

Vermont Yankee

Facility: (1999 NRC)Modified Scenario No.: 1 Op-Test No.: \_\_\_\_\_

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_ ACRO  
 \_\_\_\_\_ CRO  
 \_\_\_\_\_ CRS

Objectives: Evaluate the crew's ability to operate plant equipment to support a normal power ascension, respond to and evaluate (Technical Specification) a level instrument failure and the resultant reactivity addition transient. Recognize and take action for a Recirc Pump failure, recognize and limit the positive reactivity from a Recirc Pump speed transient. Determine the affect of a loss of a 480 VAC ECCS bus on plant operation, and to implement the EOPs to monitor and control plant parameters for a major primary containment steam leak resulting in emergency depressurization as well as recognizing the inability to spray the drywell

Initial Conditions: IC-67(Snapshot) 30% power, approaching conditions for second Feedwater Pump Start

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*	Event Description
1		R CRO CRS	Continue power ascension IAW OP 0105
2		N CRO CRS	Start the second Feedwater Pump
3	Key 1 RC04	I ACRO CRO CRS	Inadvertent RCIC initiation (TS) 5 minutes after RFP start
4	Key 2 RR07B RR08B	C CRO CRS	"B" Recirc Pump lower and upper seal failure
5	Key 3 RR10 100% @ 3600 sec	I CRO CRS	"A" Recirc Pump speed controller failure, pump speed increasing
6	Key 4 ED05C	C ACRO CRO CRS	480 VAC ECCS Bus 8 fails
7	Key 5 .4% @ 300 sec MS06 Key 6 10% @ 1000 sec	M ACRO CRO CRS	Steam line leak in the drywell – emergency depressurization
8 Preinsert	RH03A	C ACRO	Drywell Spray Valve does not open (B valves have no power)
Preinsert	RFHP05	N/A	HPCI aux oil pump ACB open - out of service for governor oil leak repair

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

# **SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#1)**

## **GENERAL REQUIREMENTS**

- All chart recorders will be rolled forward, timed and dated.
- Paper from selected chart recorders will be saved for the examination team as requested.
- All procedures, flow charts, curves, graphs, etc., will be returned to their normal storage place and closed.
- All markable procedures, boards, etc., will be erased.
- All paper used by the previous crew will be removed and kept for the examination team as requested.
- The simulator operator, or designated person, will keep a rough log of all communications into and out of the "control room " during the scenario as requested by the examination team.

## **INITIAL SETUP**

- IC- 67. setup for ~30% power getting ready to start the "C" Feedwater Pump
- Ensure the "A" Feedwater Pump is running with "C" in Standby
- Place HPCI out of service (Preinsert RFHP05, Aux oil pump ACB open) PTL aux oil pump switch
- Preinsert RH03A (RHR "A" Cont Spray 26A fails to open)
- Mark con-demin status board A/B/C in service

## **DURING THE SCENARIO**

The examination team will determine when each event is to be inserted and when to "freeze" and will inform the simulator operator.

- **EVENT 1** Provide copy of VYOPF 2404.02 for rod withdraw sequence. Support crew as Reactor Engineer as requested.
- **EVENT 2** If crew continues to raise power direct them to start the second feedpump at 40% power. When directed as AO to perform prestart checks for Feedpump start inform Control Room checks are completed. Seal water temperatures are normal after the feedwater pump start
- **EVENT 3** After conditions stable for 5 minutes insert RCIC start. Acknowledge request as I&C. They know of no reason why RCIC started. Report that RCIC initiation relays K-1 and K-2 are energized, and the investigation continues.
- **EVENT 4** Insert seal leak rate low and ramp up after recognized by crew. Use RDR12 to secure seal purge. Recirc cooling is SWR 58

- **EVENT 5** Insert malfunction after the A pump is on master control. Attempt to provide a slow speed increase to allow operators to recognize it and take actions. Master Controller fails. If they place "A" in "Manual" pump speed control will work. Acknowledge request as I&C to respond to CR to investigate Recirc Flow Control trouble.
- **EVENT 6** Insert malfunction as soon as plant stable following Event 5. Allow crew time to discuss plant status, plans for continued operation/shutdown. Support crew as requested on bus failure. It will not be available anytime soon.
- **EVENT 7** Insert leak at the lower severity. After the scram insert the leak at the higher severity
- **EVENT 8** Acknowledge request to attempt manual opening of Outbd Drywell Spray Valve (RHR-26A). At Exam Team direction after ED is performed, remotely open requested valve to allow sprays. Rf RH 46 (RHR26A)

**TERMINATION**

After vessel depressurization and RHR 26A opened via local manual operation or as Exam Team directs.

**SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#1)  
(con't)**

Event No.	Malf. No.	Event Type*	Event Description
	Verify RWM latched to GRP 64		
	RFHP05 Preinsert		PLT HPCI aux oil pump, open ACB
	RH03A Preinsert		RHR CONT SPR VLV (26A) FAIL TO OPEN
1		R CRO CRS	Continue power ascension IAW OP 0105
2		N CRO CRS	Start the second Feedwater Pump
3	RC04 Key 1	I ACRO CRO CRS	Inadvertent RCIC initiation (TS)
4	RR07B Key 2 RR08B Key 2	C CRO CRS	"B" Recirc Pump lower and upper seal failure
5	RR10 Key 3 100% @ 3600 sec	I CRO CRS	After A pump is on the master controller "A" Recirc Pump speed controller failure, pump speed increasing
6	ED05C Key 4	C ACRO CRO CRS	480 VAC ECCS Bus 8 fails
7	MS06 Key 5 .4% @ 300 sec	M ACRO CRO CRS	Steam line leak in the drywell -- emergency depressurization After drywell RRUs started post loss of Bus 8
	MS06 Key 6 10% @ 1000 sec		Steam leak will cause drywell temperature to exceed 280 degrees and require RPV-ED. After manual or auto scram on high drywell pressure
8	RH03A Preinsert	C ACRO CRO	RHR Cont Spray 26A fails to open

## **SHIFT TURNOVER (#1)**

### **PLANT CONDITIONS:**

- Approximately 30% power
- Sequence A2 Group 64, Control rod 10-27
- No rapid shutdown sequence is available

### **INOPERABLE EQUIPMENT/LCOS:**

- HPCI is out of service for repair of a governor oil leak

### **SCHEDULED EVOLUTIONS:**

- OP 0105 Phase 4 step 24 page 82
- Raise power to 40% CTP at 1%/ 1 min
- Start "C" RFP at 40% power for PMT of seal replacement. Place A RFP in STBY
- At 45% speed transfer Recic pump speed control to master manual control

### **SURVEILLANCES DUE THIS SHIFT:**

- None

### **ACTIVE CLEARANCES:**

- N/A

### **GENERAL INFORMATION:**

CONTROL ROOM SHIFT TURNOVER CHECKLIST

Scenario 1

Parameter/ Component	Allowable Cond/Limit	Checks	
		06	18
Vernon Bus Tie	3900-4500 v	✓	
DG A/B	No Alarms/Opr	✓	
DG Volt Req	8 White Lights	✓	
DG A/B ACB's	Operable	✓	
DG A/B BKR CONT SELECT Switches	In REMOTE	✓	
Bus 8/9	435-506 v	✓	
Bus 3/4	3700-4400 v	✓	
Other 4KV ACB's	Opr	✓	
S/U Transformer	Energized	✓	
Aux Transformer	Energized	✓	
Cond Backpress	1-5 in HgA	✓	
SW PPs A/B/C/D	Operable	✓	
Cond Sys	Operable	✓	
Feed Sys	Operable	✓	
CST Level (ER20001509_06)	20-90%	✓	
Inst. Air Press	95-107 psig	✓	
Rx Water Level	155-165 inches	✓	
Rx Press	950-1030 psig	✓	
Rx Power	≤1593 MWt	✓	
SLC Sys	No Alarms/Opr	✓	
SLC Tk Level	81-92%	✓	
SLC-18	Open	✓	
SLC Squib A/B	Energized	✓	
SLC PP A/B	Operable	✓	
SDV Level	-0	✓	
APRM/IRM/SRM/RBM Byp Sw (ER960026_03)	Neutral Position	✓	
Scram Air Press	70-75 psig	✓	
RCU Sys	No Alarms/Opr	✓	
RCU Inlet Cond	<1 μmho/cm	✓	
CU-15, 18, 68	Operable	✓	
RCIC Sys	No Alarms/Opr	✓	
RCIC-15,16,18,20	Open/Opr	✓	
RCIC-131,27,30,21,41,39	Closed	✓	
RCIC T/T and Gov	Open	✓	
RCIC Flow Cont/Tape/Flow	AUTO/400/<10	✓	
MSIVs, MS-74, 77	Operable	✓	
Pri Cont Vent Iso Valves	Operable	✓	
SV-70A/B Ind	Closed	✓	
Relief Valves	No Alarms/Opr	✓	
ADS Bypass Switch	NORMAL Pos.	✓	

Parameter/ Component	Allowable Cond/Limit	Checks	
		06	18
CS A/B Sys	No Alarms/Opr	✓	
CS-7 A/B	Open	✓	
CS PP A/B	AUTO/Opr	✓	
CS-5 A/B, 11 A/B	Open	✓	
CS-26 A/B, 12 A/B	Closed	✓	
CS FI-14-50A/B	±500 gpm	✓	
RHR Sys	No Alarms/Opr	✓	
RHR PP A/B/C/D	AUTO/Opr	✓	
RHR-13 A/B/C/D	Open	✓	
RHR-25 A/B	Open	✓	
RHR-65 A/B	Open	✓	
RHR-16A/B	Open	✓	
Other RHR RHRSW Vlvs	Closed	✓	
RHR FI-10-139A/B	±1500 gpm	✓	
Torus Water Temp	≥50 - <87.3°F	✓	
HPCI Sys	No Alarms/Opr	⓪	NO
HPCI Turb Trip/Inhibit SW	In AUTO	✓	
HPCI Sys Ready Light	ON	✓	
HPCI-15, 16, 17, 20	Open	✓	
HPCI-14, 25, 19, 21, 57, 58	Closed	✓	
HPCI Flow Cont/Tape/Flow	AUTO/4250/<100	✓	
RPS MG A/B Power	NORM/Alt Pwr Avail.	✓	
Off-Gas Act	Norm Trend	✓	
Stack Gas Act	Norm Trend	✓	
Ref-2 A/B	AUTO/Opr	✓	
SBGT 9KW Htrs EUH-2&4	AUTO	✓	
SGT-2A/3A	Open	✓	
SGT-1A/B, 2B, 3B, 4A/B, 5	Closed	✓	
Rx Bldg D/P H <sub>2</sub> O	-0.25 to -2.0 inches	✓	
TVS-86	Closed	✓	
Drywell/Torus D/P	>1.8 psid	✓	
Torus Water Level	OP 2115, Fig 1	✓	

	SM	CRS	STA	CRO	ACRO
Operations Log					
Switching/Tagging Log					
WOR Listing					
CRP Walkthrough (Note 1 & Note 3)					
Night Order Book					
CR Shift Turnover Cklist					
Tech Spec Sys/Comp Inop Sht					
Surveillance Schedule	----		----	----	----
Reviews Completed:					
06-18 SHIFT					
18-06 SHIFT	ABC	DEF	GHI	JKL	MNO

⓪ 0500 HPCI removed from Service ABC

NOTE 1: STA walkthrough to include status check of the Control Room Pyrotronics Panel.

NOTE 2: In the event minimum shift staffing levels cannot be met, actions to be initiated are specified in AP 0894.

