B1 RCP Seal Leakage Flow (CP O2A1939) $<$.3 gpm AND Time Trend/History for 2B1 RCP Seal Leakage Flow indicates $<$ 2 dumps in the past hour, record 0.0 gpm for 2B1 RCP Seal Leakage Flow in Step 5.5: 2B1 RCP Seal Leakage Flow: <u>0.0</u> gpm • IF 2B1 RCP Seal Leakage Flow (CP O2A1939) $<$.3 gpm AND Time Trend/History for 2B1 RCP Seal Leakage Flow indicates $\geq$ 2 dumps in the past hour, perform the following: A. Calculate flow rate using Time Trend/History 1. Record Time #1 2B1 RCP Seal Leakage Flow (CP O2A1939): _____(HH:MM:SS) 2. Record Time #2 2B1 RCP Seal Leakage Flow (CP O2A1939): _____(HH:MM:SS) 3. Record Time #1 to Time #2 Duration: _____seconds 4. Calculate 2B1 RCP Seal Leakage Flow: $(0.29 \div \frac{\text{sec}}{\text{(Duration)}}) (60) = \frac{\text{gpm}}{\text{(2B1 RCP Seal Leakage Flow)}}$ B. Record indicated value below and in Step 5.5: 2B1 RCP Seal Leakage Flow: _____ gpm <u>STANDARD:</u> Candidate determines the 2nd bulleted step applies since 2B1 RCP Seal Leakage Flow (CP O2A1939) is $<$.3 gpm (.01 gpm) AND $<$ 2 dumps in past hour so 0.0 gpm is recorded in Step 5.5 (SEQ STEP 11) <u>COMMENTS:</u>	CRITICAL STEP* ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
10	5.4	Perform one of the following to obtain 2B2 RCP Seal Leakage Flow: • *IF 2B2 RCP Seal Leakage Flow (CP O2A1941) $\geq$.3 gpm, record indicated value below and in Step 5.5: 2B2 RCP Seal Leakage Flow: _____ gpm • IF 2B2 RCP Seal Leakage Flow (CP O2A1941) $<$.3 gpm AND Time Trend/History for 2B2 RCP Seal Leakage Flow indicates $<$ 2 dumps in the past hour, record 0.0 gpm for 2B2 RCP Seal Leakage Flow in Step 5.5: 2B2 RCP Seal Leakage Flow: <u>0.0</u> gpm • IF 2B2 RCP Seal Leakage Flow (CP O2A1941) $<$.3 gpm AND Time Trend/History for 2B2 RCP Seal Leakage Flow indicates $\geq$ 2 dumps in the past hour, perform the following: A. Calculate flow rate using Time Trend/History 1. Record Time #1 2B2 RCP Seal Leakage Flow (CP O2A1941): _____(HH:MM:SS) 2. Record Time #2 2B2 RCP Seal Leakage Flow (CP O2A1941): _____(HH:MM:SS) 3. Record Time #1 to Time #2 Duration: _____seconds 4. Calculate 2B2 RCP Seal Leakage Flow: $(0.29 \div \frac{\text{_____}}{\text{(Duration)}} \text{ sec}) (60) = \frac{\text{_____}}{\text{(2B2 RCP Seal Leakage Flow)}} \text{ gpm}$ B. Record indicated value below and in Step 5.5: 2B2 RCP Seal Leakage Flow: _____ gpm <u>STANDARD:</u> Candidate determines the 1st bulleted step applies since 2B2 RCP Seal Leakage Flow (CP O2A1941) is $>$.3 gpm (.31 gpm) so 0.31 gpm is recorded in Step 5.5 (SEQ STEP 11) <u>COMMENTS:</u>	CRITICAL STEP* ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
11	5.5	Sum individual RCP Seal Leakage Flows to determine Total RCP Seal Leakage Flow: 2A1 RCP Seal Leakage Flow: _____ gpm 2A2 RCP Seal Leakage Flow: _____ gpm 2B1 RCP Seal Leakage Flow: _____ gpm 2B2 RCP Seal Leakage Flow: _____ gpm Total RCP Seal Leakage Flow: _____ gpm <u>STANDARD:</u> Candidate records the values that were determined in steps 5.1 through 5.4 for the RCP Seal Leakage flows: 2A1 = 0.0 gpm 2A2 = 0.01 gpm (.007 to .01) 2B1 = 0.0 gpm 2B2 = 0.31 gpm Total RCP Seal Leakage = 0.32 gpm (.317 to .32) <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT

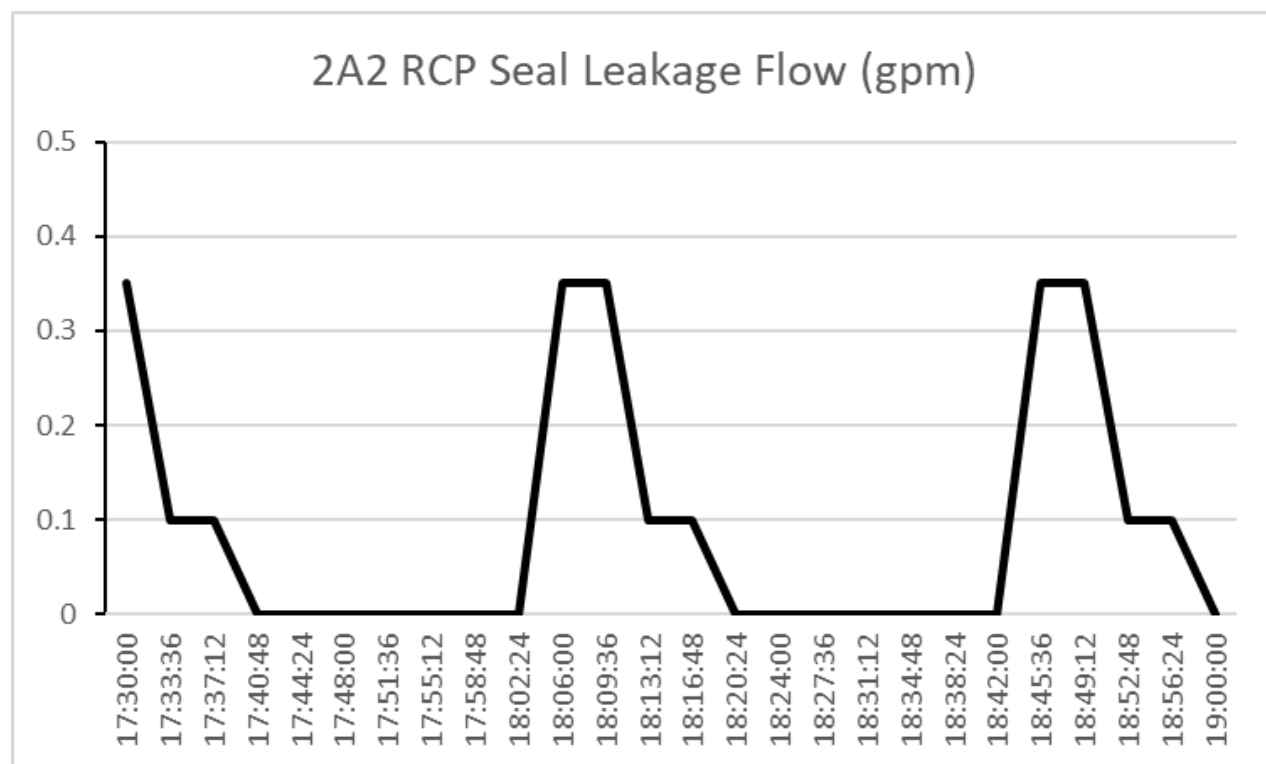
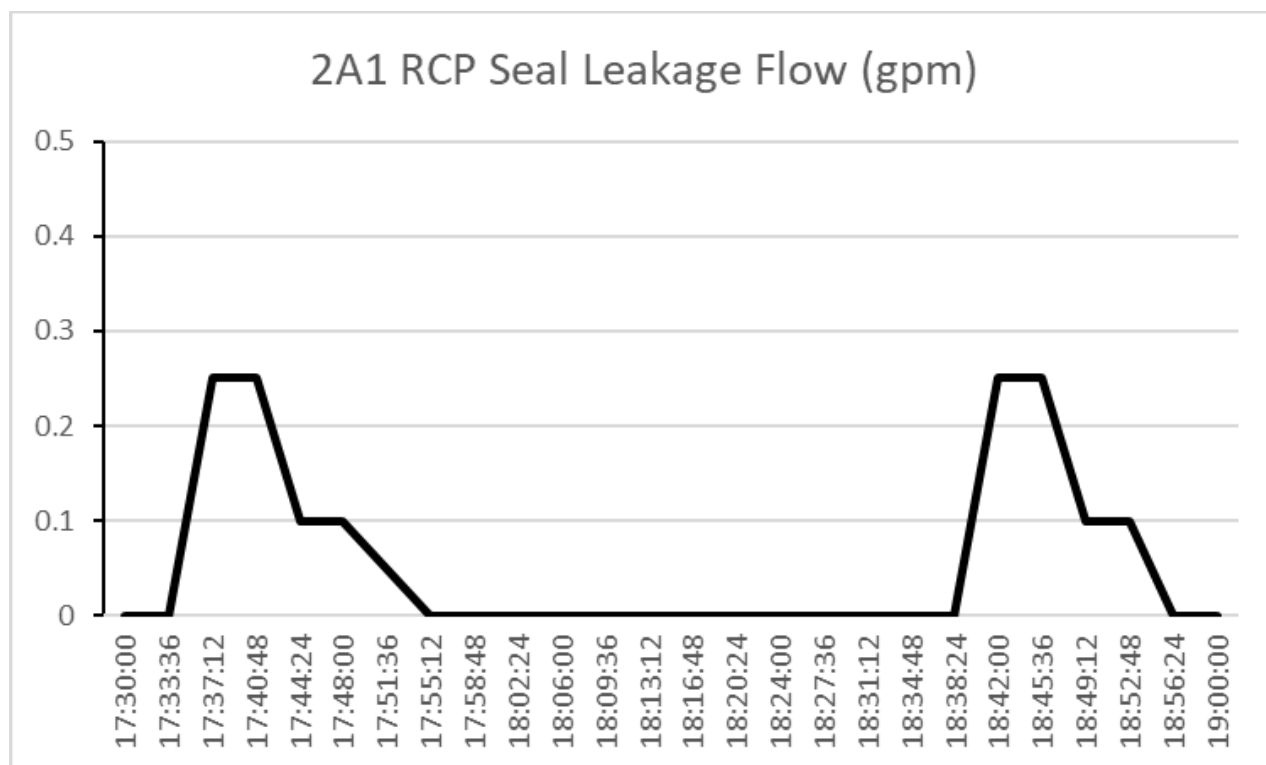
SEQ STEP	PROC STEP	DESCRIPTION	
12	5.6	Perform the following to obtain PZR Relief Valve Leak Rate: 5.6.1 Determine Quench Tank (TQ) level change: $(\text{Final QT level}) - (\text{Initial QT level}) = (\text{QT level change})$ 5.6.2 Convert QT Level Change to gallons: (QT Level Change) inches X 34.94 gals/inch = (QT Volume Change) gals 5.6.3 Calculate QT Volume Change Rate: $(\text{QT Volume Change})$ gals / (Duration) min = (QT Volume Rate) gpm <u>STANDARD:</u> Candidate uses QT Final level, QT Initial Level and duration from the cue sheet and calculates the following: $82.5 - 81.41 = 1.09$ inches (QT level change) 1.09 inches X 34.94 gals/inch = 38.08 gals 38.08 gals / 60 min = 0.63 gpm (QT Volume Rate) <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
13	5.7	Calculate PZR Steam Space Leakage: $(\text{QT Volume Rate}) \text{ gpm} - (\text{Total RCP Seal Leakage Flow}) \text{ gpm} =$ (PZR Steam Space leakage) gpm <u>STANDARD:</u> Candidate uses the QT Volume Rate (step 5.6.3) and Total RCP Seal leakage flow (step 5.5) and calculates PZR Steam Space leakage: $0.63 \text{ gpm} - 0.32 (.317 \text{ to } .32) \text{ gpm} =$ $0.31 (.31 \text{ to } .313) \text{ gpm}$ (PZR Steam Space leakage) <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
14	5.8	Determine SSF ASW Pump operability: - Refer to Narrative Log or contact I&E to determine operable SSF PZR Heaters. *Refer to TS Bases 3.10.1 to determine required PZR heaters/PZR leakage. <u>STANDARD:</u> Candidate determines that 17 PZR Heaters are available from the cue sheet. Candidate determines that: TS 3.10.1 PZR Heater/PZR Leakage requirements are NOT MET due to TSB 3.10.1 page 8, which states that if Unit 2 has 17 heaters available, the maximum allowed PZR Steam Space leakage allowed is 0.0 gpm and the current leakage is 0.31 (.31 to .313) gpm. <u>COMMENTS:</u> END OF TASK	CRITICAL STEP* ___ SAT ___ UNSAT

