

<b>Facility:</b> WNP-2	<b>Scenario No.</b> 1	<b>Op-Test No.:</b> 1
<b>Examiners:</b> _____ <b>Operators:</b> _____ _____ _____		
<b>Initial conditions:</b> IC-85. The reactor is critical, heating up, and at 400 psig on a Beginning-of-life core.		
<b>Turnover:</b> A reactor startup is in progress following a 3-day maintenance outage. The reactor is critical and in the heating range. Control rod sequence is at step 22-1, rod 30-03 at notch 12. One hour ago, RC-1 HALF TRIP (P601-A12-4-3) annunciated. Initial investigation shows that relay 3AY and 8AY on RC-1 are de-energized, putting the Div 1 Control Room Emergency Filtration system in a "half-cocked" situation. A 'Z' signal in the remainder of the Div 1 logic will result in an automatic initiation of the Control Room Emergency Filtration system. The work team is investigating the cause. CW-P-1B is out of service while the motor is being re-wound in Spokane. It is expected to be re-installed in 2 weeks. All pre-job briefs are complete.		

Event No.	Malf. No.	Event Type*	Event Description
1.	Time + 0	R(RO)	RO pulls control rods to maintain heat-up rate
2.	T + 20 (auto)	I(RO)	IRM B fails erratically causing rod block and half scram
3.	T + 24 (auto)	C(BOP)	Power supply for Channel A of the Rx. Bldg. Exhaust Vent Rad Monitor fails, resulting in RC-1 relay 3AX to de-energize and start WMA-FN-54A (control room emergency filtration train fan).
4.	Trigger 4 T + 35 (auto)	I(ALL)	A minimum seismic earthquake results in an RPV instrument line break causing a loss of instrumentation due to excess flow check valve, EFC-X114, closure.
5.	Trigger 5 T + 50 (auto)	M(ALL)	An operating basis earthquake causes a large LOCA (recirc pump suction) and feedwater leak (feed pump suction).
6.	Trigger 6 (conditional on line up to spray the wetwell)	C(RO/BOP)	RHR-P-2A experiences an overcurrent lockout and faults SM-7
7.	In-place at beginning of scenario	C(BOP)	RHR-P-2C shaft shears

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

**Event No. 1**

**Description:** RO pulls control rods to maintain heat-up rate.

*This event initiated by the turnover sheet*

***SIM OPERATOR CUE: When the crew takes the shift, click on the RUN button of the CAEP window to start the clock running for events 2-5.***

Time	Position	Applicants Actions or Behavior
T=0 when crew assumes shift	SRO	Directs RO to continue the heatup by pulling control rods.
	RO	Withdraws control rods to continue heatup (PPM 3.1.2): <ul style="list-style-type: none"> <li>- closely monitors flux levels during rod withdrawal</li> <li>- maintains heatup rate LE 80°F</li> <li>- verifies prior to each rod withdrawal:               <ul style="list-style-type: none"> <li>• correct rod selected</li> <li>• correct start/stop position</li> </ul> </li> <li>- for each rod that is fully withdrawn:               <ul style="list-style-type: none"> <li>• checks coupling integrity - initials sequence sheet (PPM 9.3.9)</li> <li>• ensures position 48 corresponds to FULL OUT light</li> </ul> </li> </ul>
	BOP	Increases DEH pressure setpoint while coordinating with the RO to maintain bypass valves at ≈20-25% with a reference of 600# at 6# per minute rate IAW PPM 2.5.7, step 5.1.37.  Monitors plant conditions.  Monitors and adjusts RWCU blowdown flow as necessary.

**COMMENTS:**

- 1) PPM 1.3.1 allows pressure increase simultaneous with pulling control rods
- 2) A WNP-2 training staff member will be used to role-play the “second person” for simultaneous verification of rod movement (PPM 1.3.1)

<b>Event No. 2</b>		
<b>Description:</b> IRM B fails erratically causing rod block and half scram		
<i>This event is automatically initiated 20 minutes into the scenario or upon direction of Lead Examiner.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T=20	RO	Reports indication of IRM B failure and receipt of a half-scram and rod block.  References ARP for INOP IRM. (PPM 4.603.A8)
	SRO	Directs RO to bypass IRM B and reset the half scram IAW with ARP.  May make plant announcement to suspend all maintenance and surveillance testing associated with RPS 'A'.  May direct BOP to place DEH in HOLD.
	RO	Bypasses IRM B and resets the half scram (PPM 4.603.A8)
	BOP	If directed, places DEH in HOLD
	SRO	Refers to Tech Spec 3.3.1.1 and LCS 1.3.2.1 & 1.3.3.1 for required actions <ul style="list-style-type: none"> <li>no actions required since minimum number of IRMs is met.</li> </ul> Contacts the maintenance team  Briefs the crew
	RO	Continues heatup with control rods
<b>COMMENTS:</b>		

<b>Event No. 3</b>		
<b>Description:</b> Power supply for Channel A of the Rx. Bldg. Exhaust Vent Rad Monitor fails, resulting in RC-1 relay 3AX to de-energize and start WMA-FN-54A (control room emergency filtration train fan).  <i>This event is automatically initiated 24 minutes into the scenario or upon direction of Lead Examiner.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T=24	RO	Reports reactor building exhaust rad hi-hi (EOP entry condition); reactor building exhaust rad monitors downscale; off-gas vault rad high; off-gas vault rad monitors downscale.  Refers to associated ARPs.
	BOP	Reports Div 1 control room HVAC trouble and goes to panel P to investigate
	SRO	Directs RO/BOP to investigate cause of RAD annunciators.
	RO	Verifies RB exhaust plenum radiation levels on REA-RR-603 on P600. Reports rad levels are normal.
	BOP	Reports that the power-supply, REA-E/S-613A, has failed causing a loss of power to REA-RIS-609A (causing the remainder of RC-1 trip circuit for Control Room Emergency Filtration System to operate) and REA-RIS-611.  Reports that WMA-FN-54A has started and that WMA-FN-54B remains off.
	SRO	May request master data sheet for the effected instrumentation.  References Tech Specs – <ul style="list-style-type: none"> <li>• 3.3.6.1 – primary containment isolation instrumentation</li> <li>• 3.3.6.2 – secondary containment isolation instrumentation</li> <li>• 3.3.7.1 – control room emergency filtration</li> <li>• determines we have a 24-hour trip requirement from all three specs</li> </ul> References ABN-FAZ Briefs the crew
<b>CUE:</b> <i>As I&amp;C report that a blown fuse has been found in REA-E/S-613A. Role-play as system engineer to provide allowance for fuse replacement and direction for restoration of HVAC to normal alignment.</i>		

	SRO	May direct replacement of fuse based on allowance in PPM 1.3.47, or may request system engineer concurrence. Once the fuse has been replaced, should direct restoration IAW with ABN-FAZ, section 4.2.
<p><b><i>TIME COMPRESSION: When maintenance has been contacted to look at REA-E/S-613A, compress time and provide information that a fuse was found blown in the power supply and is in the process of being replaced.</i></b></p> <p><b><i>SIM OPERATOR CUE: When the fuse has been replaced, select OVR-RMS002B on the Summary screen and DELETE it.</i></b></p>		
	BOP	Restores normal CR-HVAC alignment
<p><b>COMMENTS:</b> 10/19/00 – added final BOP action to restore CR-HVAC, corrected nomenclature for power supply, added CUE for sim operator regarding fuse restoration</p>		

<b>Event No. 4</b>		
<p><b>Description:</b> A small earthquake causes a small break in an RPV pressure tap resulting in a loss of instrumentation due to EFC-X114 closure.</p> <p><i>This event is automatically initiated 35 minutes into the scenario or upon direction of the Lead Examiner.</i></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
<p><b>SEISMIC SIM:</b> Preset Seismic CD player on track 4 with a volume level of -10. Start CD player approximately <u>3 seconds</u> before Event 4 automatically initiates. Allow CD to play approximately 12 seconds before securing.</p>		
T+35	SRO/RO/BOP	Recognize/report "Minimum Seismic Earthquake Exceeded" alarm (P851S1 2-5)
<p><b>CUE:</b> As OPS-1, call in on radio to report seismic activity felt in the reactor building</p>		
	BOP	Checks the seismic response lights on board L and reports that 16 amber lights and no red lights are illuminated.
	RO	<p>Stops rod movement activities if in progress</p> <p>Reports instrument failures and multiple alarms.</p> <ul style="list-style-type: none"> <li>RPV Level-Narrow Range "A" is upscale</li> <li>Level 8 trip on single channel for RFW turbine and Main Turbine</li> <li>RFW/Turbine Hi Level Trip alarm</li> </ul> <p>Verifies that the Digital feedwater control system has automatically shifted to the "B" channel for RPV level input.</p> <p>May transfer Reactor Vessel Level Control channel to "B" on P603 to restore narrow range level indication to RFW-LR-608.</p>
	RO/BOP	<p>Reports instrument failures and multiple alarms.</p> <ul style="list-style-type: none"> <li>RPV Level-Wide Range "A" (LR623A on P601) is upscale</li> <li>HPCS Hi level alarm – P601</li> </ul> <p>Places DEH in HOLD</p>
	SRO/RO/BOP	Determines the cause of multiple alarms and level indications to be an instrument line break downstream of EFC-X114. References ABN-HELB to determine the effects of EFC-X114 closure.

	SRO	Briefs crew on instrumentation loss.  Contacts SSS and Work Team to investigate line break in Reactor Bldg.  Directs plant walkdown to determine earthquake damage.
<b>COMMENTS:</b>		

<b>Event No. 5</b>		
<p><b>Description:</b> A large earthquake causes a large LOCA inside containment and a large feedwater leak in the turbine building.</p> <p><i>This event is automatically initiated 50 minutes into the scenario or upon direction of the Lead Examiner.</i></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
<p><b>SEISMIC SIM:</b> Preset Seismic CD player on track 4 with a volume level of 0. Start CD player approx. 3 seconds before initiating TRIGGER 5. Allow CD to play approximately 15 seconds before securing. After securing, set volume level to -10 and randomly run 5-10 second aftershocks over the remainder of the scenario.</p>		
T+50	SRO/RO/BOP	Recognize/report "Operating Basis Earthquake Exceeded" alarm
	BOP	Checks the seismic response lights on board L and reports that all amber lights and multiple red lights are illuminated.
<p><b>CUE:</b> As OPS-1, call in on radio to report seismic activity felt in the turbine building.</p>		
	RO	Monitors plant indications for response to earthquake.
	BOP	Reports increasing drywell pressure, then high drywell pressure trip.
	SRO	May elect to scram prior to high drywell pressure trip. Directs RO to perform scram actions
	RO	Performs immediate scram actions: <ul style="list-style-type: none"> <li>• Makes scram report</li> <li>• Places mode switch to shutdown</li> <li>• Monitors/reports Power, Level, Pressure</li> <li>• Verifies all control rods inserted; Manual scram &amp; ARI if rods out.</li> <li>• Inserts SRMs/IRMs.</li> </ul>
	SRO	Enters EOP 5.1.1 on low RPV level (LT +13") and EOP 5.2.1 on increasing drywell pressure (GT 1.68 psig) <ul style="list-style-type: none"> <li>• Directs RO to enter PPM 3.3.1.</li> <li>• Directs RO/BOP to maintain RPV level between +13" and +54" using HPCS and LP ECCS pumps.</li> <li>• *Directs RO/BOP to spray wetwell before wetwell pressure reaches 12 psig.</li> <li>• Directs RO/BOP to confirm RRC pumps are stopped and stop drywell</li> </ul>



