




Exam Title:	Station Blackout
Revision:	0
ID Number:	Y2KNRC-1

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SECTION 2

SIMULATOR EXAM GUIDE

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SECTION 3 EXAM OVERVIEW

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1. Purpose:
This category of the operating test implements item 1-8 and 11-13 identified in 10CFR55.45(a). This is the most performance based category of the operating test and is used to evaluate the applicants ability to safely operate the plant's systems under dynamic, integrated conditions. (ES-301-B.3)
2. Exercise brief:
The crew will take the shift with the plant at 100% power and middle of life conditions. The "B" MDAFW Pump will be out of service for routine oil change. The pump is expected back within the next 8 hrs.

Shortly after turnover, the controlling channel of Pzr Level will fail low. Letdown will isolate and the crew will need to enter AOP3571, Instrument Failure Response, to address the instrument problem. The RO will need to restore letdown and the SRO will need to address Tech Specs.

Once letdown restoration is commenced & tech specs addressed, the "A" SG controlling NR level channel will fail to 0% over 60 seconds. The BOP will need to diagnose a problem. Once identified, the crew will re-enter AOP 3571, Instrument Failure response to shift channels to a functioning channel.

Upon shifting to a functional channel and restoring level to 50%, ISO New England will call requiring a 300 MWE Rapid Downpower due to a fire in a transformer on the Montville line (*recent event at MP3*). The crew will need to enter AOP 3575, Rapid Downpower, and commence ramping down power.

Once the evaluators are satisfied with the reactivity manipulation, a failure of offsite power will occur. Both emergency diesels will fail to auto or manually start to provide emergency power to 34C/34D. The crew will exit E-0 and enter ECA-0.0 to address the complete loss of AC Power. The TDAFW Pump will have failed to auto start and will need to be manually started by the BOP **[critical task]**. Once equipment has been placed in PTL, the PEOs will be successful in starting the "B" EDG. The service water pump associated with the "B" EDG will fail to auto start requiring the RO to manually start the other service water pump in the train **[critical task]**. The crew should move ahead in ECA-0.0 and ultimately transition to ECA-0.1, Loss of All AC Recovery without SI. The scenario will terminate upon implementing CSF Status trees in ECA-0.1. The event should be classified as either an ALERT C-1 (if power was lost for <15 min) or SAE (power lost for >15 min)

3. Plant/Simulator differences that may affect the scenario are: **NONE**

4. Duration of Exam: 1.0 hour(s)

SECTION 4

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All Control Room Conduct, Operations and Communications shall be in accordance COP 200.1, Conduct of Operations, and OP 3260, Unit 3 Conduct of Operations.

"Review the Simulator Operating Limits(design limits of plant) and the Simulator Modeling Limitations and Anomalous Response List prior to performing this exam scenario on the simulator. The evaluators should be aware if any of these limitations may be exceeded." (NSEM 6.02)

SIMULATOR PROBLEMS DURING EXAMS

It is the responsibility of the Instructors in the simulator to insure that exam interruptions have a minimum negative impact on the Crew and the examinations we provide.

Be aware that at all times the Operators should treat the simulator as if it were the plant and you too should treat it as much like the plant as possible when they are in the simulator.

As soon as the Instructors are aware of a simulator problem that will adversely affect the exam in progress (computer fault, etc.) the Instructor should:

1. Place the simulator in FREEZE if possible.
2. Announce to the Crew that there is a simulator problem.
3. Request that the Crew leave the simulator control room. (The Crew should leave the simulator for problems which involve major switch alignments).
4. Deal with the problem (reboot, call STSB, etc.)
5. After the Instructors believe the simulator is restored to service, the Crew should be told how the exam will continue. If it is possible and felt to be acceptable to the evaluators, the examination can begin where it left off with an update on plant parameters and each Crew member is prepared to restart. If the examination will not begin where it left off, the crew should be told how and where the exam will begin again.
6. Once the Crew has been told how and where the exam will begin, have the crew conduct a brief so that the Instructor and evaluators can insure that the crew has all the necessary information to continue with the scenario.
7. Once all Crew members, Instructors and evaluators are satisfied that they have the necessary information to continue the scenario, place the simulator in RUN and announce to the Crew that you have continued the evaluation session.

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<ol style="list-style-type: none"> 1. START the Sun Workstation. <ol style="list-style-type: none"> a. IF the Sun Workstation is running THEN go to SIM ACTIVE. 2. PLACE Recorder Power to ON. 3. VERIFY that the current approved training load is loaded. 4. REMOVE the Step counter OVERRIDE and allow the counters to Step out during the IC reset. 5. RESET to IC 14 6. ADJUST the various pot settings to the valued specified by the chart in the simulator booth or <u>Notepad</u> for the selected IC. 7. PLACE Simulator to RUN. 8. ADJUST MWt using Turbine Load Set to 3411, (+)0, (-)3 IF using 100% power IC. 9. RESET the Plant Calorimetric at the Instructor Station PPC by Pressing "SHIFT LEFT" and "F6" simultaneously. 10. ENSURE Simulator fidelity items cleared. <ol style="list-style-type: none"> a. CHECK the STEP COUNTERS at correct position for plant conditions. b. PLACE <u>7</u> tiles under the DEMINS IN SERVICE lamarcord label on MB6. c. PLACE the Main Turbine on the LOAD LIMITER and ENSURE Standby Load Set MATCHED if conditions require. d. PLACE the Westronic (5) and Gammametrics (2) recorders in active/run by depressing up or down arrow for each. e. CLEAR DCS alarms on MB7 and BOP console. f. VERIFY annunciator, "COMPUTER FAILURE" (MB4C, 1-11), is NOT LIT. g. ENSURE NSSS Picture 1, MODES 1, 2, 3, 4; Burnup and Cb match lesson plan AND Cb sample date < 3 days old. 					

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		1) See laminated directions on clipboard in Sim booth.			
11.	RESET Computer Terminals to At Power displays if 100% power IC.				
a.	MB2, (AY6), CVCS Data Trend, 1 minute update, CHS-F132 (40-120), CHS-L112 (40-80), CHS-F121 (40-80), RCS-L461 (40-80)				
b.	MB4, (AY1), At Power Data Trend, 15 second update, CVQRPI, (3391-3428), CVQRPHRUN (3409-3413), CVQRP (3409-3413), RCL-T412*, (585-588)				
c.	MB4, (AY4), NSSS Picture 1, MODES 1, 2, 3, 4				
d.	BOP Console (AY5A), BOP Picture 26, Circ Water				
e.	STA Console, (AY3), NSSS Picture 15, RCP Seals				
12.	RESET Rad Monitor Screen to Status Grid.				
13.	OVERRIDE the annunciators that will be lit longterm in the CR, (as listed in the "Lit CRP Annunciators" section of the MP3 daily Status Report hanging near instructor booth door).				
14.	IF placing equipment OOS, THEN perform the necessary switch manipulations and hang appropriate tags, as required, listed under "Equipment OOS."				
15.	LOCK the Simulator Room front door.				

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- ° **PLACE THE FOLLOWING EQUIPMENT IN PTL:**

Equipment OOS:

"B" MDAFW Pump- place in Pull-to-lock. Yellow tag

- ° Insert applicable CREW EXAM Tape into the VCR.
- ° Verify the MONITOR Time Display the same as the digital time display on MB4. If no, call/page the Unit Tech.

Initial Malfunctions

/IOs/IDAs:

EG06A

"A" EDG auto & manual start failure

EG06B

"B" EDG auto & manual start failure

FW20C

Failure to auto start of Turbine Driven AFW Pump

ED01 rscu = 3

Loss of Offsite Power

RX10A sev = 0% rscu = 1

Failure of Pzr level transmitter

RX12M sev 20%, ramp = 60 secs, rscu = 2, "A" SG NR Level transmitter failure

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Lead Examiner: **Refer to the "Briefing Script for the Operational Exam" and brief the crew.**

Booth Instructor: **Commence Recording Simulator session**

Booth Instructor: **Perform the crew turnover (Initial Conditions page at end of Exam) with the crew .**

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		Event 1:Pzr Level channel failure			
		LT459 Failure			
T+ 1 min of turnover	RX10A	Pzr Level Transmitter LT459 fails Low			
	sev= 0%				
	rscu = 1				
		Master Pressurizer Level Controller and/or 3CHS-FK121 controller should be placed in manual.	CREW	Determine the initiating parameter and place the affected controller in MANUAL.	AOP 3571 Step 1
		CHS flow will need to be minimized since letdown isolated.	CREW	Stabilize the plant parameters.	AOP 3571 Step 2
		RO should select a channel other than channel I	RO	Defeat the failed channel input. Select other channel on recorder if necessary.	AOP 3571 Att.C Step 1
		Pzr level will continue to rise until letdown is established	RO	Restore PZR level to normal.	AOP 3571 Att.C Step 2
		AOP 3571 continues on Page 11.	RO	Using OP 3304A, "Charging and Letdown", restore letdown.	AOP 3571 Att.C Step 3

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		OP3304A Actions	RO	Establishing Normal Letdown (with continuous Charging) at Normal Operating Pressure	OP 3304A, Step 4.10
			RO	This Section Contains EOP Network Related Material	OP 3304A, Step 4.10, NOTE
			RO	Isolating charging and letdown when the system is hot causes a thermal transient in the system.	OP 3304A, Step 4.10, CAUTION
			RO	<u>WHEN</u> letdown is isolated, charging flow should be maintained until letdown can be restored. Refer To Note.	OP 3304A, Step 4.10, Note
		RO Should consult with the US and determine that Excess Letdown is not desired.	RO	<u>IF</u> desired, PLACE excess letdown in service using Section 4.13.	OP 3304A, Step 4.10.1
			RO	RECORD the following data in the Shift Manager's Log:	OP 3304A, Step 4.10.2
				* Cold leg temperature (Tc) for the appropriate loop 1 or loop 4	
				* Regenerative heat exchanger outlet temperature as indicated on 3CHS-TI 126 (MB3)	

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				* VCT outlet temperature as indicated on 3CHS-TI 116 (MB3)	
			RO	CLOSE letdown orifice isolation valve (MB3).	OP 3304A, Step 4.10.3
				* 3CHS*AV8149A	
				* 3CHS*AV8149B	
				* 3CHS*AV8149C	
			RO	OPEN 3RCS*LCV459 and 3RCS*LCV460, letdown isolation valves (MB3).	OP 3304A, Step 4.10.4. a
			RO	OPEN 3CHS*CV8160 and 3CHS*CV8152, letdown containment isolation valves (MB3).	OP 3304A, Step 4.10.4. b
			RO	PLACE 3CHS-PK131, letdown low pressure controller, in "MANUAL" and ADJUST to 50% (MB3).	OP 3304A, Step 4.10.5
			RO	ADJUST 3CHS-FK121, charging header flow controller (MB3) to establish charging flow approximately 55 gpm, (approximately 33%).	OP 3304A, Step 4.10.6

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			RO	OPEN 3CHS*AV8149B <u>OR</u> 3CHS*AV8149C, letdown orifice isolation valve B or C (MB3).	OP 3304A, Step 4.10.7
			RO	ADJUST 3CHS*PK131, letdown low pressure controller, to maintain 350 psig.	OP 3304A, Step 4.10.8
			RO	PLACE 3CHS*PK131, letdown low pressure controller, to "AUTO"	OP 3304A, Step 4.10.9
		If 121 is placed in auto, CHS will throttle back and a low flow alarm will be received. RHX outlet temp may alarm.	RO	VERIFY 3CHS*FK121, charging header flow controller, is maintaining approximately 55 gpm (MB3).	OP 3304A, Step 4.10.10
		The crew may maintain 121 in manual until Pzr level is returned to normal.	RO	PLACE 3CHS*FK121, charging header flow controller, in "AUTO", (MB3).	OP 3304A, Step 4.10.11
		NOT REQUIRED	RO	<u>IF</u> required, STOP excess letdown using Section 4.14.	OP 3304A, Step 4.10.12
			RO	VERIFY letdown heat exchanger outlet temperature has stabilized between 70°F and 115°F using 3CHS-TI 130 (MB3).	OP 3304A, Step 4.10.13
			RO	CHECK the following annunciator alarms are <u>not</u> illuminated:	OP 3304A, Step 4.10.14

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				<ul style="list-style-type: none"> * LETDOWN FLOW HI (MB3A 3-4) * REGEN HX LETDOWN TEMP HI (MB3A 5-4) * LETDOWN HX OUT PRESS HI (MB3A 4-5) * LETDOWN HX OUT TEMP HI (MB3A 5-5) 	
			RO	Refer to OP 3301D, "RCP Operation," attachment for "No 1 Seal Normal Operating Range" and VERIFY seal flows are satisfactory.	OP 3304A, Step 4.10.15
			RO	CHECK seal injection flow to each pump is between 8 gpm and 13 gpm.	OP 3304A, Step 4.10.16
			RO	Refer to SP 3601F.3, "RCS Leakage - Controlled Leakage to RCS Seals," and <u>If</u> necessary, PERFORM surveillance to verify total injection supply flow is less than 40 gpm.	OP 3304A, Step 4.10.17
		3571 ACTIONS	RO	Place PZR level controller in automatic.	AOP 3571 Att.C Step 4

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			CREW	When conditions have stabilized, observe MB annunciators and parameters. Immediately report any unexpected or unexplained conditions to the SM.	AOP 3571 Att.C Step 5
			US	Determine which Reactor Protection System bistable (s) requires tripping:	AOP 3571 Att.C Step 6
			US	Place a check mark in the box above the appropriate channel that requires tripping on the last page of this attachment.	AOP 3571 Att.C Step 6a
		3.3.1 action 6 (6 hours to trip B/SM) 3.3.35 - 3.3.3.6 does not apply.	SM	Refer to Technical Specification 3.3.1, 3.3.3.5, and 3.3.3.6.	AOP 3571 Att.C Step 6b
		TS 3.4.3.1b action B if level rises above 67%.	RO	Check the existing bistable status to ensure a reactor trip will not occur when the failed channel is tripped.	AOP 3571 Att.C Step 6c
T= Request to trip B/SM	RXR106	Protection SET 1 Door OPEN	US/	Request the I&C Department trip the appropriate bistables using Attachment C and Attachment S.	AOP 3571 Att.C Step 6d
	RXR25	Pzr Hi LVL Rx Trip TRIP	SM		
	RXR106	Protection SET 1 Door CLOSE			

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			RO	Verify the appropriate bistable status lights are lit.	AOP 3571 Att.C Step 6e
			US	Request I&C Department perform corrective maintenance on failed instrument.	AOP 3571 Att.C Step 7
EVENT 2: "A" SG NR Controlling Channel fail low					
T= 3571 complete	RX12M, 20%, 60 sec ramp rscu = 2	"A" SG Narrow Range Level Transmitter Fails low over 60 seconds.	RO	Do not leave the rod selector switch in AUTO while diagnosing a related instrument failure unless the reason for rod movement is a turbine runback.	AOP 3571 Step 1 CAUTION
		Crew should enter AOP 3571.	CREW	If a reactor trip occurs, immediately go to E-0 Reactor Trip or Safety Injection.	AOP 3571 Step 1 NOTE
		"A" Feed Reg. Valve is the affected Controller.	US	Determine The Initiating Parameter And Place The Affected Controller In MANUAL.	AOP 3571 Step 1
			CREW	Stabilize The Plant Parameters.	AOP 3571 Step 2

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			US	It is desired that I&C personnel trip the bistables specified in this procedure. If, during off-hours, IC&E personnel are not able to trip the necessary bistables within the time limitations required by the Technical Specifications, Operations Department personnel may trip the bistables using the guidance provided within this procedure.	AOP 3571 Step 3 NOTE
		Appropriate Attachment is "N"		Perform Corrective Actions Using Appropriate Attachment	AOP 3571 Step 3
			BOP	Verify the affected SG feed regulating valve in MANUAL.	AOP 3571 Att. N Step 1
		BOP should restore level to 50%	BOP	Restore SG level to normal.	AOP 3571 Att. N Step 2
		BOP should select channel 2 as the controlling channel.	BOP	Defeat the failed channel input by selecting the alternate channel on the level selector.	AOP 3571 Att. N Step 3
T= 50% LEVEL RESTORED or Evaluators cue	BOOTH	Move on to the next event. Tripping of Bistables or addressing Tech specs is not required for this event	BOP	When SG level is restored to normal and feed/steam flow are matched, Place the affected steam generator feed regulating valve controller in AUTO.	AOP 3571 Att. N Step 4

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			CREW	When conditions have stabilized, observe MB annunciators and parameters. Immediately report any unexpected or unexplained conditions to the Shift Manager.	AOP 3571 Att. N Step 5
			US	Determine which Reactor Protection System bistable(s) require(s) tripping:	AOP 3571 Att. N Step 6
			US	Place a check mark in the box above the appropriate channel that requires tripping on the last pages of this Attachment.	AOP 3571 Att. N Step 6a
		Crew should log into 3.3.1. action 6 3.3.2 action 20/21 Channels operable requirements for 3.3.3.5 and 3.3.3.6 are met. This should be checked to verify that they don't apply	SM/US	Refer to Technical Specification 3.3.1, 3.3.2, 3.3.3.5 and 3.3.3.6.	AOP 3571 Att. N Step 6b
			RO	Check the existing bistable status to ensure a reactor trip will not occur when the failed channel is tripped.	AOP 3571 Att. N Step 6c
	Booth Instructor	Bistable tripping is NOT required to move onto the next event.	US	Request the IC&E Department trip the appropriate bistables using Attachment N and Attachment S.	AOP 3571 Att. N Step 6d

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			RO	Verify the appropriate bistable status lights are lit.	AOP 3571 Att. N Step 6e
			US/SM	Request IC&E Department perform corrective maintenance on failed instrument.	AOP 3571 Att. N Step 7
Event 3: ISO New England ordered Rapid downpower					
T= Evaluators cue	BOOTH	Call as ISO New England and report the following: Millstone Unit 3, We have lost a portion of the Montville line due to a transformer fire. Perform an Emergency load reduction of 300 MWE within the next 15 minutes.	Crew	Enter and Perform AOP 3575, Rapid Downpower	AOP 3575 Entry Conditions
		AOP 3575 Rev. 5	CREW	Determine Power Reduction Rate (%/min).	AOP 3575 Step 1
			US	Check desired power reduction rate - LESS THAN OR EQUAL TO 5%/min.	AOP 3575 Step 1.a
			US	Check power reduction NOT CONVEX REQUESTED	AOP 3575 Step 1.b

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			US	Perform load reduction at 5%/min and Proceed to Step 2.	AOP 3575 Step 1.b RNO
			US	Check Rod Control In AUTO.	AOP 3575 Step 2
			CREW	If at any time the power reduction rate must be changed, Return to Step 1.	AOP 3575 Step 1 NOTE
			CREW	Verify power Reduction rate.	AOP 3575 Step 3
			US	Check power reduction rate - 5%/MIN.	AOP 3575 Step 3.a
			BOP	Check power reduction - REQUIRED TO STABILIZE PLANT.	AOP 3575 Step 3.b
			BOP	Proceed to Step 4.	AOP 3575 Step 3.b RNO
			US	Initiate Rapid Boration.	AOP 3575 Step 4
			RO	Place RCS makeup controller to AUTO.	AOP 3575 Step 4.a
			RO	START one boric acid transfer pump.	AOP 3575 Step 4.b

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			RO	OPEN emergency boration valve (3CHS*MV8104).	AOP 3575 Step 4.c
			RO	Verify power reduction rate - GRETER THAN OR EQUAL TO 5%/MIN.	AOP 3575 Step 4.d
			RO	START second boric acid transfer pump.	AOP 3575 Step 4.e
			RO	OPEN charging line flow control valve, to match boric acid flow (3CHS-FI 183A).	AOP 3575 Step 4.f
			US/RO	Record time boration started Time _____	AOP 3575 Step 4.g
			RO	Energize all PZR heaters.	AOP 3575 Step 4.h
		25 x 15 = 375 GALL	US/RO	Determine required boric acid addition by multiplying total power change ($\Delta\%$) by 15 (gal/%) = _____ gal.	AOP 3575 Step 4.i
		375 GALL / ~80 GPM = 4.5 MIN	US/RO	Determine required time to borate by dividing required gallons of boric acid (gal) by the direct boric acid flowrate (gpm) _____ min.	AOP 3575 Step 4.j
			US	Check turbine load decrease - IN PROGRESS OR COMPLETED.	AOP 3575 Step 4.k

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			US	Proceed to CAUTION prior to Step 6.	AOP 3575 Step 4.k RNO
			RO	If during the performance of this procedure the Rod Insertion Lo-Lo Limit is reached, Go to AOP 3566, Immediate Boration.	AOP 3575 Step 6 CAUTION
			RO	A CONVEX requested emergency generation reduction should be completed within 15 minutes of notification.	AOP 3575 Step 6 NOTE
			BOP	Initiate Load Reduction.	AOP 3575 Step 6
			US	Check power reduction - CONVEX REQUESTED.	AOP 3575 Step 6.a
			BOP	Check turbine OPERATING MODE - NOT IN STANDBY.	AOP 3575 Step 6.b
			BOP	Check LOAD LIMIT LIMITING light - lit.	AOP 3575 Step 6.c
			BOP	Intermittently Press DECREASE LOAD pushbutton until LOAD LIMIT LIMITING light - NOT LIT.	AOP 3575 Step 6.d
			BOP	Rotate LOAD LIMIT SET adjust knob at least one full turn in raise direction.	AOP 3575 Step 6.e

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			BOP	Select DECREASE LOADING RATE to ON.	AOP 3575 Step 6.f
			BOP	Select LOAD RATE LIMIT %/MIN to required power reduction rate (%/min).	AOP 3575 Step 6.g
			BOP	Utilizing DECREASE LOAD pushbutton, Adjust LOAD SET to desired final Mwe (power level).	AOP 3575 Step 6.h
			BOP	Maintain initial MVAR loading during power reduction, unless directed otherwise.	AOP 3575 Step 6.i
			RO	Check ROD CONTROL BANKS LIMIT LO (MB4C 3-9) annunciator - LIT.	AOP 3575 Step 6.j
			US	Proceed to Step 6.m and, IF the annunciator is received, THEN Perform Step 6.k and 6.l.	AOP 3575 Step 6.j RNO
			RO	Check boration - IN PROGRESS.	AOP 3575 Step 6.m
			RO	Boric acid total volume addition and flow rates are based on approximations. Adjustments should be made to the volume addition or flow rate as necessary to ensure the reactor reaches the desired end state of :	AOP 3575 Step 7 NOTE

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			RO	• Tavg on program	
			RO	• Rods above the Rod Insertion Limit	
			RO	• AFD on or above the target value	
			US	Restore From Rapid Boration	AOP 3575 Step 7
			RO	Check rapid boration - IN PROGRESS.	AOP 3575 Step 7.a
			US/RO	Check rapid boration performed for the required time determined in Step 4.j	AOP 3575 Step 7.b
		RNO used if crew got to this Step prior to 4.5 min	US	Proceed to Step 8, and, WHEN Rapid boration has been performed for the required time, THEN Return to Step 7.c.	AOP 3575 Step 7.b RNO
			RO	CLOSE emergency boration valve (3CHS*MV8104).	AOP 3575 Step 7.c
			RO	STOP boric acid transfer pump(s).	AOP 3575 Step 7.d
			RO	Place charging line flow control valve in AUTO.	AOP 3575 Step 7.e
			US	Proceed to Step 8.	AOP 3575 Step 7.f

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			RO	Energize all PZR heaters.	AOP 3575 Step 7.g
			US	Reduce Steam Supply to the MSRs.	AOP 3575 Step 8
			BOP	Check reheat steam flow controllers - in AUTOMATIC.	AOP 3575 Step 8.a
			BOP	Using OP 3317, "Reheat and Moisture Separator," Perform manual adjustment of moisture separator reheater steam flow control valves, as necessary.	AOP 3575 Step 8.a RNO
			BOP	Using the MSR Startup Pressure Display on the Foxboro DCS, Verify symmetrical operation of the MSR reheaters during power decrease.	AOP 3575 Step 8.b
			BOP	Using OP 3317, "Reheat and Moisture Separator," Perform manual adjustment of moisture separator reheater steam flow control valves, as necessary.	AOP 3575 Step 8.b RNO
			US	Check If RCS Sample Is Required.	AOP 3575 Step 9
			US	Verify change in Reactor Power - GREATER THAN 15% IN ONE HOUR.	AOP 3575 Step 9.a

EVALUATION GUIDE

Exam Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
T= evaluator's cue	Continue on to the next event		US	Request Chemistry sample the RCS for iodine (<i>within 2 to 6 hours after the power change.</i>)	AOP 3575 Step 9.b
			US	Verify Target Power Level - LESS THAN 50%.	AOP 3575 Step 10
			US	Continue power reduction to desired target power level. <u>WHEN</u> final power level is reached, <u>THEN</u> Proceed to Step 21.	AOP 3575 Step 10 RNO
			US	Check Plant Status	AOP 3575 Step 21
			US	Verify - AT TARGET POWER LEVEL.	AOP 3575 Step 21.a
			RO	Borate or Dilute as necessary to maintain AFD as close to the target value as possible while maintaining rods above the Rod Insertion Limit.	AOP 3575 Step 21.b
			US	Request Chemistry obtain RCS boron samples.	AOP 3575 Step 21.c
			RO	Using OP 3304C, "Primary Makeup and Chemical Addition," Align for auto makeup.	AOP 3575 Step 21.d

EVALUATION GUIDE

Exam Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			BOP	Select RESET on the steam dump mode selector switch <i>(if required)</i> .	AOP 3575 Step 21.e
			US	Report Completion and Amount of Power Reduction to the Requesting Authority.	AOP 3575 Step 22
			CREW	Continue With Normal Plant Operations Using Applicable Plant Procedures.	AOP 3575 Step 23
		Event 4: Failure of Off Site Power w/ failure of EDGs to Start.			
T= Reactivity manipulation complete	ED01 rscu = 3	Loss of Offsite Power			
		<i>NOTE: US should go to "Master Silence" before ordering reactor trip .</i>	RO	TRIP the reactor	
		E-0 (Rev. 20) STEPS	Crew	Go to E-0 Reactor Trip or Safety Injection.	
			Crew	<ul style="list-style-type: none"> Foldout page must be open 	E-0 Step 1 NOTE

EVALUATION GUIDE

Exam Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
T= 3 min of event classifiable	Floor instructor	Prompt the SM to contact the back room for the Shift Tech.	Crew	<ul style="list-style-type: none"> ADVERSE CTMT defined as GREATER THAN 180°F or GREATER THAN $10^{5R}/hr$ in containment. 	
			Crew	<ul style="list-style-type: none"> The reactor can be interpreted as "tripped" when any two of three bulleted substeps of Step 1.* are satisfied. 	
			RO	Verify Reactor Trip	E-0 Step 1
				<ul style="list-style-type: none"> Check reactor trip and bypass breakers - OPEN Check rod bottom lights - LIT Check neutron flux - DECREASING 	
			BOP	Verify Turbine Trip	E-0 Step 2
				Check all turbine stop valves - CLOSED	E-0 Step 2.a
			BOP	Verify Power to AC Emergency Busses	E-0 Step 3
			BOP	Check busses 34C and 34D - AT LEAST ONE ENERGIZED	E-0 Step 3.a

