

Facility: Vermont Yankee Scenario No.: 1 Op-Test No: 1

Examiners: _____ Operators: _____

Initial Conditions: 100%

Turnover: Equipment OOS: "B" CRD pump, "A" RHR pump
TS LCO's: 7-day LCO for RHR

Event No.	Malf. No. <i>See Attached</i>	Event Type*	Event Description
1		C	Loss of Bus 3
2		N, R	Commence plant shutdown
3		I	Failure of steam flow summer
4		C	Loss of feed
5		M	Leak in primary containment w/ inadequate high pressure make-up

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

IC-60

↳ Re-do SIM setup PFS

SIMULATOR OPERATOR INSTRUCTIONS

Simulator Set Up: I. C. No.: 9

Brief No. 1 Discretionary Distractor Malfunctions/RFs/IOs:

1. Place rRH_11 to OPEN ("A" RHR Pump breaker).
2. Place the "A" RHR Pump control switch to PTL and white tag.
3. Place rRD_15 to OPEN ("B" CRD Pump breaker) *and white tag CRD Pump "A" Control Switch*

Brief No. 2 Discretionary Distractor Malfunctions/RFs/IOs:

1. Place rRH_11 to OPEN ("A" RHR Pump breaker).
2. Place the "A" RHR Pump control switch to PTL and white tag.
3. Place rFW_02 to OPEN ("B" Feed Pump breaker)
4. Place the "B" Feed Pump control switch in PTL and white tag.

No.	MF/RF/IO #	Severity	Ramp	REM #	Act. Time	Description
1.	mfNM_31641A	-	-	-1	Pre-insert	LPRM 16-41A downscale
2.	mfRH_07A	-	-	-1	Pre-insert	RHR 27A fails to auto open
3.	mfRH_07B	-	-	-1	Pre-insert	RHR 27B fails to auto open
4.	mfCS_03A	-	-	-1	Pre-insert	CS 12A fails to auto open
5.	mfED_04A	-	-	R1	~1 min after scenario begins	Loss of Bus 3
6.	mfFW_14	100	60	R2	After S/D commenced	Steam flow summer failure
7.	mfED_03B	-	-	R3	After Rx power ~80% and stable	Loss of Bus 2.
8.	mfRR_01A	0.6 %	600 sec	R4/6	5 min after scram	Recirc loop "A" rupture.
9.	mfHP_05	-	-	R5/6	After auto or manual start	HPCI inadvertent isolation
10.	mfRC_01	-	-	R6/7	After drywell sprays if not already tripped	RCIC Turbine Trip

4
 Insert mf CD_01A (very A) (Trip of END Pump A)
 ←
 can place desired # ET or

SIMULATOR OPERATOR INSTRUCTIONS (Continued)

Additional Instructions:

1. The examination team will determine when each event is to be inserted and when to "Freeze", and will inform the simulator operator. *replace*
2. When I&C is requested to investigate the loss of Bus 3, inform the control room that the fault is on Bus 3 and that Bus 8 may be energized from Bus 9. As either I&C or AO, report an instantaneous overcurrent on the A and C phases of Bkr 3T1, and differential overcurrent on the A and C phases of the "B" D.G. output breaker. Report (after further investigation) that there is damage to the bus bars in Bus 3. Estimated time to repair is 2 days.
3. If an AO is sent to reset Bus 8 load shed relays, wait 10 minutes and use rED_21 to RESET. Use rED_13 and rED_14 to CLOSE to shut the Vital MG Bkrs, and rED_15 to AUTO to reset the Vital MG. Do this when load sheds are reset.
4. To restart the "A" RPS MG and re-power RPS Bus "A" use rRP_01.
5. To return APRM power supplies to normal, ^{place} use rRP_10. *RESET.*
6. When requested to determine the cause of the loss of Bus 2, report a fault on the bus. The source of the fault will not be found or corrected during the scenario.
7. When requested as I&C to investigate the cause of the HPCI isolation, report a faulty high flow switch. The HPCI system will not be returned to service during the scenario.
8. If dispatched as the AO to restart reactor building ventilation, place rPC_04 to RUN.
9. Use rFP_01 to secure the diesel fire pump. Use rCU_06 to acknowledge RWCU alarms.

**OPERATOR ACTIONS
EVENT NUMBERS 1 AND 2**

Crew Task Description:

Respond to a loss of Bus 3; commence plant shutdown

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	CREW	Recognize and respond to a loss of Bus 3.	
	SCRO	Recognize half scram on RPS "A" and concurrent loss of the RPS "A" Bus; inform SCRO	
	ACRO	Verify loss of Bus 3, and inform SCRO: <ul style="list-style-type: none"> • There appears to be a fault on the Bus • The "B" EDG apparently started and ^{locked out} tripped 	
	CRO/ ACRO	Request that maintenance/ AO investigate loss of Bus 3	
	ACRO	Acknowledge/respond to Seismic Event annunciator (7-M-7) <ul style="list-style-type: none"> • Identify loss of power LED indication in back of CRP 9-7 • Inform SCRO 	
	SCRO	Direct actions for loss of Bus 3 IAW ON 3171 and OT 3122: <ul style="list-style-type: none"> • Notify Chemistry of inoperable equipment and TS compensatory actions • Start/verify operating a minimum of two SW pumps • Reset "A" air compressor at CRP 9-6 • Verify/backup Group 3 isolation • Investigate loss of Bus 3, including capability to re-power busses 3 and 8 	<p>OT 3122 may provide additional guidance</p> <p>3122?</p>

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	CRO/ ACRO	When directed: <ul style="list-style-type: none"> Notify Chemistry of inoperable equipment and TS compensatory actions 	
	ACRO	When directed: <ul style="list-style-type: none"> Start/verify operating a minimum of two SW pumps Reset "A" air compressor at CRP 9-6 Verify/backup Group 3 isolation 	3122?
	SCRO	When given permission from Maintenance, direct re-energization of Bus 8 from Bus 9	
	ACRO	When directed: <ul style="list-style-type: none"> Re-energize Bus 8 from Bus 9 IAW OP 2143, Appendix C and Section O Inform SCRO of 24-hour S/D LCO per 3.5.H.1, EDG and Bus 8/9 inoperability 	<i>2 w/ 24 hr S/D LCO</i>
	SCRO	Enter 24-hour S/D LCO per 3.5.H.1 <ul style="list-style-type: none"> Direct commencement of plant S/D IAW OP 0105 Direct the following actions: <ul style="list-style-type: none"> Complete steps 5-8 of ON 3171 Restart the "A" RPS MG Set per OP 2134 	<ul style="list-style-type: none"> - Minimize DC loads • Restart Stack Gas Inlet # pumps • Restart drywell cooling • Place SACT A to Run Reset Gp 3 isolation
	CRO	When directed, commence reducing power by lowering recirc flow IAW OP 0105	

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	ACRO	Assist with plant shutdown as necessary to comply with OP 0105. When directed: <ul style="list-style-type: none"> • Complete steps 5-8 of ON 3171 <i>(see previous page)</i> • Restart the "A" RPS MG Set per OP 2134 <i>Reset Gp 3</i> 	
	SS/ SCRO	Consult AP 0156 and make necessary notifications: <ul style="list-style-type: none"> • One-hour non-emergency notification due to TS required S/D per 50.72(b)(1)(i)(A) 	

**OPERATOR ACTIONS
EVENT NUMBER 3**

Crew Task Description:

Respond to high reactor water level (failed steam flow summer).

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	CRO	Recognize and respond to increasing RPV level <ul style="list-style-type: none"> • Inform SCRO • Take master manual control of feedwater and restore RPV level 	
	SCRO	Enter/direct actions IAW OT 3114 <ul style="list-style-type: none"> • Verify control of RPV level regained in manual • Identify cause of malfunction • Transfer FWLC to single element 	
	CRO/ ACRO	Identify cause of FWLC malfunction as failed steam flow summer, inform SCRO	
	SCRO	When failed steam flow summer identified, direct the following: <ul style="list-style-type: none"> • Transfer FWLC to single element • Restore automatic control of level IAW OP 2172 	
	CRO	When directed: <ul style="list-style-type: none"> • Transfer FWLC to single element • Restore automatic control of level IAW OP 2172 	

**OPERATOR ACTIONS
EVENT NUMBER 4**

Crew Task Description:

Respond to a loss of normal feed caused by a loss of power; inadvertent HPCI isolation

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	CRO/ ACRO	Recognize the following and inform the SCRO: <ul style="list-style-type: none"> • Loss of Bus 2 • Loss of condensate pumps • Trip of feed pumps • Lowering RPV level • Reactor scram 	<i>add:</i> • MSIV isolation
	CRO	When steam flow <0.5 Mibm/hr per steamline, place mode switch in SHUTDOWN <ul style="list-style-type: none"> • Verify all rods inserted; inform SCRO 	
	SCRO	Enter and direct actions IAW OT 3100 and EOP-1 <ul style="list-style-type: none"> • Restore/maintain RPV level between 127-177 inches using CRD, HPCI, RCIC • Maintain RPV pressure between 800-1000 psig with SRVs, HPCI, and/or RCIC • Insert IRMs and SRMs • Confirm turbine trip at <50 MWe 	
	CRO	When directed: <ul style="list-style-type: none"> • Maximize CRD flow • Insert IRMs and SRMs 	