		cooling fans (in prep for drywell spray) <ul style="list-style-type: none"> <li>• *Directs RO/BOP to spray the drywell when wetwell pressure exceeds 12 psig</li> <li>• *Directs RO/BOP to secure wetwell and drywell spray when LT 1.68 psig in each area.</li> </ul> <p style="text-align: right;"><b>*CRITICAL TASK</b></p>
<b><i>CUE: OPS-1 reports large amount of water flowing into the 441' elevation of the turbine building.</i></b>		
	RO	Reports that even though the RFW-V-10 valves are open and the feedpumps are operating, there is no feed flow to the vessel indicated
	SRO	May direct the shutdown of the feed and condensate system if he determines that there is a feedwater leak.
	RO/BOP	Performs EOP actions as directed by SRO <ul style="list-style-type: none"> <li>• Restores and maintains RPV level between +13" and +54" using HPCS and LP ECCS pumps</li> <li>• *Sprays wetwell before wetwell pressure reaches 12 psig</li> <li>• Confirms RRC pumps are stopped and stops drywell cooling fans (in prep for drywell spray)</li> <li>• *Sprays the drywell when wetwell pressure exceeds 12 psig.</li> <li>• *Secures wetwell and drywell spray if/when LT 1.68 psig in each area.</li> <li>• Injects with available ECCS to recover RPV level</li> </ul> <p style="text-align: right;"><b>*CRITICAL TASK</b></p>
<b>COMMENTS:</b>  <b>Terminate the scenario when containment has been sprayed and RPV level has been restored to +13" to +54".</b>		

**Event No. 6****Description:** RHR-P-2A O/C lockout and faults SM-7

*This event is automatically initiated with **TRIGGER 6** via a conditional based on the Wetwell spray lineup or by direction of the lead examiner. This event occurs within Event 5 and should be completed prior to scenario termination.*

Time	Position	Applicants Actions or Behavior
	BOP	Reports overcurrent condition (without protective trip action) on RHR-P-2A.  Attempts to manually trip RHR-P-2A.  Reports that manual trip attempt was unsuccessful.
	SRO	May direct SM-7 de-energization.
	BOP	If directed, trips supply breakers for SM-7 and reports completion to SRO
	SRO	Directs RO/BOP to carry out actions of PPM 4.7.1.8, Loss of SM-7
	BOP	Carries out actions of PPM 4.7.1.8 <ul style="list-style-type: none"> <li>• Notifies SRO that DG-1 is running without service water</li> <li>• Ensures RCC-P-1B &amp; 1C are running</li> </ul>
	SRO	Directs BOP to trip DG-1 due to lack of engine cooling as a result of the loss of SM-7
	BOP	Trips DG-1 from Board C within 6 minutes of the loss of SM-7
		<b>CRITICAL TASK</b>
	SRO	May direct the racking out of the RHR-P-2A breaker and the re-energization of SM-7
	BOP	If directed, has the breaker for RHR-P-2A racked out and performs actions to re-energize SM-7

**COMMENTS:**

1. Depending on how soon the overcurrent situation is noticed, SM-7 may trip on overcurrent prior to any operator action

<b>Event No. 7</b>		
<b>Description:</b> RHR-P-2C shaft shears  <i>This event is initiated at the beginning of the scenario, but will not be detected until RHR-P-2C is started. This event occurs within Event 5 and should be completed prior to scenario termination.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO/BOP	Reports abnormal indications for RHR-P-2C <ul style="list-style-type: none"> <li>• No flow</li> <li>• Low run amps</li> </ul> Stops RHR-P-2C as directed by SRO
	SRO	Directs BOP to stop RHR-P-2C (if he hasn't already done it)  Directs OPS2 to investigate RHR-P-2C problem.
<b>COMMENTS:</b>		

**SRO TURNOVER INFORMATION**

A reactor startup is in progress following a 3-day maintenance outage. The reactor is critical and in the heating range. Control rod sequence is at step 22-1, rod 30-03 at notch 12.

The control-rod-movement pre-job brief has been completed. PPM 3.1.2 has been completed up to step 5.5.1.

One hour ago, RC-1 HALF TRIP (P601-A12-4-3) annunciated. Initial investigation shows that relay 3AY and 8AY on RC-1 are de-energized, putting the Div 1 Control Room Emergency Filtration system in a “half-cocked” situation. A ‘Z’ signal in the remainder of the Div 1 logic will result in an automatic initiation of the Div. 1 Control Room Emergency Filtration system. The work team is investigating the cause.

CW-P-1B is out of service. The motor is being re-wound in Spokane. It is expected to be re-installed in 2 weeks.

<b>Facility:</b> WNP-2	<b>Scenario No.:</b> 2	<b>Op-Test No.:</b> 1
<b>Examiners:</b> _____ <b>Operators:</b> _____ _____ _____		
<b>Initial conditions:</b> IC-81. The reactor is at 14% power on a beginning-of-life core. The feedwater system is in the Startup Level Control mode. The backup transformer, TRB, is under clearance.		
<b>Turnover:</b> The plant is starting up. The reactor is currently at 14% reactor power on its way to 100%. The control rod sequence is at step 29-13, control rod 14-47 at notch 08. Section 5.7 of PPM 3.1.2 is currently being performed. TRB failed 1 hour ago and is under clearance so that BPA can work on it. All pre-job briefs have been completed.		

  

Event	Malf. No.	Event Type*	Event Description
1.		N(BOP)	Transfer Feedwater lineup from Startup level control valves, RFW-FCV-10A/B, to RFPT speed control.
2.		R(RO)	Increase Reactor Power with control rods
3.	Trigger 3 manual initiation after significant reactivity change	C(RO)	RWM failure results in loss of ability to move control rods
4.	Trigger 3 +15 minutes	C(BOP)	Outboard MSIV on 'A' steam line fast closes due to failure of its 4-way air control valve. (WNP-2 PER 200-0803)
5.	Trigger 3 +18 minutes	I(RO)	CRD flow controller auto mode fails requiring transfer to manual and manual adjustment of CRD flow.
6.	Trigger 3 +28 minutes	C(BOP)	Failure of REA-FN-1B causing entry into EOP 5.3.1 on high secondary containment pressure.
7.	Trigger 3 +41 minutes	M(ALL)	Loss of offsite power
8.	In at beginning of scenario	C(BOP)	Failure of DG-2 output breaker to close. Requires BOP manual action to attempt closure. Manual attempt will also fail.
9.	In at beginning of scenario	C(RO/BOP)	HPCS SW pump shaft seizure (LER 12-20-94) requiring trip of HPCS DG.

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

<b>Event No. 1</b>		
<b>Description:</b> Transfer Feedwater lineup from Startup level control valves, RFW-FCV-10A/B, to RFP speed control.		
<i>This event is initiated by the SRO as the team continues with the plant startup per PPM 3.1.2</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	SRO	Directs the BOP to transfer FWLC from the 10 valves to RFP speed control.
	BOP	<p>Transfers FWLC from 10 valves to RFP speed control per PPM 2.2.4, sect. 5.7</p> <ul style="list-style-type: none"> <li>• Ensures Rx Vessel Level Control switch is in 1-ELEMENT</li> <li>• Ensures RFW-LIC-600 (RPV Level Master Control) is in manual and adjusted so that RFW-SC-601A(B) DEV signal is <math>\pm 0.8\%</math> from 0%</li> <li>• Places RFW-SC-601A(B) in auto</li> <li>• Ensures level setpoint on RFW-LIC-600 matches level setpoint of RFW-LIC-620</li> <li>• Places RFW-LIC-620 in manual and then immediately places RFW-LIC-600 in auto</li> <li>• Observes RFW-LIC-600 automatically maintains desired RPV level by controlling RFP speed</li> <li>• Slowly opens RFW-FCV- 10A(B) using RFW-LIC-620 in manual to achieve LE 20 psid across 10 valve. Observes RFP speed decreases to maintain RPV level at desired setpoint.</li> <li>• When RPV level is stable, opens RFW-V-112A and observes RFP speed adjusts to maintain level</li> <li>• Opens RFW-V-112B</li> <li>• Using RFW-LIC-620 in manual, slowly closes RFW-FCXV-10A(B)</li> <li>• Closes RFW-V-118</li> </ul>
	RO	Monitors plant conditions
<p><b>COMMENTS:</b> 10/11/00 – changed from event 4 to event 1</p> <p>This event may occur anytime within the scenario, based on the crew's performance of the startup procedure.</p>		

<b>Event No. 2</b>		
<b>Description:</b> Increase Reactor Power with control rods		
<i>This event is initiated by the turnover sheet.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	SRO	Directs RO to continue rod withdrawal
	RO	Withdraws control rods <ul style="list-style-type: none"> <li>• Verifies prior to each rod withdrawal               <ul style="list-style-type: none"> <li>– Correct rod selected</li> <li>– Correct start/stop position</li> </ul> </li> <li>• for each rod that is fully withdrawn:               <ul style="list-style-type: none"> <li>- checks coupling integrity - initials sequence sheet (PPM 9.3.9)</li> <li>- ensures position 48 corresponds to FULL OUT light</li> </ul> </li> </ul>
	BOP	Monitors plant conditions
<b>COMMENTS:</b> 10/11/00 – changed from event 1 to event 3 1. An examiner or WNP2 staff may be used to role-play the “second person” for simultaneous verification of rod movement (per PPM 1.3.1)		

<b>Event No. 3</b>		
<b>Description:</b> RWM failure results in loss of ability to move control rods  <i>This event is initiated with <b>TRIGGER 3</b> after a significant reactivity change has occurred in event 3 or by direction of the lead examiner.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO	Reports INSERT and WITHDRAWAL blocks are instated with no activity at P603
	SRO	Directs RO/BOP to confirm cause of rod blocks  References ABN-RWM, Rod Worth Minimizer Failure
	BOP	Reports RWM OPER led is off and RWM INOP led is on(P616, RDCS Analyzer Panel)indicating RWM is inop <i>NOTE: Immediate operator action for a failed RWM is to stop all rod movement except by scram. This action is already covered by the fact that both insert and withdrawal blocks are instated.</i>
	SRO	Directs subsequent actions of ABN-RWM <ul style="list-style-type: none"> <li>• Attempt to re-initialize RWM (this malfunction will prevent re-initialization)</li> <li>• Manually bypasses RWM IAW PPM 2.1.4</li> </ul> Refers to Tech Spec 3.3.2.1, Condition C, and determines that the RWM is not required to be operable at this current power level (<10% RTP)  <i><b>CUE: If asked as STA to administratively verify that a startup with the RWM inop has not been performed in the last calendar year, report back that the current startup is the only startup performed this calendar year.</b></i> <ul style="list-style-type: none"> <li>• Directs RO to manually bypass the RWM per PPM 2.1.4</li> <li>• May write an INOP sheet for RWM</li> <li>• Assigns a second licensed operator or qualified member of the tech staff to act as second verifier for compliance with the BPWS</li> <li>• Directs continuation of startup</li> </ul>
	RO	Bypasses RWM when directed  Continues pulling rods
<b>COMMENTS:</b> 10/11/00 – changed from event 2 to event 4; 10/19/00 –event 4 to event 3 1. This event should be performed during event #2.		