NOTE 3: Control Room staff shall contact VELCO whenever abnormal yard conditions exist. (CAR910370P1)



Seaworld |

SHIFT BRIEFING CHECKLIST

Date: Today

Mode Switch Position: RUN

Shift: X Day Night

Plant Status: Rx Power 30% Rx Water Level: 160 Rx Pressure: 940 HP Clock (Note 3) 10

Significant Equipment Out of Service (Note 1):

HPCI - RCI administratively confirmed operable - yes  
ADSCS/LPCI/RCI operable - yes

Evolutions in progress or planned (Note 2):

Plant Startup

Special Instructions or Considerations (Pertinent Night Orders, Unusual Conditions) (MOOIDD9301OP2)

- ① Raise reactor power to 40% with flow at 19% / 1 min
- ② AT 45% reactor pump speed transfer the reactor system to master control
- ③ AT 46% power start "C" RPP for PMT of seal replacement, place "A" RPP is STBX

Briefing Conducted By: \_\_\_\_\_

Control Room Supervisor

Previous twelve hour full power average during steady state operation > 1592 MWt?

Yes  No  N/A If no and unplanned, notify the Supervisor, Operations Support.

(Startup in progress)

Attendees:

SM OR CRS	_____	Shift Chem Tech.	_____
CRO	_____	Rad. Prot. Tech.	_____
STA	_____	Sec. Shift Supv.	_____
ACRO	_____		
ACRO	_____		
AO	_____		
AO	_____		
AO	_____		
AO	_____		
AO	_____		
Spare Shift	_____		

Approved by: \_\_\_\_\_

Duty Shift Manager

Note 1: Include Tech. Spec. Systems/Components entered on VYAPF 0152.02 for which active measures by Operations must be taken and list those actions. (ER970390\_01 & \_02)

Note 2: Ensure evolutions that may affect radiological conditions such as HPCI, RCIC, Core Spray and RHR operations are brought to the attention of the Radiation Protection Technician.

Note 3: State HP clock number. If clock has been reset, discuss the event that resulted in the reset.



# Scenario 1

## CONTROL ROOM TURNOVER SHEET

Date: Today

Shift:

Days

Nights

Annunciators (Existing, New, Nuisance, Disabled, Restored)

*none that are new*

Surveillances Done/Due

*RCIC administratively operable - Done*

Evolutions/Transients

- ① *Plant Startup in progress @  $\approx$  30% now*
- ② *Raise reactor power to 40% with Flow @ 1%/min*
- ③ *AT 45% recirc pump speed transfer control to the master controller*
- ④ *AT 40% power start "C" RFP for Seal PMT. Place "A" RFP in STBY*

Equipment Out of/Returned to Service

*HPCI - aux oil pump PTL/ACB open - main. is working on a governor oil leak*

Other

*Rod Sequence AZ / Group 64 / Rod 10-27  
NO RAPID S/D Sequence*

Op-Test No.:   1   Scenario No.:   1   Event No.:   1   Page   1   of   10  

Event Description: Increasing reactor power from 30% CTP to 40% with flow IAW OP 0105

Time	Position	Applicant's Actions or Behavior
	CRS	Perform crew brief for the power increase
	CRS	Direct continued power ascension IAW OP 0105 Phase 4 step 24
	CRO	Request a peer check for the reactivity increase if one is not assigned Raise reactor power with flow 1% CTP/1 Min, For each flow increase: <ul style="list-style-type: none"> <li>• Turns controller 2-184-16-1A/1B manual knob in the clockwise direction</li> <li>• Monitors recirc pumps for expected speed increase</li> <li>• Directs RBAO to monitor MG lube oil temperatures</li> <li>• Maintains pump speeds within 5% of each other</li> <li>• Monitors nuclear instrumentation for proper response</li> <li>• Monitors feedwater level control system response to the power increase</li> </ul>
	ACRO	Monitor plant parameters/assist as necessary Make preparations for second Feedwater Pump start
	CRO	Report recirc speeds at 45% as indicated on controller 2-184-16-1A/1B
	CRS	Direct recirc flow control transferred to master manual control
	CRO	Transfer recirc flow control to master manual control as flows <ul style="list-style-type: none"> <li>• Verify A/B speed &gt; or equal to 45% on 2-184-16-1A/B</li> <li>• Ensure feedwater low flow interlock is clear (Alarms 9-4-B-6/F-6)</li> <li>• Use "D" (Display) button on controllers 2-184-16-1A/B to observe "P" and "S" values</li> <li>• Adjust master controller SC-2-184-14 to match the speed on the Individual controllers</li> <li>• If necessary adjust the Bias on the second controller to be shifted to match it's speed to the master controllers speed</li> <li>• When speed signals are matched transfer to the master Controller by depressing the auto/manual push button on the Individual controllers A(B).</li> </ul>

Op-Test No.:  1  Scenario No.:  1  Event No.:  2  Page  2  of  10

Event Description: Start second Feedwater pump prior to 40% CTP

Time	Position	Applicant's Actions or Behavior
	CRS	Direct startup of "C" Feedwater Pump per Phase 4 section B of OP 0105
	ACRO	Start the second feedwater pump per OP 0105 Phase 4.B <ul style="list-style-type: none"> <li>• Review Phase 2 &amp; 4 Precautions and Administrative Limits</li> <li>• Verify both heater strings are in service</li> <li>• Verify Standby Lube Oil pump in service</li> <li>• Close feed pump discharge valve (FDW-4C)</li> <li>• Position "C" pump control switch to "Start"</li> <li>• Verify pump breaker closes, discharge valve opens and auxiliary lube oil pump stops</li> <li>• Check seal water temp</li> <li>• Monitor lube oil and bearing temps until stabilized</li> <li>• Monitor running current (max. 666 amps)</li> <li>• Check Bus 3 / 4 undervoltage relay targets</li> </ul>
	CRO	Request a peer checker if one is not assigned
	CRO	Observe system flow and reactor level stabilizes
	ACRO	Report "C" Feedwater Pump placed in service Place "A" Feedwater Pump in Standby <ul style="list-style-type: none"> <li>• Control switch placed in "Auto"</li> <li>• Open Feedwater Pump Discharge Valve (FDW-4A)</li> </ul>



Op-Test No.:  1  Scenario No.:  1  Event No.:  4  Page  4  of  10

Event Description: "B" Recirc Pump lower and upper seal failure

Cause: Worn seals

Initial Automatic Actions: Initially receive alarms 9-4 G-1 & G-2

Effects (General Sequence): Both seals on the "B" Recirc pump fail requiring pump removal and isolation, increasing drywell temperature/pressure until isolated

Time	Position	Applicant's Actions or Behavior
	CRO / ACRO	Recognize/take action IAW 9-4 G-2 & G-1, inform CRS <ul style="list-style-type: none"> <li>• Monitor "B" Recirc Pump parameters</li> <li>• Determine failure of both pump seals, inform CRS</li> <li>• Monitor Drywell equipment drain sump, temperature and drywell pressure</li> </ul>
	CRS	Enter/direct actions IAW ON 3142, "Recirc Pump Seal Failure" <ul style="list-style-type: none"> <li>• Direct "B" Recirc Pump shutdown and isolation</li> </ul> Enter/direct actions IAW OT 3117, "Reactor Instability", and OT 3118, "Recirc Pump Trip" <ul style="list-style-type: none"> <li>• May direct monitoring for reactor instabilities</li> </ul> Refer to Tech Spec 3.6.G and direct actions for single loop operation, inform RE
	CRO	Secure and isolate the "B" recirc pump IAW ON 3142 <ul style="list-style-type: none"> <li>• Open "B" Recirc Pump MG Set Drive Motor Breaker</li> <li>• Close suction valve RV-43B</li> <li>• When suction indicates closed, close discharge bypass valve RV-54B and discharge valve RV-53B</li> <li>• Direct Aux Operator to secure seal purge IAW OP 2111</li> </ul>
	CRO	Determine operating point on COLR Figure 2.4-1 Monitor LPRM readings by selecting STBLTY on ERFIS <ul style="list-style-type: none"> <li>• May initiate stability monitoring</li> </ul>

Op-Test No.:  1  Scenario No.:  1  Event No.:  5  Page  5  of  10

Event Description: "A" Recirc Pump speed controller failure, pump speed increasing

Cause: Master Controller output failure high

Initial Automatic Actions: Reactor power rise, alarms 9-5 D-2 & D-3

Effects (General Sequence): Pump speed increasing, power rise

Time	Position	Applicant's Actions or Behavior
	CRO	Recognize/report rising reactor power, inform CRS Recognize/report "A" Recirc Pump speed rising, inform CRS Recognize/take actions IAW 9-5 <ul style="list-style-type: none"> <li>• Monitor flow and power to confirm control rod blocks</li> </ul>
	CRS	Enter/direct actions IAW OT 3110, "Positive Reactivity Insertion" <ul style="list-style-type: none"> <li>• Direct the manual control of "A" Pump controller</li> </ul>
	CRO	When directed adjust speed of "A" Recirc Pump to 50-70% <ul style="list-style-type: none"> <li>• Place pump controller in " Manual" by depressing the auto/manual controller push button on controller 2-184-16-1A</li> <li>• adjust pump speed by turning the manual knob on 2-184-16-1A to adjust pump speed to 50-70% speed</li> <li>• Do not exceed 1% CTP/min power change</li> </ul>
	CRS	Contact I&C and inform them of the recirc flow controller failure
	ACRO	Monitor RPV level pressure and power for return to normal Assist as necessary

Op-Test No.: 1 Scenario No.: 1 Event No.: 6 Page 6 of 10

Event Description: Loss of 480 VAC Bus 8

Cause: Bus fault due to ground on 8

Initial Automatic Actions: Half scram, PCIS Group 3 isolation, multiple alarms

Time	Position	Applicant's Actions or Behavior
	CRO / ACRO	Recognize/take actions IAW 9-5 K-1, inform CRS <ul style="list-style-type: none"> <li>Recognize half scram and PCIS GP 3 isolation</li> <li>Recognize loss of 480 VAC Bus 8</li> </ul>
	CRS	Take actions for loss of Bus 8 <ul style="list-style-type: none"> <li>Direct identification of lost loads</li> <li>Direct backup of PCIS GP 3</li> </ul> Refer to Tech Spec 3.5.B <ul style="list-style-type: none"> <li>Determine 7 day LCO required. B EDG INOP IAW OP 2143 Precaution g</li> </ul> Tech Spec 3.10.A.4. Buses 3, 4, 8, 9, energized and operable <ul style="list-style-type: none"> <li>No action statement</li> <li>Recommend a 24 hour cold shutdown IAW AP 0151 page 5 responsibility 23. As Time permits or by follow-up questions</li> </ul> Direct troubleshooting/repair
	CRO / ACRO	Determine the following loads lost on Bus 8, inform CRS <ul style="list-style-type: none"> <li>Drywell RRUs</li> <li>A RPS half scram</li> <li>PCIS GP 3 isolation</li> <li>B CRD pump loss</li> <li>B RBCCW pump</li> <li>A TBCCW pump</li> <li>B RHR</li> <li>B CS</li> <li>B SBGT</li> <li>Stack Flow Indicator FT-108-22 ODCM Table 3.1.2</li> </ul>
	CRO	B SBLC pump
	ACRO	Stack Gas I, II indication loss Loss of RWCU (CU-15 loss of power) Vital MG Set swap to DC drive Loss of RCIC (RCIC-15 loss of power)

