Initial Dynamic Simulator Scenario

NUREG-1021, Appendix D, Attachment 1

Title: STATION BLACKOUT

ID Number: 2K1NRC-001 Revision: 0

I. Summary:

Facility: Millstone 3 PWR:_____ Scenario No: 2K1NRC-001 Op-Test No:2K1LOIT

Examiners:_____ Operators:_____

Initial Conditions: IC-18; 100% power, middle of life, MP2 in a refueling outage

Event No:	Malf. No.	Event Type *	Event Description
1	None	N(RO)	Shift Letdown 75 gpm Orifices using OP 3304A, Charging and Letdown, Section 4.7.3
2	None I/O 3CHS* MV8104	R(ALL) C(RO)	CONVEX ordered load reduction 3CHS*MV8104 will not open
3	RX05B	I(RO)	RCS Loop 2 Hot Leg Temperature Instrument fails high
4	RX15	I(BOP)	Main Steam Header Pressure Channel fails low
5	ED01 TC03 EG06B EG08A	M(ALL) C(BOP) C(US/ BOP)	Loss of Offsite Power Main Turbine Trip Failure "B" EDG will not start (can be started locally) "A" EDG will initially start then later trip
6	RC07A	C(RO)	PZR PORV is partially open
7	SW08B/D	C(RO)	Service Water Fails to Auto Start

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

SECTION 8
MILLSTONE UNIT 3
SIMULATOR SCENARIO ATTRIBUTES CHECKLIST
FORM ES-301-4

Exam Title: STATION BLACKOUT

ID Number: 2K1NRC-001 Revision: 0

Assessor: Steve Jackson

QUALITATIVE ATTRIBUTES

___Y__1. 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__2. The scenario consists mostly of related events.

___Y__3. 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 (if applicable)

___Y__4. 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__5. The events are valid with regard to physics and thermodynamics.

___Y__6. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.

_N/A__7. 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__8. The simulator modeling is not altered.

___y__9. The scenario has been validated. Any open simulator performance deficiencies have been evaluated to ensure functional fidelity is maintained while running the scenario.

___Y__10. 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__11. All individual operator competencies can be evaluated, as verified using form ES-301-6.

___Y__12. 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__13. Level of difficulty is appropriate to support licensing decisions for each crew position.

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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 — Total: 8

Station Blackout, RCS Hot Leg Temperature Instrument fails high, PORV Fails Open on Trip, PT-507 Fails Low, Loss of Offsite Power, Auto Start Failure on EDG, Immediate Boration normal flowpath not available (MV8104 stuck shut), SW pump fails to auto start

02. Malf's after EOP entry (EM's)- 1 to 2 required — Total: 2

Auto Start Failure on EDG, PORV Fails Open on Trip

03. Abnormal Events (AE)-2 to 4 required — Total: 4

Rapid Downpower, Instrument Failure Response (Tc), Instrument Failure (PT-507), Immediate Boration normal flowpath not available (MV8104 stuck shut)

04. Major Transients (MT)-1 to 2 required — Total: 2

Loss of Offsite AC, Station Blackout

05. EOP's (EU) entered/requiring substantive actions 1 to 2 required — Total: 2

E-0, Reactor Trip or Safety Injection, ECA-0.0, Loss of All AC Power

06. EOP Contingencies requiring substantive actions [ECAs/FRs](EC) 0 to 2 required — Total: 1

ECA-0.0, Loss of All AC Power,

07. Critical Task (CT) - 2 to 3 required — Total: 3

E-0 – Q	Manually trip the main turbine before a severe (orange-path) challenge develops to either the subcriticality or the integrity CSF.
ECA-0.0 -- A:	Manually close the open PZR PORV before completing step 4 of ECA-0.0 or when power is restored to the block valve.
ECA-0.0 -- F:	Manually start the SW pump and verify SW flowpath before completing step 25 of ECA-0.0.

08. Approximate Scenario Run Time: 45 to 60 min. (One scenario may approach 90 minutes) — Total: 60 min

09. EOP run time: — Total: 30min

10. Technical Specifications are exercised during the scenario. — (Y/N) Y

NOTES: Reactivity Manipulation: Rapid Downpower ordered by CONVEX

MILLSTONE NUCLEAR POWER STATION

LOIT NRC SIMULATOR EXAM GUIDE APPROVAL SHEET

Exam Title: STATION BLACKOUT

Revision: 0

ID Number: 2K1NRC-001

Submitted by:	Steve Jackson Developer	10/9/01 Date
Validated by:	Martin Technical Reviewer	11/19/01 Date
Approved by:	Operation Manager (Optional)	Date
Approved by:	Training Supervisor	11/20/01 Date

SIM EXAM 001

SUMMARY OF CHANGES RE: NRC VALIDATION

Changed leaking PORV to the B PORV (456). Deleted actions to close PORV.

Changed PT-507 failure ramp from 180 seconds to 240 seconds.

Added statement to "Check 3CHS*AV8149C Letdown Orifice in service" during Simulator set-up.

Corrected editorial error (changed 3204A to 3304A throughout).

Added statement "Total leakage flowrates listed in step 4.7.1.a have been determined to be 15.8 gpm" to the Turnover Sheet to avoid crew delay calculating these values.

Added Tech Spec detail.

Amended critical task to read.

> **[Critical Task]** [Manually close the open PZR PORV (or block valve) before completing step 3 of ECA-0.0 or when power is restored to the block valve]

Added Remotes for Instrument Rack Room doors.

SECTION 2

SIMULATOR EXAM GUIDE

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SECTIONS LISTED IN ORDER

SECTION 3

EXAM OVERVIEW

Title: STATION BLACKOUT

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Exam Brief:

The plant is at 100% power, MOL steady state operations with all control systems in automatic. The crew will initially respond to an Engineering department request and shift Letdown 75 gpm Orifices using OP 3304A, Charging and Letdown, Section 4.7.3. When that normal evolution is complete, the crew will perform a rapid downpower required by CONVEX. The unit will be ordered to reduce load by 200 MwE to 1000 MwE (~83 %). The Immediate Boration step will require an alternate path as 3CHS*MV8104 will not open.

Once the Load Reduction is commenced, the RCS Loop 2 Hot Leg Temperature Instrument will fail high. Abnormal Tave, Delta T and Rod motion will evidence this failure. The crew should respond using AOP 3571, Instrument Failure Response, to defeat the failed channel input, trip bistables and address Tech Specs. The US may or may not choose to halt the downpower while dealing with this malfunction

When the downpower is complete, MSS-PT507, Main Steam Header Pressure Channel, will fail low slowly. The crew should take manual control of the Master Feedpump Speed Controller to stop the feed system transient. This transient may cause an automatic reactor trip signal or the crew may gain control of the transient.

If the crew is able to control the feed transient, a Loss of Offsite power will initiate a reactor trip and plant shutdown. The Main Turbine will not automatically trip **[Critical Task]**. The "B" EDG will not start due to it's inability to respond to signals from the Sequencer or MB8. Though the "A" EDG will initially start it will not load and will exhibit degraded frequency due to a damaged governor linkage. The crew may conservatively decide to shutdown the EDG; if not the "A" EDG will trip at step 4 of E-0 and will not be able to be re-started.

The crew should carry out the actions of E-0. When the "A" EDG trips the crew should transition to ECA-0.0, Loss of all AC Power. At step 3 of ECA-0.0 the crew should diagnose that a PZR PORV is partially open and close the associate PORV Block Valve after attempting to close the PORV **[Critical Task]**. Plant assistance (a PEO/NLO, Maintenance, Engineering, etc.) should be dispatched to both EDGs to ascertain the reason for the start failures. The "B" EDG will be able to be started locally using ECA-0.0, Attachment E. The "B" EDG local start attempts will succeed when the crew has completed step 5 of ECA-0.0. Service Water will need to be restored to the running EDG **[Critical Task]**. The crew should then Go To step 24 as per the note prior to step 6.

The scenario will end when the crew has selected a recovery procedure, at step 27, based on plant conditions (ECA-0.1, Loss of All AC Power Recovery Without SI Required or ECA-0.2, Loss of All AC Power Recovery With SI Required).

The SM should classify this event as a **Site Area Emergency - Charlie Two** due to Loss of Voltage on Buses 34C and 34D > 15 minutes (EAL PS1).

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

4. Duration of Exam: 60 minutes

SECTION 4

EVALUATION GUIDE

Title: STATION BLACKOUT

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All Control Room Conduct, Operations and Communications shall be in accordance with MP-14-MMM.

"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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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard

Simulator Setup Instructions:

1. HANG Exam Placards on the simulator doors.
2. START the Sun Workstation.
   a. IF the Sun Workstation is running THEN go to SIM ACTIVE.
3. PLACE Recorder Power to ON.
4. VERIFY that the current approved training load is loaded.
5. REMOVE the step counter OVERRIDE and allow the counters to step out during the IC reset.
6. RESET to **IC-18, TEMP IC 2K1NRC-001**
7. ADJUST the various pot settings to the valued specified by the chart in the simulator booth or Notepad for the selected IC.
8. PLACE Simulator to RUN.
9. ADJUST MWt using Turbine Load Set to 3411, (+)0, (-)3 IF using 100% power IC.
10. RESET the Plant Calorimetric at the Instructor Station PPC by Pressing "SHIFT LEFT" and "F6" simultaneously.
11. ENSURE Simulator fidelity items cleared.
    a. CHECK the STEP COUNTERS at correct position for plant conditions.
    b. PLACE __7__ 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.

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard

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.

1) See laminated directions on clipboard in Sim booth.

12. 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

13. RESET Rad Monitor Screen to Status Grid.

14. 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).

15. IF placing equipment OOS, THEN perform the necessary switch manipulations and hang appropriate tags, as required, listed under "Equipment OOS."

16. LOCK the Simulator Room front door.

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
	°	**PLACE THE FOLLOWING EQUIPMENT OOS: STANDARD 2K1NRC EXAM EQUIPMENT**			
Initial Malfunctions					
I/O (CV)	3CHS*MV8104	Emergency Boration Valve	Open - False		
MALF	EG06B	EDG "B" Fail to Start			
MALF	EG08A	EDG "A" Load Limiter Failure	ramp=30 seconds	0%	BT1 (Rx Trip)
MALF	TC03	Turbine Fails to Trip			
MALF	RC07B	PORV 456 Leakage		15%	BT1 (Rx Trip)
I/O (RC)	3RCS*PV456	PORV 456	Green - True		BT1 (Rx Trip)
I/O (RC)	3RCS*PV456	PORV 456	Red - True		BT1 (Rx Trip)
MALF	SW02B	Service Water Pump B Failure to Auto Start			BT1 (Rx Trip)
MALF	SW02D	Service Water Pump D Failure to Auto Start			BT1 (Rx Trip)
Event Malfunctions					
MALF	RX05B	RCS Narrow Range Hot Leg Temperature TE421A Failure		100%	ramp=120 seconds
MALF	RX15	Main Steam Header Pressure Transmitter PT507 Failure		0%	ramp=240 seconds
MALF	ED01	Loss of Offsite Power			
MALF	EG07A	EDG "A" Trip			

*******Check 3CHS*AV8149C Letdown Orifice in service*******

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

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
T=0		**Event 1:** **OP 3304A,** Charging and Letdown, Rev.28-01 **[Normal Evolution]**	US	IF shifting the 75 gpm letdown orifices PERFORM the following:	OP 3304A, Step 4.7.3
			RO	Refer To Step 4.7.1 and PLACE the 45 gpm orifice in service.	OP 3304A, Step 4.7.3.a
			US	Changes in letdown flowrate will result in a change in VCT temperature, pressure and level due to the slow response of the controllers.	OP 3304A, Step 4.7.1 CAUTION
			US	When performing this section as directed by an emergency or annunciator response procedure, the 17 gpm limitation of Step 4.7.1.a does not apply.	OP 3304A, Step 4.7.1 NOTE
			RO	IF desired to increase letdown flow by placing the 45 gpm orifice in service, PERFORM the following:	OP 3304A, Step 4.7.1
			RO	VERIFY that the total of the flowrates listed below does not exceed 17 gpm: • Total RCP seal return flow_____ • Total RCS leakage _____ TOTAL _____	OP 3304A, Step 4.7.1.a

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
		NOTE: Call back after 2 minutes as PEO if asked to do CHS pump pre-start checks.	RO	Refer To Section 4.4 and START second charging pump (MB3): • 3CHS*P3A, "CHG PP A" • 3CHS*P3B, "CHG PP B"	OP 3304A, Step 4.7.1.b
			RO	PLACE 3CHS-FK121, "CHG LINE FLOW," to "MANUAL" (MB3).	OP 3304A, Step 4.7.1.c
			RO	INCREASE charging flow to approximately 110 gpm.	OP 3304A, Step 4.7.1.d
			RO	OPEN 3CHS*AV8149A, "L/D ORIFICE ISOL" (MB3).	OP 3304A, Step 4.7.1.e
			RO	VERIFY letdown flow increased to approximately 131 gpm, as indicated on 3CHS-FI 132, "LETDOWN FLOW".	OP 3304A, Step 4.7.1.f
			RO	ADJUST charging flow to maintain pressurizer level.	OP 3304A, Step 4.7.1.g
			RO	PLACE 3CHS-FK121, "CHG LINE FLOW," to "AUTO" (MB3).	OP 3304A, Step 4.7.1.h
			RO	CLOSE letdown flow orifice isolation (MB3) for the appropriate orifice: • 3CHS*AV8149B, "L/D ORIFICE ISOL"	OP 3304A, Step 4.7.3.b

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				• 3CHS*AV8149C, "L/D ORIFICE ISOL"	
			RO	OPEN letdown flow orifice isolation (MB3). • 3CHS*AV8149C, "L/D ORIFICE ISOL" • 3CHS*AV8149B, "L/D ORIFICE ISOL"	OP 3304A, Step 4.7.3.c
			RO	VERIFY letdown flow (approximately 131 gpm) is reestablished as indicated on 3CHS-FI 132, "LETDOWN FLOW" (MB3).	OP 3304A, Step 4.7.3.d
			RO	VERIFY charging flow is approximately 110 gpm as indicated on 3CHS-FI 121A, "CHG LINE FLOW" (MB3).	OP 3304A, Step 4.7.3.e
			RO	IF desired, Refer To Step 4.7.2 and REMOVE the 45 gpm orifice from service.	OP 3304A, Step 4.7.3.f
			RO	IF desired to decrease letdown flow by removing the 45 gpm orifice from service, PERFORM the following:	OP 3304A, Step 4.7.2

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			RO	When letdown flow orifice A isolation is closed, anticipated charging flow to modulate to approximately 55 gpm, as indicated by 3CHS-FI 121A, "CHG LINE FLOW" (MB3).	OP 3304A, Step 4.7.2.a NOTE
			RO	CLOSE 3CHS*AV8149A, "L/D ORIFICE ISOL" (MB3)	OP 3304A, Step 4.7.2.a
			RO	VERIFY normal letdown flow of approximately 75 gpm is established as indicated by 3CHS-FI 132, "LETDOWN FLOW" (MB3).	OP 3304A, Step 4.7.2.b
			RO	STOP the second charging pump (MB3): • 3CHS*P3A, "CHG PP A" • 3CHS*P3B, "CHG PP B"	OP 3304A, Step 4.7.2.c
T= After L/D Orifice shift		**EVENT 2**: CONVEX Rapid Downpower			
	CALL FROM SIM BOOTH	**CALL as CONVEX:** Grid instabilities required that we shed load. Millstone: Perform an emergency generation reduction of 200 MwE to 1000 MwE in the next 15 minutes. Maintain VARS loading at it's current value. Call CONVEX when target power is reached.			

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
		AOP 3575, Rapid Downpower, Rev.7		• A CONVEX requested emergency generation reduction should be completed within 15 minutes of notification. • If a unit shutdown is required, the target power level should be between 20% and 25% reactor power. • If at any time ROD CONTROL BANKS LIMIT LO - LO (MB4C 4 - 9) annunciator is received, DO NOT go to AOP 3566, Immediate Boration. Immediately perform step 9.	AOP 3575 Step 1 NOTE
			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 CONVEX REQUESTED	AOP 3575 Step 1.b
			CREW	Perform load reduction at 5% min and Proceed to step 2.	AOP 3575 Step 1.c
			US	**Check Rod Control In AUTO.**	AOP 3575 Step 2

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			CREW	**Align EHC Panel**	AOP 3575 Step 3
			US	Check turbine OPERATING MODE - MANUAL	AOP 3575 Step 3.a
			US	Check LOAD LIMIT LIMITING light - LIT	AOP 3575 Step 3.b
			BOP	Intermittently Press DECREASE LOAD pushbutton until LOAD LIMIT LIMITING light - NOT LIT	AOP 3575 Step 3.c
			BOP	Rotate LOAD LIMIT SET adjust knob at least one full turn in raise direction	AOP 3575 Step 3.d
				Select DECREASE LOADING RATE to ON	AOP 3575 Step 3.e
			BOP	Select LOAD RATE LIMIT % MIN to required power reduction rate (% min)	AOP 3575 Step 3.f
				If at any time the power reduction rate or target power level must be changed, Return to step 1.	AOP 3575 Step 4 NOTE
			US/RO	**Verify Power Reduction Rate**	AOP 3575 Step 4
			RO	Check power reduction rate 5% MIN	AOP 3575 Step 4.a

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			RO	Check power reduction - REQUIRED TO STABILIZE PLANT	AOP 3575 Step 4.b
				Proceed to step 5.	AOP 3575 Step 4.b RNO
			RO	**Initiate Rapid Boration**	AOP 3575 Step 5
				Verify RCS makeup system in - AUTO	AOP 3575 Step 5.a
				START one boric acid transfer pump.	AOP 3575 Step 5.b
INITIAL	**I/O**, 3CHS* MV8104	I/O, 3CHS*MV8104, Emergency Boration Valve, Close - True		OPEN emergency boration valve (3CHS*MV8104).	AOP 3575 Step 5.c
			RO	Verify direct boric acid flow (3CHS-FI 183A) - INDICATED.	AOP 3575 Step 5.d
		NOTE: I/O forces RNO for Gravity Boration.		Perform the following to initiate gravity boration:	AOP 3575 Step 5.d RNO
				1. Place the charging line flow control valve in MAN.	
				2. OPEN at least one gravity feed boration valve.	