<b>Event No. 4</b>		
<b>Description:</b> Outboard MSIV on 'A' steam line fast closes due to failure of its 4-way air control valve.		
<i>This event automatically initiates 15 minutes after Trigger 3.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO/BOP	<p>Reports that MS-V-28A is closed</p> <p>May Report the steam flow in MSL "A" indicates 0 Mlbm/hr.</p>
	SRO	<p>Briefs crew</p> <p>Contacts Work Control to initiate investigation and repair plan.</p> <p>Contacts plant manager.</p> <p><b><i>CUE: As upper management, express to the CRS that you want to continue with the plant startup while the work team investigates the cause.</i></b></p>
<b>COMMENTS:</b> 10/11/00 – changed from event 3 to event 5; 10/19/00 – changed from event 4 to event 3		

<b>Event No. 5</b>		
<b>Description:</b> CRD flow controller auto mode fails requiring transfer to manual and manual adjustment of CRD flow.  <i>This event auto initiates 3 minutes after event 4 (TRIGGER 3 with a 18 minute time delay).</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO	Reports that drive water pressure is very low  May report the inability to move control rods  Reports that the CRD flow controller is not operating properly in automatic.
	SRO	Directs the RO to take manual control of the flow controller and adjust flow and pressure
	RO	Takes manual control of the CRD flow controller and adjust cooling water flow to $\approx 60$ gpm and drive water pressure to $\approx 260$ psig  May refer to PPM 2.2.1 for direction on where to set CRD flow and pressure.
	SRO	Contacts work control to have them investigate and prepare repair plan for the failed controller
<b>COMMENTS:</b> It is probable that this event will remain unnoticed until rod movement is attempted. 10/11/00 – changed from event 4 to event 6; 10/19/00 – changed from event 6 to event 5		

<b>Event No. 6</b>		
<b>Description:</b> Failure of REA-FN-1B causing entry into EOP 5.3.1 on high secondary containment pressure.  <i>This event automatically initiates 10 minutes after event 5 is initiated (Trigger 3 with 28 minute time delay)</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	BOP	Reports Bus 83 ground annunciator  Investigates loads on bus 83  Determines REA-FN-1B has tripped and that
	RO	Reports “Sec Press $\Delta P$ High” annunciator and states that it is a possible EOP entry condition.
	SRO	Enters EOP 5.3.1 based on high secondary containment pressure  Refers to ABN-HVAC.
	BOP	Performs actions of PPM 4.812.R2: <ul style="list-style-type: none"> <li>• Checks fan tripped</li> <li>• Attempts to start the other Rx Bldg outlet fan</li> <li>• *If neither fan can be started, immediately secures building inlet fans, closes ROA-V-1, ROA-V-2, REA-V-1, and REA-V-2, and starts a train of SGT to maintain negative pressure in Rx Bldg.</li> <li>• Notifies chemistry to monitor Rx Bldg ventilation</li> <li>• Informs SRO that the ARP has a reference to ODCM 6.1.2.1 for all modes of operation.</li> <li>• Performs ABN-HVAC steps as directed by SRO</li> </ul> <p style="text-align: right;"><b>*CRITICAL TASK</b></p>
	SRO	Upon restoration of negative Rx Bldg pressure, requests SM’s permission to exit EOP 5.3.1
<b>COMMENTS:</b> 10/8/00 Changed abnormal reference to new ABN-HVAC. Fixed second step to say “outlet” rather than “inlet”. 10/11/00 – changed “exhaust fans” to “inlet fans” in step four, item three; 10/19/00 – changed from event 7 to event 6		

<b>Event No. 7</b>		
<b>Description:</b> Loss of offsite power		
<i>This event automatically initiates 13 minutes after event 8 (Trigger 4 with a 41 minute time delay)</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	BOP	Determines/reports loss of electrical power <ul style="list-style-type: none"> <li>• Loss of 230KV startup power</li> <li>• Backup power previously out of service</li> <li>• DG #1 and #2 have started</li> <li>• DG #2 failed to tie to the bus (see event #9)</li> </ul>
	SRO	Directs RO to perform scram actions.
	RO	Performs immediate scram actions: <ul style="list-style-type: none"> <li>• Mode switch to shutdown</li> <li>• Reports power/level/pressure</li> <li>• Inserts SRMs/IRMs</li> <li>• Reports all rods are in</li> </ul>
	SRO	Enters EOP 5.1.1 based on low RPV level. <ul style="list-style-type: none"> <li>• Gives a level band of -161" to +54" (or band between these values)</li> <li>• Gives a pressure band</li> </ul> Enters EOP 5.2.1 based on high DW pressure, high DW temperature, and high SP level <ul style="list-style-type: none"> <li>•</li> </ul>
	SRO/RO/BOP	Directs/performs actions for loss of offsite power per ABN-ELEC-LOOP: <ul style="list-style-type: none"> <li>• If HPCS-P-2 fails to start, have HPCS DG tripped locally (see event 10)</li> </ul> <p><b><i>CUE: If requested as OPS-2 to trip DG-3 locally, wait 3 minutes and then initiate TRIGGER 20 to locally trip DG-3.</i></b></p> <ul style="list-style-type: none"> <li>• *Initiate RCIC and/or HPCS (HPCS is unavailable due to its failed service water pump &lt;event 10&gt;) to maintain RPV level</li> <li>• If SW pumps fail to auto start after 20 seconds, trip the associated DG at P800</li> </ul> <p><b><i>CUE: As the Monroe Control Center dispatcher, inform the WNP2 control room that the 230KV off site supply has been restored.</i></b></p> Restores off-site power and re-energizes SM-1, SM-2, SM-3, SH-5, and SH-6 IAW PPM 2.7.1B <ul style="list-style-type: none"> <li>• If Rx Bldg DP has increased to 0 in H20, refer to EOP 5.3.1 and</li> </ul>

		<p>ensure SGT trains are operating per PPM 2.3.5</p> <ul style="list-style-type: none"> <li>• If no CAS compressors running, start CAS-C-1A(B) and ensure CJW is running per PPM 2.8.1.</li> </ul> <p><b><i>CUE: If asked as EO to verify operation of CJW, report that CJW-P-1A is running.</i></b></p> <ul style="list-style-type: none"> <li>• Restore RPS with RPS MG sets and ensure neutron monitoring systems and process radiation monitoring systems are returned to service.</li> </ul> <p><b><i>CUE: When asked as EO to restore RPS B, wait 5 minutes and initiate Trigger 22, then report that RPS MG B and associated EPA breakers are in service.</i></b></p> <ul style="list-style-type: none"> <li>• When RPS has been restored and plant conditions warrant, restore primary containment and BOP isolations per ABN-FAZ.</li> <li>• Restore CRD per PPM 2.1.1</li> </ul>
<p><b>COMMENTS:</b> 10/8/00 – Added EO cues for expected local actions for ABN-ELEC-LOOP.  10/11/00 – moved restoration of power to TRS to an earlier position in this event; 10/19/00 – changed from event 8 to event 7</p> <p><b>Terminate the scenario when power has been restored to SM-1, SM-2, SM-3, SH-5 and SH-6 (or any combination as directed by the lead examiner)</b></p>		

<b>Event No. 8</b>		
<p><b>Description:</b> Failure of DG-2 output breaker to close. Requires BOP manual action to attempt closure. Manual attempt will also fail.</p> <p><i>This event is initiated at the beginning of the scenario, but is not detected until DG-2 attempts to tie to SM-7. This event occurs within event 7 and should be completed before scenario termination.</i></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	BOP	<p>Reports that DG-2 output breaker has failed to close</p> <p>Attempts to close DG-2 breaker to complete an expected automatic operation.</p> <ul style="list-style-type: none"> <li>• Verifies CB-8/1 is open</li> <li>• Verifies CB-B8 is open</li> <li>• Places CB-DG1/8 synch switch in MAN CHECK</li> <li>• Places CG-DG1/8 control switch to CLOSE</li> </ul> <p>Reports that DG-2 output breaker will not close manually.</p>
	SRO	<p>If BOP fails to take manual action, SRO directs BOP to shut DG-2 output breaker.</p> <p>*After manual closure attempt fails, directs BOP to emergency trip DG-2 due to no Service Water flow to the DG.</p> <p>May declare an Alert after 15 minutes with only one emergency bus supply available.</p> <p style="text-align: right;"><b>*CRITICAL TASK</b></p>
	BOP	<p>Emergency trips DG-2 within 6 minutes from time of DG start.</p> <p style="text-align: right;"><b>CRITICAL TASK</b></p>
<p><b>COMMENTS:</b> 10/19/00 – changed from event 9 to event 8</p>		

Event No. 9		
<b>Description:</b> HPCS SW pump shaft seizure requiring trip of HPCS Diesel Generator.  <i>This event is initiated at the beginning of the scenario but is undetected until the HPCS DG receives a start signal. This event occurs within event 7 and should be completed before scenario termination.</i>		
Time	Position	Applicants Actions or Behavior
	BOP	*Reports that the HPCS SW pump trip has tripped.  Reports that DG 3 is operating without SW flow  Recommends tripping DG-3
	SRO	Directs trip of DG 3 per ABN-ELEC-LOOP  <div style="text-align: right;"><b>CRITICAL TASK</b></div>
	BOP	*Contacts OPS2 via radio and directs him to trip DG 3 locally  <i><b>CUE: TRIGGER 20 trips DG 3 locally. As OPS2, report back to the control room after you have tripped DG3 locally.</b></i>  Reports that DG-3 is tripped and that HPCS is secured  <div style="text-align: right;"><b>*CRITICAL TASK</b></div>
<b>COMMENTS:</b> 10/8/00 Added OPS2 cue for report back on DG3 actions. 10/11/00 – changed critical task from reporting DG without SW, to having DG-3 tripped; 10/19/00 – changed from event 10 to event 9		

**SRO TURNOVER INFORMATION**

The plant is starting up. The reactor is currently at 14% reactor power on its way to 100%.

The control rod sequence is at step 29-13, control rod 14-47 at notch 08.

Section 5.7 of PPM 3.1.2 is currently being performed. The transfer of RPV level control from RFW-V-10A/B to RFP speed control is in progress and is complete through step 5.7.4 of PPM 2.2.4.

TRB failed 1 hour ago and is under clearance so that BPA can work on it.

Your crew is to continue the startup with the RO pulling rods and the BOP completing the transfer of the feed system from “FCV-V-10A/B control” to “RFP speed control.”