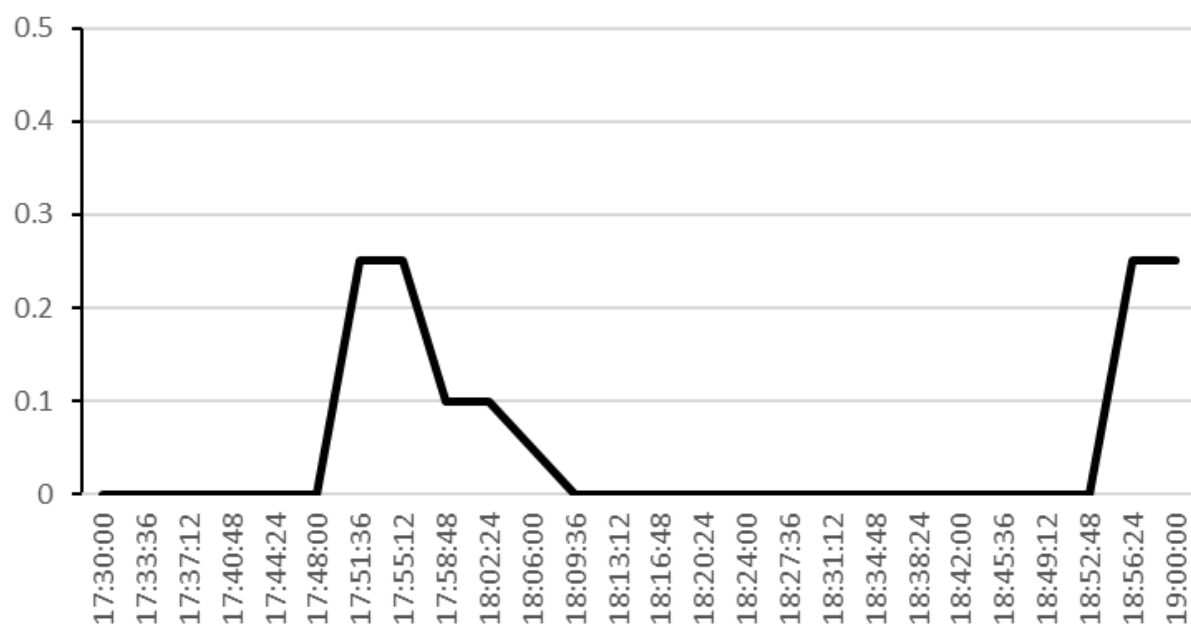
TIME STOP: _____

CRITICAL STEP EXPLANATIONS

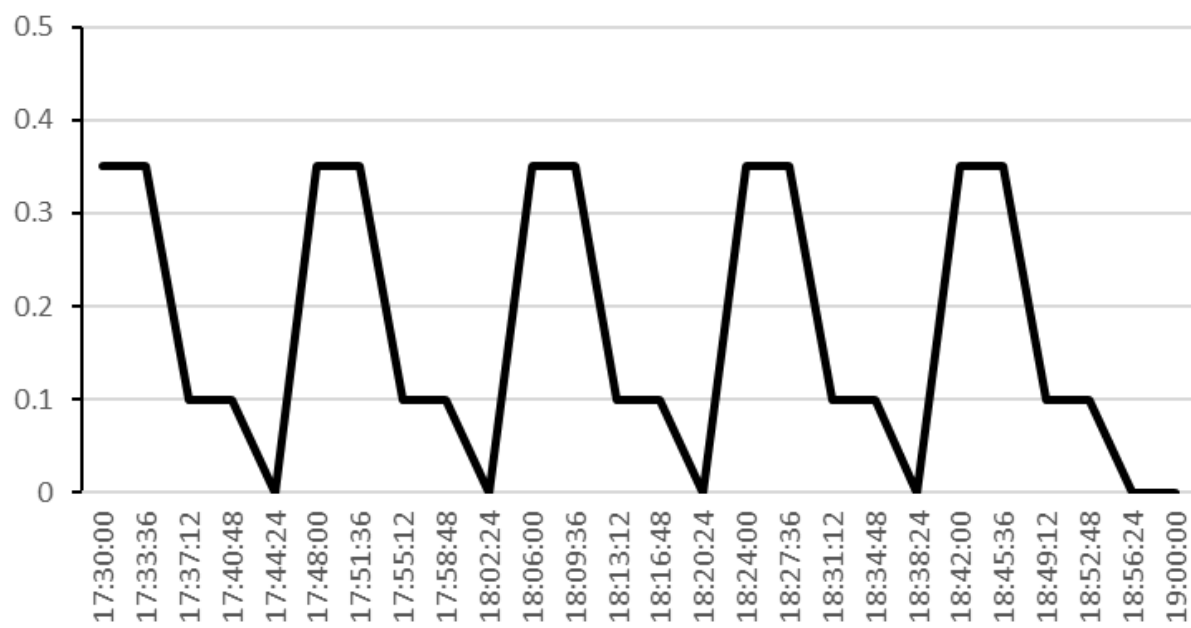
SEQ STEP #	Explanation
7	This step is required to determine 2A1 RCP Seal leakage
8	This step is required to determine 2A2 RCP Seal leakage
9	This step is required to determine 2B1 RCP Seal leakage
10	This step is required to determine 2B2 RCP Seal leakage
11	This step is required to determine Total RCP Seal leakage
12	This step is required to determine QT Volume Rate
13	This step is required to determine PZR Steam Space leakage
14	This step is required to determine if TS Bases requirements are met



2B1 RCP Seal Leakage Flow (gpm)



2B2 RCP Seal Leakage Flow (gpm)



CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

A follow up RCS Leakage calculation is being performed due to an elevated leak rate

Unit 2 parameters:

- RCS Pressure = 2155 psig stable
- RCS Temperature = 579°F stable
- Reactor power = 100% stable

Unit 2 Quench Tank Level:

- At Time = 1800 QT level = 81.41 inches
- At Time = 1900 QT level = 82.50 inches

Unit 2 RCP Seal Leakage Flows:

- O2A1938 = 0.01 gpm
- O2A1939 = 0.01 gpm
- O2A1940 = 0.05 gpm
- O2A1941 = 0.31 gpm

Primary Chemistry requested to perform weekly PZR Boron sample

Maintenance reports that 17 SSF Pressurizer Heaters are available for Unit 2

Unit 2 PZR Steam Space Leakage Excel Calculation is NOT available

INITIATING CUE

The CRS directs you to perform PT/2/A/0600/010 Enclosure 13.5 (PZR Relief Valve Leakage Calculation) up to step 5.9 and document results below.

REGION II
JOB PERFORMANCE MEASURE
OCONEE

ADM-204

Perform SG Downcomer Temperature Surveillance

Administrative: Yes

Classroom/Simulator/Plant: Classroom

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

REGION II JOB PERFORMANCE MEASURE

Task Title : Perform SG Downcomer Temperature Surveillance

Task Number :

Alternate Path: No

Time Critical: No

Validation Time: 15 minutes

K/A Rating(s):

System: Gen
K/A: 2.2.12
Rating: 3.7/4.1

Task Standard:

Perform SG Downcomer Temperature Surveillance by procedure as follows:

- Determines that OAC points O1E2008, O1E2009, O1E2012, O1E2013 do **NOT** agree within 3°F of each other, and continues to Enclosure 4.20 (Channel Check of OTSG Downcomer Temperatures).
- Determine 1A SG saturation temperature by interpolating the values using the table in Section 4 on the 75% power row and the 880 (532.8°F) and 890 (534.1°F) psig columns, to be 533.45°F (533.4 – 533.5°F).
- Determine O1E2008 (528.87°F) is within $\pm 4.9^\circ\text{F}$ of 1A SG saturation temperature (533.45°F).
- Determine O1E2009 (538.97°F) is NOT within $\pm 4.9^\circ\text{F}$ of 1A SG saturation temperature (533.45°F) and entry into Condition A of SLC 16.7.5 for OTSG Overfill protection is required.
- Determine 1B SG saturation temperature using the table in Section 4 on the 75% power row and the 890 psig column to be 534.1°F.
- Determine O1E2012 (532.77°F) is within $\pm 4.9^\circ\text{F}$ of 1B SG saturation temperature (534.1°F).
- Determine O1E2013 (533.63°F) is within $\pm 4.9^\circ\text{F}$ of 1B SG saturation temperature (534.1°F).