EVALUATION GUIDE

Exam Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
		EDGs will not start		Try to Restore power to at least one AC emergency bus.	E-0 Step 3.a RNO
			US	IF power can <u>NOT</u> be restored to at least one AC emergency bus, <u>THEN</u> go to ECA-0.0, Loss of All AC Power, Step 3.	
		ECA-0.0 Rev. 14	CREW	CSF Status Trees should be monitored for information only. Other Functional Response procedures shall NOT be implemented until at least one AC emergency bus is energized and direction is given in ECA-0.1 or ECA-0.2.	ECA-0.0 Step 1 NOTE
	BOOTH	When crew contacts CONVEX, report that the grid is unstable and a cascade failure is in progress. You are unsure of when the grid will be stabilized and power restored.	US	Check If RCS Is Isolated	ECA-0.0 Step 3
			RO	Verify PZR PORVs - CLOSED	ECA-0.0 Step 3.a
			RO	CLOSE letdown orifice isolation valves.	ECA-0.0 Step 3.b
			RO	Verify excess letdown and RX head vent isolation valves - CLOSED	ECA-0.0 Step 3.c

EVALUATION GUIDE

Exam Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
		BOP will need to start the TDAFW Pump	BOP	Verify AFW Flow To All Intact SGs - GREATER THAN 530 gpm	ECA-0.0
			BOP	Perform the following:	ECA-0.0 Step 4.a. RNO
				Verify TD AFW pump running. IF the TD AFW pump is NOT running, THEN	
		Attachment J actions are not required.	PEO	1) Locally reset the turbine trip valve as necessary using Attachment J.	
		[critical task]	BOP	2) OPEN steam supply valves.	
			BOP	Verify the TD AFW flow control valves are open.	ECA-0.0 Step 4.b. RNO
			US	If power is NOT restored to Bus 34C within 30 minutes, Inverter 6 de-energizes and the process computer will be unavailable.	ECA-0.0 Step 5 CAUTION
			US	The SBO diesel may be aligned to either bus pair 34A and 34C or 34B and 34D. The preferred bus pair is 34A and 34C.	ECA-0.0 Step 5 NOTE
			CREW	Try To Restore Power To Any AC Emergency Bus	ECA-0.0 Step 5
			US	Energize AC emergency bus from its emergency diesel generator.	ECA-0.0 Step 5.a

EVALUATION GUIDE

Exam Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
		Manual Start from MB8 will be unsuccessful.	BOP	START one emergency diesel generator.	ECA-0.0 Step 5.a.1
	NOTE >>>	The SM/US should dispatch separate PEOs to perform local starts of the "A" & "B" EDGs.	PEO	Locally Start one EDG using Attachment E	ECA-0.0 Step 5.a.1 RNO
	NOTE >>>	The SM/US should move on to Step 5.b until an EDG is running.	BOP	Verify AC emergency bus automatically energized	ECA-0.0 Step 5.a.2
		Neither Bus will be energized at this time.	BOP	Check AC emergency busses - AT LEAST ONE ENERGIZED	ECA-0.0 Step 5.b
	NOTE >>>		US	Perform the following:	ECA-0.0 Step 5.b RNO
			BOP	1) OPEN both SBO bus tie breakers (34a1-2 and 34b1-2).	
		SM/US should dispatch another PEO to perform Att. G to locally start the SBO Diesel.	PEO	2) Locally Start SBO diesel using Attachment G.	
		The bus alignment for the SBO Diesel, Att. H & I, will pull the UC fuses for the associated EDG Output Breakers which will prevent operation of the breakers. Ensure the SM stops the PEO when the appropriate EDG is started.	PEO	3) Locally align the selected non-emergency AC busses using one of the following attachments:	

EVALUATION GUIDE

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Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				For Busses 34A and 34C: Attachment H For Busses 34B and 34D Attachment I	
		SM/US should dispatch a PEO or use a CO to perform Att. B SM/US should dispatch a PEO or use a CO to perform Att. B			
T=3 minutes from dispatching CO	BOOTH	RX 106 "ON" PS Door 1	PEO	4) Open Instrument Rack Room cabinet doors using Attachment B and Proceed to CAUTION prior to step 6..	
		RXR 107 "ON" PS Door 2			
		RXR 108 "ON" PS Door 3			
		RXR 109 "ON" PS Door 4			
		Ann MB4C A4T "ON" SSPS "A"			
		Ann MB4C A4B "ON" SSPS "B"			
	Booth	Wait 7 minutes and then report Att. B of ECA-0.0 completed.	CREW	<ul style="list-style-type: none"> Maintain one service water pump available to automatically load on its AC emergency bus to provide emergency diesel generator cooling. 	ECA-0.0 Step 6 CAUTION

EVALUATION GUIDE

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ID Number: Y2KNRC-1

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			CREW	<ul style="list-style-type: none"> If a SI signal is actuated during this procedure, it must be reset to permit manual loading of equipment on an AC emergency bus. 	
			CREW	<ul style="list-style-type: none"> Spurious fire alarms may occur in areas where the temperatures exceed 120°F due to a loss of ventilation. The locking out of CO₂ protected areas which have spurious fire alarms is recommended. 	
			US	<ul style="list-style-type: none"> When power is restored to any AC emergency bus from offsite or an emergency diesel generator, recovery actions should continue starting with Step 24. ADVERSE CTMT is defined as Ctmt temperature GREATER THAN 180°F or Ctmt radiation level GREATER THAN 10⁵R/hr. 	ECA-0.0 Step 6 NOTE
			US	Block Automatic Loading of AC Emergency Busses	ECA 0.0 Step 6

EVALUATION GUIDE

Exam Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
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The crew may go as far past Step 6 as the Lead Examiner desires prior to giving the crew an EDG

		SI should not be actuated	RO	RESET SI the following if necessary:	ECA 0.0 Step 6.a
				<ul style="list-style-type: none"> • SI • Aux FW for Lo-Lo SG level. 	
ECA-0.0 Step 6	BOOTH	Perform the following steps to locally start the EDGs: However, do not remove Malfunction EG06A and EG06B until Step 6.b is initiated and the CHS Pump has been placed in PTL.	RO/BOP	Place following Control Switches in PULL-TO-LOCK	ECA 0.0 Step 6.b
				<ul style="list-style-type: none"> • Charging Pumps • One service water pump per train • RPCCW pumps • Quench spray pumps 	
T=Service Water Pump in PTL	SW01B or SW01D	For the Service Water Pump left in condition to Auto Start [not in PTL] on power returning INSERT THE APPLICABLE TRIP. The goal is to have the RO need to manually start the pump that is <u>currently</u> in PTL.		<ul style="list-style-type: none"> • Recirculation spray pumps 	

EVALUATION GUIDE

Exam Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
T=ordered to start "A" EDG	For A EDG:	Enter the following Remote Functions to simulate Local start of EDGs:		<ul style="list-style-type: none"> • SI pumps • RHR pumps • MD AFW pumps • CAR fans • Control Building HVAC chillers 	
			EGR05-Clear EDG A Local Panel Trouble	PEO	
			EGR09-EDG A Local Control	PEO	
			EGR13-EDG "A" Output Breaker to LOCAL Control	PEO	
T=ordered to start "B" EDG	For B EDG:	BOOTH	EG07A-Trip the "A" EDG		
			Call as PEO. Inform SM/US that local start of the "A" EDG unsuccessful & now the Primary lockout relay has actuated.		
			EGR07-Clear EDG B Local Panel Trouble		
			EGR11-EDG B Local Control		

EVALUATION GUIDE

Exam Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
T=CHS Pump in PTL		EGR14-EDG "B" Output Breaker to LOCAL Control			
		Remove Malfunction EG06B		The EDG should start and auto load the AC Bus.	
		Call as PEO. Inform SM/US that local start of the "B" EDG is completed up through Step 10 of Att. E and the EDG Output Breaker auto closed.			
		The US should go to Step 24 when power is restored to the first emergency bus IAW the Note prior to Step 6.	BOP	Stabilize SG Pressures.	ECA-0.0 Step 24
		No actions should be required. The BOP will have control of the "B" Train of Equipment or 2 SGs.	BOP	Adjust SG atmospheric dump valves or atmospheric dump bypass valves.	ECA-0.0 Step 24.a
			US	Verify Service Water System Operation For Each Energized Emergency Bus.	ECA-0.0 Step 25
		The "B" service pump did not auto start. The RO will need to take action to have 1 service water pump on the "B" train start	RO	Check diesel generator heat exchanger SW outlet isolation valves (3SWP*AOV39A and 3SWP*AOV39B) - OPEN.	ECA-0.0 Step 25.a

EVALUATION GUIDE

Exam Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
		[critical task]	RO	Check service water pumps - ONE PER TRAIN RUNNING.	ECA-0.0 Step 25.b
		Only "B" train is available	RO	START one pump per train.	ECA-0.0 Step 25.b RNO
		The "B" train service pump that was in PTL is now running. No "B" Service train pumps are left to go to standby/auto	RO	Place service water pumps in PULL-TO-LOCK to AUTO.	ECA-0.0 Step 25.c
			RO	Check service water pump discharge valves - OPEN FOR RUNNING PUMPS For pump A (3SWP*MOV102A) For pump B (3SWP*MOV102B) For pump C (3SWP*MOV102C) For pump D (3SWP*MOV102D)	ECA-0.0 Step 25.d
			RO	Check TPCCW heat exchanger SW supply isolation valves (3SWP*MOV71A and 3SWP*MOV71B) - CLOSED.	ECA-0.0 Step 25.e
			CREW	When placing loads on an energized emergency bus, DO NOT exceed the capacity of the power source.	ECA-0.0 Step 25 CAUTION

EVALUATION GUIDE

Exam Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	Perform the Following For Each Energized AC Emergency Bus:	ECA-0.0 Step 26
			BOP	Verify the following equipment is energized: <ul style="list-style-type: none"> • 480 volt emergency busses • Battery chargers 	ECA-0.0 Step 26.a
			Crew	Load equipment as necessary.	ECA-0.0 Step 26.a RNO
		No loads were de-energized	BOP	Energize previously de-energized DC loads.	ECA-0.0 Step 26.b
			US	Energize Inverter 6 from MCC 32-3T:	ECA-0.0 Step 26.c
			BOP	Verify Bus 34C - ENERGIZED	ECA-0.0 Step 26.c.1
			US	Proceed to Step 26.d.	ECA-0.0 Step 26.c.1 RNO
T= request made	BOOTH	Inform crew console is energized	US	Verify communications console - ENERGIZED.	ECA-0.0 Step 26.d

EVALUATION GUIDE

Exam Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	Select Recovery Procedure.	ECA-0.0 Step 27
		The crew may need to perform this manually if computer is lost	RO	Check RCS subcooling based on core exit TCs - GREATER THAN 32°F (115°F ADVERSE CTMT)	ECA-0.0 Step 27.a
		Pzr Level should be > 16%	RO	Check PZR level - GREATER THAN 16% (50% ADVERSE CTMT).	ECA-0.0 Step 27.b
		No SI equipment repositioned or actuated during this scenario		Check SI equipment NOT actuated	ECA-0.0 Step 27.c
				<ul style="list-style-type: none"> • Verify SI pumps - STOPPED • Verify RHR pumps - NOT RUNNING IN SI MODE • Verify charging pump cold leg injection valves - CLOSED 	
			US/Crew	Go to ECA-0.1, Loss of All AC Power Recovery Without SI Required.	ECA-0.0 Step 27.d

T=Transition
made

FREEZE

TERMINATE SCENARIO!!

SECTION 4

ID Number: Y2KNRC-1

Revision: 0

EVALUATION GUIDE

I. SUMMARY

1. The following **Critical Tasks** are covered in this exercise:

<u>TASK DESCRIPTION</u>	<u>TASK #</u>	<u>K/A >= 3.0</u>
Establish 525 GPM AFW flow to the SGs prior to completing Step 4 of ECA - 0.0	<u>ECA-0.0 -- B</u>	000-055-EA2.02 4.4/4.6
Manually start the SW pump by the completion of ECA -0.0 Step 25.	<u>ECA-0.0 -- F</u>	000-055-EA1.06 4.1/4.5

2. NON-Critical Tasks covered in this exercise are listed later in the guide.

SECTION 4

Lesson Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

EVALUATION GUIDE

II. FOLLOW-UP QUESTIONS: (document any follow up questions asked)

SECTION 5

SCENARIO INITIAL CONDITIONS

ID Number: Y2KNRC-1

Revision: 0

Reactor Power:	100%
Operating History:	197 days on line
RCS Boron:	1210 ppm
Core Burnup:	10,000 MWD/MTU
Condensate Demins:	IN SERVICE
Evolutions in Progress:	None
Major Equipment OOS:	"B" MDAFW Pump out for oil replacement. 56 hours left on 72 hours Tech spec clock. Pump is expected to be returned to service sometime during your shift.

Crew Instructions:

Maintain present plant conditions. Prepare to run the "B" MDAFW Pump for retest.

Plant/Simulator Differences:

- ° Rad Monitor Historical Data--Simulator Rad Monitor historical data not valid prior to the beginning of this exercise.
- ° If not using the speed dial option on the phone system, the operator must dial either #3333 or #3334 to reach the person/department they desire.
- ° The following PPC programs do not function on the simulator:
 - Samarium Follow
 - Xenon Follow
 - Sequence of Events

SECTION 6

VALIDATION CHECKLIST

Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Remote functions:

All remote functions contained in the guide are certified.

Malfunctions:

All malfunctions contained in the guide are certified.

Initial Conditions:

The initial condition(s) contained in the guide are certified or have been developed from certified IC's in accordance with NSEM-4.02.

Simulator Operating Limits:

The simulator guide has been evaluated for operating limits and/or anomalous response.

Test Run:

The scenario contained in the guide has been test run and validated (validation sheet completed, next page) on the simulator. Simulator response is reasonable and as expected.

Examination Scenario Review

The dynamic examination review checklist is complete. (This is not required unless the exam will be used as an Annual Exam, then NUREG 1021 requirements apply.)

C Martin

Technical Reviewer

2/21/00

Date

SECTION 7

REFERENCE AND TASK TRACKING

Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

I. References:

AOP 3571	Instrument Failure Response
AOP 3571	Rapid downpower
EOP E-0	Reactor trip Response
EOP ECA-0.0	Loss of All AC
EPIP*EPIP 4400	Event Assessment, Classification and Reportability
EOP*ERG_EXE	Westinghouse Owners Group Executive Document
EOP* Step _DOC	MP3 Step Deviation Document
EOP*ERG_HP	Westinghouse Owners Group Background Document
NUREG*1021 rev 8	Examiners Standards

II. Non- Critical Tasks Covered in this Guide/Test:

- Respond to a Pzr Level Instrument Failure
- Respond to a SG Level Instrument Failure
- Perform a Rapid Downpower
- Respond to a Reactor Trip
- Respond to a Loss of all AC Power
- Recover from a loss of all AC power without SI Required

SECTION 8

SCENARIO ATTRIBUTES CHECKLIST

Lesson Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Assessor: J. William Côté

Concurrence: Martin 2/21/00

QUALITATIVE ATTRIBUTES

- Y 1. The scenario summary clearly states the objectives of the scenario.
- Y 2. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the crew into expected events.
- Y 3. The scenario consists mostly of related events.
- Y 4. Each event description consists of:
- the point in the scenario when it is to be initiated
 - the malfunctions(s) that are entered to initiate the event
 - the symptoms/cues that will be visible to the crew
 - the expected operator actions (by shift position)
 - the event termination point
- Y 5. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
- Y 6. The events are valid with regard to physics and thermodynamics.
- Y 7. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
- N/A 8. If time compression techniques are used, scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.
- Y 9. The simulator modeling is not altered.
- Y 10. The scenario has been validated. Any open simulator performance deficiencies have been evaluated to ensure functional fidelity is maintained while running the scenario.
- Y 11. Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered IAW Section D.4 of ES301
- Y 12. All individual operator competencies can be evaluated, as verified using form ES-301-6.
- Y 13. Each operator will be significantly involved in the minimum number of transients and events specified on Form ES-301-5. (Form submitted with simulator scenarios).
- Y 14. Level of difficulty is appropriate to support licensing decisions for each crew position.

SECTION 8

SCENARIO ATTRIBUTES CHECKLIST

Lesson Title: Station Blackout

ID Number: Y2KNRC-1

Revision: 0

Note: Following criteria list scenario traits that are numerical (QUANTITATIVE) in nature.

- | | |
|--|-----------------|
| 01. Total Malfunctions (TM) - Include EM's- 5 to 8 required
Pzr level channel, SG NR Level channel, station blackout, TDAFW Pump auto start failure, Service water pump auto start failure. | Total <u>5</u> |
| 02. Malf's after EOP entry (EM's)- 1 to 2 required
TDAFW Pump auto start failure, Service water pump auto start failure. | Total <u>2</u> |
| 03. Abnormal Events (AE)-2 to 4 required
Pzr level channel, SG NR Level channel, Rapid down power. | Total <u>3</u> |
| 04. Major Transients (MT)-1 to 2 required
Loss of offsite AC, Station blackout. | Total <u>2</u> |
| 05. EOP's (EU) entered/requiring substantive actions 1 to 2 required
E-0, Rx Trip or Safety Injection,ECA-0.0, Loss of All AC Power. | Total <u>2</u> |
| 06. EOP Contingencies requiring substantive actions [ECAs/FRs](EC) 0 to 2 required
ECA-0.0, Loss of All AC Power. | Total <u>1</u> |
| 07. Critical Task (CT) - 2 to 3 required
TDAFW Pump manual start, Service Water pump man start after EDG start. | Total <u>2</u> |
| 08. Approximate Scenario Run Time: 45 to 60 min. (One scenario may approach 90 minutes) | Total <u>60</u> |
| 09. EOP run time: | Total <u>20</u> |
| 10. Technical Specifications are exercised during the scenario.
For failed instruments. | (Y/N) <u>Y</u> |

MILLSTONE NUCLEAR POWER STATION




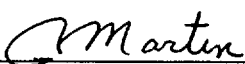

LOIT NRC SIMULATOR EXAM GUIDE APPROVAL SHEET

Exam Title: TURBINE TRIP & LARGE BREAK LOCA

Revision: 0, change 1

ID Number: Y2KNRC-2

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Submitted by:	<u></u> Developer	<u>03/30/00</u> Date
Validated by:	<u></u> Technical Reviewer	<u>3/30/00</u> Date
Approved by:	<u>N/A</u> Operation Manager (Optional)	<u> </u> Date
Approved by:	<u></u> Training Supervisor	<u>4/4/00</u> Date



SECTION 2

SIMULATOR EXAM GUIDE

TABLE OF CONTENTS

SECTIONS LISTED IN ORDER

1. Cover Page
2. Table of Contents
3. Exam Overview
4. Evaluation Guide
5. Scenario Initial Conditions Sheet
6. Scenario Validation Checklists
7. Reference and Task Tracking
8. Scenario Attributes Checklist

Attachments

- NUTIMS Module Report

STOP

THINK

ACT

REVIEW

SECTION 3 EXAM OVERVIEW

Title: TURBINE TRIP & LARGE BREAK LOCA

ID Number: Y2KNRC-2

Revision: 0, change 1

1. Purpose:
This category of the operating test implements item 1-8 and 11-13 identified in 10CFR55.45(a). This is the most performed based category of the operating test and is used to evaluate the applicants ability to safely operate the plant's systems under dynamic, integrated conditions. (ES-301-B.3)
2. Exercise brief:
The crew will take the shift at ~27% power BOL conditions with orders maintain power while awaiting primary and secondary chemistry results. The "A" MDAFW Pump will be out of service for routine oil change. The pump is expected back within the next 8 hrs.

Shortly after turnover a SG Steam flow instrument will fail low. The crew should take manual control of the Main Feed System and enter AOP 3571, Instrument Failure Response to address the failed instrument and select another channel for control.

Once the feed system has stabilized, a Power Range NI will fail high. This will cause a rapid inward rod motion which can only be stopped by going to manual on Rod Control. The crew will need to enter AOP 3571, Instrument Failure Response to address the failed NI. The crew should take actions to remove the NI channel from service, trip bistables and address Tech Specs for the failed channel. They should also attempt to restore Tave.

Prior to placing rod control back into automatic control a Turbine Trip will occur. The crew should enter AOP 3550, Turbine Trip, to address the problem. Within AOP 3550 the crew will encounter a step that says if rods are in manual and power is greater than 25 % insert rods and lower power to between 20-25% power. AOP 3550 will include a power change and associated system manipulations.

Once plant conditions have stabilized and AOP 3550 actions have slowed, the Earthquake Annunciator will alarm followed by a loss of Offsite power and a Large Break LOCA. Upon the Loss of offsite Power the "A" & "B" EDG will fail to auto start. The BOP will need to manually start the EDGs from the control room and manually close the associated output breakers **[critical task]**. The CTMT Depressurization signal will not automatically actuate the required equipment and the system will need to be manually activated by the control room team **[critical task]** as they progress through E-0, Reactor Trip or Safety Injection. Upon exiting E-0 the crew will need to address the red path on P-1 and determine that FR-P.1, Response to Imminent Pressurized Thermal Shock, does not apply. They will need to address the orange path on CTMT and implement FR-Z.1, Response to High CTMT Pressure. Upon completing the FRs the crew will transition to E-1, Loss of Reactor or Secondary Coolant. The crew should progress through E-1 and transition to ES-1.3, Transition to Cold Leg Recirculation when RWST level reaches 520,000 gallons. The scenario will end upon transition to ES-1.3

The event should be classified as an ALERT C-1 based on Barrier Reference Table criteria.

3. Plant/Simulator differences that may affect the scenario are: NONE
4. Duration of Exam: 1.0 hour(s)

SECTION 4

EVALUATION GUIDE

Title: TURBINE TRIP & LARGE BREAK LOCA

ID Number: Y2KNRC-2

Revision: 0, change 1

All Control Room Conduct, Operations and Communications shall be in accordance COP 200.1, Conduct of Operations, and OP 3260, Unit 3 Conduct of Operations.

"Review the Simulator Operating Limits(design limits of plant) and the Simulator Modeling Limitations and Anomalous Response List prior to performing this exam scenario on the simulator. The evaluators should be aware if any of these limitations may be exceeded." (NSEM 6.02)

SIMULATOR PROBLEMS DURING EXAMS

It is the responsibility of the Instructors in the simulator to insure that exam interruptions have a minimum negative impact on the Crew and the examinations we provide.

Be aware that at all times the Operators should treat the simulator as if it were the plant and you too should treat it as much like the plant as possible when they are in the simulator.

As soon as the Instructors are aware of a simulator problem that will adversely affect the exam in progress (computer fault, etc.) the Instructor should:

1. Place the simulator in FREEZE if possible.
2. Announce to the Crew that there is a simulator problem.
3. Request that the Crew leave the simulator control room. (The Crew should leave the simulator for problems which involve major switch alignments).
4. Deal with the problem (reboot, call STSB, etc.)
5. After the Instructors believe the simulator is restored to service, the Crew should be told how the exam will continue. If it is possible and felt to be acceptable to the evaluators, the examination can begin where it left off with an update on plant parameters and each Crew member is prepared to restart. If the examination will not begin where it left off, the crew should be told how and where the exam will begin again.
6. Once the Crew has been told how and where the exam will begin, have the crew conduct a brief so that the Instructor and evaluators can insure that the crew has all the necessary information to continue with the scenario.
7. Once all Crew members, Instructors and evaluators are satisfied that they have the necessary information to continue the scenario, place the simulator in RUN and announce to the Crew that you have continued the evaluation session.

SECTION 4

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Revision: 0, change 1

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
1.		START the Sun Workstation.			
		a. IF the Sun Workstation is running THEN go to SIM ACTIVE.			
2.		PLACE Recorder Power to ON.			
3.		VERIFY that the current approved training load is loaded.			
4.		REMOVE the step counter OVERRIDE and allow the counters to step out during the IC reset.			
5.		RESET to IC <u>Temp IC Y2KNRC-1</u>			
6.		ADJUST the various pot settings to the valued specified by the chart in the simulator booth or <u>Notepad</u> for the selected IC.			
7.		PLACE Simulator to RUN.			
8.		ADJUST MWt using Turbine Load Set to 3411, (+)0, (-)3 IF using 100% power IC.			
9.		RESET the Plant Calorimetric at the Instructor Station PPC by Pressing "SHIFT LEFT" and "F6" simultaneously.			
10.		ENSURE Simulator fidelity items cleared.			
		a. CHECK the STEP COUNTERS at correct position for plant conditions.			
		b. PLACE <u>4</u> tiles under the DEMINS IN SERVICE lamacord label on MB6.			
		c. PLACE the Main Turbine on the LOAD LIMITER and ENSURE Standby Load Set MATCHED if conditions require.			
		d. PLACE the Westronic (5) and Gammametrics (2) recorders in active/run by depressing up or down arrow for each.			
		e. CLEAR DCS alarms on MB7 and BOP console.			
		f. VERIFY annunciator, "COMPUTER FAILURE" (MB4C, 1-11), is NOT LIT.			

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
		g. ENSURE NSSS Picture 1, MODES 1, 2, 3, 4; Burnup and Cb match lesson plan AND Cb sample date < 3 days old.			
		1) See laminated directions on clipboard in Sim booth.			
11.		RESET Computer Terminals to At Power displays if 100% power IC.			
		a. MB2, (AY6), CVCS Data Trend, 1 minute update, CHS-F132 (40-120), CHS-L112 (40-80), CHS-F121 (40-80), RCS-L461 (40-80)			
		b. MB4, (AY1), At Power Data Trend, 15 second update, CVQRPI, (3391-3428), CVQRPHRUN (3409-3413), CVQRP (3409-3413), RCL-T412*, (585-588)			
		c. MB4, (AY4), NSSS Picture 1, MODES 1, 2, 3, 4			
		d. BOP Console (AY5A), BOP Picture 26, Circ Water			
		e. STA Console, (AY3), NSSS Picture 15, RCP Seals			
12.		RESET Rad Monitor Screen to Status Grid.			
13.		OVERRIDE the annunciators that will be lit longterm in the CR, (as listed in the "Lit CRP Annunciators" section of the MP3 daily Status Report hanging near instructor booth door).			
14.		IF placing equipment OOS, THEN perform the necessary switch manipulations and hang appropriate tags, as required, listed under "Equipment OOS."			
15.		LOCK the Simulator Room front door.			

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		<ul style="list-style-type: none"> ° PLACE THE FOLLOWING EQUIPMENT IN PTL: 			
	Equipment OOS:	"A" MDAFW Pump in PTL and yellow tag			
		<ul style="list-style-type: none"> ° Insert applicable CREW EXAM Tape into the VCR. ° Verify the MONITOR Time Display the same as the digital time display on MB4. If no, call/page the Unit Tech. 			
	Initial Malfunctions /IOs/IDAs:				
	RP11M	Failure of both EDG output breakers to auto close			
	EG13A	"A" EDG failure to auto start			
	EG13B	"B" EDG failure to auto start			
	RP06A	"A" CDA auto actuation failure			
	RP06B	"B" CDA auto actuation failure			

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
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Lead Examiner: Refer to the "Briefing Script for the Operational Exam" and brief the crew.

Booth Instructor: Commence Recording Simulator session

Booth Instructor: Perform the crew turnover (Initial Conditions page at end of Exam) with the crew .