Op-Test No.:	1	Scenario No.:	1	Event No.:	6 (cont'd)	Page 7 of 10		
	ACRO	<p>Backup Group 3 isolation IAW posted Operator Aid</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>CRP 9-3</b></p> <p>AC-8, DRYWELL PURGE</p> <p>AC-7A, DRYWELL VENT</p> <p>AC-6A, DRYWELL 3" VENT</p> <p>AC-20, N<sub>2</sub> MAKE-UP</p> <p>AC-10, TORUS PURGE</p> <p>AC-7B, TORUS VENT</p> <p>AC-6B, TORUS 3" VENT</p> <p>AC-9, AIR PURGE SUPPLY</p> <p>AC-22B, DRYWELL MAKE-UP</p> <p>SGT-6, VENT TO SBT</p> <p>AC-23, N<sub>2</sub> PURGE SUPPLY</p> <p>AC-7, VENT TO RTF-5</p> <p>AC-22A, TORUS MAKE-UP</p> <p>CA-38A, CTMT COMPR SUCT</p> <p>CA-38B, CTMT COMPR SUCT</p> </td> <td style="width: 50%; vertical-align: top;"> <p><b>CRP 9-26</b></p> <p>HVAC-9, RB VENT SUPPLY</p> <p>HVAC-10, RB VENT SUPPLY</p> <p>HVAC-12, RB VENT EXHAUST</p> <p>HVAC-11, RB VENT EXHAUST</p> <p>RB supply/exhaust fans off</p> <p>RSF-1A off    REF-1A off</p> <p>RSF-1B off    REF-1B off</p> <p><b>CRP 9-25</b></p> <p>SBGT</p> <p>REF-2A on</p> <p>REF-2B on</p> <p><b>CRP 9-47</b></p> <p>VG-26, CAM SUPPLY INBD</p> <p>VG-76A, CAM RETURN INBD</p> <p>VG-23, CAM SUPPLY OUTBD</p> <p>VG-76B, CAM RETURN OUTBD</p> <p><b>CAD Panel "A"</b></p> <p>NG 11A, 12A, 13A</p> <p>VG 22A, 9A</p> </td> </tr> </table>					<p><b>CRP 9-3</b></p> <p>AC-8, DRYWELL PURGE</p> <p>AC-7A, DRYWELL VENT</p> <p>AC-6A, DRYWELL 3" VENT</p> <p>AC-20, N<sub>2</sub> MAKE-UP</p> <p>AC-10, TORUS PURGE</p> <p>AC-7B, TORUS VENT</p> <p>AC-6B, TORUS 3" VENT</p> <p>AC-9, AIR PURGE SUPPLY</p> <p>AC-22B, DRYWELL MAKE-UP</p> <p>SGT-6, VENT TO SBT</p> <p>AC-23, N<sub>2</sub> PURGE SUPPLY</p> <p>AC-7, VENT TO RTF-5</p> <p>AC-22A, TORUS MAKE-UP</p> <p>CA-38A, CTMT COMPR SUCT</p> <p>CA-38B, CTMT COMPR SUCT</p>	<p><b>CRP 9-26</b></p> <p>HVAC-9, RB VENT SUPPLY</p> <p>HVAC-10, RB VENT SUPPLY</p> <p>HVAC-12, RB VENT EXHAUST</p> <p>HVAC-11, RB VENT EXHAUST</p> <p>RB supply/exhaust fans off</p> <p>RSF-1A off    REF-1A off</p> <p>RSF-1B off    REF-1B off</p> <p><b>CRP 9-25</b></p> <p>SBGT</p> <p>REF-2A on</p> <p>REF-2B on</p> <p><b>CRP 9-47</b></p> <p>VG-26, CAM SUPPLY INBD</p> <p>VG-76A, CAM RETURN INBD</p> <p>VG-23, CAM SUPPLY OUTBD</p> <p>VG-76B, CAM RETURN OUTBD</p> <p><b>CAD Panel "A"</b></p> <p>NG 11A, 12A, 13A</p> <p>VG 22A, 9A</p>
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	CRS	Direct drywell RRUs restarted						
	ACRO	<p>Restart drywell RRUs</p> <ul style="list-style-type: none"> <li>• CRP 9-25 RRU 3A/B control switch to A&amp;B run</li> <li>• CRP 9-25 RRU 4A/B control switch to A&amp;B run</li> </ul>						



Op-Test No.: 1 Scenario No.: 1 Event No.: 7 Page 8 of 10

Event Description: Steam leak in drywell – emergency depressurization

Cause: "A" MSL 18 inch pipe rupture between reactor vessel and flow restrictor

Initial Automatic Actions: High drywell pressure scram

Effects (General Sequence): Slowly rising drywell pressure to scram setpoint then rapid increase

Time	Position	Applicant's Actions or Behavior
	CRO / ACRO	<p>Recognizing rising drywell pressure, inform CRS</p> <ul style="list-style-type: none"> <li>• Check backpanel indications</li> </ul> <p>Recognize/take actions IAW 9-5 G-1 &amp; F-1</p> <ul style="list-style-type: none"> <li>• Check for leaks</li> </ul> <p>Maximize drywell cooling</p> <ul style="list-style-type: none"> <li>• MCA keylock to bypass on CRP 9-25</li> <li>• CRP 9-25 RRU 3A/B control switch to A&amp;B run. (already done)</li> <li>• CRP 9-25 RRU 4A/B control switch to A&amp;B run. (already done)</li> </ul>
	CRS	<p>Enter/direct actions IAW OT 3111, "High Drywell Pressure"</p> <ul style="list-style-type: none"> <li>• Direct power reduction/transfer house loads/manual scram</li> </ul> <p>Direct manual scram per OT 3100 and enter/direct actions IAW EOP-1 and 3.</p>
	CRO	<p>Insert manual scram when directed/recognize automatic scram on high drywell pressure, inform CRS.</p> <ul style="list-style-type: none"> <li>• Press manual scram pushbuttons</li> <li>• Depress PB 1 on feedwater master controller CRP 9-5</li> <li>• Reactor mode switch to shutdown CRP 9-5</li> <li>• Insert IRMs/SRMs on CRP 9-5</li> <li>• Select IRM recorders on CRP 9-5</li> <li>• Report reactor power &lt;2%</li> <li>• Report all control rods inserted</li> <li>• After verifying the RPV is recovering leave one RFP running, and place one in standby, and one in pull to lock CRP 9-6</li> <li>• Verify closed scram discharge vent and drain valves (6) on CRP 9-5</li> </ul> <p>Recognize/report EOP-1 and 3 entries on high drywell pressure.</p>
	ACRO	<p>Monitor and report RHR, CS, EDG and SBGT initiations and PCIS GROUP 2, 3, noting failures from previous power failure.</p> <ul style="list-style-type: none"> <li>• Group II valve switches to the closed position</li> <li>• LRW 82/83/94/95 on CRP 9-4</li> </ul>
	CRO	Maintain level in 127"-177" using preferred system (Feedwater and RCIC)

Op-Test No.: 1		Scenario No.: 1	Event No.: 7 (cont'd)	Page 9 of 10
Time	Position	Applicant's Actions or Behavior		
	ACRO	Close MSIVs to control cooldown rate if necessary due to steam flow from auxiliaries. Attempt reactor pressure control below 1055 psig, report pressure lowering with MSIVs closed. Report drywell/torus pressure trending up to 10 psig.		
	CRS	Direct Torus Sprays on "A" RHR loop before torus pressure reaches 10 psig.		
	ACRO	Spray the torus as directed Place <ul style="list-style-type: none"> <li>• A and D RHR pumps in PULL TO LOCK.</li> <li style="text-align: center;">OR</li> <li>• B and C RHR pumps in PULL TO LOCK.</li> <li>• Close/verify closed HX BYPASS RHR-65A</li> <li>• Verify adequate SW pumps are operating to handle RHRSW pump demand.</li> <li>• Verify no more than one SW pump is in standby mode.</li> </ul> IF a LPCI initiation signal is present, THEN place RHRSW PP A&C LPCI AUTOSTOP OVERRIDE SWITCH keylock switch to MANUAL OVERRD (3-M-2 will annunciate). <ul style="list-style-type: none"> <li>• Start RHRSW pump A or C</li> </ul> When conditions permit, verify RHRSW pump cooling water flow is 3 – 6 gpm. If necessary, adjust RHRSW DISCHARGE, RHR-89A as follows: <ul style="list-style-type: none"> <li>• Maintain RHRSW heat exchanger flow 2950 to 3140 gpm.</li> <li>• Maintain RHRSW pressure greater than 20 psid above RHR pressure.</li> </ul> IF reactor water level is greater than TAF, THEN <ul style="list-style-type: none"> <li>• turn the RHR A/C LOGIC CTMT SPRAY VLV LPCI SIG BYPASS to MAN.</li> <li>• Open TORUS SPRAY/CLG RHR-39A</li> <li>• Open TORUS SPRAY RHR-38A</li> </ul>		
	CRS	Direct drywell sprays with "A" RHR loop before reaching "Unsafe" region of DWSIL graph <ul style="list-style-type: none"> <li>• Verify torus level &lt; 22.8 ft and in "Safe"</li> <li>• Verify safe on DSIC</li> <li>• Verify RRUs tripped or order shutdown</li> </ul>		

Op-Test No.: 1 Scenario No.: 1 Event No.: 8 Page 10 of 10

Event Description: Drywell spray valve does not open

Cause: Containment spray valve mechanically binds in the closed position

Initial Automatic Actions: N/A

Effects (General Sequence): Valve will not open from Control Room

Time	Position	Applicant's Actions or Behavior
	ACRO	Place "A" RHR loop in Drywell spray per OP 2124, Appendix C <ul style="list-style-type: none"> <li>• Open RHR-31A</li> <li>• Open RHR-26A</li> <li>• Recognize loss of valve position indication when drywell spray valve opened</li> <li>• Report inability to open RHR-26A</li> </ul>
CT	CRS	Direct ACRO to coordinate with Aux Operator to locally open RHR-26A loop spray valve <ul style="list-style-type: none"> <li>• Recognize RHR-26B not available due to bus loss</li> </ul> Recognize torus level/pressure cannot be maintained in the "safe" region of PSP graph or drywell temperature cannot be maintained below 280°F, Exits EOP-1, RPV pressure leg, enter/direct actions IAW EOP-5 <ul style="list-style-type: none"> <li>• Direct rapid depressurization with bypass valves. May go direct to Emergency Depressurization</li> </ul>
	ACRO	<ul style="list-style-type: none"> <li>• Open bypass valves by going to raise on the bypass opening jack on CRP 9-7</li> <li>• Do not exceed 40% steam flow as indicated on CRP 9-5 steam flow indicators</li> </ul>
	ACRO	Perform an Emergency Depressurization when directed Prevent injection from CS and RHR Pumps: <ul style="list-style-type: none"> <li>• Core spray A/B pump control switches pull to lock</li> <li>• RHR A/B/C/D pump control switches pull to lock</li> </ul> Open all SRVs on CRP 9-3 <ul style="list-style-type: none"> <li>• RV-71A switch to open</li> <li>• RV-71C switch to open</li> <li>• RV-71B switch to open</li> <li>• RV-71D switch to open</li> </ul> Report Aux Operator is able to manually open "A" RHR Drywell Spray valve <ul style="list-style-type: none"> <li>• Recognize/report lowering drywell pressure once valve is open if RHR A loop pumps are running at that time.</li> </ul>
	CRS	Classify event IAW AO 3125 <ul style="list-style-type: none"> <li>• Alert per A-3-b/A-3-a</li> </ul>

Facility: Vermont Yankee (new) Scenario No.: 2 Op-Test No.: \_\_\_\_\_

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_ ACRO  
 \_\_\_\_\_ CRO  
 \_\_\_\_\_ CRS

Objectives: Evaluate the crew's ability to operate plant equipment in response to a loss of the startup transformers during closed cycle operation. Evaluate the Technical Specification for a loss of one off-site power source, and commence a plant shutdown to ensure NPDES compliance. Recognize a stuck FWRV and take actions to avert a high reactor water level scram. Recognize and respond to an LPRM upscale failure. Recognize and respond to a loss of main condenser vacuum, ATWS, and SLC system failures.