References:

OP/1/A/1105/014 Encl 4.1 (Mode 1 & 2), Encl. 4.20 (Channel Check Of OTSG Downcomer Temperatures) **Rev 56**
SLC 16.7.5 Steam Generator Overfill Protection **Rev 11/15/12**

Tools/Equipment/Procedures Needed:

OP/1/A/1105/014 Encl. 4.20 (Channel Check Of OTSG Downcomer Temperatures) **Rev 56 (Paper)**
OAC group display for SG information (**paper**)
SLC 16.7.5 Steam Generator Overfill Protection (**electronic**)

(Note: Below this line is used only for Initial NRC Exams)

Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____ / _____
NAME SIGNATURE DATE

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. N/A

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Unit 1 Reactor power = 75%

INITIATING CUE

The CRS directs you to perform OP/1/A/1105/014 (Control Room Instrumentation Operation And Information) Encl. 4.1 (Mode 1 & 2) component check for the SG Downcomer Temperatures on page 6 of 16. Document your results below and list all deficiencies found, if any.

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	Enc 4.1	Verify <u>All</u> SG Downcomer Temperature computer points agree within 3°F of each other. IF <u>All</u> SG Downcomer Temperatures <u>DO NOT</u> agree within 3°F of each other, then perform Enclosure 4.20, (Channel Check Of OTSG Downcomer Temperatures). <u>STANDARD:</u> Candidate observes OAC computer points on the handout provided. O1E2008 – 528.87°F O1E2009 – 538.97°F O1E2012 – 532.77°F O1E2013 – 533.63°F Determines that the above OAC points do NOT agree within 3°F of each other, and continues to Enclosure 4.20, (Channel Check of OTSG Downcomer Temperatures). <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
2	Enc 4.20 3.1.1	Determine saturation temperature for 1A OTSG based on power level and 1A OTSG outlet pressure as follows: Step 3.1.1 Determine 1A OTSG outlet pressure using <u>any one</u> of the following computer points: • O1E2281 – 885 psig • O1E2283 – 885 psig • O1E2031 – 885 psig • O1E2032 – 885 psig <u>STANDARD:</u> Using the OAC handout, determines that 1A OTSG pressure is 885 psig. <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
3	3.1.2	Using table in Section 4, determine the 1A OTSG saturation temperature based on power level and 1A OTSG Outlet Pressure obtained in step 3.1.1. _____ 1A OTSG saturation temperature <u>STANDARD:</u> Candidate determines that 1A OTSG saturation temperature is $\approx 533.45^{\circ}\text{F}$ (533.4 – 533.5°F) by using the table in section 4. <i>Examiner Note: Candidate must interpolate the values in Table 4. One way to do this is to determine the values at 75% power for 880 (532.8) and 890 (534.1).</i> $534.1 - 532.8 = 1.3$ $1.3 \text{ divided by } 10 = .13$ $.13 \times 5 = 0.65$ (1A SG Outlet press = 885) $0.65 + 532.8 = 533.45^{\circ}\text{F}$ (Add to value for 880) 533.45°F (533.4 to 533.5) <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
4	3.1.3	Compare O1E2008 SG Lower Downcomer Temperature Loop A to the 1A OTSG saturation temperature determined in step 3.1.2: <u>STANDARD:</u> Candidate compares OAC point O1E2008 (528.87°F) to value calculated in step 3.1.2 ($533.45^{\circ}\text{F} \pm .05^{\circ}\text{F}$). <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
5	3.1.4	IF O1E2008 SG Lower Downcomer Temperature Loop A is NOT within $\pm 4.9^{\circ}\text{F}$ of the 1A OTSG saturation temperature, then enter Condition A of SLC 16.7.5 for OTSG overfill protection system inoperable. <u>STANDARD:</u> Candidate determines that O1E2008 SG Lower Downcomer Temperature Loop A (528.87°F) is within $\pm 4.9^{\circ}\text{F}$ (difference is $4.58^{\circ}\text{F} \pm .05^{\circ}\text{F}$) of the 1A OTSG saturation temperature (533.45°F), and the step is N/A. <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
6	3.1.5	Compare O1E2009 SG Lower Downcomer Temperature Loop A to the 1A OTSG saturation temperature determined in step 3.1.2 <u>STANDARD:</u> Candidate compares OAC point O1E2009 (538.97°F) to value calculated in step 3.1.2 ($533.45^{\circ}\text{F} \pm .05^{\circ}\text{F}$). <u>COMMENTS:</u>	___ SAT ___ UNSAT
7	3.1.6	IF O1E2009 SG Lower Downcomer Temperature Loop A is NOT within $\pm 4.9^{\circ}\text{F}$ of the 1A OTSG saturation temperature, then enter Condition A of SLC 16.7.5 for OTSG overfill protection system inoperable. <u>STANDARD:</u> Candidate determines that O1E2009 SG Lower Downcomer Temperature Loop A (538.97) is NOT within $\pm 4.9^{\circ}\text{F}$ (difference is $5.52^{\circ}\text{F} \pm .05^{\circ}\text{F}$) of the 1A OTSG saturation temperature (533.45°F), and entry into Condition A of SLC 16.7.5 for OTSG overfill protection system inoperable is required. <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
8	Enc 4.20 3.2.1	Determine saturation temperature for 1B OTSG based on power level and 1B OTSG outlet pressure as follows: Step 3.2.1 Determine 1B OTSG outlet pressure using <u>any one</u> of the following computer points: • O1E2282 – 890 psig • O1E2284 – 890 psig <u>STANDARD:</u> Using the OAC handout, determines that 1B OTSG pressure is 890 psig. <u>COMMENTS:</u>	___ SAT ___ UNSAT
9	3.2.2	Using table in Section 4, determine the 1B OTSG saturation temperature based on power level and 1B OTSG Outlet Pressure obtained in step 3.2.1. _____ 1B OTSG saturation temperature <u>STANDARD:</u> Candidate determines that 1B OTSG saturation temperature is 534.1°F by using the table in section 4. <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
10	3.2.3	Compare O1E2012 SG Lower Downcomer Temperature Loop B to the 1B OTSG saturation temperature determined in step 3.2.2: <u>STANDARD:</u> Candidate compares OAC point O1E2012 (532.77°F) to value calculated in step 3.2.2 (534.1°F). <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
11	3.2.4	IF O1E2012 SG Lower Downcomer Temperature Loop B is NOT within $\pm 4.9^{\circ}\text{F}$ of the 1B OTSG saturation temperature, then enter Condition A of SLC 16.7.5 for OTSG overfill protection system inoperable. STANDARD: Candidate determines that O1E2012 SG Lower Downcomer Temperature Loop B (532.77°F) is within $\pm 4.9^{\circ}\text{F}$ (difference is 1.33°F) of the 1B OTSG saturation temperature (534.1°F), and the step is N/A. COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT
12	3.2.5	Compare O1E2013 SG Lower Downcomer Temperature Loop B to the 1B OTSG saturation temperature determined in step 3.2.2 STANDARD: Candidate compares OAC point O1E2013 (533.63°F) to value calculated in step 3.2.2 (534.1°F). COMMENTS:	___ SAT ___ UNSAT
13	3.2.6	IF O1E2013 SG Lower Downcomer Temperature Loop B is NOT within $\pm 4.9^{\circ}\text{F}$ of the 1B OTSG saturation temperature, then enter Condition A of SLC 16.7.5 for OTSG overfill protection system inoperable. STANDARD: Candidate determines that O1E2013 SG Lower Downcomer Temperature Loop B (533.63) is within $\pm 4.9^{\circ}\text{F}$ (difference is 0.47°F) of the 1B OTSG saturation temperature (534.1°F), and the step is N/A. COMMENTS: END TASK	CRITICAL STEP ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	Step is required to complete the surveillance.
3	Step is required to complete the surveillance.
5	Step is required to complete the surveillance.
7	Determining that the computer points in Step 3.1.6 are out of the allowable band is critical to ensure that SLC 16.7.5 Condition A is entered.
9	Step is required to complete the surveillance.
11	Step is required to complete the surveillance.
13	Step is required to complete the surveillance.

GROUP DISPLAY FOR SG_CPW DATE: TODAY TIME: NOW
 ** dynamic group **

PID	QUAL	VALUE	UNITS	DESCRIPTION
O1E2000	GOOD	115.52	INCHES	>SG 1A SU LEVEL 1
O1E2001	GOOD	115.52	INCHES	>SG 1A SU LEVEL 2
O1E2003	GOOD	46.60	%	>SG 1A OPERATING LEVEL 1
O1E2004	GOOD	46.63	%	>SG 1A OPERATING LEVEL 2
O1E2005	GOOD	116.30	INCHES	>SG 1B SU LEVEL 1
O1E2006	GOOD	116.30	INCHES	>SG 1B SU LEVEL 2
O1E2008	GOOD	528.87	DEG F	SG 1A LOWER DOWNCOMER TEMP 1
O1E2009	GOOD	538.97	DEG F	SG 1A LOWER DOWNCOMER TEMP 2
O1E2012	GOOD	532.77	DEG F	SG 1B LOWER DOWNCOMER TEMP 1
O1E2013	GOOD	533.63	DEG F	SG 1B LOWER DOWNCOMER TEMP 2
O1E2018	GOOD	43.63	%	>SG 1B OPERATING LEVEL 1
O1E2019	GOOD	43.67	%	>SG 1B OPERATING LEVEL 2
O1E2031	GOOD	885.0	PSIG	SG 1A OUTLET PRESS 3
O1E2032	GOOD	885.0	PSIG	SG 1A OUTLET PRESS 4
O1E2281	GOOD	885.0	PSIG	>SG 1A OUTLET PRESS 2 (ICCM)
O1E2282	GOOD	890.0	PSIG	>SG 1B OUTLET PRESS 2 (ICCM)
O1E2283	GOOD	885.0	PSIG	>SG 1A OUTLET PRESS 1 (ICCM)
O1E2284	GOOD	890.0	PSIG	>SG 1B OUTLET PRESS 1 (ICCM)

CANDIDATE CUE SHEET**(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)****INITIAL CONDITIONS**

Unit 1 Reactor power = 75%

INITIATING CUE

The CRS directs you to perform OP/1/A/1105/014 (Control Room Instrumentation Operation And Information) Encl. 4.1 (Mode 1 & 2) component check for the SG Downcomer Temperatures on page 6 of 16. Document your results below and list all deficiencies found, if any.

REGION II
JOB PERFORMANCE MEASURE
OCONEE

ADM-305

Determine RP Requirements for an Assigned Task

Administrative: Yes

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

REGION II
JOB PERFORMANCE MEASURE

Task Title: Determine RP Requirements for an Assigned Task

Task Number: N/A

Alternate Path: No

Time Critical: No

Validation Time: 15 minutes

K/A Rating(s):

System: Generic
K/A: 2.3.12
Rating: 3.2/3.7

Task Standard:

Using information provided on the plan view and associated RWPs, determine the correct RWP (#23), Task number (#2), Dose Alarm setpoint (25 mrem), Dose Rate Alarm setpoint (500 mrem/hr), and Dress Category (H) for the given job.