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	ACRO	When directed: <ul style="list-style-type: none"> Start HPCI or RCIC and restore/maintain RPV level between 127-177 inches Confirm turbine trip at <50 MWe Maintain RPV pressure between 800-1000 psig with SRVs, HPCI, and/or RCIC 	
	SCRO	Enter/direct actions IAW ON 3170 and OT 3122 : <ul style="list-style-type: none"> Verify EDG "A" starts and energizes Bus 4 Close or verify closed SW-20 or SW-19A/B Request Maintenance/EIC to investigate loss of Bus 2 Notify load dispatcher, DCO, and Ops Manager 	OT 3122 may provide additional guidance OT 3122 - Immed Action - FA#3
	ACRO	If HPCI started for level control, recognize HPCI isolation; inform SCRO	
	SCRO	Acknowledge HPCI isolation, direct level restored and maintained 127-177 inches using RCIC	
	CRO/ ACRO	When directed: <ul style="list-style-type: none"> Start RCIC and restore/maintain RPV level 127-177 inches Verify EDG "A" starts and energizes Bus 4 Close or verify closed SW-20 or SW-19A/B 	
	SCRO	Request Maintenance to investigate loss of HPCI	

Suppression Pool Cooling?



SCRO

Direct initiate of suppression pool cooling

ACRO

when directed, initiate suppression pool cooling

**OPERATOR ACTIONS
EVENT NUMBER 5**

Crew Task Description:

Respond to a leak in primary containment with inadequate high pressure makeup

TIME	POS.		COMMENTS
	CRO/ ACRO	Recogniz SCRO	
	SCRO	Enter and • Start :	
	ACRO	When dir:	
	SCRO	When drywell pressure exceeds 2.5 psig, enter and direct actions IAW EOP-3; re-enter EOP-1 • Restart all available drywell RRUs • BEFORE torus pressure reaches 10 psig, spray the torus	
	ACRO	When directed: • Restart all available drywell RRUs • Spray the torus using only those pumps not required for adequate core cooling	
	*CREW EOP-3 CCT	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 Standard: Spray the drywell within 5 minutes of exceeding 10 psig torus pressure <i>providing RPV level</i>	

*critical task?
only critical when there
has been a compromise
of the pressure suppression
function of the
torus*

is not the overriding concern

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	SCRO	WHEN torus pressure exceeds 10 psig, direct the following: <ul style="list-style-type: none"> • Secure recirc pumps • Secure drywell RRUs • Spray the drywell 	
	ACRO	When directed: <ul style="list-style-type: none"> • Secure recirc pumps • Secure drywell RRUs • Spray the drywell using only those pumps not required for adequate core cooling 	
	CRO	Recognize when CRD/RCIC can no longer maintain RPV level; inform SCRO	
	SCRO	When RPV level cannot be maintained 127-177 inches, direct RPV level maintained above 6 inches	
	CRO	Recognize when RPV level cannot be restored/maintained above 6 inches; inform SCRO	
	SCRO	WHEN RPV level cannot be restored/maintained above 6 inches, direct the following: <ul style="list-style-type: none"> • Inhibit ADS • Start/line up for injection CS-A and RHR-B pumps 	
	CRO/ ACRO	When directed: <ul style="list-style-type: none"> • Inhibit ADS • Start/line up for injection CS-A and RHR-B pumps Recognize when RPV level drops below 6 inches; inform SCRO	

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	*CREW EOP-1 CCT	<p>With the reactor shutdown and reactor pressure greater than the shutoff head of the low pressure systems, initiate RPV-ED BEFORE RPV levels reaches -22 inches</p> <p>Standard:</p> <p>Initiate RPV-ED BEFORE RPV level reaches -22 inches.</p>	
	SCRO	<p>BEFORE RPV level drops below -22 inches, enter EOP-5 and direct emergency depressurization:</p> <ul style="list-style-type: none"> • Open all SRVs 	
	SCRO	When directed, open all SRVs	
	*CREW EOP-1 CCT	<p>Action is taken to restore RPV water level above -22 inches by operating available low pressure ECCS system(s) when RPV pressure decreases below the shutoff head of the low pressure systems</p> <p>Standard:</p> <p>Recover RPV water level to greater than -22 inches within 5 minutes of reactor pressure dropping below 250 psig</p>	
	CRO/ ACRO	When RPV pressure drops below ~350 psig, recognize failure of the RHR and CS injection valves to auto-open; inform SCRO	
	SCRO	Direct CRO/ACRO to manually open the RHR and CS injection valves	
	CRO/ ACRO	When directed, manually open the RHR and CS injection valves	
	SCRO	Direct RPV level restored/maintained 127-177 inches	
	CRO/ ACRO	Operate injection pumps as necessary to maintain RPV level 127-177 inches	
	SS/ SCRO	Classify the event IAW AP 3125 as an Alert (A-3-a and A-3-b)	

Facility: Vermont Yankee Scenario No.: 2 Op-Test No: 1

Examiners: _____ Operators: _____

Initial Conditions: 100%

Turnover: Equipment OOS: "A" SGBT
TS LCOs: 7-day LCO for SGBT

Event No.	Malf. No.	Event Type*	Event Description
1		I	Failure of MSL rad monitor (upscale) with failure of auto 1/2 scram
2		C	Failure of EPR
3		C	MT high vibrations
4		R, N	Power reduction
5		M	Turbine trip w/ATWS, failure of fast transfer and failure of EDG to start

Word Process Done

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

IC-61

Simulator Set Up:

I. C. No.: 09

Brief No. 1 Discretionary Distractor Malfunctions/Remote Functions/IOs

1. Place SBTG Fan "A" in PTL_x and *white by control switch*
2. Place rPC_26 to OPEN (SGT "A" breaker).
3. Shut SGT-2A and SGT-3A.
4. Open SGT-2B and SGT-3B.

No.	MF/RF/IO #	Severity	Ramp	REM #	Act. Time	Description
1.	mfRD_12A	74%	-	-1	Pre-insert	Partial Scram
2.	mfRD_12B	83%	-	-1	Pre-insert	Partial Scram
3.	mfSL_02A	-	-	-1	Pre-insert	"A" Squib valve failure
4.	mfSL_02B	-	-	-1	Pre-insert	"B" Squib valve failure
5.	mfED_12B	-	-	-1	Pre-insert	Failure of Bus 2 to fast transfer
6.	mfDG_05A	-	-	-1	Pre-insert	Failure of DG "A" to auto start
7.	mfRP_111A			-1	Pre-insert	Failure of RPS "A" auto scram
8.	mf_RM011	100	-	R1	5 minutes after run	MSL rad monitor "C" fails upscale
9.	mfTC_04A	100%	60	R2	after MSL Rad Monitor TS determination	EPR Oscillations
10.	mfTU_03A	<i>STE 50% 65%</i>	300	R3	after EPR in cutout	Turbine vibration will slowly increase (will achieve a maximum of 7.5 mils)
11.	mf_TC01	-	-	R4	After actions taken for turbine high vibration	Turbine Trip <i>9.75 mils</i>

Discard

Additional Instructions:

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

2. When I&C is contacted regarding the failure of RPS "A" to auto scram, inform then that you will investigate. No further information will be provided for the duration of the scenario.
3. If I&C is contacted to verify that PCIS Group I relays have tripped in response to the MSL Rad Monitor "C" upscale failure, report that contact K7C on CRP-15 is de-energized.
4. If I&C is contacted concerning the pressure regulator failure, no reason will be given before the scenario terminates.
5. If I&C is called to perform Appendix F (Manual Scram Bypass), after 10 min. place rRP_20 in REMOVE.
6. To shut CRD 56 use rRD_02, after 5 min.
7. ^{عبدالله}₂₀₁₃ If an AO is called to perform Appendix I, wait 10 min. and until < 2% power and level band is established, then insert rSL_04 to fire squib valve "A", or rSL_05 to fire squib valve "B".

N.B.