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				3. CLOSE at least one VCT outlet isolation valve. 4. Limit net charging flow to the RCS to LESS THAN 75 gpm (charging + seal injection - RCP seal return). 5. Adjust charging line flow control valve as required. 6. Proceed to step 5.f.	
			RO	Record time boration started Time _____	AOP 3575 Step 5.f
				Energize all PZR heaters.	AOP 3575 Step 5.g
				Determine required boric acid addition by multiplying total power change (△%) by 15 (gal/%) = _____ gal.	AOP 3575 Step 5.h
				Determine required time to borate by dividing required gallons of boric acid by the direct boric acid flowrate (*net charging flow rate if using gravity boration)* _____ min.	AOP 3575 Step 5.i
			US	Check turbine load decrease - IN PROGRESS OR COMPLETED.	AOP 3575 Step 5.j

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			US	Proceed to NOTE prior to step 7	AOP 3575 Step 5.j RNO
			RO	If a unit shutdown is being performed, the final MWe load should be approximately 230 MWe.	AOP 3575 Step 7 NOTE
			US/BOP	**Initiate Load Reduction.**	AOP 3575 Step 7
			BOP	Check turbine OPERATING MODE - MANUAL	AOP 3575 Step 7.a
			BOP	Check rapid or gravity boration - IN PROGRESS	AOP 3575 Step 7.b
			BOP	Check LOAD RATE LIMIT % MIN set at - 3% OR 5%.LIMITING light - LIT.	AOP 3575 Step 7.c
			BOP	Select LOAD RATE LIMIT % MIN to 3% or 5%.	AOP 3575 Step 7.c RNO
			BOP	Utilizing DECREASE LOAD pushbutton, Adjust LOAD SET to desired final MWe (target power level)	AOP 3575 Step 7.d
			BOP	Check power reduction - CONVEX REQUESTED.	AOP 3575 Step 7.e

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			BOP	Maintain initial MVAR loading during power reduction, unless directed otherwise.	AOP 3575 Step 7.f
			US/RO	Check boration - IN PROGRESS	AOP 3575 Step 7.g
			BOP	The following step places one TD FW pump in manual while allowing the other TD FW pump to automatically unload during the downpower.	AOP 3575 Step 8 NOTE
			US/BOP	**Align One Feedwater Pump For Automatic Unloading**	AOP 3575 Step 8
			BOP	Verify removing a feedwater pump from service during the downpower - DESIRED	AOP 3575 Step 8.a
				Proceed to step 9.	AOP 3575 Step 8.a RNO
			US/RO	**Verify Rod Position**	AOP 3575 Step 9
			RO	Check ROD CONTROL BANKS LIMIT LO - LO (MB4C 4 - 9) annunciator - LIT.	AOP 3575 Step 9.a

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			US/RO	Proceed to step 9.e and, IF at any time, the annunciator is received, THEN Perform steps 9.b, 9.c and 9.d.	AOP 3575 Step 9.a RNO
			RO	Verify boration from a BAT tank is in progress at GREATER THAN OR EQUAL TO 33 gpm.	AOP 3575 Step 9.b
			RO	Perform the applicable action: • IF rapid OR gravity boration is in progress, THEN Increase boration flow. • IF normal OR no boration is in progress, THEN Perform steps 5.a through 5.e. IF the required boration flow can NOT be established, THEN TRIP the reactor and Go to E - 0, Reactor Trip or Safety Injection.	AOP 3575 Step 9.b RNO

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			RO	Continue boration at GREATER THAN OR EQUAL TO 33 gpm until the rods are restored above the insertion limit.	AOP 3575 Step 9.c
			US	Refer to the following Technical Specifications and Determine additional actions: • T/S 3.1.1.1.1 • T/S 3.1.3.6	AOP 3575 Step 9.d
			RO	Check ROD CONTROL BANKS LIMIT LO (MB4C 3 - 9) annunciator - LIT	AOP 3575 Step 9.e
			US	Proceed to NOTE prior to step 10 and, IF the annunciator is received, THEN Perform step 9.f and 9.g.	AOP 3575 Step 9.e RNO
			US	Check power reduction - CONVEX REQUESTED.	AOP 3575 Step 9.f
			US/BOP	If desired, Slow or Stop the power reduction.	AOP 3575 Step 9.f RNO
			US/RO	Increase the boration flow rate as required.	AOP 3575 Step 9.g

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			RO	Boric acid total volume addition and flow rates are based on approximations. Adjustments should be made to these values as necessary to ensure the reactor reaches the desired end state of: • Tavg on program • Rods above the Rod Insertion Limit • AFD on or above the target value	AOP 3575 Step 10 NOTE
			US	**Restore From Rapid Boration.**	AOP 3575 Step 10
			RO	Check rapid boration - IN PROGRESS.	AOP 3575 Step 10.a
			US	Proceed to Step 11.	AOP 3575 Step 10.a RNO
			US	**Restore From Gravity Boration**	AOP 3575 Step 11
			RO	Check gravity boration - IN PROGRESS	AOP 3575 Step 11.a

Lesson Title: STATION BLACKOUT

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			RO	Check gravity boration performed for the required time determined in step 5.i.	AOP 3575 Step 11.b
			RO	OPEN both VCT outlet isolation valves.	AOP 3575 Step 11.c
			RO	CLOSE both gravity feed boration valves.	AOP 3575 Step 11.d
			RO	Restore PZR level to program value and Place charging line flow control valve in AUTO.	AOP 3575 Step 11.e
T= When discovered by crew ("as-is" failure)	**MALF** RX05B, 100%, 180 seconds	**EVENT 3:** RCS Th Instrument Fails"			
		AOP 3571, Instrument Failure, Rev. 7	US	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
			US	If a reactor trip occurs, immediately go to E-0, Reactor Trip or Safety Injection.	AOP 3571 Step 1 NOTE
			RO	**Determine The Initiating Parameter And Place The Affected Controller In MANUAL.**	AOP 3571 Step 1

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			US	**Stabilize The Plant Parameters.**	AOP 3571 Step 2
				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
			US	Perform Corrective Actions Using Appropriate Attachment	AOP 3571 Step 3
				Instrument Failure	**Attachment**
			US	RCS Narrow Range Temperature Channel Failure	A
		ATTACHMENT A : RCS Narrow Range Temperature Channel Failure	US	The following annunciators are symptoms of an RTD failure:	
				TAVE/AUCT TAVE DEVIATION	MB4C 5-5
				TREF/AUCT TAVE DEVIATION	MB4C 6-5
				ΔT/AUCT ΔT DEVIATION	MB4C 4-5

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				OVERPOWER ΔT	MB4C 3-6
				TAVE HI	MB4C 5-6
				OVERTEMP ΔT	MB4C 4-6
				LOOP 1,2,3,4, OVR TEMP ΔT	MB4F 1,2,3,4-5
				LOOP 1,2,3,4 OVR PWR ΔT	MB4F 1,2,3,4-6
				LOOP 1,2,3,4 OVR TEMP ΔT	MB4F 1,2,3,4-7
				LOOP 1,2,3,4 OVR PWR ΔT	MB4F 1,2,3,4-8
				LOOP 1,2,3,4 TAVE LO	MB2D 1,2,3,4-7
				LOOP 1,2,3,4 TAVE LO-LO	MB2D 1,2,3,4-8
			RO	Defeat the failed channel input. • Loop Temp Cutout - ΔT - 3RCS-TS411F • Loop Temp Cutout - TAVG - 3RCS-TS412T • OT/OPΔT Record Select - 3RCS-	AOP 3571 Attachment A Step 1

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				TS411E	
			RO	Check the following annunciators NOT LIT:	AOP 3571 Attachment A Step 2
				TREF/AUCT TAVE DEVIAITON - MB4C 6-5	
				TAVE HI - MB4C 5-6	
			RO	Restore T_{AVE} - T_{REF} error to within 1°F and return rod control to automatic.	AOP 3571 Attachment A Step 3
			RO	Monitor PZR level until stable. If PZR level controller is in manual, Restore pressurizer level to program level and Place PZR level controller in automatic.	AOP 3571 Attachment A Step 4
			CREW	When conditions have stabilized, Observe MB annunciators and parameters. Immediately report any unexpected or unexplained conditions to the Shift Manager.	AOP 3571 Attachment A Step 5
			US	Determine which Reactor Protection System bistable(s) requires tripping:	AOP 3571 Attachment A Step 6
				Place a check mark in the box above the appropriate channel that requires tripping on page 4 of this Attachment.	AOP 3571 Attachment A Step 6a

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
		[Tech Specs] 3.3.1 Functional Unit 7 & 8, Action 6 3.3.2 Functional Unit 5.d, Action 20 3.3.2 Functional Unit 9.b, Action 21		Refer to Technical Specification 3.3.1 and 3.3.2.	AOP 3571 Attachment A Step 6b
				Check the existing bistable status to ensure a reactor trip will not occur when the failed channel is tripped.	AOP 3571 Attachment A Step 6c
	REMOTES	RXR 107 RXR 31 RXR 35 RXR 2 RXR 6 RXR 111 RXR 115 RXR 107		Request the I&C Department trip the appropriate bistables using the last page of Attachment A and Attachment S.	AOP 3571 Attachment A Step 6d
				Verify the appropriate bistable status lights are lit.	AOP 3571 Attachment A Step 6e
			US	Following corrective action by the I&C Department, the channel may be	AOP 3571 Attachment A

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				declared OPERABLE if it complies with the guidelines provided in the Table found on page 3 of this Attachment.	Step 7 NOTE
			US	Request I&C Department perform corrective maintenance on failed instrument.	AOP 3571 Attachment A Step 7
		EVENT 4: Main Steam Header Pressure Channel Failure	US	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
		ATTACHMENT J : Main Steam Header Pressure Channel Failure	US	If a reactor trip occurs, immediately go to E-0, Reactor Trip or Safety Injection.	AOP 3571 Step 1 NOTE
T= Downpower complete or **Examiner's Cue**	**MALF** RX15, 0% ramp=120 seconds		BOP	**Determine the initiating parameter and place the affected controller in MANUAL.**	AOP 3571 Step 1
			BOP	**Stabilize the plant parameters.**	AOP 3571 Step 2

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			US	It is desired that I&C personnel trip the bistables specified in this procedure. If, during off-hours, I&C 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
			US	**Perform corrective actions using appropriate attachment.**	AOP 3571 Step 3
				Instrument Failure	**Attachment**
		NOTE: Move on when correct Attachment has been identified. It is not necessary to accomplish the steps in the attachment.		Main Steam Header Pressure Channel Failure	J
			US	The following annunciators are symptoms of a MS header pressure instrument failure (PT-507): None	AOP 3571 Attachment J NOTE
			BOP	Verify feedwater pump A and B master speed control (3FWS-SK509A) in MANUAL and restore feed pump differential pressure to normal operating band (Program: 40-140 psid)	AOP 3571 Attachment J Step 1

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			BOP	Place steam generator pressure controller (3MSS-PK507) in MANUAL and reduce the output to minimum. (Automatic STEAM PRESSURE steam dump mode is inoperable until the channel is restored.)	AOP 3571 Attachment J Step 2
			CREW	When conditions have stabilized, Observe MB annunciators and parameters and immediately report any unexpected or unexplained conditions to the Shift Manager.	AOP 3571 Attachment J Step 3
			US	There are no Technical Specifications or bistables associated with 3MSS-PT507.	AOP 3571 Attachment J Step 4 NOTE
			US	Request I&C Department perform corrective maintenance on failed instrument.	AOP 3571 Attachment J Step 4
T= Feedwater Transient or AOP 3571, Att. J identified	**MALF** ED01	**EVENT 5**: Loss of Offsite Power			
		E-0, Reactor Trip or Safety Injection, Rev. 20	Crew	Go to E-0, Reactor Trip or Safety Injection.	

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				• Foldout page must be open	E-0, Step 1, NOTE
				• ADVERSE CTMT defined as GREATER THAN 180°F or GREATER THAN 10^5 R/hr in containment.	
				• 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
				• Check reactor trip and bypass breakers - OPEN	
				• Check rod bottom lights - LIT	
				• Check neutron flux - DECREASING	
			RO	TRIP the reactor.	E-0, Step 1, RNO
		[Critical Task] [Manually trip the main turbine before a severe (orange-path) challenge develops to either the subcriticality or the integrity CSF]	BOP	Verify Turbine Trip	E-0, Step 2

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				Check all turbine stop valves - CLOSED	E-0, Step 2.a
				TRIP the turbine	E-0, Step 2.a RNO
				IF the turbine will not trip THEN	
				Runback the turbine to close the control valves	
				IF the turbine cannot be runback THEN CLOSE the MSIVs and MSIV bypass valves	
			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
			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
T= Step 4 of E-0	**MALF** EG07A	**NOTE**: After A EDG Trip expect transition to step 3 of ECA-0.0	US	**Check If SI Is Actuated**	E-0, Step 4

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
		NOTE: Crew may have tripped EDG due to abnormal operations	RO	Verify Safety Injection Actuation annunciator - LIT	EOP 35 E-0, Step 4.a
			US	Check if SI is required	E-0, Step 4, RNO
		ECA-0.0, Loss of All AC Power, Rev. 15	US	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
			RO	**Verify Reactor Trip** • Check reactor trip and bypass breakers - OPEN • Check neutron flux - DECREASING	ECA-0.0 Step 1
				TRIP the reactor. IF reactor trip can NOT be verified, THEN Dispatch an operator to locally TRIP the reactor trip and bypass breakers.	ECA-0.0 Step 1, RNO
			BOP	**Verify Turbine Trip**	ECA-0.0 Step 2

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				Check all turbine stop valves - CLOSED	ECA-0.0 Step 2.a
				TRIP the turbine. IF the turbine will NOT trip, THEN Runback the turbine to close the control valves. IF the turbine can NOT be runback, THEN CLOSE MSIVs and MSIV bypass valves.	ECA-0.0 Step 2.a.a RNO
		EVENT 6: Leaking PORV **NOTE**: A PORV is partially open	RO	**Check If RCS Is Isolated**	ECA-0.0 Step 3
	MALF RC07B @ BT1			Verify PZR PORVs - CLOSED	ECA-0.0 Step 3.a
		[Critical Task] **[**Manually close the open PZR PORV (or block valve) before completing step 3 of ECA-0.0 or when power is restored to the block valve**]**	RO	IF PZR pressure is LESS THAN 2350 psia, THEN CLOSE THE PORVs.	ECA-00 Step 3.a RNO
			RO	CLOSE letdown orifice isolation valves.	ECA-0.0 Step 3.b
			RO	Verify excess letdown and reactor head vent isolation valves - CLOSED	ECA-0.0 Step 3.c

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			BOP	**Verify AFW Flow To All Intact SGs - GREATER THAN 530 gpm**	ECA-0.0 Step 4
			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
			BOP	**Try To Restore Power To Any AC Emergency Bus**	ECA-0.0 Step 5
				Energize AC emergency bus from its emergency diesel generator	ECA-0.0 Step 5.a
				START one emergency diesel generator	ECA-0.0 Step 5.a.1
				Locally Start one EDG using Attachment E	ECA-0.0 Step 5.a.1 RNO
				Verify AC emergency bus automatically energized	ECA-0.0 Step 5.a.2
				Energize an AC emergency bus from its EDG.	ECA-0.0 Step 5.a.2 RNO

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				IF an AC emergency bus can NOT be energized from its EDG, THEN Perform the applicable action: • IF offsite power is available, THEN Perform the following: 1) STOP the EDG 2) Using OP 3343, "Station Electrical Service 4.16 Kv," Try to energize bus through the RSST or the NSST as follows: 1) Restore Bus 34C (34D) to service 2) Restore Bus 34A (34B) to service	
		NOTE: Respond as PEO if directed.		• IF offsite power is unavailable, THEN locally Energize an emergency bus with a running EDG using Attachment F.	
			BOP	Check AC emergency busses - AT LEAST ONE ENERGIZED	ECA-0.0 Step 5.b
			US/BOP	Perform the following:	ECA-0.0 Step 5.b RNO

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				1) OPEN all SBO bus tie breakers: For Bus 34A: 34A1 - 1 For Bus 34B: 34B1 - 2 For Bus 24E: A505 (Unit 2)	
		NOTE: Respond as PEO if directed.		2) Locally Start SBO diesel using Attachment G.	
		NOTE: Respond as PEO if directed.		3) Locally Align the selected AC bus pair using one of the following attachments: For Busses 34A and 34C: Attachment H For Busses 34B and 34D Attachment I	
		REMOTES: RXR 106, 107, 108, 109 **ANN I/O:** MB4C, A-4T, A-4B		4) Open Instrument Rack Room cabinet doors using Attachment B and Proceed to CAUTION prior to step 6.	
			US	• 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

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			US	• If a SI signal is actuated during this procedure, it must be reset to permit manual loading of equipment on an AC emergency bus.	
			US	• Spurious fire alarms may occur in areas where the temperatures exceed 120°F due to a loss of ventilation. The locking out of CO_2 protected areas which have spurious fire alarms is recommended.	
			US	• When power is restored to any AC emergency bus from offsite or an emergency diesel generator, recovery actions should continue starting with Step 24.	ECA-0.0 Step 6 NOTE
				• ADVERSE CTMT is defined as Ctmt temperature GREATER THAN 180°F or Ctmt radiation level GREATER THAN 10^{5R}/hr.	
			US	**Block Automatic Loading Of AC Emergency Busses**	ECA-0.0 Step 6
			CREW	RESET the following if necessary	ECA-0.0 Step 6.a

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				• SI • Aux FW for Lo-Lo SG Level	
			CREW	Place Following Control Switches In PULL-TO-LOCK • Charging pumps • One service water pump per train • RPCCW pumps • Quench spray pumps • Recirculation spray pumps • SI pumps • RHR pumps • MD AFW pumps • CAR fans	ECA-0.0 Step 6.b

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
T=MDAFW pumps in PTL		**NOTE**: Respond as PEO if directed. T+2 min. Acknowledge EDG trouble. **REMOTE**: EGR05: A EGR07: B T+5 min. EDG Local Control **REMOTE**: EGR09: A EGR11: B T+6 min. EDG Output Breaker Local Control **REMOTE**: EGR13: A EGR15: B THEN: **DELETE** EG06B BUT complete all before Crew completion of Step 6. **NOTE**: Crew should Go To step 24		• Control Building HVAC chillers • CRDM cooling fans • Auxiliary Building filter exhaust fans	
			US	**Energize Any AC Emergency Bus From The SBO Diesel.**	ECA-0.0 Step 7
			BOP	Verify both AC emergency busses - DEENERGIZED.	ECA-0.0 Step 7.a

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	Consult with the ADTS and determine if the SBO diesel should be used to power a deenergized AC emergency bus.	ECA-0.0 Step 7.a RNO
			US	IF the SBO diesel is NOT to be used to power deenergized emergency bus, THEN Proceed to Step 24.	
			BOP	**Stabilize SG Pressures.**	ECA-0.0 Step 24
			BOP	Adjust SG atmospheric dump valves or atmospheric dump bypass valves.	ECA-0.0 Step 24.a
		EVENT 7: Restore Service Water **[Critical Task]** **[**Manually start the SW pump and verify SW flowpath before completing step 25 of ECA-0.0**]**	RO	**Verify Service Water System Operation For Each Energized Emergency Bus.**	ECA-0.0 Step 25
				Check diesel generator heat exchanger SW outlet isolation valves (3SWP*AOV39A and 3SWP*AOV39B) - OPEN.	ECA-0.0 Step 25.a
				OPEN valves.	ECA-0.0 Step 25.a RNO

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Check service water pumps - ONE PER TRAIN RUNNING.	ECA-0.0 Step 25.b
				START one pump per train.	ECA-0.0 Step 25.b RNO
				Place service water pumps in PULL-TO-LOCK to AUTO.	ECA-0.0 Step 25.c
				Check service water pump discharge valves - OPEN FOR RUNNING PUMPS	ECA-0.0 Step 25.d
				For pump A (3SWP*MOV102A)	
				For pump B (3SWP*MOV102B)	
				For pump C (3SWP*MOV102C)	
				For pump D (3SWP*MOV102D)	
				OPEN valves.	ECA-0.0 Step 25.d RNO
		NOTE: As PEO, may be asked to locally close MOV*71A. Wait 5 minutes and, if simulator still in dynamic mode, report valve closed.		Check TPCCW heat exchanger SW supply isolation valves (3SWP*MOV71A and 3SWP*MOV71B) - CLOSED.	ECA-0.0 Step 25.e