References:

Plan View for Room 112 MWHUT Rev 0
RWP #2 Rev 30
RWP #18 Rev 28
RWP #23 Rev 09

Tools/Equipment/Procedures Needed:

Plan View for Room 112 MWHUT (paper) Rev 0
RWP #2 (paper) Rev 30
RWP #18 (paper) Rev 28
RWP #23 (paper) Rev 09

(Note: Below this line is used only for Initial NRC Exams)

Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____
NAME

SIGNATURE / DATE

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **NONE**

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Over the last several days there has been a slow unexplained drop in Miscellaneous Waste Holdup Tank (MWHUT) level and a corresponding slow rise in High Activity Waste Tank (HAWT) level.

Due to possible leakage past the seat, the Unit 1 CRS has directed you to go to the Unit 1&2 MWHUT room and verify the following valves (located in a congested area one foot underneath the MWHUT) are CLOSED:

- LWD-970 (1A MWHUT Drain Block to HAWT)
- LWD-972 (1B MWHUT Drain Block to HAWT)

INITIATING CUE

Determine the following requirements for entry into the MWHUT room to check the above listed valves CLOSED:

- RWP number: _____
- RWP Task number: _____
- Dose Alarm setpoint: _____
- Dose Rate Alarm setpoint: _____
- Dress Category: _____

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	RWP	Determine the RWP to be used <u>STANDARD:</u> Candidate determines that RWP #23 is for Routine Plant and Systems Operation (Operations) and selects this RWP. <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
2	RWP TASK	Determine the RWP Task to be used <u>STANDARD:</u> Candidate reviews the provided plan view and determines that the work will require entry into a High Radiation Area which requires Task #2. <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
3	RWP TASK	Determine the Dose and Dose Rate setpoints in accordance with the correct RWP/Task number <u>STANDARD:</u> Candidate reviews RWP 23 Task 2 and determines that the setpoints are as follows: • Dose Alarm = 25 mrem • Dose Rate Alarm = 500 mrem/hr <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
4	RWP TASK	Determine the Dress Category for protective clothing requirements <u>STANDARD:</u> Candidate determines from the Plan View that the area is both High Radiation and Contaminated so the Task requires Category H. <u>COMMENTS:</u> END TASK	CRITICAL STEP ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	Critical to determine that RWP 23 is the correct one to use
2	Critical since some of the RP requirements for Task 2 are different from Task 1
3	Critical since proper ED setpoints provide personnel protection
4	Critical to prevent personnel contamination during performance of the task

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Over the last several days there has been a slow unexplained drop in Miscellaneous Waste Holdup Tank (MWHUT) level and a corresponding slow rise in High Activity Waste Tank (HAWT) level.

Due to possible leakage past the seat, the Unit 1 CRS has directed you to go to the Unit 1&2 MWHUT room and verify the following valves (located in a congested area one foot underneath the MWHUT) are CLOSED:

- LWD-970 (1A MWHUT Drain Block to HAWT)
- LWD-972 (1B MWHUT Drain Block to HAWT)

INITIATING CUE

Determine the following requirements for entry into the MWHUT room to check the above listed valves CLOSED:

- RWP number: _____
- RWP Task number: _____
- Dose Alarm setpoint: _____
- Dose Rate Alarm setpoint: _____
- Dress Category: _____

REGION II JOB PERFORMANCE MEASURE OCONEE

ADM-S124 DETERMINE MINIMUM SHIFT STAFFING

Administrative: Yes

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **NONE**

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Unit 1 = 100% power

- OAC OOS for the last 3 hours

Unit 2 = 48% power

- 2A HPI Pump OOS for the last 76 hours

Unit 3 = RFO

- Core off-load in progress
- U3 SFP Time to Boil = 3 hours and 11 minutes

None of the AOs/ROs are qualified Shift Communicator

All of the AOs are qualified Fire Brigade Leader

Keowee/Chemistry/RP/Security/Fire Brigade Members are fully staffed

INITIATING CUE

What are the **MINIMUM** staffing requirements using the **MINIMUM** number of licensed (RO/SRO) personnel for the shift?

Assume all SRO licensed personnel are active for all SRO assignments

Position	Minimum Number
Shift Manager (SM)	
Shift Technical Advisor (STA)	
Senior Reactor Operator (SRO)*	
Reactor Operator (RO)	
Auxiliary Operator (AO)	
Shift Maintenance	

*Number does NOT include SM and STA positions

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION															
1	SLC	Reference SLC 16.13.1 <u>STANDARD:</u> Candidate reference SLC 16.13.1 for the given plant conditions <u>COMMENTS:</u>	___ SAT ___ UNSAT														
2	SLC TAB COL #3	Reference SLC 16.13.1-1 Table to determine starting staff based upon the Modes of Operation <u>STANDARD:</u> Candidate determines that Column #3 (TWO UNITS IN MODE 1-4 CONTROLLED FROM ONE CONTROL ROOM) applies since Unit 1 and 2 are in MODE 1 and Unit 3 is in MODE 6 <table border="1"> <thead> <tr> <th>Position</th><th>Minimum Number</th></tr> </thead> <tbody> <tr> <td>Shift Manager (SM)</td><td>1</td></tr> <tr> <td>Shift Technical Advisor (STA)</td><td>1</td></tr> <tr> <td>Senior Reactor Operator (SRO)*</td><td>3</td></tr> <tr> <td>Reactor Operator (RO)</td><td>6</td></tr> <tr> <td>Auxiliary Operator (AO)</td><td>8</td></tr> <tr> <td>Shift Maintenance</td><td>4</td></tr> </tbody> </table> <i>Examiner NOTE: The Minimum Numbers provided in the Table above will be further modified by the Notes below the table in SLC 16.13.1</i> <u>COMMENTS:</u>	Position	Minimum Number	Shift Manager (SM)	1	Shift Technical Advisor (STA)	1	Senior Reactor Operator (SRO)*	3	Reactor Operator (RO)	6	Auxiliary Operator (AO)	8	Shift Maintenance	4	CRITICAL STEP ___ SAT ___ UNSAT
Position	Minimum Number																
Shift Manager (SM)	1																
Shift Technical Advisor (STA)	1																
Senior Reactor Operator (SRO)*	3																
Reactor Operator (RO)	6																
Auxiliary Operator (AO)	8																
Shift Maintenance	4																

SEQ STEP	PROC STEP	DESCRIPTION															
3	SLC TAB NTs	Reference the NOTES below SLC 16.13.1 Staffing Table to modify the SRO required numbers, as appropriate:															
		NOTE 1: SRO or AO number must be increased by one for whichever position is serving as Fire Brigade Leader															
		*NOTE 2: SRO, RO, or AO number must be increased by one for whichever position is serving as the Shift Communicator															
		*NOTE 3: SRO number must be increased by one for each unit performing CORE ALTERATIONS per SLC 16.13.1.a.2															
		<u>STANDARD:</u> Candidate determines that the SRO is not affected by NOTE 1 (since the cue sheet guidance is to use the MINIMUM number of licensed personnel. NOTE 2 requires one additional SRO for Communicator and NOTE 3 requires one additional SRO for CORE ALTERATIONS on Unit 3. Therefore, the MINIMUM number of SROs has risen from 3 to 5.	*CRITICAL STEP														
		<table><tr><th>Position</th><th>Minimum Number</th></tr><tr><td>Shift Manager (SM)</td><td>1</td></tr><tr><td>Shift Technical Advisor (STA)</td><td>1</td></tr><tr><td>Senior Reactor Operator (SRO)*</td><td>3 + 2 = 5</td></tr><tr><td>Reactor Operator (RO)</td><td>6</td></tr><tr><td>Auxiliary Operator (AO)</td><td>8</td></tr><tr><td>Shift Maintenance</td><td>4</td></tr></table>	Position	Minimum Number	Shift Manager (SM)	1	Shift Technical Advisor (STA)	1	Senior Reactor Operator (SRO)*	3 + 2 = 5	Reactor Operator (RO)	6	Auxiliary Operator (AO)	8	Shift Maintenance	4	___ SAT
		Position	Minimum Number														
		Shift Manager (SM)	1														
		Shift Technical Advisor (STA)	1														
		Senior Reactor Operator (SRO)*	3 + 2 = 5														
Reactor Operator (RO)	6																
Auxiliary Operator (AO)	8																
Shift Maintenance	4																
	___ UNSAT																
	<u>COMMENTS:</u>																

SEQ STEP	PROC STEP	DESCRIPTION															
4	SLC TAB NTs	Reference the NOTES below SLC 16.13.1 Staffing Table to modify the RO required numbers, as appropriate: NOTE 2: SRO, RO, or AO number must be increased by one for whichever position is serving as the Shift Communicator *NOTE 4: RO number must be increased by one when in TS 3.5.2 Conditions B or C <u>STANDARD:</u> Candidate determines that the RO is not affected by NOTE 2 since the cue sheet guidance is none of the ROs are qualified as Communicator. NOTE 4 requires one additional RO since Unit 2 is in TS 3.5.2 Condition B for the 2A HPI Pump. Therefore, the MINIMUM number of ROs has risen from 6 to 7. <i>Examiner NOTE: TS 3.5.2 High Pressure Injection (HPI) Condition A applies for having one HPIP inoperable. If the pump is not repaired within 72 hours, then enter Condition B. Per the cue sheet, the 2A HPIP has been inoperable for 76 hours.</i> <table><tr><th>Position</th><th>Minimum Number</th></tr><tr><td>Shift Manager (SM)</td><td>1</td></tr><tr><td>Shift Technical Advisor (STA)</td><td>1</td></tr><tr><td>Senior Reactor Operator (SRO)*</td><td>5</td></tr><tr><td>Reactor Operator (RO)</td><td>6 + 1</td></tr><tr><td>Auxiliary Operator (AO)</td><td>8</td></tr><tr><td>Shift Maintenance</td><td>4</td></tr></table> <u>COMMENTS:</u>	Position	Minimum Number	Shift Manager (SM)	1	Shift Technical Advisor (STA)	1	Senior Reactor Operator (SRO)*	5	Reactor Operator (RO)	6 + 1	Auxiliary Operator (AO)	8	Shift Maintenance	4	*CRITICAL STEP ___ SAT ___ UNSAT
Position	Minimum Number																
Shift Manager (SM)	1																
Shift Technical Advisor (STA)	1																
Senior Reactor Operator (SRO)*	5																
Reactor Operator (RO)	6 + 1																
Auxiliary Operator (AO)	8																
Shift Maintenance	4																

