

Facility: Cooper Nuclear Station Scenario No.: 1 Op-Test No.: \_\_\_\_\_

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: Reactor Power: 100% (On set up-verify LPRM 44-37C is bypassed and loss of vacuum is gradual to preclude a Group 1 isolation (15 min Ramp)

Turnover: RCIC is inoperable for planned maintenance activities. Start RCIC IAW Procedure 2.2.67.1, Section 8 (Test Mode) to perform PMT on RCIC-MO-30, which has had a packing adjustment, Required VOTES testing on the valve has been completed, along with applicable step of 6.RCIC.201, all SAT. APRM 'B' is inoperable and bypassed. F&C is investigating.

Event No.	Malf. No.	Event Type*	Event Description
1		N(BOP)	Startup RCIC system for testing.
1A		I(BOP)	RCIC Turbine Trip.
2		I(RO)	LPRM Fails Downscale.
3		C(BOP)	Lowering condenser Vacuum
4		R(RO)	Reduce Power due to condenser vacuum
5		M(ALL)	Rupture of the "A" Recirculation Loop (DBA LOCA).
5A		C(RO)	Recirc Pump "A" Suction Valve Fails in the Open Position (after EOP entry).

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

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**Event Description:** Startup RCIC System in accordance with SOP-0035 and respond to a RCIC speed controller failure and RCIC Turbine trip.

Time	Position	Event Description
	<b>CRS</b>	Direct and coordinate PMT on RCIC Direct and coordinate crew response to RCIC Turbine Trip IAW ARPs.  Refer to T.S. 3.5.3: (verify within 1 hour that HPCI is OPERABLE).
	<b>UO</b>	Startup RCIC IAW Procedure 2.2.67.1, Section 8:
		1.
		<input type="checkbox"/> verify REC-MO-711 or 714 open.
		<input type="checkbox"/> open RCIC-MO-33, EST Test Line Shutoff Valve
		<input type="checkbox"/> start the Gland Seal vacuum pump
		<input type="checkbox"/> open RCIC-MO-132, Turbin Oil Cooling Wate Supply Valve
		<input type="checkbox"/> align RCIC Turbin Speed Test and Adjust to minimum
		<input type="checkbox"/> open RCIC-131 and raise turbin speed
		<input type="checkbox"/> open RCIC-MO-30, Test Bypass to ECST Valve
		<input type="checkbox"/> verify RCIC-MO-27, Min Flow Bypass Valve closes when > 80 gpm flow
	<b>Event 1A</b>	Respond to RCIC Turbine trip:
		<input type="checkbox"/> Verify turbine coast down, Trip throttle valve closed, Flow decrease, RCIC-MO-27 closed and Discharge pressure decrease
		<input type="checkbox"/> Request Rx. Bldg. Operator to investigate
<b>Comments:</b>		

**Event Description:** LPRM 28-21C fails downscale, resulting in inadequate LPRMs per level for APRM "F", thus APRM "F" becomes INOP.

[illegible]

OP-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 3 Page 1 of 2

**Event Description:** Condenser vacuum is lowering due to an unknown source of leakage into the condenser requiring a manual reactor scram due to the inability to maintain condenser vacuum. After actions are taken to stabilize the plant, the boot will rupture resulting in total loss of vacuum.

Time	Position	Event Description
	CRS	<p>Direct and coordinate crew response to lowering condenser vacuum per Procedure 2.4.9.3.5. Direct/verify the following:</p> <ul style="list-style-type: none"><li><input type="checkbox"/> BOP to monitor main condenser vacuum.</li><li><input type="checkbox"/> reduction of reactor power to maintain condenser vacuum greater than or equal to 25" Hg. per Procedure 2.1.4 (Normal Shutdown) or 2.1.4.1 (Rapid Shutdown)</li><li><input type="checkbox"/> when vacuum cannot be maintained greater than or equal to 24.5" Hg, then manually scram the reactor and trip the turbine.</li><li><input type="checkbox"/> May change transformer RRC pump power supply per hard card</li></ul> <p>Implement GOP-2.1.5, AOP-2.4.9.1.10, and GOP-2.1.22 on reactor scram, turbine trip, and to verify isolations. (Hard Cards may be used initial to verify isolations)</p> <p>Direct/verify BOP to place MSIV control switches to the closed position after MSIV closure.</p> <p>Direct/verify crew to establish RPV pressure control.</p>



OP-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 4 Page 1 of 1

**Event Description:** Condenser vacuum is lowering due to an unknown source of leakage into the condenser requiring a reduction of reactor power– eventually the reactor will have to be manually scrammed due to the inability to maintain condenser vacuum. (See Event #3).