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	When placing loads on an energized emergency bus, DO NOT exceed the capacity of the power source.	ECA-0.0 Step 26 CAUTION
			BOP	**Perform the Following For Each Energized AC Emergency Bus:**	ECA-0.0 Step 26
			BOP	Verify the following equipment is energized: • 480 volt emergency busses • Battery chargers	ECA-0.0 Step 26.a
				Load equipment as necessary.	ECA-0.0 Step 26.a RNO
			US	Energize previously de-energized DC loads.	ECA-0.0 Step 26.b
		NOTE: Use REMOTES EDR18 @ T+2 and EDR44 @ T+4 and report.	BOP	Energize Inverter 6 from MCC 32-3T:	ECA-0.0 Step 26.c
				Verify Bus 34C - ENERGIZED	ECA-0.0 Step 26.c.1
				RESET LOP	ECA-0.0 Step 26.c.2

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Locally CLOSE the feeder breaker on 32T (32T13-2) to MCC 32-3T	ECA-0.0 Step 26.c.3
				Locally Verify Inverter 6 DC input ammeter indicating zero amps.	ECA-0.0 Step 26.c.4
		NOTE: Respond if asked that communications console is energized		Verify communications console - ENERGIZED.	ECA-0.0 Step 26.d
			US	**Select Recovery Procedure.**	ECA-0.0 Step 27
				Check RCS subcooling based on core exit TCs - GREATER THAN 32°F (115°F ADVERSE CTMT)	ECA-0.0 Step 27.a
			US	Go to ECA - 0.2, Loss of All AC Power Recovery With SI Required.	ECA-0.0 Step 27.a RNO
				Check PZR level - GREATER THAN 16% (50% ADVERSE CTMT).	ECA-0.0 Step 27.b
			US	Go to ECA - 0.2, Loss of All AC Power Recovery With SI Required.	ECA-0.0 Step 27.b RNO

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Check SI equipment NOT actuated • Verify SI pumps - STOPPED • Verify RHR pumps - NOT RUNNING IN SI MODE • Verify charging pump cold leg injection valves - CLOSED	ECA-0.0 Step 27.c
			US	Go to ECA-0.2, Loss of All AC Power Recovery With SI Required.	ECA-0.0 Step 27.c RNO
			US	Go to ECA-0.1, Loss of All AC Power Recovery Without SI Required.	ECA-0.0 Step 27.d

TERMINATE UPON TRANSITION TO ECA-0.1 or ECA-0.2

SECTION 4

ID Number: 2K1NRC-001 Revision: 0

EVALUATION GUIDE

I. SUMMARY

The following Critical Tasks are covered in this exam:

TASK DESCRIPTION	TASK #	K/A >/= 3.0	BASIS FOR SELECTION
Manually trip the main turbine before a severe (orange-path) challenge develops to either the subcriticality or the integrity CSF.	E-0 -- Q	045-K1.18 3.6/3.7	Failure to trip the main turbine under the postulated plant conditions causes challenges to CSFs beyond those irreparably introduced by the postulated conditions and constitutes a demonstrated inability by the crew to "take an action...that would prevent a challenge to plant safety."
Manually close the open PZR PORV before completing step 3 of ECA-0.0 or when power is restored to the block valve	ECA-0-0--A	010-A2.03 4.1/4.2 010-A4.03 4.0/3.8	Failure to close the PORV under the postulated plant conditions constitutes "mis-operation or incorrect crew performance that leads to degradation of any barrier to fission product release."
Manually start the SW pump and verify SW flowpath before completing step 25 of ECA-0.0 such that the EDG does not fail because of damage caused by engine overheating.	ECA-0.0 -- F	076-A2.01 3.5/3.7	Failure to restore SW flow means that the EDG is running without SW cooling which leads engine overheating. Failure to perform the critical task constitutes "mis-operation or incorrect crew performance that leads to degraded emergency power capacity."

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

SECTION 4

Title: STATION BLACKOUT

ID Number: 2K1NRC-001 Revision: 0

EVALUATION GUIDE

SECTION 5

SCENARIO INITIAL CONDITIONS

ID Number: 2K1NRC-001 Revision: 0

Reactor Power:	100%
Operating History:	250 days on line
RCS Boron:	1150 ppm
Core Burnup:	8,000 MWD/MTU
Condensate Demins:	7 demins in service
Evolutions in Progress:	Millstone Unit 2 is offline for scheduled refueling outage.
Major Equipment OOS:	NONE

Crew Instructions:

Engineering department has requested that you shift Letdown 75 gpm Orifices from 3CHS*AV8149C to 3CHS*AV8149B using OP 3304A, Charging and Letdown, Section 4.7.3. Total leakage flowrates listed in step 4.7.1.a have been determined to be 15.8 gpm.

Plant/Simulator Differences:

- Real Time and 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: 2K1NRC-001 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.)

_____ 11/20/01

Technical Reviewer Date

SECTION 7

REFERENCE AND TASK TRACKING

Title: STATION BLACKOUT

ID Number: 2K1NRC-001 Revision: 0

I. References:

AOP*3571	Instrument Failure Response
AOP*3575	Rapid Downpower
EOP*E-0	Reactor Trip or Safety Injection
EOP*ECA-0.0	Loss of Offsite Power
EOP*ERG_EXE	Westinghouse Owners Group Executive Document
EOP* Step _DOC	MP3 step deviation Document
EOP*ERG_HP	Westinghouse Owners Group Background Document
EPI*FAP06*003	Event Assessment, Classification and Reportability
NUREG*1021 rev 8	Examiners Standards

Initial Dynamic Simulator Scenario

NUREG-1021, Appendix D, Attachment 1

Title: SGTR AT LOW POWER

ID Number: 2K1NRC-002 Revision: 0

I. Summary:

Facility: Millstone 3 PWR:_____ Scenario No: 2K1NRC-002 Op-Test No:2K1LOIT

Examiners:_____ Operators:_____

Initial Conditions: IC-22; 50% power, middle of life, MP2 in a refueling outage, Unit performing power ascension.

Event No:	Malf. No.	Event Type *	Event Description
1	None	R(RO) N(ALL)	Power Increase per OP 3204, At Power Operations
2	ED08D	I(ALL)	Loss of 125 V DC Bus 4
3	CV10B	I(RO)	VCT Level Transmitter Fails High
4	IA03	C(ALL)	Loss of Instrument Air
5	SG01A	M(ALL)	SGTR "A" S/G
6	RP09A RP09B	M(ALL)	Reactor Fails to Trip from MB4 & MB7
7	RP11L	C(BOP)	Feed Water Isolation Fails to Actuate
8	MS09A	C(BOP)	S/G A Atmospheric Steam Dump Valve Fails Open

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

SECTION 8
MILLSTONE UNIT 3
SIMULATOR SCENARIO ATTRIBUTES CHECKLIST
FORM ES-301-4

Exam Title: SGTR AT LOW POWER

ID Number: 2K1NRC-002 Revision: 0

Assessor: Steve Jackson

QUALITATIVE ATTRIBUTES

___Y__1. 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__2. The scenario consists mostly of related events.

___Y__3. 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 (if applicable)

___Y__4. 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__5. The events are valid with regard to physics and thermodynamics.

___Y__6. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.

_N/A__7. 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__8. The simulator modeling is not altered.

___Y__9. The scenario has been validated. Any open simulator performance deficiencies have been evaluated to ensure functional fidelity is maintained while running the scenario.

___Y__10. 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__11. All individual operator competencies can be evaluated, as verified using form ES-301-6.

___Y__12. 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__13. Level of difficulty is appropriate to support licensing decisions for each crew position.

SECTION 8
MILLSTONE UNIT 3
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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 — Total: 8

Loss of 125 V DC Bus 4, Loss of Instrument Air, VCT Level Transmitter Failure, Service Air Compressor Trip, SGTR, Rx Fails to Trip from MB 4 & 7, ESF System (FWI) Fails to Auto Actuate,S/G A Atmospheric Dump Valve Fails Open

02. Malf's after EOP entry (EM's)- 1 to 2 required — Total: 2

ESF System (FWI) Fails to Auto Actuate,S/G A Atmospheric Dump Valve Fails Open

03. Abnormal Events (AE)-2 to 4 required — Total: 4

Loss of 125 V DC Bus 4, Loss of Instrument Air, Rx Fails to Trip from MB 4 & 7, ESF System (FWI) Fails to Auto Actuate

04. Major Transients (MT)-1 to 2 required — Total: 2

Rx Fails to Trip from MB 4 & 7, SGTR

05. EOP's (EU) entered/requiring substantive actions 1 to 2 required — Total: 2

E-0, Reactor Trip or Safety Injection, E-3, Steam Generator Tube Rupture

06. EOP Contingencies requiring substantive actions [ECAs/FRs](EC) 0 to 2 required — Total: 0

None

07. Critical Task (CT) - 2 to 3 required — Total: 3

E-0—A: Manually trip the reactor from the control room with either Main Board trip switch or by opening 32B and 32N supply breakers before completing step 1 of E-0.

E-0--OA Close feedwater isolation valves such that at least one valve is closed on each Steam Generator before the completion of step 9 of E-0

E-3—A: Isolate feedwater flow into and steam flow from the ruptured SG prior to step 4 of E-3.

08. Approximate Scenario Run Time: 45 to 60 min. (One scenario may approach 90 minutes) — Total: 70 min

09. EOP run time: — Total: 30 min

10. Technical Specifications are exercised during the scenario. — (Y/N) Y

NOTES: Reactivity Manipulation: Increase power per OP 3204, At Power Operations

MILLSTONE NUCLEAR POWER STATION

LOIT NRC SIMULATOR EXAM GUIDE APPROVAL SHEET

Exam Title: SGTR AT LOW POWER

Revision: 0

ID Number: 2K1NRC-002

Submitted by:	Steve Jackson Developer	09/24/01 Date
Validated by:	J Martin Technical Reviewer	11/19/01 Date
Approved by:	Operation Manager (Optional)	Date
Approved by:	Training Supervisor	11/20/01 Date

SIM EXAM 002

SUMMARY OF CHANGES RE: NRC VALIDATION

Added description of VCT level failure to the Exam Summary page..

Changed power increase from 3%/hr to 5%/hr throughout and added note from OP 3204, step 4.1, NOTE, to the Scenario Initial Conditions sheet, giving approval for the higher rate.

Added nomenclature for MP3 Battery Buses.

Added Tech Spec details.

Corrected editorial error (wrong REMOTE number).

Deleted critical task from step 14.a; not listed on ES-301-4; already had 3.

SIM EXAM 002

NOTE ON SGTR "TIMING" CRITICAL TASK

The DBA SGTR "timing" critical task was not added to this simulator scenario because there are several delaying malfunctions prior to entering E-3 which tend to invalidate any time critical criteria.

In addition, the scenario already contains three critical tasks:

Manually trip the reactor	Task # E-0 – A
Close Feedwater Isolation valves (faulted FWI)	Task # E-0 – OA
Isolate steam flow from ruptured S/G	Task # E-3 -- A

SECTION 2

SIMULATOR EXAM GUIDE

TABLE OF CONTENTS

SECTIONS LISTED IN ORDER

SECTION 3

EXAM OVERVIEW

Title: SGTR AT LOW POWER

ID Number: 2K1NRC-002 Revision: 0

Exam Brief:

1. Plant is in mode 1, 50 % power, preparing to increase power per OP 3204, At Power Operations. The crew is directed to increase power to 75% at 5%/hr.

   After the power ascension is clearly underway, the crew will experience a Loss of 125 Volt DC Bus 4 and will respond using AOP 3563, Loss of DC Bus Power. There are no Main Board actions other than verifying system response. The US should evaluate Tech Specs list in the AOP. If attempted, power cannot be restored to the Battery Bus.

   After Tech Specs are addressed, VCT Level Transmitter LT-185 Fails High. The crew will respond using the ARP MB3A, 4-10, and may use AOP 3571.

   Then a slow Loss of Instrument Air will occur. The loss will not be rapid nor will feedwater control immediately be lost. The crew should respond using AOP 3562, Loss of Instrument Air. Once dispatched, the PEO will discover an isolable filter leaking air and the SAS compressor tripped on hi-hi temperature. Upon receiving permission from the US to isolate the leak, the leak will significantly increase and a reactor trip will be required. When the reactor trip occurs, the PEO will successfully isolate the leak, and IAS pressure will return to normal.

   The reactor will not manually trip from MB 4 or MB 7. Tripping Bus 32B and 32N will succeed in tripping the reactor**[Critical Task].** The US should direct a PEO/NLO to locally trip the reactor trip breakers.

   The plant trip will cause a steam generator tube rupture to occur on the "A" S/G. Safety Injection should be manually actuated, if it has not already occurred, when directed at step 4 in E-0. . At step 9 of E-0 the crew will discover that Feed Water Isolation has Failed to Auto Actuate and must be manually aligned **[Critical Task]**. At step 25 a transition to E-3, Steam Generator Tube Rupture will be made. At the time of the transition the rupture S/G Atmospheric Dump Valve will fail open when the pressure transmitter, 3MSS-PT20A, fails high. Step 3.b of E-3 will direct that the isolation valve be closed (3MSS*MOV18A) **[Critical Task].**

2. The SM should classify this event as a **Alert - Charlie One** due to Entry into E-3, "Steam Generator Tube Rupture" AND Reactor Coolant Leak > the Capacity of One Charging Pump (EAL RCB4 [L])

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

4. Duration of Exam: 60 minutes

SECTION 4

EVALUATION GUIDE

Title: SGTR AT LOW POWER

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All Control Room Conduct, Operations and Communications shall be in accordance with MP-14-MMM.

"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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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard

Simulator Setup Instructions:

1. HANG Exam Placards on the simulator doors.
2. START the Sun Workstation.
   a. IF the Sun Workstation is running THEN go to SIM ACTIVE.
3. PLACE Recorder Power to ON.
4. VERIFY that the current approved training load is loaded.
5. REMOVE the step counter OVERRIDE and allow the counters to step out during the IC reset.
6. RESET to **IC-22: TEMP IC 2K1NRC-002**
7. ADJUST the various pot settings to the valued specified by the chart in the simulator booth or Notepad for the selected IC.
8. PLACE Simulator to RUN.
9. ADJUST MWt using Turbine Load Set to 3411, (+)0, (-)3 IF using 100% power IC.
10. RESET the Plant Calorimetric at the Instructor Station PPC by Pressing "SHIFT LEFT" and "F6" simultaneously.
11. ENSURE Simulator fidelity items cleared.
    a. CHECK the STEP COUNTERS at correct position for plant conditions.
    b. PLACE 5 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.

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard

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.

1) See laminated directions on clipboard in Sim booth.

12. 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

13. RESET Rad Monitor Screen to Status Grid.

14. 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).

15. IF placing equipment OOS, THEN perform the necessary switch manipulations and hang appropriate tags, as required, listed under "Equipment OOS."

16. LOCK the Simulator Room front door.

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard

° **PLACE THE FOLLOWING EQUIPMENT OOS: STANDARD 2K1NRC EXAM EQUIPMENT**

Initial Malfunctions

MALF	RP09A	Reactor Trip Breaker Failure (MB4)			
MALF	RP09B	Reactor Trip Breaker Failure (MB7)			
MALF	RP10A	Train A Automatic Reactor Trip Failure			
MALF	RP10B	Train B Automatic Reactor Trip Failure			
MALF	RP11L	Feed Water Isolation (FWI) Fails to Actuate			
MALF	SG01A	Steam Generator A Tube Rupture		50%	BT1

Event Malfunctions

MALF	ED09D	Loss of 125 Volt DC Bus (Battery 4)			
MALF	CV10B	VCT Level Instrument LT 185 Failure	100%	60 second ramp	
MALF	IA03	Instrument Air Header Leak	25%	60 second ramp	
MALF	IA01	Service Air Compressor Trip			
MALF	MS09A	S/G A Atmospheric Steam Dump Valve Fails Open		100%	No ramp

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

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
T=0		**EVENT 1**: Increase Power			
		OP 3204, AT POWER OPERATIONS, REV. 15		INSTRUCTIONS	OP 3204 Step 4
		[Reactivity Manipulation]		**Load Increase**	OP 3204 Step 4.1
			US	1. This section provides instructions to increase load from 25% to 100% power following a plant startup or for partial load increases at power. If used for a partial load increase, the SM/US should determine, on a case by case basis, which steps apply for the planned increase.	OP 3204 Step 4.1. **NOTE**
				2. The load increase rate should not exceed 3%/hour unless approved by Reactor Engineering and the Unit Director/Duty Officer.	OP 3204 Step 4.1
				3. The optimum control rod withdrawal rate is 3 steps per hour.	OP 3204 Step 4.1
				To ensure leak rate calculation compliance, PERFORM the following:	OP 3204 Step 4.1.1

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				a. IF the duration of the planned power increase 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 leak rate calculation.	OP 3204 Step 4.1.1. a
				b. IF the plant will not be in a stable condition when the RCS leakrate calculation becomes due, STOP the power increase while sufficient time remains to stabilize the plant for the calculation.	OP 3204 Step 4.1.1.b
			US	INITIATE load increase as follows:	OP 3204 Step 4.1.2
				a. INITIATE RCS boron dilution using one of the following: • Refer to OP 3304C, "Primary Makeup and Chemical Addition," and ALIGN for dilution. • Refer to OP 3304B, "Boron Thermal Regeneration System," and DILUTE the RCS using BTRS (ΔC_B < 100 ppm).	OP 3204 Step 4.1.2.a

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				b. COORDINATE power increase with CONVEX.	OP 3204 Step 4.1.2.c
				c. WHEN Tavg begins to increase due to dilution, Refer to OP 3323A, "Main Turbine," and LOAD turbine at desired rate to desired power level while continuing with this procedure.	OP 3204 Step 4.1.2.c
			US	WHEN RCS boron concentration is being changed, PERFORM the following:	OP 3204 Step 4.1.3
				a. IF Tavg or rod control responds in an unexpected manner, STOP makeup in progress and DETERMINE cause.	OP 3204 Step 4.1.3.a
				b. ENERGIZE pressurizer heaters as necessary to equalize boron concentration between the pressurizer and RCS.	OP.3204 Step 4.1.3.b
				c. IF RCS boron concentration change exceeds 50 ppm, Refer to OP 3301G, "Pressurizer Pressure Control," and INITIATE actions to equalize boron concentration while continuing with this procedure.	OP 3204 Step 4.1.3.c
			US	1. Maintaining AFD within target band is not required below 50% RTP or during RAOC operation but is recommended	OP 3204 Step 4.1.4 **NOTE**

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				to maintain optimum reactor control.	
				2. It may be necessary to insert control rods to maintain AFD in the target band.	
				3. During load increases, AFD change is a function of control rod withdrawal (positive effect) and increased Th (negative effect).	
			US	Refer to the "Reactor Engineering Curve & Data Book", "Axial Flux Difference Versus Thermal Power" and MAINTAIN AFD as follows:	OP 3204 Step 4.1.4
				a. IF power is greater than 50%, perform the following:	OP 3204 Step 4.1.4.a
				1) MAINTAIN AFD within specified RAOC limits.	
				2) IF AFD exceeds RAOC limits, Refer to T/S 3.2.1.1, "Power Distribution Limits, Axial Flux Difference," and DETERMINE action requirement.	
				b. IF AFD approaches the positive edge of the target band, PERFORM the following:	OP 3204 Step 4.1.4.b
				1) PLACE control rod bank SEL	

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				switch in "MAN."	
				2) ADJUST dilution rate to maintain Tavg-Tref matched.	
				3) WHEN AFD decreases to the target value, PLACE control rod bank SEL switch in "AUTO," if desired.	
				c. IF AFD exceeds the positive edge of the target band, PERFORM the following:	OP 3204 Step 4.1.4.c
				1) STOP the load increase.	
				2) INCREASE dilution rate.	
				3) WHEN AFD begins to decrease, CONTINUE load increase at a rate less than original rate.	
				d. IF AFD can not be maintained within the target band OR exceeds the target band by more than 5%, NOTIFY Reactor Engineering.	OP 4.1.4.d