Initial Conditions: IC-9, 100% power, preparing to chlorinate the Circ Water System

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malf. No.	Event Type*	Event Description
1		N ACRO CRS	Place CW in Closed Cycle for chlorination
2	Key 1 ED-02A	C ACRO CRO CRS	Loss of Startup Transformers
3	Preinsert FW-09A ANN Failure 9-5-E-2	R CRO C CRS	Power Reduction with stuck Feedwater regulating valve Soft panel FRV A lockup red light out
4	Key 2 NM2-24-41B NM5D 97%	I ACRO CRO CRS	LPRM upscale failure, APRM D upscale APRM D failure is Automatically deleted when LPRM 24-41B is bypassed
5	Key 3 MC-8 7%	C ACRO CRO CRS	Main Condenser air inleakage (minor)
	Key 3 modify MC-8 50% 120 Sec	M ACRO CRO CRS	After control rod insertion for event 5 has started. Main Condenser large air Leak Loss of Vacuum Turbine Trip / LNP
6	Preinsert RD 12A 69% RD 12B 74%	M ACRO CRO CRS	Hydraulic ATWS / Level Power Control
7	Preinsert SLO1 A SLO2 B	C CRO CRS	SLC A Pump Failure / B Squib Failure
	Bypass APRM A Preinsert NM-06A		APRM A INOP, Bypass APRM A prior to insertion

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

## **SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#2)**

### **GENERAL REQUIREMENTS**

- All chart recorders will be rolled forward, timed and dated.
- Paper from selected chart recorders will be saved for the examination team as requested.
- All procedures, flow charts, curves, graphs, etc., will be returned to their normal storage place and closed.
- All markable procedures, boards, etc., will be erased.
- All paper used by the previous crew will be removed and kept for the examination team as requested.
- The simulator operator, or designated person, will keep a rough log of all communications into and out of the "control room " during the scenario as requested by the examination team.

### **INITIAL SETUP**

- IC-9 Summer Time IC-Hybrid Cycle
- APRM A INOP and bypassed

### **DURING THE SCENARIO**

The examination team will determine when each event is to be inserted and when to "freeze" and will inform the simulator operator.

- **EVENT 1** If asked, chemistry is chlorinating service water. When asked if weir is overflowing:
  - if level is > 225 ft, yes
  - if level is < 225 ft, no
  - When directed report traveling screens in off and service water strainer breakers open
- **EVENT 2** OSAO when asked – report MOD T-3 open on all 3 phases, and visible damage to the startup transformers. If chemistry is asked, no chlorine has yet been added to the circ water system
- **EVENT 3** If TBAO is sent to the "A" FWRV report no obvious damage is visible. If the crew recommends "locking up" the A FWRV direct them as Operations Management to transfer control to local manual and lock up the valve.

- **EVENT 4** If reactor engineer is asked about bypassing LPRM 24-41B, inform them that as long as Technical Specifications are satisfied it can be bypassed. When LPRM 24-41B is bypassed verify that APRM D failure (NM05D) automatically deletes itself. If not delete it manually.
- **EVENT 5** No cause for the main condenser air leak will be found
- **EVENTS 7 & 8** There appears to be nothing wrong with SLC pump "A" or Squib valve "B" (this infers an SLC switch failure)

### **TERMINATION**

- SLC injecting
- RPV level controlled > -19"
- Control rod insertion in progress
- Containment parameters under control
- Exam Team directs

**SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#2)  
(con't)**

Event No.	Malf. No.	Event Type*	Event Description
1		N ACRO CRS	Place CW in Closed Cycle for chlorination
2	Key 1 ED-02	C ACRO CRO CRS	Loss of Startup Transformers
3	Preinsert FW-09A ANN Failure 9-5-E-2	R C CRO CRS	Power Reduction with stuck Feedwater regulating valve Soft panel A FRV lockup light out
4	Key 2 NM2 24-41B NM6D	I ACRO CRO CRS	LPRM upscale failure, APRM upscale failure
5	Key 3 MC-8 7%	C ACRO CRO CRS	Main Condenser air inleakage (minor)
6	Key 4 MC-8 50% 120 sec	M ACRO CRO CRS	Main Condenser large air Leak Loss of Vacuum Turbine Trip / LNP
7	Preinsert RD 12A 69% RD 12B 74%	M ACRO CRO CRS	Hydraulic ATWS / Level Power Control
8	Preinsert SLO1 A SLO2 B	C CRO CRS	SLC A Pump Failure / B Squib Failure

## SHIFT TURNOVER (#2)

### **PLANT CONDITIONS:**

- Approximately 100% power
- Rapid shutdown sequence is latched

### **INOPERABLE EQUIPMENT/LCOS:**

- APRM A is INOP and bypassed

### **SCHEDULED EVOLUTIONS:**

- Place Circ Water in closed cycle for chlorination after relieving the watch
- Service water is to be chlorinated also

### **SURVEILLANCES DUE THIS SHIFT:**

- None

### **ACTIVE CLEARANCES:**

- N/A

### **GENERAL INFORMATION:**



# Scenario 2

## CONTROL ROOM SHIFT TURNOVER CHECKLIST

Parameter/ Component	Allowable Cond/Limit	Checks	
		06	18
Vernon Bus Tie	3900-4500 v	✓	
DG A/B	No Alarms/Opr	✓	
DG Volt Req	8 White Lights	✓	
DG A/B ACB's	Operable	✓	
DG A/B BKR CONT SELECT Switches	In REMOTE	✓	
Bus 8/9	435-506 v	✓	
Bus 3/4	3700-4400 v	✓	
Other 4KV ACB's	Opr	✓	
S/U Transformer	Energized	✓	
Aux Transformer	Energized	✓	
Cond Backpress	1-5 in HgA	✓	
SW PPs A/B/C/D	Operable	✓	
Cond Sys	Operable	✓	
Feed Sys	Operable	✓	
CST Level (ER20001509_06)	20-90%	✓	
Inst. Air Press	95-107 psig	✓	
Rx Water Level	155-165 inches	✓	
Rx Press	950-1030 psig	✓	
Rx Power	≤1593 MWt	✓	
SLC Sys	No Alarms/Opr	✓	
SLC Tk Level	81-92%	✓	
SLC-18	Open	✓	
SLC Squib A/B	Energized	✓	
SLC PP A/B	Operable	✓	
SDV Level	-0	✓	
APRM/IRM/SRM/RBM Byp Sw (ER960026_03)	Neutral Position	①	NO
Scram Air Press	70-75 psig	✓	
RCU Sys	No Alarms/Opr	✓	
RCU Inlet Cond	<1 µmho/cm	✓	
CU-15, 18, 68	Operable	✓	
RCIC Sys	No Alarms/Opr	✓	
RCIC-15,16,18,20	Open/Opr	✓	
RCIC-131,27,30,21,41,39	Closed	✓	
RCIC T/T and Gov	Open	✓	
RCIC Flow Cont/Tape/Flow	AUTO/400/<10	✓	
MSIVs, MS-74, 77	Operable	✓	
Pri Cont Vent Iso Valves	Operable	✓	
SV-70A/B Ind	Closed	✓	
Relief Valves	No Alarms/Opr	✓	
ADS Bypass Switch	NORMAL Pos.	✓	

Parameter/ Component	Allowable Cond/Limit	Checks	
		06	18
CS A/B Sys	No Alarms/Opr	✓	
CS-7 A/B	Open	✓	
CS PP A/B	AUTO/Opr	✓	
CS-5 A/B, 11 A/B	Open	✓	
CS-26 A/B, 12 A/B	Closed	✓	
CS FI-14-50A/B	±500 gpm	✓	
RHR Sys	No Alarms/Opr	✓	
RHR PP A/B/C/D	AUTO/Opr	✓	
RHR-13 A/B/C/D	Open	✓	
RHR-25 A/B	Open	✓	
RHR-65 A/B	Open	✓	
RHR-16A/B	Open	✓	
Other RHR RHRSW Vlvs	Closed	✓	
RHR FI-10-139A/B	±1500 gpm	✓	
Torus Water Temp	≥50 - <87.3°F	✓	
HPCI Sys	No Alarms/Opr	✓	
HPCI Turb Trip/Inhibit SW	In AUTO	✓	
HPCI Sys Ready Light	ON	✓	
HPCI-15, 16, 17, 20	Open	✓	
HPCI-14, 25, 19, 21, 57, 58	Closed	✓	
HPCI Flow Cont/Tape/Flow	AUTO/4250/<100	✓	
RPS MG A/B Power	NORM/Alt Pwr Avail.	✓	
Off-Gas Act	Norm Trend	✓	
Stack Gas Act	Norm Trend	✓	
Ref-2 A/B	AUTO/Opr	✓	
SBGT 9KW Htrs EUH-2&4	AUTO	✓	
SGT-2A/3A	Open	✓	
SGT-1A/B, 2B, 3B, 4A/B, 5	Closed	✓	
Rx Bldg D/P	-0.25 to -2.0 inches H <sub>2</sub> O	✓	
TVS-86	Closed	✓	
Drywell/Torus D/P	>1.8 psid	✓	
Torus Water Level	OP 2115, Fig 1	✓	

	SM	CRS	STA	CRO	ACRO
Operations Log					
Switching/Tagging Log					
WOR Listing					
CRP Walkthrough (Note 1 & Note 3)					
Night Order Book					
CR Shift Turnover Cklist					
Tech Spec Sys/Comp Inop Sht					
Surveillance Schedule	-----		-----	-----	-----
Reviews Completed:					
06-18 SHIFT					
18-06 SHIFT	APM	REF	TRG	RN	CRP

① 0500 APRM 'A' Inop and bypassed APM

- NOTE 1: STA walkthrough to include status check of the Control Room Pyrotronics Panel.
- NOTE 2: In the event minimum shift staffing levels cannot be met, actions to be initiated are specified in AP 0894.
- NOTE 3: Control Room staff shall contact VELCO whenever abnormal yard conditions exist. (CAR91037OP1)



# Scenario 2

## SHIFT BRIEFING CHECKLIST

Mode Switch Position: Run

Date: Today

Shift: DAY  
Day Night

Plant Status: Rx Power 100% Rx Water Level: 160" Rx Pressure: 1005 HP Clock (Note 3) 10

Significant Equipment Out of Service (Note 1):  
APRM A - INOP and Bypassed

Evolutions in progress or planned (Note 2):  
Place CW in closed cycle  
Chlorinate CW and SW

Special Instructions or Considerations (Pertinent Night Orders, Unusual Conditions) (MOOID9301OP2)

Briefing Conducted By: \_\_\_\_\_  
Control Room Supervisor

Previous twelve hour full power average during steady state operation >1592 MWt?

Yes  No  N/A If no and unplanned, notify the Supervisor, Operations Support.

Attendees:

		Spare Shift		
SM OR CRS	_____	_____	Shift Chem Tech.	_____
CRO	_____	_____	Rad. Prot. Tech.	_____
STA	_____	_____	Sec. Shift Supv.	_____
ACRO	_____	_____		
ACRO	_____	_____		
AO	_____	_____		
AO	_____	_____		
AO	_____	_____		

Approved by: \_\_\_\_\_  
Duty Shift Manager

Note 1: Include Tech. Spec. Systems/Components entered on VYAPF 0152.02 for which active measures by Operations must be taken and list those actions. (ER970390\_01 & \_02)

Note 2: Ensure evolutions that may affect radiological conditions such as HPCI, RCIC, Core Spray and RHR operations are brought to the attention of the Radiation Protection Technician.

