

Facility: Indian Point 3 Scenario No: 1 Op-Test No: 1

Examiners: _____ Operators: _____

Initial Conditions:

Scenario begins at 6% power with turbine close to sync speed. The team will continue with the startup by synchronizing the unit to the grid and increasing power.

Turnover:

Continue with the startup. Synchronize the unit to the grid and increase power at 150 MW per hour.

Event No:	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP) N (CRS) R (CRS) R (ATC)	Sync turbine and raise power
2	XMT-RCS052	I (ATC) I (CRS)	Thot fails high. CRS references TS
3	MAL-SGN005D	C (ALL)	SG Tube Leak. CRS references TS
4	MAL-SGN005D	M (ALL)	SGTR – Manual reactor trip and manual SI actuation
5	MAL-EPS006	C (BOP)	Loss of offsite power when 6.9 KV busses transfer
6	MAL-SIS004A MAL-SIS004C	C (BOP)	31 and 33 SI pump auto start failure
7	MAL-SGN004P	C (ATC)	SG safety fails open on ruptured SG

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

Scenario Event Description NRC Scenario #1

Scenario begins at 6% power with turbine close to synchronous speed. The team has received a turnover and has been allowed to review procedures, reactivity data, and perform a brief prior to entering the simulator. The team will continue with the startup by synchronizing the unit to the grid and increasing power.

After a sufficient power increase has been observed, loop 4 Tave will fail high due to That instrument failing high. The team will respond per AOP-INST-1, Instrument/Controller Failures. During the AOP-INST-1 actions, a 20 gpm SGTL will develop on 34 SG. The team will respond per AOP-SG-1. The leak will then increase in size and the team will manually trip the reactor and actuate Safety injection.

The Station Auxiliary Transformer will fault when 6.9KV buses transfer from the Unit Aux Transformer to the Station Aux Transformer following the trip. EDGs will start and energize the 480V buses. 31 and 33 SI pumps will fail to auto start and will be manually started later by the BOP operator.

During execution of E-0, a SG safety valve on 34 SG will fail open. The team will diagnose a faulted SG and go to E-2, Faulted SG Isolation. In E-2, the team will isolate steam flow from and feed flow to 34 SG and then transition to E-3 due to secondary radiation. The team will progress through E-3 until directed to transition to ECA-3.1, SGTR With Loss of Reactor Coolant-Subcooled Recovery Desired.

The scenario will be terminated when the team has initiated a controlled cooldown in ECA-3.1.

Procedure Flow Path: POP-1.3, 3-SOP-TG-004, AOP-INST-1, AOP-SG-1, EOP E-0, E-2, E-3, ECA-3.1

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Simulator Scenario Setup
Scenario 1**

NRC-1.bat

^ MAL-SIS004C SAFETY INJECTION PUMP 33 FAILURES
IMF MAL-SIS004C (-1 0) 1
^ MAL-SIS004A SAFETY INJECTION PUMP 31 FAILURES
IMF MAL-SIS004A (-1 0) 1
^ XMT-RCS052 HOT LEG NR MICROPROC LOOP 4 TEMPERATURE
IMF XMT-RCS052 (1 0) 640.000000 0 551.284973
^ MAL-SGN005D STEAM GENERATOR 34 TUBE LEAK
IMF MAL-SGN005D (2 0) 1.000000 0 0.000000
^ MAL-SGN005D STEAM GENERATOR 34 TUBE LEAK
TRG 3 "IMF MAL-SGN005D (3 0) 8.000000 0 0.000000"
^ MAL-SGN004P STEAM GENERATOR SAFETY VALVE FAILURE (MS-45D)
IMF MAL-SGN004P (4 0) 0.000000 0 0.000000
^ MAL-EPS006 LOSS OF STATION AUX TRANSFORMER
IMF MAL-EPS006 (30 30) TRUE
TRGSET 30 "jpplp4(1).eq.1"

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Booth Instructor Directions
Scenario 1**

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	EXPECTED RESPONSE/INSTRUCTOR CUES
IC Reset	8	Reset Simulator to IC 8 Plant startup in progress, ready to sync to grid
SES Setup Batch File	Run setup batch file NRC-1.bat and verify malfunctions and over-rides have been entered	
Floor Setup	Perform setup checklist	
Event 1		Synchronize the generator to the grid, raise power, transfer 6.9KV buses
Role Play	Role play various personnel contacted during startup activities	Perform field action LOAs as requested during the startup.
Event 2	Actuate Trigger 1 At lead evaluator direction	^ XMT-RCS052 HOT LEG NR MICROPROC LOOP 4 TEMPERATURE IMF XMT-RCS052 (1 0) 640.000000 0 551.284973
Role Play	If I&C requested of other personnel outside CCR	Acknowledge request or reports. I&C will complete troubleshooting or repairs before scenario ends
Event 3	Actuate Trigger 2 At lead evaluator direction	^ MAL-SGN005D STEAM GENERATOR 34 TUBE LEAK IMF MAL-SGN005D (2 0) 1.000000 0 0.000000
Role Play	When Chemistry contacted When HP and OM notified When NPOs contacted	Wait 15 minutes before reporting leak rate = 30,000 gpd Acknowledge report Perform requested LOAs to isolate secondary side

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Booth Instructor Directions
Scenario 1**

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	EXPECTED RESPONSE/INSTRUCTOR CUES
Event 4, 5, 6	Actuate Trigger 3 At lead evaluator direction	^ MAL-SGN005D STEAM GENERATOR 34 TUBE LEAK TRG 3 "IMF MAL-SGN005D (3 0) 8.000000 0 0.000000" ^ MAL-EPS006 LOSS OF STATION AUX TRANSFORMER IMF MAL-EPS006 (30 30) TRUE TRGSET 30 "jplp4(1).eq.1"
Role Play	If ConEd contacted regarding status of offsite power	ConEd responds that offsite power is available to the station and the problem must be with stain equipment. ConEd equipment is not affected.
Event 7	Actuate Trigger 4 When the BOP operator starts RO-1	^ MAL-SGN004P STEAM GENERATOR SAFETY VALVE FAILURE (MS-45D) IMF MAL-SGN004P (4 0) 0.000000 0 0.000000
Role Play	Perform actions as directed by CCR	Perform various LOA's per NPO local task list Locally isolate 34 SG when the NPO is dispatched.

**Indian Point Unit 3
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Simulator Scenario Turnover Information
Scenario 1**

Watch Team Turnover Sheet:

Date/Time:	TODAY
RCS Temp:	550.5 °F
RCS Press:	2235 psig
PZR Level:	26 %
Condition:	Mode 1
% Power:	6%
MW Gross:	0
Boron Conc:	1488 ppm
Control Rods	118 steps CBD

Plant Status:

Plant is performing startup after refueling:

- **POP-1.3 in progress at step 4.42**
- **SOP-TG-004 in progress at step 4.2.15**

1. No equipment out of service.
2. Continue startup:
 - Synchronize unit to grid
 - Raise power to 45% at 150 MWe per hour

Op-Test No: 1 Scenario No: 1 Event No.: 1

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Event Description: Sync turbine and raise power

Time	Position	Applicant's Actions or Behavior
	CRS	Continue Plant Startup per 3-POP-1.3 Plant Startup from Zero to 45% Power, step 4.42 Direct crew actions to synchronize the generator to the grid and raise reactor power <ul style="list-style-type: none"> • Direct reactivity changes • Supervise synchronizing the generator • Direct RO to block NIS Rod Stop and Trips when P-10 light illuminates • Supervise transfer of 6.9 KV bus power supply
	RO	Control reactor power using control rods and steam dumps <ul style="list-style-type: none"> • Coordinate with BOP to control SG feed rate during load changes to maintain SG level. Adjust bypass Feedwater regulating valves. • Maintain Tavg on program using control rods in manual • Block NIS PR and IR Rod Stop and Trips when P-10 light illuminated
	BOP	Synchronize the generator to the grid using SOP-TG-004 <ul style="list-style-type: none"> • Match voltages and frequency (turbine speed) • Close generator output breaker • Operate turbine controls to load turbine to ~ 30 MWe • Coordinates load changes with RO to control SG feed rate

Op-Test No: 1 Scenario No: 1 Event No.: 1

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Event Description: Sync turbine and raise power

Time	Position	Applicant's Actions or Behavior
	BOP	Transfer 6.9 KV buses 1-4 to the Unit Aux Transformer <ul style="list-style-type: none">• Uses SOP-EL-005 section 4.3• Adjust tap changer• Operate Sync Scope switch• Operate Bus 1-4 Normal Feed Breakers• Operate Bus 1-4 Tie Breaker
Lead Evaluator		Proceed to the next event when sufficient power increase has been evaluated Direct the Booth Instructor to actuate Trigger 1

Op-Test No: 1 Scenario No: 1 Event No.: 2

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Event Description: Thot fails high.

Time	Position	Applicant's Actions or Behavior
	RO	Diagnose Tave Instrument failure <ul style="list-style-type: none"> • From memory performs AOP-INST-1 immediate actions (verifies control systems on flight panel are stable and places in manual if necessary) • Place charging pump speed control to manual • Place rod control to manual • Control charging pump speed to maintain pressurizer level in normal band per graph RCS-2
	CRS	Directs team to perform immediate actions of AOP-INST-1, Instrument/Controller Failures <ul style="list-style-type: none"> • Verifies immediate actions performed • Verifies rod control and charging pump speed control are in manual • Performs procedure section for RCS Temperature Instrument failure Evaluate Technical Specification 3.3.1 – requires placing associated bistables to trip within 6 hours.
	BOP	Perform ARP for alarms associated with instrument failure <ul style="list-style-type: none"> • High Tave • OP-DeltaT CH Trip or Rod Stop • OT-DeltaT CH Trip or Rod Stop • Delta-T Deviation • Tavg Deviation • Tavg Tref Deviation • Pressurizer Low Level

Op-Test No: 1 Scenario No: 1 Event No.: 2

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Event Description: Thot fails high.

Time	Position	Applicant's Actions or Behavior
	BOP	Defeat Loop IV Delta-T (rack B-8) Defeat Loop IV Tavg (rack D-8)
	RO	Return control of charging pump speed to auto (if desired)
Lead Evaluator		Proceed to the next event when CRS has evaluated Technical Specifications and determined BS must be tripped, or at the discretion of the lead evaluator. Direct the Booth Instructor to actuate Trigger 2

Op-Test No: 1 Scenario No: 1 Event No.: 3

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Event Description: SG Tube Leak ~20GPM on 34 SG.

Time	Position	Applicant's Actions or Behavior
	BOP	Diagnose alert alarm and rising trend on R-15, SJAЕ Exhaust Radiation Monitor (alert alarm occurs 2-3 minutes after event is initiated).
	CRS	<p>Enters AOP-SG-1, Steam Generator Tube Leak</p> <ul style="list-style-type: none"> • Directs crew actions to estimate the size of the leak and minimize secondary contamination • Directs Chemistry to calculate leak rate • Notifies HP of SGTL • Determines shutdown must be made • Develops shutdown plan to remove the unit from service within 2 hours. <p>Evaluate Technical Specification 3.4.13 RCS Operational Leakage</p> <ul style="list-style-type: none"> • Determine Condition A applies because primary to secondary exceeds limit – reduce leakage to within limits in 4 hours or be in Mode 3 in 6 hours and Mode 5 in 36 hrs
	ALL	Diagnose leak rate is approximately 20 GPM
	RO	<p>Monitors Pressurizer Level and Pressure for abnormal trends due to SGTL. If level is lowering:</p> <ul style="list-style-type: none"> • If desired, reduces letdown flow to 45 gpm • If desired, starts a second charging pump.