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				e. IF a partial load increase at power is being accomplished, PERFORM the following: 1) DILUTE as necessary during load increase to compensate for power defect. 2) BORATE to compensate for Xenon burnout and DILUTE as Xenon builds in to equilibrium concentration. 3) IF continuous power operation below 85% for longer than 14 days has occurred, REQUEST Reactor Engineering provide guidance for any power holds required for flux mapping during power ascension.	OP 3204 Step 4.1.4e
			US	IF 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 4.1.5
			US	Changes in condensate demineralizer valve alignment may cause a condensate flow transient resulting in an unanticipated power increase.	OP3204 Step 4.1.6 **CAUTION**

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			US	Refer to OP 3319C, "Condensate Demineralizer Mixed Bed System," and PLACE condensate demineralizers in service as necessary to maintain the following: • Flow through in-service demineralizers between 1200 gpm and 3200 gpm. • Differential pressure less than 60 psi.	OP 3204 Step 4.1.6
			US	IF "AMSAC TROUBLE/BYPASS" (MB4C 6-8) is lit, REQUEST IC&E Department perform SP3446C11, "AMSAC Operability Test", if required while continuing with this procedure.	OP 3204 Step 4.1.7
				IF performing a startup following a turbine shutdown, PERFORM the following:	OP 3204 Step 4.1.8.c
				a. Refer To OP3323A, "Main Turbine," Attachment 6, "SJAE Backpressure Data," and ADJUST the in service stream jet air ejector intercondenser suction valve as necessary to maintain condenser backpressure as low as achievable in the 2.0 to 4.0 inches HgA operating band while continuing with this procedure.	OP 3204 Step 4.1.8.a
				b. Prior to exceeding 30% reactor power,	OP 3204

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				REQUEST Chemistry verify secondary chemistry, except dissolved oxygen, is in specification.	Step 4.1.8.b
				c. WHEN turbine load is at 295 MWe (approximately 33% reactor power), STOP power increase and MAINTAIN turbine load between 290 and 300 MWe.	OP 3204 Step 4.1.8.c
				d. Refer To OP3329, "Condenser Air Removal," and PLACE a second SJAE in service.	OP 3204 Step 4.1.8.d
				e. REQUEST Chemistry verify dissolved oxygen in specification.	OP 3204 Step 4.1.8.e
				f. WHEN dissolved oxygen is in specification, INITIATE load increase as follows:	OP 3204 Step 4.1.8.f
				1) INITIATE RCS boron dilution using one of the following: • Refer To OP 3304C, "Primary Makeup and Chemical; Addition, " and ALIGN for dilution. • Refer To OP 3304B, "Boron Thermal Regeneration System," and DILUTE RCS	

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				using BTRS (ΔC_B < 100 ppm)	
				2) COORDINATE power increase with CONVEX.	
				3) WHEN Tavg begins to increase due to dilution, Refer To OP 3323A, "Main Turbine," and LOAD turbine at desired rate to desired power level while continuing with this procedure.	
			US	WHEN generator load increases greater than 300 MWe, PLACE the "FW PUMPS P4 TRIP BYPASS" selector switch (MB5) in "NORMAL."	OP 3204 Step 4.1.9
			US	WHEN generator load is greater than 360 MWe AND sustained loads greater than 780MWe are anticipated, Refer To OP 3317, "Reheat and Moisture Separator," and SUPPLY steam to the reheaters by performing one of the following: • PLACE the MSR reheaters in service for automatic operation • Manually PLACE the MSR reheaters in service during power ascension (30% - 65%)	OP 3204 Step 4.1.10

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
T= Reactivity manipulation complete and Examiner's Cue.	**MALF** ED09D	**EVENT 2:** Loss of 125 V DC Bus 4			
		AOP 3563, Loss of DC Bus Power, Rev. 5	US	If DC Bus 301A-1, 301B-1, 301 C-1, or 301D-1 is the affected bus, the Rx must be manually tripped and the actions in E-0 performed. Att, A, B, E, or F respectively, of this procedure, provide additional guidance which may be used concurrently with E-0.	AOP 3563 Step 1 NOTE
		NOTE: Nomenclature for MP3 Battery Buses: **Bus 301A-1** **Battery 1** **Bus 301B-1** **Battery 2** **Bus 301A-2** **Battery 3** **Bus 301B-2** **Battery 4** **Bus 301C-1** **Battery 5** **Bus 301D-1** **Battery 6**	US	Perform the applicable actions based on abnormal MB Annunciators and Indications • Check Bus 301A-1-ENERGIZED • Check Bus 301B-1-ENERGIZED • Check Bus 301A-2-ENERGIZED • Check Bus 301B-2-ENERGIZED • Check Bus 301C-1-ENERGIZED • Check Bus 301D-1-ENERGIZED	AOP 3563 Step 1

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				Use Att D	AOP 3563 Step 1 RNO
				Proceed to Step 2	AOP 3563 Step 1a RNO
			US	Verify VIAC-4 is energized from inverter 4 or the alternate power supply.	AOP 3563 Att.D step 1
			US/BOP /PEO	Restore normal DC power alignment using OP 3345C, 125 Volt DC.	AOP 3563 Att.D step 2
		[Tech Specs] 3.8.2.1 Action b 3.8.3.1 Action c.	US	Refer to the following technical specifications for required actions: • 3.8.2.1 D.C. Sources Modes 1-4 • 3.8.2.2 D.C. Sources modes 5 and 6 • 3.8.3.1 Onsite Power Distribution Modes 1-4 • 3.8.3.2 Onsite Power Distribution Modes 5 and 6	AOP 3563 Att. D step 3
		NOTE: If called, Electrical Maintenance reports a bus fault on Battery 4.	US	Continue with normal plant evolutions using applicable plant procedures	AOP 3563 step 2

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
T= Tech Specs addressed in AOP 3564 and Examiner's Cue	**MALF** CV10B, 100%, 60 sec ramp	**EVENT 3**: VCT Level Transmitter Fails High			
		AUTOMATIC FUNCTIONS	US	IF VCT level is high, 3CHS*LCV112A, VCT letdown divert, fully diverts to boron recovery tanks, (GWS).	3353.MB3A 4-10 Step 1
			US	IF VCT level is low, 3CHS*AOV71, "VCT/DEGASIFIER," diverts to VCT.	3353.MB3A 4-10 Step 2
			US	If either VCT level indicator fails to respond to decreasing VCT level, automatic shift to RWST is disabled. [Commitment 1.1.1]	3353.MB3A 4-10 Step 3 CAUTION
			US	IF 3CHS-LT185 and 3CHS-LT112, indicate less than 4.4%, the following occur:	3353.MB3A 4-10 Step 3
				3CHS*LCV112D and 3CHS*LCV112E, charging pump suction valves from RWST, open.	3353.MB3A 4-10 Step 3.1
				3CHS*LCV112B and 3CHS*LCV112C, VCT outlet	3353.MB3A 4-10 Step 3.2

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				isolation valves, close.	
		CORRECTIVE ACTIONS	RO	CHECK the following to confirm alarm: • 3CHS-LI 185, VCT level (MB3) • CHS-L112, VCT level computer point	3353.MB3A 4-10 Step 1
			US	IF 3CHS-LT185 is failed high, PERFORM the following:	3353.MB3A 4-10 Step 5
			RO	PLACE 3CHS-LCV112A, VCT letdown divert (MB3), in "VCT".	3353.MB3A 4-10 Step 5.1
			US	1. Removing "NAL card" allows automatic shift to RWST when 3CHS-LT112 indicates VCT LO-LO level. 2. "VCT LEVEL HI/LO" (MB3A 4-10) locks in on low level.	3353.MB3A 4-10 Step 5.2 NOTE
			US	REQUEST Instrument and Control Department remove "NAL card" 3CHS-LB-185A - B (RPS-RAKGP4) to simulate VCT LO-LO level.	3353.MB3A 4-10 Step 5.2
			RO = as necessary	IF VCT level is high, PLACE 3CHS*LCV112A, VCT letdown divert, in "GWS" to restore VCT	3353.MB3A 4-10 Step 5.3

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				level 41 to 54%.	

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			RO	VERIFY 3CHS*LCV112A, VCT letdown divert, in "AUTO".	3353.MB3A 4-10 Step 6
			RO	IF VCT level is high, PERFORM the following:	3353.MB3A 4-10 Step 7
				IF VCT makeup is in progress, STOP VCT makeup.	3353.MB3A 4-10 Step 7.1
				CHECK 3CHS-LK185, VCT level control, controlling 3CHS*112A, VCT letdown divert, in full divert (0 output), (MB3).	3353.MB3A 4-10 Step 7.2
				IF 3CHS*112A, VCT letdown divert, not in full divert, PLACE 3CHS*LCV112A, VCT letdown divert, in "GWS" to restore VCT level 41 to 54%.	3353.MB3A 4-10 Step 7.3
				WHEN VCT level is 41 to 54%, PLACE 3CHS*LCV112A, VCT letdown divert, in "AUTO," and MAINTAIN VCT level 41 to 54% with 3CHS-LK185, VCT level control, in "MANUAL".	3353.MB3A 4-10 Step 7.4
				IF 3CHS-LK185, VCT level control, does not control 3CHS-LCV112A, VCT letdown divert, in "AUTO" or "MANUAL," CYCLE	3353.MB3A 4-10 Step 7.5

Title: SGTR AT LOW POWER

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				3CHS*LCV112A, VCT letdown divert (MB3), to maintain VCT level 41 to 54%.	
			RO	IF VCT level is greater than 4.4.% AND less than 15.7%, PERFORM the following:	3353.MB3A 4-10 Step 8
				VERIFY makeup control mode selector in "AUTO".	3353.MB3A 4-10 Step 8.1
				VERIFY makeup control switch in "START".	3353.MB3A 4-10 Step 8.2
				IF auto makeup not in progress, Refer To OP 3304C, "Primary makeup and Chemical Addition," and PERFORM manual makeup to restore VCT level 41 to 54%.	3353.MB3A 4-10 Step 8.3
				SEND Operator to check 3CHS*AOV71, "VCT/DEGASIFIER," in "OPEN TO VCT" (GWS).	3353.MB3A 4-10 Step 8.4
			US	If VCT level cannot be maintained, the Operator shall manually maintain VCT level or shift charging pump suction to RWST. [Commitment 1.1.1]	3353.MB3A 4-10 Step 9 CAUTION
			US	IF VCT level is less than 4.4% OR can not be maintained manually, PERFORM	3353.MB3A 4-10 Step 9

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
				the following to shift charging pump suction to RWST:	
				OPEN 3CHS*LCV112D and 3CHS*LCV112E, charging pump suction from RWST, (MB3).	3353.MB3A 4-10 Step 9.1
				CLOSE 3CHS*LCV112B and 3CHS*LCV112C, VCT outlet isolation valves, (MB3).	3353.MB3A 4-10 Step 9.2
				IF VCT level is off - scale low, REQUEST engineering evaluate the potential for gas binding the charging pumps (SOER 97-01).	3353.MB3A 4-10 Step 9.3
				MONITOR charging pump discharge pressure, flow and amps for indication of gas binding.	3353.MB3A 4-10 Step 9.4
				Go To OP 3204, "At Power Operation," and COMMENCE plant shutdown.	3353.MB3A 4-10 Step 9.5
			US	WHEN VCT level control repair is complete, REQUEST Instrument and Control Department verify "NAL card" 3CHS*LB - 112A - B and "NAL card" 3CHS*LB - 185A - B installed.	3353.MB3A 4-10 Step 10

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
T= VCT Level Failure addressed and Examiner's Cue	**MALF** IA03, 25%, 60 sec ramp IA01	**EVENT 4**: Loss of Instrument Air NOTE: Manipulate MALF severity to maintain IAS pressure above 70 psig with 2 IAS compressors running.			
		AOP 3562, Loss of Instrument Air, Rev 4		The actions specified in this procedure may be performed concurrently with E-0, Reactor Trip or Safety Injection.	AOP 3562 Step 1 NOTE
			CREW	**Verify Plant Status.**	AOP 3562 Step 1
			RO	Check instrument air pressure rapidly decreasing OR loss of feedwater control.	AOP 3562 Step 1.a
		NOTE: The crew should implement this step when air pressure decreases sufficiently.	US	Proceed to Step 2 and, IF instrument air pressure decreases rapidly OR feedwater control is lost, THEN TRIP the reactor and Go to E-0, Reactor Trip or Safety Injection.	AOP 3562 Step 1.a RNO
		Succeed T+5 minutes after being dispatched and after informing Control Room. **REMOVE** MALF **IA03.**	RO/ CREW	TRIP the reactor and Go to E-0, Reactor Trip or Safety Injection.	AOP 3562 Step 1.b
			US	**Check Instrument Air System Alignment.**	AOP 3562 Step 2

Title: SGTR AT LOW POWER

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			RO	Verify both instrument air compressors - RUNNING.	AOP 3562 Step 2.a.
			PEO	Locally Place both instrument air compressor control switches to CS (continuous service).	AOP 3562 Step 2.a RNO
			RO	Check instrument air pressure - STABLE OR INCREASING.	AOP 3562 Step 2.b
		NOTE: As PEO, perform local checks. See next page.	US	Perform the following: 1) Using Attachment A, locally Start air compressors and Perform filter and dryer checks. 2) Proceed to Step 2.d.	AOP 3562 Step 2.b RNO
			US	Proceed to Step 12.	AOP 3562 Step 2.c
			US	Check for air leakage in Ctmt:	AOP 3562 Step 2.d
			RO	1) CLOSE instrument air Ctmt isolation valve (3IAS*MOV72)	AOP 3562 Step 2.d.1
			RO	2) Check instrument air pressure - STABLE OR INCREASING.	AOP 3562 Step 2.d.d
			RO	OPEN instrument air Ctmt isolation valve (3IAS*MOV72) and Proceed to Step 2e.	AOP 3562 Step 2.d.2 RNO

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	3) Proceed to Step 3.	AOP 3562 Step 2.d.3
			US	Using OP 3332A, "Instrument Air System," Start the shutdown instrument air compressor(s), *if desired*	AOP 3562 Step 2.e
T= +2min of order	**MODIFY** MALF **IA03** to 60%	**NOTE**: When reporting, PEO discovers the body of the in-service filter housing cracked and leaking air. Filter can be isolated and the standby filter placed in service. Service Air compressor has tripped on hi-hi temperature. **WHEN** given the order to isolate filter **MODIFY** malfunction. After reactor has tripped, remove malfunction and report that leak has been isolated.	US	Dispatch personnel to search for air leaks by performing walk-downs of the following locations: Turbine Building Auxiliary Building Intake Structure ESF Building Control and Service Building Waste Disposal Building Fuel Building	AOP 3562 Step 2.f
			US	**Verify TD AFW Pump Steam Supply Isolation Valves - CLOSED.**	AOP 3562 Step 3
			BOP	Throttle auxiliary feed flow as necessary.	AOP 3562 Step 3 RNO

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US/ RO	**Verify Letdown In Service** • Check letdown isolation valves - OPEN • Check letdown orifice isolation valves - AT LEAST ONE OPEN	AOP 3562 Step 4
			RO	Perform the following: a. CLOSE charging header isolation valve (3CHS*MV8106). b. CLOSE letdown orifice isolation valves. c. If desired, using OP 3304A, "Charging and Letdown," establish reactor vessel head vent letdown to the PRT.	AOP 3562 Step 4 RNO
				The High Radiation Area key is required for local access to charging pump A cubicle.	AOP 3562 Step 5 NOTE
			US/ RO	**Verify Seal Injection Flow - BETWEEN 8 and 13 gpm.**	AOP 3562 Step 5

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			RO	Perform the following: a. Locally throttle Open the appropriate charging pump bypass valve. For charging pump A 3CHS*V272 For charging pump B 3CHS*V270 For charging pump C 3CHS*V271 b. Locally Close charging RCP seal isolation valve (3CHS*V273)	AOP 3562 Step 5 RNO
			US/ RO	**Verify Train A and B Chilled Water CTMT Header Isolation Valves - OPEN** • Check inlet valves 3CDS*CTV38A 3CDS*CT91A 3CDS*CT38B 3CDS*CTV91B • Check outlet valves 3CDS*CTV39A 3CDS*CTV40A 3CDS*CTV39B 3CDS*CTV40B	AOP 3562 Step 6

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			RO	OPEN the Train A and Train B RPCCW supply and return isolation valves to chilled water.	AOP 3562 Step 6 RNO
				All condenser temperature and level instruments/indicators are pneumatic and do not provide accurate indication on a loss of instrument air.	AOP 3562 Step 7 CAUTION
			US/ BOP	**Monitor Condenser Hotwell Level - NORMAL**	AOP 3562 Step 7
			PEO	Locally Close normal makeup isolation valve (3CNS-V2).	AOP 3562 Step 7 RNO
			US/ RO	**Monitor VCT Level - NORMAL.**	AOP 3562 Step 8
			RO	Perform the following: a. OPEN RWST to charging isolation valves. b. CLOSE VCT to charging isolation valves.	AOP 3562 Step 8 RNO
			US	**Control RCS Pressure.**	AOP 3562 Step 9
			RO	Energize PZR heaters or use normal spray valves as necessary.	AOP 3562 Step 9.a

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			RO	Use one PZR PORV to depressurize if necessary.	AOP 3562 Step 9.a RNO
				• Traveling screen differential pressure instruments/indicators are pneumatic and do not provide accurate indication on a loss of instrument air.	AOP 3562 Step 10 CAUTION
				• Traveling screen differential pressure circulating water pump trip relays are pneumatic and will not operate to trip the pump is if the situation requires.	
			US/ PEO	**Increase Surveillance of Intake Structures**	AOP 3562 Step 10
				• Locally Place control switches for traveling screens to SLOW.	
			RO/ BOP	**Verify RHR Alignment**	AOP 3562 Step 11
				Check RHR Train A or B - IN COOLDOWN Mode	AOP 3562 Step 11.a
				Proceed to Step 12.	AOP 3562 Step 11.a RNO

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
		NOTE: The crew should implement this step when air pressure decreases sufficiently.	US	Proceed to Step 2 and, IF instrument air pressure decreases rapidly OR feedwater control is lost, THEN TRIP the reactor and Go to E-0, Reactor Trip or Safety Injection.	AOP 3562 Step 1.a RNO **{REPEAT}**
		PEO: Succeed in isolating leak when the crew trips the reactor and inform Control Room.	RO/ CREW	TRIP the reactor and Go to E-0, Reactor Trip or Safety Injection.	AOP 3562 Step 1.b **{REPEAT}**
		REMOVE MALF **IA03.**			
T= Reactor Trip	**MALF** (initial) SG01A on BT1	**EVENT 5**: SGTR			
		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.	
				• Foldout page must be open	E-0, Step 1, NOTE
				• ADVERSE CTMT defined as GREATER THAN 180°F or GREATER THAN 10^{5} R/$_{hr}$ in containment.	