Note 3: State HP clock number. IF clock has been reset, discuss the event that resulted in the reset.

# Scenario Z

## CONTROL ROOM TURNOVER SHEET

Date: Today

Shift:

Days

Nights

Annunciators (Existing, New, Nuisance, Disabled, Restored)

no new ANNUNCIATORS

Surveillances Done/Due

NONE

Evolutions/Transients

place CW in closed cycle  
chlorinate CW and SW

Equipment Out of/Returned to Service

APRM "A" INOP and bypassed

Other

Op-Test No.: 1 Scenario No.: 2 Event No.: 1 Page 1 of 12

Event Description: Place CW in closed cycle for chlorination

Time	Position	Applicant's Actions or Behavior
	CRS	Direct traveling screens to off, service water strainer breakers opened and circ water placed in closed cycle for chlorination
	CRO	Review prerequisites and admin limits to ensure they are satisfied
	CRO	Verify all CW and CWB pumps running Verify sufficient fans o to maintain condenser vacuum 1.0 to 5.0 inches
	CRO	Call Chemistry to determine if service water will also be chlorinated
	CRO	Request a peer check
	CRO	Open recirc gate to > 70% <ul style="list-style-type: none"> <li>Recirc gate switch on CRP 9-6 positioned to open and held (Throttle)</li> <li>Position verified &gt;70% on CRP 9-6 PI-104-3</li> <li>Recirc gate switch released</li> </ul>
	CRO	Verify wier level < 225 ft (LI-104-10-1) on CRP 9-7
	CRO	Direct an AO to check CW-7 open sufficiently to ensure no flow over of weir
	CRO	Close/check closed all intake gates <ul style="list-style-type: none"> <li>A intake gate control switch positioned to closed on CRP 9-6</li> <li>B intake gate control switch positioned to closed on CRP 9-6</li> <li>C intake gate control switch positioned to closed on CRP 9-6</li> </ul> Intake gates verified closed on CRP 9-6 <ul style="list-style-type: none"> <li>POI-104-1A</li> <li>POI-104-1B</li> <li>POI-104-1C</li> </ul>
	ACRO / CRO	Verify backpressure < 5.0" (monitor backpressure)

Op-Test No.:   1   Scenario No.:   2   Event No.:   2   Page  2  of 12

Event Description: Loss of Startup Transformers

Time	Position	Applicant's Actions or Behavior
	ACRO	Diagnose and report loss of startup transformers
	CRS	Enter ON 3150, Loss of Startup Transformers
	CRS	Send an operator to the relay house to complete VYOPF 2141.01/02. Verify MOD T-3 open. Visually inspect startup transformers.
	CRS	Consult Technical Specifications 3.10.A.4, 3.10.B.3, 3.5.D.C <ul style="list-style-type: none"> <li>• Within 1 hour verify Main Transformer backfeed is available – observation of plant status</li> <li>• Enter 7 day LCO IAW 3.10.B.C</li> </ul>
	CRS	Direct voltages checked on Bus 3, 4, 8, 9, on panel meters and ERFIS
	ACRO	Check voltages on Bus 3, 4, 8, 9 as directed <ul style="list-style-type: none"> <li>• Bus 8 EI-9-8-27</li> <li>• Bus 9 EI-9-8-28</li> <li>• Bus 3</li> <li>• Bus 4</li> </ul>
	SE	Check voltages on Bus 3, 4, 8, 9, on ERFIS (ECCS status screen)
	CRS	Direct EDG availability checked
	ACRO	Check CRP 9-8 for normal standby conditions (no EDG alarm)
	CRS	Direct Circ Water shifted to open cycle

Op-Test No.:	1	Scenario No.:	2	Event No.:	2 (cont'd)	Page	3	of	12
	ACRO	Shift Circ water to open cycle <ul style="list-style-type: none"> <li>• Inform Chemistry proceeding to open cycle</li> </ul> Open intake gates to 100% <ul style="list-style-type: none"> <li>• A intake gate control switch positioned to open on CRP 9-6</li> <li>• B intake gate control switch positioned to open on CRP 9-6</li> <li>• C intake gate control switch positioned to open on CRP 9-6</li> </ul> Intake gates verified open on CRP 9-6 <ul style="list-style-type: none"> <li>• POI-104-1A</li> <li>• POI-104-1B</li> <li>• POI-104-1C</li> </ul> Fully close the recirc gate <ul style="list-style-type: none"> <li>• Recirc gate switch on CRP 9-6 positioned to closed and held (Throttle)</li> <li>• Position verified 0% on CRP 9-6 PI-104-3</li> </ul> Recirc gate switch released           Fully lower bypass gates (A & B) <ul style="list-style-type: none"> <li>• Bypass gate A control switch to open on CRP 9-6</li> <li>• Bypass gate B control switch to open on CRP 9-6</li> <li>• Monitor fore-bay level on LI-104-2A on CRP 9-6</li> <li>• Monitor fore-bay level on LI-104-2B on CRP 9-6</li> <li>• Monitor ERFIS and report NPDES status</li> </ul>							
	CRS	Notify DCO and Operations Manager							
	CRS	Direct power reduction to < 25 CTP at ≤ 10%/minute to 27.0 to 27.5 mlbm/hr							
	CREW	Monitor river temperature points MO36/MO37							
	ACRO/CRO	Notify ISO New England of power reduction							
	CRS	Brief crew on plant status <ul style="list-style-type: none"> <li>• &lt; 25% CTP as soon as possible</li> <li>• Hot shutdown in 24 hours</li> <li>• Unusual Event on Loss of Startup Transformers</li> <li>• Startup Transformer status</li> <li>• Potential LNP on a reactor scram</li> </ul>							
	CRS	Request maintenance point of contract assigned							
	CREW	Direct Chemistry technician notify stake holders of unplanned power reduction							
	CREW	Contact ISO/VELCO, inform them of power reduction							
	CRS	Direct stability monitor verified operable							
	CRO	Reduce recirc pump speed to a core flow of 27.0 to 27.5 mlbms/hr at the rate directed by the CRS <ul style="list-style-type: none"> <li>• Turns controller 2-184-16-1A/1B manual knob in the counterclockwise direction on CRP 9-5</li> </ul>							
	ACRO	Adjust speed load changer per Figure 2 of OP 0105							

Op-Test No.:   1   Scenario No.:   2   Event No.:   3   Page   4   of  12 

Event Description: Power reduction with a stuck feedwater regulating valve

Time	Position	Applicant's Actions or Behavior
	CRO	Report increasing reactor level
	CRS	Direct power reduction stopped until reactor level can be stabilized
	CREW	Check actual FRV positions on ERFIS. Determine "A" FRV is not responding.
	CRS	Contact Operations Management and recommend actions to deal with the stuck FWRV
	CRS	Brief crew on plans to deal with stuck feedwater regulating valve
	CRS	Direct the A FWRV transferred to individual manual and then to local manual Control and locked up
	CRO	Transfer the A FWRV to individual manual control as follows: <ul style="list-style-type: none"> <li>• Press the display push button on FDW 12A individual controller</li> <li>• Compare the "S" and "V" signals</li> <li>• Verify the "S" and "V" signals are matched</li> <li>• Depress the A/M push button on the FDW 12A controller</li> <li>• Verify the green auto Led goes out on the FDW 12A controller</li> <li>• Verify the red manual Led comes illuminates on the FDW 12A controller</li> <li>• Then direct an AO to establish communications with the control room and take local manual control of the A FWRV in accordance with OP 2172</li> </ul>





Op-Test No.:   1   Scenario No.:   2   Event No.:   5   Page  6  of  12   
 Event Description: Minor Condenser Air Inleakage

Time	Position	Applicant's Actions or Behavior
	CREW	Report increased AOG flow/lowering condenser vacuum
	CRS	Enter ON 3120, High Condenser Backpressure, and direct actions
	ACRO	Verify all circ water and circ water booster pumps running on CRP 9-6 <ul style="list-style-type: none"> <li>• Circ water pump A red light on</li> <li>• Circ water pump B red light on</li> <li>• Circ water pump C red light on</li> <li>• Circ water Booster pump A red light on</li> <li>• Circ water Booster pump B red light on</li> <li>• Circ water Booster pump C red light on</li> </ul>
	ACRO	Verify 516 A open/throttled
	ACRO	Verify steam seal pressure > 1 psig on PI-101-7 on CRP 9-7
	CRS	Direct core flow reduced t 29.5 to 29 mlbm @ less than or equal to 10% CTP/Min <ul style="list-style-type: none"> <li>•</li> </ul>
	CRO	Reduce core flow to 27.5 to 29.0 mlbm as directed <ul style="list-style-type: none"> <li>• Master flow controller on CRP 9-5 rotated counter clockwise</li> </ul>
	CRO	Report increasing RPV level
	Crew	Diagnose/recall the "A" FRV as stuck using ERFIS, hold power reduction until RPV level is controlled
	CRS	Direct ACRO to monitor reactor level due to stuck FRV
	ACRO	Monitor and control RPV level as directed
	CRS	Direct control rods inserted to maintain backpressure < 5"
	CRO	Insert control rods as directed (Rapid S/D seq) <ul style="list-style-type: none"> <li>• Turn on select power</li> <li>• Depresses select button for control rod</li> <li>• Drives control rod in with continuous insert to to insert limit of the rapid shutdown sequence</li> <li>• Selects next rod in sequence and repeats step</li> </ul>
	CRS	Brief crew that if a scram is necessary and LNP will occur causing a Loss of Feedwater/Condensate/MSIVs



Op-Test No.:   1   Scenario No.:   2   Event No.:   7   Page  8  of 12

Event Description: Hydraulic ATWS / Level power control

Time	Position	Applicant's Actions or Behavior
	CRO	Initiate ARI/RPT
	CRO	Trip recirc pump drive motor breakers Scram response <ul style="list-style-type: none"> <li>• Depress PB 1 on feedwater master controller CRP 9-5</li> <li>• Reactor mode switch to shutdown CRP 9-5 when steam flow &lt;40%</li> <li>• Insert IRMs/SRMs on CRP 9-5</li> <li>• Select IRM recorders on CRP 9-5</li> <li>• Report reactor power when RPV level reaches 90"</li> <li>• Report when reactor power is &lt;2%</li> <li>• After verifying the RPV is recovering leave one RFP running, and place one in standby, and one in pull to lock CRP 9-6 when reactor power/steam flow allows</li> <li>• Verify closed scram discharge vent and drain valves (6) on CRP 9-5</li> </ul>
	CRS	Enter EOP-1 <ul style="list-style-type: none"> <li>• Direct Table A automatic action confirmed</li> </ul>
CT	CRS	Enter EOP-2 and direct: <ul style="list-style-type: none"> <li>• ADS inhibited</li> <li>• Reactor mode switch to shutdown when steam flow is &lt; .5 mlbm/hr</li> <li>• Confirm ARI/RPT</li> </ul>
CT	ACRO	Inhibit ADS <ul style="list-style-type: none"> <li>• Logic A inhibit collar depressed and rolled clockwise on CRP9-3</li> <li>• Logic B inhibit collar depressed and rolled clockwise on CRP9-3</li> </ul>
	STA	Confirm Table A when directed
CT	CRS	Direct injection into the RPV terminated IAW OE 3107 Appendix GG



Op-Test No.: 1 Scenario No.: 2 Event No.: 8 Page 10 of 12

Event Description: SLC "A" Pump failure, "B" Squib failure, (ATWS Continuing)