All pre-job briefs and reactivity briefs have been completed



**SIM OPERATOR NOTES:**

- Install a blue tag on the BU xfmr control switch on board C. Place B-7 and B-8 in PTL and Blue tag.
- Ensure running RFP min flow controller is in Manual at 80%
- Ensure FW master controller is set at 36”
- RESET RWM if necessary
- In EXPERT window, enter “bat nrc12.txt” and hit ENTER
- Click on the Microsoft Windows “Start” icon (bottom left of screen) and click on RUN; enter “m:\opensim\caep” and click on OK
- On the CAEP screen, click on File; Open File, and select NRC12.CAE. The caep file will be displayed on the CAEP screen

<b>Facility:</b> WNP-2	<b>Scenario No.</b> 3	<b>Op-Test No:</b> 1
<b>Examiners:</b> _____ _____ _____		
<b>Operators:</b> _____ _____ _____		
<b>Initial conditions:</b> IC-84. The reactor is at 100% power with APRM B in bypass for maintenance. The core is near end-of-life.		
<b>Turnover:</b> The plant is at 100% rated thermal power. The plant is scheduled to shut down in 63 days for a refueling outage. BPA has scheduled an economic dispatch to 90% to commence at the beginning on your shift. The previous shift has completed PPM 3.2.5 to step 5.1.5. The “B” APRM is in bypass while the work team troubleshoots a problem in the COUNT circuit. BPA has also requested that PCB 4888 be opened at the beginning of your shift to allow for ASHE substation maintenance. All pre-job briefs are complete		

  

Event No.	Malf. No.	Event Type*	Event Description
1.	T=0 Trigger 1 starts clock	R(RO)	Reduce power to 90% for economic dispatch
2.	T+9 min	I(RO)	APRM C fails upscale during power reduction
3.	this may get done first	N(BOP)	BPA requests that WNP-2 open PCB 4888 for switchyard maintenance.
4.	T+15 min	C(BOP)	Running DEH pump trips, standby DEH pump fails to auto start. BOP manually starts the standby pump.
5.	T+20 min	I(BOP)	DEH analog amplifier for BPVs output fails high causing all BPVs to go full open requiring BOP to take manual control of BPVs to shut them.
6.	Trigger 6 manually when all BPVs closed	C(ALL)	Loss of SM-1 due to overcurrent lockout. Results in loss of feedwater
7.	result of event 6	M(ALL)	Low RPV level reactor SCRAM with a 3 rod ATWS.
8.	in at beginning of scenario	I(RO/BOP)	RCIC flow controller output fails with no signal output rendering RCIC unusable.
9.	in at beginning of scenario	C(BOP)	PCB 4885 fails to open when the turbine trips resulting in motoring of main turbine generator.
10.	Trigger 10 auto triggers when Rx pressure is LT 650#	C(RO/BOP)	RFW-V-10A&B fail open resulting in RPV overfeed.

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

<b>Event No. 1</b>		
<p><b>Description:</b> Reduce power to 90% for economic dispatch</p> <p><i>This event is initiated by the turnover sheet. Event 3 may occur first based on SRO's prioritization. <b>SIM OPERATOR CUE:</b> This scenario is time clock driven. Initiate <b>TRIGGER 1</b> to start the time clock when the crew has assumed the shift.</i></p>		
Time	Position	Applicants Actions or Behavior
	SRO	<p>Directs power reduction with recirc flow.</p> <p>Notifies Chemistry, Health Physics, and Radwaste Control Room of pending power change.</p>
	RO	Reduces reactor power with recirc flow (AUTO or MANUAL) and monitors plant response.
	BOP	<p>Monitors plant:</p> <ul style="list-style-type: none"> <li>Recovers from Governor Valve Optimization per PPM 2.5.7</li> <li>Verifies that COND-V-144 and RFW-V-109 are closed.</li> </ul>
<p><b>COMMENTS:</b></p>		

<b>Event No. 2</b>		
<b>Description:</b> APRM C fails upscale during power reduction.		
<i>This event is auto initiated 9 minutes into the scenario or by the direction of the lead examiner.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T+9	SRO/RO/BOP	Recognizes indications of a ½ scram <ul style="list-style-type: none"> <li>Multiple RPS annunciators on panel P603 A7</li> <li>Div 1 Scram Group lights extinguished</li> <li>No rod motion</li> <li>May announce on plant page to “stop all surveillance’s” (or similar)</li> </ul>
	SRO	Directs RO/BOP to determine cause of ½ scram
	RO	Monitors P603 indications <ul style="list-style-type: none"> <li>Confirms/reports that no individual rods have scrammed</li> <li>Reports that APRM C indicates up-scale</li> <li>Refers to ½ scram and APRM upscale ARPs (4.603.A7)</li> </ul>
	SRO	Directs RO to bypass APRM C and then reset the ½ scram.
	RO	Bypasses APRM C and resets the ½ scram
	SRO	Refers to Tech Specs 3.3.1.1 (RPS Instrumentation) and LCS 1.3.2.1 (Rod Blocks) and LCS 1.3.3.1 (Post Accident Monitoring) <ul style="list-style-type: none"> <li>Determines only 2 of the 3 APRM channels are required per trip system</li> <li>May write an INOP sheet for APRM C</li> </ul>
	SRO	Contacts work team for troubleshooting/repair of APRM C
<b>COMMENTS:</b>		

<b>Event No. 3</b>
<b>Description:</b> BPA requests PCB 4888 be opened to allow BPA to perform switchyard maintenance.

<i>This event is initiated by the turnover sheet <b>or</b> may be prompted by a phone call after the SRO has completed his Tech Spec call on the failed APRM <b>or</b> by direction of the lead examiner.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
<b><i>CUE: If the crew has not taken action to open PCB 4888, call the control room on the BPA ring-down line as ASHE sub-station and request that the control room manually open PCB 4888 in preparation for maintenance.</i></b>		
	SRO	Directs BOP to manually open PCB 4888 IAW PPM 2.5.7, section 5.16.
	BOP	Manually opens PCB 4888 <ul style="list-style-type: none"> <li>• Places ASHE BKR #2 Synch Selector Switch in MANUAL.</li> <li>• Places ASHE BKR #2 BPA BKR 4888 Switch in TRIP</li> <li>• Verify breaker opens</li> <li>• Places ASHE BKR #2 Synch Selector Switch in OFF.</li> <li>• Informs ASHE sub-station/Dittmer that BKR 4888 is open.</li> </ul>
	RO	Monitors plant
<b>COMMENTS:</b> This event may be done first, depending on the SRO's prioritization.		

<b>Event No. 4</b>		
<b>Description:</b> DEH-P-1A trips. DEH-P-1B fails to auto-start.		
<i>This event is auto initiated 15 minutes into the scenario or by direction of the lead examiner.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T+15	BOP	Reports Bus-11 Ground annunciator <ul style="list-style-type: none"> <li>• Investigates Bus-11 loads</li> <li>• Finds DEH-P-1A tripped</li> <li>• Reports that DEH-P-1B failed to start automatically on low system pressure</li> </ul>
	SRO	Directs the manual start of DEH-P-1B based on failure of automatic action
	BOP	*Manually starts DEH-P-1B  Verifies normal starting parameters and return of system pressure  <div style="text-align: right;"><b>*CRITICAL TASK</b></div>
	RO	Monitors plant
	SRO	Directs OPS3 to investigate loss of DEH-P-1A and check out ground fault indication panel.  Contacts Work Team to troubleshoot/repair DEH-P-1A and pressure switch DEH-PS-5
<b>COMMENTS:</b>		

<b>Event No. 5</b>		
<b>Description:</b> DEH analog amplifier for BPVs output fails high causing all BPVs to go full open requiring BOP to take manual control of BPVs to shut them.		
<i>This event auto initiates 20 minutes into the scenario or by direction of the lead examiner.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T+20	RO/BOP	Reports various MSR low level alarms Reports lowering MW electric Reports slowly lowering reactor pressure
	BOP	Determines/reports that BPVs are open
	SRO	Directs manual control and closure of BPV's Notifies Work Control regarding DEH problem.
	RO	Monitors plant conditions Reports that Power, Pressure, and Level are normal
	BOP	Manually closes BPV's
<b>COMMENTS:</b> 10/8/00 – Event was inadvertently left out of body of scenario guide, although the outline contained the event. Event was added to the body and the remaining events renumbered to match the scenario outline.  PPM 1.3.1 provides for taking manual control of equipment that is malfunctioning in automatic mode.		

<b>Event No. 6</b>		
<b>Description:</b> Loss of SM-1 on overcurrent resulting in a loss of Feedwater.  <i>This event is <b>MANUALLY initiated with TRIGGER 6</b> after BPV's are closed or by direction of the lead examiner.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	SRO/RO/BOP	Determines/reports loss of electrical power <ul style="list-style-type: none"> <li>• Loss of SM-1</li> </ul> Reports ½ scram Verifies automatic actions occur IAW ABN-ELEC-AC <ul style="list-style-type: none"> <li>• Emergency diesel #1 starts</li> <li>• SM-1 bus breakers open</li> <li>• CB-B7 closes after time delay to power up SM-7 from backup xfmr.</li> <li>• DG #1 supplies power to SM-7 if backup supply fails.</li> </ul> Verifies Service Water for DG #1 is operating  Restores power to MC-7C and MC-7E
	RO	Reports lowering trend in reactor water level  Reports loss of running CRD pump due to momentary loss of SM-7
	SRO	Directs re-start of CRD pump IAW ABN-ELEC-AC
	BOP	Restarts CRD pump: <ul style="list-style-type: none"> <li>• Closes CRD-FCV-2A with CRD-FC-600</li> <li>• Starts or restarts CRD pump</li> </ul>
	SRO/RO/BOP	Determines that low Reactor Water Level is being caused by inadequate condensate and feed flow.
	SRO	Directs RO to manually scram reactor if water level approaches the scram setpoint. (see Event 7)
<b>COMMENTS:</b> 10/8/00 – Event number changed from 5 to 6. This event leads into event 7.		



<b>Event No. 7</b>		
<b>Description:</b> Reactor scram with a 3 rod ATWS.		
<i>This event is initiated by the actions in Event 6</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO	<p>Carries out immediate actions for reactor scram</p> <ul style="list-style-type: none"> <li>• Mode switch to shutdown</li> <li>• Reports power/level/pressure</li> <li>• Inserts SRM's/IRM's</li> <li>• Reports that 3 control rods did not insert</li> <li>• Depresses manual scram buttons</li> <li>• Initiates ARI and reports that 3 rods are still not in</li> <li>• reports downscals on APRMs</li> </ul> <p>Reports that RCIC is not responding after startup (see event 8)</p>
	SRO	<p>Enters 5.1.1 on low reactor water level</p> <p>Exits 5.1.1 and enters 5.1.2 based on incomplete scram</p> <ul style="list-style-type: none"> <li>• Directs RO/BOP to inhibit ADS and take manual control of HPCS</li> <li>• Directs verification of expected isolations and initiations</li> <li>• Directs bypass of MSIV isolations per PPM 5.5.6</li> <li>• Directs RPV level band between -192" and +54" using outside shroud injection systems</li> <li>• Directs a pressure band below 1060 psig with SRVs</li> <li>• When it becomes evident that adequate high-pressure injection sources are not available, directs a pressure band (typically 500-600 psig) to allow injection with the condensate booster pumps.</li> <li>• Directs RRC pumps taken to minimum flow (should be there due to loss of feedwater)</li> <li>• Directs alternate modes of rod movement via PPM 5.5.10 and 5.5.11</li> </ul>
	RO/BOP	<p>*Inhibits ADS</p> <p>*Takes manual control of HPCS</p> <ul style="list-style-type: none"> <li>• Manually initiates HPCS with ARM and DEPRESS</li> <li>• Secures HPCS pump and/or shuts HPCS-V-4</li> </ul> <p>Verifies +13" isolations</p> <p>Bypasses MSIV isolations using PPM 5.5.6</p> <ul style="list-style-type: none"> <li>• Obtains procedure package and keys from EOP drawer</li> <li>• At P609, places MS-RMS-S84 to BYPASS position</li> <li>• At P611, places MS-RMS-S85 to BYPASS position</li> <li>• Reports completion of PPM 5.5.6 to the SRO</li> </ul>