SEQ STEP	PROC STEP	DESCRIPTION															
5	SLC TAB NTs	Reference the NOTES below SLC 16.13.1 Staffing Table to modify the AO required numbers, as appropriate: NOTE 1: SRO or AO number must be increased by one for whichever position is serving as Fire Brigade Leader *NOTE 2: SRO, RO, or AO number must be increased by one for whichever position is serving as the Shift Communicator *NOTE 5: AO number must be increased by two when in TS 3.5.2 Conditions B or C NOTE 6: AO number must be increased by one when Underground KHU credited for TS 3.7.10 and less than two Keowee Operators NOTE 7: When all three units are in MODE 4, 5,6 or No MODE... <u>STANDARD:</u> Candidate determines that AO is increased by one per NOTE 1. AOs unaffected by NOTE 2 since none of the AOs are qualified as Communicator. NOTE 5 requires two additional AOs since Unit 2 is in TS 3.5.2 Condition B for the 2A HPI Pump. NOTES 6 and 7 don't apply based on given conditions. Therefore, the MINIMUM number of AOs has risen from 8 to 11. <i>Examiner NOTE: Same note as SEQ STEP 4</i> <table><tr><th>Position</th><th>Minimum Number</th></tr><tr><td>Shift Manager (SM)</td><td>1</td></tr><tr><td>Shift Technical Advisor (STA)</td><td>1</td></tr><tr><td>Senior Reactor Operator (SRO)*</td><td>5</td></tr><tr><td>Reactor Operator (RO)</td><td>7</td></tr><tr><td>Auxiliary Operator (AO)</td><td>8 + 3</td></tr><tr><td>Shift Maintenance</td><td>4</td></tr></table> <u>COMMENTS:</u>	Position	Minimum Number	Shift Manager (SM)	1	Shift Technical Advisor (STA)	1	Senior Reactor Operator (SRO)*	5	Reactor Operator (RO)	7	Auxiliary Operator (AO)	8 + 3	Shift Maintenance	4	*CRITICAL STEP ___ SAT ___ UNSAT
Position	Minimum Number																
Shift Manager (SM)	1																
Shift Technical Advisor (STA)	1																
Senior Reactor Operator (SRO)*	5																
Reactor Operator (RO)	7																
Auxiliary Operator (AO)	8 + 3																
Shift Maintenance	4																

SEQ STEP	PROC STEP	DESCRIPTION															
6	SLC TAB NTs	Reference the NOTES below SLC 16.13.1 Staffing Table to modify the Shift Maintenance required numbers, as appropriate:															
		NOTE 7: When all three units are in MODE 4, 5,6 or No MODE...															
		*NOTE 9: Shift Maintenance number must be increased by two when time to boil for the Spent Fuel Pool (SFP) is less than 12 hours															
		<u>STANDARD:</u> Candidate determines that NOTE 7 doesn't apply based upon plant conditions on the cue sheet. NOTE 9 requires two additional Maintenance personnel since Unit 3 SFP Time to Boil is less than 12 hours, per the cue sheet. Therefore, the MINIMUM number of Maintenance personnel has risen from 4 to 6.	*CRITICAL STEP														
		<table><tr><th>Position</th><th>Minimum Number</th></tr><tr><td>Shift Manager (SM)</td><td>1</td></tr><tr><td>Shift Technical Advisor (STA)</td><td>1</td></tr><tr><td>Senior Reactor Operator (SRO)*</td><td>5</td></tr><tr><td>Reactor Operator (RO)</td><td>7</td></tr><tr><td>Auxiliary Operator (AO)</td><td>11</td></tr><tr><td>Shift Maintenance</td><td>4 + 2</td></tr></table>	Position	Minimum Number	Shift Manager (SM)	1	Shift Technical Advisor (STA)	1	Senior Reactor Operator (SRO)*	5	Reactor Operator (RO)	7	Auxiliary Operator (AO)	11	Shift Maintenance	4 + 2	___ SAT
		Position	Minimum Number														
		Shift Manager (SM)	1														
		Shift Technical Advisor (STA)	1														
		Senior Reactor Operator (SRO)*	5														
		Reactor Operator (RO)	7														
Auxiliary Operator (AO)	11																
Shift Maintenance	4 + 2																
	___ UNSAT																
	<u>COMMENTS:</u>																

SEQ STEP	PROC STEP	DESCRIPTION															
7	SLC TAB NTs	Determine total staffing requirements <u>STANDARD:</u> Candidate applies all of the NOTES beneath the staffing table in SLC 16.13.1 and documents minimum staffing as follows: <table border="1"> <thead> <tr> <th>Position</th> <th>Minimum Number</th> </tr> </thead> <tbody> <tr> <td>Shift Manager (SM)</td> <td>1</td> </tr> <tr> <td>Shift Technical Advisor (STA)</td> <td>1</td> </tr> <tr> <td>Senior Reactor Operator (SRO)*</td> <td>5</td> </tr> <tr> <td>Reactor Operator (RO)</td> <td>7</td> </tr> <tr> <td>Auxiliary Operator (AO)</td> <td>11</td> </tr> <tr> <td>Shift Maintenance</td> <td>6</td> </tr> </tbody> </table> <u>COMMENTS:</u> END OF TASK	Position	Minimum Number	Shift Manager (SM)	1	Shift Technical Advisor (STA)	1	Senior Reactor Operator (SRO)*	5	Reactor Operator (RO)	7	Auxiliary Operator (AO)	11	Shift Maintenance	6	___ SAT ___ UNSAT
Position	Minimum Number																
Shift Manager (SM)	1																
Shift Technical Advisor (STA)	1																
Senior Reactor Operator (SRO)*	5																
Reactor Operator (RO)	7																
Auxiliary Operator (AO)	11																
Shift Maintenance	6																

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
2	This step is required to determine the minimum plant staffing based upon the MODE that each Oconee unit is in per SLC 16.13.1
3	This step is required to determine the minimum SRO staffing allowed in accordance with SLC 16.13.1
4	This step is required to determine the minimum RO staffing allowed in accordance with SLC 16.13.1
5	This step is required to determine the minimum AO staffing allowed in accordance with SLC 16.13.1
6	This step is required to determine the minimum Maintenance staffing allowed in accordance with SLC 16.13.1

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 = 100% power

- OAC OOS for the last 3 hours

Unit 2 = 48% power

- 2A HPI Pump OOS for the last 76 hours

Unit 3 = RFO

- Core off-load in progress
- U3 SFP Time to Boil = 3 hours and 11 minutes

None of the AOs/ROs are qualified Shift Communicator

All of the AOs are qualified Fire Brigade Leader

Keowee/Chemistry/RP/Security/Fire Brigade Members are fully staffed

INITIATING CUE

What are the **MINIMUM** staffing requirements using the **MINIMUM** number of licensed (RO/SRO) personnel for the shift?

Assume all SRO licensed personnel are active for all SRO assignments

Position	Minimum Number
Shift Manager (SM)	
Shift Technical Advisor (STA)	
Senior Reactor Operator (SRO)*	
Reactor Operator (RO)	
Auxiliary Operator (AO)	
Shift Maintenance	

*Number does NOT include SM and STA positions

**REGION II
JOB PERFORMANCE MEASURE
OCONEE**

ADM-S140

**PERFORM A POWER IMBALANCE VERIFICATION
AND DETERMINE ANY ASSOCIATED TS
REQUIREMENTS**

SRO ONLY

Perform on the same day as ADM-117

Administrative: Yes

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

REGION II JOB PERFORMANCE MEASURE

Task Title: Perform a power imbalance verification and determine any associated TS requirements.

Task Number: N/A

Alternate Path: No

Time Critical: No

Validation Time: 35 minutes

K/A Rating(s):

System: Generic

K/A: 2.1.7

Rating: 4.4/4.7

Task Standard:

Candidate determines that Axial Power Imbalance is NOT within the limits of the COLR. Determine that the minimum Incore Detectors are NOT operable and SLC 16.7.8 applies. Since four RCPs are operating, reduce power below 80% within 8 hours. Determine average imbalance using Outcores is -17.8% and requires entry into TS 3.2.2 Condition A. If acceptable imbalance not achieved within 2 hours, enter TS 3.2.2 Condition B.

References:

PT/1/A/0600/001 (Periodic Instrument Surveillance) procedure and Enclosures 13.1 Rev 348

OP/1/A/1105/014 (Control Room Instrumentation Operation and Information) Rev 56

Core Operating Limits Report Oconee 1 Cycle 33 Rev 1

PT/0/A/1103/019 (Backup Incore Detector System) Rev 7

Tools/Equipment/Procedures Needed:

PT/1/A/0600/001 (Periodic Instrument Surveillance) procedure and Enclosures 13.1 **(Electronic)** Rev 348

OP/1/A/1105/014 (Control Room Instrumentation Operation and Information) **(Paper)** Rev 56

Core Operating Limits Report Oconee 1 Cycle 33 **(Paper)** Rev 1

PT/0/A/1103/019 (Backup Incore Detector System) **(Paper)** Rev 7

(Note: Below this line is used only for Initial NRC Exams)

Candidate: _____

NAME

Time Start: _____

Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____

NAME

SIGNATURE

DATE

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **NONE**

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Unit 1 is at 100% power for seven days

The Reactor Calculation package is NOT running

PT/1/A/0600/001 (Periodic Instrument Surveillance), Enclosure 13.1 (Mode 1 & 2) has been completed up to page 7, Axial Power Imbalance Operating Limits

INITIATING CUE

The SRO directs you to:

1. Determine Axial Power Imbalance and evaluate against the operational alarm limits in the COLR in accordance with PT/1/A/0600/001 (Periodic Instrument Surveillance) and determine any required actions
2. Verify the minimum Backup Incore Detector points are operable per PT/0/A/1103/019 (Backup Incore Detector System) and determine any required actions