**OPERATOR ACTIONS
EVENT NUMBER 1**

I need your help w/ this malfunction, as well as expected actions

Crew Task Description:

Respond to MSL rad monitor failed upscale; failure of auto half-scam (VY staff assist)

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	CRO	Acknowledge and respond to Mn Stm Line Rad Hi annunciator (5-K-6) and ½ scam on RPS "A"; inform SCRO	(VY staff assist with failure to half-scam)
	ACRO	Acknowledge MSL monitor alarm (3-f-1); inform SCRO <ul style="list-style-type: none">• Direct SCRO to refer to Tech Specs 3.1 and 3.2• Identify "C" MSL monitor in reading upscale; inform SCRO	
	SCRO	Call I&C to investigate MSL monitor failure.	
	SS/SE SCRO	Consult Tech Specs 3.1.A, 3.2B, Table 3.1.1 and Table 3.2.2 <ul style="list-style-type: none">• Identify that TS requirements are met due to trip system being in the trip condition	
	SCRO	Identify that with the trip system in the trip condition, TS requirements are met for the MSL Rad Monitor failure	

**OPERATOR ACTIONS
 EVENT NUMBER 1**

Crew Task Description:

Respond to MSL rad monitor failed upscale; failure of auto half-scam

STEP	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	CRO	Acknowledge and respond to Mn Stm Line Rad Hi annunciator (5-K-6) <ul style="list-style-type: none"> Recognize failure of auto scam on RPS "A"; inform SCRO 				
2.	CREW	Acknowledge MSL monitor alarm (3-f-1); inform SCRO <ul style="list-style-type: none"> Prompt SCRO to refer to Tech Specs 3.1 and 3.2 (per ARS) 				
3.	ACRO	Identify "C" MSL monitor is reading upscale; inform SCRO				
4.	SCRO	Direct CRO to manually insert a half scam on RPS "A" Consult Tech Specs 3.1.A, 3.2.B, Table 3.1.1 and Table 3.2.2 <ul style="list-style-type: none"> Identify that TS requirements are met due to trip system being in the trip condition 				
5.	CREW	Request I&C to investigate MSL monitor failure, and failure of RPS "A"				

- NOTES:**
- 1) S = Satisfactory; U - Unsatisfactory; N/O = Not Observed
 All Unsatisfactory ratings require comments; a comment sheet is attached.
 - 2) * = Critical Task/Step

**OPERATOR ACTIONS
EVENT NUMBER 2**

Crew Task Description:

Respond to pressure regulator oscillations and subsequent pressure regulator failure.

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	CRO	Recognize reactor power/pressure oscillations; inform SCRO <ul style="list-style-type: none"> • Identify oscillations associated with EPR; inform SCRO 	
	SCRO	Enter/direct actions IAW OT 3115 and 3116: <ul style="list-style-type: none"> • Verify MPR takes control and lower MPR setpoint • When MPR is in control, place EPR in CUTOUT • Restore RPV pressure to pre-transient level 	
	CRO/ ACRO	When directed, coordinate between CRP 9-5 and CRP 9-7 to: <ul style="list-style-type: none"> • Verify MPR takes control and lower MPR setpoint • When MPR is in control, place EPR in CUTOUT • Restore RPV pressure to pre-transient level 	

**OPERATOR ACTIONS
EVENT NUMBER 3**

Crew Task Description:

Respond to increasing MT high vibrations; power reduction. (VY staff assist)

TIME	POS.	EXPECTED ACTIONS

help w/ actions
for ↓ power

ALARM RESPONSE SHEET

MAIN TURBINE		7-F-2																								
		Page 1 of 1																								
TURB EXCESSIVE VIBRATION		Rev. <u>4</u>																								
		Issued <u>03/18/96</u>																								
Causes:	Setpoints in mils:	Actuating Devices:																								
<ol style="list-style-type: none"> 1. Excessive vibration on main turbine bearings 1 through 10 as indicated by vibration recorder. 2. Unusually low vacuum (approx. 1 in.) 3. Unusually hi reactive load (approx. >150 MVARs). 4. <u>Eccentricity high while on turning gear or speed 0 to 500 rpm.</u> 	<table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="padding: 0 10px;"><u>Alarm</u></th> <th style="padding: 0 10px;"><u>Trip</u></th> </tr> </thead> <tbody> <tr><td style="text-align: center;">1 7</td><td style="text-align: center;">12</td></tr> <tr><td style="text-align: center;">2 7</td><td style="text-align: center;">12</td></tr> <tr><td style="text-align: center;">3 7</td><td style="text-align: center;">12</td></tr> <tr><td style="text-align: center;">4 7</td><td style="text-align: center;">12</td></tr> <tr><td style="text-align: center;">5 7</td><td style="text-align: center;">12</td></tr> <tr><td style="text-align: center;">6 7</td><td style="text-align: center;">12</td></tr> <tr><td style="text-align: center;">7 8</td><td style="text-align: center;">12</td></tr> <tr><td style="text-align: center;">8 8</td><td style="text-align: center;">12</td></tr> <tr><td style="text-align: center;">9 7</td><td style="text-align: center;">10</td></tr> <tr><td style="text-align: center;">10 7</td><td style="text-align: center;">10</td></tr> <tr><td style="text-align: center;">11 5</td><td style="text-align: center;">NA</td></tr> </tbody> </table>	<u>Alarm</u>	<u>Trip</u>	1 7	12	2 7	12	3 7	12	4 7	12	5 7	12	6 7	12	7 8	12	8 8	12	9 7	10	10 7	10	11 5	NA	<p>TURBINE VIBR RECORDER (R-110-1)</p> <hr/> <p>References:</p> <p>CWD 56, 101 OP 2160, 4160 GE Turbine Tech. Manual ON 3154 OT 3100</p>
	<u>Alarm</u>	<u>Trip</u>																								
	1 7	12																								
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10 7	10																									
11 5	NA																									
Confirmation:																										
<ol style="list-style-type: none"> 1. CRP 9-7 Vibration Recorder R-110-1 <ul style="list-style-type: none"> . Computer points W000-W007, W025, W026 3. <u>Computer point T000</u> 																										
Automatic Actions:																										
<ol style="list-style-type: none"> 1. Possible Turbine Trip. 																										
Operator Actions:																										
<ol style="list-style-type: none"> 1. This alarm can be expected when starting up or shutting down due to passes through critical speed. 2. Check causes and correct if possible. ② Reduce turbine load if approaching 10 mills. 4. Unload the turbine if vibration problem cannot be corrected. 																										
<u>NOTE</u>																										
<p>When the TSIP cabinet is disabled during turbine startup, the turbine trip due to vibration is by-passed, but the alarm still functions.</p>																										
<ol style="list-style-type: none"> 5. If turbine trips, refer to OT 3100, Scram Procedure, and ON 3154, Generator Load Reject, as necessary depending on plant conditions at the time of the scram. 																										
<ol style="list-style-type: none"> ② Notify <u>ISO New England</u> and VELCO. ② Notify Maintenance. <ul style="list-style-type: none"> . Verify 1T ACB, 81-1T ACB and T-1 mod open if turbine trips. 																										

Source

**OPERATOR ACTIONS
EVENT NUMBERS 4 AND 5**

Crew Task Description:

Respond to a turbine trip with failure to scram, failure of fast transfer and failure of EDG to start;
 respond to high DAW pressure and temperature due to safety valve lift
 ^ focus level and ^

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	CRO/ ACRO	Recognize and respond to turbine trip; inform SCRO	
	ACRO	Recognize and respond to reactor scram <ul style="list-style-type: none"> • Recognize all rods NOT inserted; inform SCRO 	
	ACRO	Recognize the following electrical malfunctions; inform SCRO <ul style="list-style-type: none"> • Failure of fast transfer on Bus 2 • Failure of EDG "A" to auto start 	
	CRO/ ACRO	Recognize Group I isolation; inform SCRO	Enter /direct actions IAW ON 3120
	SCRO	Direct ACRO to re-energize busses 2 and 4	
	ACRO	When directed, re-energize busses 2 and 4	
	SCRO	Enter/direct actions IAW OT 3100, EOP-1, and EOP-2 <ul style="list-style-type: none"> • Place mode switch in SHUTDOWN • Verify EOP-1 Table A automatic actions • Inhibit ADS • Initiate ARI/RPT • Open SRVs to stabilize pressure 800-1000 psig 	

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	*CREW EOP-2 CCT	<p>With a reactor scram required, and reactor not shutdown, INHIBITS ADS to prevent an uncontrolled RPV depressurization to prevent causing a significant power excursion.</p> <p>Standard: Inhibit ADS prior to automatic initiation.</p>	
	CRO	<p>Place mode switch in SHUTDOWN</p> <p>When directed:</p> <ul style="list-style-type: none"> Initiate ARI/RPT 	
	ACRO	<p>When directed:</p> <ul style="list-style-type: none"> Inhibit ADS Open SRVs to stabilize pressure 800-1000 psig Verify EOP-1 Table A automatic actions 	
	*CREW EOP-2 CCT	<p>During an ATWS with conditions met to perform power/level control TERMINATE AND PREVENT INJECTION, with exception of boron, CRD, and RCIC into the RPV until conditions are met to re-establish injection.</p> <p>Standard: Terminate and prevent injection IAW OE 3107 Appendix GG such that the heat capacity temperature limit curve is not exceeded and within 10 minutes of average Torus temperature exceeding 100 deg. F.</p>	
	SCRO	<p>Direct Power/Level Control IAW EOP-2</p> <ul style="list-style-type: none"> Terminate and prevent RPV injection per Appendix GG; reduce RPV level to 90 inches 	
	CRO/ ACRO	When directed, terminate and prevent RPV injection	