Op-Test No: 1 Scenario No: 1 Event No.: 3

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Event Description: SG Tube Leak ~20GPM on 34 SG.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Coordinates with RO to reduce letdown to 45 GPM, if desired</p> <ul style="list-style-type: none">• Open 200A• Close 200B and 200C• Verify PCV-135 controlling between 225 and 275 psig <p>Estimate leak rate using Attachment-1,</p> <p>Initiates AOP-SG-1 Attachment 3 Secondary Side Isolation to minimize secondary side contamination and radioactivity release.</p>
Lead Evaluator		<p>Proceed to the next event when the CRS has developed a shutdown plan, or at the discretion of the lead evaluator.</p> <p>Direct the Booth Instructor to actuate Trigger 3</p>

Op-Test No: 1 Scenario No: 1 Event No.: 4,5,6

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Event Description: Steam Generator Tube Rupture. Loss of Offsite power occurs when 6.9KV buses transfer. 31 and 33 SI pumps auto start failure.

Time	Position	Applicant's Actions or Behavior
	RO	<p>Diagnose increased leak rate, lowering pressurizer pressure and lowering pressurizer level</p> <ul style="list-style-type: none"> Determine IAAT Step 4.1 applies – Reactor power is < 50% and leak rate is > 50 gpm.
	CRS	<p>Verify that IAAT step 4.1 is met</p> <ul style="list-style-type: none"> Direct the RO to trip the reactor and verify reactor is tripped Direct BOP to manually actuate SI Direct team to perform immediate actions of E-0, Reactor Trip or Safety Injection
	RO	<p>Verify reactor is tripped</p> <p>Verify turbine is tripped</p> <p>Verify Safety Injection is actuated</p>
	BOP	<p>Verify 480 V safeguards buses are energized</p> <ul style="list-style-type: none"> Diagnose loss of offsite power- all 480V buses energized by the emergency diesel generators
	CRS	Verify immediate actions using the procedure
	CRS	Direct RO and BOP actions during use of EOPS
	RO	Check status of AFW flow to SGs

Op-Test No: 1 Scenario No: 1 Event No.: 4,5,6

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Event Description: Steam Generator Tube Rupture. Loss of Offsite power occurs when 6.9KV buses transfer. 31 and 33 SI pumps auto start failure.

Time	Position	Applicant's Actions or Behavior
	BOP	Perform RO-1, BOP Operator Actions During Use of EOPs <ul style="list-style-type: none"> • Monitor CR Annunciators • Verify SI Pumps – Starts 31 and 33 SI Pumps • Verify FCU status • Verify SI valve alignment • Verify ABFP status • Verify ABFP valve alignment • Verify CCW pump status • Verify ESW status • Verify Containment Isolation status • Verify Containment Ventilation status • Verify EDG status • Verify CCR Ventilation status • Verify Emergency DC Oil pump status • Reset SI • Reset MCCS • Check with CRS to see if additional actions are required
Lead Evaluator		Proceed to the next event when the BOP operator has commenced RO-1. Direct the Booth Instructor to actuate Trigger 4

Op-Test No: 1 Scenario No: 1 Event No.: 7

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Event Description: Steam Generator Tube Rupture

Time	Position	Applicant's Actions or Behavior
	Booth Instructor	<i>After the BOP operator commences RO-1, execute Trigger 4 to fail open a safety valve on 34 SG.</i>
	RO	Diagnose rising level in 34 SG. Using prudent operator action, isolates AFW flow to 34 SG.
	CRS/RO	<p>Continue E-0 actions:</p> <p>Verify Feedwater Isolation</p> <p>Verify SI Flow</p> <p>Verify CS not required</p> <p>Check RCP seal cooling</p> <p>Verify RCP stopped</p> <p>Establish Charging Flow</p> <ul style="list-style-type: none"> • Dispatch NPO to align backup cooling • Check HCV-142 full open • Check 204B open • Open LCV-112B • Close LCV-112C • Start one charging pump and adjust to manual maximum speed until NPO has aligned backup cooling <p>Check RCS temperatures stable (expected is no)</p> <ul style="list-style-type: none"> • Reduce AFW Flow • Stop dumping steam • Close all MSIVs <p>Check RCPs stopped</p> <p>Check PORVs, Safety Valves and Spray valves</p> <p>Determine if SGs are faulted</p> <ul style="list-style-type: none"> • Diagnose 34 SG faulted, go to E-2

Op-Test No: 1 Scenario No: 1 Event No.: 7

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Event Description: Steam Generator Tube Rupture

Time	Position	Applicant's Actions or Behavior
	CRS/RO	Perform E-2, Faulted SG Isolation <ul style="list-style-type: none"> • Check MSIVs and bypass valves closed • Check 31, 32, 33 SGs intact • Identify 34 SG faulted • Isolate Faulted SG <ul style="list-style-type: none"> ○ Check 32 and 33 SGs intact ○ Isolate Main Feedwater FRV or MOV ○ Isolate Bypass Feedwater FRV or MOV ○ Isolate AFW ○ Verify Atmospheric steam dump closed ○ Close SG Blowdown isolation valves ○ Close SG sample valves ○ Isolate MSIV upstream steam traps
	Critical Task	WOG CT: E-2--A Isolate the faulted SG before transition out of E-2
	CRS/RO	Check secondary radiation <ul style="list-style-type: none"> • Check seismic event not occurred • Direct chemistry to sample SGs • Direct HP to survey SG steamlines and SGBD lines • Reset SG Sample lines • Check secondary radiation <ul style="list-style-type: none"> ○ Go to E-3, Steam Generator Tube Rupture
	CRS	Direct the crew's actions in E-3, Steam Generator Tube Rupture

Op-Test No: 1 Scenario No: 1 Event No.: 7

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Event Description: Steam Generator Tube Rupture

Time	Position	Applicant's Actions or Behavior
	CRS/RO	Determine if RCPs should be stopped Identify ruptured SG Isolate Flow from ruptured SG <ul style="list-style-type: none"> • Adjust 34 SG atmo controller to 1040 psig • Check 34 SG atmospheric closed • Check 32 and 33 SGs intact • Verify blowdown isolation valves closed • Dispatch NPO to locally isolate ruptured SG using posted aid • Ensure ruptured (34) SG MSIV and bypass closed • Check ruptured SG isolated from at least one other SG • Check 34 SG level > 9%, then stop feed flow to 34 SG NOTE: Keeps AFW Flow isolated due to to Faulted/Ruptured SG
	Critical Task	WOG CT: E-3--A Isolate feedwater flow to and steam flow from the ruptured SG before a transition to ECA-3.1 occurs.
	ALL	Check PORVs and Block valves Determine if SGs are Faulted <ul style="list-style-type: none"> • Check all faulted SGs isolated Check intact SG levels Reset SI Reset Phase A Reset and open IA to containment PCV-1228 Stop RHR pumps Check Ruptured SG > 400 psig <ul style="list-style-type: none"> • Transition to ECA-3.1, SGTR With Loss of Reactor Coolant – Subcooled Recovery Desired.

Op-Test No: 1 Scenario No: 1 Event No.: 7

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Event Description: Steam Generator Tube Rupture

Time	Position	Applicant's Actions or Behavior
	CRS	Direct the crew's actions in ECA-3.1 SGTR With Loss of Reactor Coolant – Subcooled Recovery Desired.
	CRS/RO	Reset SI Reset Phase A Open 1228 Check 480V bus status and MCCs and lighting reset Check CS status Check 34 SG level – Feed flow should remain isolated per the caution Determine if RHR pumps should be isolated Evaluate Plant Status <ul style="list-style-type: none"> • Initiate Attachment 1
	BOP	Perform Attachment 1, Plant Equipment Status Evaluation

Op-Test No: 1 Scenario No: 1 Event No.: 7

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Event Description: Steam Generator Tube Rupture

Time	Position	Applicant's Actions or Behavior
	CRS/RO	Check RCP Seal Cooling status Establish Charging flow <ul style="list-style-type: none"> • Start all charging pumps and establish maximum flow Determine if SGs are faulted and previously isolated Check intact SG levels Initiate RCS Cooldown to Cold Shutdown <ul style="list-style-type: none"> • Verify all rods inserted • Maintain cooldown rate < 100°F/hr in cold legs • Dump steam from intact SGs using atmospherics NOTE: IF WR Cold Leg Temperatures lower to < 290°F, then transitions to FR-P.1 due to Orange Path in Integrity. Terminate the scenario after transition to FR-P.1
	Critical Task	WOG CT: ECA-3.1--B Initiate an RCS cool down to cold shutdown conditions at the highest achievable rate but less than 100°F/hr in all RCS cold legs. If cooldown rate exceeds 100°F/hr due to the effects of the faulted ruptured SG, then the team demonstrates the ability to monitor the coodown rate and takes no actions to increase it.
Lead Evaluator		Terminate the scenario after the team has demonstrated the ability to monitor and control the cooldown rate, or at the discretion of the Lead Evaluator. If necessary, administer JPM SRO-A-5

Facility: Indian Point 3 Scenario No: 2 Op-Test No: 1

Examiners: _____ Operators: _____

Initial Conditions:

The scenario begins at 100% power with 32 EDG out of service due to malfunctioning governor.

Turnover:

32 EDG out of service due to malfunctioning governor.
 Maintain current plant conditions.

Event No:	Malf. No.	Event Type*	Event Description
1	MAL-SWS001C	C (BOP)	33 SWP trips
2	MAL-EPS005C	C (ALL)	480V Bus 5A Fault
3	N/A	R (ATC) R (CRS) N (BOP) N (CRS)	TS required shutdown
4	MAL-NIS006A	C (ATC) C(CRS)	Power Range Channel 41 Upper Detector Fails High
5	MAL-EPS001	M (ALL)	Station Blackout
6	MAL-DSG001A	C (BOP)	31 EDG fail to start
7	MAL-PRS003D	C (ATC)	PRZ PORV Fails Open
8	MAL-SWS001E	C (BOP)	SW pump does not auto start after bus energized

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

Scenario Event Description NRC Scenario #2

The scenario begins at 100% power with 32 EDG out of service due to malfunctioning governor. Each crew will be provided turnover information outside of the simulator and allowed to brief prior to entering the simulator.

After the crew has the watch, 33 SWP trips. Team responds per ARP and starts a SW pump. Bus 5A then faults. Team enters AOP-480V-1 to stabilize the plant. CRS evaluates TS and determines shutdown must commence. Shutdown plan is developed and team begins shutdown.

After ~50 MWe power reduction, a failure of Power Range channel N41 upper detector occurs. Control Rods auto insert until the ATC operator places rods in manual. The CRS implements AOP-NI-1, Nuclear Instrument Failure to stabilize the plant and perform required actions.

During performance of the subsequent actions of the nuclear instrument failure procedure, a loss of grid and loss of offsite power occur. The unit trips and the crew responds per EOP E-0. 33 EDG is the only diesel running, but bus 5A is faulted and cannot be energized. 31 EDG fails to start. Team diagnoses that no 480V bus is energized and transitions to ECA-0.0, Loss of All AC.

BOP operator manually aligns 32 ABFP to supply AFW flow the SGs.

When RCS pressure rises to PORV actuation setpoint, one PORV fails to close. ATC closes the failed open PORV using the control switch.

When an NPO is dispatched to emergency start EDGs, 31 EDG will start. The associated SW pump will fail to auto start. The BOP operator will start the essential service water pump to provide EDG cooling. The running EDG will then trip.

The team will place auto-start capable equipment in pullout and dispatch an NPO to isolate RCP seal injection and thermal barrier cooling. The team will then proceed to depressurize SGs to minimize RCS inventory loss and cool the RCP seals.

The scenario will be terminated when SG atmos are dumping steam at the maximum rate.

