

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

Examiners: _____ Operators: _____

Initial Conditions: 100% Reactor Power.

Turnover: The team takes the shift with LI- 417A removed from service and they will have direction to perform a plant shutdown.

Event No.	Malf. No.	Event Type*	Event Description
1	MAL-SGN001A	R(ATC) N(CRS, BOP)	Team enters with direction to perform a plant shutdown. LI 417A failed and has been removed from service per AOP
2	MAL-CRF003AN	C (ALL) TS/TRM (CRS)	Dropped Rod N3 in Control Bank C
3	MAL-CFW012B	I (CRS, ATC) TS (CRS)	Feed flow transmitter 418B fails high
4	MAL-CCW008	C (ALL)	Loss of CCW to NRXH due to leak
5	MAL-MSS002B	M(ALL)	Steam Line break 32 SG outside containment upstream of MSIV.
6	MAL-SIS004A MAL-SIS004B MAL-SIS004C	C (CRS BOP)	Failure of all HHSI pumps to automatically start on SI signal
7	MAL-SGN005B	C (ALL)	SGTR on 32 SG post faulted SG isolation
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Simulator Exam Scenario 1 Summary

The evaluation begins with the plant at 100% power with the direction to perform a POP shutdown in four hours for a forced outage. The following equipment is out of service:

- 31 SG level channel 417A failed low on previous shift and was removed from service per AOP-INST-1, Instrument or Controller Failures including tripping bistables.

The team will be briefed they will be performing the shutdown and provided with POP-2.1, SOP-CVCS-003, OPT-25 Reactivity Summary Sheet, and the Graphs Book.

The team will begin the shutdown. After sufficient shutdown activities have been observed, Control Bank C rod N3 will drop. The team will respond using AOP-ROD-1, Rod Control and Indication Malfunctions. The ATC will place rods in manual and the BOP will reset the dropped rod mode switch. The CRS will evaluate TS.

Next, 31 SG B channel feed flow instrument will fail high. The team will take action to stabilize the plant and the ATC will transfer to the unaffected feed flow channel using AOP-INST-1, Instrument or Controller Failure. TS 3.3.1, Reactor Protection System Instrumentation will require a 6 hour AOT to trip bistables. The team will determine that they will not be able to trip bistables due to conflict with the previous failure. (Tripping bistables would result in a reactor trip.)

A leak will be discovered upstream of TCV-130 requiring isolation of CCW to the Non-Regenerative Heat Exchanger. Isolation of the leak will result in isolation of letdown and the need to place excess letdown in service per AOP-CCW-1, Loss of CCW and AOP-CVCS-1, Chemical and Volume Control Malfunctions.

After the team has established excess letdown, a steam break will occur on 32 SG steam line outside the VC and upstream of the MSIV. Due to the uncontrolled cooldown, the team will trip the reactor, and respond using E-0, Reactor Trip or Safety Injection. When it is noted that 32 SG is depressurizing, SI will be initiated. The team will need to start all HHSI pumps since auto start is defeated by a simulator malfunction.

When the team enters E-2, Faulted SG isolation, a SGTR will occur on 32 SG. The team may diagnose the SGTR due to SG pressure and level. The team may also continue to E-1 if symptoms are not picked up. The team will diagnose the SGTR and transition to E-3 either from E-2 or E-1.

The team will continue in E-3 will transition to ECA-3.1 when ruptured SG pressure is determined less than 400 psig. When cooldown is commenced or properly evaluated in ECA-3.1, the scenario will be terminated.

Procedure Flowpath: POP-2.1, AOP-INST-1, AOP-ROD-1, AOP-CCW-1, AOP-CVCS-1, E-0, E-2, E-1, E-3, ECA-3.1

Critical Tasks:

E-2 -- A	Isolate the faulted SG before transition out of E-2.
Non-WOG	Manually start at least two HHSI pumps before completion of RO-1 steps 1-12.
ECA-3.1—B	Cool down the RCS to CSD conditions at the highest achievable rate w/o exceeding 100F/hr.

EXPLANATION OF CREDITED ACTIONS:

Event 1 – Team performs shutdown. The ATC will borate and possibly drive rods. The BOP will lower load using the governor. The CRS will coordinate the evolution.

Event 2 - Dropped Rod N3. The ATC will place rods in manual. The BOP will reset the dropped rod at the NI drawer. The CRS will evaluate Tech Specs.

Event 3 – Feedflow Transmitter 418B fails high. The ATC will swap to the unaffected channel. The BOP will trip bistables. The CRS will evaluate Tech Specs.

Event 4 – Loss of CCW to NRHX due to leak. The ATC will operate the running charging pump in manual. The BOP will place Excess Letdown in service. The will coordinate the evolution.

Event 5 – Steam line break. This is the major event for the team. The reactor will be tripped and MSIVs closed. The team will initiate SI.

Event 6 – Failure of HHSI pumps to autostart on SI. The BOP will start HHSI pumps. The CRS will ensure this is action is taken.

Event 7 – SGTR on faulted SG. This will cause the team to transition to E-3 and ECA-3.1. A plant cooldown will be required.

2017 Scenario 1 Schedule File

At Time	On Event	Action	Description
00:00:00	None	Insert malfunction MAL-SGN001A to 0	STEAM GENERATOR LEVEL TRANSMITTER FAILURE (LT-417A)
00:00:00	2	Insert malfunction MAL-CRF003AN to STATIONARY on event 2	DROPPED ROD (CBC-N3)
00:00:00	3	Insert malfunction MAL-CFW012B to 4.00000 on event 3	FEEDWATER FLOW TRANSMITTER FT-418B FAILURE
00:00:00	4	Insert malfunction MAL-CCW008 to 5.00000 on event 4	LOSS OF CCW TO NON-REGENERATIVE HX (PIPE RUPTURE)
00:00:00	5	Insert malfunction MAL-MSS002B to 1518000.00000 in 180 on event 5	STEAMLINE BREAK OUTSIDE CONTAINMENT (S/G 32)
00:00:00	6	Insert malfunction MAL-SGN005B to 12.00000 in 300 on event 6	STEAM GENERATOR 32 TUBE LEAK
00:00:00	None	Insert malfunction MAL-SIS004A to FAILURE_TO_AUTOSTART	SAFETY INJECTION PUMP 31 FAILURES
00:00:00	None	Insert malfunction MAL-SIS004B to FAILURE_TO_AUTOSTART	SAFETY INJECTION PUMP 32 FAILURES
00:00:00	None	Insert malfunction MAL-SIS004C to FAILURE_TO_AUTOSTART	SAFETY INJECTION PUMP 33 FAILURES
None	None	Insert remote LOA-CCW033 to 0 on event 10	810 NON-REGEN HX INLET ISO
None	None	Insert remote LOA-CCW034 to 0 on event 10	814 NON-REGEN HX OUTLET ISO

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	EXPECTED RESPONSE/INSTRUCTOR CUES
IC Reset		Reset Simulator to 100% power IC
SES Setup Schedule File	Run Setup File: 2017 Scenario 1.sch LI-417A is failed.	Verify Schedule has been loaded. Trip the following bistables: In Yellow B-9 <ul style="list-style-type: none"> • Loop 1A, High Level • Loop 1A, Low Level • Loop 1A, Low Level Mismatch
Event 1	Plant shutdown. No trigger	
Role Play	Any	Respond to request for starting shutdown
Event 2	Activate Trigger 2 At lead evaluator direction	N3 Rod Drop
Role Play	SM	Continue S/D. We will not recover rod.
Event 3	Activate Trigger 3 At lead evaluator direction	Feedflow transmitter 418B fails high
Role Play	I&C	Will get troubleshooting package together.
Event 4	Activate Trigger 4 At lead evaluator direction	CCW Leak
Role Play	NPO	Fill surge tanks using extreme view valve commands. Full open on valves will maintain level with malfunction in.
Role Play	NPO	Report leak location just upstream of TCV-130. Isolate leak by clicking 810/814 in schedule and deleting leak malfunction. CCW surge tank level will trend up.
Event 5	Activate Trigger 5 At lead evaluator direction	Steam Break outside VC upstream of MSIV.
Roll Play	NPO	There is no steam in Turbine Building. There is lots of steam and noise in steam bridge area.
Event 6	No trigger	Failure of HHSI pumps to auto start.
Role Play		
Event 7	Activate Trigger 7 When E-2 is entered	SGTR 32 SG.
Role Play	NPO	Cannot enter steam bridge area due to steam. All other requests can be met.

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

Event Description: Plant Shutdown

Time	Position	Applicant's Actions or Behavior
	CRS	Briefs team to start shutdown as planned using POP-2.1 Attachment 3
	ATC	Energizes all PZR backup heaters
	ATC	Commences boration using SOP-CVCS-003 <ul style="list-style-type: none">• Sets YIC-110 Integrator• Takes Makeup Mode Switch to BORATE• Takes Makeup Control Switch to START then NORM
	BOP	Adjusts MTG Governor to reduce load
	ATC	Manually inserts control rods or monitors for proper automatic insertion
Lead Evaluator		When the following has been demonstrated/observed: Sufficient Shutdown Activities. Then instruct Booth to insert Event 2.

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

Event Description: Dropped Rod N3

Time	Position	Applicant's Actions or Behavior
	BOP	Acknowledges alarms "NIS Power Range Dropped Rod or Rod Stop", "NIS Power Range Channel Deviation", and "Rod Bottom Rod Stop".
	ATC	Notes Power Recorder (NR-45) drop and Power Range changes. N3 Rod Bottom Light lit.
	CRS	Announces entry into AOP-ROD-1, Rod Control and Indication System Malfunction.
	ALL	Should diagnose that this is an actual dropped rod vs. failed IRPI.
	CRS	Determines that only 1 rod is dropped and navigates to correct steps of AOP.
	ATC	Places control rods in manual if not already done.
	ATC	May lower load to match Tavg to Tref.
	CRS	Refers to TS 3.1.4, 3.2.3, and 3.2.4: <ul style="list-style-type: none"> Condition B of 3.1.4 applies requiring recovering rod within 1 hour or lowering power to <75%. 3.2.3 and 3.2.4 may require load reduction. CRS should understand TS and continue shutting down.
	BOP	Resets the Dropped Rod Mode Switch on affected NIS channel N-41.
	ALL	Continue shutdown.
Lead Evaluator		When the following has been demonstrated/observed: Dropped Rod Mode Switch is reset. Then instruct Booth to insert Event 4.

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

Event Description: Feed flow transmitter 418B fails high.

Time	Position	Applicant's Actions or Behavior
	ATC	Notes that SG is trending down for 31 SG or "Steam Generator Level Deviation Alarm" annunciates. May place FRV in Manual.
	ATC	Notes that 31 SG feed flow channel B is failed high.
	ATC	Swap to A channel for 31 SG feed flow (and possibly steam flow).
	CRS	Announces entry in AOP-INST-1, Instrument or Controller Failure.
	CRS	Goes to section in AOP-INST-1 for failed feedwater flow instrument.
	ATC	Places both SG Transfer Switches to Channel A if not already done.
	ATC	Returns FRV to Automatic if placed in Manual earlier.
	CRS	Refers to TS Table 3.3.1-1: <ul style="list-style-type: none"> Function 14 SG Water Level Low is the applicable protection. Condition E of LCO 3.3.1 applies. Place channel in trip in 6 hours. CRS may recognize that this cannot be done due to other failure.
	BOP	Verifies redundant bistable lights are extinguished. They are not.
	CRS	Recognizes that the plant is in at least a 12 hour action statement to be in Mode 3.
	ALL	AOP-INST-1 at hold step. Continue shutdown.
Lead Evaluator		When the following has been demonstrated/observed: Team gets to hold step in AOP-INST-1. Then instruct Booth to insert Event 3.

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

Event Description: Loss of CCW to NRHX due to leak.

Time	Position	Applicant's Actions or Behavior
	BOP	Notes CCW surge tanks lowering. Possibly before alarms.
	BOP	Acknowledges "Component Cooling Surge Tank 31/32 Level" alarms.
	CRS	Enters AOP-CCW-1, Loss of CCW.
	BOP	Dispatch NPO to look for leak.
	BOP	Dispatch NPO to makeup to CCW Surge Tanks.
<p>Note:</p> <p>The NPO will report that the leak is just upstream of TCV-130. It is realistic that the NPO would find this quickly since the valve is across from the NPO office.</p>		
	ALL	Determine that AC-810 and 814 will isolate the leak and that letdown will have to be secured. AC-810 and 814 will be closed when directed.
	CRS	Work through AOP-CCW-1 to section for isolating letdown.
	BOP	Close Valves 459/460 to isolate letdown.
<i>If desired, Lead Evaluator may move on to event 5 at this time</i>		
	ATC	Because of the shutdown, RCS makeup is likely to be set up for boration. The ATC will at some point have to align makeup to the VCT and perform a makeup in automatic or manual to maintain VCT level.
	ATC	Adjust charging (likely done before addressed by AOP-CVCS-1.
	CRS	Enters AOP-CVCS-1 to establish Excess Letdown
	BOP	Adjust HCV-142.
	ATC	Reduce charging pump speed to minimum.
	BOP	Dispatch NPO to adjust charging pump recirculation valve.
<p>Note:</p> <p>If needed the SM will inform the team that it is desired to put Excess Letdown in service. The attachment for placing Excess Letdown in service may be handed off to the BOP while shutdown continues.</p>		
	CRS	Implement Attachment 2 to place Excess Letdown in service.
	BOP	<p>Open the following valves to establish CCW to Excess Letdown HX:</p> <ul style="list-style-type: none"> • AC-AOV-793 • AC-AOV-796 • AC-AOV-791 • AC-AOV-798
	BOP	Verify CH-AOV-215 is aligned to RCDT
	BOP	Crack open CH-HCV-123
	BOP	Open CH-AOV-213A and B
	BOP	Slowly open CH-HCV-123

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

Event Description: Loss of CCW to NRHX due to leak.

	BOP	Following warm up: <ul style="list-style-type: none">• Close CH-HCV-123• Place CH-AOV-215 to VCT• Open CH-HCV-123
	CRS	Acknowledge that Excess Letdown is in service. Depending on timing, the PZR Level TS band may have been challenged. Excess Letdown flow should be restoring that.
Lead Evaluator		When the following has been demonstrated/observed: Excess Letdown is placed in service. Then instruct Booth to insert Event 5.

Op-Test No.: 1 Scenario No.: Event No.: 5/6

Event Description: Steam Line Break Outside VC Upstream of MSIV/ Failure of all HHSI pumps to automatically start on SI signal

Time	Position	Applicant's Actions or Behavior
	ALL	Hear sound of steam. Diagnose that reactor trip and MSIV closure is required.
	ATC	Trips reactor.
	BOP	Closed MSIVs.
	ATC	Notes that 32 SG is depressurizing.
	ATC/BOP	May actuate SI.
	CRS	Directs entry into E-0.
	ATC	Verifies reactor trip: <ul style="list-style-type: none"> • Reactor Trip Breakers Open • Rod Bottom Light Lit • IRPIs all near 0 • Flux decreasing
	ATC	Verifies turbine trip: <ul style="list-style-type: none"> • Checks Stop Valves closed • May trip turbine manually since stop valve indication is not available with SI
	BOP	Verifies power to 480V busses: <ul style="list-style-type: none"> • All have power from offsite
<p style="text-align: center;">Critical Task</p> <p>Manually start at least two HHSI pumps before completion of RO-1 steps 1-12.</p> <p>The BOP will start all 3 HHSI pumps as early as when first recognized as not starting. It is expected that this will occur during E-0 immediate actions. At least 2 shall be started when first procedurally directed which is in RO-1.</p>		
	BOP	Verifies SI: <ul style="list-style-type: none"> • SI will be manually initiated even if already done. • Recognize that no HHSI pumps are running and start pumps.
	BOP	Verify AFW flow > 365 gpm.

Op-Test No.: 1 Scenario No.: Event No.: 5/6

Event Description: Steam Line Break Outside VC Upstream of MSIV/ Failure of all HHSI pumps to automatically start on SI signal

	BOP	<p>Perform RO-1 in parallel with E-0/E-2:</p> <ul style="list-style-type: none"> • Start HHSI pumps if not already done. If not done in RO-1, the critical task is not met. • Positions FCU dampers • Place switched to open for 1104/1105 • Has NPO place switches for 1176/1176A to open. • Place CR HVAC to 10% Incident Mode • Reset SI unless done by E-2 first • Has NPO resets MCCs • Has NPO close SW valves SWN-FCV-1111/1112 • Has NPO align CW cooling • Verifies letdown valves closed. May close excess letdown valves, but no required. • Establish IA to Containment • Open 863 N2 supply • Start NESW
	ATC	Opens CH-LCV-112B and closes CH-LCV-112C
	ATC	Places M/U to stop
	ATC	Starts 1 charging pump
	ATC	Diagnoses that 32 SG is blown down or depressurizing
	CRS	Transitions to E-2
Lead Evaluator		<p>When the following has been demonstrated/observed:</p> <p>Team transitions to E-2</p> <p>Then instruct Booth to insert Event 7.</p>

Op-Test No.: 1 Scenario No.: 1 Event No.: 5/7

Event Description: Steam Line break 32 SG outside containment upstream of MSIV /SGTR on 32 SG post faulted SG isolation

Time	Position	Applicant's Actions or Behavior
<p align="center">Critical Task:</p> <p align="center">Isolate the faulted SG before transition out of E-2.</p> <p>Because of the leak location in addition to SGTR, some local actions will not be possible due to environmental hazards. To satisfy meeting the critical task. The team must:</p> <ul style="list-style-type: none"> • Secure all sources of feed to 32 SG • Trip 32 AFW pump • Verify Atmospheric closed • Verify SG BD valves closed • Verify Sample valves closed 		
	BOP	Attempt to have NPO close MS-41. The NPO will not be able to access the area.
	BOP	Place 32 AFW pump in trip.
	BOP	<p>Ensure the following are done to isolate 32 SG:</p> <ul style="list-style-type: none"> • Isolate MFW • Isolate AFW flow • Verify SG Atmospheric closed • Verify BD and Sample valves closed • Upstream traps will not be accessible.
	ALL	Should diagnose that SGTR is in progress, so 32 SG is ruptured/faulted.
<p align="center">Note:</p> <p align="center">In the unlikely event that the team transitions to E-1, a transition to E-3 should occur at step 6.</p>		
	CRS	Transition to E-3
	CRS	After some preliminary checks in E-3, the CRS will determine that 32 SG pressure is < 400 psig and transition to ECA-3.1.