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
T + 1 min of turnover	RX14A sev =0.0%	EVENT ONE: Steam Flow Transmitter Failure			
		This will cause the "A" S/G controlling steam flow detector (FT512) to fail to 0.0%	CREW	Respond by entering AOP 3571, Instrument Failure Response.	AOP 3571, Entry conditions
		AOP 3571 Att M (Rev 3) STEPS	CREW	Determine the initiating parameter and place the affected controller in MANUAL.	AOP 3571 step 1
		Unit Supervisor should transition to Attachment "M"	CREW	Stabilize the plant parameters.	AOP 3571 step 2
		Input via Steam Flow / feed Flow for Flow Error	BOP	Verify the affected steam generator feed regulating valve flow controller is in MANUAL.	AOP 3571 Att.M step 1
		Input via Total Steam Flow	BOP	Verify the feed pump A and B Master (3FWS-SK509A) speed controller is in MANUAL and restore feed pump d/p..	AOP 3571 Att.M step 2
			BOP	Restore SG level to normal.	AOP 3571 Att.M step 3
			BOP	Defeat the failed channel input by selecting the alternate channel on the steam flow selector (also selects the alternate SG pressure instrument input to SGWLC).	AOP 3571 Att.M step 4

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			BOP	When SG level is restored and feed/steam flow are matched, perform the following: <ul style="list-style-type: none"> Restore feed pump speed control to normal differential pressure (Program: 40-140 psid) and place the feed pump speed controller in automatic. Place the affected steam generator feed regulating valve controller in AUTO. 	AOP 3571 Att.M step 5
			BOP/ RO	When conditions have stabilized, observe MB annunciators and parameters and immediately report any unexpected or unexplained conditions to the Shift Manager. There are no Tech. Specs. or bistables to be tripped associated with the steam flow instrument.	AOP 3571 Att.M step 6 AOP 3571 Att.M step 7 NOTE
T= Request		Acknowledge the request and report that you will initiate an AWO to trouble shoot the transmitter.	US/ SM	Request I&C Department perform corrective maintenance on failed instrument.	AOP 3571 Att.M step 7

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
EVENT 2: Power Range NI Failure					
T+ 1 minute of Turnover	NI09A sev=100%	Power Range Channel 41 lower detector fails to 100%			
			CREW	Do not leave the rod selector switch in AUTO while diagnosing a related instrument failure unless the reason for rod movement is a turbine runback.	AOP 3571 Step 1 CAUTION
			CREW	If a reactor trip occurs, immediately go to E-0, Reactor Trip or Safety Injection.	AOP 3571 Step 1 NOTE
		Rod Control will be the affected controller.	RO	Determine The Initiating Parameter And Place The Affected Controller In MANUAL.	AOP 3571 Step 1
			CREW	Stabilize The Plant Parameters.	AOP 3571 Step 2
			US	It is desired that I&C personnel trip the bistables specified in this procedure. If, during off-hours, IC&E personnel are not able to trip the necessary bistables within the time limitations required by the Technical Specifications, Operations Department personnel may trip the bistables using the guidance provided	AOP 3571 Step 3 NOTE

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				within this procedure.	
		Appropriate Attachment is "D"	US	Perform Corrective Actions Using Appropriate Attachment	AOP 3571 Step 3
			RO	Defeat the failed channel input.	AOP 3571 Att.D step 1
			RO	At the detector current comparator drawer, turn the following switches to the failed channel: Rod Stop Bypass, Upper Section, Lower Section, Power Mismatch Bypass.	AOP 3571 Att.D step 1a
			RO	At the comparator and rate drawer, turn the following switch to the failed channel: Comparator Channel Defeat.	AOP 3571 Att.D step 1b
T= RO requesting to place rod control in Auto	INITIATE EVENT 3 EG01	The goal is to have rod control in "MAN" when the turbine trips. If Tech Specs have not been addressed yet, use follow up questions after the scenario is complete.	RO	Restore T _{AVE} - T _{REF} error to within 1 °F and place rod control in automatic.	AOP 3571 Att.D step 2

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			CREW	When conditions have stabilized, observe MB board annunciators and parameters and immediately report any unexpected or unexplained conditions to the Shift Manager.	AOP 3571 Att.D step 3
		NOTE>> Bistables need not be tripped prior to moving on to the next event	US	Determine which Reactor Protection System bistable (s) requires tripping:	AOP 3571 Att.D step 4
			US	Place a check mark in the box above the appropriate channel that requires tripping on the last page of this Attachment.	AOP 3571 Att.D step 4a
		3.3.1 actions 6 & 2 applies. Trip associated bistables in 6 hrs and bypass for 4 hours for testing	SM/US	Refer to Technical Specification 3.3.1 and 4.2.4.2.	AOP 3571 Att.D step 4b
			RO	Check the existing bistable status to ensure a reactor trip will not occur when the failed channel is tripped.	AOP 3571 Att.D step 4c
			RO	Remove the appropriate control power fuses for the affected channel.	AOP 3571 Att.D step 4d
T= Request	RXR106 RXR34 RXR05	Protection Set 1 Door "OPEN" OTΔT runback "TRIP" OTΔT Trip "TRIP" Protection Set 1	US	Request the I&C Department trip the appropriate bistables using Attachment D and Attachment S.	AOP 3571 Att.D step 4e

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
	RXR106	Door "TRIP"			
			RO	Verify the appropriate bistable status lights are lit.	AOP 3571 Att.D step 4f
		AOP is more restrictive than Tech Specs. Tech Specs requires action 8 only if less than the minimum # of instruments	US	Within <u>one hour</u> , determine by observation of the associated permissive annunciator window (s) that the following interlocks are in their required state for the existing plant condition (Tech, Spec. 3.3.1, Action 8): <ul style="list-style-type: none"> ◦ Rx or turbine not at power P-7 (MB4D 5-3) ◦ Three loop permissive P-8 (MB4D 3-3) ◦ NIS power range P-9 permissive (MB4D 6-1) ◦ Reactor at power P-10 (MB4D 4-3). 	AOP 3571 Att.D step 5
			RO	Perform the following to remove the affected power range input to the AFD computer (Program 3R5):	AOP 3571 Attachment D Step 6
			RO	On the plant process computer, Select the NSSS menu, page 2.	AOP 3571 Attachment D Step 6a

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			RO	At the NSSS menu, Select "Tilting Factors" (F9).	AOP 3571 Attachment D Step 6b
			RO	Press the key (F5 through F8) that corresponds to the channel to be removed.	AOP 3571 Attachment D Step 6c
			US	Request I&C Department perform corrective maintenance on failed instrument.	AOP 3571 Att.D step 7
		Event 3: Turbine Trip			
T= Rod Control in Man and Evaluator's CUE	EG01	Main Generator trip resulting in a turbine trip	CREW	ENTER AOP 3550, Turbine Trip	3550 entry conditions
			BOP	Verify Turbine Trip • Check all turbine stop valves- CLOSED	AOP 3550 Step 1
			CREW	Stabilize Plant Conditions	AOP 3550 Step 2

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			RO	Check reactor - TRIPPED	AOP 3550 Step 2.a
			US	Perform the following:	AOP 3550 Step 2.a, RNO
			US	1) <u>IF</u> condenser steam dumps are available, <u>THEN</u> Proceed to step 2.c.	
			RO	Check reactor power - LESS THAN 25%	AOP 3550 Step 2.c
			US	Perform the applicable action:	AOP 3550 Step 2.c, RNO
			RO	<ul style="list-style-type: none"> <u>IF</u> rod control is in MANUAL, <u>THEN</u> Insert control rods to reduce power to between 20% and 25% and Proceed to step 3. 	
			US	Verify Feedwater Status	AOP 3550 Step 3
			BOP	Check feed pumps	AOP 3550 Step 3.a

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				<ul style="list-style-type: none"> • TD FW pumps - TRIPPED • MD FW pump - STOPPED 	
			US	Proceed to step 4.	AOP 3550 Step 3.a, RNO
		NOTE>>			
		The crew will use this step only if a P-14 occurs		Check all SG NR levels - LESS THAN 80%	AOP 3550 Step 3.b
		IF, DURING THE PERFORMANCE OF P-14 RECOVERY, THE CREW		Verify FW isolation:	AOP 3550 Step 3.b, RNO
		ELECTS to TRIP the PLANT, PROCEED TO THE NEXT EVENT		<ul style="list-style-type: none"> • SG feed regulating valves closed 	
T = AOP 3550 actions have slowed & Evaluator's CUE	MB1BE-5 earthquake annunciator	Activate to "Cry Wolf".		<ul style="list-style-type: none"> • SG feed regulating bypass valves closed 	
T= ARP pulled out	ED01	Loss of Offsite Power		<ul style="list-style-type: none"> • FW isolation trip valves closed 	

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
T= E-0 actions initiated	RC03A sev= 100% ramp= 200 seconds	Large break LOCA		<ul style="list-style-type: none"> MD FW pump stopped TD FW pumps tripped SG chemical feed isolation valves closed <p><u>IF</u> any component can <u>NOT</u> be verified, <u>THEN</u></p> <p>Align component(s) as necessary.</p> <p><u>WHEN</u></p> <p>All SG NR levels are LESS THAN 80%</p> <p><u>THEN</u></p> <p>Proceed to step 3.c.</p> <p>To start the MD FW pump Place the MD FW pump control switch to STOP and then to START</p>	AOP 3550 Step 3.c

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				TRIP the reactor and Go to E-0, Reactor Trip Response.	AOP 3550 Step 3.c, RNO
				CLOSE the MD FW pump startup valve (3FWS-HIC590)	AOP 3550 Step 3.d
				RESET and OPEN the FW isolation trip valves	AOP 3550 Step 3.e
				RESET FWI at MB5	AOP 3550 Step 3.f
				Adjust the following as necessary to obtain 50% NR level for each SG:	AOP 3550 Step 3.g
				<ul style="list-style-type: none"> MD FW pump startup valve (3FWS-HIC590) MD FW pump startup valve bypass valve (3FWS-HIC590A) Feed regulating valves Feed regulating bypass valves 	
				Locally Throttle the MD FW pump bearing oil cooler outlet (3CCS-V97) to maintain oil temperature between 105°F and 115°F	AOP 3550 Step 3.h

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				CLOSE the TD FW pump discharge isolation valves (3FWS-MOV23C and 3FWS-MOV23B)	AOP 3550 Step 3.i
			US	Establish SG Level Control	AOP 3550 Step 4
			RO	Check reactor power - LESS THAN 25%	AOP 3550 Step 4.a
		The crew may need to hold here	US	<u>WHEN</u> Reactor power is LESS THAN 25%	
			US	<u>THEN</u> Proceed to step 4.b.	
			BOP	Check feed/steam differential pressure - BETWEEN 100 and 150 psid	AOP 3550 Step 4.b
			BOP	Perform the applicable action:	AOP 3550 Step 4.b, RNO

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			BOP	<ul style="list-style-type: none"> • <u>IF</u> a TD FW pump running, <u>THEN</u> <p>Adjust the FW pump master speed controller in MANUAL to maintain a feed/steam differential pressure BETWEEN 100 and 150 psid.</p>	
		The MDMFW Pump may have started on the transient produced by the turbine trip	BOP	<ul style="list-style-type: none"> • <u>IF</u> the MD FW pump running, <u>THEN</u> <p>Simultaneously Open MD FW pump startup valve bypass valve (3FWS-HIC590A) and Close the MD FW pump startup valve (3FWS-HIC590) to obtain a feed/steam differential pressure BETWEEN 100 and 150 psid.</p>	
			US	Check SG level control on - FEED REGULATING BYPASS VALVES	AOP 3550 Step 4.c
			BOP	Perform the following for each SG:	AOP 3550 Step 4.c, RNO

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			BOP	1) Place the feed regulating valve in MANUAL.	
			BOP	2) Simultaneously OPEN the feed regulating bypass valve and CLOSE the associated feed regulating valve.	
			BOP	3) CLOSE the associated FW isolation valve: 3FWS*MOV35A 3FWS*MOV35B 3FWS*MOV35C 3FWS*MOV35D	
			BOP	Check feed regulating bypass valves - IN AUTO	AOP 3550 Step 4.d
			BOP	<u>WHEN</u> SG NR level is stable at 50%,	
			BOP	<u>THEN</u> If desired, Place the SG feed regulating bypass valve in AUTO.	

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			BOP	To prevent an overspeed condition, the turbine must be verified tripped prior to opening the generator output breakers.	AOP 3550 Step 5, CAUTION
			US	Verify Main Generator Trip	AOP 3550 Step 5
			BOP	<ul style="list-style-type: none"> Check Main generator output breaker - OPEN <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Switchyard breakers 13T-2 and 14T-2 - TRIPPED 	
			US	Shutdown the Generator	AOP 3550 Step 6
			BOP	Shift voltage regulator mode selector to MANUAL	AOP 3550 Step 6.a
			BOP	Lower voltage regulator manual control to minimum (<i>green and white light lit</i>)	AOP 3550 Step 6.b
			BOP	Verify exciter field and generator field breakers - OPEN	AOP 3550 Step 6.c

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
T+ 5 min of request			BOP	OPEN breakers as necessary.	AOP 3550 Step 6.c RNO
		Report that V983 is closed.	PEO	Locally Close the exciter air cooler outlet valve (3CCS-V893)	AOP 3550 Step 6.d
		There is no booth action for this.	US	Verify Turbine Trip Caused By AMSAC Actuation	AOP 3550 Step 7
			RO	Check turbine trip first out - AMSAC TRIP (MB7B 2-3)	AOP 3550 Step 7.a
			US	Proceed to step 8.	AOP 3550 Step 7.a RNO
		Turbine tripped due to Generator Fault.	US	Check If Condenser Vacuum Should Be Broken	AOP 3550 Step 8
			BOP	Verify any of the following:	AOP 3550 Step 8.a
		NO		<ul style="list-style-type: none"> Turbine vibration - GREATER THAN 12 mils OR	

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
		NO	BOP	<ul style="list-style-type: none"> Turbine vibration - GREATER THAN 10 mils (MB7A 3-9A) FOR GREATER THAN 5 min <p>OR</p>	
		NO	BOP	<ul style="list-style-type: none"> Thrust bearing - FAILURE INDICATED (MB7B 3-3 or 3-4) <p>OR</p>	
		NO	BOP	<ul style="list-style-type: none"> Bearing oil pressure - LOW AND CAN NOT BE RESTORED (MB7A 1-8 or MB7B 3-1) <p>OR</p>	
			BOP	<ul style="list-style-type: none"> Gland seal steam pressure - LESS THAN 1.5 psig AND CAN NOT BE RESTORED <p>OR</p>	
			BOP	<ul style="list-style-type: none"> Any other indication of - TURBINE FAILURE 	
			US	Proceed to step 9.	AOP 3550 Step 8.a, RNO

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			US	Prevent Excessive RCS Cooldown	AOP 3550 Step 9
			US/RO	Check reactor - TRIPPED	AOP 3550 Step 9.a
			US	Proceed to step 10.	AOP 3550 Step 9.a, RNO
			RO	Select NR-45 Recorder Channels:	AOP 3550 Step 10
			RO	• One power range channel	
			RO	• One intermediate range channel	
			US	Check If RCS Sample Is Required	AOP 3550 Step 11
		Power change is expected to be only 5-8%	RO	Verify Change In Reactor Power - GREATER THAN 15%	AOP 3550 Step 11.a
			US	Proceed to NOTE prior to step 12.	AOP 3550 Step 5.a RNO
T+ 10 min of request	MSR01	Places Aux Boiler in Service	US/PEO	Place the Auxiliary Boilers In Service	AOP 3550 Step 12

SECTION 4

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T= Evaluator's CUE	MOVE on to Event 3		PEO	Using OP 3331A, "Auxiliary Boiler Steam and Condensate," Start the auxiliary boilers.	AOP 3550 Step 12.a
			BOP	Using OP 3331A, "Auxiliary Boiler Steam and Condensate," Shift auxiliary steam from main steam to auxiliary boiler steam.	AOP 3550 Step 12.b
			US	Shutdown Unnecessary Equipment	AOP 3550 Step 13
			BOP	<ul style="list-style-type: none"> Using OP 3319A, "Condensate System," Reduce the number of operating condensate pumps based on plant conditions. 	
			BOP	<ul style="list-style-type: none"> Using OP 3319C, "Condensate Demineralizer Mixed Bed System," Remove excess condensate demineralizers from service. 	
			BOP	<ul style="list-style-type: none"> Using OP 3317, "Reheat and Moisture Separator," Remove the moisture separator drain tank pumps from operation. 	

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			BOP	<ul style="list-style-type: none"> Using OP 3320, "Feedwater Heater Drains and Vents," Stop the 4th point heater drain pumps. 	
			BOP	<ul style="list-style-type: none"> Using OP 3317, "Reheat and Moisture Separator," Perform taking MSR reheaters out of service during normal turbine shutdown. 	
				Complete Turbine/Generator Shutdown	AOP 3550 Step 14
		EVENT 4: Earthquake followed by big break LOCA			
T = AOP 3550 actions have slowed & Evaluator's CUE	MB1BE-5 Earthquake annunciator	Activate to "Cry Wolf". This will simulate the precursor event to a loss of offsite and large Break LOCA	RO	Announce the annunciator to the crew	
T= ARP pulled out	ED01	Loss of Offsite Power	CREW	Enter E-0, Rx Trip or Safety Injection	E-0 entry conditions

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T= E-0 actions initiated	RC03A sev= 100% ramp= 200 seconds	<p>Large break LOCA</p> <p><i>NOTE: US should go to "Master Silence" when entering e-0</i></p> <p>E-0 (Rev. 20) STEPS</p> <p>no rod bottom lights will be lit</p>	CREW	<ul style="list-style-type: none"> Foldout page must be open 	E-0, Step 1, NOTE
			CREW	<ul style="list-style-type: none"> ADVERSE CTMT defined as GREATER THAN 180°F or GREATER THAN $10^5 R/hr$ in containment. 	
			CREW	<ul style="list-style-type: none"> The reactor can be interpreted as "tripped" when any two of three bulleted substeps of Step 1.* are satisfied. 	
			RO	<p>Verify Reactor Trip</p> <ul style="list-style-type: none"> Check reactor trip and bypass breakers - OPEN Check rod bottom lights - LIT Check neutron flux - DECREASING 	E-0, Step 1
			BOP	<p>Verify Turbine Trip</p>	E-0, Step 2

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				Check all turbine stop valves - CLOSED	E-0, Step 2.a
			BOP	Verify Power to AC Emergency Busses	E-0, Step 3
		"A" & "B" EDGs will have failed to auto start	BOP	Check busses 34C and 34D - AT LEAST ONE ENERGIZED	E-0, Step 3.a
		The BOP will need to start at least 1 EDG & manually close the output breaker [critical task]		Try to Restore power to at least one AC emergency bus.	E-0, Step 3.a, RNO
			BOP	Check busses 34C and 34D - BOTH ENERGIZED	E-0, Step 3.b
				Try to Restore power to de-energized AC emergency busses.	E-0, Step 3.b, RNO
			US	Check If SI Is Actuated	E-0, Step 4
		If SI is not actuated, it will be soon	RO	Verify Safety Injection Actuation annunciator - LIT	EOP 35 E-0, Step 4.a
			RO	Verify Service Water Pumps - AT LEAST ONE PER TRAIN RUNNING	E-0, Step 5
			RO	Verify Two RPCCW Pumps - ONE PER TRAIN RUNNING	E-0, Step 6
			RO	Verify ECCS Pumps Running	E-0, Step 7

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				<ul style="list-style-type: none"> • Check SI pumps - RUNNING • Check RHR pumps - RUNNING • Check two charging pumps - RUNNING 	
			BOP	Verify AFW Pumps Running	E-0, Step 8
				Check MD pumps - RUNNING	E-0, Step 8.a
				Check turbine - driven pump - RUNNING, IF NECESSARY	E-0, Step 8.b
			BOP	Verify FW Isolation	E-0, Step 9
				<ul style="list-style-type: none"> • Check SG feed regulating valves - CLOSED • Check SG feed regulating bypass valves - CLOSED • Check FW isolation trip valves - CLOSED • Check MD FW pump - STOPPED • Check TD FW pumps - TRIPPED • Check SG blowdown isolation valves - CLOSED • Check SG blowdown sample isolation valves - CLOSED 	

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				<ul style="list-style-type: none"> Check SG chemical feed isolation valves - CLOSED 	
			BOP	Check If Main Steam Lines Should Be Isolated	E-0, Step 10
		Ctmt pressure will be approaching 18 psia		Check Ctmt pressure GREATER THAN 18 psia	E-0, Step 10.a
				<u>OR</u>	
				Any SG pressure LESS THAN 660 psig	
				Verify MSIVs and MSIV bypass valves - CLOSED	E-0, Step 10.b
		CDA will need to be manually actuated [critical task]	RO	Check if CDA Required	E-0, Step 11
				Check Ctmt pressure is GREATER THAN 23 psia	E-0, Step 11.a
				<u>OR</u>	
				Ctmt spray is initiated	
			RO	Verify CDA	E-0, Step 11.b
			RO	Quench spray initiated	

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			RO	Initiate CDA.	E-0, Step 11.b.1, RNO
			RO	RPCCW Ctmt supply and return header isolations - CLOSED	E-0, Step 11.b.2
			RO	RPCCW pumps - STOPPED	E-0, Step 11.b.3
			RO	STOP RPCCW pumps.	E-0, Step 11.b.3, RNO
			BOP	CAR fans - STOPPED	E-0, Step 11.b.4
			BOP	CRDM fans - STOPPED	E-0, Step 11.b.5
			RO	STOP all RCPs	E-0, Step 11.c
			BOP	STOP all main circulating water pumps	E-0, Step 11.d
			US	Proceed to Step 13.	E-0, Step 11.e
			RO	Verify CIA	E-0, Step 13
			RO	Check ESF Group 2 status columns 2 through 10 - LIT	E-0, Step 13.a

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			RO	Verify Proper ESF Status Panel Indication <ul style="list-style-type: none"> • Verify ESF Group 1 lights - OFF • Verify ESF Group 2 lights - LIT • <u>IF</u> Main Steam Line Isolation has occurred, <u>THEN</u> verify ESF Group 3 lights - LIT • <u>IF</u> CDA has occurred, <u>THEN</u> verify ESF Group 4 lights - LIT 	E-0, Step 14
		Adverse conditions will exist	RO	Determine If ADVERSE CTMT Conditions Exist <ul style="list-style-type: none"> • Ctmt temperature GREATER THAN 180°F <u>OR</u> • Ctmt radiation GREATER THAN $10^5 R/hr$ 	E-0, Step 15

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			CREW	To provide adequate ECCS flow, RCS subcooling and PZR level should be monitored to ensure that the charging pump is manually restarted if RCS subcooling based on core exit TCs decreases to LESS THAN 32°F (115°F ADVERSE CTMT) or PZR level decreases to LESS THAN 16% (50% ADVERSE CTMT).	E-0, Step 16, CAUTION
			CREW	If offsite power is lost after SI reset, manual action to restart safeguards equipment may be required.	E-0, Step 16, CAUTION
			CREW	DO NOT reset CDA if recirculation spray pumps are required and have not automatically started.	E-0, Step 16, CAUTION
			RO	Verify ECCS Flow Check charging pump flow indicator - FLOW INDICATED	E-0, Step 16 E-0, Step 16.a
			RO	Check RCS pressure - GREATER THAN 1650 psia (1950 psia ADVERSE CTMT)	E-0, Step 16.b
			US	Proceed to Step 16.i	E-0, Step 16.b, RNO

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			RO	Check SI pump flow indicators - FLOW INDICATED	E-0, Step 16.i
			RO	Check RCS pressure - LESS THAN 300 psia (500 psia ADVERSE CTMT)	E-0, Step 16.j
		CREW should perform a short brief and come out of "Master Silence" at the completion of Step 16.	RO	Check RHR pump flow indicators - FLOW INDICATED	E-0, Step 16.k
			BOP	Verify Adequate Heat Sink	E-0, Step 17
		Because the plant tripped from a low level, levels may be > 8% (42% Adverse)		Check NR level in at least one SG - GREATER THAN 8% (42% ADVERSE CTMT)	E-0, Step 17.a
			BOP	Control feed flow to maintain NR level - BETWEEN 8% and 50% (42% and 50% ADVERSE CTMT)	E-0, Step 17.b
		only if levels are >8%. (42% Adverse)	US	Proceed to Step 18.	E-0, Step 17.c
			BOP	Verify Total AFW Flow - GREATER THAN 530 gpm	E-0, Step 17.d .
			BOP	Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT	E-0, Step 18
			RO	Verify ECCS Valve Alignment - PROPER EMERGENCY ALIGNMENT	E-0, Step 19
			US	Check Plant Status	E-0, Step 20

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BOOTH INST	NOTE	When asked, REPORT that "all SLCRS doors indicate closed."		Verify SLCRS doors - CLOSED	E-0, Step 20.a
			RO	Check CBI annunciator - LIT	E-0, Step 20.b
			RO	Verify CBI status	E-0, Step 20.c
			RO	Verify ESF Group 2 CBI lights - LIT	E-0, Step 20.c.1
			BOP	Control Building purge supply fan and purge exhaust fan - NOT RUNNING	E-0, Step 20.c.2
			BOP	Control building air bank isolation valves - OPEN (after 60 seconds)	E-0, Step 20.c.3
			BOP	OPEN valves	E-0, Step 20.c.3, RNO
			BOP	STOP kitchen exhaust fan	E-0, Step 20.d
BOOTH INST	NOTE	When called, WAIT 3 - 5 min, Then REPORT "All Control Building pressure boundary doors are Closed and Dogged."	PEO	Close and Dog (as applicable) Control Building pressure boundary doors.	E-0, Step 20.e
			RO	Check RCS Temperature	E-0, Step 21

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				Verify RCS cold leg WR temperature - BETWEEN 550°F and 560°F	E-0, Step 21.a
			US	Perform the applicable action:	E-0, Step 21.a, RNO
		temperature will be going down due to energy release and SI flow.		<ul style="list-style-type: none"> IF the temperature is LESS THAN 550°, THEN proceed to Step 21c. 	
			BOP	Maintain total feed flow BETWEEN 530 and 600 gpm until NR level is GREATER THAN 8% (42% ADVERSE CTMT) in at least one SG	E-0, Step 21.c
			BOP	CLOSE SG atmospheric dump and dump bypass valves	E-0, Step 21.d
			BOP	Check the following valves - CLOSED	E-0, Step 21.e
				<ul style="list-style-type: none"> MSIVs MSIV bypass valves 	
			RO	Check PZR Valves	E-0, Step 22
				Verify PORVs - CLOSED	E-0, Step 22.a
			RO	Verify normal PZR spray valves - CLOSED	E-0, Step 22.b

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			RO	Verify PZR safety valves - CLOSED	E-0, Step 22.c
			CREW	To prevent damage to the RCP seal(s), seal injection flow should be maintained to all RCPs.	E-0, Step 23, CAUTION
		RCPs will be off due to the loss of offsite power. The crew may proceed past this step.	RO	Check If RCPs Should Be Stopped	E-0, Step 23
			RO	Verify RCS pressure - LESS THAN 1500 psia (1800 psia ADVERSE CTMT)	E-0, Step 23.a
			RO	Verify charging or SI pumps - AT LEAST ONE RUNNING	EOP 35 E-0, Step 23.b
			RO	STOP all RCPs	E-0, Step 23.c
			BOP/RO	Check If SG Secondary Boundaries Are Intact	E-0, Step 24
				Check pressure in all SGs	E-0, Step 24.a
				<ul style="list-style-type: none"> NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER 	

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				<ul style="list-style-type: none"> • NO SG COMPLETELY DEPRESSURIZED 	
		Ensure crew request activity samples with HP coverage	BOP	Check If SG Tubes Are Intact	E-0, Step 25
			RO	Verify trend history and alarm status of radiation monitors	
				<ul style="list-style-type: none"> • Main steam line - NORMAL • Condenser air ejector - NORMAL • SG blowdown - NORMAL 	
			BOP	Check steam generator levels - NO SG LEVEL INCREASING IN AN UNCONTROLLED MANNER	E-0, Step 25.b
			RO	Align all SGs for activity samples.	E-0, Step 25.c
			RO	RESET SG blowdown sample isolation	E-0, Step 25.c.1
			RO	OPEN SG blowdown sample isolation valve(s)	E-0, Step 25.c.2
		Acknowledge request & ensure crew request HP coverage	US	Request Chemistry obtain activity samples using HP coverage	E-0, Step 25.d
			RO	Check If RCS Is Intact	E-0, Step 26

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				<ul style="list-style-type: none"> • Verify Ctmt radiation using 3CMS*RE22 (pre-trip) - NORMAL • Verify Ctmt radiation using radiation monitoring group histogram (CTMT) - NORMAL • Verify Ctmt pressure - NORMAL • Verify Ctmt recirculation sump level - NORMAL 	
		FR-P.1, Pressurized thermal shock will be "RED & FR-Z.1 will be "Orange". The crew should address FR-P.1 then FR-Z.1 & then transition to E-1	US	Initiate monitoring of CSF Status Trees and Go to E-1, Loss of Reactor or Secondary Coolant.	E-0, Step 26 RNO
		FR-P.1 rev 11	CREW	If RWST level decreases to LESS THAN 520,000 gal, Go to ES-1.3, Transfer to Cold Leg Recirculation, to align to ECCS system.	FR-P.1 Step 1 Caution
			RO	Check RCS Pressure - GREATER THAN 300 psia (500 psia ADVERSE CTMT)	FR-P.1 Step 1
			US	Perform the applicable action:	FR-P.1 Step 1 RNO
			RO	• <u>IF</u> RHR pump flow is LESS THAN 1000 gpm <u>THEN</u> Proceed to step 2.	