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	CRO	Inform SS/SCRO when: <ul style="list-style-type: none"> • RPV level reaches 90 inches • Power drops below 2% 	
	*CREW EOP-2 CCT	When conditions are met to re-establish injection, use available injection systems to MAINTAIN RPV water level above -22" Standard: Maintain RPV level greater than -22" and less than the point at which a visible power excursion takes place.	
	SCRO	Direct CRO to maintain RPV level between -22 inches and the level to which it was lowered, using feed and condensate	
	CRO	When directed, use feed and condensate to maintain RPV level between -22 inches and the level to which it was lowered	
	*CREW EOP-2 CCT	With a reactor scram required and the reactor not shutdown, TAKE ACTION TO REDUCE POWER by injecting control rods, to prevent exceeding the primary containment design limits. Standard: Take actions to reduce power by injecting SLC and/or inserting control rods IAW OE 3107 Appendix E, F, G, H, I, or BB within 10 minutes of the scram failure. Only one method needs to be used. The method may result in successful control rod insertion or SLC injection.	E- Individually scram each rod F- Initiation of manual scram G- Manually drive rods H- Vent the over-piston volume I- Local firing of Squib Valve BB- Increase CRD cooling water pressure

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	SCRO	Direct actions to achieve shutdown conditions IAW EOP-2 <ul style="list-style-type: none"> • Reset ARI/RPT • Inject SLC prior to torus temperature reaching 110 deg F • Insert control rods per appendices (E, F, G, H, or BB) 	
	CRO	When directed: <ul style="list-style-type: none"> • Reset ARI/RPT • Insert control rods per designated appendices (E, F, G, H, or BB) • Inject SLC Recognize failure of squib valves to fire; inform SCRO	
	SCRO	Direct local firing of squib valve IAW Appendix I	
	ACRO	When directed, direct AO to locally fire squib valve IAW Appendix I	
	CRO	Recognize when SLC injecting; inform SCRO	
	CREW	Recognize high drywell ^{torus level and temperature} pressure and temperature	
	SCRO	Enter/direct actions IAW EOP-3: <ul style="list-style-type: none"> • Restart all available drywell RRUs • Initiate torus cooling • Before torus pressure reaches 10 psig, spray the torus 	
	ACRO	When directed: <ul style="list-style-type: none"> • Restart all available drywell RRUs • Initiate torus cooling • Spray the torus 	

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	SS/ SE/ SCRO	<p>Consult AP 3125 and determine a Site Area Emergency EAL has been reached IAW AP 3125, Appendix A, Category S-7-c.</p> <p>Initiate a one-hour emergency report IAW AP 0156 (50.72(a)(1)(i)), 50.72(b)(1)(ii), 50.72(b)(1)(iv), and four-hour non-emergency report IAW 50.72(b)(2)(ii)</p>	

Need to add expected final status of plant; i.e., an endpoint will workout when they get here

Facility: Vermont Yankee Scenario No.: 3 Op-Test No: 1

Examiners: _____ Operators: _____

on 80% power decay?

Initial Conditions: 70% power returning to 100% following turbine BPV testing.

Do not include

Turnover: Equipment 00S: B RWCU pump; B CRD pump; A RUPS Applicable LCO: 7-day due to A RUPS.

Event No.	Malf. No.	Event Type*	Event Description
1		N, R	Power increase using recirc flow
2 1		C	A RWCU pump trip.
3 2		I	B recirc loop controller failure
4 <i>5121</i>		M	Fuel failure with leak in RWCU system and failure of RWCU isolation (PCIS)
3		N, R	Exit Exclusion Region

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

IC-62

word process

SIMULATOR OPERATOR INSTRUCTIONS

Simulator Set Up: I. C. No.: 08

Brief No. 1 Discretionary Distractor Malfunctions/RFs/IOs:

- ~~1. Place rRD_15 to OPEN for CRD Pump "B" and white tag control switch @ CRP 9-5~~
- ~~2. [REDACTED]~~
3. Secure the "A" RUPS and transfer MCC89A to the Maintenance Tie per OP 2143

No.	MF/RF/IO #	Severity	Ramp	Key #	Act. Time	Description
1.	mfPC_1CU15	-	-	-1	Pre-insert	CU15 fails to isolate
2.	mfPC_1CU18	-	-	-1	Pre-insert	CU18 fails to isolate
3.	mfPC_1SB09	-	-	-1	Pre-insert	SB09 fails to isolate
4.	mfPC_1SB10	-	-	-1	Pre-insert	SB10 fails to isolate
5.	mfPC_1SB11	-	-	-1	Pre-insert	SB11 fails to isolate
6.	mfPC_1SB12	-	-	-1	Pre-insert	SB12 fails to isolate
7.	mfNM_31641A		-	-1	Pre-insert	LPRM-16-41A-downscale
8.	mfAN04J4	SPURIOUS	-	R1	~ 5 minutes after run	"A" RWCU Pump high temperature alarm
9.	mfCU_01A	-	-		"	"A" RWCU Pump trip
10.	mfRR_11B	100	300	R2	After RWCU Pump trip addressed	Recirc loop "B" controller failure

**OPERATOR ACTIONS
 EVENT NUMBER 1**

Crew Task Description:

Respond to a trip of RWCU Pump "A", and ensure appropriate Tech Spec requirements are met.

K/A's:

204000 K1.01, K1.10, K3.01, K4.01, K6.01, A1.09, A3.02
 GENERIC 2.1.6, 2.1.9, 2.1.12, 2.1.33

STEP	POS.	CANDIDATE ACTIONS/BEHAVIOR	S	U	N/O	COMMENTS
1.	SCRO	Direct CRO to raise power IAW OP 0105 using Recirc Flow at a rate not to exceed 1% / 3 minutes				
2.	CRO	When directed, raise power by increasing Recirc flow, at a rate not to exceed 1% / 3 minutes				
3.	ACRO	Ensure proper Speed/Load Changer setting is maintained as power is increased				
4.	CREW	Acknowledge and respond to RWCU Pump A/B Trip (4-J-1) and RWCU Clg Wtr Temp Hi (4-J-4) annunciators; inform SCRO <ul style="list-style-type: none"> • Request AO to check temperature and verify hold pumps started • Monitor drywell/torus dp • Prompt SCRO to consult TS 4.6.B.3.b (per ARS) • Request Maintenance investigate pump trip 				Add Start "B" RWCU Pump May or may not be directed

- JTES:**
- 1) S = Satisfactory; U - Unsatisfactory; N/O = Not Observed
 All Unsatisfactory ratings require comments; a comment sheet is attached.
 - 2) * = Critical Task/Step

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	SS/ SCRO	Consult TS 4.6.B.3.b <ul style="list-style-type: none"> • Determine requirements to monitor for conductivity every four hours • Direct chemistry information of increased monitoring requirements 	
	CRO/ ACRO	When directed, inform chemistry of four-hour monitoring requirements.	

OPERATOR ACTIONS
EVENT NUMBER 3/2 and 3

Crew Task Description:

Respond to positive reactivity addition caused by failure of the "B" recirc loop controller; *drive rods to exit Exclusion Region*

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	CRO	Recognize power/recirc flow increasing; inform SCRO <ul style="list-style-type: none"> Identify the loop "B" controller ramping upward; inform SCRO 	
	SCRO	Enter/direct actions IAW OT 3110 <ul style="list-style-type: none"> Transfer controller to MANUAL Notify DCO, Ops Mgr, and RE Request I&C investigate 	
	CRO	When directed, take manual control of the loop "B" controller <ul style="list-style-type: none"> Recognize no response; inform SCRO 	
	ACRO	When directed: <ul style="list-style-type: none"> Notify DCO, Ops Mgr, and RE Request I&C investigate 	
	SCRO	Direct trip of the "B" recirc pump; enter and direct actions IAW OT 3118 <ul style="list-style-type: none"> Close recirc pump "B" discharge valve Identify outside <i>inside</i> the EXCLUSION REGION of Figure 2.4.1 <i>with the RSS</i> Drive Control Rods to exit the Adjust recirc pump "A" speed to 70% speed 	<i>check</i>

exclusion region

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	CRO	When directed: <ul style="list-style-type: none"> • Close recirc pump "B" discharge valve • Adjust recirc pump "A" speed to 70% • Verify outside the EXCLUSION REGION of Figure 2.4.1 • Identify operation in BUFFER REGION; inform SCRO 	
	SCRO	Enter/direct actions IAW OT 3117 <ul style="list-style-type: none"> • Monitor LPRM stability on ERFIS • Initiate SOLOMON • Insert control rods to exit the BUFFER REGION <i>EXCLUSION</i> 	
	CRO	When directed: <ul style="list-style-type: none"> • Monitor LPRM stability on ERFIS • Initiate SOLOMON • Insert control rods to exit the BUFFER REGION <i>EXCLUSION</i> 	

**OPERATOR ACTIONS
EVENT NUMBER 4**

4
X

Crew Task Description:

Fuel failure with leak in RWCU system and failure of RWCU (PCIS) to isolate

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	ACRO	Acknowledge and respond to Rx Bldg Rad Hi annunciator (3-E-3); inform SCRO • Identify alarming channel on CRP 9-11 ARM #6, RB 280' elevation by elevator; inform SCRO • Prompt SCRO to enter ON 3153	
	SCRO	Enter/direct actions IAW ON 3153: • Direct RP to obtain area dose rates and air samples • Refer to EOP-4 • Place Control Room HVAC recirc mode switch to EMER (CRP 9-25)	
	SCRO ACRO	When directed: • Direct RP to obtain area dose rates and air samples • Place control room HVAC recirc mode switch to EMER (CRP 9-25)	
	CRO	Acknowledge/respond to Rx Bldg/Refuel floor CH A/B Rad High annunciators (5-H-1/5-J-1); inform SCRO	

→
Several
steps
missing
from
SE-07

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	SCRO	<p>Direct actions IAW ARS 5-H-1/5-J-1;</p> <ul style="list-style-type: none"> • Confirm indications on CRP 9-10 • Verify HVAC isolates and SBGT starts (Group III isolation) • Evacuate reactor building • Request local surveys 	
	ACRO	<p>When directed:</p> <ul style="list-style-type: none"> • Confirm indications on CRP 9-10 • Verify HVAC isolates and SBGT starts (Group III isolation). <p>Recognize failure of SB-09, 10, 11, 12 to isolate; attempt to shut valves; inform SCRO</p>	
	<p>*CREW</p> <p>EOP-3</p> <p>CCT-1</p>	<p>When PCIS Group 1, 3, 5, or 6 fails to isolate, initiate PCIS Group manually.</p> <p>Standard:</p> <p>Initiate actions to manually isolate valves SB-09, 10, 11, 12 within 10 minutes of receiving the 5-H-1/5-J-1 annunciators</p>	
	SCRO	When informed of isolation valve failures, direct AO/Maintenance to effect repairs/isolations	
	CRO/ ACRO	<p>When requested:</p> <ul style="list-style-type: none"> • Direct AO/Maintenance to effect repairs/isolations • Acknowledge/respond to steam leak det panel Temp Hi annunciator (4-H-1) 	
	ACRO	Identify rising RB temperatures in the RWCU area; inform SCRO	

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	SCRO	Enter/direct actions IAW ON 3108 (loss of primary containment integrity) <ul style="list-style-type: none"> • Direct commencement of an orderly shutdown IAW OP 0105 Direct evacuation of the reactor building	
	CRO	When directed: <ul style="list-style-type: none"> • Commence orderly shutdown of IAW OP 0105 	
	CRO/ ACRO	Recognize a RWCU isolation failure and/or when directed, attempt to shut CU-15 and CU-18; inform SCRO that valves will not shut	
	SCRO	Enter/direct actions IAW ON 3158 (reactor building high area temperature/water level) <ul style="list-style-type: none"> • Attempt to isolate leaking system • Direct AO/Maintenance to attempt to isolate valves When Rx Bldg vent exhaust radiation exceeds 14 mR/hr., enter/direct actions IAW EOP-4 <ul style="list-style-type: none"> • Monitor RB area temperatures, rad levels, and water levels 	
	ACRO	When requested, direct AO/Maintenance to attempt to isolate valves	
	CREW	Recognize rising MSL rad levels; enter/take actions per OT 3112	
	SCRO	Enter/direct actions IAW OT 3112 <ul style="list-style-type: none"> • Reduce power at <10% per min. using recirc flow, to 27.5 - 29 Mlbm/hr. • Place the SD iodine filter in service • Direct Chemistry to sample for I-131 	
	CRO	When directed, reduce power at <10% per min recirc flow, to 27.5 - 29 Mlbm/hr.	

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	ACRO	<p>When directed:</p> <ul style="list-style-type: none"> Place the SD iodine filter in service Direct Chemistry to sample for I-131 	
	*CREW EOP-4 CCT	<p>With the reactor at power, and a primary system discharging into the Secondary Containment, manually scram the reactor before any area exceeds the maximum safe operation levels</p> <p>Standard:</p> <p>Manually scram the reactor BEFORE any area temperature exceeds max safe or before ARM 1, 2, 3, 4, 6, 7, 8, 10, or 11 exceed 1,000 mR/hr.</p>	
	SCRO	<p>Recognize area rads approaching max safe levels; direct manual scram</p> <p>Enter/direct actions IAW OT 3100 and EOP-1</p> <ul style="list-style-type: none"> Insert manual scram When steam flow <0.5 Mlbm/stream line, place mode switch in SHUTDOWN Restore/maintain RPV level 127-177 inches Stabilize RPV pressure below 1055 psig with BPVs 	
	CRO	<p>When directed, insert manual scram.</p> <p>Insert manual scram</p> <ul style="list-style-type: none"> Verify all rods inserted; inform SCRO When steam flow <0.5 Mlbm/stream line, place mode switch in SHUTDOWN Restore/maintain RPV level 127-177 inches 	

TIME	POS.	EXPECTED ACTIONS	COMMENTS
	ACRO	<ul style="list-style-type: none"> Stabilize RPV pressure below 1055 psig with BPVs Confirm/initiate turbine trip at <50 Mwe 	
	SCRO	Direct RPV cooldown using BPVs at <100 deg. F/hr.	
	ACRO	When directed, cooldown using BPVs	
	CREW	Recognize Group I isolation due to MSL high radiation	
	SCRO	Direct the following areas: <ul style="list-style-type: none"> Backup Group I isolation Resume cooldown using SRVs Place RHR in torus cooling 	
	ACRO	When directed: <ul style="list-style-type: none"> Backup Group I isolation Resume cooldown using SRVs Place RHR in torus cooling 	
	SS/ SCRO	Consult AP 3125 and classify the event as an Alert IAW Appendix A (A-1-b, A-2-a)	

Facility: Vermont Yankee Scenario No.: 1 Op-Test No: 1

Examiners: _____ Operators: _____

Initial Conditions: 100%

Turnover: Equipment OOS: "B" CRD pump, "A" RHR pump
TS LCO's: 7-day LCO for RHR

Event No.	Malf. No.	Event Type*	Event Description
1		C	Loss of Bus 3
2		N, R	Commence plant shutdown
3		I	Failure of steam flow summer
4		C	Loss of feed
5		MT	Leak in primary containment w/ inadequate high pressure make-up

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

**OPERATOR ACTIONS
EVENT NUMBERS 1 AND 2**

Crew Task Description:

Respond to a loss of Bus 3; commence plant shutdown

STEP	POS.	EXPECTED ACTIONS	COMMENTS
1.	CREW	Recognize and respond to a loss of Bus 3.	
2.	SCRO	Recognize half scram on RPS "A" and concurrent loss of the RPS "A" Bus; inform SCRO	
3.	ACRO	Verify loss of Bus 3, and inform SCRO: <ul style="list-style-type: none"> • There appears to be a fault on the Bus • The "B" EDG apparently started and tripped 	
4.	CRO/ ACRO	Request that maintenance/ AO investigate loss of Bus 3	
5.	ACRO	Acknowledge/respond to Seismic Event annunciator (7-M-7) <ul style="list-style-type: none"> • Identify loss of power LED indication in back of CRP 9-7 • Inform SCRO 	
6.	SCRO	Direct actions for loss of Bus 3 IAW ON 3171 and OT 3122: <ul style="list-style-type: none"> • Notify Chemistry of inoperable equipment and TS compensatory actions • Start/verify operating a minimum of two SW pumps • Reset "A" air compressor at CRP 9-6 • Verify/backup Group 3 isolation • Investigate loss of Bus 3, including capability to re-power busses 3 and 8 	

STEP	POS.	EXPECTED ACTIONS	COMMENTS
7.	CRO/ ACRO	When directed: <ul style="list-style-type: none"> • Notify Chemistry of inoperable equipment and TS compensatory actions 	
8.	ACRO	When directed: <ul style="list-style-type: none"> • Start/verify operating a minimum of two SW pumps • Reset "A" air compressor at CRP 9-6 • Verify/backup Group 3 isolation 	
9.	SCRO	When given permission from Maintenance, direct re-energization of Bus 8 from Bus 9	
10.	ACRO	When directed: <ul style="list-style-type: none"> • Re-energize Bus 8 from Bus 9 IAW OP 2143, Appendix C and Section O • Inform SCRO of 24-hour S/D LCO per 3.5.H.1, EDG and Bus 8/9 inoperability 	
11.	SCRO	Enter 24-hour S/D LCO per 3.5.H.1 <ul style="list-style-type: none"> • Direct commencement of plant S/D IAW OP 0105 Direct the following actions: <ul style="list-style-type: none"> • Complete steps 5-8 of ON 3171 • Restart the "A" RPS MG Set per OP 2134 	
12.	CRO	When directed, commence reducing power by lowering recirc flow IAW OP 0105	

STEP	POS.	EXPECTED ACTIONS	COMMENTS
13.	ACRO	Assist with plant shutdown as necessary to comply with OP 0105. When directed: <ul style="list-style-type: none"> • Complete steps 5-8 of ON 3171 • Restart the "A" RPS MG Set per OP 2134 	
14.	SS/ SCRO	Consult AP 0156 and make necessary notifications: <ul style="list-style-type: none"> • One-hour non-emergency notification due to TS required S/D per 50.72(b)(1)(i)(A) 	

**OPERATOR ACTIONS
EVENT NUMBER 3**

Crew Task Description:

Respond to high reactor water level (failed steam flow summer).

