

Lesson Title:	Narrow Range Level fails, Stuck CR, Roll the MT, TG Rotor Long, MSIV Closure, CR Drop, Fuel Failure/Scram/Failure of SDIV, Gp 6 Failure		Rev. No.:	00
Lesson#:	SKL0124827	SAP BET #	36607	
Prerequisites:	None	Duration (Hours):	N/A	

Appendix D	Scenario Outline	Form ES-D-1
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<p>Facility: <u>Cooper Nuclear Station</u> Scenario No.: <u>NRC 1</u> Op-Test No.: _____</p> <p>Examiners: _____ Operators: _____</p> <p>_____</p> <p>_____</p> <p>Initial Conditions: The plant is operating at 8% power with a startup in progress.</p> <p>Turnover: Raise power and put the main turbine on line. Rod 22-27 has been inserted from 48 to 46 to return temperatures back into the normal band.</p>			
Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R	Perform step 38 of the Rod Package
2	2	C	Stuck Control Rod
3	3	I	"A" Narrow Range Level Instrument fails downscale
4	N/A	N	Roll the Turbine
5	5	C	TG Rotor Position (Long)
6	6	C	Single MSIV Inadvertent Closure
7	7	C	Rod Drop Accident
8	8	M	Fuel Failure/Scram/Failure of Scram discharge volume drain valve to close.
9	9	C	Group 6 isolation failure

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Scenario Description

The plant is operating at approximately 8% power with the mode switch in RUN.

After the crew takes the watch the RO withdrawals control rods to raise power. When the RO attempts to withdraws control rod 14-23 it does not move. The crew enters 2.4CRD IAC is contacted to correct the problem and the CRS addresses TS for the inop control rod.

After the TS call "A" Narrow Range Level Instrument fails downscale. The CRS addresses the TS for the INOP instrument.

Crew rolls the turbine. As the Turbine is accelerating Main Turbine Rotor Expansion Governor End alarm occurs. Indications are a rotor LONG condition exists. The crew enters 2.4TURB and eventually takes the Turbine offline to allow maintenance to investigate.

After the turbine is tripped a single MSIV inadvertently closes. The crew investigates per 2.4MSIV. When the actions of 2.4MSIV are complete, a control Rod which was uncoupled from its drive and its drive withdrawn drops to the level of its drive causing a power excursion. The excursion results in fuel failure that increases steadily until the radiation levels cause the crew to SCRAM the reactor.

When radiation levels increase the crew scrams the reactor. All rods insert on the scram but the North Scram Discharge volume drain valve fails to close. This results in a reactor to reactor building steam leak. The crew enters EOP-5A. A group 6 isolation fails to occur and must be manually actuated by the crew.

If the crew takes immediate action the scram may be reset and ED due to high area radiation or release rate approaching GE will not occur. If the crew does not reset the scram then the crew will eventually be required to ED due to Max Safe radiation in two areas or release rate approaching a GE.

The scenario may be terminated when the reactor is depressurized or the scram is reset and reactor pressure and level are being controlled.

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Simulator Setup

Malfunction	Description	Delay	Ramp	Event	Value	Final
TU01J	Main Turbine Bearing High Temp.		6 min.	5	0	50
MS06B	MSIV Disc Separates form Stem MSL-B AO			6	False	True
RD122227	Control Rod Stuck 22-27			Active	True	True
RD132227	Control Rod Uncoupled 22-27			Active	True	True
CR03	Gross Fuel Cladding Failure (NRV)		8 min.	7	0	30
RD01A	SDV Drain/Vent Valve Failure CRD- CV-33			Active	100	100
RP07	Group 6 High Rad Isolation Failure			Active	True	True
RD121423	Control Rod Stuck 14-23			3	False	True
N186	CRD 22-27 Temperature			Active	183	

Remotes	Description	Delay	Ramp	Event	Value	Final
RD17	South SDV Drain Valve			Active	Gag- open	Gag- open

Overrides	Description	Delay	Ramp	Event	Value	Final
01M01	-10 to +10 in Torus Level Indicator Narrow Range		5 min.	2		10
03DS046	Scram Discharge VLM. Isol Valve 3-34 OP			Active	ON	ON
03DS045	Scram Discharge VLM. Isol Valve 3-34 CL			Active	OFF	OFF

Event	Event Action	Command
7	Dmf RD122227	Cause Gross clad failure on rod drop
14	ZLORPSDS1A==0	Cause Rx Build Vent Rad Monitors to begin rising on the Rx SCRAM

Panel Set-up

1. 30-39 Step 38 page 20 of 22 in Startup to IC18 100% BOL.
2. 22-27 Gets stuck at position 12 and its drive is pulled to 46 and substitute position 48 for it. Reinitialize the RWM and clear alarms.
3. Insert enough rods to lower power to approximately 8%.
4. Discharge Tags on non-running Condensate and Booster Pumps.

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Op-Test No.: _____ Scenario No.: <u>NRC 1</u> Event No.: <u>1</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Perform step 38 of the Rod Package</u>		
When to initiate: <u>When the Crew has assumed the watch and at the direction of the lead examiner.</u>		
Time	Position	Applicant's Action or Behavior
	CRS	Will brief the crew on the power change and will assign responsibilities. He will take the position of the Reactivity Manager.
	RO	Asks the BOP to second check the pulling of the rods. The Examiner will act as the second checker.
	RO	Observes the CRD Parameters and may make adjustments to drive water d/p.
	RO	Checks the position of the other rods and verifies where in the pull sheet he is.
	RO	Selects the next rod to pull and pulls it to the assigned position in the pull sheet.
	RO	Selects the rods to pull and pulls it to the assigned position in the pull sheet until Turbine Bypass Valves are approximately 50% open.
	BOP	Monitors the balance of plant and indicates when the RO has opened the bypass valves enough.
	BOP	Updates the crew when the bypass valves are 50% open.
	RO	Stops pulling rods.
		END OF EVENT
	Notes	

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Op-Test No.: _____ Scenario No.: <u>NRC 1</u> Event No.: <u>2</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Stuck Control Rod</u>		
When to initiate: <u>As the RO pulls rods he will encounter this event when he attempts to pull Rod</u>		
Time	Position	Applicant's Action or Behavior
	RO	Attempts to withdraw Control Rod 14-23 sees that it will not move off of 00.
	RO	Attempts to increase drive water d/p and tries to pull the rod again.
	RO	Updates the Crew that Rod 14-23 will not move and that is an entry into 2.4CRD.
	CRS	Enters 2.4CRD and assigns its actions to the RO.
	CRS	Contacts the WCC and asks for assistance in investigating the problem with the rod.
	Role Play	As the WCC, respond to the request and inform the CRS that some mechanics and I&C techs will go out to investigate the problem.
	RO	Contacts the Building Station Operator and request that he check the HCU for problems
	Role Play	As the Building SO, respond to the request and tell them that you will be right there. Wait 2 minutes and report that you see nothing wrong with 14-23
	CRS	Contacts the WCC with the information and request an IAC investigate 14-23.
	Role Play	As the WCC, respond to the request and tell them that you will get it started.
	CRS	Addresses Tech Specs and determines that the rod was is inoperable.
		END OF EVENT
	Notes	

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Op-Test No.: _____ Scenario No.: <u>NRC 1</u> Event No.: <u>3</u> Page <u>1</u> of <u>1</u>		
Event Description: <u>"A" Narrow Range Level Instrument fails downscale</u>		
When to initiate: <u>At the direction of the lead examiner.</u>		
Time	Position	Applicant's Action or Behavior
	RO	Identify increasing RFPs speed and disparity in RPV narrow-range level instruments or receipt of Annun 9-5-2/ G-1 Reactor Low Water Level
	CRS/BOP/RO	Identify entry to 24RXLVL and 4.4.1
	CRS	Assign 2.4RXLVL subsequent actions and 4.4.1 to BOP
	BOP	Announces SCRAM actions from 2.RXLVL
	RO	Accepts SCRAM actions from 2.4RXLVL
	BOP	Compare narrow ranges to NBI-LI-92, STEAM NOZZLE LEVEL, to determine actual level. Determines that "B" Narrow range level instrument is correct.
	CRS	Notify WCC to inform FRED and system engineer, and I& C to investigate "A" Narrow Range Level Instrument
	RO	Monitors power pressure and level
	CRS	Evaluates the failure against Tech Spec and determines that TS 3.3.2.2 applies.
		END OF EVENT
	Notes	

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Op-Test No.: _____ Scenario No.: <u>NRC 1</u> Event No.: <u>4</u> Page <u>1</u> of <u>1</u>		
Event Description: <u>Roll the Turbine</u>		
When to initiate: When the actions of the stuck rod are addressed and the CRS has addressed Tech		
Specs. And at the direction of the lead examiner contact CRS that a new Rod Sequence package is being		
developed and to continue the Main Turbine Start-up.		
Time	Position	Applicant's Action or Behavior
	CRS	Directs the BOP to roll the Main Turbine in accordance with procedure.
	BOP	Checks that bypass valve opening is 50% and that the prerequisites are met.
	BOP	Using Procedure 2.2.77 Attachment 1 Rolls the Main Turbine.
	RO	Monitors the Reactor as the Turbine is rolled.
		END OF EVENT
	Notes	

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Op-Test No.: _____ Scenario No.: <u>NRC 1</u> Event No.: <u>5</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Main Turbine Rotor Expansion Governor End alarm occurs.</u>		
Indications are a rotor LONG condition exists.		
When to initiate: <u>While the Turbine is being rolled up this event will start.</u>		
Time	Position	Applicant's Action or Behavior
	BOP	As the Main Turbine is being rolled the rotor begins to heat up abnormally causing Main Turbine Rotor Expansion Governor End alarm occurs. Indications are a rotor LONG condition exists.
	BOP	Updates the Crew Main Turbine Rotor Expansion Governor End, indications are a rotor LONG condition exists and that is an entry condition into 2.4TURB.
	CRS	Enters 2.4TURB and assigns the BOP the rotor position as a critical parameter to monitor.
	BOP	Monitors the rotor position updates the crew that the Turbine should be removed from service.
	CRS	Directs the BOP to trip the Main turbine.
	BOP	Depresses both Turbine Trip pushbuttons on Panel B.
	CRS	Directs the BOP to monitor for vibrations as well as temperature as the turbine speed slows down.
	ROLE PLAY	Once the turbine has been tripped then modify malfunction TU06B to 50% over 20 minutes.
	CRS	Contacts the WCC to request maintenance to investigate the problem with the rotor conditions.
		END OF EVENT
	Notes	