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		YES	RO/US	<ul style="list-style-type: none"> IF RHR pump flow is GREATER THAN 1000 gpm THEN Go to procedure and step in effect. 	
		FR-Z.1 Rev. 10	US/RO	Verify CIA (ESF Group 2 Status columns 2 Through 10)	FR-Z.1, Step 1
			US	Verify CIB	FR-Z.1, Step 2
			RO	Check RPCCW Ctmt supply and return header isolation valves - CLOSED	FR-Z.1, Step 2.a
			RO	Check RPCCW pumps - STOPPED	FR-Z.1, Step 2.b
		RCPs are off	RO	STOP all RCPs	FR-Z.1, Step 2.c
		not in progress		If ECA-1.1, Loss of Emergency Coolant Recirculation, is in progress, Ctmt spray should be operated as directed in ECA-1.1 rather than steps 3, 4, and 7	FR-Z.1, Step 3 CAUTION
			US	Verify Quench Spray System Operation	FR-Z.1, Step 3
			RO	Check RWST level - GREATER THAN 100,000 gal (annunciator RWST EMPTY QSS PP OFF on MB2A 5-2 not lit)	FR-Z.1, Step 3.a

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		should have been done in E-0	RO	Verify quench spray pumps - RUNNINGS	FR-Z.1, Step 3.b
		should have been done in E-0	RO	Verify quench spray pump discharge valves (3QSS*MOV34A and 3QSS*MOV34B) - OPEN	FR-Z.1, Step 3.c
		should have been done in E-0	RO	Check quench spray system - FLOW EXISTS IN AT LEAST ONE TRAIN	FR-Z.1, Step 3.d
			US	Proceed to step 5.	FR-Z.1, Step 3.e
		Pumps are off due to loss of offsite	BOP	STOP All Main Circulating Water Pumps	FR-Z.1, Step 5
			BOP	Check Containment Ventilation	FR-Z.1, Step 6
				<ul style="list-style-type: none"> Verify CAR fans - STOPPED Verify CRDM fans - STOPPED 	
			US	Verify Recirculation Spray System Operation	FR-Z.1, Step 7
			RO	Check CDA signal - PRESENT AFTER 11 minutes (annunciator CTMT RECIRC PUMP AUTO START SIGNAL on MB2B 1-8 lit)	FR-Z.1, Step 7.a
		RSS Pumps should be running	RO	Verify recirculation spray pumps - RUNNING	FR-Z.1, Step 7.b
			RO	Verify recirculation spray pump suction isolation valves - OPEN	FR-Z.1, Step 7.c

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			RO	Verify recirculation spray pump discharge isolation valves - OPEN	FR-Z.1, Step 7.d
			RO	Verify recirculation spray - FLOW EXISTS IN AT LEAST ONE TRAIN	FR-Z.1, Step 7.e
			RO	Verify ESF Status Panel Group 4 Lights - LIT	FR-Z.1, Step 8
			US/ BOP	Verify Main Steam Line Isolation	FR-Z.1, Step 9
				<ul style="list-style-type: none"> • Check MISVs and MISV bypass valves - CLOSED • Check ESF Status Group 3 lights - LIT 	
			BOP/RO	Verify Main Feedwater Isolation	FR-Z.1, Step 10
				<ul style="list-style-type: none"> • Verify MD <u>AND</u> TD FW pumps - TRIPPED • Verify FW isolation trip valves - CLOSED • Verify SG feed regulating valves - CLOSED • Verify SG feed regulating bypass valves - CLOSED • At least one SG must be maintained available for RCS cooldown. 	FR-Z.1, Step 11, CAUTION

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				<ul style="list-style-type: none"> If all SGs are faulted, at least 100 gpm feed flow should be maintained to each SG. 	FR-Z.1, Step 11, CAUTION
			US	Check If Auxiliary Feedwater Flow Should Continue To All SGs	FR-Z.1, Step 11
			BOP/RO	Check pressure in all SGs	FR-Z.1, Step 11.a
				<ul style="list-style-type: none"> NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER NO SG COMPLETELY DEPRESSURIZED 	
			US	Check Hydrogen Concentration	FR-Z.1, Step 12
T= Request made		Acknowledge request and take procedure to start placing in service	PEO	Using OP 3313A, "Hydrogen Recombiners and Recombiner Building Ventilation," Start the hydrogen monitoring system	FR-Z.1, Step 12.a
		Cannot verify until monitors are on line	US	Verify hydrogen concentration - LESS THAN 5%	FR-Z.1, Step 12.b
			US	Proceed to step 13.	FR-Z.1, Step 12.b, RNO
			SS	Notify ADTS of Hydrogen Concentration Inside Containment	FR-Z.1, Step 13

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			US	Periodically Monitor Hydrogen Concentration (every 8 hours)	FR-Z.1, Step 14
		E-1 is the procedure in effect	US	Go to Procedure and Step In Effect	FR-Z.1, Step 15
		E-1 (Rev 17) STEPS	CREW	To prevent seal damage, seal injection flow should be maintained to all RCPs.	E-1 Step 1 CAUTION
			CREW	Foldout page must be open.	E-1 Step 1 NOTE
		RCPs are off	US	Check If RCPs Should Be Stopped	E-1 Step 1
			US	Proceed to step 2	E-1 Step 1a RNO
			US	Check If SG Secondary Boundaries Are Intact	E-1 Step 2
		SG press is dropping due to RCS Temp going down	BOP	Check pressures in all SGs -	E-1 Step 2a
				<ul style="list-style-type: none"> • NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO SG COMPLETELY DEPRESSURIZED 	
			US	Check Intact SG Levels	E-1 Step 3
			BOP	Verify NR level - GREATER THAN 8% (42% ADVERSE CTMT)	E-1 Step 3a

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			BOP	Control feed flow to maintain NR level between 8% and 50% (42% and 50% ADVERSE CTMT)	E-1 Step 3b
			US	Check Secondary Radiation	E-1 Step 4
			RO	Verify trend history and alarm status of radiation monitors	E-1. Step 4a
				<ul style="list-style-type: none"> • Main steam line - NORMAL • Condenser air ejector - NORMAL • SG blowdown - NORMAL 	
		Aligned in E-0	RO	Align all SGs for activity samples	E-1 Step 4c
				1) RESET SG blowdown sample isolation	
				2) OPEN SG blowdown sample isolation valve(s)	
			US/ SS	Request chemistry obtain activity samples using HP coverage	E-1 Step 4c
				If any PZR PORV opens because of high PZR pressure, step 5.a should be repeated after pressure decreases to LESS THAN 2350 psia.	E-1 Step 5 CAUTION
			US	Check Pzr PORVs and Block Valves	E-1 Step 5
			RO	Verify PORVs - CLOSED	E-1 Step 5a

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			RO	Verify block valves - AT LEAST ONE OPEN	E-1 Step 5b
		ECCS Flow cannot be reduced	US	Check If ECCS Flow Should Be Reduced	E-1 Step 6
			RO	Verify RCS subcooling based on core exit TCs - GREATER THAN 32°F (115°F ADVERSE CTMT)	E-1 Step 6a
			BOP	Verify secondary heat sink	E-1 Step 6b
				<ul style="list-style-type: none"> Total feed flow to intact SGs - GREATER THAN 530 gpm 	
				<u>OR</u>	
				<ul style="list-style-type: none"> Narrow range level in at least one intact SG - GREATER THAN 8% (42% ADVERSE CTMT) 	
			RO	Verify RCS pressure - STABLE OR INCREASING	E-1 Step 6c
			RO	Verify PZR level - GREATER THAN 16% (50% ADVERSE CTMT)	E-1 Step 6d
			US	DO NOT stop ECCS pumps. Proceed to CAUTION prior to step 8.	E-1 Step 6d, RNO
				To ensure adequate ECCS flow, DO NOT stop any recirculation spray pumps used for core injection flow.	E-1 Step 8 CAUTION

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				The recirculation spray pumps are sequenced to automatically start 11 minutes after a CDA.	E-1 Step 8 NOTE
			US	Check If Ctmt Spray Should Be Stopped	E-1 Step 8
			RO	Verify quench spray pumps - RUNNING	E-1 Step 8a
			RO	Verify Ctmt pressure - LESS THAN 17.5 psia	E-1 Step 8b
			US	Proceed to CAUTION prior to step 9 and, <u>WHEN</u> Ctmt pressure is LESS THAN 17.5 psia, <u>THEN</u> Return to steps 8c.	E-1 Step 8b, RNO
				<ul style="list-style-type: none"> If offsite power is lost after SI reset, manual actions to restart safeguards equipment may be required. To provide adequate ECCS flow, RCS pressure should be monitored to ensure that the RHR pumps are manually restarted if pressure decreases to LESS THAN 300 psia (500 psia ADVERSE CTMT) 	E-1 Step 9 CAUTION

EVALUATION GUIDE

Exam Title: TURBINE TRIP & LARGE BREAK LOCA

ID Number: Y2KNRC-2

Revision: 0, change 1

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	Check If RHR Pumps Should Be Stopped	E-1 Step 9
			RO	Check RCS pressure 1) Verify pressure - GREATER THAN 300 psia (500 psia ADVERSE CTMT) 2) Verify pressure - STABLE OR INCREASING	E-1 Step 9a
			US	1) Proceed to step 11 Do not reset CDA if the recirculation spray pumps are required and have not automatically started.	E-1 Step 9a, RNO E-1 Step 11 CAUTION
			US	Check If Diesel Generators Should Be Stopped	E-1 Step 11
			BOP	Verify AC emergency busses - BOTH ENERGIZED BY OFFSITE POWER	E-1 Step 11a
			BOP	Proceed to step 11.c. RESET LOP at MB2. Check offsite power from RSSA or NSSA - AVAILABLE	E-1 Step 11a, RNO E-1 Step 11c E-1 Step 11d

EVALUATION GUIDE

Exam Title: TURBINE TRIP & LARGE BREAK LOCA

ID Number: Y2KNRC-2

Revision: 0, change 1

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Proceed to step 11.f and, WHEN Offsite power becomes available, THEN Perform step 11.e.	E-1 Step 11d RNO
				Perform the following as required (observe EDG loading requirements):	E-1 Step 11f
				1) START an instrument air compressor	
				2) Turn ON PZR backup heaters (H1A and H1B)	
				3) START Fuel Bldg filter exhaust fan	
				4) Check one RPCCW pump - RUNNING	
				4) Proceed to step 11.g and <u>WHEN</u> One RPCCW pump is started, <u>THEN</u> Perform step 11.f.5.	E-1 Step 11f.4, RNO
				RESET SI and CDA, if required	E-1 Step 11g
T+ 3 min of request	EDR18	Resets MCC 32-3T	PEO	Locally perform the following to energize MCC32-3T	E-1 Step 11h
T+ 5 min of request	EDR44	Resets Inv 6 DC alarms REPORT as Completed		1) CLOSE the feeder breaker on 32T for MCC 32-3T (32T13-2)	
				2) Verify Inverter 6 DC input ammeter indicating zero amps	

EVALUATION GUIDE

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Revision: 0, change 1

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Check emergency diesel generators - BOTH RUNNING UNLOADED	E-1 Step 11i
				Perform the following:	E-1 Step 11i,, RNO
				1) For the loaded EDG(s), locally Perform the following, at the associated diesel generator sequencer panel:	
				a) RESET station LOP	
				b) Press SIS, CDA TO RECIRC pushbutton	
				c) Place the automatic tester toggle switch to RESET, then Place to ON	
				3) Proceed to CAUTION prior to step 12.	
			US/ SM	Consult with the ADTS and EMT Team prior to performing any local inspections in the Auxiliary Building or ESF Building.	E-1 Step 12 CAUTION
			US	Initiate Evaluation Of Plant Status	E-1 Step 12
			US	Verify cold leg recirculation capability	E-1 Step 12a

EVALUATION GUIDE

Exam Title: TURBINE TRIP & LARGE BREAK LOCA

ID Number: Y2KNRC-2

Revision: 0, change 1

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			BOP	1) Power to recirculation spray pumps - AVAILABLE	
			RO	2) Verify power for cold leg recirculation valves using Attachment A - AVAILABLE	
			RO	Check Auxiliary Building and ESF Building radiation (radiation monitoring group histograms) <ul style="list-style-type: none"> Auxiliary Building (AUX) - NORMAL ESF Building (ESF) - NORMAL SLCRS Area (SLRW) - NORMAL 	E-1 Step 12b
			RO	Align for PASS samples <ul style="list-style-type: none"> 1) RESET CIA 2) OPEN PASS isolation valves 	E-1 Step 12c
			US/ SM	Request ADTS obtain samples using EPOP 4449, Unit 3 RX Coolant and Liquid Waste PASS <ul style="list-style-type: none"> RCS boron concentration RCS activity (fuel damage assessment) RCS hydrogen concentration 	E-a, Step 12d

EVALUATION GUIDE

Exam Title: TURBINE TRIP & LARGE BREAK LOCA

ID Number: Y2KNRC-2

Revision: 0, change 1

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				<ul style="list-style-type: none"> Ctmt sump boron concentration Ctmt sump activity 	
			US	Check If RCS Cooldown And Depressurization Is Required	E-1 Step 13
			RO	Verify RCS pressure - GREATER THAN 300 psia (500 psia ADVERSE CTMT)	E-1 Step 13a
			US	<u>IF</u> RHR pump flow is GREATER THAN 1000 GPM, <u>THEN</u> Proceed to step 14	E-1 Step 13a, RNO
			US	Check If Transfer To Cold Leg Recirculation Is Required	E-1 Step 14
			RO	Verify RWST level - LESS THAN 520,000 gal.	E-1 Step 14a
			US	Return to CAUTION prior to step 12.	E-1 Step 14a, RNO
FREEZE			US	Go to ES-1.3, Transfer to Cold Leg Recirculation	E-1 Step 14b
TERMINATE SCENARIO			CREW	<ul style="list-style-type: none"> SI recirculation flow to RCS must be maintained at all times. 	ES-1.3 Step 1, CAUTION

SECTION 4

ID Number: Y2KNRC-2

Revision: 0, change 1

EVALUATION GUIDE

I. SUMMARY

1. The following **Critical Tasks** are covered in this exercise:

<u>TASK DESCRIPTION</u>	<u>TASK #</u>	<u>K/A >= 3.0</u>
Energize at least one ac emergency bus [before transition out of E-0], unless the transition is to ECA-0.0, in which case the critical task must be performed [before placing safeguards equipment hand switches in the pull-to-lock position]	<u>E-0 -- C</u>	000-055-EA1.024. 4.3/4.4
Manually actuate CDA or start at least one Quench Spray Pump before an extreme (red-path) challenge develops to the containment CSF	<u>E-0 -- E</u>	026-000-A1.01 3.9/4.2

Note: **[critical task]** Used to designate critical tasks.
Should also be incorporated into column 3 or 4 of Instructor Guide.

2. NON-Critical Tasks covered in this exercise are listed later in the guide.

SECTION 4

Lesson Title: TURBINE TRIP & LARGE BREAK LOCA

ID Number: Y2KNRC-2

Revision: 0, change 1

EVALUATION GUIDE

II. FOLLOW-UP QUESTIONS: (document any follow up questions asked)

SECTION 5

SCENARIO INITIAL CONDITIONS

ID Number: Y2KNRC-2

Revision: 0, change 1

Reactor Power: 27%

Operating History: 3 days on line

RCS Boron: 1650 ppm

Core Burnup: 150 MWD/MTU

Condensate Demins: 4 IN SERVICE

Evolutions in Progress: Plant startup after refueling is in progress

Major Equipment OOS:

The "A" MDAFW Pump will be out of service for routine pms. The pump is expected back within the next 8 hrs. 60 hrs are left on the 72 hr clock.

Crew Instructions:

Maintain power while awaiting primary and secondary chemistry results.
The crew is currently in OP3204, At Power Operation, at step 4.1.10

Note from Reactor engineering. MTC is slightly negative with a value of approximately -4 pcm/degree. There are no restrictions on rod steps/min to maintain power or temperature.

Plant/Simulator Differences:

- ° Rad Monitor Historical Data--Simulator Rad Monitor historical data not valid prior to the beginning of this exercise.
- ° If not using the speed dial option on the phone system, the operator must dial either #3333 or #3334 to reach the person/department they desire.
- ° The following PPC programs do not function on the simulator:
 - Samarium Follow
 - Xenon Follow
 - Sequence of Events

SECTION 6

VALIDATION CHECKLIST

Title: TURBINE TRIP & LARGE BREAK LOCA

ID Number: Y2KNRC-2

Revision: 0, change 1

Remote functions:

All remote functions contained in the guide are certified.

Malfunctions:

All malfunctions contained in the guide are certified.

Initial Conditions:

The initial condition(s) contained in the guide are certified or have been developed from certified IC's in accordance with NSEM-4.02.

Simulator Operating Limits:

The simulator guide has been evaluated for operating limits and/or anomalous response.

Test Run:

The scenario contained in the guide has been test run and validated (validation sheet completed, next page) on the simulator. Simulator response is reasonable and as expected.

Examination Scenario Review

The dynamic examination review checklist is complete. (This is not required unless the exam will be used as an Annual Exam, then NUREG 1021 requirements apply.)

C. Martin

Technical Reviewer

3/30/00

Date

SECTION 7

REFERENCE AND TASK TRACKING

Title: TURBINE TRIP & LARGE BREAK LOCA

ID Number: Y2KNRC-2

Revision: 0, change 1

I. References:

AOP 3571	Response to an Instrument Failure
AOP 3550	Turbine trip
EOP E-0	Reactor Trip or safety Injection
EOP FR-P.1	Response to Imminent Pressurized Thermal Shock
EOP FR-Z.1	Response to high CTMT Pressure
EOP E-1	Loss of reactor or Secondary Coolant
EPIP 4400	Event Assessment, Classification and Reportability
ERG_EXE	Westinghouse Owners Group Executive Document
Step_DOC	MP3 Step Deviation Document
ERG_HP	Westinghouse Owners Group Background Document
NUREG-1021 rev 8	Examiners Standards

II. Non- Critical Tasks Covered in this Guide/Test:

- Respond to a Steam flow transmitter Failure
- Respond to a Power Range Instrument Failure
- Respond to a turbine Trip from Low Power
- Respond to a Loss of Offsite Power
- Respond to a Large Break LOCA
- Respond to a high CTMT Pressure
- Demonstrate the ability to classify the event using the emergency classification tables

SECTION 8

SCENARIO ATTRIBUTES CHECKLIST

Lesson Title: TURBINE TRIP & LARGE BREAK LOCA

ID Number: Y2KNRC-2

Revision: 0, change 1

Assessor: J. William Côté

Concurrence:

C Martin 3/30/00

QUALITATIVE ATTRIBUTES

- Y 1. The scenario summary clearly states the objectives of the scenario.
- Y 2. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the crew into expected events.
- Y 3. The scenario consists mostly of related events.
- Y 4. Each event description consists of:
- the point in the scenario when it is to be initiated
 - the malfunctions(s) that are entered to initiate the event
 - the symptoms/cues that will be visible to the crew
 - the expected operator actions (by shift position)
 - the event termination point
- Y 5. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
- Y 6. The events are valid with regard to physics and thermodynamics.
- Y 7. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
- N/A 8. If time compression techniques are used, scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.
- Y 9. The simulator modeling is not altered.
- Y 10. The scenario has been validated. Any open simulator performance deficiencies have been evaluated to ensure functional fidelity is maintained while running the scenario.
- Y 11. Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered IAW Section D.4 of ES301
- Y 12. All individual operator competencies can be evaluated, as verified using form ES-301-6.
- Y 13. Each operator will be significantly involved in the minimum number of transients and events specified on Form ES-301-5. (Form submitted with simulator scenarios).
- Y 14. Level of difficulty is appropriate to support licensing decisions for each crew position.

SECTION 8

SCENARIO ATTRIBUTES CHECKLIST

Lesson Title: TURBINE TRIP & LARGE BREAK LOCA

ID Number: Y2KNRC-2

Revision: 0, change 1

Note: Following criteria list scenario traits that are numerical (QUANTITATIVE) in nature.

- | | | |
|-----|--|-----------------|
| 01. | Total Malfunctions (TM) - Include EM's- 5 to 8 required
Steam flow transmitter, PR Channel, Turbine trip, Loss of offsite, large break LOCA, auto start failure of edgs, auto close failure of edg output breakers, ctmnt depressurization auto actuate failure | Total <u>8</u> |
| 02. | Mal's after EOP entry (EM's)- 1 to 2 required
large break LOCA, auto start failure of edgs with auto close failure of edg output breakers, ctmnt depressurization auto actuate failure | Total <u>4</u> |
| 03. | Abnormal Events (AE)-2 to 4 required
Steam flow transmitter, PR Channel, Turbine trip, | Total <u>3</u> |
| 04. | Major Transients (MT)-1 to 2 required
Loss of offsite, large break LOCA | Total <u>2</u> |
| 05. | EOP's (EU) entered/requiring substantive actions 1 to 2 required
E-0, reactor trip or Safety Injection, E-1, Loss of Reactor or Secondary Coolant, FR-Z.1, Response to High CTMT Pressure | Total <u>2</u> |
| 06. | EOP Contingencies requiring substantive actions [ECAs/FRs](EC) 0 to 2 required
FR-Z.1, Response to High CTMT Pressure | Total <u>1</u> |
| 07. | Critical Task (CT) - 2 to 3 required
Supply AC Power, Actuate Ctmnt Depressurization System | Total <u>2</u> |
| 08. | Approximate Scenario Run Time: 45 to 60 min. (One scenario may approach 90 minutes) | Total <u>60</u> |
| 09. | EOP run time: | Total <u>30</u> |
| 10. | Technical Specifications are exercised during the scenario.
PR channel failure | (Y/N) <u>Y</u> |

SECTION 9

Summary of Changes

1. Added a steam flow transmitter failure to ensure BOP receives an instrument failure. NRC Requested.
2. Based on additional instrument failure updated total malfunctions and abnormal events count.
3. Corrected minor typographical errors.

Developer:


J. William Côté

Date:

3/30/00

Concurrence:


Martin

Date:

3/30/00

MILLSTONE NUCLEAR POWER STATION



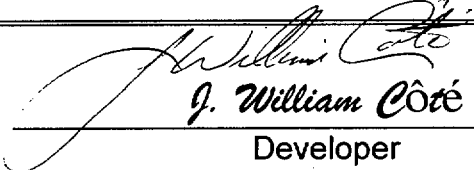
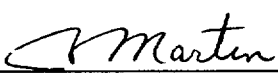
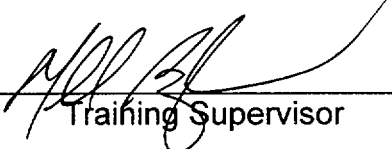
LOIT NRC SIMULATOR EXAM GUIDE APPROVAL SHEET

Exam Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

Revision: 0

ID Number: Y2KNRC-3

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Submitted by:	 J. William Côté Developer	<u>1/11/00</u> Date
Validated by:	 J. Martin Technical Reviewer	<u>2/21/00</u> Date
Approved by:	_____ Operation Manager (Optional)	_____ Date
Approved by:	 Training Supervisor	<u>2/28/00</u> Date



SECTION 2

SIMULATOR EXAM GUIDE

TABLE OF CONTENTS

SECTIONS LISTED IN ORDER

1. Cover Page
2. Table of Contents
3. Exam Overview
4. Evaluation Guide
5. Scenario Initial Conditions Sheet
6. Scenario Validation Checklists
7. Reference and Task Tracking
8. Scenario Attributes Checklist

Attachments

- NUTIMS Module Report



SECTION 3 EXAM OVERVIEW

Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

Revision: 0

1. Purpose:

This category of the operating test implements item 1-8 and 11-13 identified in 10CFR55.45(a). This is the most performance based category of the operating test and is used to evaluate the applicants ability to safely operate the plant's systems under dynamic, integrated conditions. (ES-301-B.3)

2. Exercise brief:

The crew will take the shift with the plant at 100% power and middle of life conditions. The "B" MDAFW Pump will be out of service for routine oil change. The pump is expected back within the next 8 hrs.

Shortly after turnover, a Tcold instrument will fail high. This should cause rapid inward rod motion that can only be stopped by going to "MAN" on rod control SEL Switch. The crew should enter AOP 3571, Instrument Failure Response, to address the situation. Actions should include removing the instrument from service, addressing tech specs and restoring rod control.

As the operator attempts to restore rods to the previous position, one will drop. The crew should utilize AOP 3552, Rod Control Malfunction, to recover the dropped rod. Upon investigation, the crew will be informed that the rod cannot be recovered in less than 1 hr. The crew will then be directed by the Duty Officer to lower power to less than the Tech Spec required within the next 30 minutes. The crew should utilize AOP 3575, Rapid Downpower, to execute the downpower.

Upon the evaluators cue, a rod control urgent failure alarm will occur and the other bank "D" rod will drop. The crew should respond by manually tripping reactor. Upon the reactor trip the TDAFW Pump will trip. The "A" MDAFW Pump will start and fail to deliver any water. The crew should transition to FR-H.1, Response to a Loss of Heat Sink, to address the problem. The crew will discover the discharge valve on the "A" MDAFW Pump closed and be required to open it. Once established, AFW flow will be less than 530 gpm (min required for heat sink) due to high SG Pressures. The crew will utilize the associated RNO and exit FR-H.1 based on Wide Range levels increasing and Core Exit Temperatures decreasing **[critical task]**.

Once in ES-0.1, Rx Trip Response, a leak in the Pzr Vapor space will commence. The crew will need to identify the lowering pressure situation and determine that safety injection is required and manually actuate it **[critical task]**. The crew should return to E-0, Rx Trip or Safety Injection, and commence actions. While performing actions of E-0 the leak will increase in size requiring transition to FR-Z.1, Response to High CTMT Pressure. The goal is to test the EOP users guide and implementation of status trees. Performance of E-0 not required for credit.

The session will terminate upon transition to FR-Z.1. The events should be classified as an ALERT-C1 based on either RCS Barrier Failure, Heat sink RED or Uncontrolled RCS Pressure drop with a rise in CTMT Pressure.

3. Plant/Simulator differences that may affect the scenario are: NONE

4. Duration of Exam: 1.0 hour(s)

SECTION 4

EVALUATION GUIDE

Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

Revision: 0

All Control Room Conduct, Operations and Communications shall be in accordance COP 200.1, Conduct of Operations, and OP 3260, Unit 3 Conduct of Operations.

"Review the Simulator Operating Limits(design limits of plant) and the Simulator Modeling Limitations and Anomalous Response List prior to performing this exam scenario on the simulator. The evaluators should be aware if any of these limitations may be exceeded." (NSEM 6.02)

SIMULATOR PROBLEMS DURING EXAMS

It is the responsibility of the Instructors in the simulator to insure that exam interruptions have a minimum negative impact on the Crew and the examinations we provide.