		<p>Attempts to use RCIC in order to maintain water level using RCIC with suction from CST (RCIC will not operate correctly &lt;event 7&gt;)</p> <p>Reports that the only high-pressure system injecting is CRD.</p> <p>*When directed, lowers reactor pressure to band allowing injection with condensate booster pumps.</p> <p>Maintains water level in band using condensate booster pumps via RFW-V-10A &amp; 10B (see event 9)</p> <p>Overrides ARI logic using PPM 5.5.10:</p> <ul style="list-style-type: none"> <li>Obtains procedure package and fuse pullers from EOP drawer</li> <li>At P650, pulls one of the following fuses on TB1: <ul style="list-style-type: none"> <li>F01; F02; F03; F04</li> </ul> </li> <li>At P650, pulls one of the following fuses on TB2: <ul style="list-style-type: none"> <li>F01; F02; F03; F04</li> </ul> </li> <li>Reports to SRO that PPM 5.5.10 is complete</li> </ul> <p>Performs actions of PPM 5.5.11:</p> <ul style="list-style-type: none"> <li>Obtains procedure package and tools from EOP drawer</li> <li>Determines that the appropriate sections of the procedure for the existing conditions are Tabs B and F.</li> </ul> <ul style="list-style-type: none"> <li>TAB B: <ul style="list-style-type: none"> <li>Places SDV HIGH LEVEL TRIP control switch to BYPASS</li> <li>Overrides RPS trip signals: <ul style="list-style-type: none"> <li>Installs jumper between terminal stud 2 on RPS-RLY-K9B and terminal stud 4 on PRS-RLY-K12F in P611</li> <li>Installs jumper between terminal stud 2 on RPS-RLY-K9D and terminal stud 4 on PRS-RLY-K12H in P611</li> <li>Installs jumper between terminal stud 2 on RPS-RLY-K9A and terminal stud 4 on PRS-RLY-K12E in P609</li> <li>Installs jumper between terminal stud 2 on RPS-RLY-K9C and terminal stud 4 on PRS-RLY-K12G in P609</li> </ul> </li> <li>Resets the scram on P603</li> <li>When SDV has drained for more than 2 minutes, checks rod density and initiates a manual scram</li> <li>Reports any rod movement, or lack thereof, to the SRO</li> </ul> </li> <li>TAB F: <ul style="list-style-type: none"> <li>Starts second CRD pump if available</li> <li>Places SDV HIGH LEVEL TRIP control switch to BYPASS</li> <li>Resets scram if possible</li> </ul> </li> </ul>
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		<ul style="list-style-type: none"> <li>• Bypasses all RSCS rod blocks:             <ul style="list-style-type: none"> <li>• Installs a jumper from terminal 7 to terminal 8 on the following two Bailey Alarm Cards on P613                 <ul style="list-style-type: none"> <li>• AHH (MS-PS-654A)</li> <li>• AGG (MS-PS-654B)</li> </ul> </li> <li>• Places RWM bypass switch to BYPASS</li> <li>• Manually drives rods and informs SRO of results</li> </ul> </li> </ul> <p style="text-align: right;"><b>*CRITICAL TASK</b></p>
	SRO	Enters EOP 5.2.1 on Wetwell level and later on high Drywell pressure.
<p><b>COMMENTS:</b> 10/8/00 – Event number changed from 6 to 7. 10/16/00 – added steps regarding EOP 5.2.1</p> <p><i>NOTE: STA will not be available to make determination of reactor shutdown with rods out.</i></p> <p><b>Terminate the scenario when RPV level is +13” to +54” and all rods have been driven in.</b></p>		

<b>Event No. 8</b>		
<b>Description:</b> RCIC flow controller output fails  <i>This event is initiated at the beginning of the scenario but is not detectable until RCIC is running. This event occurs within Event 7 and should be completed prior to scenario termination.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO/BOP	Reports that RCIC is running at a very low speed and that the controller is not responding. (RCIC may trip after a period of operating like this – if so, RO/BOP will report it tripped and may attempt to reset and restart RCIC)
	SRO	Directs RCIC shutdown due to improper operation.
	RO/BOP	Trips RCIC
<b>COMMENTS:</b> 10/8/00 – Event number changed from 7 to 8. 10/17/00 – added clarification regarding RCIC trip		

<b>Event No. 9</b>		
<b>Description:</b> PCB 4885 fails to open when the turbine trips.		
<i>This event is initiated at the beginning of the scenario but is not detectable until after the turbine trips. This event occurs within Event 7 and should be completed prior to scenario termination.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	BOP	Reports that PCB 4885 failed to open automatically upon turbine trip.  Opens PCB 4885 to manually complete expected automatic action.
<b>COMMENTS:</b> 10/8/00 – Event number changed from 8 to 9.		

<b>Event No. 10</b>		
<b>Description:</b> RFW-V-10A&B fail open resulting in RPV overfeed		
<i>This event is automatically initiated when reactor pressure drops below 650 psig. This event occurs within Event 7 and should be completed prior to scenario termination.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	BOP	Reports that water level is returning to normal band but that the Startup Level Control valves are not responding by throttling down.
	SRO	May direct operation of COND-V-118 to stop vessel overfill  May direct shutdown of Condensate Booster Pumps/Condensate Pumps to minimize level increase.
	BOP	Performs actions directed by SRO to mitigate overfill of reactor vessel
		<b>CRITICAL TASK</b>
<b>COMMENTS:</b> 10/8/00 – Event number changed from 9 to 10.		

**SRO TURNOVER INFORMATION**

The plant is at 100% rated thermal power. The plant is scheduled to shut down in 63 days for a refueling outage.

BPA has scheduled an economic dispatch to 90% to commence at the beginning on your shift. BPA has also requested that PCB 4888 be opened at the beginning of your shift to allow for ASHE substation maintenance.

The previous shift has completed PPM 3.2.5 to step 5.1.5.

The "B" APRM is in bypass while the work team troubleshoots a problem in the COUNT circuit.

All pre-job briefs and reactivity briefs are complete

<b>Facility:</b> WNP-2	<b>Scenario No.:</b> 1	<b>Op-Test No.:</b> 2
<b>Examiners:</b> _____ <b>Operators:</b> _____ _____ _____		
<b>Initial conditions:</b> IC-86. Reactor power is at 17%. The main generator is ready for synch with the grid.		
<b>Turnover:</b> A plant startup is in progress. The reactor is at 17% power. PPM 3.1.2 is at step 5.7.20. The rod pull is at step 32-12 with control rod 02-19 at notch 00. The main generator is at 1800 RPM and ready to synch to the grid. PPM 2.5.7 has been complete through step 5.4.13.a. All pre-job briefs are complete.		

  

Event No.	Malf. No.	Event Type*	Event Description
1.		N(BOP)	Complete synchronization of the Main Generator with the Grid.
2.	Breaker closure failure auto-clears when synch switch taken to Manual	C(BOP)	Main Generator auto synchronization circuit fails requiring manual synchronization of the main generator with the grid.
3.		R(RO)	Continue power increase by pulling control rods.
4.	This event is self initiating upon reaching rod position 10 on rod 02-19	I(RO)	Control Rod 02-19 position 10 reed switch fails closed requiring substitute rod position entry.
5.	This event is self initiating upon reaching rod 42-59 in the pull sequence	C(RO)	Stuck control rod (42-59). The RO will be able to withdraw the control rod by increasing control rod drive pressure. ( <i>Columbia PER 299-2360</i> )
6.	This event auto initiates during event 4, but the high temp alarm occurs approx. <b>8 minutes</b> after event 4 starts	I(BOP)	TSW-TE-8 instrument output fails low causing a loss of main turbine lube oil temperature indication and causing TSW-TCV-8 to go closed (due to sensed low temperature input) causing an increase in Main Turbine Bearing Oil temperature with a resultant requirement to decrease generator load and trip the main turbine.
7.	Trigger 7 (manual)	M(ALL)	Rupture in DEH causes loss of pressure in DEH resulting in the closure of all bypass valves and a high RPV pressure condition.
8.	Occurs upon scram	M(ALL)	Reactor fails to scram on high RPV pressure due to Hydraulic ATWS.
9.	Occurs when the SRV opens in response to high RPV pressure	M(ALL)	MS-RV-1B tailpipe failure above suppression pool level.
10.	Auto triggers on scram signal	C(RO)	Operating CRD pump trips on low suction pressure following the scram ( <i>Columbia PER 299-1342</i> )
11.	in at beginning of scenario	C(RO/BOP)	RHR-P-2A shaft shears requiring all containment spray functions off RHR B loop. ( <b>necessary in order to reach PSP</b> )

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



<b>Event No. 1</b>		
<b>Description:</b> Complete synchronization of the Main Generator with the Grid.		
<i>This event is initiated by the turnover sheet</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	SRO	Directs the synchronization of the main generator to the grid IAW PPM 2.5.7. starting at step 5.4.6
	BOP	<p>Performs actions of PPM 2.5.7, Main Generator Synch to Grid (starting at step 5.14.c:</p> <ul style="list-style-type: none"> <li>• Turns ASHE Breaker No. 2 Synch Selector Switch to AUTO and observes synch scope and meters</li> <li>• If necessary, adjusts turbine speed again to obtain synch scope rotation slow in the fast direction.</li> <li>• Using the Main Generator Exciter Voltage Adjuster, adjusts synch voltage to bus voltage</li> <li>• On DEH, depresses Load Rate MW/Min button and enters a load rate of 200 MWe/min and depresses ENTER.</li> <li>• When the synch scope rotates slowly in the fast direction and the pointer passes the 11 o'clock position, takes the generator breaker control switch to the CLOSE position.</li> </ul> <p><b>NOTE: The selected breaker will not close – see event #2</b></p> <p>Reports that the generator breaker will not close</p>
<b>COMMENTS:</b> NOTE: If “500KV Sync Incomplete” annunciator comes in, the BOP will take the ASHE Breaker No. 2 sync selector switch to OFF and back to AUTO to reset the 3 minute time delay for this annunciator (IAW ARP for this annunciator)		