Procedure Flowpath: ARP-SJF, AOP-480V-1, POP-2.1, EOP E-0, ECA-0.0

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Simulator Scenario Setup
Scenario 2

NRC-2.bat

^ LOA-DSG032 D/G #32 MAN/OFF/AUTO MODE SWITCH
IRF LOA-DSG032 (-1 0) OFF
^ SWI-DSG006G PULL OUT POS 480V BUS NO.6A EMERG. FEED BREAKER
CONTRO
IOR SWI-DSG006G (-1 0) ON
^ MAL-DSG001A DIESEL 31 GENERATOR FAILURE
IMF MAL-DSG001A (-1 0) TRUE
^ MAL-SWS001E SERVICE WATER PUMP 35 FAILURES
IMF MAL-SWS001E (-1 0) 1
^ MAL-SWS007C SVC WTR PUMP DISCHG CHECK VLV FAILS TO SEAT (SWN1-3)
IMF MAL-SWS007C (1 0) 20.000000 0 0.000000
^ MAL-SWS001C SERVICE WATER PUMP 33 FAILURES
IMF MAL-SWS001C (1 0) 0
^ MAL-EPS005C LOSS OF 480 V BUS 5A
IMF MAL-EPS005C (2 0) TRUE
^ MAL-NIS006A POWER RANGE CHANNEL 41 DETECTOR A FAILURE
IMF MAL-NIS006A (10 0) 0.000000 0 5.0
^ MAL-EPS001 STATION BLACKOUT
IMF MAL-EPS001 (3 0) TRUE
^ Deletes MAL-DSG001A and resets/starts 31 EDG
TRG 4 "bat lrqses015a.bat"
^ Fails 31 EDG again
TRG 5 "IMF MAL-DSG001A (-1 0) TRUE"
^ MAL-PRS003D PRESSURIZER RELIEF VALVE 456 VALVE POSITION FAILURE
IMF MAL-PRS003D (3 48) 100.000000 0 0.000000
^ Activates trigger 29 when 31 SWP control switch placed in START
TRGSET 29 "hwxcoi131r.eq.1"
^ Deletes 33 SWP Check Valve malf
TRG 29 "DMF MAL-SWS007C"
^ Activates trigger 30 when PORV 456 control switch placed in closed
TRGSET 30 "hwxeoi327c.eq.1"
^ Deletes PORV failed open malf
TRG 30 "DMF MAL-PRS003D"

**Indian Point Unit 3
2006 NRC Initial License Examination
Booth Instructor Directions
Scenario 2**

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	EXPECTED RESPONSE/INSTRUCTOR CUES
IC Reset	10	Reset Simulator to IC 10
SES Setup Batch File	Run setup batch file NRC-2.bat and verify malfunctions and over-rides have been entered	Place the control switch for 32 EDG to pullout and apply danger tag. Put protected equipment placards on 31 and 33 EDGs. Update the protected equipment PC display. Risk is yellow.
Floor Setup	Perform setup checklist	
Event 1	Actuate Trigger 1 At lead evaluator direction	^ MAL-SWS001C SERVICE WATER PUMP 33 FAILURES IMF MAL-SWS001C (1 0) 0
Role Play	When NPO is dispatched to investigate	Report no abnormalities at the pump. Report unusual odor at the breaker at bus 5A. Breaker tripped on over current.
Event 2	Actuate trigger 2 At lead evaluator direction	^ MAL-EPS005C LOSS OF 480 V BUS 5A IMF MAL-EPS005C (2 0) TRUE
Role Play	When NPO is dispatched to investigate	When NPO reports back, state that bus 5A has acrid burnt electrical odor. There is no fire or smoke.
Event 3		Technical Specification Required Shutdown
Role Play	When various personnel contacted	NPOs Perform LOAs as requested. When dispatched to swap BA transfer pumps: Close 360: LOA-CVC051 Open 370: LOA-CVC052 If maintenance is requested to return 32 EDG to service, report that maintenance will expedite re-assembly of the governor.
Event 4	Actuate Trigger 3 At lead evaluator direction	^ MAL-EPS001 STATION BLACKOUT IMF MAL-EPS001 (3 0) TRUE

**Indian Point Unit 3
2006 NRC Initial License Examination
Booth Instructor Directions
Scenario 2**

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	EXPECTED RESPONSE/INSTRUCTOR CUES
Role Play	When ConEd contacted following blackout/loss of grid If NPO dispatched to APP R EDG	ConEd reports that a widespread system blackout has occurred across NYC, Westchester County, Long Island, and Connecticut Appendix R EDG will not start. Generator Lockout Relay is tripped and will not reset.
Event 5	When NPO is dispatched to emergency start EDGs Activate Trigger 4	Executes batch file bat lrqses015a.bat: Deletes MAL-DSG001A and resets/starts 31 EDG. Associated ESW pump does not auto start and must be manually started.
Event 6	PORV 456 Fails Open	Occurs automatically 48 seconds after trigger 3 is actuated.
	After 35 SWP has been started and Attachment 1 is in progress, activate Trigger 5 to trip 31 EDG Activate Trigger 5	TRG 5 "IMF MAL-DSG001A (-1 0) TRUE"
Role Play	After 31 EDG trips, NPO contact Control Room	NPO contact Control Room and inform them that 31 EDG has been tripped Note: Any further attempts to restart 31 EDG are not successful.
Role Play	When NPO dispatched to break vacuum	Perform LOAs as requested per NPO Local Task Log to break vacuum
Role Play	When NPO dispatched to close 1158-1 or 2	Perform LOAs as requested per NPO Local Task Log
Role Play	When NPO dispatched to isolate RCP seals	Perform LOAs as requested per NPO Local Task Log to isolate seals

**Indian Point Unit 3
2006 NRC Initial License Examination
Simulator Scenario Turnover Information
Scenario 2**

Watch Team Turnover Sheet:

Date/Time:	TODAY
RCS Temp:	567 °F
RCS Press:	2235 psig
PZR Level:	45 %
Condition:	Power Ops
% Power:	100%
MW Gross:	1078
Boron Conc:	1032 ppm
Control Rods	224 CBD

Plant Equipment Status:

1. 32 EDG out of service due to malfunctioning governor.
 - Expected return to service in 12 hours
 - Declared inoperable 8 hour ago.
 - TS LCO 3.8.1 Condition B applies.
 - SR 3.8.1.1 was last performed one hour ago
2. Maintain current plant conditions.

Op-Test No: 1 Scenario No: 2 Event No.: 1

Page 1 of 1

Event Description: 33 SWP trips. Team responds per ARP and starts a SW pump.

Time	Position	Applicant's Actions or Behavior
	Booth Instructor	<i>When Directed by the lead evaluator, activate trigger 1 to cause 33 Service Water Pump trip.</i>
	BOP	<p>Diagnose trip of 33 Service Water Pump</p> <ul style="list-style-type: none"> • Perform ARP-012 for alarm "Service Water Header (31, 32, 33) High Low Pressure" • Observe low pressure indication for 31, 32, 33 header • Refers to SOP-RW-5 and starts 31 Service Water Pump • Dispatch NPO to investigate 33 SWP
	CRS	<p>Direct BOP operator response to service water transient.</p> <p>The CRS may evaluate TS 3.7.9 Service Water System:</p> <ul style="list-style-type: none"> • The LCO is satisfied with 2 pumps and required flow path for the nonessential SWS header operable. <p>NOTE: The CRS may refer to AOP-SW-1, Service Water Malfunctions for subsequent actions.</p>
	Lead Evaluator	<p>Continue with the next event at the discretion of the Lead Evaluator</p> <p>Direct the Booth Instructor to actuate Trigger 2</p>

Op-Test No: 1 Scenario No: 2 Event No.: 2

Page 1 of 1

Event Description: 480V Bus 5A Fault, Team enters AOP-480V-1 to stabilize the plant. CRS evaluates TS and determines shutdown must commence

Time	Position	Applicant's Actions or Behavior
	<i>Booth Instructor</i>	<i>When directed by the lead evaluator, activate trigger 2 to fault Bus 5A</i>
	BOP	Diagnose bus 5A de-energized <ul style="list-style-type: none"> • Perform ARPs • Dispatch NPO to investigate
	CRS	Implement AOP-480V-1, Loss of 480V Bus <ul style="list-style-type: none"> • Direct crew actions of AOP-480V-1
	RO/BOP	Verify charging pump running Verify CCW pumps running Check SW essential and non-essential headers > 60 psig Perform ARPs Verify IRPI's energized Verify condenser vacuum stable Dispatch an NPO to the monitor EDGs
	CRS	Evaluate Technical Specification 3.8.9
	<i>Booth Instructor</i>	<i>NPO reports back acrid burnt electrical odor. No fire or smoke.</i>
	CRS	Determine that bus 5A is inoperable. Since 32 EDG is also inoperable, per LCO 3.8.9 Condition E, enter LCO 3.0.3 Immediately <ul style="list-style-type: none"> • Determine shutdown must commence within one hour • Be in mode 3 in next six hours
	Lead Evaluator	Proceed to next event when unit shutdown is commenced.

Op-Test No: 1 Scenario No: 2 Event No.: 3

Page 1 of 1

Event Description: Technical Specification required shutdown.

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Refers to POP-2.1 Operation at Greater Than 45% Power</p> <ul style="list-style-type: none"> • Implements section 4.3 Lowering Plant Load • Implements Attachment 3, Reactor Power Reduction Checklist • Develops shutdown plan for power reduction • Using Attachment 5, develops a reactivity plan for power reduction • Initiate notifications • Perform a brief with the crew • Directs reactivity changes • Directs load changes
	RO	<p>Energize all pressurizer backup heaters</p> <p>Dispatch NPO to swap boric acid transfer pumps</p> <ul style="list-style-type: none"> • 31 BA transfer is de-energized due to loss of bus 5A • Ensures 32 BA Transfer Pump aligned to blender <p>Commence boration per 3-SOP-CVCS-003, Reactor Coolant System Boron Concentration Control</p> <ul style="list-style-type: none"> • Verify heaters energized • Direct chemist to sample • Set boric acid flow integrator to desired volume • Adjust FCV-110A Boric Acid Flow Control Blender controller for desire flow rate • Place Makeup Mode Selector switch to Borate • Turn Makeup Control switch to Start and return to Norm • Verify boration has started properly • Monitor Tavg, rod position, delta flux, and RCP seal injection <p>Insert control rods as directed by CRS to maintain Tavg on program and delta-flux within target band.</p>

Op-Test No: 1 Scenario No: 2 Event No.: 3

Page 2 of 2

Event Description: Technical Specification required shutdown.

Time	Position	Applicant's Actions or Behavior
	BOP	Initiate generator load reduction at rate directed by CRS <ul style="list-style-type: none">• Monitor Tave – Tref deviation• Coordinate load reductions with RO reactivity addition rate.• Maintain Feed Water Regulating Valve controllers manual setpoint nulled during power reduction.
Lead Evaluator		Proceed to the next event when sufficient load reduction had been observed. Direct the Booth Instructor to activate trigger 3

Op-Test No: 1 Scenario No: 2 Event No.: 4

Page 1 of 1

Event Description: Power Range Nuclear Instrument Channel 41 Upper Detector Fails High.

Time	Position	Applicant's Actions or Behavior
	Booth Instructor	<i>When directed by the Lead Evaluator, activate trigger 10 to activate MAL-NIS006A causing Power Range N41 Upper detector to fail high.</i>
	ATC	Diagnose failed nuclear instrument. Place Control rods in manual to stop auto rod insertion
	CRS	Direct actions of the team during AOP-NI-1, Nuclear Instrument Failurew. (Note: The crew may perform AOP-INST-1 immediate actions and then transition to AOP-NI-1 when directed, or they may directly enter AOP-NI-1.)
	BOP	Perform ARPs for alarms associated with the failed instrument.
	CRS/ATC	Adjust control rods, boron concentration, or turbine load as necessary to maintain Tave at programmed Tref.
	CRS	Evaluate TS 3.3.1 functions 2 and 17
	Lead Evaluator	Proceed to the next event at the discretion of the Lead Evaluator

Op-Test No: 1 Scenario No: 2 Event No.: 5,6,7

Page 1 of 1

Event Description: Blackout/Loss of Grid. Unit trips, all 480V buses are de-energized. PRZ PORV 456 Fails Open.