Be aware that at all times the Operators should treat the simulator as if it were the plant and you too should treat it as much like the plant as possible when they are in the simulator.

As soon as the Instructors are aware of a simulator problem that will adversely affect the exam in progress (computer fault, etc.) the Instructor should:

1. Place the simulator in FREEZE if possible.
2. Announce to the Crew that there is a simulator problem.
3. Request that the Crew leave the simulator control room. (The Crew should leave the simulator for problems which involve major switch alignments).
4. Deal with the problem (reboot, call STSB, etc.)
5. After the Instructors believe the simulator is restored to service, the Crew should be told how the exam will continue. If it is possible and felt to be acceptable to the evaluators, the examination can begin where it left off with an update on plant parameters and each Crew member is prepared to restart. If the examination will not begin where it left off, the crew should be told how and where the exam will begin again.
6. Once the Crew has been told how and where the exam will begin, have the crew conduct a brief so that the Instructor and evaluators can insure that the crew has all the necessary information to continue with the scenario.
7. Once all Crew members, Instructors and evaluators are satisfied that they have the necessary information to continue the scenario, place the simulator in RUN and announce to the Crew that you have continued the evaluation session.

SECTION 4

Lesson Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
1.		START the Sun Workstation.			
		a. IF the Sun Workstation is running THEN go to SIM ACTIVE.			
2.		PLACE Recorder Power to ON.			
3.		VERIFY that the current approved training load is loaded.			
4.		REMOVE the step counter OVERRIDE and allow the counters to step out during the IC reset.			
5.		RESET to IC 14			
6.		ADJUST the various pot settings to the valued specified by the chart in the simulator booth or <u>Notepad</u> for the selected IC.			
7.		PLACE Simulator to RUN.			
8.		ADJUST MWt using Turbine Load Set to 3411, (+)0, (-)3 IF using 100% power IC.			
9.		RESET the Plant Calorimetric at the Instructor Station PPC by Pressing "SHIFT LEFT" and "F6" simultaneously.			
10.		ENSURE Simulator fidelity items cleared.			
		a. CHECK the STEP COUNTERS at correct position for plant conditions.			
		b. PLACE <u>7</u> tiles under the DEMINS IN SERVICE lamacord label on MB6.			
		c. PLACE the Main Turbine on the LOAD LIMITER and ENSURE Standby Load Set MATCHED if conditions require.			
		d. PLACE the Westronic (5) and Gammametrics (2) recorders in active/run by depressing up or down arrow for each.			
		e. CLEAR DCS alarms on MB7 and BOP console.			
		f. VERIFY annunciator, "COMPUTER FAILURE" (MB4C, 1-11), is NOT LIT.			
		g. ENSURE NSSS Picture 1, MODES 1, 2, 3, 4; Burnup and Cb match lesson plan AND Cb sample date < 3 days old.			

SECTION 4

Lesson Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
		1) See laminated directions on clipboard in Sim booth.			
11.		RESET Computer Terminals to At Power displays if 100% power IC.			
		a. MB2, (AY6), CVCS Data Trend, 1 minute update, CHS-F132 (40-120), CHS-L112 (40-80), CHS-F121 (40-80), RCS-L461 (40-80)			
		b. MB4, (AY1), At Power Data Trend, 15 second update, CVQRPI, (3391-3428), CVQRPHRUN (3409-3413), CVQRP (3409-3413), RCL-T412*, (585-588)			
		c. MB4, (AY4), NSSS Picture 1, MODES 1, 2, 3, 4			
		d. BOP Console (AY5A), BOP Picture 26, Circ Water			
		e. STA Console, (AY3), NSSS Picture 15, RCP Seals			
12.		RESET Rad Monitor Screen to Status Grid.			
13.		OVERRIDE the annunciators that will be lit longterm in the CR, (as listed in the "Lit CRP Annunciators" section of the MP3 daily Status Report hanging near instructor booth door).			
14.		IF placing equipment OOS, THEN perform the necessary switch manipulations and hang appropriate tags, as required, listed under "Equipment OOS."			
15.		LOCK the Simulator Room front door.			

SECTION 4

Lesson Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
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- ° **PLACE THE FOLLOWING EQUIPMENT IN PTL:**

Equipment OOS: The "B" MDAFW Pump will be out of service for routine oil change. Place in PTL and Yellow Tag

- ° Insert applicable CREW EXAM Tape into the VCR.
- ° Verify the MONITOR Time Display the same as the digital time display on MB4. If no, call/page the Unit Tech.

Initial Malfunctions

/IOs/IDAs:

FW18B		"B" MDAFW Pump Trip
FW19 on BT 1		Terry Turbine trip upon Reactor Trip Breakers OPEN
FW21A		"A" MDAFW Pump discharge valve CLOSED
RC17 sev = 100% ramp = 600 sec on RSCU = 3		Pzr Manway vapor space leak
RP07A		SI Auto actuation failure Tr. "A"
RP07B		SI Auto actuation failure Tr. "B"
3FWS*CTV41A	open switch to "OFF"	Prevents CTV41A from opening from MB5
3FWS*CTV41B	open switch to "OFF"	Prevents CTV41B from opening from MB5
3FWS*CTV41C	open switch to "OFF"	Prevents CTV41C from opening from MB5
3FWS*CTV41D	open switch to "OFF"	Prevents CTV41D from opening from MB5

SECTION 4

Lesson Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
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Lead Examiner: **Refer to the "Briefing Script for the Operational Exam" and brief the crew.**

Booth Instructor: **Commence Recording Simulator session**

Booth Instructor: **Perform the crew turnover (Initial Conditions page at end of Exam) with the crew .**

SECTION 4

Lesson Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
<u>EVENT ONE: Failure of Loop "B" NR Tcold Transmitter TE421B</u>					
T+ 1 minute of turnover	RX04B sev= 100%	RCS NR Tcold transmitter failure to full scale			
	NOTE>>	Tave will fail high. Rods will drive in. Delta T for "B" Loop will go low.	CREW	Check for a valid runback. When none is detected, PLACE Rod Control in Manual and transition to AOP 3571, Instrument Failure Response.	
			CREW	Recognize entry conditions into AOP 3571, Instrument Failure Response.	AOP 3571, entry condition
		AOP 3571 (Rev. 6) Actions	US	Transition to AOP 3571, Instrument Failure Response	
		Rod Control is primarily affected. Pzr Ref level will go to 62%. Pzr Level controller will need to be placed in manual	CREW	Determine the initiating parameter and place the effective controller in manual.	AOP 3571 Step 1
			CREW	Stabilize the plant parameters.	AOP 3571 Step 2
			US	Perform Corrective Actions - Attachment A.	AOP 3571 Step 3

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			RO	Defeat the failed channel input.	AOP 3571 Att.A Step 1
		No action may be required depending on when the crew placed rods in manual.	RO	Restore $T_{AVE} - T_{REF}$ error to within 1 °F and return rod control to automatic.	AOP 3571 Att.A Step 2
			RO	Monitor PZR level until stable.	AOP 3571 Att.A Step 3
			CREW	When conditions have stabilized, Observe MB annunciators and parameters. Immediately report any unexpected or unexplained conditions to the Shift Manager.	AOP 3571 Att.A Step 4
			US	Determine which Reactor Protection System bistable (s) requires tripping:	AOP 3571 Att.A Step 5
			US	Place a check mark in the box above the appropriate channel that requires tripping on page 4 of the Attachment.	AOP 3571 Att.A Step 5a
		3.3.1 - Action 6 applies 3.3.2 - Action 20 & 21 applies These are 6 hour requirements to trip bistables.	US/ SM	Refer to Technical Specification 3.3.1 and 3.3.2.	AOP 3571 Att.A Step 5b
		GOOD PRACTICE. Crew should perform a lamp check to verify no burned out light bulbs exist.	RO	Check the existing bistable status to ensure a reactor trip will not occur when the failed channel is tripped.	AOP 3571 Att.A Step 5c

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T= Request to trip Bistables	RXR107	OPEN - Protection Set door	US	Request the I&C Department trip the appropriate bistables using the last page of Attachment A and Attachment S.	AOP 3571 Att.A Step 5d
	RXR02	TRIP - OP DELTA T			
	RXR31	TRIP - C-4			
	RXR06	TRIP - OT DELTA T			
	RXR35	TRIP - C-3			
	RXR111	TRIP - Low Tave			
	RXR115	TRIP - P-12			
	RXR107	CLOSE - Protection Set door			
	NOTE>>	If crew elects to wait on tripping bistables, when Tech Specs have been addressed, GO TO EVENT 2	RO	Verify the appropriate bistable status lights are lit.	AOP 3571 Att.A Step 5e
T= I & C called & Tech Specs addressed		GO TO EVENT 2	US/ SM	Request I&C Department perform corrective maintenance on failed instrument.	
EVENT 2: Dropped Rod					
T = Event 1 complete & evaluator's cue	RD0359, sev = 0% Dropped Rod, D12, CB- D, GP2	0% severity = fully inserted.			

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		AOP 3552 Rev. 3	CREW	Stabilize Plant Conditions	AOP 3552 Step 1
		MALFUNCTION OF THE ROD DRIVE SYSTEM			
		Note: Power may rise greater than 102% on CH3 NI. CVQRPA (4 min Ave. calorimetric [Mwth]) is used for determination and therefore should not be reportable.	RO	Place control rod bank SEL switch in MAN	AOP 3552 Step 1.a
			RO	Verify - NO RODS MOVING	AOP 3552 Step 1.b
			CREW	Stop any power increase or decrease evolutions in progress.	AOP 3552 Step 1.c
			US	Verify Tavg - Tref deviation - LESS THAN OR EQUAL TO 1.5°F	AOP 3552 Step 1.d

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		Response may be different based on plant/crew response.	BOP/ RO	Perform the applicable action: • <u>IF</u> Tav _g greater than Tref <u>AND</u> the steam dumps are open, <u>THEN</u> Increase turbine load to minimize Tav _g - Tref deviation. • <u>IF</u> Tav _g greater than Tref <u>AND</u> the steam dumps are <u>NOT</u> open, <u>THEN</u> Borate to minimize Tav _g - Tref deviation. • <u>IF</u> Tav _g less than Tref, <u>THEN</u> Decrease turbine load to minimize Tav _g - Tref deviation.	AOP 3552 Step 1.d RNO
			US	Verify TURB LOAD REJECTION ARM C-7 (MB4D 6-6) annunciator - NOT LIT Borate or Dilute as necessary to maintain Tav _g within 1.5°F of Tref	AOP 3552 Step 1.e AOP 3552 Step 1.f
		Rod CB "D" D12 has dropped	US	Check No Rod Dropped	AOP 3552 Step 2
		Annunciator should NOT be lit	US	Verify RPI URGENT FAILURE (MB4C 4-10) annunciator - NOT LIT	AOP 3552 Step 2.a
		One Rod Bottom Light Lit	RO	Check rod bottom lights - NONE LIT	AOP 3552 Step 2.b

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		Expect Crew to Refer to Attachment B	CREW	Perform the applicable action: <ul style="list-style-type: none"> • <u>IF</u> only one rod bottom light is lit, <u>THEN</u> Perform dropped rod recovery using Att. B. • <u>IF</u> two or more rod bottom lights are lit, <u>THEN</u> Trip the reactor and Go to E-0, Reactor Trip or Safety Injection. 	AOP 3552 Step 2.b RNO
		ATTACHMENT B US should verbalize Cautions to CREW	CREW	Improper rod realignment can cause fuel damage either directly or in conjunction with plant transients.	AOP 3552 Att B Step 1, Caution
T= reactivity manipulation	Ann. Override	MB4C D-8 "ON". This will activate ROD CONTROL URGENT FAILURE alarm	CREW	Resetting ROD CONTROL URGENT FAILURE (MB4C 4-8) alarm without correcting the cause may result in dropping a group of control rods.	AOP 3552 Att B Step 1, Caution
satisfied & Examiner's cue	RD0360 sev = 0%	This will drop the second Control Bank "D" Grp 2 rod (H8). The crew will need to trip the plant with two dropped rods	CREW	DO NOT implement Step 5 through 8 until I & C has corrected the dropped rod malfunction	AOP 3552 Att B Step 1, Caution
		Report as I&C that rod h-8 just blew a stationary gripper coil fuse.	US	Check Plant Conditions	AOP 3552 Att B Step 1

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			US	Verify operational mode - MODE 1	AOP 3552 Att B Step 1.a
			RO	Identify dropped rod as follows: <ul style="list-style-type: none"> • Lit rod bottom (RB) light on DRPI display 	AOP 3552 Att B Step 1.b
			RO	<ul style="list-style-type: none"> • Zero indication on plant process computer, Rod Supervision 	
			RO	Verify ROD CONTROL URGENT FAILURE (MB4C 4-8) annunciator - NOT LIT	AOP 3552 Att B Step 1.c
		Respond to request to I&C department	US	Request I & C investigate and correct malfunction	AOP 3552 Att B Step 1.d
T+10 minutes of I&C request		Call back as I&C Supervisor and inform US that Rod d12 has a blown Stationary Gripper fuse. And that their is an acrid odor coming from the cabinet. Inform SM/US a complete damage assessment should be completed prior to attempting fuse replacement. Estimated time to complete ~6 hours..			

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			US	Check Shutdown Margin	AOP 3552 Att B Step 2
		Collect the SD Margin paperwork for review after session.	RO	Calculate SHUTDOWN MARGIN with a <i>dropped/misaligned</i> rod using OPS Form 3209B-1, SHUTDOWN MARGIN For MODES 1, 2	AOP 3552 Attachment B Step 2.a
			US	Verify SHUTDOWN MARGIN - ADEQUATE	AOP 3552 Att B Step 2.b
			US	Determine Technical Specification Requirements	AOP 3552 Att B Step 3
			RO	Verify reactor power - GREATER THAN 50%	AOP 3552 Att B Step 3.a
			RO	Determine QPTR as follows: <ul style="list-style-type: none"> Plant computer - Tilting Factors <u>OR</u> <ul style="list-style-type: none"> SP 31012, Quadrant Power Tilt Ratio 	AOP 3552 Att B Step 3.b
			RO	Verify QPTR - LESS THAN OR EQUAL TO 1.09	AOP 3552 Att B Step 3.c

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			RO	Verify QPTR - LESS THAN OR EQUAL TO 1.02	AOP 3552 Att B Step 3.d
		QPTR will be above 1.02 but below 1.09 3.2.4 action A applies	US	Perform the following: 1) Refer to Technical Specification 3.2.4, ACTION A, and Determine ACTION requirement 2) Notify Reactor Engineering	AOP 3552 Att B Step 3.d, RNO
		AFD is within acceptable limits	RO	Verify indicated AFD within limits using TRM, OPS Form 3273-3/4.3.2.1.1, AXIAL FLUX DIFFERENCE AS A FUNCTION OF RATED THERMAL POWER	AOP 3552 Att B Step 3.e
			RO	Check dropped rod in a Shutdown Bank	AOP 3552 Att B Step 3.f
			US	Proceed to Step 3.h	AOP 3552 Att B Step 3.f, RNO
			US	Refer to Technical Specification 3.1.3.1, and Determine ACTION requirement	AOP 3552 Att B Step 3.h

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			US	Check If Power Should Be Reduced	AOP 3552 Att B Step 4
		If contacted as the Duty Officer, Request the crew lower power to <75% within the next half hour using AOP 3575, Rapid Downpower	US	Verify rod dropped - GREATER THAN 1 hour	AOP 3552 Att B Step 4.a
		The crew should realize that this rod will not be recovered and continue with the actions	US	Proceed to CAUTION prior to Step 5 and, <u>IF</u> the rod is <u>NOT</u> recovered within 1 hour, <u>THEN</u> Perform steps 4.b through 4.g	AOP 3552 Att B Step 4.a, RNO
			US	Refer to Technical Specification 3.1.3.1 ACTION b.3	AOP 3552 Att B Step 4.b
			US	Declare affected rod inoperable	AOP 3552 Att B Step 4.c
			RO	Verify power - GREATER THAN 75%	AOP 3552 Att B Step 4.d

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		If contacted as the duty Officer, Request the crew lower power to <75% within the next half hour using AOP 3575, Rapid Downpower	RO	Perform the following: 1) Place control rod bank SEL switch in AUTO, if desired	AOP 3552 Att B Step 4.e
			CREW	2) Reduce power to less than or equal to 75% within 2 hours of time rod dropped using OP 3204, At Power Operations Request I & C to reduce the High Neutron Flux Trip setpoint to less than or equal to 85% within 4 hours of reaching 75% power	AOP 3552 Att B Step 4.f
		AOP 3575 Rev. 5	CREW	Determine Power Reduction Rate (%/min).	AOP 3575 Step 1
	NOTE	When the Evaluator is satisfied with the reactivity manipulation, PAGE FORWARD to the next event	US	Check desired power reduction rate - LESS THAN OR EQUAL TO 5%/min.	AOP 3575 Step 1.a
			US	Check power reduction a CONVEX requested <i>Emergency Generation Reduction</i> .	AOP 3575 Step 1.b
		Decrease rate could be .5 or 1 or 3 or 5% per minute	CREW	Determine load decrease rate using Table	AOP 3575 Step 1.b RNO

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			US	Proceed to Step 2.	AOP 3575 Step 1.d
			US	Check Rod Control In AUTO.	AOP 3575 Step 2
			CREW	Verify power Reduction Rate.	AOP 3575 Step 3
			US	Check power reduction rate - 5%/MIN.	AOP 3575 Step 3.a
			US	Perform the applicable action:	AOP 3575 Step 3.a RNO
		This flowpath assumes 1%/min	US	<ul style="list-style-type: none"> IF power reduction rate is LESS THAN 3%/min, THEN Proceed to NOTE prior to Step 5. 	
			CREW	Boric acid total volume addition and flow rates are based on approximations. Adjustments should be made to the volume addition or flow rate as necessary to ensure the reactor reaches the desired end state of:	AOP 3575 Step 5 NOTE
			RO	<ul style="list-style-type: none"> Tavg on program 	
			RO	<ul style="list-style-type: none"> Rods above the Rod Insertion Limit 	
			RO	<ul style="list-style-type: none"> AFD on or above the target value 	

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			US	Align RCS Makeup System For Boration.	AOP 3575 Step 5
		25 x 15 = 375 gallons	US	Determine required boric acid addition by multiplying total power change ($\Delta\%$) by 15(gal/%) = _____ gal.	AOP 3575 Step 5.a
			RO	Set the boric acid batch counter to total gallons of boric acid required.	AOP 3575 Step 5.b
			US	Check power reduction rate- AT 0.5%/min.	AOP 3575 Step 5.c
			RO	Adjust boric acid blend flow controller pot setting to 3.75 (15 gpm) and Proceed to Step 5.e.	AOP 3575 Step 5.c RNO
			RO	Place reactor coolant makeup control mode switch to BORATE.	AOP 3575 Step 5.e
			RO	Select START on reactor coolant makeup start switch.	AOP 3575 Step 5.f
			RO	Energize all PZR heaters.	AOP 3575 Step 5.g
			RO	If during the performance of this procedure the Rod Insertion Lo-Lo Limit is reached, Go to AOP 3566, Immediate Boration.	AOP 3575 Step 6 CAUTION

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			RO	A CONVEX requested emergency generation reduction should be completed within 15 minutes of notification.	AOP 3575 Step 6 NOTE
			BOP	Initiate Load Reduction.	AOP 3575 Step 6
			US	Check power reduction - CONVEX REQUESTED.	AOP 3575 Step 6.a
			US	Inform CONVEX of load reduction rate (Mwe/min) and final Mwe level.	AOP 3575 Step 6.a RNO
			BOP	Check turbine OPERATING MODE - NOT IN STANDBY.	AOP 3575 Step 6.b
			BOP	Check LOAD LIMIT LIMITING light - LIT.	AOP 3575 Step 6.c
			BOP	Intermittently Press DECREASE LOAD pushbutton until LOAD LIMIT LIMITING light - NOT LIT.	AOP 3575 Step 6.d
			BOP	Rotate LOAD LIMIT SET adjust knob at least one full turn in raise direction.	AOP 3575 Step 6.e
			BOP	Select DECREASE LOADING RATE to ON.	AOP 3575 Step 6.f
			BOP	Select LOAD RATE LIMIT %/MIN to required power reduction rate (%/min).	AOP 3575 Step 6.g

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			BOP	Utilizing DECREASE LOAD pushbutton, Adjust LOAD SET to desired final Mwe (power level).	AOP 3575 Step 6.h
			BOP	Maintain initial MVAR loading during power reduction, unless directed otherwise.	AOP 3575 Step 6.i
			RO	Check ROD CONTROL BANKS LIMIT LO (MB4C 3-9) annunciator - LIT.	AOP 3575 Step 6.j
			US	Proceed to Step 6.m and, IF the annunciator is received, THEN Perform Step 6.k and 6.l.	AOP 3575 Step 6.j RNO
			RO	Check boration - IN PROGRESS.	AOP 3575 Step 6.m
			RO	Boric acid total volume addition and flow rates are based on approximations. Adjustments should be made to the volume addition or flow rate as necessary to ensure the reactor reaches the desired end state of:	AOP 3575 Step 7 NOTE
			RO	• Tavg on program	
			RO	• Rods above the Rod Insertion Limit	
			RO	• AFD on or above the target value	
			US	Restore From Rapid Boration.	AOP 3575 Step 7

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			RO	Check rapid boration - IN PROGRESS.	AOP 3575 Step 7.a
			US	Proceed to Step 8.	AOP 3575 Step 7.a RNO
			US	Reduce Steam Supply To The MSRs.	AOP 3575 Step 8
			BOP	Check reheat steam flow controllers - IN AUTOMATIC.	AOP 3575 Step 8.a
			BOP	Using OP 3317, "Reheat and Moisture Separator," Perform manual adjustment of moisture separator reheater steam flow control valves, as necessary.	AOP 3575 Step 8.a RNO
			BOP	Using the MSR Startup Pressure Display on the Foxboro DCS, Verify symmetrical operation of the MSR reheaters during power decrease.	AOP 3575 Step 8.b
			BOP	Using OP 3317, "Reheat and Moisture Separator," Perform manual adjustment of moisture separator reheater steam flow control valves, as necessary.	AOP 3575 Step 8.b RNO
			US	Check If RCS Sample Is Required.	AOP 3575 Step 9

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			US	Verify change in Reactor Power - GREATER THAN 15% IN ONE HOUR.	AOP 3575 Step 9.a
			US	Request Chemistry sample the RCS for iodine (<i>within 2 to 6 hours after the power change.</i>)	AOP 3575 Step 9.b
			US	Verify Target Power Level - LESS THAN 50%.	AOP 3575 Step 10
		EVENT 3: Another Dropped Rod	US	Continue power reduction to desired target power level. <u>WHEN</u> final power level is reached, <u>THEN</u> Proceed to Step 21.	AOP 3575 Step 10 RNO
T= reactivity manipulation	Ann. Override	MB4C D-8 "ON". This will activate ROD CONTROL URGENT FAILURE alarm	RO	STOP boric acid transfer pump(s).	AOP 3575 Step 6.c
satisfied & Examiner's cue	RD0360 sev = 0%	This will drop the second Control Bank "D" Grp 2 rod (H8). The crew will need to trip the plant with two dropped rods	RO	Place charging line flow control valve in AUTO.	AOP 3575 Step 6.d
		Report as I&C that rod H-8 just blew a stationary gripper coil fuse.	US	Proceed to Step 8.	AOP 3575 Step 6.e
	Note	Page forward for E-0 Actions	US	Perform the Following:	AOP 3575 Step 21

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			US	Check power reduction is a CONVEX requested emergency generation reduction.	AOP 3575 Step 21.a
			US	Report completion and amount of power reduction to Unit 1 Shift Manager.	AOP 3575 Step 22.b
			CREW	Continue With Normal Plant Operations Using Applicable Plant Procedures.	
		NOTE: US should go to "Master Silence" before ordering reactor trip .	RO	TRIP the reactor	
		E-0 (Rev. 20) STEPS	Crew	Go to E-0, Reactor Trip or Safety Injection. <ul style="list-style-type: none"> Foldout page must be open ADVERSE CTMT defined as GREATER THAN 180°F or GREATER THAN 10⁵ R/hr in containment. The reactor can be interpreted as "tripped" when any two of three bulleted substeps of Step 1.* are satisfied. 	E-0, Step 1, NOTE

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			RO	Verify Reactor Trip <ul style="list-style-type: none"> • Check reactor trip and bypass breakers - OPEN • Check rod bottom lights - LIT • Check neutron flux - DECREASING 	E-0, Step 1
			BOP	Verify Turbine Trip Check all turbine stop valves - CLOSED	E-0, Step 2 E-0, Step 2.a
				Verify Power to AC Emergency Busses	E-0, Step 3
			BOP	Check busses 34C and 34D - AT LEAST ONE ENERGIZED	E-0, Step 3.a
			BOP	Check busses 34C and 34D - BOTH ENERGIZED	E-0, Step 3.b
				Try to Restore power to de-energized AC emergency busses.	E-0, Step 3.b, RNO
			US	Check If SI Is Actuated	E-0, Step 4
		SI should not be required	RO	Verify Safety Injection Actuation annunciator - LIT	EOP 35 E-0, Step 4.a

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			US	<p>Check if SI is required</p> <ul style="list-style-type: none"> • CTMT pressure GREATER THAN 18 psia <u>OR</u> • RCS pressure LESS THAN 1890 psia <u>OR</u> • PZR level LESS THAN 16% <u>OR</u> • RCS subcooling LESS THAN 32°F <u>OR</u> • SG pressure LESS THAN 660 psig 	E-0, Step 4, RNO
		UPON Transition the crew should respond to the RED PATH on Heat Sink		<p>IF SI is <u>NOT</u> required, <u>THEN</u> Initiate monitoring of CSF Status Trees and Go to ES-0.1, Reactor Trip Response.</p>	

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Event 4. Loss of Secondary Heat Sink					
		The crew may send an operator out to investigate the loss of AFW flow from the "A" MDAFW Pump. <u>DO NOT</u> Restore flow until step 3 RNO of FR-H.1	CREW	<u>Transition to FR-H.1</u>	FR-H.1 entry conditions
Note		The intent is to establish feed with the "A" MDAFW Pump during the RNO for step 3			
		MDAFW Pump "A" Discharge valve, V4, is closed. Procedure Applies	CREW	If total feed flow is LESS THAN 530 gpm due to operator action, DO NOT PERFORM THIS PROCEDURE. Feed flow must not be reestablished to any faulted SG if a non-faulted SG is available.	FR-H.1 Step 1 CAUTION
		Heat Sink Required	US	Check IF Secondary Heat Sink is Required.	FR-H.1 Step 1
			RO/BOP	Verify RCS pressure - GREATER THAN ANY NON-FAULTED SG PRESSURE.	FR-H.1 Step 1.a
			RO	Verify RCS hot leg W temperature - GREATER THAN 350°F. Check Charging Pump Status - AT LEAST ONE RUNNING.	FR-H.1 Step 1.b FR-H.1 Step 2

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		Crew should not need to bleed and Feed	CREW	<p>Steps 10. through 14. (bleed and feed) of this procedure must be immediately initiated if either of the following occur:</p> <p>W level in any 3 SGs is LESS THAN 29% (59% ADVERSE CTMT)</p> <p>OR</p> <p>PZR pressure is GREATER THAN OR EQUAL TO 2350 psia due to loss of secondary heat sink indicated by core exit TCs increasing.</p> <p>If offsite power is lost after SI reset, manual action to restart safeguards equipment may be required.</p> <p>If the recirculation spray pumps are required and have not started, DO NOT reset CDA.</p>	FR-H.1 Step 3 CAUTION
		Main Board alignment is good	US	<p>Try to Establish AFW Flow to at Least One SG.</p> <p>Verify AFW valve alignment - PROPER EMERGENCY ALIGNMENT.</p>	FR-H.1 Step 3 FR-H.1 Step 3.a