Time	Position	Applicant's Actions or Behavior
	CRO	Inject boron <ul style="list-style-type: none"> <li>• SLC control switch on CRP 9-5 to SYS1 or SYS 2</li> <li>• Confirm pump start by red light for pump on CRP 9-5</li> </ul> Verify RWCU isolates on CRP 9- 4 <ul style="list-style-type: none"> <li>• CU 15 shut by green light only on CRP 9- 4</li> <li>• CU 18 shut by green light only on CRP 9- 4</li> <li>• CU 68 shut by green light only on CRP 9- 4</li> </ul> Verify squib valve fires by <ul style="list-style-type: none"> <li>• Amber light out of CRP 9-5</li> <li>• ANN 9-5-A-1 squib continuity loss</li> <li>• Discharge pressure on CRP 9-5 PI-11-65 do not indicate the pump dead headed</li> <li>• Red flow light on on CRP 9-5 indicating flow &gt;30 GPM</li> <li>• SLC tank level lowering as indicated on CRP 9-5 LI-11-66</li> <li>• If system fails start other system</li> </ul> Diagnose the A SLC pump failed to start and the B squib valve failed to fire <ul style="list-style-type: none"> <li>• Inject SLC with the B pump</li> <li>• Report to the CRS the SLC system failures of A SLC pump, B Squib</li> </ul>
	CRO	report SLC is injecting
CT	CRS	When reactor power is < 2%, direct injection reestablished to maintain RPV level > 19" and the level at which power went below 2% using HPCI/RCIC/CRD
CT	CRO	Reestablish RPV injection to maintain RPV level in the ordered band
CT	CRS	Direct control rods inserted IAW Appendix BB/G

Op-Test No.:	1	Scenario No.:	2	Event No.:	8 (cont'd)	Page 11 of 12
CT	CRO	<p>Insert control rods as directed</p> <p>APP G</p> <ul style="list-style-type: none"> <li>• Start all available CRD pumps.</li> <li>• Position the RWM keylock bypass switch to BYPASS concurrently</li> <li>• If necessary, perform the following to open the CRD flow control valve.</li> <li>• Place FIC 3-301 CRD Flow Control in manual.</li> <li>• Adjust FIC 3-301 CRD Flow Control to restore drive water pressure.</li> <li>• Close CRD-56 CRD Charging Water Header Supply</li> <li>• Adjust CRD-PCV-20 DRIVE WTR PRESS CONTROL VALVE to achieve drive water differential pressure to between 300 and 500 psid.</li> <li>• The appropriate rod select template (I/II) may be used as an aid, if desired.</li> <li>• The operator may initial, checkoff, or comment in the space provided after each control rod as appropriate.</li> <li>• Continuously insert control rods, using the ROD MOVEMENT CONTROL switch, to position 00 as follows:</li> <li>• Insert control rods using the sequence given on Figure I.</li> <li>• IF the sequence of Figure II is inadvertently started, THEN notify the CRS, insert all possible control rods in that sequence and proceed to the sequence given on Figure I.</li> <li>• IF, while inserting control rods, a control rod is mispositioned, THEN notify the CRS, insert that control rod to 00 and continue in the sequence.</li> <li>• IF, while inserting control rods, a control rod in the sequence is partially inserted, THEN insert that control rod to 00 and continue in the sequence.</li> <li>• IF, while inserting control rods, a control rod in the sequence cannot be moved or is at 00, THEN skip that control rod and continue in the sequence.</li> <li>• WHEN all possible control rods have been inserted per Figure I(II), THEN continue to insert control rods per Figure II(I).</li> <li>• WHEN all control rods that can be inserted have been inserted, THEN inform the CRS.</li> </ul>				
	CRO	<p>APP BB</p> <ul style="list-style-type: none"> <li>• Start all available CRD pumps.</li> <li>• Close CRD-56 CRD Charging Water Header Supply.</li> <li>• Fully OPEN CRD-PCV-20 DRIVE WTR PRESS from CRP 9-5.</li> <li>• Adjust CRD-PCV-22 CLG WTR PRESS to achieve drive water differential pressure between 300 and 500 psid.</li> <li>• When all control rods that can be inserted have been inserted, Then inform the CRS</li> </ul>				

Op-Test No.:	1	Scenario No.:	2	Event No.:	8 (cont'd)	Page	12	of	12
	CRS	Enter and direct actions in EOP-3 <ul style="list-style-type: none"> <li>Restart Drywell RRUs</li> <li>Initiate torus cooling</li> <li>Before torus pressure reaches 10 psig, spray the torus</li> </ul>							
	ACRO	Restart all drywell RRUs when directed. <ul style="list-style-type: none"> <li>MCA keylock to bypass on CRP 9-25</li> <li>CRP 9-25 Blocking relay reset push button depressed</li> <li>CRP 9-25 RRU 1A/B control switch to A&amp;B run</li> <li>CRP 9-25 RRU 2A/B control switch to A&amp;B run</li> <li>CRP 9-25 RRU 3A/B control switch to A&amp;B run</li> <li>CRP 9-25 RRU 4A/B control switch to A&amp;B run</li> </ul>							
	ACRO	Initiate torus cooling when directed Place <ul style="list-style-type: none"> <li>A and D RHR pumps in PULL TO LOCK. OR</li> <li>B and C RHR pumps in PULL TO LOCK.</li> <li>Close/verify closed HX BYPASS RHR-65A/B</li> <li>Verify adequate SW pumps are operating to handle RHRSW pump demand.</li> <li>Verify no more than one SW pump is in standby mode.</li> </ul> IF a LPCI initiation signal is present, THEN place RHRSW PP A&C LPCI AUTOSTOP OVERRIDE SWITCH keylock switch to MANUAL OVERRRD (3-M-2 will annunciate). <ul style="list-style-type: none"> <li>Start RHRSW pump A or C /B or D</li> </ul> When conditions permit, verify RHRSW pump cooling water flow is 3 – 6 gpm. If necessary, adjust RHRSW DISCHARGE, RHR-89A/B as follows: <ul style="list-style-type: none"> <li>Maintain RHRSW heat exchanger flow 2950 to 3140 gpm.</li> <li>Maintain RHRSW pressure greater than 20 psid above RHR pressure.</li> </ul> IF reactor water level is greater than TAF, THEN <ul style="list-style-type: none"> <li>turn the RHR A/C or B/D LOGIC CTMT SPRAY VLV LPCI SIG BYPASS to MAN.</li> <li>Open TORUS SPRAY/CLG RHR-39A/39B</li> </ul> Open TORUS COOLING RHR-34A/34B							
	ACRO	Spray the torus when directed. <ul style="list-style-type: none"> <li>Open RHR 39A/B</li> </ul>							
	CRS	After Freeze, determine EAL in accordance with AP 3125 as S-7-c.							





	EDdi08swz Preinsert	C	Failure of breaker 13 to close manually (Switch I/O) No malfunction for this side is available
	ED12A ED12B Preinsert	I	Failure of Bus 1 and 2 to auto transfer to the startup transformers
1	ED19B	C	Loss of Bus 89B
2	SW14A SWdi06sw12b	C	Trip of A TBCCW pump and failure of auto and manual starts of the B TBCCW pump
3	N/A	N	Power reduction due to increasing component temperatures
4	RR01A .5% @ 800 sec ramp	M	Recirc loop rupture
5	HP01	C	HPCI turbine trip, loss of all high pressure feed
6	See above preinserts		Failure of injection valves to auto open

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

# **SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#3R)**

## **GENERAL REQUIREMENTS**

- All chart recorders will be rolled forward, timed and dated.
- Paper from selected chart recorders will be saved for the examination team as requested.
- All procedures, flow charts, curves, graphs, etc., will be returned to their normal storage place and closed.
- All markable procedures, boards, etc., will be erased.
- All paper used by the previous crew will be removed and kept for the examination team as requested.
- The simulator operator, or designated person, will keep a rough log of all communications into and out of the "control room " during the scenario as requested by the examination team.

## **INITIAL SETUP**

- IC-9, 100% CTP, RCIC OOS

## **DURING THE SCENARIO**

The examination team will determine when each event is to be inserted and when to "freeze" and will inform the simulator operator.

- **EVENT 1** If the Control Room sends maintenance or an AO to investigate the loss of RUPS "B"/Bus 89B, inform the crew that:
  - at RUPS 1B - the Gen over/under voltage lite is on and BKR "CB" is open (AC output BKR).
  - at MCC 89B - breaker "feed from UPS 1B" is open. If the crew attempts to close the maintenance tie, it will trip.
  - if requested maintenance should inform the crew that there appears to be a fault on MCC89B and a work order is being initiated.
- **EVENT 2** If sent to investigate the loss of TBCCW report the A TBCCW pump breaker tripped and no reason for the start failure of the B TBCCW pump.

- **EVENT 3** When directed to control recirc lube oil temperatures insert SWR 58.  
After the manual scram and LNP if VELCO/AO/Maintenance are asked to report a cause for the LNP no cause will be found.
- **EVENT 5** When sent to investigate the cause for the HPCI trip report a large oil leak has caused a loss of hydraulic and bearing oil.
- **EVENT 6** If sent to manually open RHR 27B it will not open.

**TERMINATION:**

Reactor water level restored to above TAF and controlled with low pressure ECCS pumps. Exam Team directs.

**SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#3R)  
(con't)**

Event No.	Malf. No.	Event Type*	Event Description
	RC05 Preinsert	N/A	RCIC isolation (RCIC OOS)
	RF RCR05	N/A	RCIC 15 ACB opened after RCIC 15 is closed (RCIC OOS)
	CS03A preinsert	I	Core Spray A injection valve auto open failure
	CS03B preinsert	I	Core Spray B injection valve auto open failure
	RH07A Preinsert	I	RHR A injection valve auto open failure
	ED21 Preinsert	C	Failure of breaker 23 to close manually
	EDdi08swz Preinsert	C	Failure of breaker 13 to close manually (Switch I/O) No malfunction for this side is available
	ED12A ED12B Preinsert	I	Failure of Bus 1 and 2 to auto transfer to the startup transformers
1	ED19B	C	Loss of Bus 89B
2	SW14A SWdi06sw12b	C	Trip of A TBCCW pump and failure of auto and manual starts of the B TBCCW pump
3	N/A	N	Power reduction due to increasing component temperatures
4	RR01A .5% @ 800 sec ramp	M	Recirc loop rupture
5	HP01	C	HPCI turbine trip, loss of all high pressure feed
6	See above preinserts		Failure of injection valves to auto open

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

## **SHIFT TURNOVER (#3R)**

### **PLANT CONDITIONS:**

- Approximately 100% power
- Rapid shutdown sequence is latched
- RCIC is OOS due to a failed steam flow D/P cell causing a spurious isolation