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Op-Test No.: _____ Scenario No.: <u>NRC</u> Event No.: <u>6</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Single MSIV Inadvertent Closure</u>		
When to initiate: When the Main Turbine actions are completed and at the direction of the lead examiner.		
Time	Position	Applicant's Action or Behavior
	RO	Notes a pressure and power spike on the RPV and updates the crew.
	CRS	Directs the BOP to investigate the problem.
	BOP	Notes that the B Main Steam Line flow is 0 and the other three lines are above normal.
	BOP	Checks the MSIV positions and notes that all of them indicate open, however recommends that 2.4MSIV be entered.
	CRS	Enters 2.4MSIV and assigns the abnormal to the BOP operator.
	BOP	Enters 2.4MSIV and performs the required actions.
	BOP	Updates the crew that the most probable cause is a disc separation on one of the MSIVs.
	CRS	Contacts WCC and request assistance with the problem.
	Role Play	As the WCC, respond to the request and tell the CRS that a team will be formed and that a work order will be initiated.
		END OF EVENT
	Notes	

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Op-Test No.: _____ Scenario No.: <u>NRC 1</u> Event No.: <u>7</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Rod Drop Accident</u>		
When to initiate: When the crew has addressed the closure of the Main Steam Line and at the direction of the lead examiner		
Time	Position	Applicant's Action or Behavior
	RO	Notes spike in power again but no corresponding spike in pressure this time.
	BOP	Checks MSIVs and steam flow.
	BOP	Notes that rad levels are coming up in the DW.
	CRS	Enters 5.2FUEL and assigns the BOP the actions.
	BOP	Continues to monitor building radiation levels by bringing up the PMIS screen for RAD.
	CRS	Enters EOP 5A and has the crew monitor Reactor Building Rads, Temperatures, and Levels
	CRS	Contacts the WCC and request assistance with failed fuel from system engineering and Reactor Engineering.
	Role Play	Respond to the request for assistance and tell the CRS that they will be notified.
	CRS	Directs the RO to scram the unit and perform the mitigating scram actions.
	RO	Presses the two manual scram pushbuttons and performs the mitigating scram actions.
	Role Play	When is inserted then DELETE malfunction N186.
		END OF EVENT
	Notes	

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Op-Test No.: _____ Scenario No.: <u>NRC 1</u> Event No.: <u>8</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Fuel Failure/Scram/Failure of Scram discharge volume drain valve to close.</u>		
When to initiate: This event happens as a result of the last event and will occur shortly following the dropped rod.		
Time	Position	Applicant's Action or Behavior
	RO	Scrams the Unit and performs the required scram actions.
	CRS	Enters 5.2FUEL and EOP5A and directs the board operators to monitor the radiation levels and temperatures in the Reactor Building.
	CRS	Has the BOP verify ECCS and PCIS actuates as designed.
	BOP	Reports that the South HCU area Radiation and temperatures are rising quicker than the rest of the building.
	RO	Reports that the SDV drains 33 and 34 did not close on the scram.
	CRS	Directs the RO to verify all scram signals are clear and to reset the scram to isolate the SDV due to a possible direct path from the reactor to the building.
	RO	Checks all scram signals and makes sure that they are clear and then resets the scram to close the Scram Valves.
	BOP	Notes that the radiation levels and temperatures around the South SDV are returning to normal.
	CRS	Remains in EOP 1A and EOP 5A and performs the cleanup steps
	CRS	Directs the RO to maintain level between +3and +54 inches
	RO	Adjust the level control system to maintain the level band.
	CRS	Directs the BOP to maintain pressure less than 1050 psig.
	CRS	Directs the BOP to verify Groups
	BOP	Checks on the computer first and notes that Group 6 has failed. Next Event
		END OF EVENT
	Notes	

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Op-Test No.: _____ Scenario No.: <u>NRC 1</u> Event No.: <u>9</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Group 6 isolation failure.</u>		
When to initiate: This event is active as soon as the radiation levels in the reactor building exceed the isolation setpoint.		
Time	Position	Applicant's Action or Behavior
	BOP	When directed to verify groups notes that Group 6 failed to actuate.
	CRS	Directs the BOP to isolate the Group 6 valves.
	BOP	Using the hard card, closes all of the Group 6 valves.
	BOP	Updates that all group 6 valves are closed and that all the other groups actuated as designed.
		END OF EVENT
	Notes	

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CREW CRITICAL TASKS	TECHNICAL BASIS	SAT	UNSAT
<p>When a system fails to isolate, manually isolate the system.</p> <p>NOTE: If the crew does not RESET the SCRAM and Emergency Depressurizes then this Critical Task will not apply.</p>	<p>EOP-5A directs that this action be taken when a maximum normal operating value is exceeded. Failing to do so can significantly change the mitigation strategy as an unnecessary release will result and possibly endangering plant personnel.</p>		
<p>When a primary system is discharging into the secondary containment through an unisolable break, execute Emergency Depressurization when maximum safe operating values are exceeded in two or more areas for the same parameter.</p> <p>NOTE: If the crew does RESET the SCRAM then this Critical Task will not apply.</p>	<p>Should secondary containment parameters exceed their maximum safe operating values in more than one area, the RPV must be depressurized to preclude further degradation. RPV depressurization places the primary system in its lowest possible energy state, rejects heat to the suppression pool in preference to outside the containment, and reduces the driving head and flow of primary systems that are unisolated and discharging into the secondary containment.</p> <p>The criteria of "<i>two or more areas</i>" specified identifies the rise in secondary containment parameters as a wide-spread problem which may pose a direct and immediate threat to secondary containment integrity, equipment located in the secondary containment, and continued safe operation of the plant.</p>		
<p>When RB refuel floor exhaust radiation level exceeds 10 mr/hr or on a valid RB vent radiation Hi-Hi alarm, initiate a Group 6 Isolation (RBIS).</p>	<p>EOP-5A directs that a Group 6 be initiated when the High-High Alarm is received. This ensures any release is a filtered, elevated release.</p>		

Lesson Title:			
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IX. INITIAL CONDITIONS

A. Plant Status:

1. 10% power Beginning of Cycle.
2. Rod Sequence Information:

Step:	38
Rod:	38-23
Notch:	8

B. Tech. Spec. Limitations in effect:

C. Significant problems/abnormalities:

Rod 22-27 at position 46 due to high CRDM temperatures.

D. Evolutions/maintenance for the on-coming shift:

1. Complete step 38 of the rod sequence package
2. Roll the Main Turbine per 2.2.77 attachment 1 at 2.16
3. Continue plant Start-up:
 - a. Procedure 2.1.1 step 5.36 and step 6.3
 - b. Procedure 2.2.60 step 6.17
 - c. Procedure 2.2.28.1 step 5.14

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		Rev. No.:	00
Lesson#:	SKL0124826	SAP BET #	36606	
Prerequisites:	None	Duration (Hours):	N/A	

Appendix D

Scenario Outline

Form ES-D-1

Facility: <u>Cooper Nuclear Station</u> Scenario No.: <u>NRC 2</u> Op-Test No.: _____ Examiners: _____ Operators: _____ _____ _____			
Initial Conditions: Near the End of the Operating Cycle at 95% power and rising power to 100%. EDG 1 running unloaded for break-in run after maintenance that replaced 1 piston. Turnover: Continue EDG 1 synch and load per procedure. Continue raising power to rated power. EDG 1 LCO due to maintenance.			
Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N	Synchronize and Load EDG 1 per procedure
2	N/A	R	Raise Power with RR to rated power
3	1	C	HPCI inadvertent Initiation
4	2	I	APRM B fails at 100%
5	3	C	Condensate Pump A Trip, 'A' RR Pump Fails to run back
6	4	M	Main turbine vibration increase resulting in Turbine Trip Required, Reactor Manual Scram (ATWS no rods move)
7	5	M	Non Critical Busses fail to fast transfer on Turbine Trip
8	6	C	SLC Pump A starts then trips immediately
9	7	C	RCIC Turbine Trip

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Scenario Summary

The BOP will synchronize and load Diesel 1 to 4000 kW for post maintenance testing following a piston replacement per 2.2.20.1 Diesel Generator Operations, beginning at Step 5.23.

When DG 1 is being loaded the Doniphan Control Center will call to request a main generator load rise to 750 MWe. The crew will raise power IAW 2.1.10 Station Power Changes section 6.

HPCI will inadvertently start up after the plant is stable at the new higher power level. The crew will recognize the initiation signal is not valid and will isolate HPCI. The crew will enter 2.4CSCS, for the inadvertent HPCI start. The SRO will determine HPCI is INOPERABLE and enter TS LCO 3.5.1 condition C (14 days).

APRM B will fail upscale over approximately 2 minutes. The crew will respond IAW alarm response procedures, determine the channel is failed and bypass the channel. The SRO will reference TS 3.3.11 and 3.3.6.

Turbine vibration starts to increase. The crew takes actions per 2.4TURB. Vibrations continue to rise and when the crew attempts to scram the reactor an ATWS occurs due to the water added to the volume by the drifting rod. The turbine is tripped and pressure control is hindered by the limited capacity of the bypass valves. The crew starts RCIC for level control and stops and prevents the other feed systems. This action will aid in reducing reactor power.

When SLC pumps are started, SLC A will trip approximately 1 minute after starting. The crew is able to insert all control rods by resetting the scram and draining the volume and re-scramming the reactor.

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SIMULATOR SETUP

IC 20 EOL

Type	Event	Description	State	Delay	Ramp	Value
Malf	1	hp05 HPCI INADVERTANT INITIATION	Delayed			FALSE
Malf	3	rr17a RECIRC A JORDAN FAILURE	Delayed			80.1976
Malf	2	nm09b APRM SIGNAL FAILURE CHANNEL B	Delayed		02:00	74.4905
Malf	3	fw14a CONDENSATE PUMP TRIP CONDENSATE PUMP 1A	Delayed			FALSE
Malf	none	rd02 ATWS	Delayed			100
Malf	4	tu03c MAIN TURBINE BEARING HIGH VIBRATION BEARING #3 (#1LP	Delayed		05:00	0
Malf	4	tu03d MAIN TURBINE BEARING HIGH VIBRATION BEARING #4 (#1LP)	Delayed		07:00	0
Malf	4	tu03e MAIN TURBINE BEARING HIGH VIBRATION BEARING #5 (#2LP)	Delayed		10:00	0
Malf	None	ed03a 4160V BUS AUTO TRANSFER FAILURE 4160V BUS 1A (52B/1AN)	Active			TRUE
Malf	None	ed03b 4160V BUS AUTO TRANSFER FAILURE 4160V BUS 1B (52B/1BN)	Active			TRUE
Malf	6	sl01a SLC PUMP TRIP SLC PUMP 1A	Delayed	00:03		FALSE
Malf	7	rc04 RCIC FLOW CONTROLLER FAILURE	Delayed			99.9999
Malf	8	rc02 RCIC TURBINE TRIP	Delayed			FALSE
Event	6	ZLOSLCSWS1A(1)==0				

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Op-Test No.:1		Scenario No.:2	Event No.: 1
When to initiate:		When the Crew has assumed the watch and at the direction of the lead examiner.	
Event Description: Synchronize and load Diesel 1 to 4000 kW for post maintenance testing following a piston replacement per 2.2.20.1 Diesel Generator Operations			
Time	Position	Applicant's Action or Behavior	
	CRS	Direct BOP to continue with diesel generator Synchronize and loading per 2.2.20.1 Diesel Generator Operations	
	BOP	Obtains copy of 2.2.20.1 Diesel Generator Operations	
	BOP	Adjust DG1 speed so SYNCHROSCOPE is rotating slowly in clockwise (FAST) direction.	
	BOP	Adjust DG1 voltage slightly higher than voltage of Bus 1F.	
	BOP	When SYNCHROSCOPE is at 11 o'clock, close DIESEL GEN 1 BKR EG1.	
	BOP	Raise DG1 load to ~ 1000 kW.	
	BOP	Adjust DG1 kVARs to 400 to 600.	
	<u>NOTE</u>	DG1 kVARs should be maintained at 400 to 600 when changing load.	
	BOP	When DG1 has run for ≥ 5 minutes at 1000 kW, slowly raise load until desired load reached.	
	BOP	Record data on Attachments 1 and 2, 15 minutes after DG1 loaded to desired load, then every 2 hours thereafter.	
		END OF EVENT	
	Notes		
	Examiner Note Proceed to the next event when diesel load is stable at the		
	target load value of 4000 KW.		