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				Perform the following: 1) Align valves as necessary to restore flow. 2) Perform the applicable action: • <u>IF</u> flow is restored, <u>THEN</u> Proceed to Step 3.f. • <u>IF</u> flow is <u>NOT</u> restored, <u>THEN</u> Proceed to Step 3.b.	FR-H.1 Step 3.a RNO
			BOP	Verify DWST suction valves (3FWA*AOV61A and 3FWA*AOV61B) - OPEN.	FR-H.1 Step 3.b
			BOP	Verify DWST level - GREATER THAN 80,000 gal	FR-H.1 Step 3.c
			US	Verify AFW pump operation:	FR-H.1 Step 3.d
		The "A" AFW is operating.	BOP	Check MD pumps - RUNNING.	FR-H.1 Step 3.d.1
		"B" can't due to being tagged out. If asked, Inform the crew that it will be at least 1 hr until it is ready to start.		START pumps. <u>IF</u> the pump(s) do <u>NOT</u> start, <u>THEN</u> Restore power to the pumps (MB or locally).	FR-H.1 Step 3.d.1 RNO

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
T+ 5 minutes of request to investigate	REPORT	TDAFW Pump tripped and has no governor oil	BOP	Check turbine - driven pump - RUNNING.	FR-H.1 Step 3.d.2
		The crew should not open the Steam Isolations if they are now or were previously closed		OPEN steam supply valve(s). <u>IF</u> the pump does <u>NOT</u> start, <u>THEN</u> OPEN steam supply isolation valves: 3MSS*MOV17A 3MSS*MOV17B 3MSS*MOV17D	FR-H.1 Step 3.d.2 RNO
T+ 4 min of dispatched		Report that V-4 is closed and request permission to open it. [*] critical task	US	Dispatch an operator to locally restore AFW flow using Attachment A, <i>if required.</i>	FR-H.1 Step 3.e
		SG Pressure should be high enough to prevent achieving 530 gpm even if feeding on "A" MDAFW Pump. The crew may continue on . The crew will be unable to reset CTV 41s and be forced to trip RCPs in step 9 then return to this step when AFW is available		Check total flow to SGs - GREATER THAN 530 gpm.	FR-H.1 Step 3.f

EVALUATION GUIDE

Exam Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
T= 3f RNO entered	Remove MALF FW21A	This will simulate the opening of V-4 and re-establish AFW flow from the A MDAFW Pump	US	Perform the applicable action: <ul style="list-style-type: none">• IF no AFW flow is indicated, THEN Proceed to Step 4.• IF any AFW flow indicated, THEN	FR-H.1 Step 3.f RNO
			US/BOP	1) Verify NR level in at least one SG is GREATER THAN 8% (42% ADVERSE CTMT) and Go to procedure and step in effect. 2) Verify a secondary heat sink established: <ul style="list-style-type: none">• WR level in at least one SG is increasing• Core exit TCs are stable or decreasing	
			US	3) IF a secondary heat sink is established, THEN Maintain flow to restore NR level to GREATER THAN 8% (42% ADVERSE CTMT) and Go to procedure and step in effect.	
	Note>>	The crew should transition to ES-0.1 and stabilize plant conditions. [*] critical task			
EOP 35 ES-0.1 Rev. 17					
			CREW	IF SI actuation occurs during this	ES-0.1

EVALUATION GUIDE

Exam Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
T = ES-0.1 initiated	Activate RSCU = 3	This will activate the Pzr Manway Vapor space Leak		procedure, immediately Go to E-0, Reactor Trip or Safety Injection.	Step 1 Caution
			CREW	Foldout page must be open.	ES-0.1 Step 1 NOTE
			US	Check RCS Temperature	ES-0.1 Step 1
			RO	Verify RCS cold leg WR temperature - BETWEEN 550°F AND 560°F	ES-0.1 Step 1.a
			US	Perform the applicable action:	ES-0.1 Step 1.a RNO
			RO/BOP	<ul style="list-style-type: none"> IF temperature is GREATER THAN 560°F, THEN <ol style="list-style-type: none"> 1) Dump steam to the condenser, if available, <u>or</u> Dump steam to atmosphere. 2) Proceed to Step 2. 	
			US	Check FW Status.	ES-0.1 Step 2
			RO	Depending on actions, temp may be < 564. Both actions are listed	ES-0.1 Step 2.a
			US	Action if temp is >564	ES-0.1

EVALUATION GUIDE

Exam Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				temperature is LESS THAN 564°F, THEN Perform Step 2.	Step 2.a RNO
		Action if temp is < 564.	US	Verify FW isolation	ES-0.1 Step 2.b
			BOP	<ul style="list-style-type: none"> Check SG feed regulating valves - CLOSED 	
			BOP	<ul style="list-style-type: none"> Check SG feed regulating bypass valves - CLOSED 	
			BOP	<ul style="list-style-type: none"> Check FW isolation trip valves - CLOSED 	
			RO	<ul style="list-style-type: none"> Check SG chemical feed isolation valves - CLOSED 	
		Flow may have climbed to >530 by this time.	BOP	Verify total AFW flow to SGs - GREATER THAN 530 gpm	ES-0.1 Step 2.c
			RO	Check SG blowdown isolation	ES-0.1 Step 2.d
				<ul style="list-style-type: none"> Verify SG blowdown isolation valves - CLOSED 	
				<ul style="list-style-type: none"> Verify SG blowdown sample isolation valves - CLOSED 	
			US	Verify All Control Rods - FULLY INSERTED	ES-0.1 Step 3
			RO	<ul style="list-style-type: none"> A maximum RCS boron concentration of 2600 ppm 	

EVALUATION GUIDE

Exam Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			RO/BOP	Check PZR Level Control	ES-0.1 Step 4
			RO/BOP	Verify PZR level - GREATER THAN 22%	ES-0.1 Step 4.a
			RO	Verify charging and letdown - IN SERVICE.	ES-0.1 Step 4.b
			RO	Verify PZR level - TRENDING TO 28%.	ES-0.1 Step 4.c
			RO	Control charging and letdown to maintain PZR level at 28%.	ES-0.1 Step 4.c RNO
			US	Check PZR Pressure Control	ES-0.1 Step 5
		RCS Pressure will be trending down and approaching 1890	RO	Verify PZR pressure - GREATER THAN 1890 psia	ES-0.1 Step 5.a
			CREW	Verify SI action.	ES-0.1 Step 5.a RNO
		SI has failed to actuate. The crew will need to manually actuate SI.	CREW	IF SI has NOT actuated, THEN	
		[critical task]	RO	1) Initiate SI.	
			CREW	2) Go to E-0, Reactor Trip or Safety Injection.	

EVALUATION GUIDE

Exam Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
		NOTE: US should go to "Master Silence"	CREW	<ul style="list-style-type: none"> Foldout page must be open 	E-0, Step 1, NOTE
		TERMINATE THE SCENARIO UPON TRANSITION FROM E-0 to FR-Z.1 or UPON EXAMINER'S CUE.	CREW	<ul style="list-style-type: none"> ADVERSE CTMT defined as GREATER THAN 180°F or GREATER THAN $10^{5R}/hr$ in containment. 	
		The goal here is to ensure proper application of the EOP Users guide in that the monitoring of the status trees is active and the crew should address the orange path on Ctmt as soon as it happens. Performance of E-0 until procedure transition is not required.	CREW	<ul style="list-style-type: none"> The reactor can be interpreted as "tripped" when any two of three bulleted substeps of Step 1.* are satisfied. 	
		E-0 steps are placed here as a guide. The amount of E-0 performed will depend on how long Ctmt pressure takes to reach 23 psia (orange path criteria).	RO	Verify Reactor Trip <ul style="list-style-type: none"> Check reactor trip and bypass breakers - OPEN Check rod bottom lights - LIT Check neutron flux - DECREASING 	E-0, Step 1
			BOP	Verify Turbine Trip Check all turbine stop valves - CLOSED	E-0, Step 2 E-0, Step 2.a
			BOP	Verify Power to AC Emergency Busses	E-0, Step 3

EVALUATION GUIDE

Exam Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			BOP	Check busses 34C and 34D - AT LEAST ONE ENERGIZED	E-0, Step 3.a
			BOP	Check busses 34C and 34D - BOTH ENERGIZED	E-0, Step 3.b
			US	Check If SI Is Actuated	E-0, Step 4
			RO	Verify Safety Injection Actuation annunciator - LIT	EOP 35 E-0, Step 4.a
			RO	Verify Service Water Pumps - AT LEAST ONE PER TRAIN RUNNING	E-0, Step 5
			RO	Verify Two RPCCW Pumps - ONE PER TRAIN RUNNING	E-0, Step 6
			RO	Verify ECCS Pumps Running	E-0, Step 7
				<ul style="list-style-type: none"> • Check SI pumps - RUNNING • Check RHR pumps - RUNNING • Check two charging pumps - RUNNING 	
			BOP	Verify AFW Pumps Running	E-0, Step 8
		Only one train is operating		Check MD pumps - RUNNING	E-0, Step 8.a
		The Terry turbine is tripped and will not start		Check turbine - driven pump - RUNNING, IF NECESSARY	E-0, Step 8.b
			BOP	Verify FW Isolation	E-0, Step 9

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Exam Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			BOP	<ul style="list-style-type: none"> Check SG feed regulating valves - CLOSED 	
			BOP	<ul style="list-style-type: none"> Check SG feed regulating bypass valves - CLOSED 	
			BOP	<ul style="list-style-type: none"> Check FW isolation trip valves - CLOSED 	
			BOP	<ul style="list-style-type: none"> Check MD FW pump - STOPPED 	
			BOP	<ul style="list-style-type: none"> Check TD FW pumps - TRIPPED 	
			RO	<ul style="list-style-type: none"> Check SG blowdown isolation valves - CLOSED 	
			RO	<ul style="list-style-type: none"> Check SG blowdown sample isolation valves - CLOSED 	
			RO	<ul style="list-style-type: none"> Check SG chemical feed isolation valves - CLOSED 	
			BOP	<p>Check If Main Steam Lines Should Be Isolated</p> <p>Check Ctmt pressure GREATER THAN 18 psia</p> <p><u>OR</u></p> <p>Any SG pressure LESS THAN 660 psig</p>	<p>E-0, Step 10</p> <p>E-0, Step 10.a</p>
		CTMT press will be trending up			

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	Proceed to Step 11	E-0, Step 10.a, RNO
			RO	Check if CDA Required	E-0, Step 11
				Check Ctmt pressure is GREATER THAN 23 psia	E-0, Step 11.a
				<u>OR</u>	
				Ctmt spray is initiated	
			US	Proceed to Step 12.	E-0, Step 11.a, RNO
			BOP	Verify CAR Fans Operating In Emergency Mode	E-0, Step 12
			BOP	Check CAR fan status:	E-0, Step 12.a
				<ul style="list-style-type: none"> CAR fans A and B - RUNNING CAR fan C - STOPPED 	
			BOP	START/STOP CAR fans as necessary.	E-0, Step 12.a, RNO
			RO	Verify RPCCW Ctmt supply and return header isolations - OPEN	E-0, Step 12.b

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			RO	Verify Train A and B RPCCW supply and return to chill water valves - OPEN	E-0, Step 12.c
			RO	Verify CIA	E-0, Step 13
			RO	Check ESF Group 2 status columns 2 through 10 - LIT	E-0, Step 13.a
			RO	Verify Proper ESF Status Panel Indication	E-0, Step 14
				<ul style="list-style-type: none"> Verify ESF Group 1 lights - OFF Verify ESF Group 2 lights - LIT <u>IF</u> Main Steam Line Isolation has occurred, <u>THEN</u> verify ESF Group 3 lights - LIT <u>IF</u> CDA has occurred, <u>THEN</u> verify ESF Group 4 lights - LIT 	
		Adverse parameters will be approaching	RO	Determine If ADVERSE CTMT Conditions Exist	E-0, Step 15
				<ul style="list-style-type: none"> Ctmt temperature GREATER THAN 180°F <p><u>OR</u></p> <ul style="list-style-type: none"> Ctmt radiation GREATER THAN 10^5 R/hr 	

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			CREW	DO NOT use ADVERSE CTMT parameters.	E-0, Step 15, RNO
			CREW	To provide adequate ECCS flow, RCS subcooling and PZR level should be monitored to ensure that the charging pump is manually restarted if RCS subcooling based on core exit TCs decreases to LESS THAN 32°F (115°F ADVERSE CTMT) or PZR level decreases to LESS THAN 16% (50% ADVERSE CTMT).	E-0, Step 16, CAUTION
			CREW	If offsite power is lost after SI reset, manual action to restart safeguards equipment may be required.	E-0, Step 16, CAUTION
			CREW	DO NOT reset CDA if recirculation spray pumps are required and have not automatically started.	E-0, Step 16, CAUTION
			RO	Verify ECCS Flow	E-0, Step 16
			RO	Check charging pump flow indicator - FLOW INDICATED	E-0, Step 16.a
		RCS Pressure will be trending down	RO	Check RCS pressure - GREATER THAN 1650 psia (1950 psia ADVERSE CTMT)	E-0, Step 16.b

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	Proceed to Step 16.i	E-0, Step 16.b, RNO
			RO	Check RCS pressure - LESS THAN 300 psia (500 psia ADVERSE CTMT)	E-0, Step 16.j
		CREW should perform a short brief and come out of "Master Silence" at the completion of Step 16.	US	Proceed to Step 17.	E-0, Step 16.j RNO
			BOP	Verify Adequate Heat Sink	E-0, Step 17
		Levels may have recovered by now.		Check NR level in at least one SG - GREATER THAN 8% (42% ADVERSE CTMT)	E-0, Step 17.a
			BOP	Control feed flow to maintain NR level - BETWEEN 8% and 50% (42% and 50% ADVERSE CTMT)	E-0, Step 17.b
			US	Proceed to Step 18.	E-0, Step 17.c
			BOP	Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT	E-0, Step 18
			RO	Verify ECCS Valve Alignment - PROPER EMERGENCY ALIGNMENT	E-0, Step 19

EVALUATION GUIDE

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	Check Plant Status	E-0, Step 20
BOOTH INST	NOTE	When asked, REPORT that "all SLCRS doors indicate closed."		Verify SLCRS doors - CLOSED	E-0, Step 20.a
			US	Request Security Close all SLCRS doors.	E-0, Step 20.a, RNO
			RO	Check CBI annunciator - LIT	E-0, Step 20.b
			RO	Verify CBI status	E-0, Step 20.c
			RO	Verify ESF Group 2 CBI lights - LIT	E-0, Step 20.c.1
			BOP	Control Building purge supply fan and purge exhaust fan - NOT RUNNING	E-0, Step 20.c.2
			BOP	Control building air bank isolation valves - OPEN (after 60 seconds)	E-0, Step 20.c.3
			BOP	STOP kitchen exhaust fan	E-0, Step 20.d
BOOTH INST	NOTE	When called, WAIT 3 - 5 min, Then REPORT "All Control Building pressure boundary doors are Closed and Dogged."	PEO	Close and Dog (as applicable) Control Building pressure boundary doors.	E-0, Step 20.e

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Exam Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			RO	Check RCS Temperature	E-0, Step 21
				Verify RCS cold leg WR temperature - BETWEEN 550°F and 560°F	E-0, Step 21.a
		Temp will be trending down due to SI water flow	US	Perform the applicable action:	E-0, Step 21.a, RNO
			US	2) Proceed to Step 22. • <u>IF</u> the temperature is LESS THAN 550°, <u>THEN</u> proceed to Step 21c.	
			BOP	Maintain total feed flow BETWEEN 530 and 600 gpm until NR level is GREATER THAN 8% (42% ADVERSE CTMT) in at least one SG	E-0, Step 21.c
			BOP	CLOSE SG atmospheric dump and dump bypass valves	E-0, Step 21.d
			BOP	Check the following valves - CLOSED • MSIVs • MSIV bypass valves	E-0, Step 21.e

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	Perform the following:	E-0, Step 21.e, RNO
			BOP	Place both condenser steam dump interlock selector switches to OFF.	E-0, Step 21.e, , RNO
			RO	Check PZR Valves	E-0, Step 22
				Verify PORVs - CLOSED	E-0, Step 22.a
			RO	Verify normal PZR spray valves - CLOSED	E-0, Step 22.b
			RO	Verify PZR safety valves - CLOSED	E-0, Step 22.c
			CREW	To prevent damage to the RCP seal(s), seal injection flow should be maintained to all RCPs.	E-0, Step 23, CAUTION
			RO	Check If RCPs Should Be Stopped	E-0, Step 23
		Pressure will be approaching 1500 psi	RO	Verify RCS pressure - LESS THAN 1500 psia (1800 psia ADVERSE CTMT)	E-0, Step 23.a

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			RO	Verify charging or SI pumps - AT LEAST ONE RUNNING	EOP 35 E-0, Step 23.b
			RO	STOP all RCPs	E-0, Step 23.c
			BOP/RO	Check If SG Secondary Boundaries Are Intact Check pressure in all SGs	E-0, Step 24 E-0, Step 24.a
				<ul style="list-style-type: none"> • NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO SG COMPLETELY DEPRESSURIZED 	
		Ensure crew request activity samples with HP coverage	BOP	Check If SG Tubes Are Intact	E-0, Step 25
			RO	Verify trend history and alarm status of radiation monitors	
				<ul style="list-style-type: none"> • Main steam line - NORMAL • Condenser air ejector - NORMAL • SG blowdown - NORMAL 	

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			BOP	Check steam generator levels - NO SG LEVEL INCREASING IN AN UNCONTROLLED MANNER	E-0, Step 25.b
			RO	Align all SGs for activity samples.	E-0, Step 25.c
			RO	RESET SG blowdown sample isolation	E-0, Step 25.c.1
			RO	OPEN SG blowdown sample isolation valve(s)	E-0, Step 25.c.2
		Acknowledge request & ensure crew request HP coverage	US	Request Chemistry obtain activity samples using HP coverage	E-0, Step 25.d
			RO	Check If RCS Is Intact	E-0, Step 26
				<ul style="list-style-type: none"> • Verify Ctmt radiation using 3CMS*RE22 (pre-trip) - NORMAL • Verify Ctmt radiation using radiation monitoring group histogram (CTMT) - NORMAL • Verify Ctmt pressure - NORMAL • Verify Ctmt recirculation sump level - NORMAL 	

EVALUATION GUIDE

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
	T= transition made	FREEZE	US	Initiate monitoring of CSF Status Trees and Go to E-1, Loss of Reactor or Secondary Coolant.	E-0, Step 26 RNO

TERMINATE SCENARIO

SECTION 4

ID Number: Y2KNRC-3

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EVALUATION GUIDE

I. SUMMARY

1. The following **Critical Tasks** are covered in this exercise:

<u>TASK DESCRIPTION</u>	<u>TASK #</u>	<u>K/A >= 3.0</u>
Manually actuate at least one train of SIS-actuated safeguards before the following: •Completion of step 5 of ES-0.1	008-AK3.03	4.1/4.6
Establish AFW flow to the SGs before bleed and feed is required	E05-EA1-03	3.8/4.2

Note: **[critical task]** Used to designate critical tasks.
Should also be incorporated into column 3 or 4 of Instructor Guide.

2. NON-Critical Tasks covered in this exercise are listed later in the guide.

SECTION 4

Lesson Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

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EVALUATION GUIDE

II. FOLLOW-UP QUESTIONS: (document any follow up questions asked)

SECTION 5

SCENARIO INITIAL CONDITIONS

ID Number: Y2KNRC-3

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Reactor Power:	100%
Operating History:	200 days on line
RCS Boron:	1210 ppm
Core Burnup:	10,000 MWD/MTU
Condensate Demins:	7 IN SERVICE
Evolutions in Progress:	None
Major Equipment OOS:	The "B" MDAFW Pump is out of service for routine oil change. The pump is expected back sometime during your shift. There are 60 hours left on the 72 hour Tech Spec clock.

Crew Instructions:

Maintain present plant conditions. Prepare to perform the surveillance on the "B" MDAFW Pump when returned to service.

Plant/Simulator Differences:

- ° Rad Monitor Historical Data--Simulator Rad Monitor historical data not valid prior to the beginning of this exercise.
- ° If not using the speed dial option on the phone system, the operator must dial either #3333 or #3334 to reach the person/department they desire.
- ° The following PPC programs do not function on the simulator:
 - Samarium Follow
 - Xenon Follow
 - Sequence of Events

SECTION 6

VALIDATION CHECKLIST

Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

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Remote functions:

All remote functions contained in the guide are certified.

Malfunctions:

All malfunctions contained in the guide are certified.

Initial Conditions:

The initial condition(s) contained in the guide are certified or have been developed from certified IC's in accordance with NSEM-4.02.

Simulator Operating Limits:

The simulator guide has been evaluated for operating limits and/or anomalous response.

Test Run:

The scenario contained in the guide has been test run and validated (validation sheet completed, next page) on the simulator. Simulator response is reasonable and as expected.

Examination Scenario Review

The dynamic examination review checklist is complete. (This is not required unless the exam will be used as an Annual Exam, then NUREG 1021 requirements apply.)

J. Martin

Technical Reviewer

2/21/00

Date

SECTION 7

REFERENCE AND TASK TRACKING

Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

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I. References:

AOP 3571	Instrument Failure Response
AOP 3552	Rod Control System Malfunction
AOP 3571	Rapid Downpower
EOPE-0	Rx Trip and or Safety Injection
EOP FR-H.1	Response to a Loss of Secondary Heat Sink
EOP ES-0.1	Reactor Trip Response
EPIP 4400	Event Assessment, Classification and Reportability
ERG_EXE	Westinghouse Owners Group Executive Document
Step_DOC	MP3 Step Deviation Document
ERG_HP	Westinghouse Owners Group Background Document
NUREG*1021 rev 8	Examiners Standards
NUREG*1122 rev 2	K & A Catalog
WOG Critical Task	Critical Task Listing published by WOG

II. Non- Critical Tasks Covered in this Guide/Test:

Respond to a Tcold Instrument Failure
Respond to a Dropped rod
Rapid Downpower
Respond to a Reactor Trip
Respond to a Loss of Secondary Heat Sink
Respond to a Pzr Vapor Space Leak

SECTION 8

SCENARIO ATTRIBUTES CHECKLIST

Lesson Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

Revision: 0

Assessor: J. William Côté

Concurrence:

Matthew 2/21/00

QUALITATIVE ATTRIBUTES

- ☐Y__1. The scenario summary clearly states the objectives of the scenario.
- ☐Y__2. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the crew into expected events.
- ☐Y__3. The scenario consists mostly of related events.
- ☐Y__4. Each event description consists of:
- the point in the scenario when it is to be initiated
 - the malfunctions(s) that are entered to initiate the event
 - the symptoms/cues that will be visible to the crew
 - the expected operator actions (by shift position)
 - the event termination point
- ☐Y__5. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
- ☐Y__6. The events are valid with regard to physics and thermodynamics.
- ☐Y__7. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
- ☐N/A__8. If time compression techniques are used, scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.
- ☐Y__9. The simulator modeling is not altered.
- ☐Y__10. The scenario has been validated. Any open simulator performance deficiencies have been evaluated to ensure functional fidelity is maintained while running the scenario.
- ☐Y__11. Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered IAW Section D.4 of ES301
- ☐Y__12. All individual operator competencies can be evaluated, as verified using form ES-301-6.
- ☐Y__13. Each operator will be significantly involved in the minimum number of transients and events specified on Form ES-301-5. (Form submitted with simulator scenarios).
- ☐Y__14. Level of difficulty is appropriate to support licensing decisions for each crew position.

SECTION 8

SCENARIO ATTRIBUTES CHECKLIST

Lesson Title: DROPPED ROD, LOSS OF HEAT SINK & VAPOR SPACE LEAK

ID Number: Y2KNRC-3

Revision: 0

Note: Following criteria list scenario traits that are numerical (QUANTITATIVE) in nature.

- | | | |
|-----|---|-----------------|
| 01. | Total Malfunctions (TM) - Include EM's- 5 to 8 required
Tcold inst. fail, dropped rod, another dropped rod requiring Rx trip, loss of heat sink, Pzr Manway leak | Total <u>5</u> |
| 02. | Malf's after EOP entry (EM's)- 1 to 2 required
loss of heat sink, Pzr Manway leak | Total <u>2</u> |
| 03. | Abnormal Events (AE)-2 to 4 required
Tcold inst. fail, dropped rod, Downpower due to inability to recover rod. | Total <u>3</u> |
| 04. | Major Transients (MT)-1 to 2 required
dropped rod requiring Rx trip, loss of heat sink requiring FR-H.1, Pzr Manway leak requiring SI initiation | Total <u>3</u> |
| 05. | EOP's (EU) entered/requiring substantive actions 1 to 2 required
E-0, Rx Trip or Safety Injection, Fr-H.1, Loss of Heat Sink, ES-0.1, Rx Trip Response | Total <u>2</u> |
| 06. | EOP Contingencies requiring substantive actions [ECAs/FRs](EC) 0 to 2 required
Fr-H.1, Loss of Heat Sink | Total <u>1</u> |
| 07. | Critical Task (CT) - 2 to 3 required
Establish AFW Flow in FR- H.1 , Manually initiate Safety Injection. | Total <u>2</u> |
| 08. | Approximate Scenario Run Time: 45 to 60 min. (One scenario may approach 90 minutes) | Total <u>60</u> |
| 09. | EOP run time: | Total <u>30</u> |
| 10. | Technical Specifications are exercised during the scenario.
During Tcold inst. fail and during Rod recovery. | (Y/N) <u>Y</u> |

SECTION 9

Summary of Changes

1. Corrected minor typographical errors.

Developer:


J. William Côté

Date:

3/30/00

Concurrence:


J. Martin

Date:

3/31/00

MILLSTONE NUCLEAR POWER STATION



LOIT NRC SIMULATOR EXAM GUIDE APPROVAL SHEET

Exam Title: LOSS OF MFP, RCP SEAL FAILURE & SBLOCA

Revision: 0

ID Number: Y2KNRC-4

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Submitted by:	<u><i>J. William Côté</i></u> J. William Côté Developer	<u>01/13/00</u> Date
Validated by:	<u><i>C. Martin</i></u> Technical Reviewer	<u>2/21/00</u> Date
Approved by:	<u></u> Operation Manager (Optional)	<u></u> Date
Approved by:	<u><i>[Signature]</i></u> Training Supervisor	<u>2/24/00</u> Date



SECTION 2

SIMULATOR EXAM GUIDE

TABLE OF CONTENTS

SECTIONS LISTED IN ORDER

1. Cover Page
2. Table of Contents
3. Exam Overview
4. Evaluation Guide
5. Scenario Initial Conditions Sheet
6. Scenario Validation Checklists
7. Reference and Task Tracking
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Attachments

- NUTIMS Module Report



SECTION 3 EXAM OVERVIEW

Title: LOSS OF MFP, RCP SEAL FAILURE & SBLOCA

ID Number: Y2KNRC-4

Revision: 0

1. Purpose:

This category of the operating test implements item 1-8 and 11-13 identified in 10CFR55.45(a). This is the most performance based category of the operating test and is used to evaluate the applicants ability to safely operate the plant's systems under dynamic, integrated conditions. (ES-301-B.3)

2. Exercise brief:

The crew will take the shift at ~27% power BOL conditions with orders to maintain power while awaiting primary and secondary chemistry results.

Shortly after turnover, a trip of the running MFP will occur. The crew will be able to manually start the Motor Driven MFW Pump. This should place a transient on the feed station that will take about 10 minutes to settle out.