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	PT 600 /001 Encl. 13.1 Pg7	PT/1/A/0600/001, SR 3.2.2.1 Axial Power Imbalance Operating Limits: IF > 40% RTP, verify Power imbalance within operational alarm limits in COLR. IF Reactor Calculations package is <u>NOT</u> running on computer, refer to OP/1/A/1105/014 (Control Room Instrumentation Operation And Information). <u>STANDARD:</u> Determine reactor power is greater than 40%. Determine Reactor Calculation package is <u>NOT</u> running per Initial Conditions and refer to OP/1/A/1105/014 (Control Room Instrumentation Operation And Information). <u>COMMENTS:</u>	___ SAT ___ UNSAT
2	OP 1105 /014 Encl. 4.14 3.2.3	OP/1/A/1105/014 Encl. 4.14 (Reactor Parameter Information) <u>IF</u> Reactor Calculations package is <u>NOT</u> running, verify minimum incore detector operability requirements are met. Refer to PT/0/A/1103/019 (Backup Incore Detector System). <u>STANDARD:</u> Determine Reactor Calculations package is NOT running per initial conditions. Candidate refers to PT/0/A/1103/019 (Backup Incore Detector System) to verify the minimum incore detector operability requirements are met. <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
3	PT 1103 /019 12.2	<u>IF</u> backup Incore recorders are operable, on Enclosure 13.1 (Required Backup Recorder Points for Calculating Axial Power Imbalance) and 13.2 (Required Backup Recorder Points for Calculating Quadrant Power Tilt) place an 'X' next to the backup recorder points which are inoperable as indicated by off-scale readings <u>OR</u> notes attached to the recorders. <u>STANDARD:</u> Perform Enclosure 13.1 and determine that there are <u>not sufficient</u> recorder points for calculating Axial Imbalance. Perform Enclosure 13.2 and determine that there are not sufficient recorder points for calculating Quadrant Power Tilt. <i>Examiner Note: Candidate is directed to verify Axial Imbalance on the cue sheet, and is not required to perform the steps associated with Tilt.</i> <u>COMMENTS:</u>	___ SAT ___ UNSAT
4	PT 1103 /019 12.3	Perform <u>ONE</u> of the following: ___ 12.3.1 Verify required backup recorder points are operable (acceptance criteria 11.1.1 and 11.1.2) • *All three required points on at least three detector strings are operable per instructions on Enclosure 13.1 (Required Backup Recorder Points for Calculating Axial Power Imbalance) • All four required points on at least four groupings (two groupings in each axial core half) are operable per instructions on Enclosure 13.2 (Required Backup Recorder Points for Calculating Quadrant Power Tilt) <u>STANDARD:</u> *Determine the minimum Incore detector operability requirements are NOT met on Enclosure 13.1 (Acceptance Criteria 11.1.1 NOT met). Determine the minimum Incore detector operability requirements are NOT met on Enclosure 13.2 (Acceptance Criteria 11.1.2 NOT met). <i>Examiner Note: Candidate is directed to verify Axial Imbalance on the cue sheet, and is not required to perform the steps associated with Tilt.</i> <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
5	PT 1103 /019 12.3 cont	Perform <u>ONE</u> of the following: ___ 12.3.2 IF 12.3.1 CANNOT be verified, A. *Enter SLC 16.7.8 (CRS) B. IF AT ANY TIME backup recorder points restored... C. *IF four RCPs are operating AND SLC 16.7.8 is entered, reduce power below 80% FP within eight hours of entering SLC 16.7.8. D. IF three RCPs are operating AND SLC 16.7.8 is entered, reduce power below 61.5% FP within eight hours of entering SLC 16.7.8. <u>STANDARD:</u> Candidate should notify the CRS to enter SLC 16.7.8 and to reduce power below 80% FP within eight hours of entering SLC 16.7.8. <u>COMMENTS:</u>	*CRITICAL STEP ___ SAT ___ UNSAT
6	PT 1103 /019 12.4	IF performing this procedure to calculate axial imbalance AND quadrant power tilt,... <u>STANDARD:</u> Candidate determines this step does not apply since tilt isn't being calculated. Step is marked N/A. <u>COMMENTS:</u>	___ SAT ___ UNSAT
7	OP 1105 /014 3.2.4	Order of preference of measurement systems to determine axial imbalance and quadrant power tilt is as follows: A. Incore Detectors (Computer Reactor Calculation Package). B. Outcore Detectors (Power Range Outcore Detectors). C. Backup Incore Detectors. Refer to PT/0/A/1103/019 (Backup Incore Detector System). <u>STANDARD:</u> Candidate reviews step and determines Outcore Detectors should be used. Continues to Step 3.2.5. <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
8	OP 1105 /014 3.2.5	IF at least one power range outcore detector is NOT operable in each quadrant (NI-5 thru NI-8), outcore detectors shall NOT be used to measure axial imbalance or quadrant power tilt. STANDARD: Candidate determines NI-5 thru NI-8 are operable and can be used to measure axial imbalance. Continues to Step 3.2.6. COMMENTS:	___ SAT ___ UNSAT
9	OP 1105 /014 3.2.6	IF Outcore Detectors (Power Range Outcore Detectors) are needed for tilt calculations, contact Rx Engineering group to perform PT/0/A/1103/018 (Excore Tilt Calculations). STANDARD: Determine this step does not apply because they are not determining tilt calculation at this time. EXAMINER CUE: <i>If asked, notify the candidate that tilt calculations are not required.</i> COMMENTS:	___ SAT ___ UNSAT
10	OP 1105 /014 3.2.7	IF Outcore Detectors (Power Range Outcore Detectors) are needed for imbalance calculations, refer to the following alternate method for determining (%) Reactor Power Axial Imbalance: $\frac{NI-5^* + NI-6^* + NI-7^* + NI-8^*}{4} = \% \text{ Imbalance (Avg.)}$ * Use Imbalance CR gauges reading for each NI. STANDARD: Using the attached NI graphic determine % Imbalance (Avg.) is: $(-17.8 + -17.9 + -17.6 + -17.9)/4 = -17.8\%$. Candidate will compare this value to the limits in the COLR. COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
11	OP 1105 /014 3.2	Reactor Power Axial Imbalance and Quadrant Power Tilt: 3.2.1 Axial Imbalance shall <u>NOT</u> exceed appropriate limit curve in COLR. A. <u>IF</u> axial imbalance limit is exceeded, enter TS 3.2.2 Condition A. B. <u>IF</u> an acceptable imbalance is <u>NOT</u> achieved within 2 hours, enter TS 3.2.2 Condition B <u>STANDARD:</u> Determine the calculated outcore imbalance (-17.8%) is <u>NOT</u> within the limit (-17.7%) for current plant conditions. Notify the supervisor of the following: Enter TS 3.2.2 Condition A and restore Axial Imbalance to within limits within 2 hours. If imbalance not restored, enter TS 3.2.2 Condition B. <u>COMMENTS:</u> END TASK	CRITICAL STEP ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
4	This step is required to determine backup recorder operability
5	This step is required to required actions for recorder inoperability (SLC)
10	This step is required to determine average imbalance
11	This step is required to determine if average imbalance is within limits

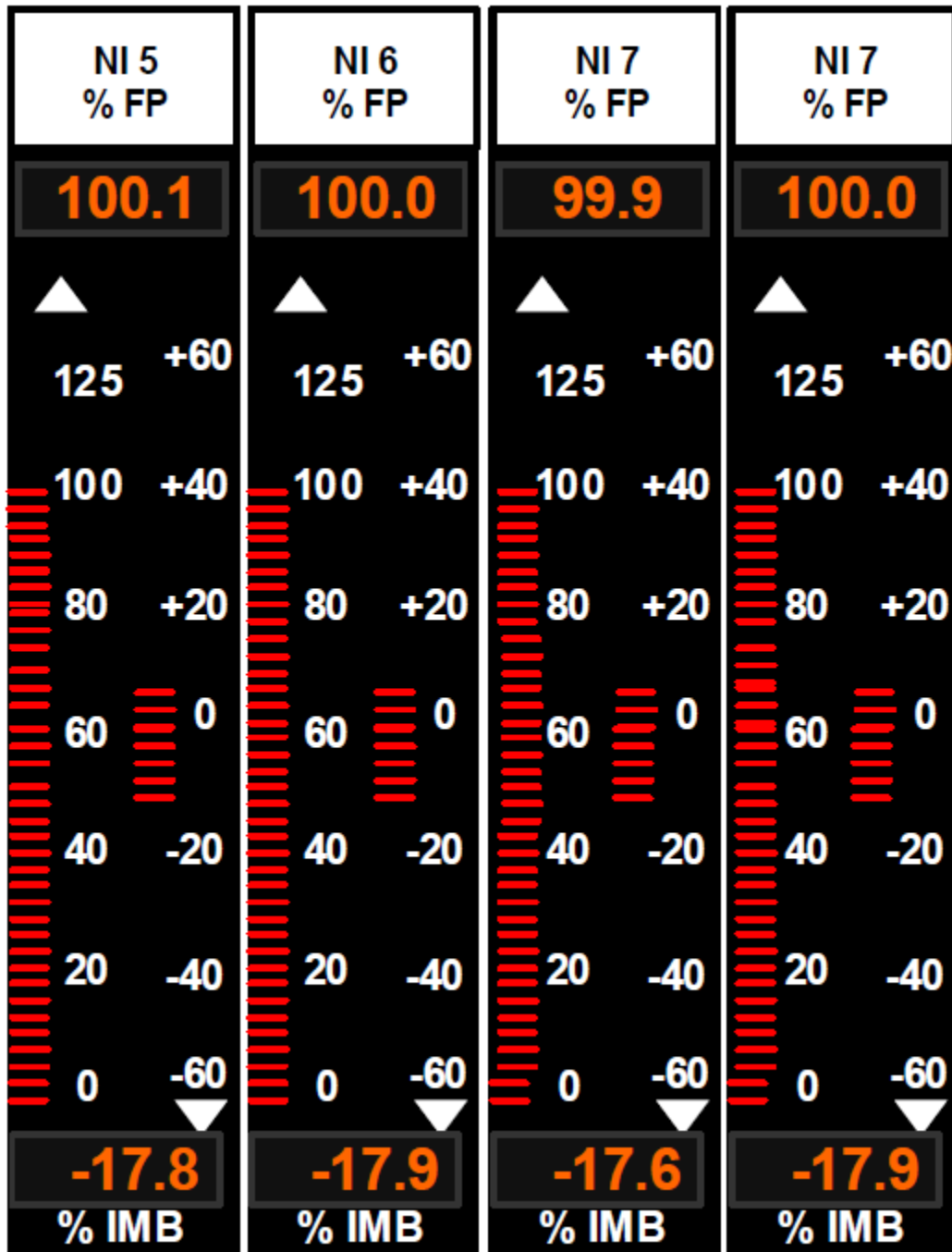
BACKUP INCORE CHART “A”		
POINT #	%	Location
1	132.7	G09-L2
2	*OOS	G09-L4
3	138.0	G09-L6
4	143.1	E09-L2
5	133.3	E09-L4
6	*OOS	E09-L6
7	128.8	G05-L2
8	154.1	G05-L6
9	133.8	M07-L2
10	*OOS	M07-L6
11	133.8	K11-L2
12	145.6	K11-L6
13	142.5	F13-L2
14	144.4	D05-L2
15	133.8	F13-L4
16	*OOS	C06-L2
17	*OOS	C06-L6
18	144.5	F13-L6
19	*OOS	O10-L6
20	*OOS	L03-L6
21	*OOS	L03-L2
22	*OOS	D05-L6
23	*OOS	O10-L2
24	122.9	D05-L4

BACKUP INCORE CHART “B”		
POINT #	%	Location
1	*OOS	E-07-L6
2	142.5	G11-L6
3	128.8	M09-L6
4	132.7	K05-L6
5	133.3	K05-L4
6	*OOS	L06-L2
7	*OOS	L06-L4
8	*OOS	L06-L6
9	*OOS	M09-L2
10	154.1	K05-L2
11	138.0	G11-L2
12	*OOS	E07-L2
13	133.8	C10-L2
14	145.6	C10-L6
15	*OOS	F03-L2
16	122.9	F03-L6
17	*OOS	N04-L2
18	144.4	N04-L4
19	*OOS	N04-L6
20	145.0	O06-L2
21	136.1	O06-L4
22	133.8	O06-L6
23	*OOS	L13-L2
24	133.8	L13-L6

Note: Listed points with values are “in calibration”.