Time	Position	Event Description
	CRS	Direct the Reactor Operator to reduce reactor power to try to maintain condenser vacuum
	RO	Reduce reactor power via the recirc pump flow to help maintain condenser vacuum
Comments:		

**Event Description:** The pressure transient associated with the reactor scram, closing of the MSIVs, and the turbine trip causes a rupture of the "A" recirculation loop with a subsequent failure of the "A" Recirc Pump Suction Valve in the open position. In response to this event the crew will take action IAW EOP-1A, EOP-3A

Time	Position	Event Description
	CRS	<p>Direct entry into AOP-2.4.2.2.3 on seal leak indication-- verify Group 2,3,&amp;6 isolations</p> <p>Direct and coordinate crew actions in response to indications of a rupture of the "A" recirculation loop.</p> <p>Implement GOP-2.1.22 to verify isolations. (Hard Cards may be used initially to verify group isolations</p> <p>Implement EOP-1A and EOP-3A on Hi Torus water level. Direct/verify the following:</p> <ul style="list-style-type: none"> <li>• start all available Drywell coolers.</li> </ul> <p>Determine a loss of all RPV water level indication has occurred. Direct/verify the following:</p> <p>RPV Pressure Control:</p> <ul style="list-style-type: none"> <li>• Control Pressure with 6 SRVs</li> <li>• verify MSIVs, MSL drain valves, and RCIC isolation valves are closed.</li> </ul> <p>RPV Flooding:</p> <ul style="list-style-type: none"> <li>• inject into RPV with the following systems to attempt to achieve 50 psig above torus pressure with no more than 4 SRVs open: <ul style="list-style-type: none"> <li>- HPCI</li> <li>- Feedwater/Condensate</li> <li>- LPCS</li> <li>- LPCI</li> <li>- CRD(maximum flow)</li> </ul> </li> </ul> <p>Attempt to isolate the "A" Recirc Loop.</p>
Comments:		

	<b>RO</b>	Recognize and report indications of a DBA LOCA. <ul style="list-style-type: none"><li>- High Drywell press.</li><li>- Low RPV level.</li><li>- RPV depressurized.</li></ul>
	<b>Event 5A</b>	Attempt to isolate the "A" Recirc Loop as directed by the CRS. <input type="checkbox"/> recognize and report failure of the "A" Recirc Pump Seals to isolate, As per AOP-2.4.2.2.3 (step 4.2.3)  Inject into the RPV using Feedwater/Condensate to attempt to obtain RPV pressure 50 psig above Torus pressure with no more than 4 SRVs open
	<b>BOP</b>	Maintain Control Room Logs.  Implement GOP-2.1.2.2 and verify applicable isolations.  Identify and report ECCS and DG status.  Assist the CRS to determine the validity of RPV level indication. <ul style="list-style-type: none"><li>• recognize that level has decreased below top of active fuel; inform CRS</li></ul> Implement EOP-1A and EOP-3A due to High Drywell d/p, High Drywell Temperature, and Hi Torus Water Level as directed by the CRS:  The Following when directed: <ul style="list-style-type: none"><li><input type="checkbox"/> Inhibit ADS</li><li><input type="checkbox"/> start all available Drywell coolers</li><li><input type="checkbox"/> Spray Drywell</li><li><input type="checkbox"/> Spray Torus between (2-10#)</li><li><input type="checkbox"/> Open 6 SRVs</li></ul>
<b>CUE: Terminate Once Injection into the RPV using Feedwater/Condensate to attempt to obtain RPV pressure 50 psig above Torus pressure with no more than 4 SRVs open has been completed</b>		
<b>Comments:</b>		



## SHIFT TURNOVER INFORMATION

**This Page May Be Given To The Crew**

- ☐ Reactor Power is at 100% at the end of life
- ☐ RCIC is inoperable for planned maintenance activities
- ☐ Start RCIC IAW Procedure 2.2.67.1, Section 8 (Test Mode) to perform PMT on RCIC-MO-30, which has had a packing adjustment, Required VOTES testing on the valve has been completed, along with applicable step of 6.RCIC.201, all SAT.
- ☐ APRM 'B' is inoperable and bypassed. I & C is investigating.
- ☐ All pre job briefs are complete

Facility: Cooper Nuclear StationScenario No.: 2

OP-Test No.: \_\_\_\_\_

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_**Initial conditions:** Reactor power is at 91% on an end-of-life core.

**Turnover:** The plant is at 91% rated thermal power and is in the process of being returned to 100% at a rate of 10 MWe/min. The plant will be shutting down in 48 days for a refueling outage. The DG-2 Monthly Operability Surveillance, 6.2DG.101, is in progress and has been completed through step 4.41.7 (DG has been running in idle for 10 minutes). SW-P-1B is running to support the DG surveillance. All pre-job briefs are complete.