STEP	POS.	EXPECTED ACTIONS	COMMENTS
11.	CRO	Recognize and respond to increasing RPV level <ul style="list-style-type: none"> • Inform SCRO • Take master manual control of feedwater and restore RPV level 	
12.	SCRO	Enter/direct actions IAW OT 3114 <ul style="list-style-type: none"> • Verify control of RPV level regained in manual • Identify cause of malfunction • Transfer FWLC to single element 	
13.	CRO/ ACRO	Identify cause of FWLC malfunction as failed steam flow summer, inform SCRO	
14.	SCRO	When failed steam flow summer identified, direct the following: <ul style="list-style-type: none"> • Transfer FWLC to single element • Restore automatic control of level IAW OP 2172 	
15.	CRO	When directed: <ul style="list-style-type: none"> • Transfer FWLC to single element • Restore automatic control of level IAW OP 2172 	

**OPERATOR ACTIONS
EVENT NUMBER 4**

Crew Task Description:

Respond to a loss of normal feed caused by a loss of power; inadvertent HPCI isolation

STEP	POS.	EXPECTED ACTIONS	COMMENTS
18.	CRO/ ACRO	Recognize the following and inform the SCRO: <ul style="list-style-type: none"> • Loss of Bus 2 • Loss of condensate pumps • Trip of feed pumps • Lowering RPV level • Reactor scram 	
19.	CRO	When steam flow <0.5 Mlbm/hr per steamline, place mode switch in SHUTDOWN <ul style="list-style-type: none"> • Verify all rods inserted; inform SCRO 	
20.	SCRO	Enter and direct actions IAW OT 3100 and EOP-1 <ul style="list-style-type: none"> • Restore/maintain RPV level between 127-177 inches using CRD, HPCI, RCIC • Maintain RPV pressure between 800-1000 psig with SRVs • Insert IRMs and SRMs • Confirm turbine trip at <50 MWe 	
21.	CRO	When directed: <ul style="list-style-type: none"> • Maximize CRD flow • Insert IRMs and SRMs 	

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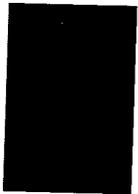
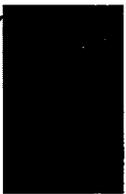
STEP	POS.	EXPECTED ACTIONS	COMMENTS
22.	ACRO	When directed: <ul style="list-style-type: none"> • Start <u>HPCI</u> or <u>RCIC</u> and restore/maintain RPV level between 127-177 inches • Confirm ^{HPCI} turbine trip at <50 MWe • Maintain RPV pressure between 800-1000 psig with SRVs 	
23.	SCRO	Enter/direct actions IAW ON 3170 and OT 3122: <ul style="list-style-type: none"> • Verify EDG "A" starts and energizes Bus 4 • Close or verify closed SW-20 <u>or</u> SW-19A/B • Request Maintenance/E/C to in investigate loss of Bus 2 • Notify load dispatcher, DCO, and Ops Manager 	
24.	ACRO	If HPCI started for level control, recognize HPCI isolation; inform SCRO	
25.	SCRO	Acknowledge HPCI isolation, direct level restored and maintained 127-177 inches using RCIC	
26.	CRO/ ACRO	When directed: <ul style="list-style-type: none"> • Start RCIC and restore/maintain RPV level 127-177 inches • Verify EDG "A" starts and energizes Bus 4 • Close or verify closed SW-20 <u>or</u> SW-19A/B 	
27.	SCRO	Request Maintenance to investigate loss of HPCI	

Suppression Pool Cooling?

**OPERATOR ACTIONS
EVENT NUMBER 5**

Crew Task Description:

Respond to a leak in primary containment with inadequate high pressure makeup

STEP	POS.	EXPECTED ACTIONS	COMMENTS
28.	CRO/ ACRO	Recognize rising drywell pressure and inform SCRO	
29.	SCRO	Enter and direct actions IAW OT 3111 • Start all available drywell RRUs	
30.	ACRO	When directed, start all available drywell RRUs	
31.	SCRO <i>CCT?</i>	When drywell pressure exceeds 2.5 psig, enter and direct actions IAW EOP-3; re-enter EOP-1 • Restart all available drywell RRUs • BEFORE torus pressure reaches 10 psig, spray the torus	<i>ignore</i> ← 
32.	ACRO	When directed: • Restart all available drywell RRUs • Spray the torus using only those pumps not required for adequate core cooling	
33.	*CREW EOP-3 CCT 4	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 Standard: Spray the drywell within 5 minutes of exceeding 10 psig torus pressure	<i>delete "4"</i> 

STEP	POS.	EXPECTED ACTIONS	COMMENTS
34.	SCRO	WHEN torus pressure exceeds 10 psig, direct the following: <ul style="list-style-type: none"> • Secure recirc pumps • Secure drywell RRUs • Spray the drywell 	
35.	ACRO	When directed: <ul style="list-style-type: none"> • Secure recirc pumps • Secure drywell RRUs • Spray the drywell using only those pumps not required for adequate core cooling 	
36.	CRO	Recognize when CRD/RCIC can no longer maintain RPV level; inform SCRO	
37.	SCRO	When RPV level cannot be maintained 127-177 inches, direct RPV level maintained above 6 inches	
38.	CRO	Recognize when RPV level cannot be restored/maintained above 6 inches; inform SCRO	
39.	SCRO	WHEN RPV level cannot be restored/maintained above 6 inches, direct the following: <ul style="list-style-type: none"> • Inhibit ADS • Start/line up for injection CS-A and RHR-B pumps 	
40.	CRO/ ACRO	When directed: <ul style="list-style-type: none"> • Inhibit ADS • Start/line up for injection CS-A and RHR-B pumps Recognize when RPV level drops below 6 inches; inform SCRO	

STEP	POS.	EXPECTED ACTIONS	COMMENTS
41.	*CREW EOP-1 CCT-2 1	<p>With the reactor shutdown and reactor pressure greater than the shutoff head of the low pressure systems, initiate RPV-ED BEFORE RPV levels reaches -22 inches</p> <p>Standard: Initiate RPV-ED BEFORE RPV level reaches -22 inches.</p>	<p>delete -2" -4"</p> 
42.	SCRO	<p>BEFORE RPV level drops below -22 inches, enter EOP-5 and direct emergency depressurization:</p> <ul style="list-style-type: none"> Open all SRVs 	
43.	SCRO	When directed, open all SRVs	
44.	*CREW EOP-1 CCT-4 7	<p>Action is taken to restore RPV water level above -22 inches by operating available low pressure ECCS system(s) when RPV pressure decreases below the shutoff head of the low pressure systems</p> <p>Standard: Recover RPV water level to greater than -22 inches within 5 minutes of reactor pressure dropping below 250 psig</p>	
45.	CRO/ ACRO	When RPV pressure drops below ~350 psig, recognize failure of the RHR and CS injection valves to auto open; inform SCRO	
46.	SCRO	Direct CRO/ACRO to manually open the RHR and CS injection valves	
47.	CRO/ ACRO	When directed, manually open the RHR and CS injection valves	
48.	SCRO	Direct RPV level restored/maintained 127-177 inches	
49.	CRO/ ACRO	Operate injection pumps as necessary to maintain RPV level 127-177 inches	
50.	SS/ SCRO	Classify the event IAW AP 3125 as an Alert (A-3-a and A-3-b)	

Facility: Vermont Yankee Scenario No.: 2 Op-Test No: 1

Examiners: _____ Operators: _____

Initial Conditions: 100%

Turnover: Equipment OOS: "A" SGBT
TS LCOs: 7-day LCO for SGBT

Event No.	Malf. No.	Event Type*	Event Description
1		I	Failure of MSL rad monitor (upscale) with failure of auto 1/2 scram
2		C	Failure of EPR
3		C	MT high vibrations
4		R, N	Power reduction
5		MT	Turbine trip w/ATWS, failure of fast transfer and failure of EDG to start

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

**OPERATOR ACTIONS
EVENT NUMBER 1**

Crew Task Description:

Respond to MSL rad monitor failed upscale, failure of auto half-scrum (VY staff assist)

STEP	POS.	EXPECTED ACTIONS	COMMENTS
1.	CRO	Acknowledge and respond to Mn Stm Line Rad Hi annunciator (5-K-6) and ½ scrum on RPS "A"; inform SCRO	(VY staff assist with failure to half-scrum)
2.	ACRO	<ul style="list-style-type: none"> Acknowledge MSL monitor alarm (3-f-1); inform SCRO • Direct SCRO to refer to Tech Specs 3.1 and 3.2 <i>who's directing whom</i> • Identify "C" MSL monitor in reading upscale; inform SCRO 	
3.	SCRO	Call I&C to investigate MSL monitor failure.	
4.	SS/SE SCRO	<ul style="list-style-type: none"> Consult Tech Specs 3.1.A, 3.2B, Table 3.1.1 and Table 3.2.2 • Identify that TS requirements are met due to trip system being in the trip condition 	
5.	SCRO	Identify that with the trip system in the trip condition, TS requirements are met for the MSL Rad Monitor failure	

*How is system in trip condition
with failure of auto ½ scrum*

**OPERATOR ACTIONS
EVENT NUMBER 2**

Crew Task Description:

Respond to pressure regulator oscillations and subsequent pressure regulator failure.