* Work Request written

POWER RANGE NIs



CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 is at 100% power for seven days

The Reactor Calculation package is NOT running

PT/1/A/0600/001 (Periodic Instrument Surveillance), Enclosure 13.1 (Mode 1 & 2) has been completed up to page 7, Axial Power Imbalance Operating Limits

INITIATING CUE

The SRO directs you to:

1. Determine Axial Power Imbalance and evaluate against the operational alarm limits in the COLR in accordance with PT/1/A/0600/001 (Periodic Instrument Surveillance) and determine any required actions
2. Verify the minimum Backup Incore Detector points are operable per PT/0/A/1103/019 (Backup Incore Detector System) and determine any required actions

REGION II
JOB PERFORMANCE MEASURE
OCONEE

ADM-S246

**DETERMINE ALL TECH SPEC AND SLC LCO'S THAT
ARE NOT MET
SRO ONLY**

Administrative: Yes

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

1. **NONE**

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

All Oconee Units operating at 100% power

Engineering reports that BOTH the A and B LPSW pump recirculation lines are inoperable

No other plant equipment is INOPERABLE at this time

INITIATING CUE

CRS directs you to determine ALL Tech Spec and SLC LCOs, if any, that are NOT met for Unit 1 including associated Required Actions and Completion times

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	SLC 16. 9.12	Refer to SLC 16.9.12 <u>STANDARD:</u> Refer to SLC 16.9.12 and determine that Conditions E and F must be entered. SLC 16.9.12 Cond E states: One required LPSW pump minimum flow recirculation line inoperable (restore in 72 hours) SLC 16.9.12 Cond F states: Two or more Unit 1 and 2 LPSW pump minimum recirculation lines when three LPSW pumps are required to be OPERABLE by TS 3.7.7 (Declare affected (A and B) LPSW Pumps inoperable immediately) <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT
2	TS	Refer to TS 3.7.7 <u>STANDARD:</u> Refer to TS 3.7.7 and determine: TS 3.7.7 (LPSW System) Condition A must be entered. Condition A states: One required LPSW pump inoperable Required Action: Restore required LPSW pump to OPERABLE status Completion Time: 72 hours <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
3	TS	Refer to TS LCO 3.0.3 <u>STANDARD:</u> Since TS 3.7.7 does not have a condition for two LPSW pumps inoperable, then the candidate is required to enter TS 3.0.3. Required Action: Action shall be initiated within 1 hour to place the unit, as applicable, in: a. MODE 3 within 12 hours: b. MODE 4 within 18 hours; and c. MODE 5 within 37 hours <u>COMMENTS:</u>	CRITICAL STEP ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
1	This step is required to determine that SLC 16.9.12 Conditions E and F are entered due to both LPSW pump recirculation lines being inoperable
2	This step is required to determine that TS 3.7.7 Condition A is entered due to one LPSW pump being inoperable
3	This step is required to determine that TS 3.0.3 is entered since TS 3.7.7 does not have a condition for both LPSW pumps being inoperable

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

All Oconee Units operating at 100% power

Engineering reports that BOTH the A and B LPSW pump recirculation lines are inoperable

No other plant equipment is INOPERABLE at this time

INITIATING CUE

CRS directs you to determine ALL Tech Spec and SLC LCOs, if any, that are NOT met for Unit 1 including associated Required Actions and Completion times

REGION II
JOB PERFORMANCE MEASURE
OCONEE

ADM-S301
Determine RIA Setpoints and Approval Level
Required for GWD Tank Release

(MUST BE PERFORMED SAME DAY AS CR JPM RO-702)

Administrative: Yes

Classroom/Simulator/Plant: Classroom

Alternate Path: No

Alt Path Description: _____

Time Critical: No

Time Critical Criteria: _____

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

REGION II JOB PERFORMANCE MEASURE

Task Title : Determine RIA Setpoints and Approval Level Required for GWD Tank Release

Task Number :

Alternate Path: No

Time Critical: No

Validation Time: 25 min

K/A Rating(s):

System: GEN

K/A: 2.3.6

Rating: 2.0/3.8

Task Standard:

Determine setpoints for 1RIA-37, 1RIA-38, 1RIA-45 and approval level required to release A GWD Tank as follows:

- Determine the setpoints for 1RIA-45 per PT/0/A/0230/001 (Radiation Monitor Check):
 - Alert: 4.66 E4 CPM / High: 1.40 E5 CPM
- Determine 1RIA-37 Alert and High setpoints by adding 4.68 E5 to 1RIA-37 background (4.25 E2):
 - Alert: 4.68 E5 to 4.69 E5 CPM / High: 4.68 E5 to 4.69 E5 CPM
- Determine 1RIA-38 Alert and High setpoints by adding 3.82 E2 to 1RIA-38 background (2.4 E1):
 - Alert: 4.06 E2 / High: 4.06 E2
- Determine the approval level for 2 GWRs in progress at 1/3 Station Limit each is the SM.

References:

OP/1-2/1104/018 (GWD System) Rev. 79

PT/0/A/0230/001 (Radiation Monitor Check) Rev. 176

Tools/Equipment/Procedures Needed:

OP/1-2/A/1104/018 Encl. 4.9 (GWD Tank Release) Rev. 79

OP/1-2/A/1104/018 Encl. 4.10 (GWD Tank Sample Request) Rev. 79

(Note: Below this line is used only for Initial NRC Exams)

Candidate: _____

NAME

Time Start: _____

Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____

NAME

SIGNATURE

DATE

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

N/A

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Unit 1 in Mode 1 at 100% power

Unit 2 in Mode 1 at 100% power

Unit 3 in Mode 5 with RB Purge in progress at 1/3 Station Limit

OP/1-2/A/1104/018 Encl. 4.9 (GWD Tank Release) in progress at step 3.1 for release of A GWD Tank.

Steps for prior to GWD Tank release in PT/1-2/A/0230/002 (GWD Tank Release) are complete.

1RIA-37 background reading = 425 cpm

1RIA-38 background reading = 24 cpm

A GWD Tank pressure = 70 psig

GWD piping is purged

INITIATING CUE

1. Continue in OP/1-2/A/1104/018 Encl. 4.9 beginning at step 3.1 to determine the setpoints for 1RIA-37, 1RIA-38, and 1RIA-45. Another operator will input the setpoints, once determined, into the RIAs as required by the procedure.

Document your answers below:

1RIA-37 Setpoints	1RIA-38 Setpoints	1RIA-45 Setpoints
Alert:	Alert:	Alert:
High:	High:	High:

2. Determine the MINIMUM approval level required to release A GWD Tank in accordance with OP/1-2/A/1104/018 (GWD System).

Document your answer below:

MINIMUM approval level required to release A GWD Tank. _____

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	3.1	Determine any other GWR(s) in progress at station: Releases in Progress Release Rate of Station Limit Unit 1 ☐ Yes ☐ No _____ Unit 2 ☐ Yes ☐ No _____ Unit 3 ☐ Yes ☐ No _____ <u>STANDARD:</u> Candidate determines a release is in progress on Unit 3 at 1/3 Station Limit from the cue sheet. <u>COMMENTS:</u>	____ SAT ____ UNSAT
2	3.2	Perform steps for <u>prior to GWD Tank release</u> in PT/1-2/A/0230/002 (GWD Tank Release). <u>STANDARD:</u> Candidate determines steps for <u>prior to GWD Tank release</u> in PT/1-2/A/0230/002 (GWD Tank Release) are complete from the cue sheet. <u>COMMENTS:</u>	____ SAT ____ UNSAT
3	3.3	Ensure RIA setpoints adjusted for GWD Tank release per RIA-45 Setpoints For Unit 1&2 GWD Tank Release enclosure of PT/0/A/0230/001 (Radiation Monitor Check). <u>STANDARD:</u> Candidate determines the setpoints for 1RIA-45 as follows: ALERT: 4.66 E4 CPM HIGH: 1.40 E5 CPM <u>COMMENTS:</u>	CRITICAL STEP ____ SAT ____ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
4	3.4	Perform the following on Enclosure 4.10 (GWD Tank Sample Request): 3.4.1 Record Initial GWD Tank Pressure AND GWD Tank Volume 3.4.2 Record Start Date AND Time 3.4.3 Record background readings for 1RIA-37 AND 1RIA-38 <u>STANDARD:</u> Determine A GWD tank pressure is 70 psig by referring to the cue sheet and record on Enclosure 4.10. Determine GWD Tank Volume is $\approx$ 6300 Ft³ (6200 – 6400) by using the curve in OP/1108/001 (General Curves and Information) and record on Enclosure 4.10. Use current date/time Determine background readings for 1RIA-37 & 1RIA-38 by referring to the cue sheet and record on Enclosure 4.10. 1RIA-37 Background reading is 425 or 4.25E2 cpm 1RIA-38 Background reading is 24 or 2.4E1 cpm Continue to Step 3.5 <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
5	3.5	Record recommended 1RIA-37 and 38 Alert and High setpoints from Enclosure 4.10 (GWD Tank Sample Request): 1RIA-37 4.68 E5 cpm above background 1RIA-38 3.82 E2 cpm above background <u>STANDARD:</u> Obtain this information from the sample request and record in the procedure. Continue to Step 3.6 <u>COMMENTS:</u>	___ SAT ___ UNSAT
6	3.6	NOTE: If N₂ was added to the most recently released GWD tank until 1RIA-37 indicated < 700 cpm, OR if the tanks' radioactivity was < 2.1E-05μCi/ml when it was released, the GWD piping is considered "purged". <u>IF</u> 1RIA-37 is out-of-service <u>OR</u> GWD piping <u>NOT</u> purged, verify the following per Enclosure 4.10 (GWD Tank Sample Request): - Independent Data Entry Checks completed - Independent Sample agrees with initial sample <u>STANDARD:</u> Determine step does not apply and N/A the step. Continue to Step 3.7 <i>Examiner Cue: If asked, inform the candidate that the GWD piping is purged.</i> <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
7	3.7	NOTE: If N₂ was added to the most recently released GWD tank until 1RIA-37 indicated < 700 cpm, OR if the tanks' radioactivity was < 2.1E-05μCi/ml when it was released, the GWD piping is considered "purged".	CRITICAL STEP ___ SAT ___ UNSAT
		IF GWD piping purged, calculate actual setpoints as follows: 3.7.1 IF 1RIA-37 Operable, calculate Alert and High setpoints as follows: $\frac{4.25E2}{1RIA-37 \text{ background}} \text{ cpm} + \frac{4.68E5}{\text{'Add to background' value from Step 3.5}} = \frac{4.68E5}{1RIA-37 \text{ Alert and High alarm setpoints}} \text{ cpm}$ STANDARD: Calculate set points using formula above. (4.68E5 to 4.69E5) Continue to Step 3.8 COMMENTS:	
8	3.8	IF 1RIA-38 Operable, calculate Alert and High setpoints as follows: $\frac{2.4E1}{1RIA-38' \text{ background}} \text{ cpm} + \frac{3.82E2}{\text{Add to background' value from Step 3.5}} = \frac{4.06E2}{1RIA-38 \text{ Alert and High alarm setpoints}} \text{ cpm}$ STANDARD: Calculate set points using formula above (4.06E2). COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
9		Determine approval level required for the release of A GWD Tank. <u>STANDARD:</u> Candidate determines the approval level for 2 GWRs in progress at 1/3 Station Limit each is the Shift Manager (SM). <i>Examiner NOTE: If asked by the candidate, the Unit 3 RB Purge will continue during the A GWD tank release</i> <u>COMMENTS:</u> END OF TASK	CRITICAL STEP ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