<b>Event No. 2</b>		
<p><b>Description:</b> Main Generator auto synchronization circuit fails requiring manual synchronization of the main generator with the grid.</p> <p><i>This event is initiated at the beginning of the scenario but is not evident until closure of the breaker is attempted. (The breaker closure override that prevented breaker closure in AUTO is removed automatically when the synch selector switch is taken to MANUAL)</i></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	SRO	<p>May call system engineer for recommendations</p> <p>May request Shift Manager input</p> <p><b><i>CUE: As system engineer, recommend that the crew continues the synchronization in Manual. As plant management/shift manager, inform the CRS that permission is given to complete the synchronization in the MANUAL mode.</i></b></p> <p>Directs BOP to synchronize the generator in MANUAL mode.</p>
	BOP	<p>Performs actions to synchronize the generator in MANUAL mode:</p> <ul style="list-style-type: none"> <li>• takes the synch selector switch for breaker to MANUAL</li> <li>• speed and voltage should already be in range from previous attempt to AUTO close the breaker</li> <li>• using the Master Close Switch, closes the breaker when synch scope is going slow in the fast direction and has just passed the 11 o'clock position</li> <li>• at DEH, depresses the LOAD RATE MW/MIN pushbutton and enters a load rate of 200 MWe/min and depresses the ENTER button.</li> <li>• at DEH, depresses REFERENCE pushbutton and enters a load setpoint of 300 MWe and depresses the ENTER button</li> <li>• at DEH, depresses the GO button</li> <li>• verifies that TG Motoring alarm clears and then depresses the HOLD button</li> <li>• takes synch selector switch to OFF</li> <li>• places voltage stabilizer to ON</li> <li>• loads main generator</li> </ul> <p>Reports completion of task to CRS</p> <p><b><i>CONTINGENCY NOTE: If the candidate fails to successfully tie the generator to the grid, RESET the simulator to IC-___, run "BAT NRC21.TXT," and inform the crew that TIME COMPRESSION has</i></b></p>

		<i>occurred and that the generator is now tied to the grid. (IC-__ is an exact replica of IC-86 but with the generator already tied. This allows this scenario to continue without effect on pending events)</i>
<b>COMMENTS:</b> 10/19/00 – included contingency to allow continuation of scenario in case the candidate is unsuccessful at tying the generator to the grid		

<b>Event No. 3</b>		
<b>Description:</b> Continue power increase by pulling control rods.		
<i>This event is initiated by the turnover sheet. It may be commenced prior to main generator synchronization, but must be put on hold during the synchronization.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	SRO	Directs RO to continue rod withdrawal
	RO	Withdraws control rods <ul style="list-style-type: none"> <li>• Verifies prior to each rod withdrawal               <ul style="list-style-type: none"> <li>– Correct rod selected</li> <li>– Correct start/stop position</li> </ul> </li> <li>• for each rod that is fully withdrawn:               <ul style="list-style-type: none"> <li>- checks coupling integrity - initials sequence sheet (PPM 9.3.9)</li> <li>- ensures position 48 corresponds to FULL OUT light</li> </ul> </li> </ul>
	BOP	Monitors plant conditions
<b>COMMENTS:</b>		

<b>Event No. 4</b>		
<p><b>Description:</b> The position 10 reed switch for control rod 0219 fails closed requiring substitute rod position entry at position 12 (RWM and RSCS cause rod blocks due to seeing both position 10 and position 12 reed switches closed).</p> <p><i>This event is initiated at the beginning of the scenario but is not evident until the rod is moved through position 10. Trigger 6 auto initiates upon receiving a rod data fault signal when rod 0219 reaches notch 12. This trigger begins the Event 6 main turbine lube oil temperature rise.</i></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO	Reports that the RPIS is not registering rod position at notch 12
	SRO	Refers to and directs actions of PPM 4.1.1.6, Loss of Control Rod Position Indication
	RO	<p>Performs actions of PPM 4.1.1.6:</p> <ul style="list-style-type: none"> <li>accepts substitute value for rod 02-19, notch 12, on RSCS by depressing the SEL SUB button on the RSCS interface panel</li> <li>inserts substitute value for rod 02-19, notch 12, in RWM by: <ul style="list-style-type: none"> <li>selecting the SUBSTITUTE/BYPASS ROD page on the RWM touch screen</li> <li>touching the UP screen button until the display shows 12</li> <li>touching the ENTER screen button for "Enter Substitute Rod Position"</li> </ul> </li> <li>determines that even though rod blocks are clear, position is still unknown by RPIS, requiring the rod to be bypassed</li> </ul> <p><b><i>SIM OPERATOR CUE - After position substitution is made on both the RWM and RSCS, select malfunction "RMC005-02190" on the SUMMARY page and DELETE it to simulate the switch un-sticking.</i></b></p> <p><b><i>ROLEPLAY CUE: If after the switch "un-sticks," the candidate remains focused on bypassing the rod, as Shift Manager mention that during the last startup, this same reed switch stayed closed for about 5 minutes, and then opened, allowing them to continue the startup without bypassing the rod. It appears that this switch has demonstrated the same problem on this startup. This CRDM's switch bundle is scheduled for replacement in the next RFO.</i></b></p>
<p><b>COMMENTS:</b> 10/8/00 – Initially this malfunction was based on a reed switch "failure to close". Due to sim problems with this malfunction, a reed switch "failure to open" is being used. If this switch were to remain failed in the closed position, a rod bypass and rod insertion would be required. To prevent this event from going to that point, the switch will un-stick following rod position substitution on the RSCS and RWM.</p> <p><b>NOTE:</b> If the RWM simulation fails during this event, prompt the SRO to bypass the RWM with the keylock switch so that the scenario may continue.</p>		

<b>Event No. 5</b>		
<p><b>Description:</b> One stuck control rod (42-59). RO is able to withdraw control rod by increasing control rod drive pressure.</p> <p><i>This event is initiated at the beginning of the scenario but is not evident until this rod is selected and movement attempted.</i></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO	<p>Reports that control rod 42-59 did not move during attempted withdrawal.</p> <p>Verifies normal CRD system parameters on P603</p>
	SRO	<p>Refers to PPM 2.1.1, CRD System:</p> <ul style="list-style-type: none"> <li>• Directs increase of CRD drive water pressure to 300 psid</li> <li>• Directs rod movement attempt</li> </ul>
	RO	<p>Increases CRD drive water pressure and attempts rod movement</p> <p>Reports no movement of selected rod</p>
	SRO	<p>Directs increase of CRD drive water pressure to 350 psid</p> <p>Directs rod movement attempt</p>
	RO	<p>Increases CRD drive water pressure and attempts rod movement</p> <p><b><i>SIM OPERATOR CUE: When CRD drive water pressure reaches 350 psid, select malfunction “RMC005-4259” on the SUMMARY page and delete it to allow for rod movement. (ensure that no other malfunctions are highlighted before clicking on DELETE)</i></b></p> <p>Reports movement of selected rod</p>
	SRO	Directs return of CRD pressure to 260 psid
	RO	Returns CRD pressure to 260 psid
	SRO	May notify system engineer to inform of problems with movement of rod 42-59
<b>COMMENTS:</b>		

<b>Event No. 6</b>		
<p><b>Description:</b> TSW-TE-8 instrument output fails low causing a loss of main turbine lube oil temperature indication and causing TSW-TCV-8 to go closed (due to sensed low temperature input) causing an increase in Main Turbine Bearing Oil temperature with a resultant requirement to decrease generator load and trip the main turbine.</p> <p><i>This event is initiated automatically with <b>TRIGGER 6</b> during event 4 to allow temperatures to rise without a long delay time between events.</i></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	BOP	<p>Reports high temperature condition for main turbine bearing oil</p> <p>Refers to ARP</p> <ul style="list-style-type: none"> <li>checks bearing oil drain temps on point 1-15 on TG-TR-48</li> <li>recommends decrease of generator load when temperature reaches 170 °F (DEH will prevent this reduction because of the minimal amount of load on the generator)</li> <li>checks for proper operation of TSW-TCV-8 (sends equipment operator)</li> </ul> <p><i><b>CUE: If requested as EO, report that TCV-8 is full closed.</b></i></p> <ul style="list-style-type: none"> <li>if necessary, has EO bypass TCV-8 with TSW-V-21.</li> </ul> <p><i><b>CUE: If this is requested early in the event, as EO, report that V-21 will not open and report that you've requested assistance from the SSS.</b></i></p>
	SRO	Directs trip of main turbine as bearing oil drain temps approach or reach 180°F
	BOP	Trips main turbine when temperature reaches 180°F or as directed
	SRO	Briefs crew
	RO	Monitors plant and reports Rx Power, Pressure, and Level following transient caused by turbine trip.
<b>COMMENTS:</b>		

<b>Event No. 7</b>		
<b>Description:</b> Rupture in DEH causes loss of pressure in DEH resulting in the closure of all bypass valves and a high RPV pressure condition.		
<i>This event is <b>MANUALLY</b> initiated with <b>TRIGGER 7</b> after the main turbine is tripped (Event 6)</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	ALL	Report Report high reactor pressure condition
	BOP	Reports that bypass valves have failed shut.  Determines that DEH has lost pressure.
	SRO	Directs manual reactor scram due to impending high pressure scram  <b>CRITICAL TASK</b>
	RO	Inserts manual reactor scram (if automatic scram has not occurred) and carries out immediate operator actions for reactor scram <ul style="list-style-type: none"> <li>• takes mode switch to shutdown</li> <li>• reports power/level/pressure</li> <li>• Due to ATWS, (see event 8) depresses manual scram pushbuttons and initiates ARI.</li> </ul> <b>CRITICAL TASK</b>
<b>COMMENTS:</b> 10/15/00 – changed rate of leak from 500 gpm to 100 gpm, allowing time for operators to take appropriate actions and to determine that a manual scram is called for.		

<b>Event No. 8</b>		
<p><b>Description:</b> Reactor fails to scram on high RPV pressure due to a partial Hydraulic ATWS. Partial rod movement occurs.</p> <p><i>This event is initiated at the beginning of the scenario but is not evident until the plant is scrammed in event 7. As soon as the scram signal is sensed, the ATWS malfunction auto-clears to allow partial rod insertion (scram discharge volume still blocks many rods due to vents and drains going closed)</i></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO	reports ATWS condition, all rods NOT in, APRMs NOT downscale
	SRO	<p>Enters PPM 5.1.2 due to ATWS condition</p> <ul style="list-style-type: none"> <li>• *directs BOP to inhibit ADS and take manual control of HPCS</li> <li>• *directs RO to trip both RRC pumps and initiate SLC</li> <li>• directs RO/BOP to ensure isolations and auto initiations have occurred</li> <li>• directs BOP to bypass MSIV isolations per PPM 5.5.6 and ECCS valve interlocks per PP 5.5.1</li> <li>• *directs RO to stop and prevent FW injection and maintain RPV level –65” to –192” (or some band in between)</li> <li>• directs BOP to maintain RPV pressure 800-1000 psig using SRV’s</li> <li>• *directs RO/BOP to attempt to insert control rods using PPM 5.5.10 and 5.5.11</li> </ul> <p style="text-align: right;"><b>*CRITICAL TASK</b></p>
	RO/BOP	<p>*Inhibits ADS</p> <p>*Takes manual control of HPCS</p> <ul style="list-style-type: none"> <li>• Manually initiates HPCS with ARM and DEPRESS</li> <li>• Secures HPCS pump and/or shuts HPCS-V-4</li> </ul> <p>*Trips RRC pumps and initiates SLC</p> <p>Verifies +13” isolations</p> <p>Bypasses MSIV isolations using PPM 5.5.6</p> <ul style="list-style-type: none"> <li>• Obtains procedure package and keys from EOP drawer</li> <li>• At P609, places MS-RMS-S84 to BYPASS position</li> <li>• At P611, places MS-RMS-S85 to BYPASS position</li> <li>• Reports completion of PPM 5.5.6 to the SRO</li> </ul> <p>Bypasses ECCS valve interlocks using PPM 5.5.1 and inserting keys:</p> <ul style="list-style-type: none"> <li>• At P625, takes HPCS-RMS-S25 to OVERRIDE</li> <li>• At P629, takes LPCS-RMS-S21 to OVERRIDE</li> <li>• At P629, takes RHR-RMS-S105 to OVERRIDE</li> </ul>