Time	Position	Applicant's Actions or Behavior
	Booth Instructor	<i>When directed by the Lead Evaluator, activate trigger 3 to cause loss of grid/station blackout</i>
	CRS	Direct crew to perform immediate actions of E-0, Reactor trip or safety injection
	RO	Verifies reactor is tripped Verifies turbine is tripped
	BOP	Diagnose none of the 480V buses are energized <ul style="list-style-type: none"> Observe that the only EDG running is 33 EDG and bus 5A cannot be energized due to fault. 31 and 32 EDGs are not running. 31 EDG did not start. 32 EDG is out of service. Informs CRS that transition to ECA-0.0 is required.
	CRS	Transitions to ECA-0.0, Loss of All AC Power and directs crew actions during implementation of ECA-0.0
	RO	Verify Reactor trip Close all MSIVs
	Evaluator Note	PORV 456 fails open 48 seconds after the unit trips.
	RO	Determine if RCS is isolated <ul style="list-style-type: none"> When PORV 456 fails open, observes pressurizer pressure < 2335 psig and lowering and places control switch for PCV-456 to close. Observes PORV PCV-456 closed

Op-Test No: 1 Scenario No: 2 Event No.: 5,6,7

Page 2 of 2

Event Description: Blackout/Loss of Grid. Unit trips, all 480V buses are de-energized. PRZ PORV 456 Fails Open.

Time	Position	Applicant's Actions or Behavior
	Critical Task	WOG CT: ECA-0.0--A Manually close the open PRZ PORV before completing step 3 of ECA-0.0
	BOP	Close Letdown Isolation valves <ul style="list-style-type: none"> Places control switches for LCV-459, 460, 200A, 200B, and 200C to CLOSE Check Excess letdown stop valves APV-213A and 213B closed Check HCV-133 Closed CLOSE RCS Sample Isolation valves SP-AOV-956A, C, E, G and SP-AOV-956B, D, F, H
	RO/BOP	Check 32 ABFP running <ul style="list-style-type: none"> Adjust HCV-1118 ABFP Turb Speed Control to maintain discharge pressure > SG Pressure Check SG levels > 9% Adjust 32 ABFP FCV-405A, B, C, and D as necessary to maintain total feed flow > 365 gpm. Preferentially feed 32 or 33 SG (selects one and feeds at a higher rate) Maintain feed flow in all other SGs at \leq 100 gpm
	Critical Task	WOG CT: ECA-0.0--B Establish at least 365 gpm AFW flow to the SGs before SG WR level decreases to below 16%
	BOP	Check status of 480V buses 2A and 3A – both de-energized

Op-Test No: 1 Scenario No: 2 Event No.: 5,6,7

Page 3 of 3

Event Description: Blackout/Loss of Grid. Unit trips, all 480V buses are de-energized. PRZ PORV 456 Fails Open.

Time	Position	Applicant's Actions or Behavior
	ALL	Try to restore power to any 480V Ac Safeguards Bus <ul style="list-style-type: none">• Dispatch NPO to emergency start EDGs and energize 480V bus per SOP-EL-1• Contact ConEd and request urgent power restoration• Attempt to energize any 480V bus using SOP-EL-1 or SOP-EL-5
Lead Evaluator		Proceed to next event after NPO has been dispatched to emergency start EDGs. Direct Booth Instructor to activate trigger 4 to start 31 EDG

Op-Test No: 1 Scenario No: 2 Event No.: 8

Page 1 of 3

Event Description: 31 EDG is successfully started but must be shutdown due to insufficient cooling water. Loads are placed to pullout, RCP seals are isolated, and the RCS is depressurized to preserve the RCP seals.

Time	Position	Applicant's Actions or Behavior
	Booth Instructor	<p>When NPO is dispatched to emergency start EDGs, activate trigger 4 to execute batch file bat lrqses015a.bat: Deletes MAL-DSG001A and resets/starts 31 EDG.</p> <p>APP R EDG will not start.</p> <p>When ConEd contacted, report that a widespread system blackout has occurred across NYC, Westchester County, Long Island, and Connecticut. ConEd cannot estimate when offsite power will be available to IPEC.</p>
	BOP	<p>Observes 480V buses 2A and 3A are energized from 31 EDG.</p> <ul style="list-style-type: none"> Manually starts 35 Service Water Pump
	CRS	<p>Determines two SW Pumps cannot be started on the essential header</p> <ul style="list-style-type: none"> Initiates Attachment 1, Essential Service Water Alignment
	BOP/RO	<p>Close 1104 and 1105, Serv Wtr Cont Clg valves</p> <ul style="list-style-type: none"> Direct NPO to monitor temperature of running EDGs and trip when jacket water temperature exceeds high temperature alarm setpoint. Monitor ESW header pressure. Determine that pressure cannot be maintained above the SERVICE WTR HDR HIGH LOW PRESS alarm setpoint (60 psig) Direct NPO to trip EDGs
	Booth Instructor	<p>After 35 SWP has been started and Attachment 1 is in progress, activate Trigger 5 to trip 31 EDG</p> <p>NPO contact Control Room and inform them that 31 EDG has been tripped</p> <p>Note: Any further attempts to restart 31 EDG are not successful.</p>
	BOP	<p>Perform Attachment 2, Preventing overheating of equipment and instrumentation.</p>

Op-Test No: 1 Scenario No: 2 Event No.: 8

Page 2 of 3

Event Description: 31 EDG is successfully started but must be shutdown due to insufficient cooling water. Loads are placed to pullout, RCP seals are isolated, and the RCS is depressurized to preserve the RCP seals.

Time	Position	Applicant's Actions or Behavior
	CRS/RO	Check SI Actuated <ul style="list-style-type: none"> • Reset Safety Injection in accordance with ECA-0.0 step 20 (per step 8 caution) • Return to step 8
	RO	Place control switches to pullout: <ul style="list-style-type: none"> • PZR Heaters • Containment Spray Pumps • FCUs • SI Pumps • Motor Drive ABFPs • RHR Pumps • CCW Pumps
	CRS/RO	Determine RCP seal should be isolated Dispatch NPO to close the following valves <ul style="list-style-type: none"> • MOV-222, Seal Water Return Isolation • FCV-625, CCW return From RCP Thermal Barrier • RCP Seal Injection needle valves CH-241A, B, C, and D
	RO	Check CST Hotwell Isolation Valves 1158-1 and 2 closed Check Main and bypass FRVs Closed Check SG Blowdown Isolation valves and sample valves closed Dispatch NPO to break condenser vacuum Check for faulted or ruptured SG Check SG levels and control AFW

Op-Test No: 1 Scenario No: 2 Event No.: 8

Page 3 of 3

Event Description: 31 EDG is successfully started but must be shutdown due to insufficient cooling water. Loads are placed to pullout, RCP seals are isolated, and the RCS is depressurized to preserve the RCP seals.

Time	Position	Applicant's Actions or Behavior
	CRS/RO	Determine if intact SGs should be depressurized <ul style="list-style-type: none"> • Check seal cooling established • Check 32 HHSI pump available
	RO	Depressurize intact SGs to 225 psig <ul style="list-style-type: none"> • Check SG NR Levels – any > 9% • Manually dump steam at maximum rate using SG atmospheric
	Critical Task	WOG CT: ECA-0.0--G If all of the following conditions are met, depressurize intact SGs at maximum rate: <ul style="list-style-type: none"> • Any intact SG NR level > 9% • SG Pressure does not decrease below 125 psig • RCS Cold Leg Temperatures > 320°F • SUR 0 or negative
Lead Evaluator		Terminate scenario when SG Atmospheric are dumping steam at the maximum rate, or at the discretion of the Lead Evaluator. If necessary, administer JPM SRO-A-5 to the CRS.

Facility: Indian Point 3 Scenario No: 3 Op-Test No: 1

Examiners: _____ Operators: _____

Initial Conditions:

The scenario begins at 100% power steady state conditions and no equipment OOS.

Turnover:

Maintain current plant conditions.

Event No:	Malf. No.	Event Type*	Event Description
1	MAL-PRS005A	I (ATC) I (SRO)	PRZR pressure Instrument PT-455 fails high. Spray valves open and actual pressure lowers until manual action is taken. TS for SRO
2	MAL-PRS003C	C (ATC) C (SRO)	PORV 455C fails open. Block valve can be manually closed to isolate the leak. TS for SRO
3	ASISRWST	C (SRO)	Loss of RWST level. Fork truck crashes into RWST resulting in level lowering to about 11 feet over 40 minutes. TS for SRO
4	N/A	R (ATC) R (CRS) N (BOP) N (CRS)	Tech Spec Required Shutdown – Due to inoperable RWST, team commences a shutdown.
5	MAL-RCS007C MAL-RCS012C		RCP Seal malfunction - High vibrations and #1 seal degradation. During shutdown, indications of RCP malfunction occur.
6	MAL-RCS002C	C (ATC)	While team is investigating RCP malfunction the affected RCP trips. RO must manually actuate reactor trip.
7	MAL-RCS001K	M (ALL)	Seal LOCA on affected RCP occurs resulting in eventual Low Pressure SI actuation
8	MAL-SIS001A MAL-SIS001B		SI fails to auto actuate, but manual SI is successful
9	MAL-SIS004B	C (BOP) C (BOP)	32 SI Pump fails to auto start 34 and 35 FCU dampers do not auto reposition to incident mode.

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

Scenario Event Description
NRC Scenario #3

The scenario begins at 100% power steady state conditions and no equipment OOS.

After taking the watch, PRZ Pressure controlling channel (PT-455) fails high. The team manually controls pressure and takes actions per AOP-INST-1. After TS are addressed the team will trip bistables. When pressure control is placed back in auto, PORV 455C fails open. The ATC will attempt to close the PORV and then close its Block Valve.

A fork truck moving equipment near the containment building equipment hatch has a brake failure and crashes into the RWST. RWST level will lower to 11 feet in 40 minutes. The team will evaluate TS and commence a plant shutdown.

During the shutdown, 33 RCP #1 seal degrades and vibrations increase. The team responds per AOP-RCP-1, Reactor Coolant Pump Malfunction. The RCP trips but auto reactor trip does not occur as it should. The team will manually actuate reactor trip.

Concurrent with the trip, 33 RCP seal degrades further to 300 gpm LOCA. Auto SI actuation will not occur requiring manual SI actuation. 32 SI pump does not auto start and the dampers on two Fan Cooler Units do not automatically reposition to incident mode. The team progresses through E-0 and E-1 until RWST level reaches the cold leg recirculation switchover level. The team will transition to ES-1.3, Transfer to Cold Leg Recirculation, but indication of adequate sump levels will not exist to support cold leg recirculation. The team will be directed to ECA-1.1, Loss of Emergency Coolant Recirculation. In ECA-1.1 they will align makeup to the RWST and reduce ECCS suction to a single train to conserve inventory. The scenario will be terminated when SI flow has been reduced to a single train (one SI pump).

Procedure Flowpath: AOP-INST-1, ARP, POP-2.1, AOP-RCP-1, E-0, E-1, ES-1.3, ECA-1.1.