Once the feed station appears to be under control the running CHS Pump will trip. Upon the start (*using either the associated ARP or EOP 3506, Loss of all CHS Pumps*) of the standby CHS Pump, the mechanical shock will cause the "D" RCP #1 seal to begin to degrade. The crew will initially utilize ARP for the seal leakage high alarm. The seal will degrade to a point where the ARP will instruct the crew to remove the RCP from service using AOP 3554, Stopping a RCP at Power. Once the RCP has been stopped and the #1 seal isolated the crew will need to lower power to take the plant off line. The crew will need to lower power IAW OP 3204, At Power Operations, and transition to OP3206, Plant Shutdown.

Upon evaluators cue, the #2 seal on the "D" RCP will fail and a Small Break LOCA will occur on the "D" loop. The crew will need to Manually Trip the Plant from the MB4 or MB7 Trip Switch, and manually actuate SI **[critical task]**. The AFW Pumps will not auto start upon the SI signal and will need to be manually started **[critical task]**. The crew should progress through E-0, Reactor Trip or Safety Injection, and transition to E-1, Loss of Reactor or Secondary Coolant. The session will terminate during actions of E-1 when the crew demonstrated the understanding that the transition to ES-1.2.

The scenario should be classified as an ALERT C-1 based on Barrier reference Table.

3. Plant/Simulator differences that may affect the scenario are: NONE

4. Duration of Exam: 1.25 hour(s)

SECTION 4

EVALUATION GUIDE

Title: LOSS OF MFP, RCP SEAL FAILURE & SBLOCA

ID Number: Y2KNRC-4

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All Control Room Conduct, Operations and Communications shall be in accordance COP 200.1, Conduct of Operations, and OP 3260, Unit 3 Conduct of Operations.

"Review the Simulator Operating Limits(design limits of plant) and the Simulator Modeling Limitations and Anomalous Response List prior to performing this exam scenario on the simulator. The evaluators should be aware if any of these limitations may be exceeded." (NSEM 6.02)

SIMULATOR PROBLEMS DURING EXAMS

It is the responsibility of the Instructors in the simulator to insure that exam interruptions have a minimum negative impact on the Crew and the examinations we provide.

Be aware that at all times the Operators should treat the simulator as if it were the plant and you too should treat it as much like the plant as possible when they are in the simulator.

As soon as the Instructors are aware of a simulator problem that will adversely affect the exam in progress (computer fault, etc.) the Instructor should:

1. Place the simulator in FREEZE if possible.
2. Announce to the Crew that there is a simulator problem.
3. Request that the Crew leave the simulator control room. (The Crew should leave the simulator for problems which involve major switch alignments).
4. Deal with the problem (reboot, call STSB, etc.)
5. After the Instructors believe the simulator is restored to service, the Crew should be told how the exam will continue. If it is possible and felt to be acceptable to the evaluators, the examination can begin where it left off with an update on plant parameters and each Crew member is prepared to restart. If the examination will not begin where it left off, the crew should be told how and where the exam will begin again.
6. Once the Crew has been told how and where the exam will begin, have the crew conduct a brief so that the Instructor and evaluators can insure that the crew has all the necessary information to continue with the scenario.
7. Once all Crew members, Instructors and evaluators are satisfied that they have the necessary information to continue the scenario, place the simulator in RUN and announce to the Crew that you have continued the evaluation session.

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Lesson Title: LOSS OF MFP, RCP SEAL FAILURE & SBLOCA

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
1.		START the Sun Workstation.			
		a. IF the Sun Workstation is running THEN go to SIM ACTIVE.			
2.		PLACE Recorder Power to ON.			
3.		VERIFY that the current approved training load is loaded.			
4.		REMOVE the step counter OVERRIDE and allow the counters to step out during the IC reset.			
5.		RESET to IC <u>Temp IC Y2K NRC-1</u>			
6.		ADJUST the various pot settings to the valued specified by the chart in the simulator booth or <u>Notepad</u> for the selected IC.			
7.		PLACE Simulator to RUN.			
8.		ADJUST MWt using Turbine Load Set to 3411, (+)0, (-)3 IF using 100% power IC.			
9.		RESET the Plant Calorimetric at the Instructor Station PPC by Pressing "SHIFT LEFT" and "F6" simultaneously.			
10.		ENSURE Simulator fidelity items cleared.			
		a. CHECK the STEP COUNTERS at correct position for plant conditions.			
		b. PLACE <u>4</u> tiles under the DEMINS IN SERVICE lamarcord label on MB6.			
		c. PLACE the Main Turbine on the LOAD LIMITER and ENSURE Standby Load Set MATCHED if conditions require.			
		d. PLACE the Westronic (5) and Gammametrics (2) recorders in active/run by depressing up or down arrow for each.			
		e. CLEAR DCS alarms on MB7 and BOP console.			
		f. VERIFY annunciator, "COMPUTER FAILURE" (MB4C, 1-11), is NOT LIT.			

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
					g. ENSURE NSSS Picture 1, MODES 1, 2, 3, 4; Burnup and Cb match lesson plan AND Cb sample date < 3 days old. 1) See laminated directions on clipboard in Sim booth.
11.		RESET Computer Terminals to At Power displays if 100% power IC.			a. MB2, (AY6), CVCS Data Trend, 1 minute update, CHS-F132 (40-120), CHS-L112 (40-80), CHS-F121 (40-80), RCS-L461 (40-80) b. MB4, (AY1), At Power Data Trend, 15 second update, CVQRPI, (3391-3428), CVQRPHRUN (3409-3413), CVQRP (3409-3413), RCL-T412*, (585-588) c. MB4, (AY4), NSSS Picture 1, MODES 1, 2, 3, 4 d. BOP Console (AY5A), BOP Picture 26, Circ Water e. STA Console, (AY3), NSSS Picture 15, RCP Seals
12.		RESET Rad Monitor Screen to Status Grid.			
13.		OVERRIDE the annunciators that will be lit longterm in the CR, (as listed in the "Lit CRP Annunciators" section of the MP3 daily Status Report hanging near instructor booth door).			
14.		IF placing equipment OOS, THEN perform the necessary switch manipulations and hang appropriate tags, as required, listed under "Equipment OOS."			
15.		LOCK the Simulator Room front door.			

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Lesson Title: LOSS OF MFP, RCP SEAL FAILURE & SBLOCA

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
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- ° PLACE THE FOLLOWING EQUIPMENT IN PTL:

Equipment OOS:

- ° Insert applicable CREW EXAM Tape into the VCR.
- ° Verify the MONITOR Time Display the same as the digital time display on MB4. If no, call/page the Unit Tech.

Initial Malfunctions /IOs/IDAs:

MALF	FW20A	AFW pump auto start failure
MALF	FW20B	AFW pump auto start failure
MALF	FW20C	AFW pump auto start failure
MALF	RC034 sev = .06% rscu = 1	SBLOCA on Loop 4
MALF	RP07A	TR"A" SI auto actuate failure
MALF	RP07B	TR"B" SI auto actuate failure

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
Lead Examiner: Refer to the "Briefing Script for the Operational Exam" and brief the crew.					
Booth Instructor: Commence Recording Simulator session					
Booth Instructor: Perform the crew turnover (Initial Conditions page at end of Exam) with the crew .					

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
Event 1: Trip of the running TDMFW Pump					
T+ 1 min of after turnover	FW07B	This will trip the running TDMFW Pump. This should put an oscillation on the feedstation that the BOP will have to control.	RO/US	Transition to the ARP associated with the tripped TDMFW Pump	OP3353.MB5 A.5-5 Entry conditions
			BOP	Verify that 3FWS-P1, MDMFW Pump, starts	OP3353.MB5 A.5-5 step 1
			BOP	Throttle open PV-V590, MDMFW Pump start up valve, to maintain 40-140 psid on program	OP3353.MB5 A.5-5 step 2
			BOP	CLOSE 3FWS-MOV23C, TDMFW Pump "A" discharge isolation.	OP3353.MB5 A.5-5 step 3
			BOP	IF not in service refer to OP3321, Main Feedwater, and PLACE TDMFW Pump "B" in service.	OP3353.MB5 A.5-5 step 4
		Go on to Event 2			

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
T= Transient under control & Evaluator's cue	CV11B	Event 2: Trip of the running CHS Pump			
		This will trip the running "B" CHS Pump			
		"B" CHS Pump trip. The operators may directly enter EOP 3506, Loss of all Charging Pumps, or enter the ARP for electrical trip of the CHS Pump. Either is satisfactory.			
			CREW	Identify affected CHS Pump and either enter the EOP or ARP for the affected CHS pump	OP3353.MB3A, 5-9
		ARP MB3A.5-9 Actions			
			RO	START 3CHS*P3A or 3CHS*P3B, standby charging pump, (MB3).	3353.MB3A 5 -9 Step 1
			RO	STABILIZE charging flow rate.	3353.MB3A 5 -9 Step 3
			RO	PLACE 3CHS*FK121, charging header flow controller (MB3), in "AUTO", and MONITOR pressurizer level trend.	3353.MB3A 5 -9 Step 4
			RO	VERIFY individual RCP seal supply flows 8 to 13 gpm each, and total RCP supply flow less than 40 gpm.	3353.MB3A 5 -9 Step 5
			RO	IF directed by SM/US, Refer to OP 3304A, "Charging and Letdown," and	3353.MB3A 5 -9 Step 6

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				ALIGN 3CHS*P3C, charging pump C, to affected train.	
			US	Refer to the following Technical Specifications and DETERMINE Limiting Condition for Operation:	3353.MB3A 5 -9 Step 7
	T.S. 3.1.2.4 72 hrs action 3.1.2.2 72 hrs action			<ul style="list-style-type: none"> T/S 3.1.2, "Reactivity Control Systems, Boration Systems" 	
	T.S. 3.5.2 72 hrs action			<ul style="list-style-type: none"> T/S 3.5.2, "ECCS Subsystems - Tavg Greater Than or Equal to 350°F" 	
	n/a greater than 350 degrees			<ul style="list-style-type: none"> T/S 3.5.3, "ECCS Subsystems - Tavg Less Than 350°F" 	
	EOP 3506 ACTIONS		CREW	FOLDOUT PAGE MUST BE OPENED	EOP 3506 Step 1 NOTE
			RO	Verify Charging Pump Operation - AT LEAST ONE RUNNING	EOP 3506 Step 1
	Crew should start the A charging pump.		RO	Start one CHS Pump	EOP 3506 step 1 RNO

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			RO	Check Charging System alignment a- FK -121 open b- CHS Loop isolations one open c- CHS header isolations open d- CHS pump recircs open e- CHS pump miniflows closed f- Verify RCP seal supply valve open g- Verify RCP seal supply flow > 6 gpm	EOP 3506 step 2
			RO	Verify PZR Level - STABLE OR INCREASING	EOP 3506 step 3
		T.S. 3.1.2.4 72 hrs action 3.1.2.2 72 hrs action 3.5.2 72 hrs action TRM 7.4I for "C" CHS Pump	RO	Verify CHS flow to RCS a- PZR Level - STABLE OR INCREASING b- Proceed to step 5	EOP 3506 step 4
	BOOTH	SP3604A.3 on "C" Pump. If crew request status, report complete SAT 3 weeks ago.	RO	Verify letdown in service	EOP 3506 step 5

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
T= second CHS pump running and Crew addressed Tech Specs	CV13D sev = 6%	"D" RCP #1 Seal Fails to ≤ 6 gpm. 6% = ~5.8 gpm & alarm. This malfunction has an auto ramp of ~ 4 minutes.	CREW	Verify MB annunciators are as expected	EOP 3506 step 6
T+ 5 min of request		Report that there is an overcurrent trip on the "B" CHS Pump.	US/ CREW	Continue with normal plant evolutions using applicable plant procedures	EOP 3506 step 7

EVENT THREE: RCP SEAL LEAK

BOOTH INSTRUCTOR: IF contacted about the status of the "C" CHS Pump, report that you are having problems getting the breaker racked up, and electrical maintenance is there troubleshooting. It also appears, according to electrical maintenance, that the "B" CHS pump has a motor bearing problem and the pumped tripped on overcurrent.

BOOTH INSTRUCTOR: The RCP SEAL malfunction is to stabilize the leak at a value of ≤ 6 gpm, as seen by the operator at MB3. *If the leak is initially greater than 6 gpm, the actions of the crew will be different than what is desired.*

CREW	Identify affected RCP and identify appropriate ARP as MB3B, 2-10	OP3353.MB3B, 2-10
RO	Check 3CHS-FR160, high range RCP #1 seal leak off flow recorder and CHS-F159*, RCP D No. 1 seal L/O flow computer point, to confirm alarm.	OP3353.MB3B, 2-10 step 1

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
		NSSS, F4, 15, <ENTER>	RO/ BOP	Display "RCP Status" NSSS, picture 15	OP3353.MB3B, 2-10 step 2
			RO	VERIFY leakage flow high indication by observing the following indications: <ul style="list-style-type: none"> Seal injection flow Affected RCP #1 seal inlet temperatures VCT level Charging header flow Pressurizer level 	OP 3353.MB3B Step 3
			RO	<ul style="list-style-type: none"> 3CHS-FR158 and 3CHS-FR160, high range RCP No. 1 seal leakoff flow recorders (MB3) 3CHS-PI 124, excess L/D Hx outlet pressure 	
	<u>FLOOR Evaluator s</u>	<i>See items listed under expected response for table interpretation,</i>	US	Using table 1, EVALUATE plant conditions for the affected RCP, and GO TO indicated step. <ul style="list-style-type: none"> < 6 gpm instructs crew to go to step 8. Bottom block. 	OP3353.MB3B, 2-10 step 4 table

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
		<u>BOOTH INSTRUCTOR:</u> When contacted perform the following: <ul style="list-style-type: none"> As Duty Officer, acknowledge problem with RCP. As Engineering Department acknowledge request to evaluate continued pump operation. 	US	PERFORM the Following: <ul style="list-style-type: none"> Notify Duty officer of alarm condition IF "VCT TEMP HI" (MB3A 5-10) is lit, Refer To OP 3353.MB3A 5-10, "VCT TEMP HI." Request Engineering Department evaluate continued pump operation. IF, at any time, seal parameters degrade, IMPLEMENT steps as specified in Table 1. 	OP3353.MB3B, 2-10 step 8
T = step 7	CV13D sev = 8.1% ramp = 60 seconds	<u>BOOTH INSTRUCTOR:</u> increase the severity of the RCP leak to 7 gpm. 8.1% ~ 7.0 gpm.	RO	Inform US that RCP Seal leakage is slowly getting worse and is stabilizing at ~7.0 gpm	
		<u>FLOOR Evaluators:</u> <i>See items listed under expected response for table interpretation,</i>	US	Using the table 1, proceed to step 7. <ul style="list-style-type: none"> ≥ 7 gpm, column does not apply due to RCP #2 Seal leak off <u>not being lit</u>. ≥ 8 gpm column does not apply as leak off flow is only 7.0 gpm 	OP3353.MB3B, 2-10 step 4 table

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				<ul style="list-style-type: none"> > 6 gpm column applies, #1 seal inlet temp stable, proceed to step 7 	OP3353.MB3B, 2-10 step 3 table
		<u>Step applies</u> ; IF called, as Duty Officer, request downpower rate of 0.5% / min, per discussion with the Unit Director.	US	Rx Power > 25%, go to OP3204 and COMMENCE an orderly plant S/D while continuing with this step	OP3353.MB3B, 2-10 step 7.1
		Step does <u>not</u> apply. Rx power >25%	US	IF Rx Power \leq 25%, go to OP3206 and COMMENCE an orderly plant S/D while continuing with this step	OP3353.MB3B, 2-10 step 7.2
			CREW	IF at any time, RCP #1 Seal parameters degrade, Implement steps as specified in table #1.	OP3353.MB3B, 2-10 step 7.3
			US/ SM	When in mode 3, Refer to OP3301D and STOP the affected pump.	OP3353.MB3B, 2-10 step 7.4
T = step 5 of attachment L	CV13D sev = 20% ramp = 60 seconds	<u>BOOTH INSTRUCTOR</u> : increase the severity of the RCP leak to > 8 gpm. 20% = > 10.0 gpm.	RO	Inform US that RCP #1 Seal parameters are degrading	OP3353.MB3B, 2-10 step 7.3

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			US	RETURN to Table #1	OP3353.MB3B, 2-10 step 7.3
		<u>FLOOR Evaluators:</u>	US	EVALUATE plant conditions per the table:	OP3353.MB3B, 2-10 step 4 table #1
		<i>See items listed under expected response for table interpretation,</i>		<ul style="list-style-type: none"> • ≥ 8 gpm seal leak off flow • $< P-8$ - Rx Power (100%) • go to step 5 	
			US	Go to AOP 3554, "RCP Trip or Stopping an RCP at Power," and INITIATE actions to perform an immediate RCP shutdown.	MB3B 2-10 step 5
		<u>AOP 3554 ACTIONS</u>	RO	Check RCP Status - ALL PUMPS RUNNING.	AOP 3554 Step 1
			RO	Check Reactor Power.	AOP 3554 Step 2
			RO	Verify THREE LOOP PERMISSIVE P-8 annunciator (MB4D 3-3) - LIT.	AOP 3554 Step 2.a
			CREW	If stopping the RCP due to No. 1 seal failure, steps 3 through 5 should be completed as quickly as possible in order to isolate the affected pump No. 1 seal within the recommended 5 minutes.	AOP 3554 Step 3 NOTE

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			BOP	Feed Affected Loop SG NR Level to Between 65% and 70%.	AOP 3554 Step 3
			US	Defeat Affected Loops Temperature Input.	AOP 3554 Step 4
			RO	Place loop temperature cutout switch for ΔT to the affected loop and pull out.	AOP 3554 Step 4.a
			RO	Place loop temperature cutout switch for Tavg to the affected loop and pull out.	AOP 3554 Step 4.b
			RO	Place OT/OP ΔT recorder select switch to an <i>unaffected</i> loop.	AOP 3554 Step 4.c
			US	Remove Affected RCP From Service.	AOP 3554 Step 5
			RO	Check RCP status - ALL PUMPS RUNNING.	AOP 3554 Step 5.a
			BOP	Verify affected SG NR level - GREATER THAN 65%.	AOP 3554 Step 5.b
			US/BOP	Continue to feed affected SG and, WHEN SG NR level is GREATER THAN 65%, THEN proceed to Step 5c.	AOP 3554 Step 5.b RNO
			RO	STOP affected RCP.	AOP 3554 Step 5.c

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			RO	Check RCP 1 and 2 - BOTH RUNNING.	AOP 3554 Step 5.d
			US	Check if RCP Seal Leakoff should be isolated.	AOP 3554 Step 6
			US	Verify RCP stopped as a result of seal failure requiring <i>immediate</i> shutdown	AOP 3554 Step 6.a
			US	Verify the affected RCP has been tripped - AT LEAST 3 minutes	AOP 3554 Step 6.b
			US	<u>WHEN</u> the RCP has been tripped at least 3 minutes, <u>THEN</u> Perform step 6.c.	AOP 3554 Step 6.b, RNO
			RO	CLOSE the affected RCP No. 1 seal leakoff isolation valve	AOP 3554 Step 6.c
			RO	Verify affected RCP RPCCW thermal barrier isolation valve - OPEN	AOP 3554 Step 6.d
			BOP	Shift affected SG to Main Feed Bypass Flow.	AOP 3554 Step 7
			BOP	Close affected SG feed regulating valve.	AOP 3554 Step 7.a

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			BOP	CLOSE affected SG FW control isolation valve 3FWS-MOV35A 3FWS-MOV35B 3FWS-MOV35C 3FWS-MOV35D	AOP 3554 Step 7.b
		NOTE: P-14 may occur. If P-14 occurs and the crew elects to TRIP the Plant, Move on to the next event. Page 26	BOP	Maintain affected SG level between 45% and 55% using the SG feed regulating bypass valve.	AOP 3554 Step 7.c
		Next Event:			
T = #1 seal leakoff isolation closed and transition made	Ann Override "ON"	MB4B 1-8 #2 Seal Leakoff High MB4B 2-8T Standpipe high Alarm	US	Perform Follow-up Actions.	AOP 3554 Step 8
	activate rscu=1	This will activate the SBLOCA	CREW	Monitor MB annunciators and parameters - NORMAL.	AOP 3554 Step 8.a
			RO	Check reactor power - GREATER THAN 25%.	AOP 3554 Step 8.b
			US	Continue plant shutdown using OP 3204, At Power Operation.	AOP 3554 Step 8.c

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
		OP3204, At Power Operations, Load Decrease Actions		Load Decrease	OP 3204 Step 4.2
			CREW	1. This section provides instructions to decrease load from 100% to 25% for plant shutdown or for partial load reductions. If used for a partial load reduction, the SM/US should determine, on a case by case basis, which steps apply for the planned reduction.	OP 3204 Step 4.2 NOTE
			CREW	2. Load reduction should normally be performed at a controlled, even rate to avoid thermal stresses to turbine.	
			CREW	3. The power reduction rate will not exceed 10%/hour using this procedure unless approved by the Operations Manager or Unit Director.	
			CREW	To ensure leak rate calculation compliance, PERFORM the following:	OP 3204 Step 4.2.1
		Inform crew that a leak rate was obtained at midnight the night before	CREW	a. <u>IF</u> the duration of the planned power decrease will preclude obtaining a valid RCS leakrate calculation within the required 72 hour T/S surveillance interval, Refer To SP3601F.6, "Reactor Coolant System Water Inventory Measurement," and PERFORM a leakrate calculation.	OP 3204 Step 4.2.1.a

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			US	INITIATE load decrease:	OP 3204 Step 4.2.2
	NOT DESIRED		US	a. <u>IF</u> a load decrease rate of greater than 10% per hour is desired <u>AND</u> permission to use this procedure has <u>not</u> been given by the Operations Manager or Unit Director, Go To AOP 3575, "Rapid Downpower."	OP 3204 Step 4.2.2.a
			RO	b. INITIATE RCS boration using one of the following:	OP 3204 Step 4.2.2.b
			RO	• Refer To OP 3304C, "Primary Makeup and Chemical Additions," and ALIGN for boration.	
	Acknowledge as Convex/ISO New England		US	c. COORDINATE power decrease with CONVEX.	OP 3204 Step 4.2.2.c
			RO/BOP	d. <u>WHEN</u> Tav _g begins to decrease due to boration, Refer To OP3323A, "Main Turbine," and DECREASE turbine load at desired rate to desired power level while continuing with this procedure.	OP 3204 Step 4.2.2.d
			RO	<u>WHEN</u> RCS boron concentration is being changed, PERFORM the following:	OP 3204 Step 4.2.3.
			RO	a. <u>IF</u> Tav _g or rod control responds in an unexpected manner, STOP makeup in progress and DETERMINE the	OP 3204 Step 4.2.3.a

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				cause.	
			RO	b. ENERGIZE pressurizer heaters as necessary to equalize boron concentration between the pressurizer and RCS	OP 3204 Step 4. 2.3.b
	Not expected for a 5% change		RO	c. <u>IF</u> RCS boron concentration change exceeds 50 ppm, Refer To OP 3301G, "Pressurizer Pressure Control," and EQUALIZE boron concentration	OP 3204 Step 4.2.3.c
			RO	1. Maintaining AFD within the target band is not required below 50% RTP or during RAOC operation but is recommended to maintain optimum reactor control unless the plant is being shutdown for greater than 24 hours.	OP 3204 Step 4.2.4 NOTE
			RO	2. During load reductions, AFD change is a function of control rod insertion (negative effect) and reduced Th (positive effect)	
			RO	Refer To the "Reactor Engineering Curve & Data Book", "Axial Flux Difference Versus Thermal Power" and MAINTAIN AFD as follows:	OP 3204 Step 4.2.4
	step is n/a, Power is < 50%		RO	a. <u>IF</u> power is greater than 50%, <u>PERFORM</u> the following:	OP 3204 Step 4.2.4.a

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		step is n/a,	RO	b. <u>IF</u> a partial load reduction is being performed, PERFORM the applicable action:	Op 3204 Step 4.2.4.b
		step is n/a,	RO	c. <u>IF</u> AFD approaches the negative edge of the target band, PERFORM the following:	OP 3204 Step 4.2.4.c
		step is n/a,	RO	d. <u>IF</u> AFD exceeds the negative edge of the target band, PERFORM the following:	OP 3204 Step 4.2.4.d
		step is n/a,	RO/US	e. <u>IF</u> AFD can <u>not</u> be maintained within the target band <u>OR</u> exceeds the target band by more than 5%, NOTIFY Reactor Engineering.	OP 3204 Step 4.2.4.e
		ALREADY SHIFTED	CREW	The Plant calorimetric shifts from a steam flow based calculation to a feed flow calculation at approximately 88% nuclear power, decreasing. The shift is indicated by a Computer priority alarm.	OP 3204 Step 4.2.5 NOTE
		ALREADY COMPLETED	CREW	<u>WHEN</u> the calorimetric shifts from steam flow based to feed flow based calculation, PERFORM the following:	OP 3204 Step 4.2.5
			US	INITIATE Load decrease:	OP 3204 Step 4.2.6
			US	a. <u>IF</u> a load decrease rate of greater than 10% per hour is desired <u>AND</u> permission to use this procedure has	OP 3204 Step 4.2.6.a

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T= REACTIVITY Manipulation COMPLETE	GO TO NEXT EVENT			not been given by the Operations Manager or Unit Director, Go To AOP 3575, "Rapid Downpower."	
			RO	b. INITIATE RCS boration using one of the following: <ul style="list-style-type: none"> Refer To OP 3304C, "Primary Makeup and Chemical Additions," and ALIGN for boration. Refer To OP 3304B, "Boron Thermal Regeneration System," and BORATE RCS using BTRS. 	OP 3204 Step 4.2.6.b
			RO	c. COORDINATE power decrease with CONVEX..	OP 3204 Step 4.2.6.c
				d. <u>WHEN</u> Tav _g begins to decrease due to boration, Refer To OP 3323A, "Main Turbine," and DECREASE turbine load at desired rate to desired power level while continuing this procedure.	OP 3204 Step 4.2.6.d
			US	<u>IF</u> a power change exceeding 15% of RTP within a 1-hour period occurs, REQUEST Chemistry Department perform an isotopic analysis for Iodine between 2 and 6 hours following the power change.	OP 3204 Step 4.2.7

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	not in services		BOP	IF manual removal of MSR reheaters is desired, Refer To OP 3317, "Reheat and Moisture Separator," and PERFORM removing the MSR reheaters from service at greater than 30% power in conjunction with the load decrease.	OP 3204.2.8
			BOP	Changes in condensate demineralizer valve alignment may cause a condensate flow transient resulting in an unanticipated power increase.	OP 3204 Step 4.2.9 CAUTION
			BOP	Refer To OP 3319C, "Condensate Demineralizer Mixed Bed System," and REMOVE condensate demineralizers from service as necessary to maintain the following:	OP 3204 Step 4.2.9
			BOP	<ul style="list-style-type: none"> Flow through in-service demineralizers between 1200 gpm and 3200 gpm 	
			BOP	<ul style="list-style-type: none"> Differential pressure less than 60 psi 	
			BOP	Refer To OP 3324A, "Main Generator," and MAINTAIN generator VAR loading as directed by the Unit Operator controlling station VARS (normally Unit 1) and within limits of Figure "TURBINE GENERATOR CAPABILITIES."	OP 3204 Step 4.2.10