STEP	POS.	EXPECTED ACTIONS	COMMENTS
6 7.	CRO	Recognize reactor power/pressure oscillations; inform SCRO <ul style="list-style-type: none">Identify oscillations associated with EPR; inform SCRO	
8.	SCRO	Enter/direct actions IAW OT 3115 and 3116: <ul style="list-style-type: none">Verify MPR takes control and lower MPR setpointWhen MPR is in control, place EPR in CUTOUTRestore RPV pressure to pre-transient level	
9.	CRO/ ACRO	When directed, coordinate between CRP 9-5 and CRP 9-7 to: <ul style="list-style-type: none">Verify MPR takes control and lower MPR setpointWhen MPR is in control, place EPR in CUTOUTRestore RPV pressure to pre-transient level	

**OPERATOR ACTIONS
EVENT NUMBER 3**

Crew Task Description:

Respond to increasing MT high vibrations; power reduction. (VY staff assist)

STEP	POS.	EXPECTED ACTIONS	COMMENTS

?

**OPERATOR ACTIONS
EVENT NUMBERS 4 AND 5**

Crew Task Description:

Respond to a turbine trip with failure to scram, failure of fast transfer and failure of EDG to start; respond to high D/W pressure and temperature due to safety valve lift

STEP	POS.	EXPECTED ACTIONS	COMMENTS
10.	CRO/ ACRO	Recognize and respond to turbine trip; inform SCRO	
11.	ACRO	Recognize and respond to reactor scram <ul style="list-style-type: none"> • Recognize all rods NOT inserted; inform SCRO 	
12.	ACRO	Recognize the following electrical malfunctions; inform SCRO <ul style="list-style-type: none"> • Failure of fast transfer on Bus 2 • Failure of EDG "A" to auto start 	
13.	CRO/ ACRO	Recognize Group I isolation; inform SCRO	
14.	SCRO	Direct ACRO to re-energize busses 2 and 4	
15.	ACRO	When directed, re-energize busses 2 and 4	
16.	SCRO	Enter/direct actions IAW OT 3100, EOP-1, and EOP-2 <ul style="list-style-type: none"> • Place mode switch in SHUTDOWN • Verify EOP-1 Table A automatic actions • Inhibit ADS • Initiate ARI/RPT • Open SRVs to stabilize pressure 800-1000 psig 	

STEP	POS.	EXPECTED ACTIONS	COMMENTS
17.	*CREW EOP-2 CCT-5 7	<p>With a reactor scram required, and reactor not shutdown, INHIBITS ADS to prevent an uncontrolled RPV depressurization to prevent causing a significant power excursion.</p> <p>Standard: Inhibit ADS prior to automatic initiation.</p>	<p>del. 5/6 "5" "6"</p> 
18.	CRO	<p>Place mode switch in SHUTDOWN</p> <p>When directed:</p> <ul style="list-style-type: none"> Initiate ARI/RPT 	
19.	ACRO	<p>When directed:</p> <ul style="list-style-type: none"> Inhibit ADS Open SRVs to stabilize pressure 800-1000 psig Verify EOP-1 Table A automatic actions 	
20.	*CREW EOP-2 CCT-6 7	<p>During an ATWS with conditions met to perform power/level control TERMINATE AND PREVENT INJECTION, with exception of boron, CRD, and RCIC into the RPV until conditions are met to re-establish injection.</p> <p>Standard: Terminate and prevent injection IAW OE 3107 Appendix GG such that the heat capacity temperature limit curve is not exceeded and within 10 minutes of average Torus temperature exceeding 100 deg. F.</p>	
21.	SCRO	<p>Direct Power/Level Control IAW EOP-2</p> <ul style="list-style-type: none"> Terminate and prevent RPV injection per Appendix GG; reduce RPV level to 90 inches 	
22.	CRO/ ACRO	When directed, terminate and prevent RPV injection	

STEP	POS.	EXPECTED ACTIONS	COMMENTS
23.	CRO	Inform SS/SCRO when: <ul style="list-style-type: none"> RPV level reaches 90 inches Power drops below 2% 	<i>del 370 44</i> 
24.	*CREW EOP-2 CCT-7 <i>7</i>	When conditions are met to re-establish injection, use available injection systems to MAINTAIN RPV water level above -22" Standard: Maintain RPV level greater than -22" and less than the point at which a visible power excursion takes place.	
25.	SCRO	Direct CRO to maintain RPV level between -22 inches and the level to which it was lowered, using feed and condensate	
26.	CRO	When directed, use feed and condensate to maintain RPV level between -22 inches and the level to which it was lowered	
27.	*CREW EOP-2 CCT-4 <i>7</i>	With a reactor scram required and the reactor not shutdown, TAKE ACTION TO REDUCE POWER by injecting control rods, to prevent exceeding the primary containment design limits. Standard: Take actions to reduce power by injecting SLC and/or inserting control rods IAW OE 3107 Appendix E, F, G, H, I, or BB within 10 minutes of the scram failure. Only one method needs to be used. The method may result in successful control rod insertion or SLC injection.	E- Individually scram each rod F- Initiation of manual scram G- Manually drive rods H- Vent the over-piston volume I- Local firing of Squib Valve BB- Increase CRD cooling water pressure
28.	SCRO	Direct actions to achieve shutdown conditions IAW EOP-2 <ul style="list-style-type: none"> Reset ARI/RPT Inject SLC prior to torus temperature reaching 110 deg F Insert control rods per appendices (E, F, G, H, or BB) 	

STEP	POS.	EXPECTED ACTIONS	COMMENTS
29.	CRO	<p>When directed:</p> <ul style="list-style-type: none"> Reset ARI/RPT Insert control rods per designated appendices (E, F, G, H, or BB) Inject SLC <p>Recognize failure of squib valves to fire; inform SCRO</p>	
30.	SCRO	Direct local firing of squib valve IAW Appendix I	
31.	ACRO	When directed, direct AO to locally fire squib valve IAW Appendix I	
32.	CRO	Recognize when SLC injecting; inform SCRO	
33.	CREW	Recognize high drywell pressure and temperature	
34.	SCRO	<p>Enter/direct actions IAW EOP-3:</p> <ul style="list-style-type: none"> Restart all available drywell RRUs Initiate torus cooling Before torus pressure reaches 10 psig, spray the torus 	
35.	ACRO	<p>When directed:</p> <ul style="list-style-type: none"> Restart all available drywell RRUs Initiate torus cooling Spray the torus 	
36.	SS/ SE/ SCRO	<p>Consult AP 3125 and determine a Site Area Emergency EAL has been reached IAW AP 3125, Appendix A, Category S-7-c.</p> <p>Initiate a one-hour emergency report IAW AP 0156 (50.72(a)(1)(i)), 50.72(b)(1)(ii), 50.72(b)(1)(iv), and four-hour non-emergency report IAW 50.72(b)(2)(ii)</p>	

*Expected final state?
Pw Level
Cooling Mode*

Facility: Vermont Yankee Scenario No.: 3 Op-Test No: 1

Examiners: _____ Operators: _____

Initial Conditions: 70% power; returning to 100% following turbine BPV testing.

Turnover: Equipment 00S: B RWCU pump; B CRD pump; A RUPS Applicable LCO: 7-day due to A RUPS.

Event No.	Malf. No.	Event Type*	Event Description
1		N, R	Power increase using recirc flow
2		C	A RWCU pump trip
3		I	B recirc loop controller failure
4		MT	Fuel failure with leak in RWCU system and failure of RWCU isolation (PCIS)

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

**OPERATOR ACTIONS
EVENT NUMBERS 1 AND 2**

Crew Task Description:

Power increase using recirc flow; respond to a trip of A RWCU pump, and ensure appropriate Tech Spec requirements are met.

STEP	POS.	EXPECTED ACTIONS	COMMENTS
1.	CRO/ ACRO	Acknowledge and respond to RWCU Pump A/B Trip (4-J-1) and RWCU Clg Water Temp Hi (4-J-4) annunciators; inform SCRO <ul style="list-style-type: none"> • Request AO to check temperature and verify hold pumps started • Monitor drywell/torus dp • Prompt SCRO to consult TS 4.6.B.3.b • Request Maintenance investigate pump trip 	
2.	SCRO	Enter and verify actions IAW OP 2112 for RWCU Pump trip (Section K) <ul style="list-style-type: none"> • Direct contact of Maintenance to investigate pump trip 	
3.	SS/ SCRO	Consult TS 4.6.B.3.b <ul style="list-style-type: none"> • Determine requirements to monitor for conductivity every four hours • Direct chemistry information of increased monitoring requirements 	
4.	CRO/ ACRO	When directed, inform chemistry of four-hour monitoring requirements.	