**Indian Point Unit 3
2006 NRC Initial License Examination
Simulator Setup
Scenario 3**

Run Batch File NRC-3.bat

Verify the following commands are pending:

```
^ IND-CNM037B 3LR-1254 REC 2 SIGNAL CONTAINMENT LEVEL RECORDER TRAIN
IOR IND-CNM037B (-1 0) 0 0
^ IND-CNM037A 3LR-1254 REC 1 SIGNAL CONTAINMENT LEVEL RECORDER TRAIN
IOR IND-CNM037A (-1 0) 0 0
^ IND-CNM032B 3LR-1253 REC 2 SIGNAL CONTAINMENT LEVEL RECORDER TRAIN
IOR IND-CNM032B (-1 0) 0 0
^ IND-CNM032A 3LR-1253 REC 1 SIGNAL CONTAINMENT LEVEL RECORDER TRAIN
IOR IND-CNM032A (-1 0) 0 0
^ SWI-CNM016A 1302 GREEN LAMP CONT RECIRC UNIT #34 FLOW VLV 1302 CONT
IOR SWI-CNM016A (-1 0) OFF
TRGSET 10 "hwxaoui159o.eq.0"
TRG 10 "DOR SWI-CNM016A"
^ SWI-CNM016B 1302 RED LAMP CONT RECIRC UNIT #34 FLOW VLV 1302 CONT S
IOR SWI-CNM016B (-1 0) ON
TRGSET 11 "hwxaoui159o.eq.0"
TRG 11 "DOR SWI-CNM016B"
^ SWI-CNM017A 1303 GREEN LAMP CONT RECIRC UNIT #34 FLOW VLV 1303 CONT
IOR SWI-CNM017A (-1 0) OFF
TRGSET 12 "hwxaoui160o.eq.0"
TRG 12 "DOR SWI-CNM017A"
^ SWI-CNM017B 1303 RED LAMP CONT RECIRC UNIT #34 FLOW VLV 1303 CONT S
IOR SWI-CNM017B (-1 0) ON
TRGSET 13 "hwxaoui160o.eq.0"
TRG 13 "DOR SWI-CNM017B"
^ SWI-CNM018A 1304 GREEN LAMP CONT RECIRC UNIT #34 FLOW VLV 1304 CONT
IOR SWI-CNM018A (-1 0) ON
TRGSET 14 "hwxaoui161o.eq.1"
TRG 14 "DOR SWI-CNM018A"
^ SWI-CNM018B 1304 RED LAMP CONT RECIRC UNIT #34 FLOW VLV 1304 CONT S
IOR SWI-CNM018B (-1 0) OFF
TRGSET 15 "hwxaoui161o.eq.1"
TRG 15 "DOR SWI-CNM018B"
^ SWI-CNM019A 1305 GREEN LAMP CONT RECIRC UNIT #35 FLOW VLV 1305 CONT
IOR SWI-CNM019A (-1 0) OFF
TRGSET 16 "hwxaoui162o.eq.0"
TRG 16 "DOR SWI-CNM019A"
^ SWI-CNM019B 1305 RED LAMP CONT RECIRC UNIT #35 FLOW VLV 1305 CONT S
IOR SWI-CNM019B (-1 0) ON
TRGSET 17 "hwxaoui162o.eq.0"
TRG 17 "DOR SWI-CNM019B"
^ SWI-CNM020A 1306 GREEN LAMP CONT RECIRC UNIT #35 FLOW VLV 1306 CONT
IOR SWI-CNM020A (-1 0) OFF
TRGSET 18 "hwxaoui163o.eq.0"
TRG 18 "DOR SWI-CNM020A"
^ SWI-CNM020B 1306 RED LAMP CONT RECIRC UNIT #35 FLOW VLV 1306 CONT S
IOR SWI-CNM020B (-1 0) ON
TRGSET 19 "hwxaoui163o.eq.0"
TRG 19 "DOR SWI-CNM020B"
^ SWI-CNM021A 1307 GREEN LAMP CONT RECIRC UNIT #35 FLOW VLV 1307 CONT
IOR SWI-CNM021A (-1 0) ON
TRGSET 20 "hwxaoui164o.eq.1"
TRG 20 "DOR SWI-CNM021A"
^ SWI-CNM021B 1307 RED LAMP CONT RECIRC UNIT #35 FLOW VLV 1307 CONT S
IOR SWI-CNM021B (-1 0) OFF
TRGSET 21 "hwxaoui164o.eq.1"
TRG 21 "DOR SWI-CNM021B"
```

**Indian Point Unit 3
2006 NRC Initial License Examination
Simulator Setup
Scenario 3**

^ MAL-RPS002A REACTOR TRIP BREAKERS FAIL TO OPEN (AUTO FAILURE)
IMF MAL-RPS002A (-1 0) TRUE
^ MAL-SIS001A SAFETY INJECTION FAILURE TRAIN A
IMF MAL-SIS001A (-1 0) TRUE
^ MAL-SIS001B SAFETY INJECTION FAILURE TRAIN B
IMF MAL-SIS001B (-1 0) TRUE
^ MAL-SIS004B SAFETY INJECTION PUMP 32 FAILURES
IMF MAL-SIS004B (-1 0) 1
^ MAL-PRS005A PRESSURIZER PRESSURE CHANNEL 455 FAILURE
IMF MAL-PRS005A (1 0) 2500.000000 21 2235.330078
^ MAL-PRS003C PRESSURIZER RELIEF VALVE 455C VALVE POSITION FAILURE
IMF MAL-PRS003C (2 0) 100.000000 180 0.000000
^ RWST Leak to 11 ft level in 40 minutes
TRG 3 "RAMP ASISRWST 2.82e6 7e5 2400"
^ MAL-RCS007C RCP 33 VIBRATION
IMF MAL-RCS007C (4 10) 14.000000 120 11.000000
^ MAL-RCS012C RCP 33 NUMBER 1 SEAL FAILURE
IMF MAL-RCS012C (4 0) 0.625000 0 0.000000
^ MAL-RCS002C REACTOR COOLANT PUMP 33 TRIP
IMF MAL-RCS002C (5 0) TRUE
^ Makes seal leak big after reactor trips
TRGSET 30 "jplp4(1).eq.1"
TRG 30 "IMF MAL-RCS012C (-1 0) 100.0 0 0.625000"
^ MAL-RCS001K RCS RUPTURE (LOOP 3 CROSSOVER LEG)
IMF MAL-RCS001K (30 0) 0.028000 0 0.000000

**Indian Point Unit 3
2006 NRC Initial License Examination
Booth Instructor Directions
Scenario 3**

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	EXPECTED RESPONSE/INSTRUCTOR CUES
IC Reset	10	Reset Simulator to IC 10
SES Setup Batch File	Run setup batch file NRC-3.bat and verify malfunctions and over-rides have been entered	
Floor Setup	Perform setup checklist	
Event 1	Actuate Trigger 1 At lead evaluator direction	^ MAL-PRS005A PRESSURIZER PRESSURE CHANNEL 455 FAILURE IMF MAL-PRS005A (1 0) 2500.000000 21 2235.330078
Role Play	If I&C is sent to investigate	Inform team you will look into the problem (no diagnosis before the end of the scenario).
Event 2	Actuate trigger 2 At lead evaluator direction	^ MAL-PRS003C PRESSURIZER RELIEF VALVE 455C VALVE POSITION FAILURE IMF MAL-PRS003C (2 0) 100.000000 180 0.000000
Role Play	If NPO sent to de-energize the block valve	Override the panel lamps off (red lamp and green lamp)
Event 3	Actuate Trigger 3 At lead evaluator direction	RWST Leak. The tank will be at 11 feet in 40 minutes from time of actuation.
Role Play	After lo level alarm, security calls and reports damage to RWST: If maintenance sent to try to stop the leak If NPO directed to align makeup to the RWST	The brakes failed on a truck which crashed into the tank and ruptured the tank. Water is gushing out from about 15 feet above the ground. Maintenance is unable to stop the leak Perform local NPO actions as requested to align makeup to the RWST

**Indian Point Unit 3
2006 NRC Initial License Examination
Booth Instructor Directions
Scenario 3**

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	EXPECTED RESPONSE/INSTRUCTOR CUES
Event 4	When outside agencies and personnel notified of shutdown. NPO directions during shutdown	Acknowledge reports and communication for plant shutdown Perform requested NPO actions during shutdown
Event 5	Actuate Trigger 4 At lead evaluator direction	^ MAL-RCS007C RCP 33 VIBRATION IMF MAL-RCS007C (4 10) 14.000000 120 11.000000 ^ MAL-RCS012C RCP 33 NUMBER 1 SEAL FAILURE IMF MAL-RCS012C (4 0) 0.625000 0 0.000000
Event 5	Actuate Trigger 5 At lead evaluator direction	^ MAL-RCS002C REACTOR COOLANT PUMP 33 TRIP IMF MAL-RCS002C (5 0) TRUE
	When reactor is tripped, trigger 30 auto actuates:	^ Makes seal leak big after reactor trips TRGSET 30 "jpplp4(1).eq.1" TRG 30 "IMF MAL-RCS012C (-1 0) 100.0 0 0.625000" ^ MAL-RCS001K RCS RUPTURE (LOOP 3 CROSSOVER LEG) IMF MAL-RCS001K (30 0) 0.028000 0 0.000000
Events 6-9 Role Play	Perform actions as directed by CCR When directed to align makeup to RWST	Perform various LOA's per NPO local task list Align RWST makeup as requested

**Indian Point Unit 3
2006 NRC Initial License Examination
Simulator Scenario Turnover Information
Scenario 1**

Watch Team Turnover Sheet:

Date/Time:	TODAY
RCS Temp:	567 °F
RCS Press:	2235 psig
PZR Level:	45 %
Condition:	Power Ops
% Power:	100%
MW Gross:	1078
Boron Conc:	1032 ppm
Control Rods	224 CBD

Plant Equipment Status:

1. No equipment out of service.
2. Maintain current plant conditions.

Op-Test No: 1 Scenario No: 3 Event No.: 1

Page 1 of 2

Event Description: Pressurizer Pressure Instrument (Controlling Channel) fails High

Time	Position	Applicant's Actions or Behavior
	Booth Instructor:	<i>When directed by the Lead Evaluator, actuate trigger 1:</i> MAL-PRS005A PRESSURIZER PRESSURE CHANNEL 455 FAILURE
	RO	Diagnose pressurizer pressure controlling channel instrument failure <ul style="list-style-type: none"> • Take manual control of pressurizer pressure control, close spray valves and energize heaters. • From memory, perform AOP-INST-1 immediate operator actions. • Control pressurizer pressure in manual. • Return pressurizer pressure to program.
	CRS	Direct team to perform immediate actions of AOP-INST-1, Instrument Controller Failures. <ul style="list-style-type: none"> • Verify that RO has taken manual control of pressurizer pressure • Implement AOP-INST-1
	BOP	Perform ARPs for alarms associated with the instrument failure <ul style="list-style-type: none"> • Pressurizer High Press Channel Trip • Pressurizer Low Press
	CRS	Direct BOP to defeat the failed PRZR Pressure Channel
	BOP	Defeat failed PRZR Pressure Channel <ul style="list-style-type: none"> • In rack B-6, place P/455A to DFT CH I IV • In rack B-8, place 3T/411A in DFT CH I

Op-Test No: 1 Scenario No: 3 Event No.: 1

Page 2 of 2

Event Description: Pressurizer Pressure Instrument (Controlling Channel) fails High

Time	Position	Applicant's Actions or Behavior
	CRS	Evaluate Technical Specifications: <ul style="list-style-type: none">• 3.4.1 – Requires pressure > 2205 in two hours• 3.3.1 – Requires RPS Bistables tripped in 6 hours• 3.3.2 – Requires SI Bistables tripped within 6 hours and Low Pressure Unblock SI in correct condition within 1 hour
	Lead Evaluator	Proceed to the next event after TS have been evaluated, or at the discretion of the lead evaluator. Direct the Booth Instructor to activate trigger 2

Op-Test No: 1 Scenario No: 3 Event No.: 2

Page 1 of 2

Event Description: Pressurizer PORV 455C fails open.

Time	Position	Applicant's Actions or Behavior
	<i>Booth Instructor:</i>	<i>When directed by the Lead Evaluator, actuate trigger 2:</i> MAL-PRS003C PRESSURIZER RELIEF VALVE 455C VALVE POSITION FAILURE
	RO	Diagnose open PORV – Take the following actions based on prudent operator actions to control the plant before an auto trip occurs: <ul style="list-style-type: none"> • Observe RCS pressure and determine that PORV should not be open for current conditions • Place control switch for PORV 455C to close • Observe that PORV is still Open • Place control switch for PORV 455C Block Valve to close • Observe block valve closed and PRZR Pressure rising
	BOP/RO	Perform ARP-004 page 32 and 33 for PCV-455C NOT FULLY CLOSED <ul style="list-style-type: none"> • Verify alarm • Check if PORV closes on pressure reduction • Determine PORV open due to failure • Close (or verify closed) affected block valve • Remove fuses for affected PORV solenoid (inside Flight Panel) • Dispatch NPO to de-energize affected block valve (MOV-535) Perform ARP-003 page 13 and 14 for PZR LOW PRESS alarm

Op-Test No: 1 Scenario No: 3 Event No.: 2

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Event Description: Pressurizer PORV 455C fails open.