Op-Test No.: 1 Scenario No.: 1 Event No.: 5/7

Event Description: Steam Line break 32 SG outside containment upstream of MSIV /SGTR on 32 SG post faulted SG isolation

	ATC	Places Modulating Heater switch in TPO and Backup Heater switches in OFF.
	BOP	Secures RHR pumps
	ATC	Establishes maximum charging by starting 2 additional pumps and running all 3 pumps speed controllers to maximum.
<p style="text-align: center;">Critical Task:</p> <p>Cool down the RCS to CSD conditions at the highest achievable rate w/o exceeding 100F/hr.</p> <p>The procedure does not specify a minimum, however the following will constitute satisfying the critical task:</p> <ul style="list-style-type: none">• A target rate, once control established, of at least 75°F/hour.• The ATC/BOP can monitor and control to be within 15°F/hour of rate given by CRS.• RCS is not intentionally cooled down such that temperature decreases by more than a 100°F in any 1 hour.		
	ATC	Used Atmospheric Steam Dumps to establish <100°F/hour cooldown: <ul style="list-style-type: none">• Individual Controllers (31, 33, 34) to Manual• Dumps throttled open as necessary to maintain cooldown rate
Lead Evaluator		When the following has been demonstrated/observed, cooldown established, then scenario may be terminated.

Emergency Plan Follow Up:

For this scenario, the following conditions occurred regarding Emergency Declarations:

- Site Area Emergency based on FS-1.1, loss or potential loss of two barriers.
- The RCS is lost as shown by subcooling (or potentially lost due to ECCS flow – this does not affect EAL)
- Containment is lost due to a SGTR with secondary break outside Containment.

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

Examiners: _____ Operators: _____

Initial Conditions: 100% Reactor Power.

Turnover: Unit is at hour 70 of a 72 hour AOT for 32 EDG being OOS, retest in progress. Unit in a 7 day AOT for PCV-455C and its block valve MOV-535 being held off due to 455C blowing control power fuses. Feeder 33332 L&M is OOS for high resistance readings on BT-5-6 connections.

Event No.	Malf. No.	Event Type*	Event Description
1	MAL-HVA001B2	TS(CRS)	32 Containment Recirc Fan (FCU) trips.
2	MAL-DSG001B		32 EDG trips during retest.
3		N(CRS, BOP) R(ATC)	Shutdown due to inoperable EDG and FCU.
4	MAL-TUR 010A	I (ALL) TS (CRS)	Turbine First Stage Pressure (PT-412A) fails low.
5	MAL-CVC008	C (ALL)	VCT level instrument fails low.
6	MAL-CFW013C	C (CRS, ATC) TS (CRS)	32 Feed Reg Valve fails in automatic, manual control available.
7	LOA-SWD011	C(ALL)	Loss of 138KV power that results in loss of 480V Bus 6A due to EDG OOS.
8	MAL-CFW015 MAL-ATS004	M(ALL)	Feed Pumps Trip and 31 AFW Pump Trips
9	MAL-DSG001A/C	C(ALL)	31 and 33 EDGs trip causing loss of all AC power

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

Simulator Exam Scenario # 2 Summary

The evaluation begins with the plant at 100% power steady state operation. Ensure charging pumps and service water pumps are running on 480V Bus 6A. The following equipment is out of service:

- 32 EDG is inoperable due preventative maintenance. The plant entered a 72 hour AOT per TS 3.8.1 36 hours ago. A retest is in progress per 3-PT-M79B.
- PORV PCV-455C and its Block Valve, MOV-535 is held off due to PCV-455C blowing control power fuses. Per TS 3.4.11, the block valve has been closed with power removed and 7 day AOT entered. An estimated time for return to service has not been determined.

After taking the watch 32 FCU will trip due to a bearing failure. This will require the CRS to review TS 3.6.6 for FCU operability. At a minimum, this is a 7 day AOT per 3.6.6 Condition C. However with the EDG inoperable, two trains may be considered inoperable putting the plant in a 72 hour AOT (there is a 4 hour action to declare systems supported by the EDG inoperable if redundant equipment is inoperable).

Next 32 EDG will trip during the retest. Since the AOT is in effect when the team takes the watch, no credit is given for the TS. This event will give a reason to shut down and sets up a loss of 480V bus 6A when offsite power is lost later in the scenario.

The Operation Manager will prompt the team to shut down the plant starting now to address these issues. The crew will perform AOP-RSD-1, Rapid Shutdown.

When some shutdown has been started, Turbine First Stage Pressure Transmitter PT-412A will fail low causing rods to step in. The ATC will place rods in manual. The BOP will bypass AMSAC (and trip bistables if desired by the lead examiner) for the instrument. The CRS will address TS.

VCT level transmitter will fail low causing charging pump suction to swap the RWST. The BOP will have address charging pump suction. The ATC will address makeup.

After charging suction is stabilized, 32 FRV will fail in auto with manual available. The ATC will have to control 32 SG level in manual.

When SG level is stabilized, offsite power will be lost. 480V Bus 6A will not have power because 32 EDG is not available. The team will enter AOP-138KV-1 and possible AOP-480V-1. Charging will have to be started by the ATC and service water will be started by the BOP. There are TS for this event, but the CRS will not have time to address them.

When the ATC and BOP have had a chance to take action for service water, CCW, and charging, both MFW pumps will trip. Operators will trip the reactor. 31 AFW pump will trip and 33 has no power. AFW flow will be established using 32 AFW pump. When this is done, 31 and 33 EDGs will sequentially trip causing a loss of all AC power.

The team will transition to ECA-0.0. 13.8 KV power is available. The team may already be taking action to restore power. However, in ECA-0.0 there is direction to use SOP-EL-005 to restore power. This will be successful. The scenario may be terminated at any time after power is restored, to at least one 480V bus.

Procedure flow path: ARP011, AOP-RSD-1, AOP-INST-1, AOP-CVCS-1, AOP-FW-1, AOP-138KV-1 (AOP-480V-1), E-0, ECA-0.0, SOP-EL-5.

Event 1 – 32 Fan Cooler Unit Trips. The CRS will evaluate Tech Specs. BOP will place in Trip to restore 480V Motor Trip (Common) alarm.

Event 2 – 32 Emergency Diesel Generator (EDG) trips during retest. This event will give reason to shutdown the unit. If necessary, the SM will prompt the shutdown.

Event 3 – Power Reduction. The ATC will borate and possibly drive rods. The BOP will lower turbine load using the governor. The CRS will coordinate the evolution.

Event 4 – Turbine First Stage Pressure Instrument fails low. The ATC will place rod control in manual. The BOP will bypass AMSAC and trip bistables if desired. The CRS will evaluate Tech Specs.

Event 5 – VCT Level transmitter fails low. The ATC will address makeup. The BOP will swap charging pump suction from RWST to VCT. The ATC and BOP will control VCT level by controlling VCT pressure. The CRS will coordinate the evolution.

Event 6 - 33 Fed Reg Valve fails open in automatic, manual control is available. The ATC will take manual control of FRV and control SG level. The CRS will coordinate the evolution.

Event 7 – Loss of 138KV (offsite) power; bus 6A will not have power because 32 EDG is out of service. The CRS will implement the procedure AOP-138KV-1 and possibly AOP-480V-1. The ATC will restart a charging pump. The BOP will restart service water.

Event 8 – 31 and 32 Main Feedwater Pumps trip; 31 AFW pump trips. After Charging, Service Water and CCW pumps are started, both Main Feedwater pumps trip. The ATC will trip the reactor.

2017 Scenario 2 Schedule File

At Time	On Event	Action	Description
00:00:00	None	Insert remote LOA-DSG005 to ON	D/G #32 SURVEILLANCE TEST START
00:00:00	None	Insert override SWI-RCS021A to Off	PCV-455C GREEN LAMP PRESSURIZER RELIEF VALVE PCV-455C CONTROL SWITCH
00:00:00	None	Insert override SWI-RCS022A to Off	535 GREEN LAMP PRZR POWER RELIEF BLOCK VLV NO.535 CONTROL SWITCH
00:00:00	None	Insert override SWI-RCS022D to On	535 CLOSE POS PRZR POWER RELIEF BLOCK VLV NO.535 CONTROL SWITCH
00:00:00	None	Insert remote LOA-SWD012 to OPEN_BREAKER	BT 5-6 BREAKER
00:00:00	None	Insert malfunction MAL-HVA001B2 to 0.00000 on event 1	FAN COOLER UNIT 32 TRIP DUE TO BRG FAILURE
00:00:00	None	Insert malfunction MAL-DSG001B on event 2	DIESEL 32 GENERATOR FAILURE
00:00:00	None	Insert malfunction MAL-TUR010A to 0.31446 on event 4	TURB FIRST-STAGE PRESS TRANS FAILURE (PT-412A)
00:00:00	None	Create Event 28 hwxboa082w<0.9 -desc Set Event 28 for AFW Flow Established	
00:00:00	None	Insert malfunction MAL-DSG001A after 30 on event 28	DIESEL 31 GENERATOR FAILURE
00:00:00	None	Insert malfunction MAL-DSG001C after 60 on event 28	DIESEL 33 GENERATOR FAILURE
00:00:00	None	Insert malfunction MAL-CVC008 to 0 on event 5	VCT LEVEL TRANSMITTER FAILURE
00:00:00	None	Insert malfunction MAL-CFW013C to 100.00000 on event 6	FDW CNTRL FIC-427 AUTO MODE FAILURE (MANUAL AVAIL)
00:00:00	None	Insert remote LOA-SWD011 to OPEN_BREAKER on event 7	BT 2-6 BREAKER
00:00:00	None	Create Event 30 JPPLP4(1)=1 -desc Set Trigger 30 to actuate after Reactor Trip	
00:00:00	None	Insert malfunction MAL-ATS004A on event 8	MAIN FEEDWATER PUMP 31 TRIP
00:00:00	None	Insert malfunction MAL-ATS004B after 10 on event 8	MAIN FEEDWATER PUMP 32 TRIP
00:00:00	None	Insert malfunction MAL-CFW001A after 55 to TRIP on event 30	AUXILIARY FEEDWATER PUMP 31 FAILURES

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	EXPECTED RESPONSE/INSTRUCTOR CUES
IC Reset		Reset Simulator to 100% power IC
SES Setup Schedule File	Run Setup File: 2017 Scenario 2.sch MOV-535 in TPO with Red Tag	Verify Schedule has been loaded. Ensure 33 Charging Pump, and 33 & 36 Service Water Pumps are in service. Clear EDG Trouble Alarm.
Event 1	Actuate Trigger 1 At lead evaluator direction	32 Fan Cooler Unit Trip
Role Play	Conventional NPO	NPO reports circuit breaker tripped with no unusual smell or conditions
Event 2	Actuate Trigger 2 At lead evaluator direction	32 EDG trip
Role Play	FSS	Governor performance became erratic. Same issue as before.
Role Play	Shift Manager	Direct Rapid Shutdown using AOP-RSD-1
Event 3	Rapid Shutdown	Acknowledge notifications
Event 4	Actuate Trigger 4 At lead evaluator direction	PT-412A Failure Low
Role Play	When NPO or Maintenance dispatched to investigate	Report – No unusual conditions at the transmitter.
Role Play	When SM, I&C or Work Control are notified	Inform team that work package is being developed. Bistables need to be tripped.
Event 5	Actuate Trigger 5 At lead evaluator direction	VCT Level Transmitter Failure Low
Event 6	Actuate Trigger 6 At lead evaluator direction	32 Feedwater Regulating Valve Failure Open in Auto Only.
Role Play	When NPO or Maintenance dispatched to investigate	Report – No unusual conditions at the valve.
Event 7	Actuate Trigger 7 At lead evaluator direction	Loss of Offsite Power
Event 8	Actuate Trigger 8	Feed Pump Trips

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	EXPECTED RESPONSE/INSTRUCTOR CUES
Role Play	When NPO dispatched, to perform Local Operator Actions	Perform actions using the Operator Action Tool. Report when actions are complete.
Event 9	Actuate Trigger 9	Loss of All AC Power
Role Play	Con Ed System Operator	Report Investigating reason for loss of 138KV power. If asked 13.8KV power is available.

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

Event Description: 32 Fan Cooler Unit Trip

Time	Position	Applicant's Actions or Behavior
	BOP	Acknowledges Alarm 480V SWGR MOTOR TRIP (COMMON)
	CRS/ATC/ BOP	Diagnose 32 Fan Cooler Unit trip
	CRS	Refer to TS 3.6.6 <ul style="list-style-type: none">• Condition C for 1 FCU Inoperable is 7 day LCO• Condition D for 2 Trains Inoperable is 72 hour LCO<ul style="list-style-type: none">○ 32 FCU and 32 EDG (35 FCU)○ NOTE 4 hour action to declare 35 FCU Inoperable due to EDG AND 32 FCU Inoperable
	BOP	Place switch in stop per Alarm Response Procedure
	BOP	Close Dampers for 32 FCU
Lead Evaluator		When the following has been demonstrated/observed: Tech Specs evaluated by the CRS. Then instruct Booth to insert Event 2

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

Event Description: 32 EDG Trips

Time	Position	Applicant's Actions or Behavior
	BOP	Determine 32 EDG Tripped. (EDG Trouble Alarm will annunciate. May take a prompt from the NPO operating the EDG that it tripped).
	CRS	Determine that a shutdown is required.
	SM	PROMPT to use Rapid Shutdown procedure AOP-RSD-1
Lead Evaluator		When the following has been demonstrated/observed: Tech Specs evaluated by the CRS. Then continue to Event 3.

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

Event Description: Plant Shutdown using RSD due to FCU and EDG Inoperable

Time	Position	Applicant's Actions or Behavior
	CRS	Direct actions per AOP-RSD-1, Rapid Shutdown.
	ATC	<ul style="list-style-type: none">• Energize all PRZR heaters.• Initiate 100 gallon boration per Attachment 2 at rate of 10 gpm (will reduce to lower boration rate after 20 gallons are added).• Set YIC-110 Boric Acid Integrator to 100 gallons.• Place Makeup Mode Selector Switch to Borate.• Turn Makeup Control Switch to START and return to NORMAL.
	BOP	Peer Check Boration.
	CRS/ATC	Check Rods in Auto.
	CRS	Initiate Shutdown notifications.
	BOP	When directed Lower Turbine Load using the governor.
Lead Evaluator		When the following has been demonstrated/observed: Sufficient load reduction Then instruct Booth to insert Event 4.