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				• The reactor can be interpreted as "tripped" when any two of three bulleted substeps of Step 1.* are satisfied.	
	MALF (initial) RP09A RP09B	**EVENT 6**: Reactor Fails to Trip from MB4 or MB7 **[Critical Task]**	RO	TRIP the reactor.	E-0, Step 1, RNO
				IF reactor will NOT trip, THEN	
		NOTE: Necessary to implement this RNO to trip the reactor	BOP	TRIP Bus 32B and 32N.	E-0, Step 1.a, RNO
		NOTE: Necessary to implement this RNO to complete tripping the reactor. When dispatched as PEO wait 2 minutes (ensure the crew has completed step 9 to avoid complicating the FWI restoration) THEN **MALF** RP02A and RP02B	US	Dispatch an operator to locally TRIP the reactor trip and bypass breakers.	E-0, Step 1.b, RNO
			RO	**Verify Reactor Trip** • Check reactor trip and bypass breakers - OPEN • Check rod bottom lights - LIT	E-0, Step 1

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				• 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
			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
			US	Check if SI is required	E-0, Step 4, RNO
				• CTMT pressure GREATER THAN 18 psia OR • RCS pressure LESS THAN 1890 psia OR	

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
		NOTE: SI will ultimately be required, most likely on PZR Level		• PZR level LESS THAN 16% OR • RCS subcooling LESS THAN 32°F OR • SG pressure LESS THAN 660 psig IF SI is required, THEN initiate SI.	
			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** • Check SI pumps - RUNNING • Check RHR pumps - RUNNING • Check two charging pumps - RUNNING	E-0, Step 7
			BOP	**Verify AFW Pumps Running**	E-0, Step 8
				Check MD pumps - RUNNING	E-0, Step 8.a

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				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 8.b, RNO
		EVENT 7: FWI does not actuate **[Critical Task]** Close feedwater isolation valves such that at least one valve is closed on each Steam Generator before the completion of step 9 of E-0. **NOTE**: FWI Pumps has failed to actuate.	BOP	**Verify FW Isolation** • 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	E-0, Step 9

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				• Check SG blowdown isolation valves - CLOSED • Check SG blowdown sample isolation valves - CLOSED • Check SG chemical feed isolation valves - CLOSED	
			BOP	**Check If Main Steam Lines Should Be Isolated**	E-0, Step 10
				Check Ctmt pressure GREATER THAN 18 psia	E-0, Step 10.a
				OR	
				Any SG pressure LESS THAN 660 psig	
				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
				OR	
				Ctmt spray is initiated	

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	Proceed to Step 12.	E-0, Step11,a, RNO
			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** • Verify ESF Group 1 lights - OFF • Verify ESF Group 2 lights - LIT • IF Main Steam Line Isolation has occurred, THEN verify ESF Group 3 lights - LIT • IF CDA has occurred, THEN verify ESF Group 4 lights - LIT	E-0, Step 14
			RO	**Determine If ADVERSE CTMT Conditions Exist** • Ctmt temperature GREATER THAN 180°F OR • Ctmt radiation GREATER THAN 10^5 R/hr	E-0, Step 15

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
				Check charging pump flow indicator - FLOW INDICATED	E-0, Step 16.a
			RO	Check RCS pressure - GREATER THAN 1650 psia (1950 psia ADVERSE CTMT)	E-0, Step 16.b

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 PORV block valves - OPEN	E-0, Step 16.c
			RO	OPEN energized block valves.	E-0, Step 16.c RNO
			RO	VERIFY the following: 1) Charging pumps - TWO RUNNING 2) RCS subcooling based on core exit TC's GREATER THAN 32°F (115°F ADVERSE CTMT). 3) Secondary heat sink: • Total feed flow to SGs - GREATER THAN 530 gpm OR • NR level in at least one SG - GREATER THAN 8% (42% ADVERSE CTMT) 4) RCS pressure - STABLE OR INCREASING	E-0, Step 16.d

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				5) PZR level - GREATER THAN 16% (50% ADVERSE CTMT)	
		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.d RNO
		\	BOP	**Verify Adequate Heat Sink**	E-0, Step 17
				Check NR level in at least one SG - GREATER THAN 8% (42% ADVERSE CTMT)	E-0, Step 17.a
			US	Proceed to Step 17.d.	E-0, Step 17.a, RNO
			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 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

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
		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	Check if CBI is required	E-0, Step 20.b, RNO
			RO	• Ctmt pressure GREATER THAN 18 psia OR	
			RO	• Control Building radiation monitor in alarm OR	
				• SI manually actuated	
			RO	IF CBI required, THEN initiate CBI.	
			US	IF CBI is NOT required, THEN proceed to Step 21.	
			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

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	Perform the applicable action:	E-0, Step 21.a, RNO
				• IF temperature is GREATER THAN 550°F AND 560°F, THEN	
				1) Dump steam to the condenser, if available OR Dump steam to atmosphere.	
			US	2) Proceed to Step 22.	
				• IF the temperature is LESS THAN 550°, THEN proceed to Step 21c.	
			US	Proceed to Step 22	E-0, Step 21.b
			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
				• MSIVs	
				• MSIV bypass valves	

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.1, RNO
			BOP	IF unexpected cooldown continues, THEN CLOSE the MSIVs and MSIV bypass valves.	E-0, Step 21.e.2, 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
			RO	Verify RCS pressure - LESS THAN 1500 psia (1800 psia ADVERSE CTMT)	E-0, Step 23.a

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	Proceed to Step 24	E-0, Step 23.a, RNO.
			RO	Verify charging or SI pumps - AT LEAST ONE RUNNING	EOP 35 E-0, Step 23.b
			US	Proceed to Step 24	E-0, Step 23.b, RNO
			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
				• NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER	
				• NO SG COMPLETELY DEPRESSURIZED	
			BOP	**Check If SG Tubes Are Intact**	E-0, Step 25
			RO	Verify trend history and alarm status of radiation monitors	
				• Main steam line - NORMAL	

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				• Condenser air ejector - NORMAL • SG blowdown - NORMAL	
			US	Initiate monitoring of CSF Status Trees and Go to E-3, Steam Generator Tube Rupture.	E-0, Step 25.b, RNO
T= Entry into E-3	**MALF** MS09A	**EVENT 8**: S/G Atmospheric Dump Valve Fails Open			
		E-3, Steam Generator Tube Rupture, Rev. 16	US	***To prevent damage to the RCP seal(s), seal injection flow should be maintained to all RCPs.***	E-3 Step 1 CAUTION
			US	***Foldout page must be open***	E-3, Step 1, NOTE
			RO	**Check If RCPs Should Be Stopped**	E-3, Step 1
				Verify RCS pressure - LESS THAN 1500 psia (1800 psia ADVERSE CTMT)	E-3, Step 1.a
				Proceed to step 2.	E-3, Step 1.a, RNO
			BOP	**Identify Ruptured SGs**	E-3, Step 2
				• High radiation from any SG steam line as indicated by the trend history or alarm status	

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				OR • High radiation from any SG sample OR • Unexpected increase in any SG level	
				Proceed to steps 5 through 12 and, WHEN the ruptured SGs identified, THEN Return to the CAUTION prior to step 3 and Perform steps 3 and 4.	E-3, Step 2, RNO
			US	***If the TD AFW pump is the only available source for feed flow, steam supply to the TD AFW pump must be maintained from at least one SG.***	E-3, Step 3, CAUTION
			US	***At least one SG must be maintained available for RCS cooldown.***	E-3, Step 3, CAUTION
		[Critical Task][Isolate feedwater flow into and steam flow from the ruptured SG prior to step 4 of E-3.]	BOP	**Isolate Flow From Each Ruptured SG**	E-3, Step 3

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Verify each ruptured SG atmospheric dump valve controller - IN AUTO AT 1125 psig	E-3, Step 3.a
				Perform the following: Place the SG atmospheric dump valve controller in MANUAL. Adjust the setpoint controller to 1125 psig. Place the controller in AUTO.	E-3, Step 3.a, RNO
				Check each ruptured SG atmospheric dump valve - CLOSED	E-3, Step 3.b
				WHEN ruptured SG pressure is LESS THAN 1125 psig. THEN Verify the SG atmospheric dump valve is closed IF the atmospheric dump valve is NOT closed, THEN Place the controller in MANUAL and Close.	E-3, Step 3.b, RNO

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				IF the atmospheric dump valve can NOT be closed, THEN CLOSE the atmospheric dump isolation valve. 3MSS*MOV18A 3MSS*MOV18B 3MSS*MOV18C 3MSS*MOV18D	
				IF the ruptured SG atmospheric dump isolation valve can NOT be closed, THEN locally Close the atmospheric dump isolation valve.	
				Check each ruptured SG atmospheric dump bypass valve - CLOSED.	E-3, Step 3.c
				CLOSE each ruptured SG steam supply isolation valve to TD AFW pump.	E-3, Step 3.d
				Verify each ruptured SG blowdown sample isolation valve - CLOSED	E-3, Step 3.e

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Verify each ruptured SG blowdown sample isolation valve - CLOSED	E-3, Step 3.f
				CLOSE each ruptured SG MSIV and MSIV bypass valve.	E-3, Step 3.g
				CLOSE the main steam line drains upstream of the MSIVs and TD AFW pump for each ruptured SG as follows: **SGA** 3DTM*AOV29A 3DTM*AOV61A 3DTM*AOB63A 3DTM*AOB64A	
			US	***If any ruptured SG is faulted, feed flow to that SG should remain isolated during subsequent recovery actions unless the SG is needed for RCS cooldown.***	E-3, Step 4, CAUTION
			BOP	**Check Ruptured SG Level**	E-3, step 4

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Verify one of the following is satisfied: • Ruptured SG WR level - GREATER THAN 67% (95% ADVERSE CTMT) OR • Ruptured SG NR level - GREATER THAN 8% (42% ADVERSE CTMT)	E-3, Step 4.a
				Perform the following: 1. Maintain feed flow to the ruptured SGs. 2. Proceed to CAUTION prior to Step 5 and WHEN WR level is GREATER THAN 67% (95% ADVERSE CTMT) OR NR level is GREATER THAN 8% (42% ADVERSE CTMT) THEN Stop feed flow to ruptured SG.	E-3, Step 4.a, RNO
				Stop feed flow to ruptured SGs.	E-3, Step 4.b
			US	***If any PZR PORV opens because of high PZR pressure, Step 5.a should be repeated when pressure decreases to LESS THAN 2350 psia.***	E-3, Step 5, CAUTION

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			RO	**Check PZR PORVs And Block Valves**	E-3, step 5
				Verify PORVs - CLOSED	E-3, Step 5.a
				Verify PORV block valves - AT LEAST ONE OPEN	E-3, Step 5.b
			BOP	**Check If SG Secondary Boundaries Are Intact**	E-3, Step 6
				Check pressure in all SGs • NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO SG COMPLETELY DEPRESSURIZED	E-3, Step 6.a
			US	***To aid in identifying previously undetected steam generator tube failures, the wide range SG level indication should be used if the narrow range level is off scale.***	E-3, Step 7, NOTE
				Check Intact SG Levels	E-3, step 7
				Verify NR level - GREATER THAN 8% (42% ADVERSE CTMT)	E-3, Step 7.a

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Maintain total feed flow GREATER THAN 530 gpm until NR level is GREATER THAN 8% (42% ADVERSE CTMT) in at least one SG.	E-3, Step 7.a, RNO
				Control feed flow to maintain NR level between 8% and 50% (42% and 50% ADVERSE CTMT)	E-3, Step 7.b
				IF NR level in any intact SG continues to increase in an uncontrolled manner, THEN Return to CAUTION prior to step 1.	E-3, Step 7.b, RNO
			US	***If offsite power is lost after SI reset, manual action to restart safeguards equipment may be required.*** ***DO NOT reset CDA if recirculation spray pumps are required and have not automatically started.***	E-3, Step 8, CAUTION
			RO	**RESET SI And CDA**	E-3, Step 8
			RO	**RESET CIA And CIB**	E-3, Step 9
			RO	**Establish Instrument Air to Ctmt**	E-3, Step 10
				Check instrument air compressors - AT LEAST ONE RUNNING	E-3, Step 10.a

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				OPEN instrument air Ctmt isolation valves	E-3, Step 10.b
			BOP	**Check Electrical Alignment**	E-3, Step 11
				Verify AC emergency busses - ENERGIZED BY OFFSITE POWER	E-3, Step 11.a
				Proceed to Step 11.g.	E-3, Step 11.b
	REMOTE EDR18 EDR44	**NOTE**: When requested: EDR18: T+2 minutes EDR44: T+4 minutes and call in report		Locally perform the following to energize MCC 32-3T: 1. CLOSE the feeder breaker on 32T for MCC 32-3T (32T13-2) 2 Verify inverter 6 DC input ammeter indicating zero amps.	E-3, Step 11.g
				Verify busses 34A and 34B - BOTH ENERGIZED BY OFFSITE POWER.	E-3, Step 11.h
				Proceed to Step 11.1.	E-3, Step 11.i
				Check RCPs - ANY RUNNING.	E-3, Step 11.l

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
		NOTE: Use the following remotes RCR 23, RCR 24, RCR 25, RCR 26		Locally (SM Key Locker #34-38) on each RCP circuit breaker and potential transformer cubicle, use the setpoint switches' (43PP and 43PB) to select COLD for the over current trip setpoint (eight switches)	E-3, Step 11.m
			US	***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-3, Step 12, CAUTION
			RO	**Check If RHR Pumps Should Be Stopped**	E-3, Step 12
				Verify RCS pressure - GREATER THAN 300 psia (500 psia ADVERSE CTMT)	E-3, Step 12.a
				STOP RHR pumps and Place in AUTO	E-3, Step 12.b

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	***DO NOT proceed to step 13 if isolation of the ruptured SGs from the intact SGs is NOT complete unless a ruptured SG is needed for cooldown. Closing the MSIV and MSIV bypass valve for the ruptured SGs or for the intact SGs to be used for cooldown will satisfy the isolation requirement.***	E-3, Step 13, CAUTION
			BOP	**Check Ruptured SGs Pressure - GREATER THAN 420 psig**	E-3, Step 13
			US	***To allow steam dump operation to continue during a controlled cooldown, ensure the Low-Low Tavg interlock is bypassed at 553°F.***	E-3, Step 14, NOTE
			US	***Ensure Low Steam Line Pressure SI is blocked when pressurizer pressure is LESS THAN 2000 psia.***	E-3, Step 14, NOTE
			US	***After the Low Steam Line Pressure SI signal is blocked, MSI will occur if the high steam pressure rate setpoint is exceeded.***	E-3, Step 14, NOTE
			US	***The RCP trip criteria does not apply once a controlled cooldown is initiated.***	E-3, Step 14, NOTE
			US/BOP	**Initiate RCS Cooldown**	E-3, Step 14

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US/BOP	Determine required core exit temperature without interpolating (use lower pressure)	E-3, Step 14.a

Lowest Ruptured SG Pressure (psig)	Core ExitTemps (°F) NORMAL	Core Exit Temps (°F) ADVERSE
1285	538	498
1185	528	485
1085	516	470
985	504	453

		Dump steam to condenser from intact SGs at maximum rate.	E-3, Step 14.b
		Verify annunciator CONDENSER AVAIL FOR STM DUMP C-9 (MB4D 5-6) - LIT	E-3, Step 14.b.1
		Establish no demand signal on steam pressure controller output	E-3, Step 14.b.2
		Transfer condenser steam dumps to Steam Pressure Mode	E-3, Step 14.b.3
		Place both condenser interlock selector switches - ON	E-3, Step 14.b.4

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Adjust steam pressure controller to dump steam to condenser at maximum rate.	E-3, Step 14.b.5
				Verify cores exit TCs - LESS THAN REQUIRED TEMPERATURE	E-3, Step 14.c
				Stop RCS cooldown	E-3, Step 14.d
				Maintain core exit TCs - LESS THAN REQUIRED TEMPERATURE	E-3, Step 14.e
			US	***DO NOT proceed to step 15 unless RCS cooldown is complete.***	E-3, Step 15, CAUTION
			BOP	**Check Ruptured SGs Pressure - STABLE OR INCREASING**	E-3, Step 15
			RO	**Check RCS Subcooling Based on Core Exist TCs - GREATER THAN 52°F (135°F ADVERSE CTMT)**	E-3, Step 16
			RO	**Depressurize RCS To Minimize Break Flow and Refill PZR**	E-3, Step 17
				Verify normal PZR spray - AVAILABLE	E-3, Step 17.a

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Spray PZR with maximum available spray until one of the following occur: • RCS pressure - LESS THAN ruptured SGs pressure AND PZR level is GREATER THAN 16% (50% ADVERSE CTMT) OR • PZR level - GREATER THAN 73% (63% ADVERSE CTMT) OR • RCS subcooling based on core exit TCs - LESS THAN 32°F (115°F ADVERSE CTMT)	E-3, Step 17.b
				CLOSE spray valves	E-3, Step 17.c
				Normal spray valves	E-3, Step 17.c.1
				Auxiliary spray valve	E-3, Step 17.c.2
				Proceed to CAUTION prior to step 20.	E-3, Step 17.d

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	***Voiding in the upper head region shall NOT preclude SI termination. SI MUST be terminated when termination criteria are satisfied to prevent overfilling of the ruptured SGs.***	E-3, Step 20, CAUTION
			RO	**Check If ECCS Flow Should Be Terminated**	E-3, Step 20
				Verify RCS subcooling based on core exit TCs - GREATER THAN 32°F (115°F ADVERSE CTMT)	E-3, Step 20.a
				Verify secondary heat sink: • Total feed flow to SGs - GREATER THAN 530 gpm AVAILABLE OR • NR level in at least one intact SG - GREATER THAN 8% (42% ADVERSE CTMT)	E-3, Step 20.b
				RCS pressure - STABLE OR INCREASING	E-3, Step 20.c
				PZR level - GREATER THAN 16% (50% ADVERSE CTMT)	E-3, Step 20.d

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			RO	**STOP ECCS Pumps** • STOP SI pumps and Place in AUTO • STOP" all but one charging pump and Place in AUTO	E-3, Step 21
			RO	**Establish Normal Charging Flow Path**	E-3, Step 22
				Fully Open charging line flow control valve	E-3, Step 22.a
				Verify charging header loop isolation valves (3CHS*AV8146 or 3CHS*AV8147) - ONE OPEN	E-3, Step 22.b
				Re-position valves to establish only one open.	E-3, Step 22.b, RNO
				OPEN charging header isolation valves (3CHS*MV8106 and 3CHS*MV8105)	E-3, Step 22.c
				CLOSE the charging pump miniflow isolations to the RWST (3CHS*MV8511A and 3CHS*MV8511B)	E-3, Step 22.d
				CLOSE both charging pump cold leg injection valves	E-3, Step 22.e
			RO	**Align Charging Pump Recirculation**	E-3, Step 23

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				OPEN the charging pump recirculation isolation valves	E-3, Step 23.a
				3CHS*MV8111A	
				3CHS*MV8111B	
				3CHS*MV8111C	
				3CHS*MV8110	
			RO	**Control Charging Flow to Maintain PZR Level**	E-3, Step 24
			RO	**Verify ECCS Flow Not Required**	E-3, Step 25
				Check RCS subcooling based on core exit TCs - GREATER THAN 32°F (115°F ADVERSE CTMT)	E-3, Step 25.a
				Check PZR level - GREATER THAN 16% (50% ADVERSE CTMT)	E-3, Step 25.b

TERMINATE UPON Verification That ECCS Flow is NOT Required (E-3, Step 25).