Time	Position	Applicant's Actions or Behavior
	CRS	Direct crew's response to failed PORV Ensure block valve is closed Evaluate Technical Specification 3.4.11 Condition B – One PORV inoperable and incapable of being manually cycled: <ul style="list-style-type: none">• Close associated block valve within 1 hour• Remove power from associated block valve within 1 hour• Restore PORV to operable status with 7 days
Lead Evaluator		Proceed to the next event Direct the Booth Instructor to activate trigger 3

Op-Test No: 1 Scenario No: 3 Event No.: 3, 4

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Event Description:

Event 3: Loss of RWST level. Fork truck crashes into RWST resulting in level lowering to about 11 feet over 40 minutes

Event 4: Tech Spec Required Shutdown – Due to inoperable RWST, team commences a shutdown

Time	Position	Applicant's Actions or Behavior
		<p><i>Booth Instructor:</i></p> <p><i>When directed by the Lead Evaluator, actuate trigger 3: ^ RWST Leak to 11 ft level in 40 minutes TRG 3 "RAMP ASISRWST 2.82e6 7e5 2400"</i></p>
	ALL	Diagnose Lowering RWST Level
	BOP	<p>Perform ARP-012 for alarm panel SJF REFUELING WATER STORAGE TANK LO LEVEL</p> <ul style="list-style-type: none"> • Direct watch personnel to check for source of leakage • Monitor sump levels
		<p><i>Booth Instructor:</i></p> <p><i>Telephone CCR and inform them as Security Guard that a fork truck crashed into the RWST and split open a weld about 10 feet from the bottom of the tank and water is gushing from the tank.</i></p>
	CRS	<p>Evaluate TS 3.5.4</p> <ul style="list-style-type: none"> • Determine RWST is not operable • Determine Condition C applies and unlikely to restore operability within one hour • Determine Condition D applies and plant shutdown to mode 3 in 6 hours and mode 5 in 36 hours required.
	CRS	<p>Implement POP-2.1 Attachment 3, Reactor Power Reduction Checklist</p> <ul style="list-style-type: none"> • Develop reactivity plan to place unit in mode 3 within 6 hours • Direct shutdown activities during TS required shutdown

Op-Test No: 1 Scenario No: 3 Event No.: 3, 4

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Event Description:

Event 3: Loss of RWST level. Fork truck crashes into RWST resulting in level lowering to about 11 feet over 40 minutes

Event 4: Tech Spec Required Shutdown – Due to inoperable RWST, team commences a shutdown

Time	Position	Applicant's Actions or Behavior
	RO	Borate the RCS at rate determined by reactivity plan <ul style="list-style-type: none"> • Monitor TAVE and TREF • Monitor Delta-Flux and ensure control rods insert when required to maintain TAVE on program and Delta-flux within target band
	BOP	Initiate generator load reduction at rate directed by CRS
	Lead Evaluator	Proceed to the next event after load reduction has commenced Direct the Booth Instructor to activate trigger 4

Op-Test No: 1 Scenario No: 3 Event No.: 5

Page 1 of 1

Event Description: RCP Seal malfunction - High vibrations and #1 seal degradation. During shutdown, indications of RCP malfunction occur.

Time	Position	Applicant's Actions or Behavior
	Booth Instructor:	<p>When directed by the Lead Evaluator, actuate trigger 4:</p> <p>^ MAL-RCS007C RCP 33 VIBRATION IMF MAL-RCS007C (4 10) 14.000000 120 11.000000 ^ MAL-RCS012C RCP 33 NUMBER 1 SEAL FAILURE IMF MAL-RCS012C (4 0) 0.625000 0 0.000000</p>
	TEAM	Diagnose RCP Seal Malfunction
	BOP	<p>Perform ARPs for associated Alarms:</p> <p>ARP-013, REACTOR COOLANT PUMP HIGH VIBRATIONS ARP-009, RCP No. 1 SEAL RETURN HIGH LOW FLOW</p> <ul style="list-style-type: none"> Observe 33 RCP is affected
	RO	Diagnose rising seal return flow on RCP 33 seal return flow recorders
	CRS	Implement AOP-RCP-1
	Lead Evaluator	<p>Proceed to the next event after team determines that 33 RCP is affected</p> <p>Direct the Booth Instructor to activate trigger 5</p>

Op-Test No: 1 Scenario No: 3 Event No.: 6

Page 1 of 1

Event Description: While team is investigating RCP malfunction, the affected RCP trips. Auto reactor trip does not occur but manual trip is successful

Time	Position	Applicant's Actions or Behavior
	Booth Instructor:	When directed by the Lead Evaluator, actuate trigger 5: ^ MAL-RCS002C REACTOR COOLANT PUMP 33 TRIP IMF MAL-RCS002C (5 0) TRUE
	RO	Determine reactor trip is required but has not actuated <ul style="list-style-type: none"> Manually trips the reactor
	Critical Task	WOG CT E-0--A Manually trip the reactor from the CCR before completing E-0, Step 1
	TEAM	Diagnose 33 RCP has tripped
	CRS	Direct the team to perform the immediate actions of E-0, Reactor Trip or Safety Injection <ul style="list-style-type: none"> Ensures that the reactor is manually tripped following trip of 33 RCP without auto reactor trip
	Lead Evaluator	Proceed to the next event after team manually trips the reactor

Op-Test No: 1 Scenario No: 3 Event No.: 7,8,9

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Event Description: Seal LOCA on affected RCP occurs resulting in eventual Low Pressure SI actuation. SI fails to auto actuate, but manual SI is successful. 32 SI Pump fails to auto start and 34 and 35 FCU dampers do not auto reposition to incident mode

Time	Position	Applicant's Actions or Behavior
	<i>Booth Instructor:</i>	<i>Verify that trigger 30 actuated when the reactor tripped. Trigger 30 causes a 300 gpm seal LOCA on 33 RCP.</i>
	CRS	Enter EOP E-0, Reactor Trip or Safety Injection and direct the actions of the crew. <ul style="list-style-type: none"> • Verifies immediate actions using the procedure • Directs BOP to implement RO-1 • When RCS subcooling lowers, directs RO to trip RCPs • Diagnoses Loss of RCS Coolant and transitions to EOP E-1
	RO	Performs EOP actions as directed by the CRS Determines SI is required but not actuated and manually actuates SI. (Critical task) When RCS subcooling lowers to < 32°F, verifies SI pumps running and stops all RCPs. (Critical task)
	Critical Task	WOG CT E-0--D Manually actuate at least one train of SIS actuated safeguards before any of the following: <ul style="list-style-type: none"> • Transition to any E-1, E-2, or E-2 series or FR procedures • Completion of ES-0.1, step 5A
	Critical Task	WOG CT E-1--C Trip all RCPs before the completion of E-1, step 1 NOTE: This task is only critical if subcooling lowers to <32°F and is dependant upon timing of previous actions. If subcooling does not lower to < 32°F, then this task will not be performed and is not critical.

Op-Test No: 1 Scenario No: 3 Event No.: 7,8,9

Page 2 of 3

Event Description: Seal LOCA on affected RCP occurs resulting in eventual Low Pressure SI actuation. SI fails to auto actuate, but manual SI is successful. 32 SI Pump fails to auto start and 34 and 35 FCU dampers do not auto reposition to incident mode

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Verifies automatic actions occurred</p> <ul style="list-style-type: none"> • Determines that 32 SI pump did not auto start and manually starts it. • Determines 34 and 35 FCU dampers did not auto reposition to incident mode and manually repositions dampers using control switches. • Informs CRS of status <p>Resets SI</p>
	CRS	<p>Enter EOP E-1 Loss of Reactor or Secondary Coolant and direct the actions of the crew</p> <ul style="list-style-type: none"> • Holds a crew brief upon transition • Transitions to ES-1.3 when RWST Low-Low level annunciators alarm.
	RO/BOP	<p>When RWST LOW-LOW LEVEL annunciators alarm, immediately inform the CRS so that a transition to ES-1.3 is made.</p>
	CRS	<p>Directs the crew actions during performance of ES-1.3, Transfer to Cold Leg Recirculation</p>
	TEAM	<p>Diagnose that containment level is not trending upwards and that VC level is not greater than 47'8" (due to RWST rupture from fork truck.)</p> <ul style="list-style-type: none"> • Transition to ECA-1.1, Loss of Emergency Coolant Recirculation

Op-Test No: 1 Scenario No: 3 Event No.: 7,8,9

Page 3 of 3

Event Description: Seal LOCA on affected RCP occurs resulting in eventual Low Pressure SI actuation. SI fails to auto actuate, but manual SI is successful. 32 SI Pump fails to auto start and 34 and 35 FCU dampers do not auto reposition to incident mode

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Directs crew actions during performance of ECA-1.1, Loss of Emergency Coolant Recirculation</p> <ul style="list-style-type: none"> • Diagnose cause of loss of recirculation capability is not due to sump blockage • Verify availability of recirculation equipment (equipment is available, adequate sump level to support recirc is not) • Dispatch personnel to align makeup to the RWST
	RO	<p>Initiate RCS cooldown</p> <ul style="list-style-type: none"> • Verify all rods inserted • Dump steam to condenser using high pressure steam dumps • Maintain cooldown rate < 100°F/hr
	BOP	<p>Check for indications of sump blockage</p> <p>Check recirc equipment available</p> <p>Align makeup to the RWST</p> <p>Check FCU aligned for incident mode</p> <p>Verify SI reset</p> <p>Establish one train of SI flow</p> <ul style="list-style-type: none"> • Stops two SI pumps
	Critical Task	<p>WOG CT ECA-1.1--B</p> <p>Make up to the RWST and minimize outflow before the end of the scenario.</p> <ul style="list-style-type: none"> • This CT is satisfied by dispatching personnel to align makeup to the RWST and by reducing SI flow to a single train

Op-Test No: 1 Scenario No: 3 Event No.: 7,8,9

Page 4 of 3

Event Description: Seal LOCA on affected RCP occurs resulting in eventual Low Pressure SI actuation. SI fails to auto actuate, but manual SI is successful. 32 SI Pump fails to auto start and 34 and 35 FCU dampers do not auto reposition to incident mode

Time	Position	Applicant's Actions or Behavior
	Lead Evaluator	Terminate the after scenario SI has been reduced to one train, or at the discretion of the Lead Evaluator. If required, administer JPM SRO-A-5 to the CRS

Facility: Indian Point 3 Scenario No: 4 Rev.1 Op-Test No: 1

Examiners: _____ Operators: _____

Initial Conditions:

Scenario begins with the plant stable at 100% power. 31 ABFP has been out of service for 10 hours for bearing inspections with an expected return to service in 12 hours.

Turnover:

31 ABFP has been out of service for 10 hours for bearing inspections with an expected return to service in 12 hours.

Maintain Current Plant Conditions

Event No:	Malf. No.	Event Type*	Event Description
1	XMT-MSS019	I (ATC) I (CRS)	PT-412A fails low TS CRS
2	XMT-MSS019	C (ATC) N (BOP) N (CRS) R (ATC) R (CRS)	Loss of Condenser Vacuum and subsequent power reduction
3	AL-CFW005C	C (ALL) R (ATC) R (CRS)	Condensate Pump trip
4	MAL-CFW015	M (ALL)	FW rupture in Turbine bldg
5	MAL-RPS002A	C (ATC)	Auto reactor trip failure, one RTB does not open
6	MAL-CFW001C	C(BOP)	MDAFP 33 fails to start (with 31 MDADP OOS) manual action required to feed with turbine driven ABFP
7	MAL-CFW001B		TDAFP trip, results in loss of heat sink

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

Scenario Event Description
NRC Scenario #4

Scenario begins with the plant stable at 100% power. 31 ABFP has been out of service for 10 hours for bearing inspections with an expected return to service in 12 hours.