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

Event Description: PT-412A fails LOW

Time	Position	Applicant's Actions or Behavior
		Respond to alarms <ul style="list-style-type: none"> • HIGH STEAM FLOW SI CHANNEL TRIP • T-AVG T-REF DIVIATION • Observe Rods stepping in a maximum speed with no load rejection.
	ATC	<ul style="list-style-type: none"> • Diagnose PT-412A failure • PLACE Rod Control in MANUAL
	CRS	Announces entry AOP-INST-1, Instrument or Controller Failures.
	CRS	Determines that Turbine First Stage Pressure failure has occurred and goes to procedure section.
	CRS/ATC	Determine if Tavg is within 1.5°F of Tref. Depending on crew response Tavg may or may not be within 1.5°F of Tref.
	ATC	MAY stop boration
	BOP	MAY reduce load to match Tavg with Tref
	ATC	Place Steam Dump in Pressure Mode <ul style="list-style-type: none"> • Place controller in Manual • Adjust controller output to 0% • Steam Dump Control Switch to RESET the PRESS CONT. • Place Controller in Auto
	BOP	Place BS/2MSS 400 block switch in AMSAC cabinet to BYPASS
	CRS	Review Tech Specs <ul style="list-style-type: none"> • Table 3.3.1-1 function 17b (1 hour completion time) • Table 3.3.1-1 function 17e (1 hour completion time) • Table 3.3.2-1 function 1g • Table 3.3.2-1 function 4d • Table 3.3.2-1 function 4e • TRM TROS 3.1.A
<p align="center">NOTE:</p> <p align="center">If needed, prompt CRS as the SM that bistables need to be tripped.</p>		

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

Event Description: PT-412A fails LOW

	BOP	<p>Trip Bistables</p> <ul style="list-style-type: none">• Loop 3A High SF-SI• Loop 4A High SF-SI• Loop 1A High SF-SI• Loop 2A High SF-SI
	CRS	Determine channel failed low
Lead Evaluator		<p>When the following has been demonstrated/observed:</p> <ul style="list-style-type: none">• Bistables tripped (may be skipped)• TS Addressed <p>Then instruct Booth to insert Event 5</p>

Op-Test No.: 1 Scenario No.: 2 Event No.: 5

Event Description: VCT Level Transmitter

Time	Position	Applicant's Actions or Behavior
	ATC	May observe Auto Makeup VCT level recorder at 0 and VCT pressure recorder increasing. (May be in Borate/Manual.)
	BOP	Observes Auto Makeup VCT level meter at 0 and VCT pressure meter increasing
	ATC	Stop Boration (may or may not be in progress due to shutdown and previous failure)
	CRS	Announces entry into AOP-CVCS-1 <ul style="list-style-type: none">Determine VCT level indicator LI-112 has failed low.
	BOP	Place CH-LCV-112C control switch to Open When CH-LCV-112C is Open, THEN Place CH-LCV-112B control switch to Close.
	ATC/BOP	Maintain VCT pressure 2 – 10 psig above pre-malfunction value using makeup or diverting VCT.
Lead Evaluator		When the following has been demonstrated/observed: When LCV-112C is open and LCV-112B is closed Then instruct Booth to insert Event 6

Op-Test No.: 1 Scenario No.: 2 Event No.: 6

Event Description: 32 Feedwater Regulating Valve fails open in Automatic Manual control is available

Time	Position	Applicant's Actions or Behavior
	ATC	Observe 32 SG level increasing. Possible STEAM GENERATOR LEVEL CONTROL DEVIATION
	ATC	Place 32 Feedwater Regulating Valve in MANUAL Restore SG Level to program
	CRS	Announce entry into AOP-FW-1 and direct Perform Immediate Operator Actions of AOP-FW-1, Loss of Feedwater
	ATC	Determine Both Main Feedwater Pumps are operating and announces Immediate Operator Actions Complete.
	CRS	Determines Valve Failure and goes to procedure section. Determines Only Main Feedwater Regulating valve failed and returns to AOP for Rapid Shutdown
	CRS	Refer to Tech Spec 3.7.3 Condition B for One MFRV inoperable 72 hours to close or isolate
Lead Evaluator		When the following has been demonstrated/observed: Steam Generator Level control stable. Then instruct Booth to insert Event 7

Op-Test No.: 1 Scenario No.: 2 Event No.: 7

Event Description: Loss of 138KV power results in Loss of 480V bus 6A

Time	Position	Applicant's Actions or Behavior
	CREW	Respond to multiple alarms indicating loss of offsite power from 138KV
	CRS	Announce entry into AOP-138KV-1 Loss of Power to 6.9KV bus 5 and/or 6
	ATC	Start 31 or 32 Charging Pump
	BOP	Start Essential and/or Non-Essential Service Water Pumps as necessary to maintain > 60 psig.
	BOP	Possible load reduction due to decreasing condenser vacuum.
	CRS	Review Tech Specs <ul style="list-style-type: none"> • 3.8.1 AC Sources Operating • 3.8.4 DC Sources Operating • 3.8.9 Distribution Systems Operating Determines buses 1 – 4 powered from Unit Aux Transformer
Lead Evaluator		When the following has been demonstrated/observed: Charging, CCW and Service Water Pumps are running.. Then instruct Booth to insert Event 8

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

Event Description: Feed Pumps Trip, 31 AFW Pump Trip, Manual Reactor Trip

Time	Position	Applicant's Actions or Behavior
	ATC	Identify both Main Feedwater Pumps Tripped Announces Manually Tripping Reactor <ul style="list-style-type: none"> Depresses Reactor Trip Pushbutton Verify Reactor Trip Verify Turbine Trip (Push Turbine Trip pushbutton)
	ATC	Perform Immediate Operator Actions of E-0 <ul style="list-style-type: none"> Verify Reactor Trip Verify Turbine Trip (Push Turbine Trip pushbutton)
	BOP	Verify 480V Power for buses 5A, 2A and 3A
	ATC	Checks requirements for Safety Injection. <ul style="list-style-type: none"> Safety Injection NOT required
	BOP	Identify no Motor Driven AFW pumps operating. <ul style="list-style-type: none"> Increase speed of 32 AFW pump until adequate discharge pressure Open 405A – D to provide flow to all Steam Generators
<p align="center">Critical Task</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> <p>Crew will increase the speed of 32 (Steam Driven Auxiliary Feedwater Pump) and open the discharge valves.</p>		
Lead Evaluator		When the following has been demonstrated/observed: Loss of 31 and 33 EDG automatically actuated when adequate AFW flow established Continue to Event 9

Op-Test No.: 1 Scenario No.: 2 Event No.: 9

Event Description: Loss of All AC Power

Time	Position	Applicant's Actions or Behavior
	CREW	Identify when 31 and 33 EDGs trip
	CRS	Direct performance of Immediate Operator Actions for ECA-0.0, Loss of All AC Power.
	ATC	Immediate Operator Actions <ul style="list-style-type: none">• Verify Reactor Trip• Close Main Steam Isolation Valves
	BOP	Isolate RCS by Closing: <ul style="list-style-type: none">• 459• 460• 200 A-C
	BOP	Maintain SG Level using 32 AFW Pumps <ul style="list-style-type: none">• Preferentially feed 32 or 33 SG as directed by CRS<ul style="list-style-type: none">◦ Maintain feed flow to other SGs at less than or equal to 100 gpm
	BOP	Re-energize any 480V bus using offsite power per SOP-EL-005 Attachment 2 <ul style="list-style-type: none">• Place 35 Circ Water Pump breaker in PULL OUT• Verify 6900 Bus 5 Normal Feed breaker in PULL OUT• Verify voltage on bus No. 5 is zero• Close GT 35 6.9 KV us No. 5 feed breaker• Verify 6.9 KV Bus No. 5 is energized• Check Bus 5A Normal Feed breaker OPEN• CLOSE Station Service Transformer 5 Supply breaker• Hold 480V bus 5A Normal Feed breaker in the closed position until bus voltage is observed

Op-Test No.: 1 Scenario No.: 2 Event No.: 9

Event Description: Loss of All AC Power

Critical Task

Energize at least one AC emergency bus before degrading RCP seals in ECA-0.0. Criteria will be to begin taking actions to restore power with available 13.8KV power prior to depressurizing SGs.

Crew should restore offsite power from 13.8 KV using SOP-EL-005.

Lead Evaluator

When the following has been demonstrated/observed: Power is restored to at least one 480V Bus

Then scenario may be terminated.

Emergency Plan Follow Up:

For this scenario, the following conditions occurred regarding Emergency Declarations:

- SAE SS1.1 Loss of All offsite and all onsite AC power (Table 2.1) to 480V safeguards buses (5A, 2A and 3A, 6A) for ≥ 15 minutes.

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

Examiners: _____ Operators: _____

Initial Conditions: 30% Reactor Power.

Turnover: FRVs were just placed in automatic. Continue with load ascension. 33 Safety Injection pump is out due to motor fault and has been out for 6 hours. There is no projected time for return at this time (72 hr AOT).

Event No.	Malf. No.	Event Type*	Event Description
1		N(BOP) N(CRS)	Start HDTP
2		N (BOP) R (ATC) N (CRS)	Power ascension.
3	MAL-RCS011D	I (CRS, BOP) TS(CRS)	32 RCS Loop flow instrument failure.
4	MAL-SWS001F	C (BOP) TS(CRS)	36 SW Pump trips
5	MAL-RCS007B		32 RCP high vibrations.
6	MAL-RCS005A	C (ALL)	32 RCP seal degrading.
7	MAL-RCS002B	C(ALL)	32 RCP trips
8	MAL-RPS002B	M(ALL)	ATWS
9	MAL-RCS005A	C (ALL)	SBLOCA due to 32 RCP seal failure.
10	MAL-EPS006	C (ALL)	Loss of Station Auxiliary Transformer after SI reset.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Simulator Exam Scenario 4 Summary

The evaluation begins with the plant at approximately 30% power during a power ascension. The following equipment is out of service:

- 33 Safety Injection pump is out due to motor fault and has been out for 6 hours. There is no projected time for return at this time (72 hr AOT – 3.5.2). 31 and 32 SI Pumps are designated as protected equipment.

After taking the watch, the team will raise power and start the first Heater Drain Tank Pump.

Following sufficient power increase, Loop 32 RCS Flow transmitter FT-424 fails low. The team will respond per AOP-INST-1. The CRS will reference Technical Specifications, and the bistable will be tripped by the BOP.

After the bistable for the failed instrument is tripped, 36 Service Water Pump will trip. The BOP will start 34 or 35 SW pump in accordance with the ARP.

Next, 32 RCP begins to degrade as evidenced by increased RCP vibrations. The team will take actions per AOP-RCP-1, "RCP Malfunctions" to increase monitoring.

32 RCP Number 1 Seal will degrade slightly and the Team will re-enter AOP-RCP-1. Prior to completion of the Subsequent Actions of AOP-RCP-1, 32 RCP will trip. The team will attempt to trip the reactor.

The reactor will not trip from the Control Room and the team will respond per FR-S.1, "Response to Nuclear Power Generation / ATWS" and will S/D the reactor by inserting control rods and initiating Emergency Boration. The reactor trip breakers will be locally opened and the team will transition to E-0, "Reactor Trip or Safety Injection."

After the Reactor Trip Breakers are opened, 32 RCP seal will fail resulting in a SBLOCA. The team will progress through E-0 toward entry into E-1, "Loss of Reactor or Secondary Coolant." One minute after SI is reset, a loss of offsite power will occur. The team will respond per LOOP-1, "Loss of Offsite Power After SI."

Procedure flow path: AOP-INST-1, AOP-IB-1, AOP-RCP-1, ARP-010 (or 3-AOP-CCW-1), AOP-RCP-1, E-0, FR-S.1, E-0, LOOP-1, E-1.

Critical Tasks:

FR-S.1--C Insert negative reactivity into the core by at least 1 of the following methods before Step 4 of FR-S.1 is complete:

- Deenergize Rod Drive MG Sets
- Manually insert the rods
- Establish Emergency Boration

E-1--C Trip all RCPs before completion of E-1 Step 1

E-0--I Establish flow from at least one SI Pump before transition out of LOOP-1

EXPLANATION OF CREDITED ACTIONS:

Event 1 – Start a Heater Drain Tank Pump. The BOP will coordinate with the Conventional NPO to start the first Heater Drain Tank Pump. The CRS will coordinate the evolution.

Event 2 – Increase Power. The ATC will withdraw control rods and/or dilute the RCS boron concentration. The BOP will raise turbine load. The CRS will coordinate the evolution.

Event 3 – 32 RCS Loop Flow Instrument Failure. The ATC will diagnose the instrument failure. There are no actions necessary to stabilize the plant. The BOP will trip bistables and the CRS will evaluate Tech Specs.

Event 4 – 36 SW pump trip. The BOP will diagnose 36 SW pump trip and determine that another pump must be started to maintain SW header pressure,

Event 5 – 32 RCP High Vibrations. The BOP will investigate alarms and determine that 32 RCP vibrations have increased. The BOP will increase monitoring the RCP vibrations.

Event 6 – 32 RCP #1 Seal degradation. ATC will determine 32 RCP seal flow has increased but not to the trip setpoint of AOP-RCP-1. The CRS will re-enter AOP-RCP-1

Event 7 – 32 RCP Trip. While performing subsequent actions of AOP-RCP-1, 32 RCP will trip. The ATC will attempt to trip the reactor from the flight panel and the BOP will attempt to trip the reactor from the supervisory panel. The reactor will not trip.

Event 8 – ATWS. The CRS will enter E-0, Reactor Trip or Safety Injection, and transition to FR-S.1, Response to Nuclear Power Generation ATWS. The ATC will insert control rods in manual. The BOP will dispatch an NPO to trip the reactor locally from the Cable Spreading Room. The BOP will trip the turbine generator, start both motor driven AFW pumps, and establish AFW flow of 686 gpm. The BOP will open 333 to initiate emergency boration and close HCV-104 and 105. The ATC will start both boric acid transfer pumps in fast speed and transfer charging to manual at maximum speed. The NPO will open the reactor trip breakers tripping the reactor.

Event 9 – 32 RCP Seal LOCA. The team will complete actions in FR-S.1 to secure emergency boration and establish normal boration. The team will return to E-0. The team will progress through E-0 toward E-1.

Event 10 – Loss of Station Auxiliary Transformer. One minute after SI has been reset a loss of offsite power will occur. The CRS will enter LOOP-1. The BOP will start all Essential Service Water pumps and place CCW pumps in trip pull out. ATC/BOP will start Safety Injection pumps, RHR pumps, Fan Cooler Units, and AFW pumps.

At Time	On Event	Action	Description
00:00:00	None	Insert override SWI-SIS003G to On	PULL OUT POS SI PUMP #33 CONT SW
00:00:00	None	Insert malfunction MAL-CCW001B to FAILURE_TO_AUTOSTART	CCW PUMP 32 FAILURES
00:00:00	None	Insert malfunction MAL-RPS002B	REACTOR TRIP BREAKERS FAIL TO OPEN (AUTO & MANUAL)
00:00:00	None	Insert malfunction MAL-TUR002A	TURBINE PROTECTION TRIP FAILURE (ELECTRICAL)
00:00:00	None	Insert malfunction MAL-RCS011D to 0 on event 3	LOOP 32 FLOW TRANSMITTER FAILURE 3FI-424
00:00:00	None	Insert malfunction MAL-SWS001F to TRIP on event 4	SWS PUMP 36 FAILURE
00:00:00	None	Insert malfunction MAL-RCS007B to 10.30000 on event 5	RCP 32 VIBRATION
00:00:00	None	Insert malfunction MAL-RCS012B to 1.80000 in 30 on event 6	RCP 32 NUMBER 1 SEAL FAILURE
00:00:00	None	Insert malfunction MAL-RCS002B on event 7	REACTOR COOLANT PUMP 32 TRIP
00:00:00	None	Create Event 29 jpplp4(1)==1 -desc Set Event 29 to actuate after Reactor Trip	Set Event 29 to actuate after Reactor Trip
00:00:00	None	Insert malfunction MAL-RCS013B to 100.00000 on event 29	RCP 32 NUMBER 2 SEAL FAILURE
00:00:00	None	Insert malfunction MAL-RCS014B to 100.00000 on event 29	RCP 32 NUMBER 3 SEAL FAILURE
00:00:00	None	Insert malfunction MAL-RCS005A to 25.00000 in 60 on event 29	RCS LEAK (LOOP 1 COLD LEG)
00:00:00	None	Create Event 30 hwxeoi364f==1 -desc Set Event 30 to allow manual trip	Set Event 30 to allow manual trip
None	30	Delete malfunction MAL-TUR002A	TURBINE PROTECTION TRIP FAILURE (ELECTRICAL)
00:00:00	None	Create Event 28 jpplsir(1)==1 -desc Set Event 28 to actuate after SI Reset	Set Event 28 to actuate after SI Reset
00:00:00	None	Insert malfunction MAL-EPS006 after 60 on event 28	LOSS OF STATION AUX TRANSFORMER

00:00:00	None	Insert malfunction MAL-CFW001A to TRIP	AUXILIARY FEEDWATER PUMP 31 FAILURES
None	None	Delete malfunction MAL-RPS002B	REACTOR TRIP BREAKERS FAIL TO OPEN (AUTO & MANUAL)

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	EXPECTED RESPONSE/INSTRUCTOR CUES
IC Reset		Reset Simulator to 30% IC
SES Setup Schedule File	Run Setup File: 2017 Scenario 4.sch	Verify Schedule has been loaded. 33 Safety Injection Pumps is OOS. Hang Danger Tag on pump Ensure LCV-1127 is in manual at about 0.4 Ensure Rods are in MANUAL
Event 1		Start Heater Drain Pump
Role Play	When NPO called to standby start LOA-FWH021 (1127) LOA-FWH022 (1127A)	4 inch dumps fully open Discharge LCV (1127 for 31 1127A for 32) is in Manual Request CR to Start and HOLD switch until told to release. Wait approximately 15 seconds and inform CR to release pump switch
Event 2		Power ascension.
Role Play	When individuals outside CR called	Acknowledge request. Perform actions as necessary Report when actions complete
Event 3	Actuate Trigger 3 At lead evaluator direction	32 Loop Flow instrument failure
Event 4	Actuate Trigger 4 At lead evaluator direction	Loss of 36 Service Water Pump
Role Play	If NPO dispatched	Report breaker is tripped and pump will not rotate.
Event 5	Actuate Trigger 5 At lead evaluator direction	RCP vibrations
Role Play	If NPO dispatched	Report vibrations in upper electrical tunnel the same as indicated in the control room.
Event 6	Actuate Trigger 6 At lead evaluator direction	32 RCP seal degradation
Role Play	If Nuclear NPO dispatched to investigate	Report 32 RCP local seal return flow is approximately 5.2 gpm
Event 7	Actuate Trigger 8 At lead evaluator direction	32 RCP Trips
Event 8	Entered in setup	ATWS
Role Play	When NPO dispatched to locally trip the reactor	Wait approximately 2 minutes. Remove malfunction MAL-RPS002B. If reactor does not trip insert MAL-RPS001A and B to open Trip Breakers. Ensure breakers are open.
Event 9	Entered at Setup	Seal failure will occur when reactor trips. Additional leakage will ramp in over 60 seconds.