Event No.	Malf. No.	Event Type*	Event Description
1.		N(BOP)	Parallel DG-2 to the bus.
2.		C(BOP)	DG-2 voltage regulator failure causes MVARs to go upscale requiring the DG to be tripped.
3.		C(BOP)	Hotwell level controller (LIC-2) power supply fails while hotwell level is on an upward trend requiring BOP to transfer control to LIC-1 and manually restore level in hotwell.
4.		R(RO)	Continue power increase with reactor recirc flow.
5.		I(RO)	APRM INOP trip during power increase
6.		I(BOP)	Reactor Building DP controller, REA-DPIC-1B, auto feature fails causing high positive pressure in secondary containment and requiring BOP to take manual control of DP or start SGT to restore negative pressure.
7.		C(RO)	Small earthquake causes a small LOCA and causes a CRD B pump trip
8.		M(ALL)	Large earthquake causes a large LOCA and scram
9.		C(RO/BOP)	Loss of condensate and feedwater system
10.		C(BOP)	HPCI-MO-19, HPCI injection valve, fails closed rendering HPCS unusable.

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

**Event No. 1****Description:** Parallel DG-2 to the bus.*This event is initiated by the turnover sheet.*

Time	Position	Applicants Actions or Behavior
	SRO	Directs BOP to continue DG-2 Surveillance
	BOP	<p>Continues DG-2 Surveillance:</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Place SYNCH SWITCH EG2 OR 1GE to EG2 ON</li><li><input type="checkbox"/> Using DIESEL GEN 2 GOVERNOR switch, adjust DG2 speed so SYNCHROSCOPE is rotating slowly in clockwise (FAST) direction.</li><li><input type="checkbox"/> Using DIESEL GEN 2 VOLTAGE REGULATOR switch, adjust DG2 voltage slightly higher than Bus 1G voltage.</li><li><input type="checkbox"/> When SYNCHROSCOPE is at 11 o'clock, close DIESEL GEN 2 BKR EG2.</li><li><input type="checkbox"/> Using DIESEL GEN 2 GOVERNOR switch, raise DG2 load to ~ 1000 kW and hold for 5 minutes.</li><li><input type="checkbox"/> Place SYNCH SWITCH EG2 OR 1GE to OFF.</li></ul> <p><b>Note: Event #2 is triggered upon closure of the breaker EG2: MVARs pegged upscale.</b></p>
<b>COMMENTS:</b>		

Event No. 2		
<b>Description:</b> DG-2 voltage regulator failure causes MVARs to peg upscale requiring the DG to be tripped. <i>This event is automatically initiated when the DG output breaker is closed.</i>		
Time	Position	Applicants Actions or Behavior
	<b>BOP</b>	Reports that MVARs pegged upscale after paralleling the DG <input type="checkbox"/> Attempt to decrease MVARs by increasing diesel voltage May do one or more of the following: <input type="checkbox"/> Emergency trips the DG (based on precaution in the surveillance procedure) <input type="checkbox"/> Report the condition to the CRS <input type="checkbox"/> Trip output breaker EG2
	<b>CRS</b>	Directs DG-2 emergency trip if not already accomplished Directs BOP to back out of surveillance procedure Calls work control for investigation and correction of DG regulator problem Refers to tech spec 3.8.1: <ul style="list-style-type: none"> <li>determines that SR 3.8.1.1 must be performed on OPERABLE offsite circuits within 1 hour and once per 8 hours thereafter</li> <li>determines that no redundant features are inoperable</li> <li>determines that either OPERABLE DG is not inop due to common cause failure OR performs SR 3.8.1.2 for OPERABLE DGs within 24 hours</li> </ul> <b>Note: If asks cue CRS to prepare to test DG-1 within 3 Hours</b> <ul style="list-style-type: none"> <li>determines that DG-2 must be restored to OPERABLE status within 7 days</li> </ul> Calls plant management to inform them of DG-2 problem <b>CUE: As plant management, direct the SRO to back out of the surveillance procedure and restore the electric plant to a normal lineup</b>
	<b>BOP</b>	Note: If engine is tripped above, procedure requires that the engine be restored to standby status—no further action needed to restore the bus May be directed to perform S.P. 6.EE.610 to verify offsite power sources are operable
<b>COMMENTS:</b>		

**Event No. 3**

**Description:** Hotwell level controller (LIC-2) power supply fails while hotwell level is on an upward trend requiring BOP to transfer control to LIC-1 and manually restore level in hotwell.