SECTION 4

ID Number: 2K1NRC-002 Revision: 0

EVALUATION GUIDE

I. SUMMARY

The following Critical Tasks are covered in this exam:

TASK DESCRIPTION	TASK #	K/A >/= 3.0	BASIS FOR SELECTION
Manually trip the reactor from the control room with either Main Board trip switch or by opening 32B and 32N supply breakers before completing step 1 of E-0.	E-0—A	001.A2.13 4.4/4.6	Failure to manually trip the reactor cause a challenge to the subcriticality CSF beyond that irreparably introduced by the postulated condition. Additionally it constitutes an ".incorrect performance which necessitates the crew taking compensating action which complicates the event mitigation strategy..."
Close feedwater isolation valves such that at least one valve is closed on each Steam Generator before the completion of step 9 of E-0.	E-0--OA	059-K4.19 3.2/3.4	Failure to close at least one feedwater isolation valve on each steam generator, under the postulated plant conditions and when it is possible to do so, constitutes a "demonstrated inability by the crew to recognize a failure/ incorrect auto actuation of an ESF system or component."
Isolate feedwater flow into and steam flow from the ruptured SG prior to step 4 of E-3.	E-3--A	000-038 EA1.16 4.4 / 4.3	Failure to isolate the ruptured SG causes a loss of differential pressure between the ruptured SG and the intact SGs. Upon a loss of differential pressure, the crew must transition to a contingency procedure that constitutes an incorrect performance that "...necessitates the crew taking compensating action which complicates the event mitigation strategy...."

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

SECTION 4

Title: SGTR AT LOW POWER

ID Number: 2K1NRC-002 Revision: 0

EVALUATION GUIDE

SECTION 5

SCENARIO INITIAL CONDITIONS

ID Number: 2K1NRC-002 Revision: 0

Reactor Power:	50%
Operating History:	1 day on line
RCS Boron:	970 ppm
Core Burnup:	8,000 MWD/MTU
Condensate Demins:	5 demins in service
Evolutions in Progress:	Power Ascension
	Millstone Unit 2 is Offline for scheduled refueling outage
Major Equipment OOS:	NONE

Crew Instructions:

The previous crew completed a CONVEX ordered downpower to 50% reactor power. You are directed to increase power to 75% at 5%/hr IAW OP 3204, At Power Operations, beginning at step 4.1.15. Heater Drain pumps and MSR Drain Tank Pumps are still in service and the Reheater Drain Tank level control is on the normal level control valves. This load increase rate has been approved by Reactor Engineering and the Unit Director.

Plant/Simulator Differences:

- Real Time and Simulator Rad Monitor historical data not valid prior to the beginning of this exercise.
- Auto-log terminals need to be refreshed after entry is made.
- 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: SGTR AT LOW POWER

ID Number: 2K1NRC-002 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.)

_____ _____

Technical Reviewer Date

SECTION 7

REFERENCE AND TASK TRACKING

Title: SGTR AT LOW POWER

ID Number: 2K1NRC-002 Revision: 0

I. References:

OP*3204	At Power Operations
ARP*MB4A,4-10	VCT Level Instrument Fails High
AOP*3563	Loss of 125 VDC Bus
AOP*3562	Loss of Instrument Air
EOP*E-0	Reactor Trip or Safety Injection
EOP*E-1	Loss of Reactor or Secondary Coolant
EOP*E-3	SGTR
EOP*ERG_EXE	Westinghouse Owners Group Executive Document
EOP* Step _DOC	MP3 step deviation Document
EOP*ERG_HP	Westinghouse Owners Group Background Document
EPIP*FAP 001	Event Assessment, Classification and Reportability
NUREG*1021 rev 8	Examiners Standards

Initial Dynamic Simulator Scenario

NUREG-1021, Appendix D, Attachment 1

Title: UNCONTROLLED DEPRESSURIZATION OF ALL S/Gs

ID Number: 2K1NRC-004 Revision: 0

I. Summary:

Facility: Millstone 3 PWR:_____ Scenario No: 2K1NRC-004 Op-Test No:2K1LOIT

Examiners:_____ Operators:_____

Initial Conditions: IC-18; 100% power, middle of life, MP2 in a refueling outage

Event No:	Malf. No.	Event Type *	Event Description
1	None	N(RO)	Shift Train B Service Water Pumps per OP 3326, Section 4.6
2	RX10A	I(RO)	PZR Level Channel 459 Fails Low
3	FW01 NONE	C(BOP) R(ALL)	Loss of Condenser Vacuum Rapid Downpower; AOP 3575
4	MS03 ED06C PC01	C(ALL) C(BOP) C(ALL)	Small Steam Break in the Turbine Building Loss of MCC 32-3T Loss of Plant Process Computer
5	ED05A MS07B MS07D MS12A MS12C	M(ALL)	Loss of Voltage to Load Center 32A (Trip Initiator) Uncontrolled Depressurization of All Steam Generators
5(rods)	RD16	C(RO)	Multiple Rods Stick Out on Reactor Trip
6	RP08A RP08B	C(ALL)	MSLI Fails to Auto Actuate

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

SECTION 8
MILLSTONE UNIT 3
SIMULATOR SCENARIO ATTRIBUTES CHECKLIST
FORM ES-301-4

Exam Title: UNCONTROLLED DEPRESSURIZATION OF ALL S/Gs

ID Number: 2K1NRC-004 Revision: 0

Assessor: Steve Jackson

QUALITATIVE ATTRIBUTES

___Y__1. 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__2. The scenario consists mostly of related events.

___Y__3. 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 (if applicable)

___Y__4. 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__5. The events are valid with regard to physics and thermodynamics.

___Y__6. Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.

_N/A__7. 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__8. The simulator modeling is not altered.

___Y__9. The scenario has been validated. Any open simulator performance deficiencies have been evaluated to ensure functional fidelity is maintained while running the scenario.

___Y__10. 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__11. All individual operator competencies can be evaluated, as verified using form ES-301-6.

___Y__12. 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__13. Level of difficulty is appropriate to support licensing decisions for each crew position.

SECTION 8
MILLSTONE UNIT 3
SIMULATOR SCENARIO ATTRIBUTES CHECKLIST
FORM ES-301-4

Exam Title: Uncontrolled Depressurization of All S/G's

ID Number: 2K1NRC-004 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 — Total: 8

PZR Level Channel Fails Low, Loss of Condenser Vacuum, Multiple Stuck Rods on the Trip, Steam Break in the Turbine Building, Loss of Bus 32A, Loss of Plant Process Computer (MCC 32-3T), Uncontrolled Depressurization of All S/G's, ESF System (MSLI) Fails to Auto Actuate

02. Malf's after EOP entry (EM's)- 1 to 2 required — Total: 2

ESF System (MSLI) Fails to Auto Actuate, Uncontrolled Depressurization of All S/G's

03. Abnormal Events (AE)-2 to 4 required — Total: 3

AOP 3559, Loss of Condenser Vacuum, AOP 3566, Immediate Boration, AOP 3571, Instrument Failure Response

04. Major Transients (MT)-1 to 2 required — Total: 1

Uncontrolled Depressurization of All S/G's

05. EOP's (EU) entered/requiring substantive actions 1 to 2 required — Total: 2

E-0, Reactor Trip or Safety Injectiion, ECA-2.1, Uncontrolled Depressurization of All S/G's

06. EOP Contingencies requiring substantive actions [ECAs/FRs](EC) 0 to 2 required — Total: 1

ECA-2.1, Uncontrolled Depressurization of All S/G's

07. Critical Task (CT) - 2 to 3 required — Total: 2

E-0—P:	Manually actuate Main Steamline Isolation or close MSIVs.
ECA-2.1 – A	Control the AFW flow rate to at least 100 gpm per SG in order to minimize the RCS cooldown rate

08. Approximate Scenario Run Time: 45 to 60 min. (One scenario may approach 90 minutes) — Total: 60 min

09. EOP run time: — Total: 30 min

10. Technical Specifications are exercised during the scenario. — (Y/N) Y

NOTES:

Reactivity Manipulation: Downpower required by Loss of Vacuum procedure

MILLSTONE NUCLEAR POWER STATION

LOIT NRC SIMULATOR EXAM GUIDE APPROVAL SHEET

Exam Title: UNCONTROLLED DEPRESSURIZATION OF ALL S/Gs

Revision: 0

ID Number: 2K1NRC-004

Submitted by:	Steve Jackson Developer	09/11/01 Date
Validated by:	Marten Technical Reviewer	11/19/01 Date
Approved by:	Operation Manager (Optional)	Date
Approved by:	Training Supervisor	11/20/01 Date

SIM EXAM 004

SUMMARY OF CHANGES RE: NRC VALIDATION

Deleted critical task on exercise brief page. This was left over from previous revision.

Clarified that US can delegate manual status trees on exercise brief page.

Deleted the Boolean trigger from malfunctions MS12A & MS12C; unnecessary.

Defined which Tech Specs apply in body of Sim Guide

Added note that "US or designee must do manual status trees because the computer is NOT available"

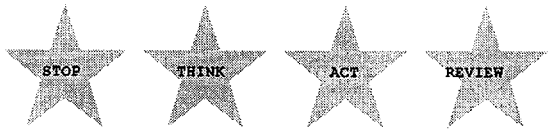
Added Simulator REMOTES to specify energizing accumulator isolation valves.

SECTION 2

SIMULATOR EXAM GUIDE

TABLE OF CONTENTS

SECTIONS LISTED IN ORDER



SECTION 3
EXAM OVERVIEW

Title: UNCONTROLLED DEPRESSURIZATION OF ALL S/Gs

ID Number: 2K1NRC-004 Revision: 0

1. Exercise brief:

   The plant is at 100% power, MOL steady state operations with all control systems in automatic. The crew will initially shift Train B Service Water Pumps using OP 3326, Service Water Service, Section 4.6. When that normal evolution is complete, the controlling channel of PZR Level, LT459, will fail low causing 3RCS*LCV459 to close (isolating letdown), de-energizing PZR heaters and increasing Charging flow to maximum. The crew will respond using AOP 3571, Instrument Failure Response, to stabilize the plant, trip bistables, address Tech Specs and restore normal plant conditions.

   Once the crew has recovered from the PZR level instrument failure Main Condenser vacuum will begin to degrade from an unknown cause. Condenser backpressure will increase to greater than 5 inches Hg Absolute necessitating a plant shutdown using AOP 3575, Rapid Downpower, at 5%/min. At ~70% reactor power a small steam break will occur in the Turbine Bldg. which will ultimately lead to a Reactor Trip. On the Reactor Trip multiple rods will stick out of full insertion.

   Corollary damage from this steam leak will include the loss of MCC 32-3T, the normal source of power to the Plant Process Computer. During the automatic shift of power supplies to Load Center 32P, the Plant Process Computer will be lost and will not return for this scenario.

   Once the Loss of Load Center 32A causes the unit to trip, the "A" & "C" MSIVs will fail to close and the "B" and "D" SG low set safety valves will stick open. Main Steamline Isolation will fail to automatically actuate but can be manually actuated **[Critical Task]**. The crew should proceed through E-0 to E-2 to ECA-2.1. At the transition from E-0 to E-2 (E-0 step 23) the first opportunity to check status trees will occur. With the Plant Process Computer unavailable, the US should perform or designate manual status trees using input from the board operators.

   While carrying out the SI termination steps in ECA-2.1, the "A" MSIV will close. The crew should complete the SI Termination steps, steps 12 through 28. The scenario will end when the crew elects to transition to E-2.

2. The SM should classify this event as a **Alert - Charlie One** based on an Unisolable Steam Line Break Outside CTMT.(EAL BA2)

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

4. Duration of Exam: 60 minutes

SECTION 4

EVALUATION GUIDE

Title: UNCONTROLLED DEPRESSURIZATION OF ALL S/Gs

ID Number: 2K1NRC-004 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.

Exam Title: UNCONTROLLED DEPRESSURIZATION OF ALL S/Gs

ID Number: 2K1NRC-004 Revision: 0

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard

1. START the Sun Workstation. 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 **IC18: Temp IC 2K1 NRC-004**
6. ADJUST the various pot settings to the valued specified by the chart in the simulator booth or Notepad 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 4 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.

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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 OOS: Standard 2K1NRC Exam Equipment

Initial Malfunctions

MALF	RP08A	MSI Fails to Auto Actuate (Train A)			
MALF	RP08B	MSI Fails to Auto Actuate (Train B)			
MALF	MS07B	B S/G Low Setpoint Safety Stuck Open	100%		BT1
MALF	MS07D	D S/G Low Setpoint Safety Stuck Open	100%		BT1
MALF	MS12A	A S/G MSIV Stuck Open			
MALF	MS12C	C S/G MSIV Stuck Open			
MALF	RD16	Multiple Rods Stick Out on Reactor Trip			

Event Malfunctions

MALF	RX10A	PZR Level LT*459 Fails Low		0%	20 second ramp
MALF	FW01	Lowering Condenser Vacuum	~100% (@ 5"HgAbs or begin downpower MODIFY to 50%)		
MALF	MS03,	Steam Leak Downstream of the MSIVs		~10%	30 second ramp
ANN I/O	MB08C, 1-10	BATT 6 TROUBLE	ON		
ANN I/O	MB08C, 1-11	INV 6 TROUBLE	ON		
ANN I/O	VP1B, 1-8	TB VENT PANEL TROUBLE	ON		
MALF	ED06C	Loss of Voltage to MCC 32-3T			
MALF	PC01	Loss of Plant Process Computer			
MALF	ED05A	Loss of Voltage to Load Center 32A			

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

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		EVENT 1: Shift SW Pumps **OP 3326**,Section 4.6, Shifting B Train Service Water Pumps, Rev 21 chg 2	US	**Shifting Train B Service Water Pumps**	OP 3326 Step 4.6
		[Normal Evolution]	RO	VERIFY 3SWP*P3B, "SW BSTR PP", stopped	OP 3326 Step 4.6.1
			US	After pump swap 3SWP*P3, MCC/RCA booster pump, may be inoperable until vented. Venting should be accomplished in a timely manner. Specific two hour time limits may apply as specified in T/S 3.8.1.1.d, "Electrical power Systems, A.C. Sources."	OP 3326 Step 4.6.2 CAUTION
			US/PEO	IF hypochlorite is being injected at the service water pump suction bell, Refer To OP 3328, "Hypochlorite," and PERFORM the appropriate actions: • IF both trains of service water are in service, SHIFT injection from two trains service water to one train service water. • IF only one train of service water is in service, SHUTDOWN the Hypochlorite System.	OP 3326 Step 4.6.2
		NOTE: Both trains of Service Water are in service. As PEO, wait 2 to 3 minutes after direction and then report hypochlorite shifted.			

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			US	IF shifting to 3SWP*P1D, service water pump D, PERFORM the following;	OP 3326 Step 4.6.3
		NOTE: All pre-start checks have been completed	US	VERIFY 3SWP*P1D, service water pump D, upper and lower motor bearing lube oil level approximately at 'STANDSTILL" mark.	OP 3326 Step 4.6.3.a
			US	To limit time Service Water System flow exceeds limits through the RPCCW heat exchanger, if the RPCCW heat exchanger is the major load on the Service Water System, there should be no delay in performing steps 4.6.3.b through 4.6.3.d.	OP 3326 Step 4.6.3.b CAUTION
			RO	START 3SWP*P1D, service water pump D, and VERIFY the following valves open (MB1): • 3SWP*MOV102D, "DISD" • 3SWP*MOV24D, "SWP-MOV24D"	OP 3326 Step 4.6.3.b
			US	IF hypochlorite is being injected into the service water pump discharge header, PERFORM the following: 1. Refer To OP 3328, "Hypochlorite," and ALTERNATE hypochlorite injection to 3SWP*P1D, service water pump D.	OP 3326 Step 4.6.3.c

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				2. WHEN the hypochlorite injection isolation valve for the off-going pump is closed, PLACE hand switch for 3SWP*P1B, service water pump B, in "STOP" and HOLD (MB1).	
				3. Go To step 4.6.3.e.	
			RO	WHEN service water header pressure stabilizes, PLACE 3SWP*P1B, service water pump B, in "AUTO" and RELEASE hand switch (MB1).	OP 3326 Step 4.6.3.e
			RO	VERIFY 3SWP*MOV102B, "DIS B," closed (MB1).	OP 3326 Step 4.6.3.f
			RO	VERIFY the following annunciators not lit: • MB1C 4-3, "SERVICE WTR PUMP DIS PRES LO" • MB1E 6-2, "SERVICE WATER SYSTEM"	OP 3326 Step 4.6.3.g
			PEO	CHECK for positive indication of service water pump shaft gland seal leakoff.	OP 3326 Step 4.6.3.h
			RO	WHEN approximately three minutes of pump operation have elapsed, VERIFY	OP 3326 Step 4.6.3.i

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				3SWP*MOV24D, "SWP-MOV24D," closed (MB1).	
	REMOTE	Lead/Follow switches SWR02	US/PEO	At bus 34D, PLACE service water pump "LEAD/FOLLOW" switch to "B-FOLLOW/D-LEAD" (34D 16-2).	OP 3326 Step 4.6.3.j
				Go To step 4.6.5.	
		NOTE: Planned end of normal evolution		IF hypochlorite is to be injected at the service water pump suction bell, PERFORM the following:	OP 3326 Step 4.6.5
		Event 2: PZR Level Channel Fails Low			
T+ Shifting of Service Water Pumps complete	**RX10A 0% 20sec ramp**	**NOTE**: This will close 3CHS*LCV459, isolating letdown, de-energize PZR Heaters, and increase Charging flow to maximum.			
			US	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
			US	If a reactor trip occurs, immediately go to E-0, Reactor Trip or Safety Injection	AOP 3571 Step 1, NOTE

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			RO	**Determine the initiating parameter and place the affected controller in MANUAL.**	AOP 3571 Step 1
			US/ CREW	**Stabilize the plant parameters.**	AOP 3571 Step 2
			US	It is desired that IC&E 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
			US	**Perform Corrective Actions Using Appropriate Attachment**	AOP 3571 Step 3
				Instrument Failure	**Attachment**
				PZR Level Channel Failure	C
				Defeat the failed channel input.	AOP 3571 Attachment C Step 1
				• Pressurizer Level Select - Control - 3RCS-LS459D	

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				• Pressurizer Level Select - Record - 3RCS-LS459E	
				Restore PZR level to normal.	AOP 3571 Attachment C Step 2
			US/ RO	**If necessary, using OP 3304A, "Charging and Letdown," Restore letdown.**	AOP 3571 Attachment C Step 3
			RO	**Place PZR level controller in automatic.**	AOP 3571 Attachment C Step 4
			RO	**Reset pressurizer heaters as necessary.**	AOP 3571 Attachment C Step 5
			CREW	**When conditions have stabilized, Observe MB annunciators and parameters. Immediately report any unexpected or unexplained conditions to the SM.**	AOP 3571 Attachment C Step 6
			US	**Determine which Reactor Protection System bistable(s) requires tripping:**	AOP 3571 Attachment C Step 7
				Place a check mark in the box above the appropriate channel that requires tripping on the last page of this attachment.	AOP 3571 Attachment C Step 7a

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		[Tech Specs] 3.3.1, Functional Unit 11, Action 6 IF PZR level increases to > 67.5% then also 3.4.3.1, Action b.		Refer to Technical Specification 3.3.1, 3.3.3.5, and 3.3.3.6.	AOP 3571 Attachment C Step 7b
	REMOTE	Bistables: RXR 106 (door open/close) RXR 25 (459A)		Check the existing bistable status to ensure a reactor trip will not occur when the failed channel is tripped.	AOP 3571 Attachment C Step 7c
				Request the I&C Department trip the appropriate bistables using Attachment C and Attachment S.	AOP 3571 Attachment C Step 7d
				Verify the appropriate bistable status lights are lit.	AOP 3571 Attachment C Step 7e
				Request I&C Department perform corrective maintenance on failed instrument.	AOP 3571 Attachment C Step 8
T= Complete AOP 3571, Att.C or Examiner's Cue		**Event 2:** Loss of Condenser Vacuum **NOTE**: Put in early if possible. Takes ~5 minutes to develop.			