Simulator Setup and Instructor Directions		
Setup/Event	INSTRUCTOR ACTIONS	EXPECTED RESPONSE/INSTRUCTOR CUES
Role Play	When individuals outside CR called	Acknowledge request. Perform actions as necessary Report when actions complete
Event 10	Entered at Setup	Loss of Offsite Power 60 seconds after Safety Injection was reset.
Role Play	When individuals outside CR called	Acknowledge request. Perform actions as necessary Report when actions complete

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

Event Description: Start Heater Drain Pump

Time	Position	Applicant's Actions or Behavior
	BOP	Dispatch NPO to perform actions to start a Heater Drain pump (Team can select either 31 or 32 pumps) Start Heater Drain Pump
	CRS	Coordinate evolution
	NPO	Report > 600 gpm flow when alarm clears to signal BOP to release switch
Lead Evaluator		When the following has been demonstrated/observed: Heater Drain Pump is running Then continue to Event 2

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

Event Description: Power ascension

Time	Position	Applicant's Actions or Behavior
	CRS	Briefs team to raise power as planned using POP-1.3
	ATC	Withdraw Control Rods in acceptable increments.
	BOP	Peer check rod withdrawal.
	ATC	Commence Dilution <ul style="list-style-type: none"> • Determine volume of water • Set YIC-111 Integrator • Take Makeup Mode Switch to Dilute • Take Makeup Control Switch to Start
	BOP	Raise turbine Load
	CRS	Coordinates procedure actions.
Lead Evaluator		When the following has been demonstrated/observed: Sufficient power level change Then instruct Booth to insert Event 3

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

Event Description 32 RCS Loop Flow Instrument failure

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	Respond to alarms: <ul style="list-style-type: none">Reactor Coolant Loop # 32 Low Flow Channel Trip
	ATC	<ul style="list-style-type: none">Diagnose FI-424 Failure low
	CRS	Announces entry AOP-INST-1, Instrument or Controller Failures.
	CRS	Determines that FI-424 failure has occurred and goes to procedure section.
	CRS	Refer to Tech Specs: <ul style="list-style-type: none">Table 3.3.1-1 Function 9
	BOP	Trip bistable <ul style="list-style-type: none">Loop 2A, Low Flow
Lead Evaluator		When the following has been demonstrated/observed: Bistable is tripped Then instruct Booth to insert Event 4

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

Event Description: 36 SWS Pump trip

Time	Position	Applicant's Actions or Behavior
		Multiple alarms indicating SWS pump trip <ul style="list-style-type: none">• 480V Motor Trip (Common)• Service Water Header (34, 35, 36) High Low Pressure
	BOP	Determine 36 SWS Pump is tripped
		Start 334 or 35 SWS pump
	CRS	May enter AOP-SWS-1.
	CRS	Refer to Tech Specs <ul style="list-style-type: none">• 3.7.9, action a
Lead Evaluator		When the following has been demonstrated/observed: 34 or 35 SWS pump is running and pressure is > 60 psig Then instruct Booth to insert Event 5

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

Event Description: Plant Shutdown

Time	Position	Applicant's Actions or Behavior
	BOP	Respond to Reactor Coolant Pumps High Vibration alarm Determine 32 RCP is affected
	CRS	Announce entry into AOP-RCP-1.
	ATC/BOP	Verify RCP Shutdown Criteria <ul style="list-style-type: none"> • Motor Winding Temp > 250°F • Motor Winding Temp > 300°F • Upper or Lower motor bearing temp > 200°F • Shaft Vibration > 20 mils • Shaft Vibration > 15 mils and increasing >1 mil/hr • Frame Vibration > 5 mils • Frame Vibration > 3 mils and increasing >0.2 mils/hr • #1 Seal Return Flow > 6 gpm • #1 Seal Return Flow < 0.84 gpm and seal temps increasing • Seal ΔP < 200 psid • Seal Inlet temp > 225°F • Seal Outlet temp > 235°F
	CRS	Goes to correct section of the procedure.
	BOP	Record indications every 10 minutes Determine vibrations are stable
Lead Evaluator		When the following has been demonstrated/observed: Trending RCP vibrations Then instruct Booth to insert Event 6

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

Event Description: RCP Seal Degradation

Time	Position	Applicant's Actions or Behavior
	BOP	Respond to alarms <ul style="list-style-type: none"> • RCP No. 1 Seal Return High Low Flow (Common) • RCP Thermal Barrier Low ΔP
	ATC	Diagnose 32 RCP Seal Return Flow increasing not at trip setpoint
	CRS	Re-enter AOP-RCP-1.
	ATC/BOP	Verify RCP Shutdown Criteria <ul style="list-style-type: none"> • Motor Winding Temp > 250°F • Motor Winding Temp > 300°F • Upper or Lower motor bearing temp > 200°F • Shaft Vibration > 20 mils • Shaft Vibration > 15 mils and increasing >1 mil/hr • Frame Vibration > 5 mils • Frame Vibration > 3 mils and increasing >0.2 mils/hr • #1 Seal Return Flow > 6 gpm • #1 Seal Return Flow < 0.84 gpm and seal temps increasing • Seal ΔP < 200 psid • Seal Inlet temp > 225°F • Seal Outlet temp > 235°F
	CRS	Goes to appropriate section of the procedure
Lead Evaluator		When the following has been demonstrated/observed: When adequate progress through subsequent steps Then instruct Booth to insert Event 7

Op-Test No.: 1 Scenario No.: 4 Event No.: 7/8

Event Description: 32 RCP Trip Reactor /ATWS

Time	Position	Applicant's Actions or Behavior
		Multiple alarms indicating RCP Trip <ul style="list-style-type: none"> • 6900 V Motor Trip (Common) • Loss of Flow Single Loop • ΔT Deviation
	ATC	Announce Tripping Reactor from Flight Panel
	BOP	Backup Reactor Trip from Supervisory Panel
	CRS	Announce Perform Immediate Operator Actions of E-0
	ATC	Determine Reactor Not Tripped
	BOP	Dispatch NPO to locally trip reactor
	ATC	Announce reactor Power > 5%
	CRS	Announce Transitioning to FR-S.1
	ATC	<ul style="list-style-type: none"> • Reactor still not tripped • Manually insert Control Rods
	BOP	<ul style="list-style-type: none"> • Manually trip the Turbine • Start both motor driven AFW pumps (will not auto start due to plant conditions) • Establish > 686 gpm AFW flow • Open MOV-333 • Close HCV-104 and 105
	ATC	<ul style="list-style-type: none"> • Start both Boric Acid Transfer Pumps in fast speed • Check Pressurizer Pressure < 2335 psig

Op-Test No.: 1 Scenario No.: 4 Event No.: 7/8

Event Description: 32 RCP Trip Reactor /ATWS

Critical Task

Insert negative reactivity into the core by at least 1 of the following methods before step 4 of FR-S.1 is complete.

Deenergize Rod drive MG Sets

Manually Insert the rods

Establish Emergency Boration

Booth Operator

Remove MAL-RPS002B and ensure the Reactor is tripped. Insert MAL-RPS001A/B to trip the reactor if necessary.

	BOP	<ul style="list-style-type: none">• Check Purge Valves Closed• Check Pressure Relief Valves Closed• Check WCCPP Low Pressure Alarms NOT lit• Check SI not actuated
	ATC	Check Reactor Subcritical <ul style="list-style-type: none">• Power <5%• Rods < 20 steps
	BOP	<ul style="list-style-type: none">• Close MOV-333
	ATC	<ul style="list-style-type: none">• Place Boric Acid Transfer Pumps in Slow Speed
	BOP	<ul style="list-style-type: none">• Open HCV-104 and 105 to 25%
	ATC	<ul style="list-style-type: none">• Check RCP Seal Cooling established• Check Charging Pumps running• Establish Normal Boration
Lead Evaluator		When the following has been demonstrated/observed: After reactor trips. Event 9 Entered in Setup

Op-Test No.: 1 Scenario No.: 4 Event No.: 9

Event Description: SBLOCA

Time	Position	Applicant's Actions or Behavior
	CRS/ATC/ BOP	Respond to alarms/plant conditions indicating SBLOCA <ul style="list-style-type: none">• Pressurizer Level decreasing rapidly• Containment humidity increasing
	CRS	Directs entry into E-0.
	ATC	Verifies reactor trip: <ul style="list-style-type: none">• Reactor Trip Breakers Open• Rod Bottom Light Lit• IRPIs all near 0• Flux decreasing
	ATC	Verifies turbine trip: <ul style="list-style-type: none">• Checks Stop Valves closed
	BOP	Verifies power to 480V busses: <ul style="list-style-type: none">• All energized from offsite power
	ATC	Check if SI is actuated or required <ul style="list-style-type: none">• SI may not actuated but is required• Manually actuates SI
	BOP	Check Status of AFW > 365 gpm <ul style="list-style-type: none">• Control SG level between 9 and 50%

Op-Test No.: 1 Scenario No.: 4 Event No.: 9

Event Description: SBLOCA

	BOP	<p>Perform RO-1 in parallel with E-0/E-1:</p> <ul style="list-style-type: none">• Attempt Start HHSI pumps.• Start RHR pumps• Positions FCU dampers• Place switched to open for 1104/1105• Has NPO place switches for 1176/1176A to open.• Place CR HVAC to 10% Incident Mode• Reset SI unless done by E-2 first• Has NPO resets MCCs• Has NPO close SW valves SWN-FCV-1111/1112• Has NPO align CW cooling• Verifies letdown valves closed. May close excess letdown valves, but no required.• Establish IA to Containment• Open 863 N2 supply• Start NESW
	ATC	<ul style="list-style-type: none">• Verify Feedwater Isolation• Verify SI Flow• Verify Containment Spray Not Required• Check RCP Seal Cooling• Check Average RCS Temperature
Critical Task		
Trip all RCPs before completion of E-1 Step 1		
Lead Evaluator		<p>When the following has been demonstrated/observed: 1 minute after SI is reset by BOP or ATC Then Event 10 will occur</p>

Op-Test No.: 1 Scenario No.: 4 Event No.: 10

Event Description: Loss of Offsite Power after SI Reset

Time	Position	Applicant's Actions or Behavior
		Control room lights will turn off and on when offsite power is lost. 480V buses will quickly re-energize but essential and non-essential loads will be shed.
	CRS	Announce entry into LOOP-1
	BOP	<ul style="list-style-type: none"> • Verify power to 480V buses • Check 3 Essential Service Water Pumps running <ul style="list-style-type: none"> ◦ Start 3 Essential Service Water Pumps • Place CCW in TPO • Ensure Letdown is isolated
	ATC/BOP	Restart <ul style="list-style-type: none"> • High Head SI Pumps • RHR Pumps • Fan Cooler Units • AFW Pumps
Critical Task		
Establish flow from at least one SI Pump before transition out of LOOP 1		
Lead Evaluator		When the team restarts HHSI Pumps and RHR pumps, the scenario may be terminated.

Emergency Plan Follow Up:

For this scenario, the following conditions occurred regarding Emergency Declarations:

- SAR SS2.1 Failure of an automatic trip signal to reduce power range $< 5\%$
AND
Manual trip actions taken at the reactor control console (manual reactor trip switches) are not successful.

Facility: Indian Point Unit 3Task No: 32-200-SU/SD-002Task Title: **Review a Manual ECP Calculation**K/A Reference: 1940012137
SRO-4.6Job Performance Measure No: SRO
Admin-1

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance	_____	Actual Performance	<u>X</u>
Classroom	<u>X</u>	Simulator	_____
		Plant	_____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

- A Unit trip occurred due to a Main Transformer Fire 20 days ago at 1000.
- The unit had been operating for 100 Days at 100% power following a refueling outage.
- Prior to the trip:
 - Control Bank D at 230
 - Boron Concentration 1025 ppm
- Current Plant Conditions:
 - Tavg 547°F
 - Boron Concentrations 1320
- The Plant Computer is Out of Service
- Estimated time of Criticality 1800 tonight
- The spare RO prepared a manual ECP

Required Materials: Calculator

General References: -SOP-RPC-003, Estimated Critical Rod Position and Boron
Concentration Calculation
3-Graph-RV-3C
3-Graph-RV-4A
3-Graph-RV-1
3-Graph-RV-5A
3-Graph-RV-6
3-Graph-RV-7A
RPC-1
3-GRAPH-RPC-14A

Initiating Cue: You are the CRS and the SM has directed you to review the ECP.

Time Critical Task: No

Task Standard: ECP Calculation reviewed and errors found.

Validation Time: 45 minutes

Performance Information

(Denote critical steps with a check mark ✓)

1. Performance Step: Review data for equilibrium operating conditions prior to shutdown in Section 1.0 of data sheet

Standard: Data given in initial conditions.
Determines data entered correctly

Comment:

2. Performance Step: Review estimated date, time, RCS Temperature, boron concentration and length of shutdown for forthcoming criticality recorded in Section 2.0 of data sheet

Standard: Data given in initial conditions
Determine data entered correctly

Comment:

3. Performance Step: Perform required data entries AND Calculations using referenced graphs.

Standard: Actions listed in JPM Steps below 5 - 26

Comment:

4. Performance Step: Calculate Xe contribution to reactivity balance

Standard: Identifies 2782 pcm from Graph RV-3C
Determines data entered correctly at step 4.2.4.2

Comment:

Performance Information

(Denote critical steps with a check mark ✓)

5. Performance Step: Calculate Sm contribution to reactivity balance

Standard: Identifies 171 pcm from Graph RV-4A
Determines data entered correctly at step 4.2.5.3

Comment:

6. Performance Step: Determines Power contribution to reactivity balance

Standard: Determine 1496 is NOT correct.
Correct Value from graph between 1696 and 1707
Determine data entered incorrectly.

Comment:

7. Performance Step: Determine Temperature contribution to reactivity balance

Standard: Determines Reactivity is 0 pcm from procedure since
temperature at criticality will be 547°F.

Comment:

✓ 9. Performance Step: Calculate Boron Worth

Standard: Determine Delta Boron is NOT correct
1320 – 1025 = 295 NOT 395
Using 295 as Delta Boron Calculated Boron Worth is
2037 ± 2% entered at step 4.2.8.6 instead of 2727.

Comment: The ECP given to the SRO for review appears satisfactory. In fact performing a startup under these conditions would violate TS. May need to cue candidate to calculate actual ECP to show this. Candidate should be offered clean Attachment 1.

Performance Information

(Denote critical steps with a check mark ✓)

10. Performance Step: Determine Rod Worth at shutdown from Graph RV-7A

Standard: Determines Remaining Rod Worth is 2960
Determines data entered correctly at step 4.2.9.1

Comment: This is actually correct on the form given to the candidate.

✓ 11. Performance Step: Calculate Estimated Critical Position

Standard: Determines Estimated Critical Position is NOT correct.
Determines ACTUAL Estimated Critical Position is less than 25 steps above the rod insertion limit. Actually off the table.

Comment: ECP cannot be performed and a startup cannot be performed under these conditions. Boron concentration has to be increased to proceed.

Terminating Cue: JPM Complete

ESTIMATED CRITICAL ROD POSITION AND BORON CONCENTRATION CALCULATION

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ATTACHMENT 1, ECP DATA SHEET

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4.2.1 Equilibrium Condition Prior to Last Shutdown:
 Shutdown Date 26 DAYS AGO Time 1000
 Control Bank D at 250 steps
 Boron Concentration 1025 ppm
 Power Level 100 %

4.2.2 Estimated Conditions at Critical
 Critical Date TODAY Time 1800
 Tavg 547
 Desired Boron Concentration 1300

4.2.3 Length of Shutdown 488 hrs

4.2.4 Equiv. Power for Xenon

Hrs. Prior to S.D.	Avg. Power	Multiplier	Product
0-4		x 5 =	
4-8		x 4 =	
8-16		x 6 =	
16-24		x 4 =	
24-36		x 3 =	
Total			

Equiv. Xe Power = (Total) / 22 = 100 %

4.2.5 Equiv. Power for Samarium

Days Prior to S.D.	Avg. Power	Multiplier	Product
Day of S.D.		x 15.6 =	
1		x 24.7 =	
2		x 18.1 =	
3		x 13.2 =	
4		x 9.6 =	
5		x 7.0 =	
6		x 5.2 =	
7		x 3.8 =	
8		x 2.8 =	
Total			

Equiv. SM Power = (Total) / 100 = 100 %

Procedure Section	Component	Reactivity Balance Sign	Change
4.2.4.2	Xe Defect	(+ or -)	<u>2782</u>
4.2.5.3	Sm Defect	(-)	<u>171</u>
4.2.6.2	Pwr Defect	(+)	<u>1496</u> *
4.2.7.1 or .2	Isothermal Temp. Defect (+)		<u>0</u>
4.2.8.6	Boron Worth	(+ or -)	<u>2727</u> *
4.2.9.1	C.B. Worth At Shutdown (-)		<u>2960</u>
4.2.9.2	Required SU Bank Worth (Total of above)		<u>1580</u> *

4.2.8 Boron Worth

4.2.8.1 B (SU) = 1320 B(SD) = 1025

4.2.8.2 $\Delta \text{Boron} = \frac{B(SU) - B(SD)}{B(SD)}$ ppm = 1025 ppm

$\Delta \text{Boron} = \frac{B(SU) - B(SD)}{B(SD)}$ ppm = 395 *

4.2.8.4 $\alpha B(SU) = \frac{B(SU)}{B(SD)}$ $\alpha B(SD) = \frac{B(SD)}{B(SD)}$ = 7.13