*This event is initiated with **TRIGGER 3** while the electric plant is being restored to normal.*

Time	Position	Applicants Actions or Behavior
	BOP	<p>Reports Main Condenser Hotwell Level Hi annunciator</p> <p>Reports that LIC-2 has no power</p> <p>Refers to AOP-2.4.9.4.6 for level control failure</p>
	SRO	Directs actions of AOP-2.4.9.4.6 for level control failure
	BOP	<p>Performs actions of Procedure 2.2.6, step 12</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Directs TG SO to adjust the set point on standby MC-LIC-2A until its diaphragm pressure matches the in-service LIC diaphragm pressure</li> <li><input type="checkbox"/> At Panel A, place Condenser Level Control switch to the controller being placed into service</li> <li><input type="checkbox"/> Adjust setpoint of LIC places into service to control hotwell level at 7'</li> </ul> <p><b>CUE:</b> <i>If requested as TG SO to verify valve positions again, report that COND-LCV-1B is closed and that COND-LCV-1A is opening now.</i></p>
<b>COMMENTS:</b>		

**Event No. 4**

**Description:** Continue power increase with reactor recirc flow.

*This event is initiated by the turnover sheet and can be carried out anytime that the RO's attention is not elsewhere. Load dispatcher may have to call and request and increase in power to approximately 740 MWe.*

Time	Position	Applicants Actions or Behavior
	SRO	Directs RO to continue power increase with recirc flow. (To 740 MWe)
	RO	Increases recirc flow IAW GOP-2.1.10 while monitoring reactor power:  <input type="checkbox"/> using master flow controller, increases reactor power by increasing recirc flow at a rate not to exceed 10 Mwe/minute  <input type="checkbox"/> monitors RPV level and feed system operation  Informs SRO when plant is generating 740 MWe
<b>COMMENTS:</b>		

**Event No. 5****Description:** APRM 'B' INOP trip during power increase

*This event is initiated with **TRIGGER 5** when power is approximately 95% or when directed by the lead examiner.*

Time	Position	Applicants Actions or Behavior
	RO	<p>Observes/reports that APRM 'B' has failed INOP and resulted in a half scram</p> <p>Refers to ARP</p> <p>Checks full core display for individual control rods that may have scrambled during the half scram transient.</p>
	CRS	<p>Directs RO to bypass the failed APRM and reset the half scram per ARP</p> <p>Refers to Tech. Spec. 3.3.1.1</p> <p><input type="checkbox"/> no action required – still have required number of channels</p> <p>Refers to TRM 3.3.1.1</p> <p><input type="checkbox"/> no action required – still have required number of channels</p>
	RO	<p>Bypasses APRM and resets the half scram as directed</p> <p>Verifies that scram group solenoid lights are energized</p> <p>Verifies that backup scram lights have extinguished</p>
	BOP	Check APRM in back of the console and report status to CRS
<b>COMMENTS:</b>		

**Event No. 6**

**Description:** Reactor Building DP controller, HV-DPIC-835A, auto feature fails causing high positive pressure in secondary containment and requiring BOP to take manual control of DP or start SGT to restore negative pressure.

*This event is initiated with **TRIGGER 6** after the half scram has been reset or when directed by the lead examiner.*

Time	Position	Applicants Actions or Behavior
	RO/BOP	Reports Secondary Containment Pressure DP annunciator  Refers to AOP-2.4.8.4.1
	BOP	Goes to panel VDB-R to determine RB HVAC problem  Reports failure of HV-DPIC-835A controller  Refers to PPM <input type="checkbox"/> checks DP on HV-DPIC-835A <input type="checkbox"/> if RB DP is at or above 0.0" H <sub>2</sub> O, reports entry condition for EOP 5A <input type="checkbox"/> checks RB fan ROA-FN-1A(1B) running <input type="checkbox"/> checks RB exh fan REA-FN-1A(1B) running  refers to AOP-2.4.8.4.1 <input type="checkbox"/> *starts SGT to maintain negative pressure in RB <input type="checkbox"/> closes Reactor Build H&V isolation valves <input type="checkbox"/> if REA fans are running, secures them  restores RB HVAC to service as soon as possible  May take manual control of faulty DPIC by allowance of EOP 5A vice starting SGT.  <div style="text-align: right;"><b>*CRITICAL TASK</b></div>
	SRO	Enters EOP 5A due to high reactor building pressure  References AOP-2.4.8.4.1 and determines that ARP actions preclude entry into AOP-2.4.8.4.1