### **INOPERABLE EQUIPMENT/LCOS:**

- RCIC 14 days Technical Specifications 3.5.G.2. Entered 8 hours ago

### **SCHEDULED EVOLUTIONS:**

- I/C is working on the failed RCIC steam flow D/P cell

### **SURVEILLANCES DUE THIS SHIFT:**

- None

### **ACTIVE CLEARANCES:**

- N/A

### **GENERAL INFORMATION:**

# Scenario 3

## CONTROL ROOM SHIFT TURNOVER CHECKLIST

Parameter/ Component	Allowable Cond/Limit	Checks	
		06	18
Vernon Bus Tie	3900-4500 v	✓	
DG A/B	No Alarms/Opr	✓	
DG Volt Req	8 White Lights	✓	
DG A/B ACB's	Operable	✓	
DG A/B BKR CONT SELECT Switches	In REMOTE	✓	
Bus 8/9	435-506 v	✓	
Bus 3/4	3700-4400 v	✓	
Other 4KV ACB's	Opr	✓	
S/U Transformer	Energized	✓	
Aux Transformer	Energized	✓	
Cond Backpress	1-5 in HgA	✓	
SW PPs A/B/C/D	Operable	✓	
Cond Sys	Operable	✓	
Feed Sys	Operable	✓	
CST Level (ER20001509_06)	20-90%	✓	
Inst. Air Press	95-107 psig	✓	
Rx Water Level	155-165 inches	✓	
Rx Press	950-1030 psig	✓	
Rx Power	≤1593 MWt	✓	
SLC Sys	No Alarms/Opr	✓	
SLC Tk Level	81-92%	✓	
SLC-18	Open	✓	
SLC Squib A/B	Energized	✓	
SLC PP A/B	Operable	✓	
SDV Level	-0	✓	
APRM/IRM/SRM/RBM Byp Sw (ER960026_03)	Neutral Position	✓	
Scram Air Press	70-75 psig	✓	
RCU Sys	No Alarms/Opr	✓	
RCU Inlet Cond	<1 µmho/cm	✓	
CU-15, 18, 68	Operable	✓	
RCIC Sys	No Alarms/Opr	① NO	
RCIC-15,16,18,20	Open/Opr	② NO	
RCIC-131,27,30,21,41,39	Closed	✓	
RCIC T/T and Gov	Open	✓	
RCIC Flow Cont/Tape/Flow	AUTO/400/<10	✓	
MSIVs, MS-74, 77	Operable	✓	
Pri Cont Vent Iso Valves	Operable	✓	
SV-70A/B Ind	Closed	✓	
Relief Valves	No Alarms/Opr	✓	
ADS Bypass Switch	NORMAL Pos.	✓	

Parameter/ Component	Allowable Cond/Limit	Checks	
		06	18
CS A/B Sys	No Alarms/Opr	✓	
CS-7 A/B	Open	✓	
CS PP A/B	AUTO/Opr	✓	
CS-5 A/B, 11 A/B	Open	✓	
CS-26 A/B, 12 A/B	Closed	✓	
CS FI-14-50A/B	±500 gpm	✓	
RHR Sys	No Alarms/Opr	✓	
RHR PP A/B/C/D	AUTO/Opr	✓	
RHR-13 A/B/C/D	Open	✓	
RHR-25 A/B	Open	✓	
RHR-65 A/B	Open	✓	
RHR-16A/B	Open	✓	
Other RHR RHRSW Vlvs	Closed	✓	
RHR FI-10-139A/B	±1500 gpm	✓	
Torus Water Temp	≥50 - <87.3°F	✓	
HPCI Sys	No Alarms/Opr	✓	
HPCI Turb Trip/Inhibit SW	In AUTO	✓	
HPCI Sys Ready Light	ON	✓	
HPCI-15, 16, 17, 20	Open	✓	
HPCI-14, 25, 19, 21, 57, 58	Closed	✓	
HPCI Flow Cont/Tape/Flow	AUTO/4250/<100	✓	
RPS MG A/B Power	NORM/Alt Pwr Avail.	✓	
Off-Gas Act	Norm Trend	✓	
Stack Gas Act	Norm Trend	✓	
Ref-2 A/B	AUTO/Opr	✓	
SBGT 9KW Htrs EUH-2&4	AUTO	✓	
SGT-2A/3A	Open	✓	
SGT-1A/B, 2B, 3B, 4A/B, 5	Closed	✓	
Rx Bldg D/P	-0.25 to -2.0 inches H <sub>2</sub> O	✓	
TVS-86	Closed	✓	
Drywell/Torus D/P	>1.8 psid	✓	
Torus Water Level	OP 2115, Fig 1	✓	

	SM	CRS	STA	CRO	ACRO
Operations Log					
Switching/Tagging Log					
WOR Listing					
CRP Walkthrough (Note 1 & Note 3)					
Night Order Book					
CR Shift Turnover Cklist					
Tech Spec Sys/Comp Inop Sht					
Surveillance Schedule	----	----	----	----	----
Reviews Completed:					
06-18 SHIFT	ABC	OPG	HAUF	JLAD	ORR
18-06 SHIFT					

TIME      REMARKS:      INITIALS

① 0500 Spurious RCIC ABC  
Isolation on  
high D/P

② 0500 RCIC mov-15/16 ABC  
Shut, ACB open  
for mov-15

NOTE 1: STA walkthrough to include status check of the Control Room Pyrotronics Panel.

NOTE 2: In the event minimum shift staffing levels cannot be met, actions to be initiated are specified in AP 0894.

NOTE 3: Control Room staff shall contact VELCO whenever abnormal yard conditions exist. (CAR91037OP1)





# Scenario 3

## SHIFT BRIEFING CHECKLIST

Mode Switch Position: Run

Date: Today

Shift: DAY  
Day Night

Plant Status: Rx Power 100% Rx Water Level: 160" Rx Pressure: 1005 HP Clock (Note 3) 10

Significant Equipment Out of Service (Note 1):

RCIC - HPCI was immediately verified operable by administrative means at 0500 today

Evolutions in progress or planned (Note 2):

Repair of RCIC High steam line flow D/P cell

Special Instructions or Considerations (Pertinent Night Orders, Unusual Conditions) (MOOID9301OP2)

NO

Briefing Conducted By: \_\_\_\_\_  
Control Room Supervisor

Previous twelve hour full power average during steady state operation >1592 MWt?

Yes  No  N/A If no and unplanned, notify the Supervisor, Operations Support.

Attendees:

		Spare Shift		
SM OR CRS	_____	_____	Shift Chem Tech.	_____
CRO	_____	_____	Rad. Prot. Tech.	_____
STA	_____	_____	Sec. Shift Supv.	_____
ACRO	_____	_____		
ACRO	_____	_____		
AO	_____	_____		
AO	_____	_____		
AO	_____	_____		

Approved by: \_\_\_\_\_  
Duty Shift Manager

Note 1: Include Tech. Spec. Systems/Components entered on VYAPF 0152.02 for which active measures by Operations must be taken and list those actions. (ER970390\_01 & \_02)

Note 2: Ensure evolutions that may affect radiological conditions such as HPCI, RCIC, Core Spray and RHR operations are brought to the attention of the Radiation Protection Technician.

Note 3: State HP clock number. IF clock has been reset, discuss the event that resulted in the reset.

# Scenario 3

## CONTROL ROOM TURNOVER SHEET

Date: Today

Shift: Days Nights

Annunciators (Existing, New, Nuisance, Disabled, Restored)

no new Annunciators except RCIC Hi D/P

Surveillances Done/Due

Done - HPCI operable by administrative means

Evolutions/Transients

Repair RCIC steam flow D/P cell → I+C

Equipment Out of/Returned to Service

RCIC

Other



Op-Test No.: \_\_\_\_\_ Scenario No.: 3R Event No.: 2 Page 2 of 9

Event Description: Respond to a loss of TBCCW

Time	Position	Applicant's Actions or Behavior
	CRO	Recognize a loss of running TBCCW pump
	CRO	Attempt to start the standby TBCCW pump, recognize both TBCCW pumps have tripped.
	CRS	Direct maintenance and an AO to attempt to reset the breaker to restart a TBCCW pump
	CRS	Direct the CRO to begin lowering recirc speed to 27.5-29 mlb/hr at a rate not to exceed 10% RTP/min
	CRO	Begin lowering Recirc speed using the master controller at a rate directed by the CRS <ul style="list-style-type: none"> <li>• Adjusts master controller SC-2-184-14 in the counter clockwise direction</li> </ul>
	CRS	Direct the crew to monitor the Condensate and Feed pump bearing temperatures
	STA	Report when ERFIS alarms for Feed and Condensate pump temperatures High
	CRS	Direct the ACRO to transfer House Loads to the Startup Transformers
	ACRO	Attempt to transfer house loads to the startup transformers and report that the breakers will not close <ul style="list-style-type: none"> <li>• Insert sync key in 13 bkr</li> <li>• Turn on sync scope</li> <li>• Place 13 bkr control switch to close</li> <li>• Report 13 bkr close failure</li> <li>• Insert sync key in 23 bkr</li> <li>• Turn on sync scope</li> <li>• Place 23 bkr control switch to close</li> <li>• Report 23 bkr close failure</li> </ul>
	CRS	Direct a reactor scram and carry out actions in OT3100, and possible LNP.

Op-Test No.: \_\_\_\_\_ Scenario No.: 3R Event No.: 3 Page 3 of 9

Event Description: Respond to a Reactor Scram with a loss of Off Site Power.

Time	Position	Applicant's Actions or Behavior
	CRO	Report reactor scram. Take scram actions <ul style="list-style-type: none"> <li>• Press manual scram pushbuttons</li> <li>• Depress PB 1 on feedwater master controller CRP 9-5</li> <li>• Reactor mode switch to shutdown CRP 9-5 when steam flow &lt;40%</li> <li>• Insert IRMs/SRMs on CRP 9-5</li> <li>• Select IRM recorders on CRP 9-5</li> <li>• Report reactor power &lt;2%</li> <li>• Report all control rods inserted</li> <li>• After verifying the RPV is recovering leave one RFP running, and place one in standby, and one in pull to lock CRP 9-6</li> <li>• Verify closed scram discharge vent and drain valves (6) on CRP 9-5</li> </ul> Recognize/report EOP-1 and 3 entries on high drywell pressure.
	ACRO	Recognize and inform CRS of Turbine Trip with Loss of Off Site Power <ul style="list-style-type: none"> <li>• Report power on buses 3,4,8,9 from the Diesels</li> </ul>
	CRS	Enter and direct actions IAW OT 3122 LNP
	ACRO	Respond to LNP IAW 3122. <ul style="list-style-type: none"> <li>• Verify DG start</li> <li>• SW pumps start</li> <li>• Station AC start</li> </ul> Restart drywell RRUs <ul style="list-style-type: none"> <li>• Depress blocking relay reset on CRP 9-25</li> </ul>
	ACRO	Inform CRS that Buses 1 and 2 failed to transfer and the 13 and 23 breakers will not close.
	CRS	Enter and direct crew actions IAW OT 3100, Rx Scram and EOP-1, RPV Control
	CRS	Direct reactor water level maintained 127" - 177" per EOP-1 with HPCI.
	CRO	Report feed and condensate is unavailable.