4.2.8.5 $\alpha B = \frac{\alpha B(SU) + \alpha B(SD)}{2}$ = 6.9 pcm/ppm

4.2.8.6 Boron Worth = $\Delta \text{Boron} \times \alpha B$
 Boron Worth = (395) x (6.9)

Boron Worth = 2727 pcm *

4.2.9 Estimated Critical Position

4.2.9.3 C.B. C Steps 55 *

4.2.9.4 T.S. Insertion Limit + 25 Steps =
 C.B. C Steps 25

4.2.9.5 Withdrawal Limit - 25 Steps =
 C.B. _____ Steps _____

4.2.9.6 + 500 pcm position = 025 Steps

4.2.9.6 - 500 pcm position = 025 Steps

4.2.10 Estimated Critical Boron Concentration

4.2.10.1 Desired ECP: CB _____ Steps _____

4.2.10.2 Desired ECP Bank Worth _____ pcm

4.2.10.3 + 500 pcm position = _____ Steps

- 500 pcm position = _____ Steps

4.2.10.4 $\Delta \text{Rod Worth} = \text{Required SU Bank Worth (4.2.9.2)} - \text{Desired ECP Bank Worth (4.2.10.2)}$ pcm

$\Delta \text{Rod Worth} = \text{_____} \text{ pcm}$

4.2.10.5 $\Delta \text{Boron} = \frac{\Delta \text{Rod Worth (4.2.10.4)}}{\alpha B(SU) (4.2.8.4)}$

= (_____) = _____ ppm

4.2.10.6 Critical Boron = Desired Boron - ΔBoron
 Critical Boron = _____ - _____ ppm
 Critical Boron = _____ ppm

4.3.5 Actual Critical Conditions

C.B. _____ Steps _____

Tavg _____

Boron Concentration _____

Date _____ Time _____

Calculation Performed By: REACTOR OPERATOR

Date: TODAY

Verified By: _____
 Rx Engineer / STA

Date: _____

Approved By: _____
 Shift Manager

Date: _____

SEND a copy to Site
 Reactor Engineering
 and the completed ECP
 to Operations Staff

* Critical Steps

ESTIMATED CRITICAL ROD POSITION AND BORON CONCENTRATION CALCULATION

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ATTACHMENT 1, ECP DATA SHEET

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4.2.1 Equilibrium Condition Prior to Last Shutdown
Shutdown Date 20 DAYS Ago Time 1000
Control Bank D at 250 steps
Boron Concentration 1025 ppm
Power Level 100 %

4.2.2 Estimated Conditions at Critical
Critical Date TODAY Time 1800
Tavg 54.7
Desired Boron Concentration 1300

4.2.3 Length of Shutdown 488 hrs

4.2.4 Equiv. Power for Xenon

Hrs. Prior to S.D.	Avg. Power	Multiplier	Product
0-4		x 5 =	
4-8		x 4 =	
8-16		x 6 =	
16-24		x 4 =	
24-36		x 3 =	
		Total	

Equiv. Xe Power = (Total) / 22 = 100 %

4.2.5 Equiv. Power for Samarium

Days Prior to S.D.	Avg. Power	Multiplier	Product
Day of S.D.		x 15.6 =	
1		x 24.7 =	
2		x 18.1 =	
3		x 13.2 =	
4		x 9.6 =	
5		x 7.0 =	
6		x 5.2 =	
7		x 3.8 =	
8		x 2.8 =	
		Total	

Equiv. SM Power = (Total) / 100 = 100 %

Procedure Section	Component	Reactivity Balance Sign	Change
4.2.4.2	Xe Defect	(+ or -)	<u>2782</u>
4.2.5.3	Sm Defect	(-)	<u>171</u>
4.2.6.2	Pwr Defect	(+)	<u>1696.3</u>
4.2.7.1 or .2	Isothermal Temp. Defect	(+)	<u>0</u>
4.2.8.6	Boron Worth	(+ or -)	<u>2037</u>
4.2.9.1	C.B. Worth At Shutdown	(-)	<u>2960</u>
4.2.9.2	Required SU Bank Worth (Total of above)		<u>- 609.7</u>

4.2.8 Boron Worth

4.2.8.1 B (SU) = 1300 B (SD) = 1025

4.2.8.2 $\Delta \text{Boron} = \frac{B(SU)}{B(SD)} \text{ ppm} - 1025 \text{ ppm}$

$\Delta \text{Boron} = \frac{275}{1} \text{ ppm}$

4.2.8.4 $\alpha B (SU) = \frac{6.48}{1} \alpha B (SD) = 7.13$

4.2.8.5 $\alpha B = \frac{\alpha B (SU) + \alpha B (SD)}{2} = \frac{6.9}{2} \text{ pcm/ppm}$

4.2.8.6 Boron Worth = $\Delta \text{Boron} \times \alpha B$
Boron Worth = $(275) \times (6.9)$
Boron Worth = 2037 pcm

4.2.9 Estimated Critical Position

4.2.9.3 C.B. _____ Steps _____

4.2.9.4 T.S. Insertion Limit + 25 Steps =
C.B. _____ Steps 25

4.2.9.5 Withdrawal Limit - 25 Steps =
C.B. _____ Steps

4.2.9.6 + 500 pcm position = _____ Steps

4.2.9.6 - 500 pcm position = _____ Steps

4.2.10 Estimated Critical Boron Concentration

4.2.10.1 Desired ECP: CB _____ Steps _____

4.2.10.2 Desired ECP Bank Worth _____ pcm

4.2.10.3 + 500 pcm position = _____ Steps

- 500 pcm position = _____ Steps

4.2.10.4 $\Delta \text{Rod Worth} =$
Required SU Bank Worth (4.2.9.2) _____ pcm
- Desired ECP Bank Worth (4.2.10.2) _____ pcm

$\Delta \text{Rod Worth} =$ _____ pcm

4.2.10.5 $\Delta \text{Boron} = \frac{\Delta \text{Rod Worth} (4.2.10.4)}{\alpha B (SU) (4.2.8.4)}$

= (_____) = _____ ppm
= (_____) = _____ ppm

4.2.10.6 Critical Boron = Desired Boron - ΔBoron
Critical Boron = _____ - _____ ppm
Critical Boron = _____ ppm

4.3.5 Actual Critical Conditions

C.B. _____ Steps _____

Tavg _____

Boron Concentration _____

Date _____ Time _____

Calculation Performed By: _____ Date: _____

Verified By: _____ Date: _____
Rx Engineer / STA

Approved By: _____ Date: _____
Shift Manager

**SEND a copy to Site
Reactor Engineering
and the completed ECP
to Operations Staff**

Correct Calculation

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Initial Conditions:

- A Unit trip occurred due to a Main Transformer Fire 20 days ago at 1000.
- The unit had been operating for 100 Days at 100% power following a refueling outage.
- Prior to the trip:
 - Control Bank D at 230
 - Boron Concentration 1025 ppm
- Current Plant Conditions:
 - Tavg 547°F
 - Boron Concentrations 1320
- The Plant Computer is Out of Service
- Estimated time of Criticality 1800 tonight
- The spare RO prepared a manual ECP

Initiating Cue:

You are the CRS and the SM has directed you to review the ECP.

ESTIMATED CRITICAL ROD POSITION AND BORON CONCENTRATION CALCULATION

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ATTACHMENT 1, ECP DATA SHEET

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4.2.1 Equilibrium Condition Prior to Last Shutdown

Shutdown Date 26 DAYS AGO Time 1000
Control Bank 0 at 250 steps
Boron Concentration 1025 ppm
Power Level 100 %

4.2.2 Estimated Conditions at Critical

Critical Date TODAY Time 1800
Tavg 597
Desired Boron Concentration 1320

4.2.3 Length of Shutdown 488 hrs

4.2.4 Equiv. Power for Xenon

Hrs. Prior to S.D.	Avg. Power	Multiplier	Product
0-4		x 5 =	
4-8		x 4 =	
8-16		x 6 =	
16-24		x 4 =	
24-36		x 3 =	
		Total	

Equiv. Xe Power = (Total) / 22 = 100 %

4.2.5 Equiv. Power for Samarium

Days Prior to S.D.	Avg. Power	Multiplier	Product
Day of S.D.		x 15.6 =	
1		x 24.7 =	
2		x 18.1 =	
3		x 13.2 =	
4		x 9.6 =	
5		x 7.0 =	
6		x 5.2 =	
7		x 3.8 =	
8		x 2.8 =	
		Total	

Equiv. SM Power = (Total) / 100 = 100 %

Procedure Section	Component	Reactivity Balance Sign	Change
4.2.4.2	Xe Defect	(+) or (-)	<u>2782</u>
4.2.5.3	Sm Defect	(-)	<u>171</u>
4.2.6.2	Pwr Defect	(+)	<u>1496</u>
4.2.7.1 or .2	Isothermal Temp. Defect	(+)	<u>0</u>
4.2.8.6	Boron Worth	(+) or (-)	<u>2727</u>
4.2.9.1	C.B. Worth At Shutdown	(-)	<u>2960</u>
4.2.9.2	Required SU Bank Worth (Total of above)		<u>1580</u>

4.2.8 Boron Worth

4.2.8.1 B (SU) = 1320 B (SD) = 1025

4.2.8.2 $\Delta \text{Boron} = \frac{B(\text{SU})}{B(\text{SD})} \text{ ppm} - \frac{1025}{1025} \text{ ppm}$

$\Delta \text{Boron} = \frac{395}{1025} \text{ ppm}$

4.2.8.4 $\alpha \text{B (SU)} = \frac{6.68}{1025} \alpha \text{B (SD)} = \frac{7.13}{1025}$

4.2.8.5 $\alpha \text{B} = \frac{\alpha \text{B (SU)} + \alpha \text{B (SD)}}{2} = \frac{6.9}{2} \text{ pcm/ppm}$

4.2.8.6 Boron Worth = $\Delta \text{Boron} \times \alpha \text{B}$
Boron Worth = $(\frac{395}{1025}) \times (6.9)$
Boron Worth = 2727 pcm

4.2.9 Estimated Critical Position

4.2.9.3 C.B. C Steps 55

4.2.9.4 T.S. Insertion Limit + 25 Steps =
C.B. C Steps 25

4.2.9.5 Withdrawal Limit - 25 Steps =
C.B. C Steps 25

4.2.9.6 + 500 pcm position = 025 Steps
4.2.9.6 - 500 pcm position = C-25 Steps

4.2.10 Estimated Critical Boron Concentration

4.2.10.1 Desired ECP: CB C Steps 55

4.2.10.2 Desired ECP Bank Worth pcm

4.2.10.3 + 500 pcm position = Steps
- 500 pcm position = Steps

4.2.10.4 $\Delta \text{Rod Worth} =$
Required SU Bank Worth (4.2.9.2) pcm
- Desired ECP Bank Worth (4.2.10.2) pcm
 $\Delta \text{Rod Worth} = \text{ }$ pcm

4.2.10.5 $\Delta \text{Boron} = \frac{\Delta \text{Rod Worth (4.2.10.4)}}{\alpha \text{B (SU) (4.2.8.4)}}$
 $= \frac{\text{ }}{\text{ }} = \text{ }$ ppm
 $= \frac{\text{ }}{\text{ }} = \text{ }$ ppm

4.2.10.6 Critical Boron = Desired Boron - ΔBoron
Critical Boron = - ppm
Critical Boron = ppm

4.3.5 Actual Critical Conditions

C.B. Steps
Tavg
Boron Concentration
Date Time

Calculation Performed By: REACTOR OPERATOR

Date: TODAY

Verified By:
Rx Engineer / STA

Date:

Approved By:
Shift Manager

Date:

SEND a copy to Site Reactor Engineering and the completed ECP to Operations Staff

Facility: Indian Point Unit 3Task No: 32-035-ABNORMAL-006Task Title: **Review a SG Tube Leakrate Determination using 3-AOP-SG-1**K/A Reference: 1940012125
RO-3.9 SRO-4.2Job Performance Measure
No:SRO
Admin-2

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance	<u>X</u>	Actual Performance	_____
Classroom	<u>X</u>	Simulator	_____
		Plant	_____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

- The plant is operating at 25% power
- Radiation Monitor 15 is in alert.
- The operating crew is responding in accordance with 3-AOP-SG-1 Steam Generator Tube Leak.
- Condenser air in leakage is 2.7 SCFM
- RCS Total Gaseous Activity 1.62×10^{-2} $\mu\text{Ci/cc}$
- Given the attached Leakrate Log

Required Materials: Leakrate Log

General References: 3-AOP-SG-1 Attachment 1 and 2

Initiating Cue:

You are the CRS and the SM has directed you to review the estimated SG Tube Leakage Log for today, and determine:

- sample frequency
- recommend actions (if any)

Time Critical Task: NA

Validation Time: 15 Minutes

Task Standard: SG Tube Leakage calculation reviewed using 3-AOP-SG-1 Attachment 1 and 2; errors found in accordance with the answer key.

Performance Information

(Denote critical steps with a check mark ✓)

1. Performance Step: Check Calculations

Standard: Candidate may use Attachment 1 or separate paper
Candidate should determine that the calculations for
1115 through 1315 are correct.

Comment:

✓2. Performance Step: Check Calculation for 1330

Standard: Determines calculation is incorrect. The correct
value is 64.6 gpd

Comment:

✓3. Performance Step: Check Calculation for 1345

Standard: Determines calculation is incorrect. The correct
value is 77.2 gpd
In addition to the calculation being incorrect, The
CRS should recognize that the leakrate is > 75 gpd
and the plant should be placed in MODE 3 within
the next 2 hours (procedure step 4.16).

Comment:

Performance Information

(Denote critical steps with a check mark ✓)

4. Performance Step: Calculate SG Tube Leakage change over last hour

Standard: Determines SG Tube Leakage has increased by:

- 7.9 gpd from 1215 to 1315.
- 19.7 gpd from 1230 to 1330.
- 31.8 gpd from 1245 to 1345.

Comment:

✓ 5. Performance Step: Review Sample frequency recommendation by RO

Standard: Determine Sample Frequency is every 15 minutes.

Comment:

Terminating Cue: JPM Complete

**Steam Generator Tube Leak
Attachment 2
Leak Rate Log**

3-AOP-SG-1 Rev11
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- If leak rate is unknown, take data & determine LR every 15 minutes.
- If leak < 30 gpd, take data once every 4 hours.
- If leak increases ≥ 30 gpd but < 75 gpd take data & determine LR every 15 minutes.
- If leak ≥ 30 gpd but < 75 gpd and stable for 1 hour (≤ 5 gpd increase in 1 hour), take data every 2 hours.
- If leak ≥ 30 gpd but < 75 gpd and stable for 24 hours ($\leq 10\%$ increase in 1 hour), take data at frequency for normal operation.
- If leak ≥ 75 gpd, take data & determine LR every 15 minutes.

Time	*Date	R-15 ($\mu\text{Ci/cc}$)	R-63 ($\mu\text{Ci/cc}$)		Current Leakrate gpm (gpd)	**DELTA LEAKRATE gpm (gpd)/hr	Method Used To Determine Leakrate
			A	B			
1215	Today	2.46E-05		1.62E-02	44.2		2
1230		2.50E-05		1.62E-02	44.9		2
1245		2.53E-05		1.62E-02	45.4		2
1300		2.68E-05		1.62E-02	48.1		2
1315		2.90E-05		1.62E-02	52.1	7.9	2
1330		3.20E-05		1.62E-02	64.6	19.7	2
1345		4.00E-05		1.62E-02	77.2	31.8	2

* The DATE is required to be recorded in the first entry and when the date changes: otherwise, the DATE may be left blank.

** DELTA LEAKRATE is determined by subtracting the previous period leakrate from the CURRENT LEAKRATE (extrapolate result out to one hour). Use a minus (-) to indicate decreasing leakrate.

Answer Key

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

**Steam Generator Tube Leak
Attachment 2
Leak Rate Log**

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- If leak rate is unknown, take data & determine LR every 15 minutes.
- If leak < 30 gpd, take data once every 4 hours.
- If leak increases ≥ 30 gpd but < 75 gpd take data & determine LR every 15 minutes.
- If leak ≥ 30 gpd but < 75 gpd and stable for 1 hour (≤ 5 gpd increase in 1 hour), take data every 2 hours.
- If leak ≥ 30 gpd but < 75 gpd and stable for 24 hours ($\leq 10\%$ increase in 1 hour), take data at frequency for normal operation.
- If leak ≥ 75 gpd, take data & determine LR every 15 minutes.

Time	*Date	R-15 ($\mu\text{Ci/cc}$)	R-63 ($\mu\text{Ci/cc}$)		Current Leakrate gpm (gpd)	**DELTA LEAKRATE gpm (gpd)/hr	Method Used To Determine Leakrate
			A	B			
1215	Today	2.46E-05		1.62E-02	44.2		2
1230		2.50E-05		1.62E-02	44.9		2
1245		2.53E-05		1.62E-02	45.4		2
1300		2.68E-05		1.62E-02	48.1		2
1315		2.90E-05		1.62E-02	52.1	7.90	2
1330		3.60E-05		1.62E-02	57.5	12.6	2
1345		4.30E-05		1.62E-02	63.4	18.0	2

* The DATE is required to be recorded in the first entry and when the date changes: otherwise, the DATE may be left blank.

** DELTA LEAKRATE is determined by subtracting the previous period leakrate from the CURRENT LEAKRATE (extrapolate result out to one hour). Use a minus (-) to indicate decreasing leakrate.