**COMMENTS:**



Event No. 7		
<b>Description:</b> Small earthquake causes a small LOCA and a trip of the CRD B <i>This event is initiated with <b>TRIGGER 7</b> after reactor building negative pressure has been restored</i>		
Time	Position	Applicants Actions or Behavior
<b>CUE: As TG SO, report that you felt seismic activity in the turbine building</b>		
	SRO/RO/BOP	Recognize/report " Seismic Event " alarm and enter Procedures 5.1.1, Earthquake and 2.4.11 for CRD pump failure  Directs/Performs actions of AOP-5.1.1:  Start checks of all plant parameters for indications of changes or off-normal conditions <ul style="list-style-type: none"> <li>• Announces seismic activity detected</li> <li>• Directs/performs a walk-down of the plant by equipment operators to determine damage caused by the seismic activity.</li> </ul>
	RO/BOP	Monitors control room instrumentation for evidence of system leakage
	RO/BOP	Reports Leak Detection drywell sump Hi level and HI Fill annunciator  Checks floor drain flow on RW-FR-528 (May check integrator on PNL 9)  Reports floor drain flow is ~5 gpm and rising slowly  Refers to AOP-2.3.9.4.2
	CRS	References/directs actions of AOP-2.4.2.1.1: <ul style="list-style-type: none"> <li><input type="checkbox"/> Directs the monitoring of containment rad monitors at VBD-Q</li> <li><input type="checkbox"/> Directs the monitoring of drywell temp and press and humidity</li> <li><input type="checkbox"/> Refers to Tech Spec 3.4.4 Drywell vent monitor (3.4.5 RCS Leakage Detector Integrator)</li> </ul>
	RO/BOP	Reports rising trend in drywell pressure and temperature  Reports rising trend on containment rad monitors
	CRS	Briefs crew on pending scram due to rising DW pressure  *Gives direction as to what pressure the crew will initiate a manual scram  <div style="text-align: right;"><b>*CRITICAL TASK</b></div>
	RO	Initiates a manual scram at the pre-described DW pressure or as directed by the SRO.

**COMMENTS:**

NOTE: A very small drywell leak develops and begins to propagate 5 minutes into this event. CRD 'B' pump trips during small break LOCA

**Event No. 8**

**Description:** Large earthquake causes a LOCA and scram

*This event is initiated by **TRIGGER 8** when CRS gives direction to manual scram the reactor based on increasing DW pressure.*

Time	Position	Applicants Actions or Behavior
<b>CUE: As TG SO, report that you felt seismic activity in the radwaste building; much worse than the last tremor. There is a lot of dust in the air.</b>		
	CRS/RO/BOP	<p>Recognize/report "Emergency Seismic High Level" alarm</p> <p>Directs/performs actions of ARP (Enter 5.1.1 Earthquake):</p> <p>initiates a reactor shutdown if not already occurred</p> <p>announces OBE</p> <ul style="list-style-type: none"> <li>Monitors control room instrumentation for evidence of increases in: <ul style="list-style-type: none"> <li>Drywell leakage</li> <li>Drywell pressure</li> <li>Drywell gaseous or particulate activity</li> <li>Leak detection temperature changes</li> </ul> </li> <li>Directs a walk-down of the plant by equipment operators to determine damage caused by the seismic activity.</li> </ul>
	RO	<p>Initiates manual reactor scram (if auto scram has not already occurred)</p> <p>Performs immediate scram actions</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Places mode switch to shutdown</li> <li><input type="checkbox"/> Reports power/pressure/level</li> <li><input type="checkbox"/> Reports all rods in</li> <li><input type="checkbox"/> Inserts SRMs/IRMs</li> <li><input type="checkbox"/> Lower RFC-LC-83 Master Level Controller setting to 15"</li> </ul>
	CRS	<p>Enters EOP-1A on low RPV level and EOP-3A on high DW pressure:</p> <ul style="list-style-type: none"> <li>Directs RO/BOP to verify isolation, initiations, and DG starts</li> <li>*Directs RO to maintain RPV level between +3" and +54" (will give a band within these limits) with Table 3 systems.</li> <li>*Directs RO/BOP spray of Torus before reaching 10 psig in the Torus</li> <li>Directs RO/BOP to confirm RR pumps are stopped and stop DW cooling fans in prep for DW spray</li> <li>*Directs RO/BOP to spray DW when Torus press exceeds 10 psig and within DSIL</li> <li>*Directs the securing of containment sprays when pressure drops LE 0.0 psig in respective area.</li> <li>*At -113", if ADS timer has started, direct inhibition of ADS</li> <li>*At TAF, determines that LP ECCS is available and that current trend will drop level below -25"FZ ; determines Emergency RPV depressurization is required; enters 2A, Emerg. RPV Depress.</li> <li>*Directs RO/BOP to open 6 SRVs</li> </ul>

**\*CRITICAL TASK**

	RO/BOP	<p>Reports that expected initiations, isolations, and DG starts have occurred except that HPCI-MO-19 has failed closed (<b>see event 10</b>).</p> <p>*Uses RCIC and FW systems to maintain RPV level</p> <p>*Sprays the Torus when directed</p> <p>Confirms that RR pumps and DW fans have been secured</p> <p>*Sprays the DW when directed</p> <p>*Secures Torus/DW sprays when if or when LT 0.0 psig in each area</p> <p>*Opens 6 SRVs to emergency depressurize the RPV.</p> <p style="text-align: right;"><b>*CRITICAL TASK</b></p>
	CRS	Directs restoration of RPV level to band of +3" to +54"
	RO/BOP	Controls injection systems to restore RPV level to new band.
<p><b>COMMENTS:</b></p> <p><b>CUE: Terminate the scenario after the RPV has been depressurized and water level is in the +13" to +54" band.</b></p>		

**Event No. 9**

**Description:** Loss of condensate and feedwater system

*This event is automatically initiated after the reactor scram. The earthquake caused a break in the suction expansion joint on the condensate pumps (to avoid the bypass to open). This event occurs within event 8 and should be completed prior to scenario termination.*

Time	Position	Applicants Actions or Behavior
	RO	<input type="checkbox"/> Reports that even though the FW system is aligned properly, there is no flow from the feedwater system <input type="checkbox"/> Recognizes/reports that the condensate booster pumps have all tripped.