After the crew has the watch, PT-412A fails low. The crew responds by placing rods in manual and entering AOP-INST-1, Instrument/Controller Failures. CRS will direct the crew to restore delta-flux to target and return Tave to program (withdraw rods to pre-failure position is expected.) CRS will reference TS for ESFAS instruments, and for power distribution if rod inserted enough to affect delta flux.

After the plant is stabilized, a condenser vacuum leak will occur. The crew will identify the loss of vacuum and perform a load reduction per AOP-VAC-1, Loss of Condenser Vacuum. After load has been reduced about 50 MW, 33 Condensate Pump will trip. The team will perform AOP-FW-1, Loss of Feedwater to stabilize the plant. Prior to completing the actions of AOP-FW-1, a rupture will occur in the main feedwater pipe in the turbine building. The reactor will not auto trip, but manual trip is successful.

The team will enter EOP E-0, Reactor Trip or Safety Injection. 33 ABFP will trip immediately after start. The team will manually align FCVs to feed SGs with the turbine driven ABFP and then exit E-0 to ES-0.1, Reactor Trip Response. While performing ES-0.1, the Turbine Drive ABFP will trip resulting in a loss of heat sink. The team will recognize a red path in Heat Sink with heat sink required and transition to FRP FR-H.1, Loss of Heat Sink. SG levels will require the plant be aligned for bleed and feed.

The scenario will be terminated when adequate core cooling has been verified following alignment of bleed and feed.

Procedure Flowpath: AOP-INST-1, AOP-VAC-1, AOP-FW-1, EOP E-0, EOP ES-0.1, FRP FR-H.1

**Indian Point Unit 3
2006 NRC Initial License Examination
Simulator Scenario Setup
Scenario 4**

NRC-4.bat

^ SWI-AFW009A GREEN LAMP AUX FEEDWATER PUMP NO. 31 CONTROL SWITCH
MO
IOR SWI-AFW009A (-1 0) OFF
^ SWI-AFW009D STOP AUX FEEDWATER PUMP NO. 31 CONTROL SWITCH
MODULE
IOR SWI-AFW009D (-1 0) ON
^ SWI-AFW009F START AUX FEEDWATER PUMP NO. 31 CONTROL SWITCH
MODULE
IOR SWI-AFW009F (-1 0) OFF
^ SWI-AFW009G PULL OUT POS AUX FEEDWATER PUMP NO. 31 CONTROL
SWITCH
IOR SWI-AFW009G (-1 0) OFF
^ MAL-RPS002A REACTOR TRIP BREAKERS FAIL TO OPEN (AUTO FAILURE)
IMF MAL-RPS002A (-1 0) TRUE
^ MAL-RPS006A REACTOR TRIP BREAKER A FAILURE TO OPEN
IMF MAL-RPS006A (-1 0) TRUE
^ XMT-MSS019 TURB 1ST STAGE PRESSURE
IMF XMT-MSS019 (1 0) 0.000000 0 653.484985
^ MAL-CND002B LOSS OF VACUUM CONDENSOR 32
IMF MAL-CND002B (2 0) 20.000000 0 0.000000
^ MAL-CFW005C CONDENSATE PUMP 33 TRIP DUE TO BRG FAILURE
IMF MAL-CFW005C (3 0) 1.000000 0 0.000000
^ MAL-CFW015A FEEDLINE BREAK OUTSIDE CONTAINMENT - S/G 31
IMF MAL-CFW015A (4 0) 1e6 0 0.000000
^ MAL-CFW015B FEEDLINE BREAK OUTSIDE CONTAINMENT - S/G 32
IMF MAL-CFW015B (4 0) 1e6 0 0.000000
^ MAL-CFW015C FEEDLINE BREAK OUTSIDE CONTAINMENT - S/G 33
IMF MAL-CFW015C (4 0) 1e6 0 0.000000
^ MAL-CFW015D FEEDLINE BREAK OUTSIDE CONTAINMENT - S/G 34
IMF MAL-CFW015D (4 0) 1e6 0 0.000000
^ MAL-CFW001B AUXILIARY FEEDWATER PUMP 32 TRIP
IMF MAL-CFW001B (5 0) TRUE
^ MAL-CFW001C AUXILIARY FEEDWATER PUMP 33 FAILURES
IMF MAL-CFW001C (30 80) 0
TRGSET 30 "jpplp4(2).eq.1"

**Indian Point Unit 3
2006 NRC Initial License Examination
Booth Instructor Directions
Scenario 4**

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	EXPECTED RESPONSE/INSTRUCTOR CUES
IC Reset	10	Reset Simulator to IC 10
SES Setup Batch File	Run setup batch file NRC-3.bat and verify malfunctions and over-rides have been entered	Place 31 ABFP to pullout and apply a danger tag. Put protected equipment placards on 32 and 33 ABFPs. Update the protected equipment computer display. Risk is yellow.
Floor Setup	Perform setup checklist	
Event 1	Actuate Trigger 1 At lead evaluator direction	^ XMT-MSS019 TURB 1ST STAGE PRESSURE IMF XMT-MSS019 (1 0) 0.000000 0 653.484985
Role Play	If I&C or NPO is sent to investigate	I&C will review prints and develop a troubleshooting plan but will not actually do anything during this scenario There are no obvious anomalies locally at the transmitter.
Event 2	Actuate trigger 2 At lead evaluator direction BOOTH INSTRUCTOR: Control size of vacuum leak to maintain condenser vacuum greater than 26.5" Hg. Delete the air leak malfunction after the load reduction has begun.	^ MAL-CND002B LOSS OF VACUUM CONDENSOR 32 IMF MAL-CND002B (2 0) 20.000000 0 0.000000
Role Play	If NPO sent to investigate loss of vacuum	Acknowledge request to search for vacuum leak. Don't report back before next event.
Event 3	Actuate Trigger 3 At lead evaluator direction	^ MAL-CFW005C CONDENSATE PUMP 33 TRIP DUE TO BRG FAILURE IMF MAL-CFW005C (3 0) 1.000000 0 0.000000

**Indian Point Unit 3
2006 NRC Initial License Examination
Booth Instructor Directions
Scenario 4**

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	EXPECTED RESPONSE/INSTRUCTOR CUES
Role Play	If NPO dispatched	Oil has come out of the upper motor bearing
Event 4	Actuate Trigger 4 At lead evaluator direction but before team trips reactor or auto reactor trip if not successful at stabilizing plant following previous events.	^ MAL-CFW015A FEEDLINE BREAK OUTSIDE CONTAINMENT - S/G 31 IMF MAL-CFW015A (4 0) 1e6 0 0.000000 ^ MAL-CFW015B FEEDLINE BREAK OUTSIDE CONTAINMENT - S/G 32 IMF MAL-CFW015B (4 0) 1e6 0 0.000000 ^ MAL-CFW015C FEEDLINE BREAK OUTSIDE CONTAINMENT - S/G 33 IMF MAL-CFW015C (4 0) 1e6 0 0.000000 ^ MAL-CFW015D FEEDLINE BREAK OUTSIDE CONTAINMENT - S/G 34 IMF MAL-CFW015D (4 0) 1e6 0 0.000000
Role Play	NPO Report When NPO dispatched to open failed RTB	Call the CCR and NPO report that feedwater line has ruptured in the overhead of the 15' elevation north end of turbine hall Delete MAL-RPS006A
Event 5, 6	Actuate Trigger 5 At lead evaluator direction	^ MAL-CFW001B AUXILIARY FEEDWATER PUMP 32 TRIP IMF MAL-CFW001B (5 0) TRUE
Role Play	When dispatched to reset 32 ABFP	NPO reports that he cannot reset the overspeed latch on 32 ABFP. It is broken.
Events 7 Role Play	Perform actions as directed by CCR	Perform various LOA's per NPO local task list

**Indian Point Unit 3
2006 NRC Initial License Examination
Simulator Scenario Turnover Information
Scenario 4**

Watch Team Turnover Sheet:

Date/Time:	TODAY
RCS Temp:	567 °F
RCS Press:	2235 psig
PZR Level:	45 %
Condition:	Power Ops
% Power:	100%
MW Gross:	1078
Boron Conc:	1032 ppm
Control Rods	224 CBD

Plant Equipment Status:

1. 31 ABFP has been out of service for 10 hours for bearing inspections with an expected return to service in 12 hours.
 - Technical Specification 3.7.5 Condition B applies.
2. Maintain current plant conditions.

Op-Test No: _____ Scenario No: 4 Event No.: 1

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Event Description: PT-412A, Turbine First Stage Pressure instrument fails low. This causes Tref to fail low and control rods auto insert. Team takes actions per AOP-INST-1

Time	Position	Applicant's Actions or Behavior
	Booth Instructor	Activate trigger 1 when directed by the lead examiner.
	RO	Diagnose PT-412A instrument failure <ul style="list-style-type: none"> • Check Tave, Turbine Load, Reactor Power and determine that auto rod insertion is not required • Place Rod Control Mode Selector switch to MAN to stop auto rod insertion
	CRS	Direct RO to perform immediate actions of AOP-INST-1, Instrument/Controller Failures
	BOP	Perform ARPs for alarms associate with instrument failure: <ul style="list-style-type: none"> • HIGH STEAM FLOW SI CHANNEL TRIP • TAVG TREF DEVIATION • Verify instrument failure has occurred and CRS has implemented AOP-INST-1.
	RO	Performs AOP-INST-1 Immediate Actions: <ul style="list-style-type: none"> • Checks for control system failures • Determines that Rod Control has failed and places rod control in manual • Announce immediate actions complete when all control systems have been checked
	CRS	Announces entry into AOP-INST-1 and directs the actions of the crew <ul style="list-style-type: none"> • Verifies that all control systems have been checked and manual actions performed to stabilize the plant (rods in manual) • Verifies that an instrument failure has occurred • Performs section for Turbine 1st Stage Pressure instrument failure • Verify that Channel A has failed

Op-Test No: _____ Scenario No: 4 Event No.: 1

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Event Description: PT-412A, Turbine First Stage Pressure instrument fails low. This causes Tref to fail low and control rods auto insert. Team takes actions per AOP-INST-1

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Direct crew activities</p> <ul style="list-style-type: none"> • Verify that rods are in manual • Direct RO to determine Tref based on graph RPC-9 • Develop a reactivity plan to restore Tave to program (expected action is to withdraw control rods to pre-failure position) using rods, boron, or turbine load. • Direct RO to perform reactivity manipulation (withdraw rods)
	RO	<p>Refer to graphs RPC-9 (Tref vs 1st stage Pressure) and PT-412B indication to determine program Tref.</p> <p>Restore Tave to Tref and Delta-flux to target by withdrawing control rods</p> <ul style="list-style-type: none"> • Operates Rod Control In-Hold-Out switch in OUT position <ul style="list-style-type: none"> ○ observes Control Bank D bank demand and ○ IRPI position, ○ monitors reactor power, ○ delta-flux, and ○ Tavg.
	BOP	Performs peer check of rod withdrawal
	RO	<p>Place Steam Controller in Pressure Mode</p> <ul style="list-style-type: none"> • Place steam dump controller in manual • Adjust controller output to 0% • Place steam dump control switch to RESET and then to PRESS CONT.
	BOP	Place AMSAC BS/2MSS 400 block switch to BYPASS (up) position

Op-Test No: _____ Scenario No: 4 Event No.: 1

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Event Description: PT-412A, Turbine First Stage Pressure instrument fails low. This causes Tref to fail low and control rods auto insert. Team takes actions per AOP-INST-1

Time	Position	Applicant's Actions or Behavior
	CRS	<p>Evaluate Technical Specification table 3.3.1-1 Function 17 for required action</p> <ul style="list-style-type: none"> • Verify interlocks (P-7) in correct state for plant conditions within 1 hour. • Direct RO to verify Power Below P-7 lamp is extinguished (within 1 hour) <p>Evaluate Technical Specification 3.3.2 Condition A</p> <ul style="list-style-type: none"> • Requires evaluation of Table 3.3.2-1. • Functions 1f, 1g, 4d, and 4e all require entry into Condition D • Condition D requires tripping bistables within 6 hours. <p>Evaluate TRM 3.1.A AMSAC – 30 Days to restore AMSAC to operable.</p>
	Lead Evaluator	Direct the Booth Instructor to actuate Trigger 2 to start the condenser vacuum leak. It will be a couple minutes until the team notices vacuum lowering
	BOP	Check bistables status lights for redundant channels extinguished per Attachment 11 Table 1
	BOP	<p>Trip bistables for failed instrument listed in Attachment 11 Table 2</p> <p>Verify bistable status lights for failed instrument are illuminated per Attachment 11 Table 3.</p>
	Lead Evaluator	Proceed to next event when the team determines vacuum is lowering, or at the discretion of the Lead Evaluator.