Initial Conditions:

- The plant is operating at 25% power
- Radiation Monitor 15 is in alert.
- The operating crew is responding in accordance with 3-AOP-SG-1 Steam Generator Tube Leak.
- Condenser air in leakage is 2.7 SCFM
- RCS Total Gaseous Activity $1.62 \times 10^{-2} \mu\text{ci/cc}$
- Given the attached Leakrate Log

Initiating Cue:

You are the CRS and the SM has directed you to review the estimated SG Tube Leakage Log for today, and determine:

- sample frequency
- recommend actions (if any)

Facility: Indian Point Unit 3Task No: 32-200-NORMAL-040Task Title: Review Tagout Isolation BoundariesK/A Reference: 1940012213
(4.1/4.3)Job Performance Measure No: Admin - 3

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance	<u>X</u>	Actual Performance	_____
Classroom	<u>X</u>	Simulator	_____
		Plant	_____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

- The unit is in Cold Shutdown with no fuel in the reactor
- A malfunction has resulted in mechanical damage to 31 SI Pump.
- The motor was not affected by the malfunction.
- A new pump is available in the warehouse.
- The shift manager has waived the requirement for double valve protection.
- Single Valve protection is adequate for this tagout.
- Restoration alignment is NOT necessary. Restoration lineup will be performed in accordance with the Fill and Vent procedure.
- An RO prepared the Isolation Boundaries for 31 Safety Injection Pump

Required Materials: None

General References: SI System Print 9321-F-27503
SI System Print 9321-F-27513

Initiating Cue: You are a Spare SRO and the SM had directed you to review the isolation boundaries for 31 SI Pump.

Time Critical Task: No

Task Standard: Boundries reviewed and errors noted in accordance with the attached answer key.

Validation Time: 45 minutes

Performance Information

(Denote critical steps with a check mark ✓)

1. Performance Step: Reviews component list and flow diagrams

Standard: Reviews 9321-F-77503 and 9321-F-77513

Comment: *If candidate requests EN-OP-102, it is available*

✓ 2. Performance Step: **Determine Safe Work Boundary for 31 Safety Injection Pump Replacement**

Standard: Identify that CCW was not isolated for the pump removal

Comment:

✓ 3. Performance Step: **Review the isolation boundaries and identify the following errors:**

- Identify AC-749A CC Supply to 31 SI Pump Cooler Outlet Isolation NOT Listed
- Identify AC-749D CC Return from 31 SI Pump Cooler Outlet Isolation NOT Listed
- Candidate may include additional valves which are not critical

Standard: **See Attached Answer Key**

Comment:

Terminating Cue: JPM Complete

Answer Key with Missing Components

Tag Serial No.	Tag Type	Equipment Equipment Description Equipment Location	Place Seq.	Placement Configuration
1	Danger	31 Safety Injection Pump 480V Bus 5A Control Switch CCR Pnl SBF-2	1	Pullout
2	Danger	31 Safety Injection Pump Breaker Control Fuses 480 V Room Bus 5A	2	Removed/ Off
3	Danger	31 Safety Injection Pump breaker 480V room Bus 5A	3	Racked Out
4	Danger	MOV-850A 31 SI Pump Discharge Valve Waste Disposal Panel 55' EI PAB	4	Closed
5	Danger	MOV-850A 31 SI Pump Discharge Valve Breaker MCC-36B PAB 55' EL	5	OFF
6	Danger	MOV-850A 31 Safety Injection Pump Discharge Stop Handwheel SI Pump Room 34' PAB	6	Do Not Operate

7	Danger	SI-1807A 31 SI Pump Recirc Test Line Stop SI Pump Room 34' PAB	7	Closed
8	Danger	SI848A 31 Safety Injection Pump Suction Stop SI Pump Room 34' PAB	8	Closed
9.	Danger	SI-1819A 31 SI Pump Thrust Balance Flow Line Stop SI Pump Room 34' PAB	9	Closed
10	Danger	SI-2176-Cap Cap Downstream of vent valve 2176 SI Pump Room 34' PAB	12	Cap Removed
11	Danger	SI-2176 31 SI Pump Casing Vent Stop SI Pump Room 34' PAB	13	Open
√ 12	Danger	AC-749D CC Return from 31 SI Pump Cooler Outlet Isolation SI Pump Room 34' PAB		Closed
√ 13	Danger	AC-749A CC Supply to 31 SI Pump Cooler Outlet Isolation SI Pump Room 34' PAB		Closed

14	Danger	AC-58 CC Return from 31 SI Pump Cooler Outlet Drain		Open Cap Removed
15	Danger	AC-8022 31 Safety Injection Pump Discharge Test Line Isolation		Open Cap Removed

Items 14 and 15 are optional, but not required/critical.

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Proposed Tagging Boundary

Tag Serial No.	Tag Type	Equipment Equipment Description Equipment Location	Place Seq.	Placement Configuration
1	Danger	31 Safety Injection Pump 480V Bus 5A Control Switch CCR Pnl SBF-2	1	Pullout
2	Danger	31 Safety Injection Pump Breaker Control Fuses 480 V Room Bus 5A	2	Removed/ Off
3	Danger	31 Safety Injection Pump breaker 480V room Bus 5A	3	Racked Out
4	Danger	MOV-850A 31 SI Pump Discharge Valve Waste Disposal Panel 55' EI PAB	4	Closed
5	Danger	MOV-850A 31 SI Pump Discharge Valve Breaker MCC-36B PAB 55' EL	5	OFF
6	Danger	MOV-850A 31 Safety Injection Pump Discharge Stop Handwheel SI Pump Room 34' PAB	6	Do Not Operate

7	Danger	SI-1807A 31 SI Pump Recirc Test Line Stop SI Pump Room 34' PAB	7	Closed
8	Danger	SI848A 31 Safety Injection Pump Suction Stop SI Pump Room 34' PAB	8	Closed
9.	Danger	SI-1819A 31 SI Pump Thrust Balance Flow Line Stop SI Pump Room 34' PAB	9	Closed
10	Danger	SI-2176-Cap Cap Downstream of vent valve 2176 SI Pump Room 34' PAB	12	Cap Removed
11	Danger	SI-2176 31 SI Pump Casing Vent Stop SI Pump Room 34' PAB	13	Open

Initial Conditions:

- The unit is in Cold Shutdown with no fuel in the reactor
- A malfunction has resulted in mechanical damage to 31 SI Pump.
- The motor was not affected by the malfunction.
- A new pump is available in the warehouse.
- The shift manager has waived the requirement for double valve protection.
- Single Valve protection is adequate for this tagout.
- Restoration alignment is NOT necessary. Restoration lineup will be performed in accordance with the Fill and Vent procedure.
- An RO prepared the Isolation Boundaries for 31 Safety Injection Pump

Initiating Cue:

You are a Spare SRO and the SM had directed you to review the isolation boundaries for 31 SI Pump.

Facility: Indian Point Unit 3Task No: 32-200-NORMAL-018Task Title: **Review Large Gas Decay Tank Release Permit**K/A Reference: 1940012306
SRO – 3.8Job Performance Measure No: SRO Admin 4

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance	<u>X</u>	Actual Performance	_____
Classroom	<u>X</u>	Simulator	_____
		Plant	_____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

- Preparations are in progress to release 34 Large Gas Decay Tank
- The Tank is currently at 100 psig
- Gas Decay Tank Unpressurized Volume 525 Ft³
- Grab Sample Number 35617
- Concentration of Noble Gases 0.26 $\mu\text{Ci/cc}$
- All Radiation Monitor 27 (R-27) Channels are Operable
- R-27 Alarm Setpoint is 3570 $\mu\text{Ci/sec}$, Alert Setpoint is 1500 $\mu\text{Ci/sec}$
- Current R-27 Reading is 10 $\mu\text{Ci/sec}$
- Permit Number is 170072
- The BOP calculated a manual Release Permit

Required Materials: Calculator

General References: 3-SOP-WDS-013, Gaseous Waste Releases
IP-SMM-CY-001, Radioactive Effluents Control Program

Initiating Cue: You are the CRS and the SM has directed you to review the Gaseous Waste Release Permit and approve the release.

Time Critical Task: NA

Validation Time: 45 minutes

Task Standard: Calculation complete and errors identified.

Performance Information

(Denote critical steps with a check mark ✓)

✓ 1. Performance Step: Review Entered given data

Standard: Identify that Concentration of Nobel Gas (C)(6) was entered incorrectly.
Incorrect Value 2.6 E-2
Correct Total Activity is 2.6 E-1

Comment: Value is incorrect 10^{-2} entered versus 10^{-1} . The error results in incorrect calculations AND a non-conservative setting on RCV-014.

Prompt candidate to perform calculations to see impact of error.

✓ 2. Performance Step: Calculate Total Activity

Standard: Determines Total Activity is NOT correct.
Incorrect Value 3.02×10^6
Correct Total Activity is 3.02×10^7

Comment: Step 4.2.9

3. Performance Step: Calculate Available Release Rate

Standard: Determine Available Release Rate Calculation is correct.

Comment: Step 4.2.10.1

Performance Information

(Denote critical steps with a check mark ✓)

4. Performance Step: Record NA on Attachment 1

Standard: Observe NA items correct

Comment: Step 4.2.11

5. Performance Step: Record Discharge Monitor and Actual Alarm Setpoint

Standard: Observe correct discharge monitor and alarm setpoint entered

Comment: Step 4.2.12

6. Performance Step: Determine Maximum Allowable Release Rate Emax

Standard: Determine Maximum Allowable Release Rate is NOT correct.
Incorrect Value 290
Correct Total Activity is 29

Comment: Step 4.12.13

Performance Information

(Denote critical steps with a check mark ✓)

7 Performance Step: Select a conservative release rate which is less than Emax

Standard: This value is conservative for the incorrectly calculated Emax; however it is NOT conservative for the correct value.

Comment: Sep 4.2.14

8. Performance Step: Determine associated conservative percent lift setting from Attachment 11

Standard: The value is correct for the incorrectly selected value in previous step; however, the previously selected value for Actual Release Rate was not conservative.

Comment: Step 4.2.15

✓ 9. Performance Step: Determine Calculated Release Rate

Standard: Determine Calculated Release Rate is NOT correct.
Incorrect Value $1.47 \times 10^3 \mu\text{Ci/sec}$
Correct Release Rate is $3.68 \times 10^3 \mu\text{Ci/s}$
which would alarm the monitor.

Comment: Step 4.2.17

Performance Information

(Denote critical steps with a check mark √)

10. Performance Step:	Determine if Calculated Release Rate is greater than Available Release Rate.
Standard:	Determine Calculate Release Rate is less than Available Release Rate.
Comment:	Step 4.2.18

Terminating Cue: JPM Complete

GASEOUS WASTE RELEASES

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**ATTACHMENT 1,
GASEOUS WASTE RELEASE PERMIT FORM**
(Page 1 of 1)

Tank/ System (1)	<u>34 LGDT</u>	Current Date/Time (2)	<u>TODAY</u>	<u>CURRENT</u>	Permit No. (3)	<u>170072</u>
		Date	Time			
Volume (4)	<u>525</u>	ft ³	Initial Pressure (5)	<u>100</u>	psig	Concentration of Noble Gas (C)(6)
					<u>2.6E-2</u>	μCi/cc
Grab Sample:(7)	Sample # <u>35617</u>	Date <u>TODAY</u>	Time <u>30 MIN</u>	<u>ago</u>	OR R-12 Monitor	
Activity (A)(8)	<u>3.02E6</u>	μCi	Noble Gas	Iodine 131 Activity (8a)	<u>NA</u>	μCi/cc
				VC Purge Only		
Calculated Release Rate (R)(9)	<u>1.47E3</u>	μCi/sec	Available Release Rate (D)(10)	<u>3.56E3</u>	μCi/sec	
Discharge Monitor (11)	<u>R-27</u>	Actual Alarm Setpoint (12)	<u>3.57E3</u>	μCi/sec		
Calculated alarm setpoint (13)	<u>N/A</u>	μCi/sec	Alert setpoint (14)	<u>1.5E3</u>	μCi/sec	
R-12 Auto Closure/Alarm Setpoints: Calculated (15)	<u>N/A</u>	μCi/cc	Actual (16)	<u>N/A</u>	μCi/cc	
IF discharge monitor is OOS, THEN COMPLETE the following:						
• Monitor (17)	placed out service @		Date	Time		
• Vent Sample:(18)	Sample #	Date	Time	Results (19)	μCi/cc	
				(Noble Gas)		
• Vent flow rate (20)	cfm	Continuous Release Rate (CR)(21)	μCi/sec			
		Release Calculations verified by (22)				
Release Path Valve Alignment Verified (23)						
		CRS/SM				
Discharge Authorized (24)	CRS/SM		Release Start (25)	Date	Time	
Final Pressure (26)	psig		Release Stop (27)	Date	Time	
Calculations Results: S (28)			E _{max} (29)	<u>290</u>	ft ³ /min	
E (30)	<u>120</u>	ft ³ /min	RCV-014 Setting (31)	<u>100</u>	% OPEN	
Comments:(32)						

* Critical

GASEOUS WASTE RELEASES	No: 3-SOP-WDS-013 Rev: 29
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**ATTACHMENT 1,
GASEOUS WASTE RELEASE PERMIT FORM**
(Page 1 of 1)

Tank/ System (1) 34 LGDT Current Date/Time (2) TODAY CURRENT Permit No. (3) 170072

Volume (4) 525 ft³ Initial Pressure (5) 100 psig Concentration of Noble Gas (C)(6) 2.6 E-1 μCi/cc

Grab Sample: (7) Sample # 35617 Date TODAY Time 30 MIN AGO OR R-12 Monitor

Activity (A)(8) 3.02 E 7 μCi Noble Gas Iodine 131 Activity (Ba) N/A μCi/cc

VC Purge Only

Calculated Release Rate (R)(9) 3.68 E 3 μCi/sec Available Release Rate (D)(10) 3.56 E 3 μCi/sec

Discharge Monitor (11) R-27 Actual Alarm Setpoint (12) 3.57 E 3 μCi/sec

Calculated alarm setpoint (13) N/A μCi/sec Alert setpoint (14) 1.50 E 3 μCi/sec

R-12 Auto Closure/Alarm Setpoints: Calculated (15) N/A μCi/cc Actual (16) N/A μCi/cc

IF discharge monitor is OOS, THEN COMPLETE the following:

- Monitor (17) _____ placed out service @ _____
Date _____ Time _____
- Vent Sample: (18) Sample # _____ Date _____ Time _____ Results (19) _____ μCi/cc
(Noble Gas)
- Vent flow rate (20) _____ cfm Continuous Release Rate (CR)(21) _____ μCi/sec

Release Calculations verified by (22) _____

Release Path Valve Alignment Verified (23) _____

CRS/SM

Discharge Authorized (24) _____ Release Start (25) _____
CRS/SM Date _____ Time _____

Final Pressure (26) _____ psig Release Stop (27) _____
Date _____ Time _____

Calculations Results: S (28) _____ Emax (29) 29 ft³/min

E(30) 30 ft³/min RCV-014 Setting (31) _____ % OPEN

Comments: (32) _____

Cannot Release Tank

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Initial Conditions:

- Preparations are in progress to release 34 Large Gas Decay Tank
- The Tank is currently at 100 psig
- Gas Decay Tank Unpressurized Volume 525 Ft³
- Grab Sample Number 35617
- Concentration of Noble Gases 0.16 μ Ci
- All Radiation Monitor 27 (R-27) Channels are Operable
- R-27 Alarm Setpoint is 3570 μ Ci/sec, Alert Setpoint is 1500 μ Ci/sec
- Current R-27 Reading is 10 μ Ci/sec
- Permit Number is 170072
- The BOP calculated a manual Release Permit

Initiating Cue:

You are the CRS and the SM has directed you to review the Gaseous Waste Release Permit and approve the release.

GASEOUS WASTE RELEASES

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**ATTACHMENT 1,
GASEOUS WASTE RELEASE PERMIT FORM**
(Page 1 of 1)

Tank/ System (1) 34 LGDT Current Date/Time (2) TODAY CURRENT Permit No. (3) 170072
 Volume (4) 525 ft³ Initial Pressure (5) 100 psig Noble Gas (C)(6) 2.6E-2 $\mu\text{Ci/cc}$
 Grab Sample:(7) Sample # 35617 Date TODAY Time 30 MIN AGO OR R-12 Monitor
 Activity (A)(8) 3.02E6 μCi Noble Gas Iodine 131 Activity (8a) NA $\mu\text{Ci/cc}$
 Calculated Release Rate (R)(9) 1.47E3 $\mu\text{Ci/sec}$ Available Release Rate (D)(10) 3.56E3 $\mu\text{Ci/sec}$ VC Purge Only

Discharge Monitor (11) R-07 Actual Alarm Setpoint (12) 3.57E3 $\mu\text{Ci/sec}$
 Calculated alarm setpoint (13) N/A $\mu\text{Ci/sec}$ Alert setpoint (14) 1.5E3 $\mu\text{Ci/sec}$
 R-12 Auto Closure/Alarm Setpoints: Calculated (15) N/A $\mu\text{Ci/cc}$ Actual (16) N/A $\mu\text{Ci/cc}$

IF discharge monitor is OOS, THEN COMPLETE the following:

- Monitor (17) _____ placed out service @ _____
 Date _____ Time _____
- Vent Sample:(18) Sample # _____ Date _____ Time _____ Results (19) _____ $\mu\text{Ci/cc}$
 (Noble Gas)
- Vent flow rate (20) _____ cfm Continuous Release Rate (CR)(21) _____ $\mu\text{Ci/sec}$
 Release Calculations verified by (22) _____

Release Path Valve Alignment Verified (23) _____

Discharge Authorized (24) _____ CRS/SM Release Start (25) _____
 Date _____ Time _____
 Final Pressure (26) _____ psig Release Stop (27) _____
 Date _____ Time _____

Calculations Results: S (28) _____ Emax (29) 290 ft³/min
 E(30) 120 ft³/min RCV-014 Setting (31) 100 % OPEN

Comments:(32) _____

Facility: Indian Point Unit 2 Task No: 1500010503

Task Title: Classify Event and Complete Form EP-1, Part 1

K/A Reference: 1940002.4.41 Job Performance Measure SRO Admin 5
SRO – 4.6 No: _____

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance _____ Actual Performance X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

This is a TIME CRITICAL Job Performance Measure from the time you are told to begin until the time you classify the event. Also, from the time you classify the event until you complete the Radiological Emergency Data Form (EP-1, Part 1).