**COMMENTS:****Event No. 10**

**Description:** HPCI-MO-19, HPCI injection valve, fails closed rendering HPCI unusable.

*This event is initiated at the beginning of the scenario but is not evident until HPCI is initiated. This event occurs within event 8 and should be completed prior to scenario termination.*

Time	Position	Applicants Actions or Behavior
	RO	<input type="checkbox"/> Reports that HPCI-MO-19 did not open upon system initiation <input type="checkbox"/> Attempts to open HPCI-MO-19 (does not open) <input type="checkbox"/> Reports that HPCI is unavailable

**COMMENTS:**

This event occurs within Event 9.

**SHIFT TURNOVER INFORMATION****This Page May Be Given To The Crew**

- ☐ The plant is at 91% rated thermal power and is in the process of being returned to 100% at a rate of 10 MWe/min.
- ☐ The plant will be shutting down in 48 days for a refueling outage.
- ☐ The DG-2 Monthly Operability Surveillance, 6.2DG.101 , is in progress and has been completed through step 4.41.7 (DG has been running in idle for 10 minutes). SW-P-1B is running to support the DG surveillance.
- ☐ All pre-job briefs are complete.

Facility: Cooper Nuclear Station Scenario No.: 3 Op-Test No.: \_\_\_\_\_

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Initial Conditions: Reactor Power @ 75%,

Turnover: Reactor Power @ 75%, Perform HPCI 92 Day Mode Surveillance Test as per procedure  
6.HPCI.103 beginning with step 4.14. The Reactor Building Operator has been briefed and is in the HPCI  
quad.

Event No.	Malf. No.	Event Type*	Event Description
1		C-RO	Recirc speed controller fails, Scoop tube lock-out
2		N-BOP	Perform HPCI surveillance test (92 Day Test Mode)
3		C-BOP	Stop Valve remains closed on release of local trip knob (Step 4.21 of 6.hpci.103). Must declare HPCI inop.
4		I-RO	"A" steam line flow signal fails to zero
5		N-BOP	Remove "A" feed pump from service due to a oil leak
6		R-RO	Reduce power to 60% for removing "A" feed pump
7		M-All	Loss of remaining reactor feed pump, RCIC fails after auto start, ATWS with ARI failure

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

OP-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 1 Page \_\_\_\_\_ Of \_\_\_\_\_

Event Description: Perform HPCI 92 Day Test Mode Surveillance—per 6.HPCI.103. The Stop Valve remains closed on the release of the local trip knob (step 4.21). HPCI should then be declared inoperable. CRS has directed BOP to begin with step 4.14

**\*\*Need to have a Stop Watch in the control room\*\***

Time	Position	Event Description
	CRS	Direct BOP to complete the HPCI 92 Day test mode surveillance and to start at 6.HPCI.103 Step 4.14  Review T.S. for HPCI inop
	BOP	Inform CRS that HPCI is inop  Start auxiliary oil pump and time stop valve; record time on Attachment 1, Table 1
		Call SO and ensure the following:  Check oil pressures on HPCI-PI-2782, HPCI-PI-2783, HPCI-PI-2784, and HPCI-PI-2785 are within range specified on Attachment 1, Table 3
		Ask SO to Lift and hold local trip knob
		Check STOP Valve closes
		Ask So to Release local trip knob
		Check Stop Valve opens (Valve stays closed—See next event)

Comments:




**Event Description:** Stop Valve of Step 4.21 of procedure 6.HPCI.103 remains closed—this causes HPCI to be declared inoperable

Time	Position	Event Description
	BOP	Reports that the Stop Valve failed to open as expected
		Reviews procedures and determine that HPCI is to be declared inop
		Determines the availability of RCIC when directed
		Returns HPCI back to previous condition.
	CRS	Review TS (3.5) and declare that HPCI is inop, Ask BOP to ensure that RCIC is operable
Comments:		

OP-Test No.: \_\_\_\_\_ Scenario No.:   3   Event No.:   3   Page \_\_\_\_\_ Of \_\_\_\_\_Event Description: Scoop Tube Lockout on Reactor Recirculation Pump "A"