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	FW01 @ 100%, THEN 50%	**NOTE**: Main Condenser vacuum will begin to degrade from an unknown cause, possibly boot rupture. Backpressure will stabilize at about 5.8 in. Hg Abs. **Sim. Driver**: Modify **MALF FW01** to 50% to maintain Cond Vacuum at about 5.8 in. Hg Abs. At 5" Hg Abs or when crew begins rapid downpower. Should be above 5 in. Hg Abs. but **not** approach 7.5 in. Hg Abs.(Rx Trip Criteria)			
			US	**Check If Turbine Load Should Be Reduced**	AOP 3559 Step 1
			BOP	Verify condenser backpressure - LESS THAN OR EQUAL TO 7.5 inches Hg Absolute	AOP 3559 Step 1.a
		Note: First pass through the procedure Condenser Backpressure probably will not be >5 inches Hg Absolute	BOP	Verify condenser backpressure - GREATER THAN 5 inches Hg Absolute	AOP 3559 Step 1.b

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		NOTE: Continuous Action; expect to return to step 1.c		Proceed to step 2 and, IF condenser backpressure increases to GREATER THAN 5 inches Hg Absolute THEN Return to step 1.c.	AOP 3559 Step 1.b RNO
				Verify turbine load - GREATER THAN 360 Mwe	AOP 3559 Step 1.c
				Using AOP 3575, "Rapid Downpower," Lower turbine load at 5%/min until one of the following occur: • Backpressure LESS THAN EQUAL TO 5 inches Hg Absolute OR • Turbine load at 360 Mwe	AOP 3559 Step 1.d
			BOP	**Check Circulating Water System Operation**	AOP 3559 Step 2
				Verify circulating water pumps - ONE PER CONDENSER RUNNING	AOP 3559 Step 2.a
				Verify water box outlet isolation valves - OPEN	AOP 3559 Step 2.b
				Verify all circulating water pumps - RUNNING	AOP 3559 Step 2.c

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				Verify the traveling screen differential pressure - LESS THAN 12 inches H_2O	AOP 3559 Step 2.d
		NOTE: All local equipment indications, in this step, will appear normal.	US/ PEO	**Check Condenser Air Removal Alignment**	AOP 3559 Step 3
				Verify steam jet air ejector auxiliary steam supply valve (3ASS-AOV22) - OPEN	AOP 3559 Step 3.a
				Using OP 3329, "Condenser Air Removal," locally Perform the following:	AOP 3559 Step 3.b
				Verify both sets of steam jet air ejectors in service	AOP 3559 Step 3.b.1
				Verify all first stage jets in service on each air ejector	AOP 3559 Step 3.b.2
				Check for indications of air ejector backfiring	AOP 3559 Step 3.b.3
				Verify isolation dampers for gaseous waste to Unit 1 stack (3GWS*AOD78A and 3GWS*AOD78B) - OPEN	AOP 3559 Step 3.c
				At Gas Waste Panel (3GWS-PNL-P6), Verify process vent fans (3GWS-FN1A or 3GWS-FN1B) - ONE RUNNING	AOP 3559 Step 3.d

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				Locally (Turbine Bldg 38' southwest) Verify steam jet air ejector exhaust valves (3ARC-AOV36A and 3ARC-AOV36B) - OPEN	AOP 3559 Step 3.e
			BOP	**Check Gland Seal Pressure - BETWEEN 2 and 6 psig**	AOP 3559 Step 4
			US	Locked valve key is required for some local operations.	AOP 3559 Step 5 Note
			BOP	**Check Condensate Surge Tank Level** • GREATER THAN 18,000 gal • NOT DECREASING IN AN UNEXPECTED MANNER	AOP 3559 Step 5
				A turbine trip occurs if the exhaust hood temperature exceeds 225°F.	AOP 3559 Step 6 Note
			BOP	**Check Exhaust Hood Temperature Annunciators EXH HOOD A, B, and C TEMP HI (175°F) (MB6A 5-4, 5-5, and 5-6) - NOT LIT**	AOP 3559 Step 6
			US/ PEO	**Check For Condenser In-Leakage**	AOP 3559 Step 7

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				Verify condenser vacuum breakers (MB7) (3ARC-MOV20A-B-C) - CLOSED	AOP 3559 Step 7.a
				Locally Check vacuum breaker loop seals (Turbine Bldg 60' west) - FILLED	AOP 3559 Step 7.b
		NOTE: If dispatched, the PEO will hear air inleakage around the "B" Main Condenser rubber boot.		Locally Check for unusual noises indicative of air in-leakage	AOP 3559 Step 7.c
				Check seal water supply pressure annunciator EXT STM NRV SEAL PRES LO (MB6A 3-6B) - NOT LIT	AOP 3559 Step 7.d
				Using OP 3353.MB6A, "Main Board 6A Annunciator Response," Perform corrective actions for MB6A 3-6B.	AOP 3559 Step 7.d RNO
				Contact Engineering to assist in locally checking condenser penetrations for air in-leakage	AOP 3559 Step 7.e
			US	**Review Current Maintenance and Testing Activities.**	AOP 3559 Step 8
			US/ PEO	**Verify Condenser Backpressure - STABLE OR DECREASING**	AOP 3559 Step 9

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		NOTE: At second pass through procedure the backpressure should be at the correct value for requiring a Rapid Downpower		Return to step 1.	AOP 3559 Step 9 RNO
T= Condenser Back-pressure >5"HgAbs		**AOP 3575,** Rapid Downpower, Rev. 7 **[Reactivity Manipulation]**	US	• A CONVEX requested emergency generation reduction should be completed within 15 minutes of notification. • If a unit shutdown is required, the target power level should be between 20% and 25% reactor power. • If at any time ROD CONTROL BANKS LIMIT LO - LO (MB4C 4 - 9) annunciator is received, DO NOT go to AOP 3566, Immediate Boration. Immediately perform step 9.	AOP 3575 Step 1 NOTE
			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 CONVEX REQUESTED	AOP 3575 Step 1.b

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			US	Proceed to Step 1.d.	AOP 3575 Step 1.b RNO
		NOTE: AOP 3559 requires **5%/minute** downpower	CREW	Determine power reduction rate using Table.	AOP 3575 Step 1.d
			US	**Check Rod Control In AUTO.**	AOP 3575 Step 2
			CREW	**Align EHC Panel**	AOP 3575 Step 3
			US	Check turbine OPERATING MODE - MANUAL	AOP 3575 Step 3.a
			US	Check LOAD LIMIT LIMITING light - LIT	AOP 3575 Step 3.b
			BOP	Intermittently Press DECREASE LOAD pushbutton until LOAD LIMIT LIMITING light - NOT LIT	AOP 3575 Step 3.c
			BOP	Rotate LOAD LIMIT SET adjust knob at least one full turn in raise direction	AOP 3575 Step 3.d
				Select DECREASE LOADING RATE to ON	AOP 3575 Step 3.e
			BOP	Select LOAD RATE LIMIT % MIN to required power reduction rate (% min)	AOP 3575 Step 3.f

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				If at any time the power reduction rate or target power level must be changed, Return to step 1.	AOP 3575 Step 4 NOTE
			US/RO	**Verify Power Reduction Rate**	AOP 3575 Step 4
			RO	Check power reduction rate 5% MIN	AOP 3575 Step 4.a
		Note: Either the Action/Expected Response or RNO flowpath is acceptable. (judgement call if time available to perform boration at this step).	RO	Check power reduction - REQUIRED TO STABILIZE PLANT	AOP 3575 Step 4.b
				Proceed to step 5.	AOP 3575 Step 4.b RNO
			RO	Proceed to NOTE prior step 7.	AOP 3575 Step 4.c
			RO	**Initiate Rapid Boration**	AOP 3575 Step 5
				Verify RCS makeup system in - AUTO	AOP 3575 Step 5.a
				START one boric acid transfer pump.	AOP 3575 Step 5.b

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				OPEN emergency boration valve (3CHS*MV8104).	AOP 3575 Step 5.c
			RO	Verify direct boric acid flow (3CHS-FI 183A) - INDICATED.	AOP 3575 Step 5.d
				OPEN charging line flow control valve, to match boric acid flow (3CHS-FI 183A)	AOP 3575 Step 5.e
			RO	Record time boration started Time _____	AOP 3575 Step 5.f
				Energize all PZR heaters.	AOP 3575 Step 5.g
				Determine required boric acid addition by multiplying total power change (△%) by 15 (gal/%) = _____ gal.	AOP 3575 Step 5.h
				Determine required time to borate by dividing required gallons of boric acid by the direct boric acid flowrate (*net charging flow rate if using gravity boration)* _____min.	AOP 3575 Step 5.i
			US	Check turbine load decrease - IN PROGRESS OR COMPLETED.	AOP 3575 Step 5.j

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			US	Proceed to NOTE prior to Step 7.	AOP 3575 Step 5.j RNO
			US	Proceed to NOTE prior to Step 8.	AOP 3575 Step 5.k
			CREW	Boric acid total volume addition and flow rates are based on approximations. Adjustments should be made to these values as necessary to ensure the reactor reaches the desired end state of: • Tavg on program • Rods above the Rod Insertion Limit • AFD on or above the target value	AOP 3575 Step 6 NOTE
			US	**Align RCS Makeup System For Boration.**	AOP 3575 Step 6
			US/RO	Determine required boric acid addition by multiplying total power change (△%) by 15(gal/%) = _____ gal.	AOP 3575 Step 6.a
			RO	Set the boric acid batch counter to total gallons of boric acid required.	AOP 3575 Step 6.b

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			US	Check power reduction rate- AT 0.5%/min.	AOP 3575 Step 6.c
			RO	Adjust boric acid blend flow controller pot setting to 3.75 (15 gpm) and Proceed to Step 6.e.	AOP 3575 Step 6.c RNO
			RO	Adjust boric acid blend flow controller pot setting to 1.9 (7.5 gpm).	AOP 3575 Step 6.d
			RO	Select BORATE on the reactor coolant makeup select switch.	AOP 3575 Step 6.e
			RO	Select START on the reactor coolant makeup start switch.	AOP 3575 Step 6.f
			RO	Verify boric acid flow - INDICATED	AOP 3575 Step 6.g
			US	Return to step 5.	AOP 3575 Step 6.g RNO
			RO	Energize all PZR heaters.	AOP 3575 Step 6.h
			RO	If a unit shutdown is being performed, the final MWe load should be approximately 230 MWe.	AOP 3575 Step 7 NOTE

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		NOTE: Proceed to next event when examiner is satisfied with the performance of the power change **reactivity manipulation**.	US/BOP	**Initiate Load Reduction.**	AOP 3575 Step 7
			BOP	Check turbine OPERATING MODE - MANUAL	AOP 3575 Step 7.a
			BOP	Unload turbine at required rate using the STANDBY LOAD SET pot and Proceed to step 7.e.	AOP 3575 Step 7.a RNO
			BOP	Check rapid or gravity boration - IN PROGRESS	AOP 3575 Step 7.b
			BOP	Proceed to step 7.d.	AOP 3575 Step 7.b RNO
			BOP	Check LOAD RATE LIMIT % MIN set at - 3% OR 5%.LIMITING light - LIT.	AOP 3575 Step 7.c
			BOP	Select LOAD RATE LIMIT % MIN to 3% or 5%.	AOP 3575 Step 7.c RNO
			BOP	Utilizing DECREASE LOAD pushbutton, Adjust LOAD SET to desired final MWe (target power level)	AOP 3575 Step 7.d

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			BOP	Check power reduction - CONVEX REQUESTED.	AOP 3575 Step 7.e
			US	Inform CONVEX of load reduction rate (MWe/min) and final MWe level.	AOP 3575 Step 7.e RNO
			BOP	Maintain initial MVAR loading during power reduction, unless directed otherwise.	AOP 3575 Step 7.f
			US/RO	Check boration - IN PROGRESS	AOP 3575 Step 7.g
			US	Return to step 5.	AOP 3575 Step 7.g RNO
			BOP	The following step places one TD FW pump in manual while allowing the other TD FW pump to automatically unload during the downpower.	AOP 3575 Step 8 NOTE
			US/BOP	**Align One Feedwater Pump For Automatic Unloading**	AOP 3575 Step 8
			BOP	Verify removing a feedwater pump from service during the downpower - DESIRED	AOP 3575 Step 8.a

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T= Examiner Cue; Reactivity Manipulation Complete	**MALF** MS03, ~10%, 30 second ramp	**EVENT 4**: Small steam break in the Turbine Building Small steam leakage will cause shorting and loss of load center 32A. Plant Process Computer will shutdown on transfer from it's normal power supply.			
	ANN I/O MB08C, 1-10	**NOTE**: Annunciator signs of steam leakage. BATT 6 TROUBLE ON			
	MB08C, 1-11	INV 6 TROUBLE ON			
	VP1B, 1-18	TB VENT PANEL TROUBLE ON			
T= Steam Leak Evident to Crew	**MALF** ED06C PC01	Loss of Voltage to MCC 32-3T Loss of Plant Process Computer			
		EVENT 5: Uncontrolled Depressurization of All S/Gs			
T= Ready for Rx Trip	**MALF** ED05A	Loss of Voltage to Load Center 32A. Initiates Reactor Trip			

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		NOTE: US should go to "Master Silence" before ordering reactor trip .	RO	TRIP the reactor	
T= Manual Trip by crew decision or Auto Trip		**E-0, Reactor Trip or Safety Injection (Rev. 20) STEPS**	Crew	Go to E-0, Reactor Trip or Safety Injection.	
	MALF MS07B MS07D **MALF** MS12A MS12C on BT1	On the trip, the B & D S/G low setpoint safeties will open and fail to close. Additionally, when manual or automatic MSI occurs, the A & C MSIVs will fail to close.		• Foldout page must be open	E-0, Step 1, NOTE
				• ADVERSE CTMT defined as GREATER THAN 180°F or GREATER THAN 10^5 R/hr in containment. • 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

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				• Check reactor trip and bypass breakers - OPEN	
		EVENT 5 (rods): Multiple Rods Stick Out on the Reactor Trip		• Check rod bottom lights - LIT	
		NOTE: RO should identify condition and verify reactivity concerns are being met by SI flow.			
				• 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
			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

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			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
				• 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
				• Check SG feed regulating valves - CLOSED	
				• Check SG feed regulating bypass valves - CLOSED	
				• Check FW isolation trip valves - CLOSED	

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				• 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	
	INITIAL MALF RP08A RP08B	**EVENT 6**: MSI fails to Auto Actuate **[CRITICAL TASK]** **E-0—P:** Manually actuate MSI or close MSIVs	BOP	**Check If Main Steam Lines Should Be Isolated**	E-0, Step 10
		NOTE: MSI fails to auto actuate		Check Ctmt pressure GREATER THAN 18 psia OR Any SG pressure LESS THAN 660 psig	E-0, Step 10.a
				Proceed to Step 11	E-0, Step 10.a, RNO

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				Verify MSIVs and MSIV bypass valves - CLOSED	E-0, Step 10.b
			BOP	Initiate MSI.	E-0, Step 10.b, RNO
				IF MSI will NOT actuate, THEN CLOSE the MSIVs and MSIV bypass valves.	
			RO	**Check if CDA Required**	E-0, Step 11
				Check Ctmt pressure is GREATER THAN 23 psia OR Ctmt spray is initiated	E-0, Step 11.a
			US	Proceed to Step 12.	E-0, Step11,a, RNO
			BOP	**Verify CAR Fans Operating In Emergency Mode**	E-0, Step 12
			BOP	Check CAR fan status: • CAR fans A and B - RUNNING • CAR fan C - STOPPED	E-0, Step 12.a

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			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
			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	Initiate CIA AND Verify minimum safety function is met.	E-0, Step 13.a, RNO
			RO	IF CIA will NOT actuate, THEN reposition valves as necessary for minimum safety function using Attachment A	
			RO	**Verify Proper ESF Status Panel Indication** • Verify ESF Group 1 lights - OFF • Verify ESF Group 2 lights - LIT	E-0, Step 14

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				• IF Main Steam Line Isolation has occurred, THEN verify ESF Group 3 lights - LIT	
			RO/BOP	Align component(s) as necessary for minimum safety function.	E-0, Step 14, RNO
			RO	**Determine If ADVERSE CTMT Conditions Exist** • Ctmt temperature GREATER THAN 180°F OR • Ctmt radiation GREATER THAN 10^5 R/hr	E-0, Step 15
			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

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			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
				Check charging pump flow indicator - FLOW INDICATED	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
			RO	Check PORV block valves - OPEN	E-0, Step 16.c
			RO	VERIFY the following: 1) Charging pumps - TWO RUNNING 2) RCS subcooling based on core exit TC's GREATER THAN 32°F (115°F ADVERSE CTMT).	E-0, Step 16.d

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				3) Secondary heat sink: • Total feed flow to SGs - GREATER THAN 530 gpm OR • NR level in at least one SG - GREATER THAN 8% (42% ADVERSE CTMT)	
				4) RCS pressure - STABLE OR INCREASING	
				5) PZR level - GREATER THAN 16% (50% ADVERSE CTMT)	
		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.d RNO
			BOP	**Verify Adequate Heat Sink**	E-0, Step 17
				Check NR level in at least one SG - GREATER THAN 8% (42% ADVERSE CTMT)	E-0, Step 17.a
			US	Proceed to Step 17.d.	E-0, Step 17.a, RNO
			BOP	Verify Total AFW Flow - GREATER THAN 530 gpm	E-0, Step 17.d

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			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
		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
			RO	Align HVAC components as necessary for minimum safety function.	E-0, Step 20.c.1, RNO
			BOP	Control Building purge supply fan and purge exhaust fan - NOT RUNNING	E-0, Step 20.c.2
			BOP	Perform the following: • Stop purge supply fan.	E-0, Step 20.c.2, RNO

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				• Stop purge exhaust fan.
				• Locally Close instrument air isolations
				  • 3IAS-V725
				  • 3IAS-V726
				  • 3IAS-V644
				• Locally Close instrument air isolation valve for 3HVC-AOD134	

			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	IF at least one air bank isolation valve can NOT be opened, THEN locally throttle Open at least one pair of air bank isolation bypass valves to maintain 0.125 inches water at Control Building ΔP indicator on VP1.
				  • 3HVC*V750 and 3HVC*V751
				  • 3HVC*V758 and 3HVC*V759	

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Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard
			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 if CBI is required	E-0, Step 20.b, RNO
			RO	• Ctmt pressure GREATER THAN 18 psia OR	
			RO	• Control Building radiation monitor in alarm OR • SI manually actuated	
			RO	IF CBI required, THEN initiate CBI.	
			US	IF CBI is NOT required, THEN proceed to Step 21.	
			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
				• IF temperature is GREATER THAN 550°F AND 560°F, THEN 1) Dump steam to the condenser, if available OR Dump steam to atmosphere.	
			US	2) Proceed to Step 22.	
				• IF the temperature is LESS THAN 550°, THEN proceed to Step 21c.	
			US	Proceed to Step 22	E-0, Step 21.b
			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

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T= When Directed	I/O	**NOTE**: 2 are not closed. US may direct PEO to pull fuses on MSIV using guidance in E-2. I/O (MS) 3MSS*CTV27A*LR Red-Off I/O (MS) 3MSS*CTV27A*LR Grn-Off I/O (MS) 3MSS*CTV27C*LR Red-Off I/O (MS) 3MSS*CTV27C*LR Grn-Off		• MSIVs	
				• MSIV bypass valves	
			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.1, RNO
			BOP	IF unexpected cooldown continues, THEN CLOSE the MSIVs and MSIV bypass valves.	E-0, Step 21.e.2, 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