SEQ STEP #	Explanation
3	This step is required to determine the setpoints for 1RIA-45.
7	This step is required to determine the setpoints for 1RIA-37.
8	This step is required to determine the setpoints for 1RIA-38.
9	This step is required to determine the approval level required for the release.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit 1 in Mode 1 at 100% power

Unit 2 in Mode 1 at 100% power

Unit 3 in Mode 5 with RB Purge in progress at 1/3 Station Limit

OP/1-2/A/1104/018 Encl. 4.9 (GWD Tank Release) in progress at step 3.1 for release of A GWD Tank.

Steps for prior to GWD Tank release in PT/1-2/A/0230/002 (GWD Tank Release) are complete.

1RIA-37 background reading = 425 cpm

1RIA-38 background reading = 24 cpm

A GWD Tank pressure = 70 psig

GWD piping is purged

INITIATING CUE

1. Continue in OP/1-2/A/1104/018 Encl. 4.9 beginning at step 3.1 to determine the setpoints for 1RIA-37, 1RIA-38, and 1RIA-45. Another operator will input the setpoints, once determined, into the RIAs as required by the procedure.

Document your answers below:

1RIA-37 Setpoints	1RIA-38 Setpoints	1RIA-45 Setpoints
Alert:	Alert:	Alert:
High:	High:	High:

2. Determine the MINIMUM approval level required to release A GWD Tank in accordance with OP/1-2/A/1104/018 (GWD System).

Document your answer below:

MINIMUM approval level required to release A GWD Tank. _____

REGION II
JOB PERFORMANCE MEASURE
OCONEE

ADM-S432

Determine the Appropriate Emergency Action Level

Administrative: Yes

Classroom/Simulator/Plant: Classroom

Alternate Path: No

Alt Path Description: _____

Time Critical: Yes

Time Critical Criteria: 15 minutes to classify

Prepared By:		Date:
EP Review By:		Date:
Reviewed By:		Date:
Approved By:		Date:

REGION II JOB PERFORMANCE MEASURE

Task Title : Determine the Appropriate Emergency Action Level

Task Number :

Alternate Path: No

Time Critical: Yes

Validation Time: 15 min

K/A Rating(s):

System: GEN

K/A: 2.4.38

Rating: 2.4/4.4

Task Standard:

Determine The appropriate classification is made within 15 minutes by determining the following:

- The Spent Fuel Pool level has lowered to the top of the fuel racks (-22 feet)
- The classification is RS2.1 (Site Area Emergency)

References:

CSD-EP-ONS-0101-02 (WALLCHART) Rev. 03

AD-EP-ALL-0101 Emergency Classification Rev. 05

CSD-EP-ONS-0101-01 Bases Rev. 05

Tools/Equipment/Procedures Needed:

CSD-EP-ONS-0101-02 (WALLCHART) (**Paper**) Rev. 03

AD-EP-ALL-0101 Emergency Classification (**Electronic**) Rev. 05

CSD-EP-ONS-0101-01 Bases (**Electronic**) Rev. 05

(Note: Below this line is used only for Initial NRC Exams)

Candidate: _____

NAME

Time Start: _____

Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time: _____

Examiner: _____

NAME

SIGNATURE

DATE

Comments

SIMULATOR OPERATOR JPM SETUP INSTRUCTIONS

N/A

READ TO OPERATOR

DIRECTIONS TO CANDIDATE

I will explain the initial conditions, and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Unit 1 Reactor power = 100%

Unit 2 Reactor defuel in progress

Unit 3 Reactor power = 100%

Time = 0400:

- The site experiences a seismic event
- Unit 1 conditions:
 - SB LOCA occurs
 - ES Channels 1-6 actuate
- Unit 2 conditions:
 - Fuel Handling activities are suspended
 - SFP level: -0.5 feet lowering
- Unit 3 conditions:
 - 3A LPSW pump trips causing 3B LPSW to auto start
 - Statalarm 3SA-9/E-1 (SEISMIC TRIGGER) in alarm

Time = 0450:

- Unit 1 conditions:
 - ES Channels 7 and 8 actuate
- Unit 2 conditions:
 - SFP level: -19 feet lowering
- Unit 3 conditions:
 - Statalarm 3SA-9/E-1 (SEISMIC TRIGGER) reflash
 - Main Turbine trips

Time = 0505:

- Unit 1 conditions:
 - Chemistry reports DEI = 235 μ Ci/ml
- Unit 2 conditions:
 - Boggs Box spraying into SFP
 - SFP level: -23 feet rising

(continued on next page)

INITIATING CUE

At Time = 0505, the SM directs you to determine the highest Emergency Action Level

Indicate the EAL# below and raise your hand to inform the examiner when you have made the classification

THIS IS A TIME CRITICAL JPM

Note: Do not use EC's Judgement as the basis for classifying the event

OPERATOR NAME: _____

HIGHEST EAL CLASSIFICATION: (Include EAL #) _____

START TIME: _____

SEQ STEP	PROC STEP	DESCRIPTION	
1	Time 0400	Analyze the conditions given in the timeline to determine appropriate EAL based upon the EAL Wallchart (Conditions as Time = 0400) <u>STANDARD:</u> Candidate refers to the Wallchart and analyzes the conditions and determines that: • Unit 1 conditions warrant an ALERT (FA1.1) due to Table F-1 Fission Product Barrier Threshold Matrix for the RCS Barrier LOSS A.1 (An automatic ES actuation required by UNISOLABLE RCS leakage) • Unit 2 conditions are approaching UE (RU2.1) when the SFP low level alarm is received (-1 ft) • Unit 3 conditions warrant an UE (HU2.1) due to seismic trigger alarm <i>Examiner NOTE: the intermediate or lower level EAL calls are not required to be documented. The intent of this step is to show the progression of the EAL calls through the event.</i> <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
2	Time 0450	Analyze the conditions given in the timeline to determine appropriate EAL based upon the EAL Wallchart (Conditions as Time = 0450) <u>STANDARD:</u> Candidate refers to the Wallchart and analyzes the conditions and determines that: • Unit 1 receiving ES Channels 7 and 8 do NOT elevate the ALERT (FA1.1) due to Table F-1 Fission Product Barrier Threshold Matrix for the RCS Barrier LOSS A.1 (An automatic ES actuation required by UNISOLABLE RCS leakage) • Unit 2 conditions warrant an ALERT (RA2.3) due to SFP level < -13.5 feet • Unit 3 conditions do NOT elevate the UE (HU2.1) due to seismic trigger alarm <i>Examiner NOTE: the intermediate or lower level EAL calls are not required to be documented. The intent of this step is to show the progression of the EAL calls through the event.</i> <u>COMMENTS:</u>	___ SAT ___ UNSAT

SEQ STEP	PROC STEP	DESCRIPTION	
3	Time 0505	Analyze the conditions given in the timeline to determine appropriate EAL based upon the EAL Wallchart (Conditions as Time = 0505) <u>STANDARD:</u> Candidate refers to the Wallchart and analyzes the conditions and determines that: - Unit 1 DEI value does NOT exceed the Table 1 Fuel Clad (FC) Barrie C.2 and remains at an ALERT (FA1.1) due to Table F-1 Fission Product Barrier Threshold Matrix for the RCS Barrier LOSS A.1 (An automatic ES actuation required by UNISOLABLE RCS leakage) *Unit 2 conditions warrant a SAE (RS2.1) due to SFP level < -22 feet, however, the conditions are NOT met for the GE (RG2.1) since the SFP has not been < -22 feet for 60 minutes - Unit 3 remains at the UE (HU2.1) due to seismic trigger alarm <i>The HIGHEST EAL CLASSIFICATION is SAE (RS2.1) and is required to be made within 15 minutes of the JPM start time</i> <u>COMMENTS:</u> END OF TASK	*CRITICAL STEP ___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS

**SEQ
STEP #**

Explanation

- | | |
|---|--|
| 3 | This step is required for the candidate to utilize the EAL Wallchart and determine the conditions meet a SAE (RS2.1) within 15 minutes |
|---|--|

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

- Unit 1 Reactor power = 100%
- Unit 2 Reactor defuel in progress
- Unit 3 Reactor power = 100%

Time = 0400:

- The site experiences a seismic event
- Unit 1 conditions:
 - SB LOCA occurs
 - ES Channels 1-6 actuate
- Unit 2 conditions:
 - Fuel Handling activities are suspended
 - SFP level: -0.5 feet lowering
- Unit 3 conditions:
 - 3A LPSW pump trips causing 3B LPSW to auto start
 - Statalarm 3SA-9/E-1 (SEISMIC TRIGGER) in alarm

Time = 0450:

- Unit 1 conditions:
 - ES Channels 7 and 8 actuate
- Unit 2 conditions:
 - SFP level: -19 feet lowering
- Unit 3 conditions:
 - Statalarm 3SA-9/E-1 (SEISMIC TRIGGER) reflash
 - Main Turbine trips

Time = 0505:

- Unit 1 conditions:
 - Chemistry reports DEI = 235 $\mu\text{Ci/ml}$
- Unit 2 conditions:
 - Boggs Box spraying into SFP
 - SFP level: -23 feet rising

INITIATING CUE

At Time = 0505, the SM directs you to determine the highest Emergency Action Level

Indicate the EAL# below and raise your hand to inform the examiner when you have made the classification

THIS IS A TIME CRITICAL JPM

Note: Do not use EC's Judgement as the basis for classifying the event

OPERATOR NAME: _____

HIGHEST EAL CLASSIFICATION: (Include EAL #) _____