Time	Position	Event Description
	RO	Response to alarm 9-4-3/c-2 Scoop tube lockout  Directs investigation by SO to identify cause of alarm  <i>CUE: Alarm was caused by Station Operator accidentally bumping the Limit Switch while wiping up oil around the Limit Switch</i>  Resets scoop tube lockout  Verifies reset and pump speed steady  Verifies that the annunciator is cleared  Verifies that M/A station position indication is stable at zero deviation  Verifies that the annunciator is cleared
	CRS	-Directs RO: Place recirc pump "A" in manual Directs investigation by AO to identify cause of alarm Return reactor recirc pump "A" control to auto Verifies that the annunciator is cleared  -Reviews TS and ensures compliance
Comments:		

OP-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 4 Page \_\_\_\_\_ Of \_\_\_\_\_

Event Description: Failure of the 'B' steam input to the feedwater 3-element speed control

Time	Position	Event Description
	CRS/RO	Respond to alarms (may not get alarms depending on response)
	RO	<input type="checkbox"/> Identify decreasing RPV Level <input type="checkbox"/> Stop power changes that may be in progress and perform actions in AOP-2.4.5.1 <input type="checkbox"/> Place RFC-LC-83 to manual mode and set at 35" <input type="checkbox"/> Switch the input from 3-element control to Single element control <input type="checkbox"/> Place Master Level Control back to auto mode <input type="checkbox"/> Call Rx Building to look at steam line $\Delta P$ for 'B' CUE: Rx Building reports no abnormal steam line $\Delta P$ for 'B'
	CRS	-Directs RO to enter AOP-2.4.5.1 (Rx level control system malfunction) <input type="checkbox"/> To call the Rx Building to look at steam line $\Delta P$ for 'B' steam line <input type="checkbox"/> To control feedwater flow manually <input type="checkbox"/> To return Master Level Control to Auto -Reviews TS for Compliance
Comments:		

OP-Test No.: \_\_\_\_\_ Scenario No.:   3   Event No.:   5   Page \_\_\_\_\_ Of \_\_\_\_\_

Event Description: Down Power to about 60% due to oil leak on "A" feed pump per procedure 2.1.10. This is done in preparation to remove RFP "A" from operation.

**Simulator Cue:** Reactor Building

Operator calls and reports oil leak on RFPT A approximately a pencil stream in size. Sump level slowly lowering  
Call from the field to notify control room of the oil leak

**Simulator Cue:** If queried by BOP/RO, expect problems with the oil in about 30 minutes

Time	Position	Event Description
	RO	Using procedure 2.1.10 reduce power to about 500 MWe via recirc flow
		Review Power-to-Flow map to avoid region of instability, Control rods may have to be inserted.
	CRS	Review the TS and implications of the oil leak.
		Direct RO to reduce reactor power in preparation to remove RFP "A"
	BOP	Monitors turbine and RFP indications
Comments:		

OP-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 6 Page \_\_\_\_\_ of \_\_\_\_\_

Event Description: After decreasing the reactor power, RFP "A" is removed from service to fix oil leak.