You will be allowed sufficient time to read the initial conditions and cue. You will then be allowed to ask questions about the conditions. However, once you review the E-Plan EALs, your clock starts.

Required Materials: IP-EP-120, Emergency Classification
IPEC Emergency Action Level Charts / EAL Book
Appropriate E-Plan Forms (EP-1, Part 1)
GE Checklist Form EP-3G

General References: IP-EP-120, Emergency Classification
IPEC Emergency Action Level Charts / EAL Book
Appropriate E-Plan Forms (EP-1, Part 1)
GE Checklist Form EP-3G

Initial Conditions:

The Reactor and Turbine have tripped 30 minutes ago.

The following plant conditions exist:

- All Emergency Diesel generator Fuel Oil Storage tanks are on fire.
- The on-site Fire Brigade is on the scene and off-site assistance was requested but has not yet arrived.
- All EDGs are secured, without fuel oil.
- Loss of offsite power occurred and the minimum time before power from offsite or Appendix R power will be restored is six (6) hours.
- The team is responding to ECA-0.0, "Loss of All AC Power", prior to cooldown.
- ALL SG levels are >10%NR and rising.

Unit 2 remains stable at 100% power.

METEOROLOGICAL CONDITIONS:

Wind Speed: 4.2 meters/second
Wind Direction: 050 degrees @ 10 meters
Stability Class: C

Initiating Cue:

The Shift Manager has become ill. You are the CRS and you must perform the duties of the Emergency Director until a replacement Shift Manager can arrive on site. You must Classify the event and Complete the NYS Radiological Emergency Data Form, Part 1.

- **This is a TIME CRITICAL JPM**
- **Inform the examiner when you have classified the event.**
- **Inform the examiner when you have completed the EP-1, Part 1 Form.**

Time Critical Task: **YES**

Validation Time: 13 minutes total (6min / 7min)

Task Standard: Event properly classified and EP-1, Part 1 Form completed within the required times in accordance with the attached key with critical elements highlighted.

Performance Information

(Denote critical steps with a check mark ✓)

1. Performance Step: Candidates review initial conditions and the initiating cue. They ask questions if necessary and then obtain the correct procedures.

Standard: Obtains IP-EP-120, Emergency Classification

Comment: Allow up to 15 minutes for students to fully understand the initial conditions and requested time critical task. Allow questions as a group and/or individual. Once the student understands the task and has been given the appropriate procedures, the JPM is started. Provide the student with the JPM start time.

Record JPM Start Time here: _____

CUE: Provide the student with the JPM start time.

✓2. Performance Step: Evaluate Plant Status to determine if GE, SAE, Alert, or NUE applies. Determines the highest classification and makes declaration.

Standard: Determines Event is a GE
EAL . SG-1.1 Loss of all offsite and onsite AC power to 480V safeguards buses And restoration of at least one safeguard bus within 4 hours is not likely.

Must be determined within 15 minutes.

TIME CRITICAL – Must complete this step within 15 minutes of start of JPM.

Comment: **Record the Time Declaration Made: _____**

✓3. Performance Step: Completes and approves "New York State Radiological Emergency Data Form, Part 1" (IP-EP-115-EP-1).

Standard: Completes all necessary information on the form and signs the form.

TIME CRITICAL – Must complete this step within 15 minutes of Time of Declaration (JPM Step 2)

Comment: **Record the Time Form is completed: _____**

Terminating Cue: JPM Complete

New York State
Indian Point Energy Center

RADIOLOGICAL EMERGENCY DATA FORM - PART 1		Notification # <u>1</u>
1.	This is an: <u>EXERCISE</u> ACTUAL EMERGENCY-- EVENT/DRILL TERMINATION notification at the Indian Point Energy Center	
2.	The Emergency Classification is: <div style="display: flex; justify-content: space-between; margin-top: 5px;"> A. Unusual Event B. Alert C. Site Area Emergency </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> * <u>D. General Emergency</u> </div> This Emergency Classification declared on: <u>Today</u> at <u>Current Time</u> <small>(Date) (Time 24 hr clock)</small>	
3.	Release of Radioactive Materials due to the Classified Event: <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 45%;"> <u>To Atmosphere:</u> <u>A. NO Release</u> B. Release BELOW Federal Limits C. Release ABOVE Federal Limits D. Unmonitored Release Requiring Evaluation </div> <div style="width: 45%;"> <u>To Water:</u> <u>A. NO Release</u> B. Release BELOW Federal Limits C. Release ABOVE Federal Limits D. Unmonitored Release Requiring Evaluation </div> </div>	
4.	The following Protective Actions are recommended to be implemented as soon as practicable: <u>A. NO NEED</u> for PROTECTIVE ACTIONS outside the site boundary * <u>B. EVACUATE</u> and IMPLEMENT the KI PLAN for the following Sectors 2 miles around 5-miles downwind: In the following Sectors: 1 2 3 4 5 6 7 8 9 <u>10</u> <u>11</u> <u>12</u> 13 14 15 16 2 miles around 10-miles downwind: In the following Sectors: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 <u>C. SHELTER-IN-PLACE</u> and IMPLEMENT the KI PLAN for the following Sectors 2 miles around 5 miles downwind: In the following Sectors: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 5-10 miles downwind: In the following Sectors: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 <div style="text-align: center; margin-top: 5px;"> Advise Remainder of EPZ to MONITOR the EMERGENCY ALERT SYSTEM NOTE: IMPLEMENT PROTECTIVE MEASURES FOR THE HUDSON RIVER AS APPROPRIATE NOTE: OFFSITE AUTHORITIES SHOULD CONSIDER SHELTER-IN-PLACE + IMPLEMENT KI PLAN IF EVACUATION IS NOT FEASIBLE </div>	
5.	EAL#: <u>541.1</u> <u>Loss of all offsite and onsite AC power to 48V</u> <u>Safeguards buses AND restoration of at least one</u> <input type="checkbox"/> This is a Rapidly Progressing Severe Accident <u>safeguards buses within 4 hours</u> <u>is not likely</u> <div style="float: right; text-align: right;"> Affected Location: A. UNIT 2 <u>B. UNIT 3</u> * C. IPEC SITE </div>	
6.	<u>Reactor Status:</u> Unit 2: Operational or Shutdown at (Date) <u>Today</u> (Time) <u>Current Time</u> (24 hr clock) Unit 3: Operational or <u>Shutdown</u> * at (Date) <u>Today</u> (Time) <u>Current Time - 30 min</u> (24 hr clock)	
7.	Wind Speed: <u>4.2</u> Meters/Sec at elevation 10 meters	
8.	Wind Direction: (From) <u>050</u> Degrees at elevation 10 meters	
9.	Stability Class: A B <u>C</u> D E F G	
10.	Reported by - Communicator: _____ Telephone # _____ <small>(Communicator's Name)</small>	
11.	Emergency Director Approval: _____ Date/Time: _____ <small>(Director's Name)</small>	

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Initial Conditions:

The Reactor and Turbine have tripped 30 minutes ago.

The following plant conditions exist:

- All Emergency Diesel generator Fuel Oil Storage tanks are on fire.
- The on-site Fire Brigade is on the scene and off-site assistance was requested but has not yet arrived.
- All EDGs are secured, without fuel oil.
- Loss of offsite power occurred and the minimum time before power from offsite or Appendix R power will be restored is six (6) hours.
- The team is responding to ECA-0.0, "Loss of All AC Power", prior to cooldown.
- ALL SG levels are >10%NR and rising.

Unit 2 remains stable at 100% power.

METEOROLOGICAL CONDITIONS:

Wind Speed: 4.2 meters/second
Wind Direction: 050 degrees @ 10 meters
Stability Class: C

Initiating Cue:

The Shift Manager has become ill. You are the CRS and you must perform the duties of the Emergency Director until a replacement Shift Manager can arrive on site. You must Classify the event and Complete the NYS Radiological Emergency Data Form, Part 1.

- **This is a TIME CRITICAL JPM**
- **Inform the examiner when you have classified the event.**
- **Inform the examiner when you have completed the EP-1, Part 1 Form.**

You will be allowed sufficient time to read the initial conditions and cue. You will then be allowed to ask questions about the conditions. However, once you review the E-Plan EALs, your clock starts.

Facility: Indian Point 3Task No: 34-103-NORMAL-002Task Title: Perform a Containment Pressure ReliefK/A Reference: 029000A103
RO – 3.0 SRO – 3.3Job Performance Measure No: In Plant 1

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing: _____

Simulated Performance X Actual Performance _____Classroom _____ Simulator _____ Plant X***Read to the examinee:***

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

- Unit is at 100% power
- Containment pressure is 1.25 psig
- RWST Temp is 60°F
- R-11 and R-12 are OPERABLE and in service.
- 0-SOP-Leakrate -001 is NOT in progress
- A Gaseous Waste Release Permit has been prepared.
- Manual operation of Pressure Relief valves is NOT required.
- All P&Ls are satisfied.
- Switches for 1191 & 1192 and 1190 are in OPEN in the control room.

Initiating Cue: You are the Nuc Watch NPO and you are directed to perform a Containment Pressure Relief in accordance with 3-SOP-CB-003, Containment Pressure Relief and Purge Systems Operation, steps 4.1.1.5 through 4.1.1.7 and 4.1.3.1 through 4.1.3.3.

Required Materials: None

General References: 3-SOP-CB-003, Containment Pressure Relief and Purge Systems Operation

Task Standard: Locate and properly manipulate equipment to reduce containment pressure in accordance with 3-SOP-CB-003, Containment Pressure Relief and Purge Systems Operation.

Time Critical Task: No

Validation Time: Minutes 15 Minutes

Performance Information

(Denote critical steps with a check mark ✓)

1. Performance Step: Obtain correct procedure

Standard: Hand candidate 3-SOP-CB-003.

Comment:

NOTE: All actions for steps 4.1.1.1 through 4.1.1.4 have been completed. If candidates ask, refer them to Initial Conditions.

2. Performance Step: Review NOTE before step 4.1.1.5

Standard: Note Reviewed

Comment:

3. Performance Step: VERIFY Fire Detection System Fan Interlock Bypass Switch For Fan CBP-31 CBP-32 & CBPR, is in NORMAL to start CB Pressure Relief System from fan room Ventilation Control Panel (Ventilation Control Panel, 82' Fan Room).

Standard: Observe switch is in NORMAL

Comment: Step 4.1.1.5

Performance Information

(Denote critical steps with a check mark ✓)

4. Performance Step: Review NOTES before step 4.1.1.6

Standard: Notes Reviewed

Comment:

✓ 5. Performance Step: OPEN the following valves by positioning associated control switches to OPEN (spring return to AUTO):
(Ventilation Control Panel, 82' Fan Room)

- VS-PCV-1190, Containment Building Pressure Relief Valve
- VS-PCV-1191, VS-PCV-1192, Containment Building Pressure Relief Valves

Standard: Rotate switches to OPEN position

CUE: Immediately get red light lit when switch taken to open. Valves indicate dual red and green for approximately 15 seconds then only red light remain on (indicates valves are open).

Comment: Step 4.1.1.6

Performance Information

(Denote critical steps with a check mark ✓)

6. Performance Step: Review NOTE before step 4.1.1.7

Standard: Note Reviewed

Comment:

✓ 7. Performance Step: WHEN CB Pressure Relief valves indicate OPEN,
THEN PLACE CB Pressure Relief Fan control switch in
START (Ventilation Control Panel, 82' Fan Room).

Standard: Fan Switch rotated to Start

EXAMINER NOTE: *As long as the candidate does not wait longer
than 40 seconds from the time valves open, Fan will start*

CUE: *Red light is lit.*

Comment: Step 4.1.1.7

CUE: *Time Compression – Containment Pressure is .25 psig and the
CRS has directed you to secure Containment Pressure Relief.*

Performance Information

(Denote critical steps with a check mark ✓)

8. Performance Step: Review NOTES before step 4.1.3.1

Standard: Notes Reviewed

Comment:

✓ 9. Performance Step: CLOSE Cont Bldg Press Relief Valves VS-PCV-1191, VS-PCV-1192 (outside) and Cont Bldg Press Relief Valve VS-PCV-1190 (inside) from either of the following locations:

- Control Room (CCR) switches on panel SNF (Not Used)
- Ventilation Control Panel (82' Fan Room)

Standard: Rotate and hold Switch for 1190 to close position.

CUE: *After 5 seconds and if candidate held switch to close position, cue candidate the 1190 red light is extinguished.*

Standard: Rotate and hold Switch 1191 & 1192 to close.

CUE: *After 5 seconds and if candidate held switch to close position, cue candidate the 1191 and 1192 red light is extinguished.*

Comment: Step 4.1.3.1

Performance Information

(Denote critical steps with a check mark ✓)

10. Performance Step: VERIFY CB Pressure Relief Fan has stopped.

Standard: Observe red light extinguished and green light lit.

CUE: *Red light is extinguished and Green light is lit*

Comment: Step 4.1.3.2

11. Performance Step: Review NOTE before step 4.1.3.3

Standard: Note Reviewed

Comment:

12. Performance Step: VERIFY the following valves are CLOSED:

- VS-PCV-1190, Cont Bldg Press Relief Valve
- VS-PCV-1191, Cont Bldg Press Relief Valve
- VS-PCV-1192, Cont Bldg Press Relief Valve

Standard: Observe Green light lit and Red light extinguished

CUE: *Red lights extinguished and Green lights lit.*

Comment: Step 4.1.3.3

Terminating Cue: JPM Complete

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Initial Conditions:

- Unit is at 100% power
- Containment pressure is 1.25 psig
- RWST Temp is 60°
- R-11 and R-12 are OPERABLE and in service.
- 0-SOP-Leakrate -001 is NOT in progress
- A Gaseous Waste Release Permit has been prepared.
- Manual operation of Pressure Relief valves is NOT required.
- All P&Ls are satisfied.
- Switches for 1191 & 1192 and 1190 are in OPEN in the control room.

Initiating Cue:

You are the Nuc Watch NPO and you are directed to perform a Containment Pressure Relief in accordance with 3-SOP-CB-003, Containment Pressure Relief and Purge Systems Operation, steps 4.1.1.5 through 4.1.1.7 and 4.1.3.1 through 4.1.3.3.

Facility: Indian Point 3Task No: 31-007-NORMAL-001Task Title: Lower Level in the PRT007000A101K/A Reference: RO – 2.9 SRO – 3.1Job Performance Measure No: In Plant 2

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing: _____

Simulated Performance X

Actual Performance _____

Classroom _____

Simulator _____

Plant X**Read to the examinee:**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

- PRT level is 80%
- PRT Temperature is 80°F
- 32 RCDT Pump is NOT available
- CVCS HUT is 30%

Initiating Cue: You are the Nuc Side NPO and the CRS has directed you to lower the PRT level to between 67% and 77% in accordance with 3-SOP-RCS-007, Pressurizer Relief Tank Operations steps 4.3.2.1 through 4.3.2.10.

Required Materials: None

General References: 3-SOP-RCS-007, Pressurizer Relief Tank Operations.

Task Standard: Locate and properly manipulate equipment to lower PRT Level to between 67 and 77% in accordance with 3- SOP-RCS-007, Pressurizer Relief Tank Operations.

Time Critical Task: No

Validation Time: 15 Minutes

Performance Information

(Denote critical steps with a check mark ✓)

1. Performance Step: Obtain correct procedure

Standard: Hand candidate 3-SOP-RCS-007 Pressurizer Relief Tank Operations

Comment:

2. Performance Step: Review NOTES prior to step 4.3.2

Standard: Notes Reviewed

Comment:

3. Performance Step: VERIFY sufficient volume available in the in-service CVCS HUT.

Standard: From Initial Conditions CVCS HUT is at 30% (sufficient volume available)

Comment: Step 4.3.2.1

Performance Information

(Denote critical steps with a check mark ✓)

4. Performance Step: VERIFY both RCDT pump control switches are in OFF.

Standard: Observe Switch Position in OFF

CUE: RCDT Pump switches are in OFF position.

Comment: Step 4.3.2.2

5. Performance Step: OPEN PRT Drn Vlv 523 (Panel SAF)

Standard: Contact Control Room to Open Drain Valve 523.

CUE: When Control Room called, report PRT Drain Valve 523 is OPEN.

Comment: Step 4.3.2.3

6. Performance Step: RECORD the position of the RCDT Pump suction valve control switches:

- LCV-1003A, 31 RCDT Pump Suction Isolation
- LCV-1003B, 32 RCDT Pump Suction Isolation

Standard: Observe the Valve Control Switch Positions and record.
Candidate may only record position of LCV-1003A because 32 pump is OOS

CUE: Use actual indicated valve switch position.

Comment: Step 4.3.2.4

Performance Information

(Denote critical steps with a check mark ✓)

✓ 7. Performance Step: Open the suction valve(s) of the desired RCDT Pump(s).

a) LCV-1003A, 31 RCDT Pump Suction Isolation

Standard: Rotate switch to Open
Observe Indicator increasing.