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	DONE		US	<u>WHEN</u> power decreases below 50%, Refer To OP 3321, "Main Feedwater," and REMOVE a feedwater pump from service while continuing with this procedure.	OP 3204 Step 4.2.11
	DONE		US	<u>WHEN</u> power decreases below approximately 49%, PERFORM the following:	OP 3204 Step 4.2.12
	DONE		US	<u>WHEN</u> power decreases approximately 2% below the P-9 setpoint, CHECK "NIS POWER RANGE P-9 PERMISSIVE" (MB4D 6-1) lit	OP 3204 Step 4.2.13
	DONE		US	<u>WHEN</u> MSS*PT 505 OR MSS*PT 506, first stage turbine impulse pressure channels, decrease below approximately 245 psig (approximately 480 MWE), CHECK AMSAC blocked by observing "AMSAC NOT ARMED" (MB4C 1-6), lit.	OP 3204 Step 4.2.14
	DONE		US	<u>WHEN</u> power decreases below approximately 35.5%, CHECK permissive P-8 resets by observing "THREE LOOP PERMISSIVE P-8" (MB4D 3-3), lit.	OP 3204 Step 4.2.15
	DONE		US	<u>WHEN</u> generator load decreases below 360 MWE, Refer To Op 3320, "Feedwater Heater Drains and Vents," and STOP the heater drain pumps.	OP 3204 Step 4.2.16

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			CREW	At 25% power, STOP the power decrease and PERFORM the following:	OP 3204 Step 4.2.17
			CREW	a. STABILIZE reactor power.	OP 3204 Step 4.2.17.a
			CREW	b. Refer To SP 31002, "Plant Calorimetric," and perform a heat balance calculation to adjust nuclear instrumentation.	OP 3204 Step 4.2.17.b
<u>Event 4: Small Break LOCA</u>					
T = #1 seal leakoff isolation closed and transition made	Ann Override	MB4B 1-8 #2 Seal Leakoff High			
	"ON"	MB4B 2-8T Standpipe high Alarm			
	activate rscu=1	This will activate the SBLOCA			
		The crew should trip the plant and initiate SI	US	Foldout page must be open.	ES-0 step 1 Note

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		[E-0]	RO	Verify Reactor Trip <ul style="list-style-type: none"> ◦ Check reactor trip and bypass breakers - OPEN ◦ Check digital rod position indicators - AT ZERO ◦ Check neutron flux DECREASING 	E-0, step 1
		Booth instructor: If requested to investigate the recently tripped CHS pump, after ~5 minutes, report that the pump motor has an acrid odor.			
		Floor Evaluators: The crew will need to implement the Fold Out page and trip the remaining RCPs when RCS Pressure drifts down to 1500 psia.	BOP	Verify Turbine Trip <ul style="list-style-type: none"> a. Check all turbine stop valves - CLOSED 	E-0 Step 2
			BOP	Verify Power to AC Emergency Busses	EOP 35 E-0, Step 3
			BOP	Check busses 34C and 34D - AT LEAST ONE ENERGIZED	EOP 35 E-0, Step 3.a
				Check busses 34C and 34D - BOTH ENERGIZED	EOP 35 E-0, Step 3.b
		SI SHOULD HAVE BEEN ACTUATED BY THE CREW	RO	Check If SI Is Actuated	E-0, step 4
		[CRITICAL TASK]		Verify Safety Injection - Actuation annunciator - LIT	

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			RO	Verify Service Water Pumps - AT LEAST ONE PER TRAIN RUNNING	E-0, Step 5
		Initial Classification will be an ALERT C-1 based on RCB4	RO	Verify Two RPCCW Pumps - ONE PER TRAIN RUNNING	E-0, Step 6
			RO	Verify ECCS Pumps Running	E-0, Step 7
				<ul style="list-style-type: none"> • Check SI pumps - RUNNING • Check RHR pumps - RUNNING • Check two charging pumps - RUNNING 	
		NO only 1 CHS Pump is running			
		NO, BOP will have to start all AFW pumps if not already contacted.	BOP	Verify AFW Pumps Running	E-0, Step 8
		[CRITICAL TASK]			
				Check MD pumps - RUNNING	E-0, Step 8.a
				START pump(s)	E-0, Step 8.a, RNO
				Check turbine - driven pump - RUNNING, IF NECESSARY	E-0, Step 8.b
				OPEN steam supply valves.	E-0, Step
			BOP	Verify FW Isolation	E-0, Step 9

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				<ul style="list-style-type: none"> • Check SG feed regulating valves - CLOSED • Check SG feed regulating bypass valves - CLOSED • Check FW isolation trip valves - CLOSED • Check MD FW pump - STOPPED • Check TD FW pumps - TRIPPED • Check SG blowdown isolation valves - CLOSED • Check SG blowdown sample isolation valves - CLOSED • Check SG chemical feed isolation valves - CLOSED 	
			BOP	<p>Check If Main Steam Lines Should Be Isolated</p> <p>Check Ctmt pressure GREATER THAN 18 psia</p> <p style="text-align: center;"><u>OR</u></p> <p>any SG pressure LESS THAN 660 psig</p>	<p>E-0, Step 10</p> <p>E-0, Step 10.a</p>

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				Proceed to step 11	E-0, Step 10.a, RNO
			RO	Check if CDA Required	E-0, Step 11
				Check Ctmt pressure is GREATER THAN 23 psia	E-0, Step 11.a
				<u>OR</u>	
				Ctmt spray is initiated	
			US	Proceed to step 12.	E-0, Step 11a, RNO
			BOP	Verify CAR Fans Operating In Emergency Mode	E-0, Step 12
				Check CAR fan status:	E-0, Step 12.a
				• CAR fans A and B - RUNNING	
				• CAR fan C - STOPPED	
				START/STOP CAR fans as necessary.	E-0 Step 12.a, RNO
				Verify RPCCW Ctmt supply and return header isolations - OPEN	E-0, Step 12.b

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				Verify Train A and B RPCCW supply and return to chill water valves - OPEN	E-0, Step 12.c
			RO	Verify CIA	E-0, Step 13
				Check ESF Group 2 status columns 2 through 10 - LIT	E-0, Step 13.a [*]
			RO	Verify proper ESF status panel indication	E-0, step 14 [*]
				<ul style="list-style-type: none"> Verify ESF Group 1 lights - OFF Verify ESF Group 2 lights - LIT <u>IF</u> Main Steam Line Isolation has occurred, <u>THEN</u> Verify ESF Group 3 lights - LIT <u>IF</u> CDA has occurred, <u>THEN</u> Verify ESF Group 4 lights - LIT 	
			RO	Determine If ADVERSE CTMT Conditions Exist	E-0, Step 15
				<ul style="list-style-type: none"> Ctmt temperature GREATER THAN 180°F 	
				<u>OR</u>	
				<ul style="list-style-type: none"> Ctmt radiation GREATER THAN 10⁵ R/hr 	

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			CREW	DO NOT use ADVERSE CTMT parameters.	E-0, Step 15, RNO
			CREW	To provide adequate ECCS flow, RCS subcooling and PZR level should be monitored to ensure that the charging pump is manually restarted if RCS subcooling based on core exit TCs is less than 32°F or PZR level is less than 16%.	E-0, Step 16, Caution
			RO	Verify ECCS Flow	E-0, Step 16
	BOOTH	If requested, report that the CHS pump breaker will not rack up properly. Electrical maintenance is investigating the problem.	RO	Check charging pump flow indicator - FLOW INDICATED	E-0, Step 16.a
			RO	START pumps and Align valves.	E-0, Step 16.a, RNO
			RO	Check if a charging pump should be stopped	EOP 35 E-0, Step 16.b
				Check RCS pressure - GREATER THAN 1650 psia (1950 psia ADVERSE CTMT)	EOP 35 E-0, Step 16.b.1)
			US	Proceed to step 16.i.	

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			RO	Check SI pump flow indicators - FLOW INDICATED	EOP 35 E-0, Step 16.i
		CREW should perform a short brief and come out of "Master Silence".	RO	Check RCS pressure - LESS THAN 300 psia (500 psia ADVERSE CTMT)	EOP 35 E-0, Step 16.j
			US	Proceed to step 17.	E-0 Step 16.j, RNO
			US	Verify Adequate Heat Sink.	E-0 Step 17
			BOP	Check NR level in at least one SG - GREATER THAN 8% (42% ADVERSE CTMT)	EOP 35 E-0, Step 17.a.
			BOP	Control feed flow to maintain NR level - BETWEEN 8% and 50% (42% AND 50% ADVERSE CTMT)	EOP 35 E-0, Step 17.b.
			US	Proceed to step 18	EOP 35 E-0, Step 17.c.
			BOP	Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT	EOP 35 E-0, Step 18
			RO	Verify ECCS Valve Alignment - PROPER EMERGENCY ALIGNMENT	EOP 35 E-0, Step 19
			US	Check Plant Status	E-0, step 20

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		Report "SLCRS DOORS CLOSED" when requested	SM	Verify SLCRS doors - CLOSED	E-0, Step 20.a
			US	Check CBI annunciator - LIT	E-0, Step 20.b
			RO	Verify CBI status	E-0, Step 20.c
			RO	Verify ESF Group 2 lights - LIT	E-0, Step 20.c.1
			BOP	Control Building purge supply fan and purge exhaust fan - NOT RUNNING	E-0, Step 20.c.2
			BOP	Control building air bank isolation valves - OPEN (after 60 seconds)	E-0, Step 20.c.3
			BOP	STOP kitchen exhaust fan	E-0, Step 20.d
			PEO	Close and Dog (as applicable) Control Building pressure boundary doors.	E-0, Step 20.e
			RO	Check RCS Temperature	EOP 35 E-0, Step 21
			RO	Verify RCS cold leg WR temperature - BETWEEN 550°F AND 560°F.	EOP 35 E-0, Step 21.a
T+ 5 min of request		Report the Control Building Pressure Boundary doors are closed & dogged.			

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			US	Perform the applicable action:	EOP 35 E-0, Step 21.a, RNO
			US	<ul style="list-style-type: none"> IF the temperature is LESS THAN 550°F, THEN Proceed to step 21c. 	EOP 35 E-0, Step 21.a, RNO
			BOP	Maintain total feed flow BETWEEN 530 and 600 gpm until NR level is GREATER THAN 8% in at least one SG	EOP 35 E-0, Step 21.c
			BOP	Close SG atmospheric dump and dump bypass valves	EOP 35 E-0, Step 21.d
			BOP	Check the following valves - CLOSED <ul style="list-style-type: none"> MSIVs MSIV bypass valves 	EOP 35 E-0, Step 21.e
			US	Check PZR Valves	E-0, Step 22
			RO	Verify PORVs - CLOSED	E-0, Step 22.a
			RO	Verify normal PZR spray valves - CLOSED	E-0, Step 22.b
			RO	Verify PZR safety valves - CLOSED	E-0, Step 22.c

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			US	To prevent damage to the RCP seal(s), seal injection flow should be maintained to all RCPs.	E-0, Step 23, CAUTION
			RO	Check If RCPs Should Be Stopped	E-0, Step 23
		This only applies if RCS Pressure has drifted down.	RO	Verify RCS pressure - LESS THAN 1500 psia (1800 psia ADVERSE CTMT)	E-0, Step 23.a
			RO	Verify charging or SI pumps - AT LEAST ONE RUNNING	EOP 35 E-0, Step 23.b
			RO	STOP all RCPs	E-0, Step 23.c
			BOP/	Check If SG Secondary	E-0, Step 24
			RO	Boundaries Are Intact	
			BOP/	Check pressure in all SGs	E-0, Step 24.a
			RO	<ul style="list-style-type: none"> NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER NO SG COMPLETELY DEPRESSURIZED 	

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			US	Check If SG Tubes Are Intact	E-0, Step 25
			RO	Verify trend history and alarm status of radiation monitors <ul style="list-style-type: none"> • Main steam line - NORMAL • Condenser air ejector - NORMAL • SG blowdown - NORMAL 	
			BOP	Check steam generator levels - NO SG LEVEL INCREASING IN AN UNCONTROLLED MANNER	E-0, Step 25.b
			RO	Align all SGs for activity samples.	E-0, Step 25.c
			RO	RESET SG blowdown sample isolation	E-0, Step 25.c.1
			RO	OPEN SG blowdown sample isolation valve(s)	E-0, Step 25.c.2
	BOOTH	Acknowledge the request to perform the S/G samples. Ensure crew request activity samples with HP coverage	US/ SM	Request Chemistry obtain activity samples using HP coverage	E-0, Step 25.d
		No. CTMT Pressure is slowly going up. CTMT histogram is not normal	RO	Check If RCS Is Intact	E-0, Step 26
			RO	<ul style="list-style-type: none"> • Verify Ctmt radiation using 3CMS*RE22 (pre-trip) - NORMAL 	

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			RO	<ul style="list-style-type: none"> Verify Ctmt radiation using radiation monitoring group histogram (CTMT) - NORMAL 	
			RO	<ul style="list-style-type: none"> Verify Ctmt pressure - NORMAL 	
			RO	<ul style="list-style-type: none"> Verify Ctmt recirculation sump level - NORMAL 	
			CREW	Initiate monitoring of CSF Status Trees and Go to E-1, Loss of Reactor or Secondary Coolant.	E-0, Step 26 RNO
			RO	To prevent seal damage, seal injection flow should be maintained to all RCPs.	E-1, Step 1 CAUTION
	Note	The US should remind the operators to review their Foldout Page Books	US	Note: Foldout page must be open.	E-1, Step 1 NOTE
		RCP's may have been stopped in E-0	US	Check If RCPs Should Be Stopped	E-1, Step 1
			RO	Verify RCS pressure LESS THAN 1500 psia (1800 psia ADVERSE CTMT)	E-1, Step 1a
			RO	Verify charging or safety injection pumps - AT LEAST ONE RUNNING	E-1, Step 1b
			RO	STOP all RCPs	E-1, Step 1c
			US	Check If SG Secondary Boundaries Are Intact	E-1, Step 2

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			BOP/	Check pressures in all SGs.	E-1, Step 2a
			RO	<ul style="list-style-type: none"> • NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO SG COMPLETELY DEPRESSURIZED 	
			US	Check Intact SG Levels	E-1, Step 3
			BOP	Verify NR level - GREATER THAN 8% (42% ADVERSE CTMT)	E-1, Step 3a
			BOP	Control feed flow to maintain NR level between 8% and 50% (42% and 50% ADVERSE CTMT)	E-1, Step 3b
			US	Check Secondary Radiation	E-1, Step 4
			RO	Verify trend history and alarm status of radiation monitors <ul style="list-style-type: none"> • Main steam line - NORMAL • Condenser air ejector - NORMAL • SG blowdown - NORMAL 	E-1, Step 4a
		S/Gs should be lined up for activity samples	US	Align all SGs for activity samples	E-1, Step 4b

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				1) RESET SG blowdown sample isolation	
				2) OPEN SG blowdown sample isolation valve(2)	
			US/ SM	Request chemistry obtain activity samples using HP coverage	E-1, Step 4c
			CREW	If any PZR PORV opens because of high PZR pressure, step 5a should be repeated after pressure decreases to LESS THAN 2350 psia.	E-1, Step 5 CAUTION
			US	Check PZR PORVs and Block Valves	E-1, Step 5
			RO	Verify PORVs - CLOSED	E-1, Step 5a
			RO	Verify block valves - AT LEAST ONE OPEN	E-1, Step 5b
			US	Check If ECCS Flow Should Be Reduced	E-1, Step 6
			RO	Verify RCS subcooling based on core exit TCs - GREATER THAN 32°F (115°F ADVERSE CTMT)	E-1, Step 6a
			US	DO NOT stop ECCS pumps. Proceed to CAUTION prior to step 8.	E-1, Step 6a, RNO

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Exam Title: LOSS OF MFP, RCP SEAL FAILURE & SBLOCA

ID Number: Y2KNRC-4

Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	To ensure adequate ECCS flow, do not stop any recirculation spray pumps used for core injection flow.	E-1, Step 8 CAUTION
			US	The recirculation spray pumps are sequenced to automatically start 11 minutes after a CDA.	E-1, Step 8 NOTE
			RO	Check if containment spray should be stopped.	E-1, step 8
			RO	Verify quench spray pumps - RUNNING	E-1, Step 8a
			US	Proceed to CAUTION prior to step 9.	E-1, Step 8a, RNO
		<i>This is a continuous action and RHR Pumps should be stopped when RCS pressure is stable. (WOG Background document step 9). ONCE THE PUMPS ARE STOPPED IF PRESSURE DROPS < 300 PSIA, THEY SHOULD BE RESTARTED.</i>	CREW	<ul style="list-style-type: none"> If offsite power is lost after SI reset, manual actions to restart safeguards equipment may be required. 	E-1, Step 9 CAUTION
			CREW	<ul style="list-style-type: none"> To provide adequate ECCS flow, RCS pressure should be monitored to ensure that the RHR pumps are manually restarted if pressure decreases to LESS THAN 300 psia (500 psia ADVERSE CTMT) 	E-1, Step 9 CAUTION

EVALUATION GUIDE

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	Check If RHR Pumps Should Be Stopped	E-1, Step 9
			RO	Check RCS pressure	E-1, Step 9a
				1) Verify pressure - GREATER THAN 300 psia (500 psia ADVERSE CTMT)	
				2) Verify pressure - STABLE OR INCREASING	
		Crew should reset SI	RO	RESET SI, if necessary	E-1, Step 9b
			RO	STOP RHR pumps and Place in Auto	E-1, Step 9c
			US	Check RCS and SG Pressures	E-1, Step 10
Note		As CTMT Pressure increases towards 18 psia, the crew may elect to manually MSI instead of allowing an auto actuation at 18 psia.	BOP	<ul style="list-style-type: none"> Check pressure in all SGs - INCREASING OR STABLE (consistent with plant cooldown) 	
			RO	<ul style="list-style-type: none"> Check RCS pressure - DECREASING OR STABLE <p>Do not reset CDA if the recirculation spray pumps are required and have not automatically started.</p>	E-1, Step 10 E-1, Step 11 CAUTION

EVALUATION GUIDE

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard	
T+ 5 min of Request	EDR18	This will reset MCC32-3T	US	Check If Diesel Generators Should Be Stopped	E-1 Step 11	
			BOP	Verify AC emergency busses - BOTH ENERGIZED BY OFFSITE POWER	E-1 Step 11a	
	US		Proceed to step 11.g.	E-1 Step 11b		
	RO		RESET SI and CDA, if required	E-1 Step 11g		
	PEO		Locally perform the following to energize MCC32-3T	E-1 Step 11h		
	EDR44		This will clear Inv6 alarms on MB8	1) CLOSE the feeder breaker on 32T for MCC 32-3T (32T13-2)		
				2) Verify Inverter 6 DC input ammeter indicating zero amps		
	BOP			Check emergency diesel generators - BOTH RUNNING UNLOADED	E-1 Step 11i	
	BOP			STOP unloaded diesel generator(s)	E-1 Step 11j	
	PEO			3) Locally perform the following for unloaded emergency diesel generators:	E-1 Step 11k	
			Report task as being competed			

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			PEO	<ul style="list-style-type: none"> For EDG A, Place 3EGS*PNL1A control switch on MCC 32-1T-3H to START 	
			PEO	<ul style="list-style-type: none"> For EDG B, Place 3EGS*PNL1B control switch on MCC 32-1U-3H to START 	
			US/ SM	Consult with the ADTS and EMT Team prior to performing any local inspections in the Auxiliary Building or ESF Building.	E-1 Step 12 CAUTION
			US	Initiate Evaluation Of Plant Status	E-1 Step 12
			US	Verify cold leg recirculation capability	E-1 Step 12a
			BOP	1) Power to recirculation spray pumps - AVAILABLE	
			RO	2) Verify power for cold leg recirculation valves using Attachment A - AVAILABLE	
			RO	Check Auxiliary Building and ESF Building radiation (radiation monitoring group histograms)	E-1 Step 12b

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				<ul style="list-style-type: none"> Auxiliary Building (AUX.) - NORMAL ESF Building (ESF) - NORMAL SLCRS Area (SLRW) - NORMAL 	
			RO	Align for PASS samples 1) RESET CIA 2) OPEN PASS isolation valves	E-1 Step 12c
			US/ SM	Request ADTS obtain samples using EPOP 4449, Unit 3 RX Coolant and Liquid Waste PASS <ul style="list-style-type: none"> RCS boron concentration RCS activity (fuel damage assessment) RCS hydrogen concentration Ctmt sump boron concentration Ctmt sump activity 	E-a, Step 12d

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	Check If RCS Cooldown And Depressurization Is Required	E-1 Step 13
			RO	Verify RCS pressure - GREATER THAN 300 psia (500 psia ADVERSE CTMT)	E-1 Step 13a
			US	Go to ES-1.2, post LOCA Cooldown and Depressurization	E-1 Step 13b

FREEZE

TERMINATE SCENARIO

SECTION 4

ID Number: Y2KNRC-4

Revision: 0

EVALUATION GUIDE

I. SUMMARY

1. The following **Critical Tasks** are covered in this exercise:

<u>TASK DESCRIPTION</u>	<u>TASK #</u>	<u>K/A >= 3.0</u>
Manually actuate at least one train of SIS-actuated safeguards before any of the following: Transition past step 4 of E-0 or Transition past step 5 of ES-0.1	006-030-A2.01 E03-EA1.1	4.5/4.8 4.0/4.0
Establish 525 GPM AFW flow to the SGs before transition out of E-0, unless the transition is to FR-H.1, in which case the task must be initiated before RCPs are manually tripped in accordance with step 9 of FR-H.1	061-000-A2.02 E01-EA1.1	3.2/3.6 3.7/3.7

Note: **[CRITICAL TASK]** Used to designate critical tasks. Should also be incorporated into column 3 or 4 of Instructor Guide.

2. NON-Critical Tasks covered in this exercise are listed later in the guide.

SECTION 4

Lesson Title: LOSS OF MFP, RCP SEAL FAILURE & SBLOCA

ID Number: Y2KNRC-4

Revision: 0

EVALUATION GUIDE

II. FOLLOW-UP QUESTIONS: (document any follow up questions asked)

SECTION 5

SCENARIO INITIAL CONDITIONS

ID Number: Y2KNRC-4

Revision: 0

Reactor Power:	~27%
Operating History:	3 days on line
RCS Boron:	1650 ppm
Core Burnup:	150 MWD/MTU
Condensate Demins:	4 IN SERVICE
Evolutions in Progress:	Plant startup after refueling is in progress
Major Equipment OOS:	NONE

Crew Instructions:

Maintain power while awaiting primary and secondary chemistry results.
The crew is currently in OP3204, At Power Operation, at step 4.1.10

Note from Reactor engineering. MTC is slightly negative with a value of approximately -4 pcm/degree. There are no restrictions on rod steps/min to maintain power or temperature.

Plant/Simulator Differences:

- ° Rad Monitor Historical Data--Simulator Rad Monitor historical data not valid prior to the beginning of this exercise.
- ° If not using the speed dial option on the phone system, the operator must dial either #3333 or #3334 to reach the person/department they desire.
- ° The following PPC programs do not function on the simulator:
 - Samarium Follow
 - Xenon Follow
 - Sequence of Events

SECTION 6

VALIDATION CHECKLIST

Title: LOSS OF MFP, RCP SEAL FAILURE & SBLOCA

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Remote functions:

All remote functions contained in the guide are certified.

Malfunctions:

All malfunctions contained in the guide are certified.

Initial Conditions:

The initial condition(s) contained in the guide are certified or have been developed from certified IC's in accordance with NSEM-4.02.

Simulator Operating Limits:

The simulator guide has been evaluated for operating limits and/or anomalous response.

Test Run:

The scenario contained in the guide has been test run and validated (validation sheet completed, next page) on the simulator. Simulator response is reasonable and as expected.

Examination Scenario Review

The dynamic examination review checklist is complete. (This is not required unless the exam will be used as an Annual Exam, then NUREG 1021 requirements apply.)

CMartin

Technical Reviewer

2/21/00

Date

SECTION 7

REFERENCE AND TASK TRACKING

Title: LOSS OF MFP, RCP SEAL FAILURE & SBLOCA

ID Number: Y2KNRC-4

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I. References:

ARP MB5A.5-5	Response to a trip of the running TDMFW Pump
ARP/AOP3506	Loss of the running CHS Pump
ARP MB3B. 2-10	RCP Seal Leakoff High Alarm
AOP 3554	Removing a RCP from service at Power
EOP E-0	Rx Trip or Safety Injection
EOP E-1	Loss of Reactor or Secondary Coolant
EPIP 4400	Event Assessment, Classification and Reportability
ERG_EXE	Westinghouse Owners Group Executive Document
EOP* Step _DOC	MP3 Step Deviation Document
EOP*ERG_HP	Westinghouse Owners Group Background Document
NUREG*1021 rev 8	Examiners Standards

II. Non- Critical Tasks Covered in this Guide/Test:

Demonstrate the ability to classify the event using the emergency classification tables
Respond to a trip of the running MFP
Respond to a RCP Seal Failure
Respond to a Small Break LOCA

SECTION 8

SCENARIO ATTRIBUTES CHECKLIST

Lesson Title: LOSS OF MFP, RCP SEAL FAILURE & SBLOCA

ID Number: Y2KNRC-4

Revision: 0

Assessor: J. William Côté

Concurrence:

C. Martin 2/21/00

QUALITATIVE ATTRIBUTES

- Y 1. The scenario summary clearly states the objectives of the scenario.
- Y 2. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the crew into expected events.
- Y 3. The scenario consists mostly of related events.
- Y 4. Each event description consists of:
- the point in the scenario when it is to be initiated
 - the malfunctions(s) that are entered to initiate the event
 - the symptoms/cues that will be visible to the crew
 - the expected operator actions (by shift position)
 - the event termination point
- Y 5. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
- Y 6. The events are valid with regard to physics and thermodynamics.
- Y 7. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
- N/A 8. If time compression techniques are used, scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.
- Y 9. The simulator modeling is not altered.
- Y 10. The scenario has been validated. Any open simulator performance deficiencies have been evaluated to ensure functional fidelity is maintained while running the scenario.
- Y 11. Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered IAW Section D.4 of ES301
- Y 12. All individual operator competencies can be evaluated, as verified using form ES-301-6.
- Y 13. Each operator will be significantly involved in the minimum number of transients and events specified on Form ES-301-5. (Form submitted with simulator scenarios).
- Y 14. Level of difficulty is appropriate to support licensing decisions for each crew position.

SECTION 8

SCENARIO ATTRIBUTES CHECKLIST

Lesson Title: LOSS OF MFP, RCP SEAL FAILURE & SBLOCA

ID Number: Y2KNRC-4

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Note: Following criteria list scenario traits that are numerical (QUANTITATIVE) in nature.

- | | | |
|-----|---|-----------------|
| 01. | Total Malfunctions (TM) - Include EM's- 5 to 8 required
Trip of the running MFP, Trip of the running CHS Pump, RCP seal leak, complete RCP seal failure, Small Break LOCA, Auto Rx Trip failure, Auto SI initiate failure, AFW Pump auto start failure | Total <u>7</u> |
| 02. | Mal's after EOP entry (EM's)- 1 to 2 required
Auto Rx Trip failure, Auto SI initiate failure, AFW Pump auto start failure | Total <u>3</u> |
| 03. | Abnormal Events (AE)-2 to 4 required
Trip of the running MFP, RCP seal leak & Removal of RCP from Service | Total <u>2</u> |
| 04. | Major Transients (MT)-1 to 2 required
Rx Trip due to SBLOCA, Plant SI initiation | Total <u>2</u> |
| 05. | EOP's (EU) entered/requiring substantive actions 1 to 2 required
E-0, Rx Trip or Safety injection, E-1, Response to a Loss of Reactor or Secondary Coolant. | Total <u>1</u> |
| 06. | EOP Contingencies requiring substantive actions [ECAs/FRs](EC) 0 to 2 required | Total <u>0</u> |
| 07. | Critical Task (CT) - 2 to 3 required
Manually trip the Reactor, Manually actuate SI, Manual start of AFW Pumps | Total <u>3</u> |
| 08. | Approximate Scenario Run Time: 45 to 60 min. (One scenario may approach 90 minutes) | Total <u>60</u> |
| 09. | EOP run time: | Total <u>20</u> |
| 10. | Technical Specifications are exercised during the scenario.
Loss of CHS Pump, Removal of RCP from service at power. | (Y/N) <u>Y</u> |