Time	Position	Event Description
	CRS	Directs the BOP to remove RFP "A" from service per procedure 2.2.28.1
	BOP	<p>Remove RFP "A" using Procedure 2.2.28.1</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Ensure feedwater flow is <math>5.2 \times 10^6</math> to <math>6.5 \times 10^6</math> lbs/hr</li> <li><input type="checkbox"/> Ensure RFC-MA-84A, FEEDWATER CONTROLLER STATION A, is in BAL.</li> <li><input type="checkbox"/> For RFC-MA-84A, null its deviation meter and place it in MAN.</li> <li><input type="checkbox"/> <u>Slowly</u> lower speed of RFPT being removed from service with manual control on RFC-MA-84A(B).</li> <li><input type="checkbox"/> Check speed of operating RFPT rises to maintain RPV level.</li> <li><input type="checkbox"/> Ensure minimum flow valve for RFP being removed from service opens: <ul style="list-style-type: none"> <li><input type="checkbox"/> RFP A - RF-FCV-11A, MINIMUM FLOW.</li> <li><input type="checkbox"/> RFP B - RF-FCV-11B, MINIMUM FLOW.</li> </ul> </li> <li><input type="checkbox"/> When FW DEMAND is 45% for RFPT being removed from service, ensure following: <ul style="list-style-type: none"> <li><input type="checkbox"/> MANUAL STARTUP RATE SELECTOR switch is in "4".</li> <li><input type="checkbox"/> STARTUP MODE SELECTOR switch is in MANUAL S/U.</li> <li><input type="checkbox"/> FW HOLD is blank.</li> <li><input type="checkbox"/> STARTUP IN SERVICE green LED is off.</li> <li><input type="checkbox"/> FEEDWATER IN SERVICE green LED is on.</li> <li><input type="checkbox"/> SPEED LIMIT amber LED is off.</li> <li><input type="checkbox"/> MANUAL S/U green LED is on.</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li><input type="checkbox"/> Lower STARTUP DEMAND for RFPT being removed from service with MANUAL STARTUP SPEED CONTROL switch to 50%.</li> <li><input type="checkbox"/> Place MANUAL STARTUP RATE SELECTOR switch for RFPT being removed from service to "1".</li> <li><input type="checkbox"/> Lower STARTUP DEMAND for RFPT being removed from service to 45% with MANUAL STARTUP SPEED CONTROL switch and check following:</li> <li><input type="checkbox"/> STARTUP IN SERVICE green LED turns on.</li> <li><input type="checkbox"/> FEEDWATER IN SERVICE green LED turns off.</li> </ul>
		<ul style="list-style-type: none"> <li><input type="checkbox"/> Ensure feedwater flow is <math>5.2 \times 10^6</math> to <math>6.5 \times 10^6</math> lbs/hr</li> <li><input type="checkbox"/> Ensure RFC-MA-84A, FEEDWATER CONTROLLER STATION A, is in BAL.</li> <li><input type="checkbox"/> For RFC-MA-84A, null its deviation meter and place it in MAN.</li> <li><input type="checkbox"/> <u>Slowly</u> lower speed of RFPT being removed from service with manual control on RFC-MA-84A(B).</li> <li><input type="checkbox"/> Check speed of operating RFPT rises to maintain RPV level.</li> <li><input type="checkbox"/> Ensure minimum flow valve for RFP being removed from service opens: <ul style="list-style-type: none"> <li><input type="checkbox"/> RFP A - RF-FCV-11A, MINIMUM FLOW.</li> <li><input type="checkbox"/> RFP B - RF-FCV-11B, MINIMUM FLOW.</li> </ul> </li> <li><input type="checkbox"/> When FW DEMAND is 45% for RFPT being removed from service, ensure following: <ul style="list-style-type: none"> <li><input type="checkbox"/> MANUAL STARTUP RATE SELECTOR switch is in "4".</li> <li><input type="checkbox"/> STARTUP MODE SELECTOR switch is in MANUAL S/U.</li> <li><input type="checkbox"/> FW HOLD is blank.</li> <li><input type="checkbox"/> STARTUP IN SERVICE green LED is off.</li> <li><input type="checkbox"/> FEEDWATER IN SERVICE green LED is on.</li> <li><input type="checkbox"/> SPEED LIMIT amber LED is off.</li> <li><input type="checkbox"/> MANUAL S/U green LED is on.</li> </ul> </li> <li><input type="checkbox"/> Lower STARTUP DEMAND for RFPT being removed from service with MANUAL STARTUP SPEED CONTROL switch to 50%.</li> <li><input type="checkbox"/> Place MANUAL STARTUP RATE SELECTOR switch for RFPT being removed from service to "1".</li> <li><input type="checkbox"/> Lower STARTUP DEMAND for RFPT being removed from service to 45% with MANUAL STARTUP SPEED CONTROL switch and check following:</li> <li><input type="checkbox"/> STARTUP IN SERVICE green LED turns on.</li> <li><input type="checkbox"/> FEEDWATER IN SERVICE green LED turns off.</li> </ul>

Comments:

OP-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 7 Page \_\_\_\_\_ of \_\_\_\_\_

Event Description: Trip of the remaining feed pump, RCIC fails after auto start, ATWS with ARI Failure

Time	Position	Event Description
	RO	Scram due to low water level and places mode switch to shutdown
		Reports failure of control rods to insert
		Attempts ARI and reports failure
		Inject SLC
		Manually inserts control rods
		Reports all scram valves open and hydraulic lock (Rx power 15-40%)
		Installs jumpers to bypass RPS
	BOP	Verifies that RCIC has initiated
		Reports that RCIC has not started
		RCIC is successfully manually started
		When Directed maintain Reactor pressure 800-1000 psig using SRVs
		Bypasses MSIV closure on low level when directed
		Injects water to maintain reactor vessel level between 0" FZ and +100" FZ while reactor is pressurized
		Initiates Suppression Pool Cooling on 2/3 core height (Directed by CRS)
	CRS	Enters EOP on Level < 3" and failure to scram (EOP-6A and 7A)
		Enters EOP-6A and 7A Directs initiation of SLC Directs actions to insert control rods
		Enters EOP-6B Directs water level between 0"-100" FZ Directs BOP to maintain pressure between 800-1000 psig Directs (RO) Jumpers be installed to bypass RPS
		Enters 3A on Torus water level and Torus temperature Enters 5A on HI rad in SE quad
CUE: Terminate once Hot shutdown boron weight injected		



Comments:

## SHIFT TURNOVER INFORMATION

**This Page May Be Given To The Crew**

- ☐ Reactor Power @ 75% at the end-of-life
- ☐ Perform HPCI 92 Day Mode Surveillance Test as per procedure 6.HPCI.103 beginning with step 4.14.  
The Reactor Building Operator has been briefed and is in the HPCI quad.
- ☐ All pre-Job briefs have been completed