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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
			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
			US	Proceed to Step 24	E-0, Step 23.a, RNO.
			RO	Verify charging or SI pumps - AT LEAST ONE RUNNING	EOP 35 E-0, Step 23.b
			US	Proceed to Step 24	E-0, Step 23.b, RNO
			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

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				• NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO SG COMPLETELY DEPRESSURIZED	
		NOTE: US or designee must do manual status trees because the computer is NOT available	US	Initiate monitoring of CSF Status Trees and Go to E-2, Faulted Steam Generator Isolation.	E-0, Step 24.a RNO
		E-2, FAULTED STEAM GENERATOR ISOLATION, Rev. 8		At least one SG must be maintained available for RCS cooldown. Any faulted SG or secondary break should remain isolated during subsequent recovery actions unless needed for RCS cooldown or sampling is required. If RWST level decreases to LESS THAN 520,000 gal, Go to ES-1.3, Transfer to Cold Leg Recirculation, to align the ECCS system.	E-2 CAUTION
			BOP US	**Check Main Steam Isolation And Bypass Valves - CLOSED**	E-2, Step 1
T= When requested	**I/Os**	**NOTE**: 2 are not closed. US may direct PEO to pull fuses on MSIV using guidance in E-2.	BOP	CLOSE valves. IF flow path(s) can NOT be isolated,	E-2, Step 1 RNO

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		I/O (MS) 3MSS*CTV27A*LR Red-Off I/O (MS) 3MSS*CTV27A*LR Grn-Off I/O (MS) 3MSS*CTV27C*LR Red-Off I/O (MS) 3MSS*CTV27C*LR Grn-Off		THEN Dispatch an operator to locally Close valve(s) using Attachment A for guidance.	
			US	**Check at least one SG boundary intact.**	E-2, step 2
			RO/ BOP	Check pressures in all SGs - AT LEAST ONE STABLE OR INCREASING	E-2, step 2.a
			US	IF all SG pressures decreasing in an uncontrolled manner, THEN Go to ECA-2.1, Uncontrolled Depressurization of All Steam Generators.	E-2, Step 2.a RNO
		ECA-2.1, Uncontrolled Depressurization of All Steam Generators, Rev 13	US	• If any SG pressure increases at any time, except while performing SI termination in Steps 12 through 28, Go to E-2, Faulted Steam Generator Isolation. • If, during the performance of the procedure, the capability to feed SGs at GREATER THAN 530 gpm is NOT available, Go to FR-H.1, Response to Loss of Secondary Heat Sink.	ECA 2.1 Step 1 CAUTION

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				• If the TD AFW pump is the only available source of feed flow, steam supply to the pump must be maintained from one SG.	
			US	Foldout page must be open.	ECA 2.1 Step 1 NOTE
			CREW	**Check Secondary Pressure Boundary** • Verify MSIVs and MSIV bypass valves - CLOSED • Verify SG feed regulating valves - CLOSED • Verify SG feed regulating bypass valves - CLOSED • Verify FW isolation trip valves - CLOSED • Verify steam supply valves to TD AFW pump - CLOSED IF MD AFW PUMP RUNNING • Verify the SG atmospheric dump valves - CLOSED	ECA 2.1 Step 1

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Action	Standard

- Verify SG blowdown isolation valves - CLOSED
- Verify SG blowdown sample isolation valves - CLOSED
- Verify main steam line drains upstream of MSIVs and TD AFW pump - CLOSED

SG A	SG B	SGC	SGD
3DTM*AOV29A	3DTM*AOV29B	3DTM*AOV29C	3DTM*AOV29D
3DTM*AOV61A	3DTM*AOV61B	3DTM*AOV61C	3DTM*AOV61D
3DTM*AOV63A	3DTM*AOV63B		3DTM*AOV63D
3DTM*AOV64A	3DTM*AOV64B		3DTM*AOV64D

Close valves or isolation valves.

IF a flow path can NOT be isolated, THEN Dispatch an operator to locally Close valves, one loop at a time, using Attachment B.

ECA 2.1 Step 1 RNO

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				A minimum feed flow of 100 gpm must be maintained to each SG with a NR level LESS THAN 8% (42% ADVERSE CTMT).	ECA 2.1 Step 2 CAUTION
		[Critical Task] Control the AFW flow rate to at least 100 gpm per SG in order to minimize the RCS cooldown rate before a severe (orange-path) challenge develops to the integrity CSF	BOP	**Control Feed Flow To Minimize RCS Cooldown.**	ECA 2.1 Step 2
				Check cooldown rate in RCS cold legs - LESS THAN 80°F/hr.	ECA 2.1 Step 2.a
				Decrease AFW flow to 100 gpm to each SG and Proceed to Step 2c.	ECA 2.1 Step 2.a RNO
				Check NR level in all SGs - LESS THAN 50%.	ECA 2.1 Step 2.b
				Control feed flow to maintain NR level LESS THAN 50% in all SGs.	ECA 2.1 Step 2.b RNO
				Check RCS hot leg WR temperatures - STABLE OR DECREASING.	ECA 2.1 Step 2.c
				Control feed flow or Dump steam to stabilize RCS hot leg WR temperatures.	ECA 2.1 Step 2.c RNO

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Seal injection flow should be maintained to all RCPs.	ECA 2.1 Step 3 NOTE
			RO	**Check If RCPs Should Be Stopped.**	ECA 2.1 Step 3
				Verify RCS pressure - LESS THAN 1500 psia (1800 psia ADVERSE CTMT).	ECA 2.1 Step 3.a
				Proceed to step 4.	ECA 2.1 Step 3.a RNO
				Verify charging or SI pumps - AT LEAST ON RUNNING.	ECA 2.1 Step 3.b
				Proceed to Step 4.	ECA 2.1 Step 3.b RNO
				Stop all RCPs.	ECA 2.1 Step 3.c
			BOP	**Check DWST Level - GREATER THAN 80,000 gal.**	ECA 2.1 Step 4
			US	If any PZR PORV opens because of high PZR pressure, Step 5a must be repeated after pressure decreases to LESS THAN 2350 psia.	ECA 2.1 Step 5 CAUTION

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			RO	**Check PZR PORVs And Block Valves**	ECA 2.1 Step 5
				Verify PORVs - CLOSED.	ECA 2.1 Step 5.a
				Verify block valves - AT LEAST ONE OPEN.	ECA 2.1 Step 5.b
			RO	**Check Secondary Radiation.**	ECA 2.1 Step 6
				Verify trend history and alarm status of radiation monitors • Main steam line - NORMAL • Condenser air ejector - NORMAL • SG blowdown - NORMAL	ECA 2.1 Step 6.a
				Align for SG activity samples 1. RESET SG blowdown sample isolation 2) OPEN SG blowdown sample isolation valves	ECA 2.1 Step 6.b
			US	Request Chemistry obtain activity samples using HP coverage.	ECA 2.1 Step 6.c

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			US	• If offsite power is lost after SI reset, manual actions to restart safeguards equipment may be required.	ECA 2.1 Step 7 CAUTION
				• DO NOT reset CDA if recirculation spray pumps are required and have not automatically started.	
				• 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).	
			RO	**Check If RHR Pumps Should Be Stopped.**	ECA 2.1 Step 7
				Check RHR pumps - RUNNING.	ECA 2.1 Step 7.a
				Check RCS pressure.	ECA 2.1 Step 7.b
				Pressure - GREATER THAN 300 psia (500 psia ADVERSE CTMT)	ECA 2.1 Step 7.b.1
				Pressure - STABLE OR INCREASING.	ECA 2.1 Step 7.b.2

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				RESET ESF actuation signals • SI • CDA • LOP • CIA • CIB	ECA 2.1 Step 7.c
				STOP RHR pumps and Place in AUTO.	ECA 2.1 Step 7.d
				The recirculation spray pumps are sequenced to automatically start 11 minutes after CDA actuation.	ECA 2.1 Step 8 NOTE
			RO	**Check If Containment Spray Should Be Stopped.**	ECA 2.1 Step 8
				Verify quench spray pumps - RUNNING.	ECA 2.1 Step 8.a
				Proceed to Step 9.	ECA 2.1 Step 8.a RNO
				• IF the ADTS determines to operate both pumps, THEN Proceed to Step 8f.	

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
			RO	**Check RWST Level - GREATER THAN 520,000 gal.**	ECA 2.1 Step 9
			RO	**Check If Accumulators Should Be Isolated.**	ECA 2.1 Step 10
				Verify at least two RCS hot leg WR temperatures - LESS THAN 380°F.	ECA 2.1 Step 10.a
	REMOTE	Accumulator Isolation Valves: SIR 15 SIR 16 SIR 17 SIR 18		Unlock and CLOSE the SI accumulator isolation valve breakers: • 32-2R-F4M • 32-2R-R5F • 32-2W-F4M • 32-2W-R3J	ECA 2.1 Step 10.b
				CLOSE all SI accumulator isolation valves	ECA 2.1 Step 10.c
	REMOTE	Accumulator Isolation Valves: SIR 15 SIR 16 SIR 17 SIR 18		PLACE the SI accumulator isolation valve breakers to OFF and LOCK: • 32-2R-F4M • 32-2R-R5F • 32-2W-F4M • 32-2W-R3J	ECA 2.1 Step 10.d

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Proceed to Step 11.	ECA 2.1 Step 10.a RNO
			US	**Check If ECCS Flow Should Be Reduced.**	ECA 2.1 Step 11
		NOTE: If asked as I&C to monitor ICC Cabinet, use steam tables and report subcooling and RVLMS head and plenum levels: FULL		Verify RCS subcooling based on core exit TCs - GREATER THAN 32°F (115°F ADVERSE CTMT).	ECA 2.1 Step 11.a
				Verify RCS pressure - STABLE OR INCREASING.	ECA 2.1 Step 11.b
				Verify PZR level - GREATER THAN 16% (50% ADVERSE CTMT).	ECA 2.1 Step 11.c
				Perform the following: 1. DO NOT stop ECCS pumps. 2. Try to stabilize PZR pressure using normal spray. 3) Return to Step 11a.	ECA 2.1 Step 11.c RNO
			US	• If offsite power is lost after SI reset, manual actions to restart safeguards equipment may be required.	ECA 2.1 Step 12 CAUTION

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				• DO NOT reset CDA if the recirculation spray pumps are required and have not automatically started. • If any SG pressure increases, Complete Steps 12 through 28, then Go to E-2, Faulted Steam Generator Isolation.	
			RO	**RESET ESF Actuation Signals** • SI • CDA • LOP • CIA • CIB	ECA 2.1 Step 12
		NOTE: Not possible. This MCC was damaged/de-energized by the steam leak and cannot be re-energized. If the crew does not realize this, as the PEO, report that the feeder breaker trips free during attempts to close.	BOP/ RO	**Restore Power To MCC 32-3T.**	ECA 2.1 Step 13
				Locally Close the feeder breaker on 32T (32T13-2) to MCC 32-3T.	ECA 2.1 Step 13.a

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Locally Verify inverter 6 DC input ammeter indicating zero amps.	ECA 2.1 Step 13.b
T= Step 14 of ECA-2.1	**REMOVE** MALF MS12A	**NOTE**: Simulates one of the MSIVs going shut. Allows transition back to E-2 after ECA-2.1 step 28	RO	**Establish Instrument Air To Ctmt.**	ECA 2.1 Step 14
				Check instrument air compressors - AT LEAST ONE RUNNING.	ECA 2.1 Step 14.a
				START one instrument air compressor.	ECA 2.1 Step 14.a RNO
				OPEN instrument air Ctmt isolation valves.	ECA 2.1 Step 14.b
			RO	**STOP All But One Charging Pump And Place In AUTO.**	ECA 2.1 Step 15
			RO	**Check RCS Pressure - STABLE OR INCREASING.**	ECA 2.1 Step 16
			RO	**Establish Normal Charging Flow Path.**	ECA 2.1 Step 17
				Fully Open charging line flow control valve.	ECA 2.1 Step 17.a
				Verify charging header loop isolation valves (3CHS*AV8146 or 3CHS*AV8147) - ONE OPEN.	ECA 2.1 Step 17.b

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Re-position valves to establish only one open.	ECA 2.1 Step 17.b RNO
				OPEN charging header isolation valves (3CHS*MV8106 and 3CHS*MV8105).	ECA 2.1 Step 17.c
				CLOSE the charging pump miniflow isolations to the RWST (3CHS*MV8511A and 3CHS*MV8511B).	ECA 2.1 Step 17.d
				CLOSE the remaining charging pump cold leg injection valve.	ECA 2.1 Step 17.e
			RO	**Align Charging Pump Recirculation.**	ECA 2.1 Step 18
				OPEN the charging pump recirculation isolation vales 3CHS*MV8111A 3CHS*MV8111B 3CHS*MV8111C 3CHS*MV8110	ECA 2.1 Step 18.a
			RO	**Control Charging Flow To Maintain PZR Level.**	ECA 2.1 Step 19
			RO	**Check If SI Pumps Should Be Stopped.**	ECA 2.1 Step 20

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Check SI pumps - RUNNING.	ECA 2.1 Step 20.a
				Check RCS pressure • Pressure - GREATER THAN 1650 psia (1950 psia ADVERSE CTMT). • Pressure - STABLE OR INCREASING.	ECA 2.1 Step 20.b
				DO NOT stop additional SI pumps. Return to CAUTION prior to Step 2.	ECA 2.1 Step 20.b RNO
				STOP SI pumps and Place in AUTO.	ECA 2.1 Step 20.c
			RO	**STOP RHR Pumps and Place In AUTO.**	ECA 2.1 Step 21
			RO	**Verify ECCS Flow Not Required.**	ECA 2.1 Step 22
				Check RCS subcooling based on core exit TCs - GREATER THAN 32°F (115°F ADVERSE CTMT).	ECA 2.1 Step 22.a
				Check PZR level - GREATER THAN 16% (50% ADVERSE CTMT).	ECA 2.1 Step 22.b

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Control charging flow to maintain PZR level. IF PZR level can NOT be maintained, THEN 1. Operate ECCS pumps as necessary. 2) Return to CAUTION prior to Step 2.	ECA 2.1 Step 22.b RNO
			RO	**Check RCS Hot Leg WR Temperatures - STABLE OR DECREASING.**	ECA 2.1 Step 23
				Control AFW flow OR Dump steam to stabilize RCS hot leg WR temperatures.	ECA 2.1 Step 23 RNO
			BOP	**Check NR Level In All SGs - LESS THAN 50%.**	ECA 2.1 Step 24
				Control AFW flow to maintain NR level LESS THAN 50% in all SGs.	ECA 2.1 Step 24 RNO
			RO	**Check If Letdown Can Be Established.**	ECA 2.1 Step 25
				Verify PZR level - GREATER THAN 30% (50% ADVERSE CTMT).	ECA 2.1 Step 25.a

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Proceed to CAUTION prior to Step 28, and WHEN PZR level increases to GREATER THAN 30% (50% ADVERSE CTMT), THEN Return to Step 25.	ECA 2.1 Step 25.a RNO
				Verify RPCCW pumps - AT LEAST ONE RUNNING.	ECA 2.1 Step 25.b
				Perform the following to establish normal letdown:	ECA 2.1 Step 25.c
				1. Verify Train A RPCCW pump - RUNNING	
				2) Using OP 3304A, "Charging and Letdown," Establish normal letdown (with continuous charging) at normal operating pressure	
				2) Proceed to CAUTION prior to step 28.	
			RO	**Check RCS Makeup System.**	ECA 2.1 Step 26
				Adjust boric acid flow controller to pot setting 8.3.	ECA 2.1 Step 26.a
				Using OP 3304C, "Primary Makeup and Chemical Addition," Align for auto makeup	ECA 2.1 Step 26.b

Time	IDA/Malf	Instructor Information/Activity	Task Assign	Expected Actions	Standard
				Verify BTRS - OFF.	ECA 2.1 Step 26.c
			RO	**Align Charging Pump Suction to VCT.**	ECA 2.1 Step 27
				OPEN VCT to charging isolation valves.	ECA 2.1 Step 27.a
				2) Using OP 3304A, "Charging and Letdown," Place excess letdown in service.	
				3) Proceed to CAUTION prior to Step 28.	
				CLOSE RWST to charging isolation valves.	ECA 2.1 Step 27.b
			RO	**Control PZR Pressure.**	ECA 2.1 Step 28
		Previous Note: If any SG pressure increases, Complete Steps 12 through 28, then Go to E-2, Faulted Steam Generator Isolation.		Maintain pressure stable using PZR heaters and normal spray as necessary.	ECA 2.1 Step 28.a
T= E-2 transition		**NOTE**: Terminate scenario on the transition to E-2			

TERMINATE SCENARIO

SECTION 4

ID Number: 2K1NRC-004 Revision: 0

EVALUATION GUIDE

I. SUMMARY

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

TASK DESCRIPTION	TASK #	K/A >/= 3.0	BASIS FOR SELECTION
Manually actuate Main Steamline isolation or close MSIVs before a severe (orange path) challenge develops to either the subcriticality or the integrity CSF or before transition to ECA-2.1, whichever happens first	E-0—P	E12-EA1-1 3.8/3.8 039-K4.05 3.7/3.7	Failure to close the MSIVs under the postulated plant conditions causes challenges to CSFs beyond those irreparably introduced by the postulated conditions. Such an omission constitutes a "demonstrated inability by the crew to recognize a failure of the auto actuation of an ESF system or component and to take an action that would prevent a challenge to plant safety."
Control the AFW flow rate to at least 100 gpm per SG in order to minimize the RCS cooldown rate before a severe (orange-path) challenge develops to the integrity CSF	ECA-2.1 -- A	E12.EA1.3 3.4/3.9	Failure to control the AFW flow rate to the SGs leads to an unnecessary and avoidable severe challenge to the integrity CSF and to the subcriticality and the containment CSFs beyond those irreparably introduced by the postulated plant conditions. Thus, failure constitutes "demonstrated inability by the crew to take an action or combination of actions that would prevent a challenge to plant safety."

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

SECTION 4

Exam Title: UNCONTROLLED DEPRESSURIZATION OF ALL S/Gs

ID Number: 2K1NRC-004 Revision: 0

EVALUATION GUIDE

SECTION 5

SCENARIO INITIAL CONDITIONS

ID Number: 2K1NRC-004 Revision: 0

Reactor Power:	100%
Operating History:	250 days on line
RCS Boron:	1100 ppm
Core Burnup:	8000 MWD/MTU
Condensate Demins:	7 IN SERVICE
Evolutions in Progress:	Millstone Unit 2 is in a Refueling Outage
Major Equipment OOS:	None

Crew Instructions:

- Shift Train B Service Water Pumps to "B" pump running, "D" pump in standby, using OP 3326, Service Water Service, Section 4.6

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

Exam Title: UNCONTROLLED DEPRESSURIZATION OF ALL S/Gs

ID Number: 2K1NRC-004 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.)

_____ 11/20/2001

Technical Reviewer Date

SECTION 7

REFERENCE AND TASK TRACKING

Exam Title: UNCONTROLLED DEPRESSURIZATION OF ALL S/Gs

ID Number: 2K1NRC-004 Revision: 0

I. References:

AOP 3571	Instrument Failure Response
AOP 3559	Loss of Condenser Vacuum
EOP E-0	Rx Trip or Safety Injection
EOP E-2	Faulted Steam Generator Isolation
EOP ECA-2.1	Uncontrolled Depressurization of All Steam Generators
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