Power increase actions?

**OPERATOR ACTIONS
EVENT NUMBER 3**

Crew Task Description:

Respond to positive reactivity addition caused by failure of the "B" recirc loop controller.

STEP	POS.	EXPECTED ACTIONS	COMMENTS
5.	CRO	Recognize power/recirc flow increasing; inform SCRO <ul style="list-style-type: none"> • Identify the loop "B" controller ramping upward; inform SCRO 	
6.	SCRO	Enter/direct actions IAW OT 3110 <ul style="list-style-type: none"> • Transfer controller to MANUAL • Notify DCO, Ops Mgr, and RE • Request I&C investigate 	
7.	CRO	When directed, take manual control of the loop "B" controller <ul style="list-style-type: none"> • Recognize no response; inform SCRO 	
8.	ACRO	When directed: <ul style="list-style-type: none"> • Notify DCO, Ops Mgr, and RE • Request I&C investigate 	
9.	SCRO	Direct trip of the "B" recirc pump; enter and direct actions IAW OT 3118 <ul style="list-style-type: none"> • Close recirc pump "B" discharge valve • Verify outside the EXCLUSION REGION of Figure 2.4.1 • Adjust recirc pump "A" speed to 70% speed 	

STEP	POS.	EXPECTED ACTIONS	COMMENTS
10.	CRO	When directed: <ul style="list-style-type: none"> • Close recirc pump "B" discharge valve • Adjust recirc pump "A" speed to 70% • Verify outside the EXCLUSION REGION of Figure 2.4.1 • Identify operation in BUFFER REGION; inform SCRO 	
11.	SCRO	Enter/direct actions IAW OT 3117 <ul style="list-style-type: none"> • Monitor LPRM stability on ERFIS • Initiate SOLOMON • Insert control rods to exit the BUFFER REGION 	
12.	CRO	When directed: <ul style="list-style-type: none"> • Monitor LPRM stability on ERFIS • Initiate SOLOMON • Insert control rods to exit the BUFFER REGION 	

**OPERATOR ACTIONS
EVENT NUMBER 4**

Crew Task Description:

Fuel failure with leak in RWCU system and failure of RWCU (PCIS) to isolate

STEP	POS.	EXPECTED ACTIONS	COMMENTS
13.	ACRO	<p>Acknowledge and respond to Rx Bldg Rad Hi annunciator (3-E-3); inform SCRO</p> <ul style="list-style-type: none"> • Identify alarming channel on CRP 9-11 ARM #6, RB 280' elevation by elevator; inform SCRO • Prompt SCRO to enter ON 3153 	
14.	SCRO	<p>Enter/direct actions IAW ON 3153:</p> <ul style="list-style-type: none"> • Direct RP to obtain area dose rates and air samples • Refer to EOP-4 • Place Control Room HVAC recirc mode switch to EMER (CRP 9-25) 	
15.	SCRO	<p>When directed:</p> <ul style="list-style-type: none"> • Direct RP to obtain area dose rates and air samples • Place control room HVAC recirc mode switch to EMER (CRP 9-25) 	
16.	CRO	<p>Acknowledge/respond to Rx Bldg/Refuel floor CH A/B Rad High annunciators (5-H-1/5-J-1); inform SCRO</p>	

STEP	POS.	EXPECTED ACTIONS	COMMENTS
17.	SCRO	<p>Direct actions IAW ARS 5-H-1/5-J-1;</p> <ul style="list-style-type: none"> • Confirm indications on CRP 9-10 • Verify HVAC isolates and SBGT starts (Group III isolation) • Evacuate reactor building • Request local surveys 	
18.	ACRO	<p>When directed:</p> <ul style="list-style-type: none"> • Confirm indications on CRP 9-10 • Verify HVAC isolates and SBGT starts (Group III isolation) <p>Recognize failure of SB-09, 10, 11, 12 to isolate; attempt to shut valves; inform SCRO</p>	
19.	<p>*CREW</p> <p>EOP-3</p> <p>CCT-1</p>	<p>When PCIS Group 1, 3, 5, or 6 fails to isolate, initiate PCIS Group manually.</p> <p>Standard:</p> <p>Initiate actions to manually isolate valves SB-09, 10, 11, 12 within 10 minutes of receiving the 5-H-1/5-J-1 annunciators</p>	
20.	SCRO	When informed of isolation valve failures, direct AO/Maintenance to effect repairs/isolations	
21.	CRO/ ACRO	<p>When requested:</p> <ul style="list-style-type: none"> • Direct AO/Maintenance to effect repairs/isolations • Acknowledge/respond to steam leak det panel Temp Hi annunciator (4-H-1) 	
22.	ACRO	Identify rising RB temperatures in the RWCU area; inform SCRO	

STEP	POS.	EXPECTED ACTIONS	COMMENTS
23.	SCRO	<p>Enter/direct actions IAW ON 3108 (loss of primary containment integrity)</p> <ul style="list-style-type: none"> • Direct commencement of an orderly shutdown IAW OP 0105 <p>Direct evacuation of the reactor building</p>	
24.	CRO	<p>When directed:</p> <ul style="list-style-type: none"> • Commence orderly shutdown of IAW OP 0105 	
25.	CRO/ ACRO	<p>Recognize a RWCU isolation failure and/or when directed, attempt to shut CU-15 and CU-18; inform SCRO that valves will not shut</p>	
26.	SCRO	<p>Enter/direct actions IAW ON 3158 (reactor building high area temperature/water level)</p> <ul style="list-style-type: none"> • Attempt to isolate leaking system • Direct AO/Maintenance to attempt to isolate valves <p>When Rx Bldg vent exhaust radiation exceeds 14 mR/hr., enter/direct actions IAW EOP-4</p> <ul style="list-style-type: none"> • Monitor RB area temperatures, rad levels, and water levels 	
27.	ACRO	<p>When requested, direct AO/Maintenance to attempt to isolate valves</p>	
28.	CREW	<p>Recognize rising MSL rad levels; enter/take actions per OT 3112</p>	
29.	SCRO	<p>Enter/direct actions IAW OT 3112</p> <ul style="list-style-type: none"> • Reduce power at <10% per min. using recirc flow, to 27.5 - 29 Mlbm/hr. • Place the SD iodine filter in service • Direct Chemistry to sample for I-131 	
30.	CRO	<p>When directed, reduce power at <10% per min recirc flow, to 27.5 - 29 Mlbm/hr.</p>	

STEP	POS.	EXPECTED ACTIONS	COMMENTS
31.	ACRO	When directed: <ul style="list-style-type: none"> Place the SD iodine filter in service Direct Chemistry to sample for I-131 	
32.	*CREW EOP-4 CCT-1	With the reactor at power, and a primary system discharging into the Secondary Containment, manually scram the reactor before any area exceeds the maximum safe operation levels Standard: Manually scram the reactor BEFORE any area temperature exceeds max safe or before ARM 1, 2, 3, 4, 6, 7, 8, 10, or 11 exceed 1,000 mR/hr.	
33.	SCRO	Recognize area rads approaching max safe levels; direct manual scram Enter/direct actions IAW OT 3100 and EOP-1 <ul style="list-style-type: none"> Insert manual scram When steam flow <0.5 Mlbm/stream line, place mode switch in SHUTDOWN Restore/maintain RPV level 127-177 inches Stabilize RPV pressure below 1055 psig with BPVs 	
34.	CRO	When directed, insert manual scram. Insert manual scram <ul style="list-style-type: none"> Verify all rods inserted; inform SCRO When steam flow <0.5 Mlbm/stream line, place mode switch in SHUTDOWN Restore/maintain RPV level 127-177 inches 	
35.	ACRO	<ul style="list-style-type: none"> Stabilize RPV pressure below 1055 psig with BPVs Confirm/initiate turbine trip at <50 Mwe 	

STEP	POS.	EXPECTED ACTIONS	COMMENTS
36.	SCRO	Direct RPV cooldown using BPVs at <100 deg. F/ hr.	
37.	ACRO	When directed, cooldown using BPVs	
38.	CREW	Recognize Group I isolation due to MSL high radiation	
39.	SCRO	Direct the following areas: <ul style="list-style-type: none"> • Backup Group I isolation • Resume cooldown using SRVs • Place RHR in torus cooling 	
40.	ACRO	When directed: <ul style="list-style-type: none"> • Backup Group I isolation • Resume cooldown using SRVs • Place RHR in torus cooling 	
41.	SS/ SCRO	Consult AP 3125 and classify the event as an Alert IAW Appendix A (A-1-b, A-2-a)	