Op-Test No.:	Scenario No.:	3R	Event No.:	3 (cont'd)	Page	4 of 9																		
	CRO/ACRO	<p>Maintain reactor water level as directed with HPCI.</p> <ul style="list-style-type: none"> <li>• Open TEST RETURN HPCI-24.</li> <li>• Close/check closed PUMP DISCHARGE HPCI-19.</li> <li>• Throttle open FULL FLOW TEST HPCI 21 8-10 seconds. (BMO-200-7R_01)</li> <li>• Start HPCI GL SL VAC FN-2-1A.</li> <li>• Verify both trains of SBT start. (As time permits)</li> <li>• Open MINIMUM FLOW HPCI-25.</li> <li>• Open STEAM SUPPLY HPCI 14.</li> <li>• As time permits, verify that STM LINE DRAIN HPCI-42 and HPCI-43 close.</li> <li>• Start AUX OIL PUMP P-85-1A and monitor SI 23-2 TURBINE SPEED.</li> <li>• As flow increases above 800 gpm, verify that MINIMUM FLOW HPCI-25 closes.</li> <li>• Control recirc flow rate to the CST and turbine speed by:               <ol style="list-style-type: none"> <li>a. Adjusting HPCI FLOW CONTROLLER FIC 23-108, or</li> <li>b. Throttling FULL FLOW TEST HPCI-21 as necessary.</li> <li>c. If HPCI FLOW CONTROLLER FIC 23-108 automatic feature fails:                   <ol style="list-style-type: none"> <li>1) Place HPCI PUMP FLOW CONTROLLER FIC 23-108 in MANUAL.</li> <li>2) Control flow using the MANUAL knob.</li> </ol> </li> </ol> </li> <li>• Monitor the following HPCI parameters:               <table border="1" data-bbox="726 1319 1503 1574" style="margin-left: 40px;"> <thead> <tr> <th><u>Parameters</u></th> <th><u>Normal Range</u></th> <th><u>Trip Point</u></th> </tr> </thead> <tbody> <tr> <td>Exhaust Pressure</td> <td>0-50 psig</td> <td>130 psig</td> </tr> <tr> <td>Suction Pressure</td> <td>6-30 psig</td> <td>15 in. Hg Vac.</td> </tr> <tr> <td>Stm Supply Pressure</td> <td>150-1120 psig</td> <td>≥70 psig</td> </tr> <tr> <td>Turbine Speed</td> <td>&gt;2200-4000 rpm</td> <td>5000 rpm</td> </tr> <tr> <td>Discharge Pressure</td> <td>&lt;1250 psig</td> <td>N/A</td> </tr> </tbody> </table> </li> <li>• If injection to vessel is required:               <p style="margin-left: 40px;">Open PUMP DISCHARGE HPCI-19.</p> <p style="margin-left: 40px;">Throttle FULL FLOW TEST HPCI-21 as necessary to control reactor water level.</p> </li> </ul>					<u>Parameters</u>	<u>Normal Range</u>	<u>Trip Point</u>	Exhaust Pressure	0-50 psig	130 psig	Suction Pressure	6-30 psig	15 in. Hg Vac.	Stm Supply Pressure	150-1120 psig	≥70 psig	Turbine Speed	>2200-4000 rpm	5000 rpm	Discharge Pressure	<1250 psig	N/A
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	ACRO	Control reactor pressure as directed.(Expect the use of HPCI)																						
	CRS	Direct torus cooling.																						

Op-Test No.:	Scenario No.: 3R	Event No.: 3 (cont'd)	Page 5 of 9
ACRO	<p>Start torus cooling as directed.</p> <p>Place</p> <ul style="list-style-type: none"> <li>• A and D RHR pumps in PULL TO LOCK.</li> <li style="text-align: center;">OR</li> <li>• B and C RHR pumps in PULL TO LOCK.</li> <li>• Close/verify closed HX BYPASS RHR-65A/B</li> <li>• Verify adequate SW pumps are operating to handle RHRSW pump demand.</li> <li>• Verify no more than one SW pump is in standby mode.</li> </ul> <p>IF a LPCI initiation signal is present, THEN place RHRSW PP A&amp;C LPCI AUTOSTOP OVERRIDE SWITCH keylock switch to MANUAL OVERRD (3-M-2 will annunciate).</p> <ul style="list-style-type: none"> <li>• Start RHRSW pump A or C /B or D</li> </ul> <p>When conditions permit, verify RHRSW pump cooling water flow is 3 – 6 gpm.</p> <p>If necessary, adjust RHRSW DISCHARGE, RHR-89A/B as follows:</p> <ul style="list-style-type: none"> <li>• Maintain RHRSW heat exchanger flow 2950 to 3140 gpm.</li> <li>• Maintain RHRSW pressure greater than 20 psid above RHR pressure.</li> </ul> <p>IF reactor water level is greater than TAF, THEN</p> <ul style="list-style-type: none"> <li>• turn the RHR A/C or B/D LOGIC CTMT SPRAY VLV LPCI SIG BYPASS to MAN.</li> <li>• Open TORUS SPRAY/CLG RHR-39A/39B</li> </ul> <p>Open TORUS COOLING RHR-34A/34B</p>		
CRS	<p>Declare UE due to loss of Offsite Power per AP 3125, U-6-a</p> <p>May be performed after the freeze</p>		

Op-Test No.: \_\_\_\_\_ Scenario No.: 3R Event No.: 4 Page 6 of 9

Event Description: Respond to a high drywell pressure.

Time	Position	Applicant's Actions or Behavior
	Crew	Report increasing drywell pressure.
	CRS	Enter EOP-3. Primary Containment Control
	CRS	Direct ACRO to restart drywell RRU's.
	ACRO	Restart drywell RRU's. <ul style="list-style-type: none"> <li>• MCA keylock to bypass on CRP 9-25</li> <li>• CRP 9-25 RRU 1A/B control switch to A&amp;B run</li> <li>• CRP 9-25 RRU 2A/B control switch to A&amp;B run</li> <li>• CRP 9-25 RRU 3A/B control switch to A&amp;B run</li> <li>• CRP 9-25 RRU 4A/B control switch to A&amp;B run</li> </ul>
	CRS	Direct torus sprays before torus pressure reaches 10 psig.
	ACRO/CRO	<p>Spray the torus, as directed.</p> <p>Spray the torus as directed</p> <p>Place</p> <ul style="list-style-type: none"> <li>• A and D RHR pumps in PULL TO LOCK.</li> <li>OR</li> <li>• B and C RHR pumps in PULL TO LOCK.</li> <li>• Close/verify closed HX BYPASS RHR-65A</li> <li>• Verify adequate SW pumps are operating to handle RHRSW pump demand.</li> <li>• Verify no more than one SW pump is in standby mode.</li> </ul> <p>IF a LPCI initiation signal is present, THEN place RHRSW PP A&amp;C LPCI AUTOSTOP OVERRIDE SWITCH keylock switch to MANUAL OVERRD (3-M-2 will annunciate).</p> <ul style="list-style-type: none"> <li>• Start RHRSW pump A or C / B or D</li> </ul> <p>When conditions permit, verify RHRSW pump cooling water flow is 3 – 6 gpm.</p> <p>If necessary, adjust RHRSW DISCHARGE, RHR-89A/B as follows:</p> <ul style="list-style-type: none"> <li>• Maintain RHRSW heat exchanger flow 2950 to 3140 gpm.</li> <li>• Maintain RHRSW pressure greater than 20 psid above RHR pressure.</li> </ul> <p>IF reactor water level is greater than TAF, THEN</p> <ul style="list-style-type: none"> <li>• turn the RHR A/C LOGIC CTMT SPRAY VLV LPCI SIG BYPASS to MAN.</li> <li>• Open TORUS SPRAY/CLG RHR-39A/B</li> </ul> <p>Open TORUS SPRAY RHR-38A/B</p>



Op-Test No.:		Scenario No.: 3R	Event No.: 4 (cont'd)	Page 7 of 9
CT	CRS	<p><b>Prior to RPV-ED, when torus pressure exceeds the suppression chamber spray initiation pressure, initiate drywell containment spray while in the safe region of the drywell spray initiation limit</b></p> <p>Standard: Spray the drywell within 10 minutes of exceeding 10 psig torus pressure AND RPV level not an overriding priority</p>		
	CRS	Verify drywell pressure and temperature allow the drywell to be sprayed.		
	CRS	Direct drywell RRU's secured.		
	ACRO	Secure drywell RRU's. <ul style="list-style-type: none"> <li>• ON CRP 9-25 four RRU control switches positioned to OFF or MCA keylock returned to normal</li> </ul>		
	CRS	Direct drywell sprays.		
	ACRO/CRO	Spray the drywell as directed. <ul style="list-style-type: none"> <li>• CRP 9-3 Open RHR 26A/B</li> <li>• CRP 9-3 Open RHR 31 A/B</li> </ul>		

Op-Test No.: \_\_\_\_\_ Scenario No.: 3R Event No.: 5 Page 8 of 9

Event Description: Respond to a loss of high pressure feed.

Time	Position	Applicant's Actions or Behavior
	ACRO	Report HPCI trip and contact maintenance.
	CRS	Direct CRD flow maximized to vessel.
	CRO	Start both CRD pumps <ul style="list-style-type: none"> <li>• Pump A switch to start CRP 9-5</li> <li>• Pump B switch to start CRP 9-5</li> </ul>
	CRS	Direct SLC tank injected for reactor water level control.
	CRO	Inject SLC, as directed. <ul style="list-style-type: none"> <li>• SLC control switch on CRP 9-5 to SYS1 or SYS 2</li> <li>• Confirm pump start by red light for pump on CRP 9-5</li> </ul> Verify RWCU isolates on CRP 9- 4 (already isolated on low RPV level) <ul style="list-style-type: none"> <li>• CU 15 shut by green light only on CRP 9- 4</li> <li>• CU 18 shut by green light only on CRP 9- 4</li> <li>• CU 68 shut by green light only on CRP 9- 4</li> </ul> Verify squib valve fires by <ul style="list-style-type: none"> <li>• Amber light out of CRP 9-5</li> <li>• ANN 9-5-A-1 squib continuity loss</li> <li>• Discharge pressure on CRP 9-5 PI-11-65 do not indicate the pump dead headed</li> <li>• Red flow light on on CRP 9-5 indicating flow &gt;30 GPM</li> <li>• SLC tank level lowering as indicated on CRP 9-5 LI-11-66</li> </ul>
	CRS	Direct injection subsystems CS "A", CS "B" and RHR "A" lined up for injection.
	ACRO	Lineup injection subsystems, as directed. <ul style="list-style-type: none"> <li>• Shut RHR 34 A</li> <li>• Shut RHR 39 A</li> <li>• Shut RHR 38 A</li> </ul>
	CRS	Direct ADS inhibited.
	ACRO/CRO	Inhibit ADS <ul style="list-style-type: none"> <li>• Logic A inhibit collar depressed and rolled clockwise on CRP9-3</li> <li>• Logic B inhibit collar depressed and rolled clockwise on CRP9-3</li> </ul>

Op-Test No.:		Scenario No.:	3R	Event No.:	5 (cont'd)	Page	9	of	9
CT	CRS	<p><b>With the reactor shutdown and reactor pressure greater than the shutoff head of the low pressure systems, initiate RPV-ED BEFORE RPV level reaches -19 inches</b></p> <p><b>Standard:</b></p> <p>Initiate RPV-ED (begin opening valves) BEFORE RPV level reaches -48 inches</p>							
	CRS	Direct all SRV's opened.							
	ACRO	<p>Open all SRVs on CRP 9-3</p> <ul style="list-style-type: none"> <li>• RV-71A switch to open</li> <li>• RV-71C switch to open</li> <li>• RV-71B switch to open</li> <li>• RV-71D switch to open</li> </ul>							
CT	CRS	<p><b>Action is taken to restore RPV water level above -19 inches by operating available low pressure ECCS system(s) when RPV pressure decreases below the shutoff head of the low pressure systems</b></p> <p><b>Standard:</b></p> <ul style="list-style-type: none"> <li>• All available ECCS pumps are lined up for injection and running prior to RPV pressure reaching the injection valve open permissive pressure.</li> <li>• No pumps are secured until adequate core cooling is assured.</li> <li>• Initiate manual opening of injection valves within 1 minute of reaching valve open permissive pressure</li> </ul>							
	ACRO/CRO	Report failure of RHR-27A, CS-12A and CS-12B to AUTO open and start to open them.							
	CRS	Direct RHR and CS injection valves opened.							
	ACRO/CRO	Manually open RHR 27A and CS 12A and 12B injection valves as directed.							
	CRS	Direct reactor level restored to > TAF and then > 127" using RHR/CS.							
	CRS	<p>Consult AP 3125 and determine an Alert EAL has been reached IAW AP 3125, A-3-a and/or A-3-b.</p> <p>May be performed after the freeze</p>							