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
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Op-Test No.:1	Scenario No.:2	Event No.: 1

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
Lesson#:	SKL0124826	Rev. No.:	00

Op-Test No.: _____ Scenario No.: <u>2</u> Event No.: <u>2</u>		
Event Description: <u>Doniphan Control Center will call to request a main generator load rise to 780 MWe.</u>		
Time	Position	Applicant's Action or Behavior
	SRO	Take position of Reactivity Manager
	SRO	Ensure reactivity brief has been completed with involved Control Room personnel.
	SRO/RO	<p>Monitor various independent/redundant parameters and power indications for proper plant response during all power changes; utilize the list below (as a minimum) as dictated by plant conditions:</p> <ul style="list-style-type: none"> • Reactor Water Level. • Reactor Steam Pressure and Flow. • Reactor Power, APRMs, RBMs, IRMs, or SRMs, as required. • Reactor Recirc Speed, Jet Pump, and Loop Flows. • Total Core Flow and Core Support Plate DP. • Reactor Feed Pump Flow and Speed. • Main Generator Output (Gross and Net).
	SRO/BOP	Ensure APRM indicated power versus actual power from other indications does not result in non-conservative protective trip setpoints (indicated power + allowable gain adjustment tolerances less than actual power)
	Role Play	If called to monitor and adjust DEH and Reactor Recirc oil temperature, tell them that you are on your way and will call them when you are ready. In a few minutes call back and tell them that you are standing by.
	RO	Ensure RR Subsystem flows are balanced.

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
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	RO	Raise power by raising RR pump flow as follows: Maintain rate of power change consistent with system capabilities as determined by Load Dispatcher and TG limits.
	RO	Monitor core thermal limits (MFLCPR, MFLPD, and MAPRAT), per Procedure 6.LOG.601, to ensure compliance with Technical Specifications Section 3.2.
	RO	Inform CRS of completion of power rise.
		END OF EVENT
	Notes	
	Proceed to the next event at the direction of the lead examiner	

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
Lesson#:	SKL0124826	Rev. No.:	00

Op-Test No.: _____ Scenario No.: <u>NRC 2</u> Event No.: <u>3</u>		
Event Description: Component - HPCI inadvertently starts.		
Time	Position	Applicant's Actions or Behavior
	BOP/RO	Identifies HPCI initiation by observing the initiation of the system's valve and parameter indications on Panel 9-3.
	BOP/RO	Observes drywell pressure and reactor water level to determine that it is an inadvertent start. A lack of a high drywell pressure and low level alarms are an appropriate way to quickly verify this is inadvertent.
	BOP/RO	Secures HPCI and places it in Pull To Lock (PTL). This is a from-memory task, however the hard card may be used.
	CRS	Updates the crew that this is an entry into 2.4CSCS and directs the BOP to ensure all necessary actions are performed.
	BOP/RO	Sends Building Station Operator to the area to investigate the initiation.
	Role Play	As the Station Operator, respond to the report and let the BOP know that you will look around to try to determine what caused the initiation.
	RO	Monitors for signs that HPCI injected into the vessel. This is done by checking for level swings, power spikes.
	CRS	Technical Specifications 3.5.1 (C) HPCI is inoperable. LCO time of 14 days. RCIC must be administratively verified operable within one hour.
	CRS	Contacts Work Control to confirm that RCIC surveillance was successful and within periodicity.

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
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	Roll Play	As either Work Control or Management, respond to the report about the Inadvertent Initiation of HPCI and the fact that both HPCI and RCIC are inoperable.
	CRS	Updates Crew with status of HPCI.
		Event ends with system declared inoperable and RCIC verified operable
		END OF EVENT
	Notes	
	Proceed to the next event at the direction of the lead examiner	

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
Lesson#:	SKL0124826	Rev. No.:	00

Op-Test No.: _____ Scenario No.: <u>NRC 2</u> Event No.: <u>4</u>		
Event Description: <u>APRM B fails upscale</u>		
Time	Position	Applicant's Action or Behavior
	RO	Reports ½ Scram and its cause to the Crew.
	RO	Diagnoses that APRM "B" has failed upscale causing the ½ scram. Also that it was the only one.
	RO	Pulls Annunciator cards for the RPS Trip and APRM Upscale and reports the actions to the CRS.
	BOP	Checks the APRM in the back panels and reports finding to the crew.
	CRS	Directs the RO to bypass the APRM and reset the ½ Scram.
	RO	Selects "B" APRM joy stick and places it to the "B" position to bypass the failed APRM. Following the instructions in the APRM Upscale Alarm Procedure, Selects the appropriate Joy Stick and places it to the "B" position.
	BOP	Peer checks bypassing the APRM.
	RO	Selects the Scram Reset switch and places it momentarily in the 1-4, then the 2-3 positions and lets it return to the neutral position.
	RO	Reports that the ½ has been reset and that the annunciators have cleared.
	CRS	Evaluates TS and determines that potential LCOs exists for T.S. 3.3.1.1 (RPS Instrumentation) Table 3.3.1.1-1 Function 2, TLCO 3.3.1 for Rod Blocks, and TLCO 3.3.3 PAM
	CRS	Notifies work control of the failures and request repair.

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
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	Role Play	As the work control center, respond to the report and let the CRS know that a work order will be initiated and a team put together to investigate the failure of the APRM.
		END OF EVENT
	Notes	
	Proceed to the next event	

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
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Op-Test No.: _____ Scenario No.: <u>NRC 2</u> Event No.: <u>5</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Condensate pump trip and "A" RR RUNBACK failure</u>		
When to initiate: At the direction of the lead examiner.		
Time	Position	Applicant's Action or Behavior
	BOP	Reports that the 1A Condensate Pump has tripped.
	BOP	Monitor reactor feed pump suction pressure.
	RO or BOP	Sends the Station Operator to investigate the tripping of the 1A Condensate Pump.
	Role Play	Respond as the Station Operator and tell the Control Room Operator that you will go check the 1A Condensate Pump out and report back that there is no obvious cause.
	BOP	Update the crew that this is an entry condition into 2.4MC-RF.
	RO	Reports Reactor Recirc Pump runback.
	RO	Reports "A" RR RUNBACK failed to completely runback currently at 80% and entry to 2.4RR.
	RO	Reports mismatched flows between A and B Recirc loops.
	CRS	Ensure requirements of SR 3 .4.1 .1 are met as soon as practical.
	CRS	Announce entry into 2.4RR and assign it to the RO.
	Role Play	If requested as a licensed operator to locally adjust "A" RRMG then use remote function RR05 "RRMG A SCOOP TUBE" as directed by the reactor operator.
	CRS	Announce entry into 2.4MC-RF and assign it to the BOP.

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
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	CRS	Assign critical parameters, scram actions, and subsequent operator actions.
	RO	Monitors reactor parameters and core stabilities.
	BOP	Monitors condensate pressures and flows.
		END OF EVENT
	Notes	

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
Lesson#:	SKL0124826	Rev. No.:	00

Op-Test No.:	_____	Scenario No.:	<u>NRC 2</u>	Event No.:	<u>6</u>
Event Description:	<u>Turbine High Vibration/Turbine Trip/ATWS</u>				
When to initiate:					
Time	Position	Applicant's Action or Behavior			
	BOP	Notes that Turbine Bearing vibrations are rising. Either by seeing the red LEDs on the Bentleys or by the vibration annunciator.			
	BOP	Updates the crew with the fact that turbine vibrations are rising and that is an entry into 2.4TURB.			
	CRS	Enters 2.4TURB and assigns it to the BOP Operator.			
	BOP	Updates crew as vibrations rise.			
	CRS	Briefs crew on action points and responsibilities if the vibrations continue to rise. <ul style="list-style-type: none"> • Report vibration in 1 mil increments on highest reading bearing. • Alert LED - contact engineering. • Danger LED - reduce power. • 14 mils - Scram Action. • Brief Procedure 2.1.5 and assign responsibilities (If TCV/TSV scram enabled). • Assign operator to continue Procedure 2.4TURB action post-scram. • Brief power reduction. • Obtain TG/BOP Engineering recommendation on continued operation. • Monitor hotwell conductivity for indications of thrown blade. 			
	CRS	Directs that Reactor Power be reduced.			

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
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	RO	Performs a power reduction in accordance with Procedure 2.1.10.
	BOP	Updates Vibration 14 Mils which is the Scram Point.
	CRS	Directs the RO to Scram the Reactor.
	RO	Presses the Manual Scram Pushbuttons and announces ATWS conditions. Next Event
	CRS	Directs the BOP to trip the Turbine and continue actions of 2.4TURB.
		END OF EVENT
	Notes	

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
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Op-Test No.: _____ Scenario No.: <u>NRC 2</u> Event No.: <u>7</u> Page <u>1</u> of <u>1</u>		
Event Description: <u>Non Critical Busses fail to fast transfer on Turbine Trip</u>		
Time	Position	Applicant's Action or Behavior
	BOP/RO	Identifies 4160 A and B non-critical buses failed to transfer and critical buses are powered from the emergency transformer.
	CRS/BOP/RO	Entry in to 5.3EMPWR
	CRS	Assigns 5.2EMPWR and sets priorities on restoring SW, Station Service air, and REC cooling
	BOP	Restores SW, Station Service air, and REC cooling using 5.3empwr
	Notes	

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
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Op-Test No.: _____ Scenario No.: <u>NRC 2</u> Event No.: <u>8</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>SLC Pump A starts then trips immediately.</u>		
When to initiate: This is an automatic event once the SLC system is started.		
Time	Position	Applicant's Action or Behavior
	RO	Starts the 1A and 1B SLC Pumps using the control switches on Panel 9-5.
	RO	Observes that SLC Pumps Started and has developed sufficient discharge Pressure to inject into the vessel that the squib valve continuity light is extinguished and that RWCW isolated. And reports the observations and initial SLC tank level to the CRS.
	RO	Notes that the 1A SLC Pump tripped approximately one minute after starting and reports that to the CRS.
	CRS	Calls WCC and request repair of the SLC system.
	Role Play	As the WCC respond to the report about SLC pump 1A failure and tell the CRS that a team is getting right on it.
	CRS	Directs the RO to concentrate on driving rods and scrambling.
		END OF EVENT
	Notes	