		<ul style="list-style-type: none"> <li>• At P618, takes RHR-RMS-S106 to OVERRIDE</li> <li>• At P618, takes RHR-RMS-S107 to OVERRIDE</li> </ul> <p>*Maintains water level using FW system</p> <p>Reports that control rods appear to be drifting into the core.</p> <p>*Overrides ARI logic using PPM 5.5.10: <b><u>(see note 1)</u></b></p> <ul style="list-style-type: none"> <li>• Obtains procedure package and fuse pullers from EOP drawer</li> <li>• At P650, pulls one of the following fuses on TB1:             <ul style="list-style-type: none"> <li>• F01; F02; F03; F04</li> </ul> </li> <li>• At P650, pulls one of the following fuses on TB2:             <ul style="list-style-type: none"> <li>• F01; F02; F03; F04</li> </ul> </li> <li>• Reports to SRO that PPM 5.5.10 is complete</li> </ul> <p>*Performs actions of PPM 5.5.11: <b><u>(see note 1)</u></b></p> <ul style="list-style-type: none"> <li>• Obtains procedure package and tools from EOP drawer</li> <li>• Determines that the appropriate sections of the procedure for the existing conditions are Tabs B and F.</li> <li>• TAB B:             <ul style="list-style-type: none"> <li>• Places SDV HIGH LEVEL TRIP control switch to BYPASS</li> <li>• Overrides RPS trip signals:                 <ul style="list-style-type: none"> <li>• Installs jumper between terminal stud 2 on RPS-RLY-K9B and terminal stud 4 on PRS-RLY-K12F in P611</li> <li>• Installs jumper between terminal stud 2 on RPS-RLY-K9D and terminal stud 4 on PRS-RLY-K12H in P611</li> <li>• Installs jumper between terminal stud 2 on RPS-RLY-K9A and terminal stud 4 on PRS-RLY-K12E in P609</li> <li>• Installs jumper between terminal stud 2 on RPS-RLY-K9C and terminal stud 4 on PRS-RLY-K12G in P609</li> </ul> </li> <li>• Resets the scram on P603</li> <li>• When SDV has drained for more than 2 minutes, checks rod density and initiates a manual scram</li> <li>• Reports any rod movement, or lack thereof, to the SRO</li> </ul> </li> <li>• TAB F:             <ul style="list-style-type: none"> <li>• Starts second CRD pump if available</li> <li>• Places SDV HIGH LEVEL TRIP control switch to BYPASS</li> <li>• Resets scram if possible</li> <li>• Bypasses all RSCS rod blocks:                 <ul style="list-style-type: none"> <li>• Installs a jumper from terminal 7 to terminal 8 on the following two Bailey Alarm Cards on P613                     <ul style="list-style-type: none"> <li>• AHH (MS-PS-654A)</li> </ul> </li> </ul> </li> </ul> </li> </ul>
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		<ul style="list-style-type: none"> <li>• AGG (MS-PS-654B)</li> <li>• Places RWM bypass switch to BYPASS</li> </ul> <p>Manually drives rods and informs SRO of results</p> <p style="text-align: right;"><b>*CRITICAL TASK</b></p>
	RO	Reports when all rods are in
	SRO	<p>Exits PPM 5.1.2 and re-enters 5.1.1</p> <ul style="list-style-type: none"> <li>• directs RO to stop SLC and restore RPV level to +13" to +54"</li> <li>• may direct BOP to remove RPS jumpers</li> </ul>
<p><b>COMMENTS: NOTE 1 : These tasks may not be necessary depending on how the crew prioritizes their actions.</b></p>		

<b>Event No. 9</b>		
<b>Description:</b> MS-RV-1B tail pipe failure above suppression pool level  <i>This event is initiated at the beginning of the scenario but is not evident until the high-pressure condition occurs in the RPV resulting in SRV operation. When the associated SRV operates, it sticks open to drive containment towards PSP.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	BOP	Reports rapidly increasing drywell and wetwell pressure  Reports that MS-RV-1B is stuck open  May report possible tail pipe failure based on DW/WW pressure response
	SRO	Directs actions of ABN-SRV <ul style="list-style-type: none"> <li>• directs BOP to verify SRV open using MS-TR-614, or rising suppression pool level</li> <li>• directs BOP to place SRV control switch to OFF on P601</li> <li>• *directs RO/BOP to place a loop of RHR (B preferred) in suppression pool cooling</li> <li>• *directs BOP to remove the SRV's fuses (fuse BB-F27 and F28 in P628)</li> </ul> <p style="text-align: right;"><b>*CRITICAL TASK</b></p>
	BOP	Verifies SRV is open by checking associated point on MS-TR-614  Takes SRV control switch to OFF  *Places a loop of RHR in suppression pool cooling  *Removes fuses for SRV  <i><b>CUE:</b> When operator goes to P628, explain to him that you will perform the fuse removal (fuses are not physically modeled in the simulator). Fuse removal will not be successful in closing the valve.</i> <p style="text-align: right;"><b>*CRITICAL TASK</b></p>
	SRO	Enters PPM 5.2.1 on high PC pressure <ul style="list-style-type: none"> <li>• directs initiation of WW sprays</li> <li>• when WW pressure is GT 12 psig, and within DSIL, directs shutdown of RRC pumps and DW cooling fans and initiation of DW sprays</li> <li>• directs PC sprays shutdown when PC pressure drops below 1.68 psig</li> <li>• when PC pressure cannot be maintained less than PSP, enters PPM</li> </ul>

		5.1.3, Emergency RPV Depressurization  <b>CRITICAL TASK</b>
	RO/BOP	*When directed, initiates WW sprays  Secures DW coolers (RRC pumps secured earlier due to initial ATWS condition)  *When directed, initiates DW sprays  <b>*CRITICAL TASK</b>
	SRO	Determines that DW pressure cannot be maintained LT PSP  *Directs BOP/RO to emergency depressurize the RPV by placing 7 ADS valves to OPEN  <b>*CRITICAL TASK</b>
	RO/BOP	Places 7 ADS valves to OPEN  <b>CRITICAL TASK</b>
<p><b>COMMENTS:</b> 10/8/00 Clarified event initiation statement regarding RPV pressure increase causing SRV operation.</p> <p><b>Terminate the scenario when all rods are in and the RPV has been emergency depressurized.</b></p>		

<b>Event No. 10</b>		
<p><b>Description:</b> Operating CRD pump trips on low suction pressure following the scram</p> <p><i>This event is initiated automatically after the reactor scram. This even occurs within event 8 and should be completed prior to termination of the scenario.</i></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO	<p>Reports that the running CRD pump has tripped</p> <p>Refers to ARPs</p> <p>Attempts start of standby pump or previously running pump:</p> <ul style="list-style-type: none"> <li>• places CRD-FC-600, CRD Flow Controller, in manual and reduce the manual output to zero</li> <li>• attempts restart of CRD pump</li> <li>• if restart fails, attempts start of other CRD pump</li> </ul> <p>Reports that pumps start but trip again</p> <p>Reports suction filter hi DP when pump is running</p>
	SRO	Directs placement of standby suction and discharge filters into service
	RO	<p>Notifies OPS2 to align standby suction and discharge filters for the CRD pumps.</p> <p><b><i>Cue: When directed as EO to align standby filters, wait 3 minutes and initiate Trigger 26.</i></b></p> <p>When filters are aligned, restarts the CRD system:</p> <ul style="list-style-type: none"> <li>• ensures CRD Flow Controller is at zero</li> <li>• restarts CRD pump</li> <li>• restores CRD system to normal lineup</li> </ul>
<p><b>COMMENTS:</b></p>		

<b>Event No. 11</b>		
<b>Description:</b> RHR-P-2A shaft shears requiring all containment spray functions off RHR B loop.  <i>This event is initiated at the beginning of the scenario but is not evident until the pump is started.  This event occurs within event 8 and should be completed prior to termination of the scenario.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO	Reports that RHR-P-2A is not pumping. Reports no flow and low pump amps.
	SRO	Directs the shutdown of RHR-P-2A.  Directs all containment spray functions performed with RHR-P-2B
	RO	Secures RHR-P-2A
<b>COMMENTS:</b> This event is necessary in order to drive the containment towards PSP		

**SRO TURNOVER INFORMATION**

A plant startup is in progress. The reactor is at 17% power.

PPM 3.1.2 is at step 5.7.20.

Rod pull is at step 32-12, control rod 02-19 at notch 00.

The main generator is at 1800 RPM and ready to synch to the grid. Procedure 2.5.7 has been completed up to step 5.4.13.b.

All pre-job briefs and reactivity briefs are complete.

Comments/TTD:

- **ensure RFP A min flow set in manual at 70-80%**
- **reset RWM at beginning of scenario to clear rod blocks if necessary**



<b>Facility:</b> WNP-2	<b>Scenario No.:</b> 2	<b>Op-Test No.:</b> 2	
<b>Examiners:</b> _____ <b>Operators:</b> _____ _____ _____			
<b>Initial conditions:</b> IC-80. The plant is at 100% power on a beginning-of-life core.			
<b>Turnover:</b> The plant is operating at 100% power. OSP-ELEC-M703, HPCS DG Monthly Operability Surveillance, is in progress and completed through step 7.5.47, the diesel has been idling for greater than 10 minutes. All pre-job briefs are complete.			
Event No.	Malf. No.	Event Type*	Event Description
1.		N(BOP)	Start HPCS DG for surveillance testing.
2.	Auto triggers <b>ONE minute</b> after DG-3 breaker closure	C(BOP)	HPCS SW pump trips. ( <i>LaSalle LER 12-20-94</i> )
3.	Trigger 3 (manual)	I(RO)	Rod Block Monitor Channel 'B' fails upscale resulting in a rod block.
4.	Trigger 4 (manual)	C(BOP)	RCC pump 1B shaft coupling break
5.	Started when event 4 is started	C(RO)	TSW to RFP "B" oil cooler isolates resulting in high oil temperatures, vibration problems, and eventual RFP trip.
6.		R(RO)	Decreases reactor power with recirc for RFP shutdown
7.	Trigger 7 auto initiates when the RFP trips	M(ALL)	Recirc runback resulting in Region A entry and resultant manual scram ( <i>WNP-2 97-004</i> )
8.	Trigger 8 auto initiates on the Rx scram	C(ALL)	RFP turbine "A" governor fails low requiring level control with Condensate by lowering RPV pressure.