Op-Test No: _____ Scenario No: 4 Event No.: 2

Page 1 of 2

Event Description: Condenser vacuum begins to lower due to air in-leakage. The team takes action per AOP-VAC-1 and commences a turbine load reduction.

Time	Position	Applicant's Actions or Behavior
	Booth Instructor	<p><i>When directed by the lead examiner, actuate trigger 2.</i></p> <p><i>Control the size of the vacuum leak to maintain condenser vacuum greater than 26.5" Hg.</i></p> <p><i>Delete the air leak malfunction after the load reduction has begun.</i></p>
	RO	<p>Diagnose loss of vacuum</p> <ul style="list-style-type: none"> • Generator MW load lowering • Vacuum recorder on panel FDF • Computer Trends
	CRS	<p>Implement AOP-VAC-1, Loss of Condenser Vacuum</p> <ul style="list-style-type: none"> • Supervise and direct actions of the crew • Develop a reactivity plan (~100 MWe expected) to reduce turbine load to maintain condenser and LP turbine parameters within allowed values. • Dispatch NPOs to perform Attachment 5 to investigate source of vacuum loss
	Booth Instructor	<p><i>When NPOs are dispatched, acknowledge request but do not report back with source of vacuum leak</i></p>
	BOP	<p>Check condenser vacuum parameters to determine if load reduction is necessary.</p>
	CRS	<p>Direct power reduction and reactivity manipulations</p>
	RO	<p>Borate and/or insert control rods per the reactivity plan</p>

Op-Test No: _____ Scenario No: 4 Event No.: 2

Page 2 of 2

Event Description: Condenser vacuum begins to lower due to air in-leakage. The team takes action per AOP-VAC-1 and commences a turbine load reduction.

Time	Position	Applicant's Actions or Behavior
	BOP/RO	Lower turbine load
Lead Evaluator		After ~ 50 MWe load reduction, proceed to next event. Direct the Booth Instructor to activate Trigger 3 to cause 33 Condensate Pump trip

Op-Test No: _____ Scenario No: 4 Event No.: 3

Page 1 of 1

Event Description: 33 Condensate Pump trips. Team implements AOP-FW-1, Loss of Feed Water to stabilize the plant. Main Boiler Feed Pumps begin low suction pressure cutbacks that cause Main Feed Flow oscillations.

Time	Position	Applicant's Actions or Behavior
	Booth Instructor	<i>When directed by the Lead Evaluator, activate trigger 3 to trip 33 Condensate Pump</i>
	ALL	Diagnose Condensate Pump Trip
	CRS	Implement AOP-FW-1, Loss of Feedwater. <ul style="list-style-type: none"> • Direct the RO to perform immediate actions of AOP-FW-1 • Supervise and direct the actions of the crew
	RO	Perform immediate actions of AOP-FW-1 <ul style="list-style-type: none"> • Check both Main Boiler Feed Pumps operating • Announce immediate actions complete
	BOP	Continue load reduction to reduce Steam Flow < Feed Flow
	CRS	Verify immediate actions complete Perform procedure section for Heater Drain or Condensate Pump trip <ul style="list-style-type: none"> • Verify all available condensate pumps are running • Direct RO/BOP to initiate/continue load reduction as necessary to maintain FF>SF and MBFP suction pressure > 265 psig.
	Lead Evaluator	Direct the Booth Instructor to activate trigger 4 before the reactor trips (or before manual trip). Allow the team to continue load reduction until FF>SF or at the discretion of the Lead Evaluator. MBFP suction pressure cutback is expected and is the planned initiator for the next event: Main Feed Line Rupture in turbine hall

Op-Test No: _____ Scenario No: 4 Event No.: 4,5,6

Page 1 of 3

Event Description: Main Feed Line rupture in the turbine hall (due to the flow oscillations from the MBFP suction pressure cutback). Auto reactor trip does not occur. Reactor must be manually tripped.

Time	Position	Applicant's Actions or Behavior
	Booth Instructor	<i>When directed by the Lead Evaluator (or before reactor trip occurs if the team has difficulty stabilizing the plant) execute trigger 4 to cause a main feedwater line rupture in the turbine hall. After E-0 immediate actions are complete, call the CCR and NPO report that feedwater line has ruptured in the overhead of the 15' elevation north end of turbine hall.</i>
	RO	Diagnose rapidly lowering SG levels <ul style="list-style-type: none"> Manually actuate reactor trip
	Critical Task	WOG CT: E-0--A Manually trip the reactor from the CCR before completion of E-0, step 1.
	CRS	Direct team to perform immediate actions of E-0 Reactor Trip or Safety Injection <ul style="list-style-type: none"> Verifies immediate actions using the procedure.
	RO	Verify Reactor is tripped <ul style="list-style-type: none"> Determine one RTB did not open Dispatch NPO to locally open RTB's Verify turbine is tripped
	BOP	Verify all 480 V buses energized

Op-Test No: _____ Scenario No: 4 Event No.: 4,5,6

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Event Description: Main Feed Line rupture in the turbine hall (due to the flow oscillations from the MBFP suction pressure cutback). Auto reactor trip does not occur. Reactor must be manually tripped.

	RO	<p>Check if SI is actuated</p> <ul style="list-style-type: none"> • Checks for SI annunciators • Checks for SI system pumps running <p>Check if SI is required</p> <ul style="list-style-type: none"> • Checks Containment pressure • Checks PRZR Pressure • Checks PRZR Level • Checks Steamline delta-P • Checks High Steam Flow • Checks subcooling • Determines SI is not required
	RO	<p>Observes 33 ABFP has tripped and 31 ABFP is OOS</p> <p>Manually aligns 32 ABFP to establish > 686 gpm feed flow to the SGs</p> <ul style="list-style-type: none"> • Throttles open FCV-405A though D • Adjust HCV-1118 as necessary to obtain desired discharge pressure • Announces immediate actions complete
	Critical Task	<p>WOG CT: E-0--F</p> <p>Establish greater than 365 gpm AFW flow to the SGs before transition out of E-0 or tripping RCPs in FR-H.1</p>
<i>Booth Instructor</i>		<i>NPO reports that feedwater line has ruptured in the overhead of the 15' elevation north end of turbine hall</i>

Op-Test No: _____ Scenario No: 4 Event No.: 4,5,6

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Event Description: Main Feed Line rupture in the turbine hall (due to the flow oscillations from the MBFP suction pressure cutback). Auto reactor trip does not occur. Reactor must be manually tripped.

	CRS	<p>Verifies completion of immediate actions using the procedure</p> <p>Transitions to ES-0.1, Reactor Trip Response</p> <p>Holds a brief</p> <p>Directs the actions of the crew in ES-0.1</p>
	RO	<p>Check RCS Average Temperatures stable or trending to 547°F</p> <p>Check 345KV Motor Operated Disconnect F1-3 OPEN</p>
Lead Evaluator		<p>Proceed to the next event when the team determines a transition to FR-H.1 is required</p> <p>Direct the Booth Instructor to activate Trigger 5 to trip 32 ABFP</p>

Op-Test No: _____ Scenario No: 4 Event No.: 7

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Event Description: 32 ABFP trips with no other ABFPs available and SG levels very low. Team goes to FR-H.1, Response to Loss of Secondary Heat Sink and must immediately proceed to the steps for aligning bleed and feed.

Time	Position	Applicant's Actions or Behavior
	Booth Instructor	<p><i>When directed by the Lead Evaluator, activate Trigger 5 to trip 32 ABFP</i></p> <p><i>When an NPO is dispatched to attempt to reset it, the NPO is unable to re-latch the over-speed trip mechanism (it is broke).</i></p>
	ALL	<p>Diagnose trip of 32 ABFP</p> <p>Determine that a Red Path exists on the heat sink CSF and transition to FR-H.1, Response to Loss of Secondary Heat Sink</p>
	CRS	<p>Direct the actions of the crew</p> <p>Review Foldout page Criteria for Bleed and Feed</p>
	BOP/RO	<p>Check the average of the three lowest WR SG Levels < 25%</p> <p>Check RCS pressure > than the highest SG Pressure</p>
	CRS	<p>Immediately proceed to step 9 to establish bleed and feed</p>
	RO	<p>Manually actuate SI</p> <p>Close all MSIVs</p> <p>Stop all Reactor Coolant Pumps</p>
	RO	<p>Verify RCS Feed Path</p> <ul style="list-style-type: none"> • Check SI pumps running • Check Safeguard Valve Off Normal Position alarm clear • Ensure BIT discharge valves 1835A and 1835B open • Ensure BIT Inlet valves 1852A and 1852B open • Ensure High Head Stop Valves 856J, 856H, 856C, 856E open

Op-Test No: _____ Scenario No: 4 Event No.: 7

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Event Description: 32 ABFP trips with no other ABFPs available and SG levels very low. Team goes to FR-H.1, Response to Loss of Secondary Heat Sink and must immediately proceed to the steps for aligning bleed and feed.

	RO	<p>Establish RCS Bleed Path</p> <ul style="list-style-type: none"> • Check power available to both PORV Block valves • Check both PORV Block Valves open • OPEN both PRZR PORVS
	RO	<p>Verify adequate RCS Bleed path</p> <ul style="list-style-type: none"> • Check both PORVs open • Check both Block valves open
	Critical Task	<p>WOG CT: FR-H.1--F</p> <p>Establish RCS bleed and feed when the average of the three lowest SG Levels reach 25% WR</p>
	BOP	<p>Reset SI</p> <ul style="list-style-type: none"> • Place FCU damper control switches to SI position • Place 1104 and 1105 control switches to OPEN • Place control room AC to switch position 3 • Dispatch NPO to set switches for 1176 and 1176A to OPEN • Perform steps 35-42 of E-0 <ul style="list-style-type: none"> ○ Verify SI pumps running ○ Verify FCU status ○ Verify SI valve alignment ○ Verify ABFP status – Dispatch NPO ○ Verify CCW status ○ Verify ESW status ○ Verify Phase A actuated ○ Verify Containment Ventilation Isolation status

Op-Test No: _____ Scenario No: 4 Event No.: 7

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Event Description: 32 ABFP trips with no other ABFPs available and SG levels very low. Team goes to FR-H.1, Response to Loss of Secondary Heat Sink and must immediately proceed to the steps for aligning bleed and feed.

	BOP	Reset SI <ul style="list-style-type: none">• Reset Phase A• Check PORV N2 Lo pressure alarm clear
	ALL	Maintain RCS Heat Removal <ul style="list-style-type: none">• Maintain SI Flow• Maintain PORVs open
Lead Evaluator		Terminate the scenario at this point, or at the discretion of the Lead Evaluator If required, administer JPM SRO-A-5 to the CRS