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
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Op-Test No.: _____ Scenario No.: <u>NRC 2</u> Event No.: <u>9</u> Page <u>1</u> of <u>1</u>		
Event Description: <u>RCIC Turbine Trip</u>		
Time	Position	Applicant's Action or Behavior
	BOP	Identifies RCIC turbine tripped and informs CRS
	SRO	Calls WCC to investigate trip of the RCIC system.
	BOP	Dispatch a station operator to investigate cause of the RCIC turbine trip.
	ROLE PLAY	When directed as a station operator to investigate the RCIC turbine trip wait a few minutes then report that the cause of the RCIC trip is not readily apparent.
	Notes	
	TERMINATE THE SCENARIO	

Lesson Title:	Synchronize EDG 1, HPCI inadvertent Initiation, APRM B fails, Cond Pump Trip, 'A' RR Fails to run back, MT Vib, ATWS, Non Critical Busses fail to transfer, SLC A trips, RCIC Trip		
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CREW CRITICAL TASKS	TECHNICAL BASIS	SAT	UNSAT
Inhibit ADS prior to auto initiation during a failure to Scram.	With a Reactor Scram required, reactor not shutdown, and conditions for ADS blowdown are met, INHIBIT ADS to prevent an uncontrolled RPV depressurization and cold water injection from low pressure sources, to prevent causing a significant power excursion.		
Take action to reduce reactor power by injecting boron and/or inserting control rods, to prevent exceeding the primary containment design limits.	Failure to inject SLC and insert control rods could result in torus water temperature exceeding the HCTL. Exceeding the HCTL unnecessarily would require that the RPV be depressurized which substantially changes the mitigation strategy.		
During failure to scram conditions, insert control rods using one or more methods contained within Procedure 5.8.3. (This does not require the Operator to reach the point of Reactor Shutdown, but instead to demonstrate the skills necessary to perform this task.)	Achieving reactor shutdown is one of the primary goals of EOP-6A.		

Lesson Title:			
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IX. **INITIAL CONDITIONS**

E. Plant Status:

1. 95% power End of Cycle.

2. Rod Sequence Information:

Page:

Rod:

Notch:

F. Tech. Spec. Limitations in effect:

Day 5 of 7 LCO 3.8.1B for DG-1.

G. Significant problems/abnormalities:

DG1 in running unloaded, currently at step 5.23 of procedure 2.2.20.1

H. Evolutions/maintenance for the on-coming shift:

1. Synchronize DG-1 to 4160 1F and complete an 8 hour full load run.
2. Restore Reactor power to 100% per 2.1.10 using Reactor Recirculation.

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization	Rev No.:	00
Lesson No.:	SKL0124824	BET No.:	36604
Prerequisites:	None	Duration (Hours)	1.5

Facility: Cooper Nuclear Station Scenario No.: NRC 3 Op-Test No.:

Examiners: _____ Operators: _____

Initial Conditions: The plant is operating at 75% power near the end of the current fuel cycle. CBP B is being restored to service following corrective maintenance. It is a red light day and the dispatcher has requested that power be raised to maximum. SLC pump 1A is out of service to replace the discharge relief valve.

Turnover: Crew is to Start CBP B and continue power ascension. TS for SLC pump LCO is included.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Start Condensate Booster Pump B
2		R	Raise Power using RR
3	1	I	RRMG A controller failure to maximum
4	2	C	Loss RCIC 125 VDC
5	3	M	Lowering Main Condenser Vacuum resulting in Scram and Turbine trip Required
6		R	Emergency Power reduction to maintain Vacuum
7	4	C	When Reactor is Scrammed both Reactor Feed pumps trip
8	5	M	When turbine tripped Loss of Offsite power occurs. EDG #2 fails to start and can not be started from the Control room and 4160F lock out occurs due to a fault on the bus. This results in a Station black Out.
9	6	C	HPCI oil system fails (leak) resulting in HPCI unavailable to inject to RPV

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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References:

1. Technical Specifications

- a. 3.5.3 RCIC
- b. 3.4.1 Recirculation Loops Operating

2. Procedures

- a. COP 2.0.11, Entering and exiting TS/TRM/ODAM LCO Conditions
- b. GOP 2.1.5, Reactor Scram
- c. 2.4RR Reactor Recirculation Abnormal
- d. 2.2.68.1 Reactor Recirculation
- e. EPIP 5.7.1, Emergency Classification
- f. EOP 1A, RPV Control
- g. EOP 2A, Emergency RPV Depressurization/Steam Cooling
- h. 5.3SBO Station Blackout.

3. Miscellaneous

- a. None

4. PRA

- a. Key Contributor - HPCI Failure, Loss of DG#2
- b. Initiator of Core Damage - Loss of Offsite power

COMMITMENT LIST

Commitment

Rev. Added

None

Method:

This evaluation scenario is intended to be used as an examination mechanism for evaluating Licensed Operator candidates in a dynamic plant situation.

Special Equipment/Materials/Special Instructions:

Validation Load 0912. Compare current simulator load to the validation load. If they are not the same, run the scenario and look for possible changes.

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
Lesson No.:	SKL0124824	Rev No.:	00

I. SCENARIO SUMMARY

The plant is operating at 75% power near the end of the current fuel cycle. CBP B is being restored to service following corrective maintenance. It is a red light day and the dispatcher has requested that power be raised to maximum. SLC pump 1A is out of service to replace the discharge relief valve.

The crew starts CBP B in preparation to raise power. After the CBP is running, power is raised with recirc flow to approximately 600 MWe net. A controller failure causes RRMG set 1A to increase. The crew locks the scoop tube on the RR pump. The crew addresses Technical specifications and may continue to raise power.

A loss of the RCIC 125VDC SR occurs making the RCIC system inoperable. The crew declares the RCIC system inoperable and addresses Technical Specifications.

After the loss of power to RCIC is addressed condenser vacuum begins to degrade due to air in-leakage. The Crew takes action to address the loss of vacuum including reducing reactor power. Eventually the crew determines that a scram is required and scrams the reactor and trips the turbine. When the scram actions are taken both feed pumps trip resulting in a loss of feedwater. When the turbine trips offsite power is lost due in part due to the loss of generation from Cooper.

After offsite power is lost 4160V 1F switchgear develops a fault and #2 DG fails to start resulting in a station blackout. The crew enters 5.3SBO and EOP-1A.

When HPCI initiates (manual or automatic) an oil system rupture occurs preventing HPCI operation. RCIC is not available to automatically initiate or inject due to the loss of the RCIC SR. The crew may initiate action to start RCIC locally at the pump, but these actions are not completed before the steam cooling contingency is entered. RPV level slowly decreases due to LLS cycling. When TAF is reached, steam cooling is required. After the crew enters steam cooling maintenance reports that DC power to RCIC can be restored. The crew restores DC power to RCIC and the crew initiates RCIC.

When RCIC is placed in service the RCIC injection valve fails partially open limiting RCIC flow to approximately 50 gpm. Since this is insufficient flow to restore water level to greater than -183 FZ, emergency depressurization is required. After emergency depressurization is commenced the #2 DG is restored to service and RHR and CS are used to restore reactor water level.

The scenario ends when Emergency Depressurization has been completed, RPV level restored and maintained +3 to 54" and containment is being cooled.

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
Lesson No.:	SKL0124824	Rev No.:	00

II. SIMULATOR SET-UP

A. Materials Required

None

B. Initialize the simulator in IC18, 100% (BOC) or from a saved IC

C. Change the simulator conditions as follows:

1. Triggers

Number	File Name	Description
E1	None	
E2	None	
E3	None	
E4	None	
E5	None	Trigger is true when the turbine trips
E6	None	

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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2. Malfunctions						
Number	Title	Trigger	TD	Severity	Ramp	Initial
ED12b	Loss of RCIC Starter Rack	E3	0	N/A	N/A	N/A
RR17a	RR Control Signal Failure	E2	0	100%	1:00	N/A
MC01	Main Condenser Air In-leakage	E4	0	100%	20:00	N/A
ED05	Loss of Power (Startup Transformer)	E5	1 sec	N/A	N/A	N/A
ED06	Loss of Power (Emergency Transformer)	E5	1 sec	N/A	N/A	N/A
ED08f	Loss of 4160 F	E5	16 Sec	N/A	N/A	N/A
DG01b	DG2 Fail to Start	A	N/A	N/A	N/A	N/A
DG06b	DG2 Fails to Auto Start		N/A	N/A	N/A	N/A
HP12	HPCI LUBE OIL PUMP DISCHARGE LINE RUPTURE	A	N/A	N/A	N/A	N/A

3. Remotes				
Number	Title	Trigger	Value	Ramp
FW14	MC-MO-302	N/A	10%	N/A
RC09a	RCIC Injection Valve Power	E10	DE-ENERG	N/A
RC09b	RCIC Injection Valve manual position	E10	.5	N/A
SL06	SLC Pump A TAGOUT	N/A	TAGOUT	N/A

4. Overrides					
Instrument	Tag	Trigger	TD	Value	Ramp
none					

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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D. Panel Set-up

1. Ensure PMIS IDTs are blank.
2. **Take the simulator out of FREEZE and allow it to run for several minutes to verify stable plant conditions.**
3. Reduce **power to 75%**.
4. Adjust generator MVARs to ~+50 MVARs.
5. Ensure CRD pump 1B is running and CRD pump 1A is OFF.
6. Stop CBP B and start its auxiliary oil pump.
7. Ensure CBP Auxiliary Oil Pump B is operating.
8. Place a red tag on SLC pump 1A control switch.
9. **FREEZE the simulator.**

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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Op-Test No.: _____ Scenario No.: <u>NRC 3</u> Event No.: <u>1</u> Page <u>1</u> of <u>4</u> Event Description: <u>Start Condensate Booster Pump B</u>		
When to initiate: _____ When directed by the lead evaluator call as the WCC that you standing by for the start of Condensate Booster Pump B		
Time	Position	Applicant's Action or Behavior
	CRS	Directs BOP to Start Condensate Booster Pump B per procedure 2.2.6
	BOP	Inform Radwaste Operator condensate booster pump is to be placed in service and are sufficient F/Ds are precoated per Procedure 2.2.5.
	Role Play	Report as Radwaste operator that all condensate F/Ds are precoated per Procedure 2.2.5.
	BOP	Direct Turbine Building operator to throttle open following valves until air free water flows and then close valves: a. MC-272, CONDENSATE BOOSTER PUMP B VENT. b. MC-273, CONDENSATE BOOSTER PUMP B VENT. c. MC-274, CONDENSATE BOOSTER PUMP B VENT. d. MC-912, CONDENSATE BOOSTER PUMP B SEAL FLUSH VENT.
	Role Play	Report that you have throttled open following valves until air free water flows and then close valves: a. MC-272, CONDENSATE BOOSTER PUMP B VENT. b. MC-273, CONDENSATE BOOSTER PUMP B VENT. c. MC-274, CONDENSATE BOOSTER PUMP B VENT. d. MC-912, CONDENSATE BOOSTER PUMP B SEAL FLUSH VENT.
	BOP	Ensures Auxiliary Oil Pump B has been operating for ≥ 5 minutes.