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

<b>Event No. 1</b>		
<b>Description:</b> Start HPCS DG for surveillance testing.		
<i>This event is initiated by the turnover sheet.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	SRO	Directs the continuation of OSP-ELEC-M703 from step 7.5.48
	BOP	Continues DG-3 surveillance: <ul style="list-style-type: none"> <li>• places CB-4DG3 synch selector switch to D.GEN/BUS</li> <li>• adjusts voltage output until incoming voltage is slightly higher than running voltage</li> <li>• adjust frequency until synch scope is running slow in the fast direction</li> <li>• closes CB-4DG3 at about 5 minutes before 12 o'clock position and immediately loads the DG to GE 100 KW using the diesel engine governor control switch</li> <li>• loads DG-3 to approximately 1300 KW</li> <li>• adjusts reactive load to approximately 325 KVAR out</li> </ul> <See event 2>
<b>COMMENTS:</b>		

<b>Event No. 2</b>		
<b>Description:</b> HPCS SW pump trips. ( <i>LaSalle LER 12-20-94</i> )		
<i>This event is initiated 1 minute after DG output breaker is closed</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	BOP	<p>Reports DG-3 SW pump has tripped and there is no SW flow to DG-3</p> <p>Performs immediate operator action of ABN-SW and has OPS2 trip the HPCS DG</p> <p><b><i>CUE: When requested as OPS2 to trip DG-3 locally, initiate TRIGGER 20 and report back the DG-3 has been tripped locally.</i></b></p> <p>Inform SRO that DG-3 was tripped per ABN-SW</p>
	SRO	<p><b><i>ROLEPLAY CUE: If the SRO does not direct the restoration of the electric plant, as Shift Manager, direct the placement of SM-2 back on TRN.</i></b></p> <p>Directs BOP to back out of surveillance procedure and restore the electric plant to a normal lineup</p>
	BOP	<p>Backs out of DG-3 surveillance by restoring electric plant to normal lineup:</p> <ul style="list-style-type: none"> <li>• ensures CB-N1/2 white Lockout Circuit Avail light and green tripped light are illuminated</li> <li>• ensures green position flag is being displayed in the CB-N1/2 control switch window</li> <li>• ensures CB-S2 white Lockout Circuit Avail light and red closed light are illuminated</li> <li>• places CB-N1/2 sync selector switch in the MANUAL position</li> <li>• checks voltage present on both incoming and running buses</li> <li>• places CB-N1/2 control switch to the CLOSE position</li> <li>• ensures CB-N1/2 closes</li> <li>• ensures CB-S2 auto trips when CB-N1/2 closes</li> <li>• places CB-S2 control switch to the TRIP position and ensures green flag is displayed</li> <li>• places CB-N1/2 sync selector switch to the OFF position</li> </ul>
	SRO	<p>Refers to Tech Spec 3.7.2</p> <p>Declares HPCS system inoperable immediately</p>
<b>COMMENTS:</b>		

<b>Event No. 3</b>		
<b>Description:</b> Rod Block Monitor Channel 'B' fails upscale resulting in a rod block.  <i>This event is <b>MANUALLY initiated with TRIGGER 3</b> after the crew has backed out of the surveillance procedure, or by direction of the lead examiner.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO	Reports rod block on RBM channel 'B' due to upscale condition  Refers to ARP: <ul style="list-style-type: none"> <li>• Monitors power level to verify power not increasing</li> <li>• checks RBM indicators on P608</li> <li>• refers to PPM 4.1.2.4, RBM failure</li> <li>• informs SRO that the ARP recommends consideration to bypass the RBM</li> <li>• informs SRO that the ARP references Tech Spec 3.3.2.1</li> </ul>
	SRO	Refers to PPM 4.1.2.4: <ul style="list-style-type: none"> <li>• directs RO to bypass the failed RBM</li> </ul> Refers to Tech Spec 3.3.2.1 <ul style="list-style-type: none"> <li>• determines that the inop RBM must be restored to Operable status within 24 hours (unless peripheral rod is selected)</li> </ul> Directs selection of a peripheral rod May write an INOP sheet for the failed RBM Contacts work control to schedule repair of RBM
<b>COMMENTS:</b> 10/9/00 – Added event trigger information		

<b>Event No. 4</b>		
<b>Description:</b> RCC pump 1B shaft coupling break  <i>This event is <b>MANUALLY initiated with TRIGGER 4</b> after the RBM tech spec determination has been made by the SRO, or by the direction of the lead examiner</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	BOP	Reports RCC pump B discharge pressure low annunciator  Refers to ARP: <ul style="list-style-type: none"> <li>• checks system pressure, flow, and surge tank level</li> <li>• starts RCC-P-1C</li> <li>• investigates cause of low pressure condition – contacts OPS2 to check out RCC-P-1B</li> </ul> <i><b>CUE:</b> When contacted as OPS2 to check out the pump, wait 3 minutes, or until the SRO brief is complete, and report that the pump to motor coupling on RCC-P-1B has separated. Also, if requested for pump B's discharge check valve position, report that it is closed.</i>
	SRO	Refers to ABN-RCC: <ul style="list-style-type: none"> <li>• directs RCC-P-1C start if not already done by BOP</li> <li>• directs BOP to ensure that RCC-V-6 is open</li> <li>• directs securing of RCC-P-1B</li> </ul>
<b>COMMENTS:</b> TRIGGER 4 also initiates event 5 to allow time for temperatures to rise in the RFP turbine oil system		

<b>Event No. 5</b>		
<b>Description:</b> TSW to RFPT “B” oil cooler isolates resulting in high oil temperature, vibration problems, and eventual RFPT trip.		
<i>This event is initiated at the same time as event 4 to allow time for oil temperatures to rise.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO	<p>Reports feed pump turbine B oil cooler outlet temperature hi annunciator</p> <p>Refers to ARP:</p> <ul style="list-style-type: none"> <li>• checks oil cooler outlet temperature GE 140°F on TSW-TI-14B</li> <li>• notifies SRO that ARP recommends consideration for shifting filter units and oil coolers</li> </ul> <p><b><i>CUE: If requested to shift filters and coolers, acknowledge the request but do not transfer at this time.</i></b></p> <ul style="list-style-type: none"> <li>• directs OPS3 to investigate the cause of the high temperature</li> </ul> <p><b><i>CUE: If requested to investigate high lube oil temperatures, report that TSW-TCV-14D (cooler outlet temperature control valve) is indicating full closed. If requested to bypass it, acknowledge but do not bypass.</i></b></p> <ul style="list-style-type: none"> <li>• monitors turbine bearing temperatures on RFW-TR-1</li> <li>• shutdown the feed pump turbine if bearing high temp limits are exceeded (GT 175°F)</li> </ul> <p>Reports RFW Pump/Turbine Bearing Temperature High annunciator</p> <p>Refers to ARP:</p> <ul style="list-style-type: none"> <li>• checks attached list to determine which bearing has alarmed</li> <li>• determines that RFT bearings are reading GT 175°F on RFW-TR-1 (P823)</li> <li>• informs SRO that the ARP requires the feed pump turbine to be shutdown per PPM 2.2.4, Main Condensate and Feedwater System.</li> </ul>
	SRO	<p>Directs a reactor power reduction to 65% in preparation for the shutdown of RFP B. <b>(See Event 6)</b></p> <p>Directs the shutdown of feed pump turbine ‘B’</p>

	RO	<p>Reduces reactor power with recirc to 65%. <b>(See Event 6)</b></p> <p>Begins shutdown of the 'B' feed pump turbine in accordance with PPM 2.2.4</p> <ul style="list-style-type: none"> <li>• places RFP B speed controller to MDEM (manual)</li> <li>• slowly lowers speed of RFP B</li> </ul> <p><b><i>SIM OPERATOR CUE: As soon as the RO takes manual control of RFP B, <u>initiate TRIGGER 5</u> to cause RFP B to trip.</i></b></p>
<p><b>COMMENTS:</b></p> <p>Event 6, "Decreases reactor power with recirc for RFP shutdown", occurs within this event</p>		

<b>Event No. 6</b>		
<b>Description:</b> Decreases reactor power with recirc for RFP shutdown		
<i>This even occurs within event 5 and is initiated by PPM 2.2.4, RFP shutdown.</i>		
Time	Position	Applicants Actions or Behavior
	SRO	Directs power reduction to 65% with recirc in accordance with PPM 2.2.4, step 5.11.1
	RO	Using the recirc master controller, reduces recirc flow to lower reactor power to 65% Monitors power/level/pressure and reports to SRO
	BOP	Monitors FW heaters as necessary during power reduction.
<b>COMMENTS:</b>		

<b>Event No. 7</b>		
<b>Description:</b> Recirc runback to 15% resulting in Region A entry and resultant manual scram (WNP-2 97-004)		
<i>This event automatically initiates when the 'B' feed pump trips.</i>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO	<p>Reports Feedwater Pump Trip Limit annunciator and expected recirc runback due to RFP B trip.</p> <p>Verifies recirc pump runback to 30%</p> <p>Reports that recirc pumps ran back to 15% rather than the expected 30%</p> <p>Checks position on power to flow map and determines that the plant is operating in Region A</p>
	SRO	<p>Upon determination of entry into Region A of the power to flow map, directs RO to manually scram the reactor (if RO has not already done so)</p> <p style="text-align: right;"><b>CRITICAL TASK</b></p>
	RO	<p>Places mode switch to shutdown and performs immediate scram actions:</p> <ul style="list-style-type: none"> <li>monitors/reports power/pressure/level</li> <li>inserts SRMs/IRMs</li> <li>verifies all rods are in</li> </ul> <p style="text-align: right;"><b>CRITICAL TASK</b></p>
	SRO	<p>Enters/directs actions of PPM 5.1.1:</p> <ul style="list-style-type: none"> <li>directs RO to carry out actions of PPM 3.3.1, Rx Scram</li> <li>directs RO/BOP to verify actuations/isolations</li> <li>directs RO to maintain RPV level +13" to +54" using feedwater system</li> <li>directs RO/BOP to maintain pressure LT 1060 psig with BPVs</li> </ul>
	RO	<p>Establishes RFW-V-10 control of feedwater injection:</p> <ul style="list-style-type: none"> <li>closes RFW-V-112s</li> <li>opens RFW-V-118</li> <li>sets 10 valve controller at 36" and places in AUTO</li> <li>places 'A' feed pump speed controller in MDEM and adjusts speed to obtain a pressure 100 psig greater than RPV pressure</li> </ul> <p>Reports that feed pump turbine 'A' is not responding to its speed controller (see event 7)</p>
	SRO	<p>Directs RO to maintain level with RCIC within +13" to +54" or directs BOP to lower reactor pressure to a band of 500 to 700 psig to allow injection with the condensate system.</p>



	BOP	If directed, uses DEH to establish pressure at approximately 500 psig with BPVs
	RO	Restores level to band of +13" to +54" with RCIC or condensate
<b>COMMENTS:</b>  <b>Terminate scenario when level is restored to the normal band</b>		

<b>Event No. 8</b>		
<p><b>Description:</b> RFP turbine “A” governor fails low resulting in an RFP turbine trip, requiring level control with RCIC/HPCS</p> <p><i>This event is automatically initiated by TRIGGER 8 upon reactor scram. This event occurs within Event 7 and should be complete prior to the termination of the scenario.</i></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
	RO	<p>Reports Turbine A Controller Oil Pressure Low annunciator</p> <p>Reports Turbine A Oil Filter DP High annunciator</p> <p>Reports that the ‘A’ feed pump is not responding to its speed controller and that it is running at minimum RPMs.</p> <p>Reports that there is no feed-flow into the vessel</p>
	SRO	Determines that injection must be with RCIC or by lowering RPV pressure and allowing the Condensate system to inject.
<b>COMMENTS:</b>		

**SRO TURNOVER INFORMATION**

The plant is operating at 100% power ever since the post-refueling startup done 34 days ago

OSP-ELEC-M703, HPCS DG Monthly Operability Surveillance, is in progress and completed through step 7.5.47, the diesel has been idling for greater than 10 minutes.

All pre-job briefs are complete.