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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	BOP	<p>Direct Turbine Building operator to:</p> <ul style="list-style-type: none"> • Ensure pump oil reservoir level is normal and flow exists through bearing sightglasses. • Ensure TEC-42, CONDENSATE BOOSTER PUMP B OIL COOLER INLET, is open. • Ensure TEC-43, CONDENSATE BOOSTER PUMP B OIL COOLER OUTLET, is throttled to maintain oil temperature as high as possible but < 110°F. • Ensure MC-MO-302, CONDENSATE BOOSTER PUMP B DISCHARGE, is closed. • Place MC-SW-FCV10, LOCAL MANUAL SWITCH FOR MC-AOV-FCV10, to OPEN.
	Role Play	<p>Report that:</p> <ul style="list-style-type: none"> • Pump oil reservoir level is normal and flow exists through bearing sightglasses. • TEC-42, CONDENSATE BOOSTER PUMP B OIL COOLER INLET, is open. • TEC-43, CONDENSATE BOOSTER PUMP B OIL COOLER OUTLET, is throttled to maintain oil temperature < 110°F. • MC-MO-302, CONDENSATE BOOSTER PUMP B DISCHARGE, is closed. • MC-SW-FCV10, LOCAL MANUAL SWITCH FOR MC-AOV-FCV10, is in OPEN.
	BOP	Checks MC-FCV-10, MIN FLOW VLV, open
	BOP	Direct Turbine Building operator to Jog open for ~ 2 seconds MC-MO-302.
	Role Play	Report that MC-MO-302 has been opened ~ 2 seconds
	BOP	Start Condensate Booster Pump B and Direct Turbine Building operator to slowly open MC-MO-302.
	Role Play	<p>Report that MC-MO-302 has been slowly opened.</p> <p>Modify Remote Function FW14 to 100%.</p>
	BOP	<p>When pump is up to speed and oil pressure is normal, place AUXILIARY OIL PUMP B switch to OFF to stop pump.</p> <p>Check Condensate Booster Pump B AMPS are in green band.</p> <p>Direct Turbine Building operator to place MC-SW-FCV10, LOCAL MANUAL SWITCH FOR MC-AOV-FCV10, to AUTO</p>

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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	Role Play	Report that LOCAL SWITCH for MC-AOV-FCV10 is in AUTO
	BOP	<p>Press COND SYS/BOOSTER PUMP MIN FLOW RESET button to close MC-FCV-10</p> <p>Direct Turbine Building operator to check Condensate Booster Pump B is operating properly and throttle TEC-43 to maintain oil temperature between 100°F and 110°F</p>
	Role Play	Report that Condensate Booster Pump B is operating properly and you throttle TEC-43 to maintain oil temperature between 100°F and 110°F.
	BOP	<p>Direct Turbine Building operator to:</p> <ol style="list-style-type: none"> 1 Open MC-906, ROOT HYDROGEN INJECTION INTO BOOSTER PUMP B (T-882-N CBP B Suction). 2 Cycle OWC-SW-H2B, H2 ISOLATION TO CBP B, to CLOSE and then back to AUTO (OWC Control Room, P500 Panel). 3 Verify OWC-SOV-H2B indicates OPEN (OWC Control Room, P500 Panel).
	Role Play	<p>Report that:</p> <ol style="list-style-type: none"> 4 MC-906 is Open 5 Cycle OWC-SW-H2B, has been cycled CLOSE and then back to AUTO 6 OWC-SOV-H2B indicates OPEN
	BOP	Report to CRS that Condensate Booster Pump B is in service.
		END OF EVENT
	Notes	

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
Lesson No.:	SKL0124824	Rev No.:	00

Op-Test No.:	Scenario No.:	Event No.:	Page	o	f
	NRC 3	2	1		2
Event Description: <u>Raise Reactor Power</u>					
When to initiate: Following the start of the CBP or directed by the lead evaluator					
call as the load dispatcher and request that power be raised to 600 MWe net.					
Time	Position	Applicant's Action or Behavior			
	Role Play	As the Load Dispatcher call the CRS and request that Cooper raise load to 600 Net following normal rate of rise.			
	Role Play	If contacted as reactor engineering indicate that we are at the target rod line and to accomplish the entire power increase should be with recirc flow.			
	CRS	Directs the RO to raise power using Reactor Recirc Pumps to 600 Net Megawatts.			
	RO	Reviews Procedures 2.1.10, Plant Power Changes for raising power with recirc pump speed controllers.			
	RO	Contacts the RB Station Operator to monitor reactor Recirc Pump Temperatures while raising load.			
	Role Play	As the RB Station Operator respond to the request.			
	RO	Request a Peer Check from the BOP.			
	BOP	Provides requested Peer Checks.			
	CRS	Provides oversight as the reactivity manager for the power change.			
	RO	Checks current power and RR Pump Speeds.			
	RO	Selects one of the RR Pump controllers and rotates the speed adjust potentiometer clockwise to raise the speed of the RR Pump.			
	RO	Selects the other RR Pump controllers and rotates the speed adjust potentiometer clockwise to raise the speed of the RR Pump.			
	RO	Alternates between the A and B RR Pump controllers and raises the speed of the pumps and therefore Reactor Power.			
	BOP	Monitors the balance of plant as reactor power is raised.			
	RO	Stops raising power when Net Megawatt output is 600 and notifies the CRS.			

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
Lesson No.:	SKL0124824	Rev No.:	00

		END OF EVENT
	Notes	

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
Lesson No.:	SKL0124824	Rev No.:	00

Op-Test No.: _____		Scenario No.: <u>NRC 3</u>	Event No.: <u>3</u>	Page <u>1</u> of <u>2</u>
Event Description: <u>RRMG A controller failure to maximum</u>				
When to initiate: <u>When power has increased TO APPROXIMATELY 600 MWe net</u>				
Time	Position	Applicant's Action or Behavior		
	RO	Announces increasing RR loop A flow.		
	RO	Lockout the RRMG A scoop tube		
	RO	Reports RRMG A speed is no longer raising and loop flows differ.		
	CRS	Directs actions per 2.4RR and assigns 2.4RR to BOP		
	CRS/BOP	Announce SCRAM actions from 2.4RR: If both RR pumps are tripped and reactor power > 1 % rated thermal . <ul style="list-style-type: none"> • SCRAM • Enter Procedure 2 .1 .5 If abnormal neutron flux oscillations are observed while operating in the Stability Exclusion Region : <ul style="list-style-type: none"> • SCRAM • Enter Procedure 2 .1 .5 		
	RO	Accepts SCRAM actions from 2.4RR		
	CRS	Assesses Technical Specification 3.4.1 to determine RR loop operability, if loop flows differ by 15% then loop B is declared inoperable.		
	BOP	Takes action per 2.4RR attachment 4 Reactor Recirculation Flow Control Failure/RRMG Scoop Tube Lockout to Operate scoop tube locally per Procedure 2 .2.68.1		
		END OF EVENT		

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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	Notes	

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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Op-Test No.:	Scenario	Event
No.:	<u>NRC 3</u>	No.:
Event		
Description:	<u>Loss RCIC 125 VDC</u>	Page <u>1</u> of <u>2</u>
When to initiate: <u>After actions for RRMG A controller failure complete</u>		
Time	Position	Applicant's Action or Behavior
	BOP	Announces the 125VDC Blown Fuse Annunciator C-1/A-2 125V DC SWGR BUS 1A BLOWN FUSE Blown fuse on SWGR for:125 VDC RCIC SR NORMAL FEEDER BLOWN FUSE
	BOP	Announces entry to 5.3DC125 referenced in alarm card.
	CRS	Enters 5.3DC125 and assigns procedure to BOP
	BOP	Direct Turbine building operator to investigate B 125 DC switchgear for RCIC starter rack.
	Role Play	Report that you can not determine cause of the blown fuse.
	CRS	Declares RCIC inoperable and refers to TS 3.5.1. Enters LCO 3.5.3.A and determines that HPCI is required to be verified operable within 1 hour by administrative means and that RCIC is required to be restored to operable status with 14 days.
	CRS	Contacts the WCC to initiate actions to investigate repair the RCIC starter rack.
	Role Play	Respond as the WCC that a team will investigate the cause of the 125 VDC RCIC blown fuse
		END OF EVENT

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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	Notes	

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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Op-Test No.:		Scenario	Event
Event		No.: <u>NRC 3</u>	No.: <u>5</u>
Description:		Page <u>1</u> of <u>2</u>	
Lowering Main Condenser Vacuum resulting in Scram and Turbine trip Required			
When to initiate: When the initial actions for the loss of RCIC starter Rack are complete Activate Trigger E4 , MC01, Main Condenser Air In leakage.			
Time	Position	Applicant's Action or Behavior	
	BOP	Reports lowering condenser vacuum. May diagnose the cause of the lowering vacuum as air in leakage. Entry to 2.4VAC	
	CRS	Enters 2.4VAC and assigns to BOP	
	CRS/BOP	Announce SCRAM actions from 2.4VAC: If vacuum cannot be maintained >_ 23" Hg: <ul style="list-style-type: none"> • If Annunciator 9-5-2/C-4 clear, SCRAM and enter Procedure 2.1.5. • Trip Main Turbine. • If reactor not scrammed, enter Procedure 2 .2 .77 	
	RO	Accepts SCRAM actions from 2.4VAC	
	CRS	Directs the RO to reduce reactor power to maintain vacuum	
	RO	Reduces reactor power to maintain vacuum	
		END OF EVENT	
	Notes		

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
Lesson No.:	SKL0124824	Rev No.:	00

Op-Test No.: _____		Scenario No.: <u>NRC 3</u>	Event No.: <u>6</u> Page <u>1</u> of <u>1</u>
Event Description: <u>Emergency Power reduction to maintain Vacuum</u>			
When to initiate: <u>Automatic as vacuum lowers</u>			
Time	Position	Applicant's Action or Behavior	
	RO	Reduces Reactor Recirc Pump A and B speeds to maintain condenser vacuum. Both speeds are reduced one at a time in accordance with Procedure 2.1.10 while checking with the BOP on the status of vacuum.	
	RO	Monitors RR Pump speeds and parameters on RR Speed controller along with reactor power as the speeds are reduced.	
	RO/BOP	Sends the Station Operators to monitor Recirc Pump MG Set oil temperatures	
	Role Play	Respond to the order to monitor DEH and RR MG Set temperatures.	
	CRS	Directs that the RO and BOP coordinate actions to maintain condenser vacuum.	
	CRS	Contacts Load dispatcher that an emergency load reduction is in progress due to a lowering condenser vacuum	
	CRS	Orders Reactor SCRAM when vacuum can not be maintained	
		END OF EVENT	
	Notes		

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
Lesson No.:	SKL0124824	Rev No.:	00

<div style="text-align: right; margin-bottom: 0;">Event</div> Op-Test No.: _____ Scenario No.: <u>NRC 3</u> No.: <u>7</u> Page <u>1</u> of <u>3</u>																																																								
Event Description: <u>When Reactor is Scrammed both Reactor Feed pumps trip</u>																																																								
When to initiate: _____																																																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Time</th> <th style="width: 15%;">Position</th> <th style="width: 85%;">Applicant's Action or Behavior</th> </tr> </thead> <tbody> <tr style="background-color: #d3d3d3;"> <td></td> <td>Simulator operator</td> <td>When the reactor scrams <u>Modify Malfunction MC01</u> ramp time to <u>0.0 secs.</u></td> </tr> <tr> <td></td> <td>RO</td> <td>Scrams the reactor per 2.1.5 and takes scram actions when vacuum can not be maintained.</td> </tr> <tr> <td></td> <td>RO</td> <td>Reports the trip of both reactor feed pumps And EOP entry on low RPV level</td> </tr> <tr> <td></td> <td>CRS</td> <td>Enters EOP-1A.</td> </tr> <tr> <td></td> <td>BOP</td> <td>Trips the Main Turbine</td> </tr> <tr> <td></td> <td></td> <td>END OF EVENT</td> </tr> <tr> <td></td> <td>Notes</td> <td></td> </tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table>			Time	Position	Applicant's Action or Behavior		Simulator operator	When the reactor scrams <u>Modify Malfunction MC01</u> ramp time to <u>0.0 secs.</u>		RO	Scrams the reactor per 2.1.5 and takes scram actions when vacuum can not be maintained.		RO	Reports the trip of both reactor feed pumps And EOP entry on low RPV level		CRS	Enters EOP-1A.		BOP	Trips the Main Turbine			END OF EVENT		Notes																															
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Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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Op-Test No.: _____	Scenario No.: <u>NRC 3</u>	Event No.: <u>8</u>	Page <u>1</u> of <u>4</u>
Event Description: When turbine tripped Loss of Offsite power occurs. EDG #2 fails to start and can not be started from the Control room and 4160F lock out occurs due to a fault on the bus. This results in a Station black Out.			
When to initiate: Automatic on turbine trip			
Time	Position	Applicant's Action or Behavior	
	Simulator Operator	When the turbine is tripped <u>VERIFY that trigger E5 goes active.</u>	
	BOP	<ul style="list-style-type: none"> Announces the loss of Offsite power/Station Blackout Reports #1 DG running Reports 1FE is tripped and will not close. Announces that DG2 will not start. 	
	BOP	Dispatch Station Operators to investigate the DG failure to start and run.	
	RO	Monitors LLS operation.	
	Role Play	When directed to secure DG1 Remote Function DG17 to secure the DG	
	Role Play	When directed to investigate 4160V Bus 1F, wait 3 minutes, report all feeder breakers have numerous lockout devices tripped.	
	Role Play	When directed to investigate #2 DG, wait 2 minutes, report that the DG cranked but did not start, you have contacted Maintenance for assistance.	
	Role Play	When directed to go to Instrument Rack 25-5 monitor reactor level and report level to the control room on the requested periodicity.	
	Simulator Operator	Use RR19 Shutdown Cooling Loss of Mass to reduce RPV level as directed by Floor instructor. (use monitored parameter rrmrvloss=0 to reset RR19 as required)	

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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	CRS	<ul style="list-style-type: none"> CRS enters and ensures actions of EOP-1A: RPV Control/RPV Level. Low-Low Set operation verified. Directs HPCI Failure Investigated Directs PCIS isolations verified. Directs ADS Inhibited. Enters 5.3SBO Enters and directs actions per all three attachments of 5.3SBO. May direct a cooldown to be started.
	BOP	<ul style="list-style-type: none"> Verifies the start of DC Oil pumps. Places CP, CBP and CW pump switches to trip. VBD-H, place MANUAL TRANSFER SW to ALT Secures DC oil pumps when equipment stops. Aligns Electric Plant per attachment 3.
	Role Play	<p>When directed by the crew to open N₂-74, Modify Remote Function PC-21 Nitrogen storage tank isolation solenoid bypass to 100%.</p> <p>When remote function PC-21 is at 100% report to the control room that N₂-74 is open.</p>
	RO/BOP	<ul style="list-style-type: none"> Monitors Available Instrumentation. Directs Field Operations of 5.3SBO
	Simulator Operator	At the discretion of the lead examiner report indicated level at -40 FZ (this corresponds to TAF at 1000 psig and would push the crew into steam cooling). Adjust the value as needed dependent upon reactor pressure.
	CRS	<p>When reactor water level reaches TAF the CRS determines that steam cooling is required and Enters EOP-2A.</p> <p>Directs that reactor pressure be stabilized.</p>
	RO/BOP	Stabilizes reactor pressure.
	Role Play	When steam cooling has been entered, contact the control room as maintenance and inform them that the RCIC Starter Rack is repaired and you can re-energize it when directed.
	CRS	Direct that RCIC SR be place in service and RCIC started.
	RO/BOP	Directs RCIC SR reenergized and starts the RCIC system
	Role Play	<p>When the crew directs that the RCIC starter rack be reenergized, <u>Insert Trigger E10,</u></p> <p><u>then DELETE Malfunction ED12b.</u></p>

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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	RO/BOP	<ul style="list-style-type: none"> • Determines that RCIC is not developing full flow. • Informs the CRS that RCIC is injecting at 50 gpm • May diagnose the cause as a failure of the RCIC injection valve.
	Role Play	If directed to manually open the RCIC injection valve report that you cannot move the valve it seems to be seized.
	CRS	<p>Determines that an emergency depressurization is required because an injection system is available and level is less than -25FZ.</p> <p>Directs the RO to open 6 ADS valves.</p>
	RO	Opens 6 ADS valves.
	Role Play	Once ED has commenced then, <u>delete Malfunction DG01b</u> and inform the control Room that DG2 is repaired and may be started from the Control Room.
	BOP	Starts DG2 and verifies that 41601G is energized.
	RO/BOP	Control Reactor water level +3 to +54 using CS and/or RHR
	NOTE	This scenario was developed to evaluate Hot license candidates. As such it may not be practical for the SRO candidate to make the emergency classification until after the scenario is terminated.
	CRS	DECLARES a General Emergency EAL 4.4.1 loss of all AC power with the inability to keep the core covered.
		END OF EVENT
	Notes	

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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Op-Test No.:		Scenario	Event
No.:		NRC 3	No.:
Page		1	of 1
Event Description:		HPCI oil system fails (leak) resulting in HPCI unavailable to inject to	
RPV			
When to initiate: This is a latent failure.			
Time	Position	Applicant's Action or Behavior	
	RO/BOP	Identifies that HPCI failed to start automatically and attempts to start HPCI manually and informs CRS.	
	RO/BOP	Recognizes that HPCI AOP is running with no oil pressure	
	RO/BOP	Direct station operator to investigate failure of HPCI	
	Role Play	When directed to investigate the HPCI Failure report that an oil pipe is broken and the floor is covered with oil and maintenance has been contacted to investigate the failure.	
	RO/BOP	Reports HPCI oil leak to CRS and recommends placing AOP in pull-to-lock.	
	CRS	Directs HPCI AOP be place in pull-to-lock and contacts WCC to investigate failure of HPCI	
	Role Play	As WCC report that a team will investigate HPCI failure.	
		END OF EVENT	
	Notes		

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
Lesson No.:	SKL0124824	Rev No.:	00

VI. SCENARIO TERMINATION

When the RPV has been depressurized and Reactor water level is restored within the Normal Level Band, **FREEZE** the simulator.

VII. POST-SCENARIO CRITIQUE

If this scenario is not being used to evaluate HLC candidates for NRC Audit Exam or NRC Exam or for an annual exam, provide a critique in accordance with the general critique guidelines of OTP-806.

CREW CRITICAL TASKS	TECHNICAL BASIS	SAT	UNSAT
Energize a 4160 VAC safety bus when off-site power is not available and EDGs fail to automatically start.	Failure to recognize the auto start not occurring and energizing of the safety bus, and failure to take manual action per Procedure 5.3EMPWR will result in loss of safety-related equipment.		
Inhibit ADS prior to auto initiation.	An unnecessary ADS initiation would significantly change the mitigation strategy. Additionally, during certain conditions an ADS blowdown could result in a loss of adequate core cooling and/or exceeding the Technical Specification allowable cooldown rate.		
When RPV level cannot be restored and maintained > -183", Emergency Depressurize per EOP 2A.	The MSCRWL is the lowest RPV water level at which the covered portion of the reactor core will generate sufficient steam to preclude any clad temperature in the uncovered portion of the core from exceeding 1500°F. When water level decreases below MSCRWL with injection, clad temperatures may exceed 1500°F.		
Ensure RPV water level restoration and maintenance above -158" (TAF) when low pressure systems are available.	Submergence is the preferred method for cooling the core. All fuel nodes are then assumed to be covered with water and heat is removed by boiling heat transfer.		

Lesson Title:	Start CBP, Raise Power, Runaway RR pump, DC failure, Loss of Vacuum, EOP1 Station Blackout Steam cooling, Emergency Depressurization		
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CREW CRITICAL TASKS	TECHNICAL BASIS	SAT	UNSAT
During steam cooling operations, Emergency Depressurize IAW EOP-2A the reactor when RPV level reaches -202".	At -202", the steam generated by the covered portion of the core is sufficient to remove the heat generated in the uncovered region with PCT at 1800°F. The level at which this correspondence occurs is designated the Minimum Zero-Injection RPV Water Level (MZIRWL). When RPV water level drops below the MZIRWL, steam cooling may no longer be sufficient to preclude the peak clad temperature from exceeding 1800°F. RPV depressurization is then required per EOP-2A. Unless the RPV is already depressurized, it is expected that the resulting swell will be sufficient to quench the uncovered portion of the fuel and reduce PCT almost to the value that would exist if the core were submerged. As the swell subsides and steam flow through the open SRVs decreases, however, PCT turns and again rises. If no injection source can be made available, PCT will eventually exceed 1800°F.		

Lesson Title:			
Lesson No.:	SKL0124824	Rev No.:	00

IX. INITIAL CONDITIONS

I. Plant Status:

1. 70% power Beginning of Cycle.

2. Rod Sequence Information:

Page: 1

Rod: 26-19

Notch: 8

J. Tech. Spec. Limitations in effect:

7 day LCO is in effect due to inoperability of SLC pump 1A.

K. Significant problems/abnormalities:

Limiting Control Rod Pattern

L. Evolutions/maintenance for the on-coming shift:

1. Start CBP B and raise power to maximum currently at step 8.6.9 of procedure 2.2.6

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument, CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED	Rev. No.:	01
Lesson#:	SKL0124822	SAP BET #	30052
Prerequisites:	None	Duration (Hours):	N/A

Facility: <u>Cooper Nuclear Station</u>	Scenario No.: <u>NRC 4</u>	Op-Test No: _____
Examiners: _____ _____	Operators: _____ _____	
Initial Conditions: The plant is operating at 90% power with no equipment out of service.		
Turnover: After the crew has assumed the watch, Start 1B CRD Pump and secure 1A CRD Pump to allow maintenance on the motor.		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N	Swap CRD Pumps
2	1	C	RCIC Steam Leak and Manual Isolation of RCIC
3	2	I	Oscillating Feedwater Flow Instrument
4	3	C	Condensate booster pump trip
5	5	C	A Reactor Recirc Pump Trip
6	4	R	Emergency Power Reduction
7	6	C	Reactor Recirc Pump Seal Failure
8	7	M	Large LOCA
9	8	C	RHR Pumps fail to Auto Start
10	9	C	Core Spray Valves Fail to Auto Start

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
Lesson No.:	SKL0124822	Rev No.:	01

Scenario Description

The plant is operating at 90% power.

After the Crew assumes the watch the crew will start 1A CRD pump and secure 1B out of service.

Shortly after the CRD Pumps have been swapped a steam leak occurs on the RCIC steam supply line. The crew manually isolates the RCIC steam supply line terminating the steam leak. The CRS evaluates Technical Specifications for RCIC INOP.

After conditions are stable following the RCIC steam line break a Main Feedwater Flow Signal Oscillation occurs causing reactor water level transient. The crew responds per 2.4RXVLV and 4.4.1.

After the crew stabilizes reactor water level, a Condensate Booster Pump trips resulting in a Reactor Recirc runback and lowered reactor power. While the power is lowering the "A" Reactor Recirc Pump trips requiring the crew to make an emergency power reduction. This will cause in the future the failure of the seals.

After the "A" Reactor Recirc Pump trips and the plant is stable the #1 seal on RR Pump 1A fails. After the initial actions are complete the #2 seal fails resulting in rising DW pressure and temperature. The crew attempts to isolate the reactor recirc loop but when the loop isolation valves are closed a preexisting flaw in the RR pump suction piping propagates resulting in a large unisolable LOCA.

The crew responds per EOP-1A and EOP-3A. Eventually level cannot be maintained and an Emergency Depressurization is required. When the LOCA signal occurs the RHR pumps fail to start and the Core Spray injection valves fail to automatically open as required as reactor pressure decreases. The operators manually start and align RHR and CS to refill the reactor vessel.

The scenario may be terminated when reactor water level is greater than 3" and containment spray/cooling is in service.

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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Simulator Setup

Malfunction	Description	Delay	Ramp	Event	Value	Final
RC06	RCIC Steam Line Break			2	0	30
FW12B	MAIN FW FLOW SIGNAL OSCILLATION FT-50A		5 min.	3		100
FW15C	Condensate Booster Pump Trip CBP 1C			4	False	True
RR03A	Recirc Pump Shaft Binding RR Pump 1A			15	False	True
RR05A	Recirc Pump Field Breaker Trip RRMG 1A	4 sec.		15	False	True
RR10A	Recirc Pump #1 Seal Failure RR Pump 1A		3 min.	7		100
RR11A	Recirc Pump #2 Seal Failure RR Pump 1A	5 min.	10 min.	7		100
RR32A	Recirc Discharge Loop A Rupture			8		2
RH08A	RHR Pump A Auto Start Failure			Active		True
RH08B	RHR Pump B Auto Start Failure			Active		True
RH08C	RHR Pump C Auto Start Failure			Active		True
RH08D	RHR Pump D Auto Start Failure			Active		True
CS02A	Core Spray Injection Valve Fails to Auto Open. A Loop			Active		True
CS02B	Core Spray Injection Valve Fails to Auto Open. B Loop			Active		True

Remotes	Description	Delay	Ramp	Event	Value	Final

Overrides	Description	Delay	Ramp	Event	Value	Final
02S48 ZDIRRSWS6A[2]	Control Switch for RR-MO43A			Active	Open	Open
02S49 ZDIRRSWS7A[2]	Control Switch for RR-MO53A			Active	Open	Open

Event	Event Action	Command
15	RRFT110[1] < 35000	When Recirc A Flow drops to 35,000 the shaft will bind followed by the tripping of the field breaker in 4 seconds.

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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Op-Test No.: _____ Scenario No.: <u>NRC 4</u> Event No.: <u>1</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Swap CRD Pumps.</u>		
When to initiate: After the crew has assumed the watch and have settled into their roles and at the direction of the lead examiner.		
Time	Position	Applicant's Action or Behavior
	CRS	Directs the RO to start CRD Pump 1A and secure 1B CRD Pump.
	RO	Pulls Procedure 2.2.8 CRD Section 14 and calls the Station Operator in the CRD Pump area.
	Role Play	As the Station Operator report that the 1A CRD Pump's suction, min flow, and discharge valves are OPEN and that Pump and Motor oil levels are normal. Also report that the casing and suction filter have been vented.
	RO	Request Peer Check from BOP.
	BOP	Supplies Peer Checks
	RO	At Panel 9-5 balances the CRD Flow Controller and places it to manual.
	RO	Select the 1A CRD Pump and Starts it by placing its control switch to START.
	RO	Contacts Station Operator and inquires if the pump is running normally.
	Role Play	Report as the Station Operator that the 1A CRD Pump is running Normally.
	RO	Selects and stops the 1B CRD Pump.
	RO	Slowly adjust the CRD Flow Controller to 50 gpm and places the controller to BALANCE.
	RO	Checks that the CRD parameters are normal.
		END OF EVENT

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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	Notes

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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Op-Test No.: _____ Scenario No.: <u>NRC 4</u> Event No.: <u>2</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>RCIC Steam Leak and Manual Isolation.</u>		
When to initiate: When the CRD Pumps have been swapped and the CRD Parameters are normal and at the direction of the lead examiner.		
Time	Position	Applicant's Action or Behavior
	BOP	Updates the Crew that Annunciator 9-4-1 A-2 RCIC Steam Line D/P has been received and pulls the Annunciator card.
	BOP	Identifies steam leak on RCIC and recommends closing RCIC-MO-15, INBD STM SUPP ISOL VLV and RCIC-MO-16, OUTBD STM SUPP ISOL VLV.
	CRS	Directs closure of RCIC-MO-15, INBD STM SUPP ISOL VLV and RCIC-MO-16, OUTBD STM SUPP ISOL VLV.
	CRS	Directs the BOP to monitor Reactor Building Temperatures and Radiation Levels.
	BOP	Sends Rx Building Station Operator to investigate. He should provide him with steam leak safety information.
	Role Play	As the Reactor Building Station Operator respond to the request and call him back in a few minutes, when he is not busy and report that in the area of the Steam Tunnel there is a sound of a decreasing steam leak.
	BOP	Notes that RCIC Area temperatures have risen and are returning to normal after the isolation. Updates the Crew that, that is an entry into EOP-5A.
	CRS	Enters EOP 5A and notes that all of the actions have already been performed and exits the EOP.
	CRS	Briefs the Crew concerning the RCIC Steam Leak.
	CRS	Contacts the Work Control Center and reports the problem with RCIC Steam Line leak.
	Role Play	As the WCC respond to the report and tell the CRS that a team will be formed to recover from the Steam Line leak.

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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	CRS	Evaluates the condition against Tech Specs and determines that RCIC is inoperable per T.S. 3.5.3, ensure HPCI is operable and restore to operable within 14 days.
		END OF EVENT
	Notes	

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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Op-Test No.: _____ Scenario No.: <u>NRC 4</u> Event No.: <u>3</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Oscillating Feedwater Flow Instrument</u>		
When to initiate: When the RCIC Steam Leak has been isolated and at the direction of the lead examiner.		
Time	Position	Applicant's Action or Behavior
	BOP	Updates the crew that level and Reactor Feed pump is oscillating and this is an entry into 2.4RXLVL. <i>The Crew may catch that the feedwater flow instrument is oscillating causing the feed pump and level oscillations.</i>
	CRS	Enters 2.4RXLVL & 4.4.1 and assigns it to the BOP. The CRS will also enter the procedure and ensure that the appropriate steps are performed. Establish action points including scram action setpoint.
	CRS/BOP	Performs the steps of 2.4RXLVL and Updates the Scram Actions "If RPV Level cannot be maintained above +12 inches on the Narrow Range Instruments or RPV Level cannot be maintained below +50 inches on the Narrow Range instruments the reactor is to be scrammed."
	BOP	Identifies <i>feedwater flow instrument</i> is oscillating and updates the crew.
	BOP	Determines that Attachment 2 should be performed for a failure of a Level/Steam/Feed/Flow Instrument.
	BOP	<p>After level has stabilized, perform one of following :</p> <ol style="list-style-type: none"> 1. If affected instrument parameter displays a quality of red INV, then affected instrument has been automatically bypassed . No further action required. 2. If affected instrument parameter displays a quality of green, then perform following :Ensure LEVEL CONTROL SELECT switch is in 1 ELEMENT CONT. 3. Bypass selected instrument per Procedure 4 .4.1.

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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Op-Test No.: _____ Scenario No.: <u>NRC 4</u> Event No.: <u>4</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Condensate booster pump trip</u>		
When to initiate: After the crew has recovered from the loss of the Steam Flow Instrument and at the direction of the lead examiner.		
Time	Position	Applicant's Action or Behavior
	BOP	Reports that the 1C Condensate Booster Pump has tripped.
	BOP	Monitor reactor feed pump suction pressure.
	RO or BOP	Sends the Station Operator to investigate the tripping of the 1C Condensate Booster Pump.
	Role Play	Respond as the Station Operator and tell the Control Room Operator that you will go check the 1C Condensate Booster Pump out and report back that there is no obvious cause.
	BOP	Update the crew that this is an entry condition into 2.4MC-RF.
	CRS	Announce entry into 2.4MC-RF and assign it to the BOP.
	RO	Monitors Reactor plant parameters
	BOP	Monitors condensate pressures and flows.
		END OF EVENT
		Next Event
	Notes	

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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Op-Test No.: _____ Scenario No.: <u>NRC 4</u> Event No.: <u>5</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>"A" Reactor Recirc Pump Trip.</u>		
When to initiate: <u>When directed by the lead evaluator.</u>		
Time	Position	Applicant's Action or Behavior
	RO	Updates the crew that the A Recirc Pump tripped.
	CRS	Directs the RO to monitor for instabilities, Updates the crew that this is an entry condition into 2.4RR and assigns it to the RO.
	RO	Updates the crew with Scram Actions of "If both Recirc Pumps are tripped", and "If abnormal neutron flux oscillations are observed while operating in the stability exclusion region." Scram and enter 2.1.5.
	RO	Displays the Power to Flow map on the CRT and evaluates the location of operation. It will take approximately 1 minute for the screen to update real time data.
	RO	Determines that the plant is operating in the Stability Exclusion Region of the Power to Flow Map.
	RO	Updates the Crew that the plant is operating in the Stability Exclusion Region.
	RO	Performs both Attachment 1 and Attachment 3 of 2.4RR.
	RO	Informs the CRS that LCO 3.4.1 Condition A entry is required.
	RO	States that he will have to insert the emergency Power Reduction Rods per Procedure 10.13.
	CRS	Address Tech Specs and finds that with one RR Pump out of service, LCO 3.4.1 Condition A applies and that Required Action A.1 Initiate Action to Exit the Stability Exclusion Region immediately; <i>Also Condition B Required Action B.1 Satisfy the requirements of the LCO within 24 hours. That will required entry into LCOs 3.2.1 APLHGR Single Loop limits, 3.2.2 MCPR single loop operation limits, 3.3.1.1 RPS APRM reset for single loop settings and T 3.3.2 Single Loop Operation LHGR Limits. If missed, this should be asked as a follow-up question of the CRS.</i>

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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		END OF EVENT
	Notes	

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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Op-Test No.: _____ Scenario No.: <u>NRC 4</u> Event No.: <u>6</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Emergency Power Reduction</u>		
When to initiate: The crew will perform an emergency power reduction to exit the stability exclusion region.		
Time	Position	Applicant's Action or Behavior
	CRS	Directs the RO to perform an emergency power reduction in accordance with Procedure 2.4RR and monitor for abnormal neutron flux oscillations.
	RO	Inform CRS LCO 3 .4.1, Condition A, entry required.
	RO	Monitor for abnormal neutron flux oscillations by NOISE Program on PMIS computer to monitor peak-to-peak fluctuations of LPRMs and APRMs and SRM period, APRM, and LPRM indications.
	RO	Exit region by performing either or both of following: raise speed of operating recirculation pump(s) per Procedure 2 .1 .10 or insert Emergency Power Reduction Rods per Procedure 10.13.
	RO	Updates the crew when stability exclusion region has been exited.
	CRS	Contacts the Work Control Center and FRED on entry to the stability exclusion region.
		END OF EVENT
		Next Event
	Notes	

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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Op-Test No.: _____ Scenario No.: <u>NRC 4</u> Event No.: <u>7</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Reactor Recirc Pump Seal Failure</u>		
When to initiate: When the plant is stable following the Recirc Pump trip and before the crew starts the actions to exit the Stability Exclusion Region of the power to flow map and at the direction of the lead examiner.		
Time	Position	Applicant's Action or Behavior
	BOP	Updates the crew on the failure of the #1 seal of the "A" Reactor Recirc Pump; Annunciator 9-4-3 A-3 Recirc Pump A Seal Trouble. The BOP Operator may notice the pressure on the seal instrument above the RR controls before it alarms.
	BOP	Updates the crew that this is an entry into 2.4RR again. Notes that the # 1 seal for the A RR Pump has failed and that the #1 seal pressure has equalized with #2.
	BOP	Enters Attachment 2 of 2.4RR, and Updates the crew with actions to take if both seals fail. There are no real actions to take on the failure of one seal, but it does provide a good time to brief the crew on the possibility of the other seal failing.
	CRS	Briefs Crew on the possibility for both seals to fail on the "A" Reactor Recirc Pump and what to expect. He will assign action points and parameters for the operators to observe and take action, such as "at 1.5 psig in the Drywell Scram the Reactor" or "isolate the RR Pump if there are indications that the other seal is failing"
	BOP	Notes that the number 2 seal is also failing and attempts to isolate the pump's suction and discharge valves. <i>This failure is slow and will allow actions to be taken.</i>
	BOP	Updates the crew that the number 2 seal is failing and that Drywell Pressure is rising slowly.
	CRS	Updates the Crew that 2.4PC has been entered and directs the BOP to vent the containment per 2.4PC in an attempt to maintain pressure below 1.5 psig. <i>This activity may be directed before isolating the Recirc Loop or the other order can be expected.</i>
	BOP	Using 2.4PC operates the Primary Containment Vents to attempt to lower containment pressure.

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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	BOP	Attempts to isolate the "A" Reactor Recirc Pump by placing the RR-MO-43 and 53 valve control switches to close. Notes that neither valve closed and reports same.
	CRS	When Containment is 1.5 psig the CRS directs the RO to scram the unit.
	RO	Pushes the manual scram pushbuttons and performs the scram actions. Places the Reactor Mode Switch to the Shutdown Position, trips a feed pump and makes a scram report – Reactor Shutdown, APRMs Downscale.
	CRS	Enters EOP 1A and 2.4PC and assigns the BOP actions of 2.4PC. <i>If DW Pressure is above 1.84 psig will enter EOP-3A. At this point the RHR Pumps should have started, but they fail to.</i>
	CRS	Directs the RO to maintain RPV Level greater than +3 inches and Pressure less than 1050 psig.
	RO	Monitors level and pressure and adjust the level control system to control level within the desired band of +3 to +54 inches.
	RO	Uses Turbine Bypass Valves to control pressure at 960 psig. The MSIV should remain open and the Bypass valves will work to control pressure around 960 psig.
	BOP	Performs the steps of 2.4PC and ensures all DW FCUs are running and that REC-MO-702 and REC-MO-709 are open. This is performed in the back panels.
	BOP	<i>May ask the RO if HPCI is needed for level control, gets permission from the CRS to trip and lock out HPCI. The operator will Place the Aux Oil Pump Control Switch to START, then Manually trip HPCI by depressing the trip pushbutton until the turbine speed drops to 0 the places the Aux Oil pump control switch to PTL.</i>
		END OF EVENT
	Notes	

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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Op-Test No.: _____ Scenario No.: <u>NRC 4</u> Event No.: <u>8</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Large LOCA</u>		
When to initiate: <u>When RR pump isolation is conducted by the crew.</u>		
Time	Position	Applicant's Action or Behavior
	RO	Notes Drywell Pressure rising rapidly and Level falling rapidly, updates the crew.
	BOP	Controls HPCI to maintain reactor water level in the specified level band +3 to +54 inches.
	CRS	At a Drywell Pressure of 1.84 psig will enter EOP-3A.
	CRS	Directs the use of HPCI to maintain Level +3 to +54 inches.
	CRS	EOP 1A has a step right at the top of the level leg to ensure that Group isolations ECCS and DGs initiate. CRS notes that the RHR Pumps are not running if not recognized by the board operators. Next Event "9"
	BOP	Sends an operator to monitor the Diesel Generators.
	Roll Play	Respond as the Station Operator and following a few minutes report that the Diesels are running fine.
	CRS	If the ADS timer starts, will direct the inhibiting of ADS, if the timer is not running, then this actions will be performed later as level lowers.
	BOP	If the ADS timer is running will place both ADS timer inhibit switches to "Inhibit" and report back to the CRS when it is done.
	CRS	Direct the BOP or RO to restore and maintain level above -150 inches using the available injection systems.
	RO, BOP	RO and/or BOP will initiate and align all available injection sources and will ensure that the ones with a high enough discharge pressures are injecting into the RPV.
	BOP,RO	Updates the crew that level cannot be maintained above -150 inches.
	CRS	Directs the ADS Inhibit Switches to be placed in "Inhibit"

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	RO,BOP	Places the ADS Inhibit switches to "Inhibit" and reports same.
	BOP,RO	Updates the crew at 0 inches Fuel Zone and dropping.
	CRS	Directs the board operators to make available for injection any injection system with pumps running.
	RO,BOP	Report back that all Injection Systems are available and with pumps running.
	RO,BOP	Updates crew that level is -183 inches Fuel Zone.
	CRS	Directs Emergency Depressurization.
	RO,BOP	Monitors and controls injection into the RPV as pressure drops.
	RO,BOP	Secure injection systems or throttles them back as RPV level starts rising.
		END OF EVENT
	Notes	

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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Op-Test No.: _____ Scenario No.: <u>NRC 4</u> Event No.: <u>9</u> Page <u>1</u> of <u>1</u>		
Event Description: <u>RHR pumps fail to Auto Start</u>		
When to initiate: When DW Pressure is 1.84 psig the RHR Pumps should have started, so as soon as they are noticed not running.		
Time	Position	Applicant's Action or Behavior
	BOP,RO	Notes that The RHR Pumps failed to start when the 1.84 psig signal was received.
	BOP,RO	Confirms the auto start signal and manually started them. Letting them run on minimum flow.
	BOP, RO	Updates the crew that the RHR pumps failed to start on an initiation signal.
		END OF EVENT
	Notes	

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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Op-Test No.: _____ Scenario No.: <u>NRC 4</u> Event No.: <u>10</u> Page <u>1</u> of <u>1</u>		
Event Description: <u>Core Spray Valves failed to open</u>		
When to initiate: When RPV level is -183 inches Fuel Zone and injection systems are aligned and running.		
Time	Position	Applicant's Action or Behavior
	CRS	Directs the BOP to open 6 SRVs.
	BOP	Opens 6 SRVs one at a time and verifies that the amber light illuminates to indicate that the valves are actually open.
	BOP	Updates that RPV Pressure is dropping rapidly.
	BOP	Notes that the Core Spray Valves failed to open and reports that to the CRS.
	BOP	Monitors for RPV Pressure of 50 psig above Torus Pressure, and updates that Emergency Depressurization is completed.
	RO	Monitors and controls injection into the vessel as pressure lowers.
		END OF EVENT
	Notes	

Lesson Title:	Swap CRD Pumps, RCIC STM Leak, Oscillating FW Instrument , CBP trip, RR Pump Trip, RR Seal Failure, LOCA, CS Valves Fail to Auto Open, RHR pumps fail to Auto Start, ED		
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CREW CRITICAL TASKS	TECHNICAL BASIS	SAT	UNSAT
Inhibit ADS prior to auto initiation.	An unnecessary ADS initiation would significantly change the mitigation strategy. Additionally, during certain conditions an ADS blowdown could result in a loss of adequate core cooling and/or exceeding the Technical Specification allowable cooldown rate.		
When RPV level cannot be restored and maintained > -183", Emergency Depressurize per EOP 2A.	The MSCRWL is the lowest RPV water level at which the covered portion of the reactor core will generate sufficient steam to preclude any clad temperature in the uncovered portion of the core from exceeding 1500°F. When water level decreases below MSCRWL with injection, clad temperatures may exceed 1500°F.		
Ensure RPV water level restoration and maintenance above -158" (TAF) when low pressure systems are available.	Submergence is the preferred method for cooling the core. All fuel nodes are then assumed to be covered with water and heat is removed by boiling heat transfer.		
When systems required to maintain core submergence do not automatically start, manually align the systems.	Submergence is the preferred method for cooling the core. All fuel nodes are then assumed to be covered with water and heat is removed by boiling heat transfer.		

Lesson Title:			
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IX. INITIAL CONDITIONS

M. Plant Status:

1. 90% power End of Cycle.
2. Rod Sequence Information:

Page:

Rod:

Notch:

N. Tech. Spec. Limitations in effect:

None.

O. Significant problems/abnormalities:

None

P. Evolutions/maintenance for the on-coming shift:

1. Start 1B CRD Pump and secure 1A CRD Pump to allow Post maintenance Testing.