CUE: Position indicator Red light lit and Green Light extinguished.

Comment: Step 4.3.2.5

8. Performance Step: VERIFY that 1702, R.C. Drain Tank Pump Disch. Isolation Valve, is OPEN

Standard: Observe 1702 Red Light Lit.

CUE: Red light is lit.

Comment: Step 4.3.2.6

9. Performance Step: VERIFY that 1705, R.C. Drain Tank Pump Disch. Isolation Valve, is OPEN

Standard: Observe 1705 Red Light Lit.

CUE: Red light is lit.

Comment: Step 4.3.2.7

Performance Information

(Denote critical steps with a check mark ✓)

✓ 10. Performance Step: **START** desired RCDT pump(s) by placing control switch to ON

Standard: Rotate Switch for 31 RCDT pump to ON

CUE: *31 RCDT Pump Red light is lit.*

Comment: Step 4.3.2.8

11. Performance Step: MONITOR the following parameters:

- b) PRT Level
- c) PRT Pressure
- d) CVCS HUT Level
- e) Vent Header Pressure
- f) RCDT level
- g) RCDT Pressure

Standard: Locate indications for all of the above

CUE: *PRT LEVEL and Pressure are lowering slowly.
PRT Level is 70%*

Comment: Step 4.3.2.9

√ 12. Performance Step: WHEN desired PRT level is obtained
OR any unexpected parameter changes occur,
THEN SECURE draining PRT as follows:

- a) **VERIFY 31 RCDT control switch is OFF**
- b) IF Valve 1705 was opened in step 4.3.2.7
THEN CLOSE Valve 1705
IF Valve 1702 was opened in step 4.3.2.6
THEN CLOSE Valve 1702
- c) **VERIFY that the RCDT Pump suction valve control switches are in the position recorded in step 4.3.2.4.**
- d) **CLOSE PRT Drn Vlv 523 (Panel SAF).**

Standard: Rotate 31 RCDT Pump switch to OFF
Rotate Switch for LCV-1003A until indicator equals value recorded in step 4.3.2.4
Contact Control Room to close PRT Drain Valve 523.

CUE: *31 RCDT Pump green light lit.*
LCV-1003A indicator is equal to previous value.
Valve 1705 is OPEN (Not a change in position)
Valve 1702 is OPEN (Not a change in position)
Control Room Reports "PRT Drain Valve 523 is Closed"

Comment: Step 4.3.2.10

Terminating Cue: JPM Complete

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Initial Conditions:

- PRT level is 80%
- PRT Temperature is 80°F
- 32 RCDT Pump is NOT available
- CVCS HUT is 30%

Initiating Cue:

You are the Nuc Side NPO and the CRS has directed you to lower the PRT level to between 67 and 77% in accordance with 3-SOP-RCS-007, Pressurizer Relief Tank Operations steps 4.3.2.1 through 4.3.2.10.

Facility: Indian Point Unit 3Task No: 34-039-ABNORMAL-004Task Title: Local Operation of 32 Atmospheric Steam Dump ValveK/A Reference: 000068A101
SRO 4.5Job Performance Measure No: In-Plant 3

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance	<u>X</u>	Actual Performance	
Classroom	<u>Simulator</u>	Plant	<u>X</u>

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

- A fire occurred in the Control Building resulting in a Control Room Evacuation.
- Communications have been established with the Reactor Operator.
- 32 SG pressure is 1040 psig.
- No SG Atmospherics have failed open.
- The other three SGs are at 1005 psig.

Required Materials: 3-SOP-ESP-001 Section 4.9

General References: 3-SOP-ESP-001 Local Equipment Operation and Contingency
ActionsInitiating Cue: You have been directed to establish local control of 32 atmospheric and
decrease pressure to 1005 psig per SOP-ESP-001.

Time Critical Task: No

Task Standard: Locate and properly manipulate equipment to reduce and maintain 32 SG pressure at 1005 psig locally using the atmospheric steam dump valve in accordance with 3-SOP-ESP-001, Local Equipment Operation and Contingency Actions.

Validation Time: 15 minutes

Performance Information

(Denote critical steps with a check mark ✓)

1. Performance Step: Obtain correct procedure

Standard: 3-SOP-ESP-001, SECTION 4.9

Comment: Hand the candidate the procedure section.

2. Performance Step: Review Notes prior to step 4.9.1

Standard: Notes Reviewed

Comment:

✓ 3. Performance Step: CLOSE valve No. 1 Air Booster Relay Valve.

Standard: Rotates valve operator 90°

CUE: Rotate operator 90° until handle is perpendicular to the pipe.

Comment: Step 4.9.1

4. Performance Step: VERIFY valve No. 2, Vent, is CLOSED.

Standard: Check valve handle perpendicular to pipe.

CUE: Valve handle is perpendicular to the pipe.

Comment: Step 4.9.2

Performance Information

(Denote critical steps with a check mark ✓)

5. Performance Step: VERIFY valve No. 3, N₂ Supply Header Pressure Gauge Isolation, is OPEN

Standard: Check valve in clockwise directions – Valve Movement

CUE: Valve moves slightly in clockwise direction and moved back to full out. (valve is open)

Comment: Step 4.9.3

6. Performance Step: VERIFY valve No. 7, Manual Regulator Used For Controlling Atmospheric is BACKED OUT FULLY (counter-clockwise).

Standard: Checks fully counter clockwise

CUE: Valve moves slightly in clockwise direction and back until it stops moving (Regulator is backed out)

Comment: Step 4.9.4

7. Performance Step: VERIFY applicable valve No. 4, N₂ Supply Header To SG # (31 and 32) Manual Regulator For Atmospheric CLOSED

Standard: Check valve in clockwise direction – No Movement

CUE: Valve does not move in clockwise direction (valve is closed)

Comment: Step 4.9.5

Performance Information

(Denote critical steps with a check mark ✓)

✓ 8. Performance Step: CONNECT back-up N₂ bottle to quick disconnect at valve No. 4

Standard: Quick Disconnect made up from N₂ Bottle

Comment: Step 4.9.6.1

✓ 9. Performance Step: OPEN N₂ bottle isolation

Standard: Rotate valve counter clockwise until stops

***CUE: Valve moves in counter clockwise direction until it stops.
(valve is open)***

Comment: Step 4.9.6.2

✓ 10. Performance Step: ADJUST N₂ bottle regulator to 85 psig

Standard: Rotate valve either direction as necessary to establish 85 psig.

CUE: Meter indicates 85 psig

Comment: Step 4.9.6.3

Performance Information

(Denote critical steps with a check mark ✓)

✓ 11. Performance Step: OPEN manual valve downstream of bottle regulator

Standard: Rotate valve counter clockwise until stops

CUE: Valve moves counter clockwise direction (valve is open)

Comment: Step 4.9.6.4

✓ 12. Performance Step: OPEN manual valve 5 (immediately upstream of valve No.7)

Standard: Rotate valve counter clockwise until stops

CUE: Valve moves counter clockwise direction (valve is open)

Comment: Step 4.9.6.5

✓ 13. Performance Step: OPEN manual valve 6 (immediately downstream of valve No.7)

Standard: Rotate valve 90° until parallel with pipe

CUE: Valve moves 90° and is parallel with the pipe.

Comment: Step 4.9.6.6

14. Performance Step: MAINTAIN all four SG at approximately the same pressure as directed by CRS/RO.

Standard: From Initial Conditions remaining SGs are at 1005 psig

Comment: Step 4.9.7.1

√ 15. Performance Step: OPEN or THROTTLE OPEN by increasing (clockwise) diaphragm pressure using valve No. 7, Manual regulator

Standard: Rotate T handle clockwise to reduce/maintain pressure.

CUE: Steam Flow noise is heard and 32 SG pressure is lowering to 1005 psig

EXAMINER NOTE: Open valve #7 by turning clockwise, use local indication for pressure. Close or Throttle by rotating counter clockwise to maintain pressure at 1005

Comment: Step 4.9.7.2

Terminating Cue: JPM Complete

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Initial Conditions:

- A fire occurred in the Control Building resulting in a Control Room Evacuation
- Communications have been established with the Reactor Operator
- 32 SG pressure is 1040 psig
- No SG Atmospherics have failed open
- The other three SGs are being controlled at 1005 psig by the remainder of the team

Initiating Cue:

You have been directed to establish local control of 32 atmospheric and decrease pressure to 1005 psig per SOP-ESP-001.

Facility: Indian Point Unit 3Task No: 31-004-EMERGENCY-042Task Title: **Emergency Borate**K/A Reference: **000024A120****RO – 3.2 SRO – 3.3**Job Performance Measure No: Sim 1

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance	<u>X</u>	Actual Performance	_____
Classroom	_____	Simulator	<u>X</u>
		Plant	_____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

- The reactor has just tripped.
- 31 BATP is aligned to the blender.
- All actions in E-0, Steps 1-4 and ES-0.1, Steps 1 through 3 have been completed.
- Current Boron concentration is 1148 ppm

Required Materials: ONOP-CVCS-3

General References: ONOP-CVCS-3, Emergency Boration

Initiating Cue: You are the ATC and the CRS has directed to emergency borate per ONOP-CVCS-3 up to and including the completion of Step 19a due to multiple stuck rods.

Time Critical Task: NA

Task Standard: Locate and manipulate controls to Emergency Borated for two stuck rods and reduced RCS temperature in accordance with ONOP-CVCS-3.

Validation Time: 10 minutes

Performance Information

(Denote critical steps with a check mark ✓)

1. Performance Step: Obtain correct procedure
Standard: Hand candidate ONOP-CVCS-3

Comment:

2. Performance Step: Check Charging Pump running
Standard: Observe Charging Pump RUNNING
Comment: Step 1

3. Performance Step: Check MCC-36A, 36B and 36C available
Standard: Verify MCC-36A, 36B, and 36C available

- Can be verified by breaker positions (Panel SBF-1 and SBF-2)

Comment: Step 2

Performance Information

(Denote critical steps with a check mark ✓)

Alternate Path Steps

4. Performance Step: OPEN Emergency Boration Valve

Standard: Places CH-MOV-333 to OPEN
Observes Valve does not Open
Go To Attachment 1, Emergency Boration using Normal Boration

CUE: MOV-333 will not open

Comment: Step 10

✓ 5. Performance Step: Place both Boric Acid Trans Pumps Speed switches in FAST

Standard: 31 Boric Acid Transfer Pump Speed Switch to FAST
32 Boric Acid Transfer Pump Speed Switch to FAST

Comment: Attachment 1 Step 1

✓ 6. Performance Step: Restart Boric Acid Transfer Pumps

Standard: 31 Boric Acid Transfer Pump switch to START
32 Boric Acid Transfer Pump switch to START

Comment: Attachment 1 Step 2

Performance Information

(Denote critical steps with a check mark ✓)

7. Performance Step: Place FCV-110A, Boric Acid Flow Control Blender, controller in Manual

Standard: Raise "T" bar switch to Manual Position

Comment: Attachment 1 Step 3

✓ 8. Performance Step: Ensure FCV-110A, Boric Acid Flow Control Blender, controller is fully open

Standard: Move "T" bar to left Open

Comment: Attachment 1 Step 4

9. Performance Step: Place FCV-111A, Makeup H2O to Boric Acid Blender, controller in Manual

Standard: Raise "T" bar switch to Manual Position

Comment: Attachment 1 Step 5

✓ 10. Performance Step: Ensure FCV-111A, Boric Acid Flow Control Blender, controller is closed

Standard: Move "T" bar to left Open

Comment: Attachment 1 Step 6

Performance Information

(Denote critical steps with a check mark ✓)

✓ 11. Performance Step: Place Makeup Mode Selector switch in Manual

Standard: Rotate Switch to Manual Position

Comment: Attachment 1 Step 7

✓ 12. Performance Step: Turn Makeup Control Switch to Start and Return to Normal

Standard: Rotate Switch to Start then back to Normal

Comment: Attachment 1 Step 8

13. Performance Step: Check FI-110A flow Indicated

Standard: Observe Flow is indicated

Comment: Attachment 1 Step 9

14. Performance Step: Close Boric Acid Storage Tank Recirculation Valves HCV-104 & HCV-105

Standard: Rotate Controllers (Panel SFF) to 0%

Comment: Attachment 1 Step 10

Performance Information

(Denote critical steps with a check mark ✓)

✓ 15. Performance Step: **Transfer operating charging pump speed to manual and Increase speed to MAXIMUM**

Standard: **Place Auto/Manual switch to Manual and rotate small potentiometer to increase speed increase speed to Maximum**

Comment: Step 15

16. Performance Step: Check Pressurizer pressure LESS THAN 2335 psig

Standard: Verify Pressurizer pressure < 2335 psig

Comment: Step 16

17. Performance Step: Check Reactor – Critical

Standard: Verify reactor subcritical

Comment: Step 17a

18. Performance Step: Check RCS temperature >500°F

Standard: Verify RCS >500°F

Comment: Step 17d

Performance Information

(Denote critical steps with a check mark ✓)

19. Performance Step: Check RCS temperature >540°F

Standard: Observe RCS approximately 535°F

CUE: Cue Candidate Temperature is 530°F if necessary

Comment: Step 17e

20. Performance Step: If any rod is greater than or equal to 20 steps emergency borate per attachment 4

Standard: Observes 2 rod fully withdrawn

Comment: Step 17e RNO

✓ 21. Performance Step: **DETERMINE the expected boration time AND required RCS boron concentration**

**Standard: Go To Attachment 4, Required Emergency Boration Time for Cooldown
Determines minimum of 158 seconds using Attachment 4 Table 3**

NOTE: Minimum Boration Time 158 seconds for temperature. Candidate may continue with procedure and add 158 seconds with the time for stuck rods (24 min). for a total of 26 minutes and 22 seconds.

CUE: (Time Compression) Inform candidate that the calculated time has passed.

Comment: Attachment 4 Step 1 and Table 3

Performance Information

(Denote critical steps with a check mark ✓)

22. Performance Step: Check all rods FULLY INSERTED

Standard: Determine 2 Rods > 20 Steps

Comment: Step 17f

✓ 23. Performance Step: If more than one rod is greater than or equal to 20 steps, then increase RCS boron 179 for each additional stuck rod greater than one to a max of 2372 ppm.

Standard: Using normal boration expected time of 24 minutes for stuck rod.

Total boration time for cooldown and stuck rod is 26 minutes and 38 seconds.

CUE (Time Compression) Inform Candidate that 27 minutes has elapsed.

Comment: Step 17f RNO

End Alternate Path Steps

Examiner can terminate JPM at this time.

There are no more critical steps.

Performance Information

(Denote critical steps with a check mark ✓)

24. Performance Step: Determine if Emergency Boration can be secured

Standard:

- Contact Watch Chemist and Direct Watch Chemist to sample RCS boron concentration
- Check Boration Time complete

CUE: (Time Compression) 27 Minutes has elapsed.

Comment: Step 18

25. Performance Step: Place both Boric Acid Transfer pumps to SLOW speed

Standard: Rotate speed switch to slow position

Comment: Step 19 RNO a.1

26. Performance Step: Turn Makeup Control Switch to Stop

Standard: Rotate Makeup Control Switch to Stop

Comment: Step 19 RNO a.2

27. Performance Step: Open Boric Acid Storage Tank Recirculation Valves to approximately 25%

Standard: Rotate valve potentiometer to 25% on Panel SFF

Comment: Step 19 RNO b.1

Terminating Cue: JPM Complete

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Simulator Setup

Reset to any 100% IC

Insert Malfunctions for Stuck Rods

MAL-CRF004AJ (CBB – Rod H12) – UNTRIPPABLE

MAL CRF004AZ (CBD – Rod K2) – UNTRIPPABLE

SWI CVC016C ON – MOV-333 Fails to Open

SWI CVC016D OFF – MOV-333 Fails to Open

Manually trip the reactor.

Open Atmospheric Steam Dumps to cooldown to approximately 535°F

Secure Auto Makeup.

Initial Conditions:

- The reactor has just tripped.
- 31 BATP is aligned to the blender.
- All actions in E-0, Steps 1-4 and ES-0.1, Steps 1 through 3 have been completed.
- Current Boron concentration is 1148 ppm

Initiating Cue:

You are the ATC and the CRS has directed to emergency borate per ONOP-CVCS-3 up to and including the completion of Step 19a due to multiple stuck rods

Facility: Indian Point Unit 3Task No: 31-013-EMERGENCY-015Task Title: **Realign the SI System for Cold Leg Recirculation**

000011A1.11

K/A Reference: RO – 4.2 SRO – 4.2Job Performance Measure No: Sim - 2

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance	<u>X</u>	Actual Performance	_____
Classroom	_____	Simulator	<u>X</u>
		Plant	_____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

INITIATING CUES:

- A Large Break LOCA occurred approximately 25 minutes ago.
- The RWST LOW LOW Level alarm has just illuminated.
- SI has been RESET per RO-1 and procedure E-1, Steps 1 through 19 actions have been completed.

Required Materials: 3-ES-1.3

General References: 3-ES-1.3, Transfer to Cold Leg Recirculation

Initiating Cue: You are the BOP and the CRS has directed you to transfer to Cold Leg Recirculation per ES-1.3, steps 1 through 11.

Time Critical Task: No

Task Standard: Locate and manipulate equipment to align the RCS for cold leg recirculation using RHR in accordance with 3-ES-1.3.

Validation Time: 25 Minutes

Performance Information

(Denote critical steps with a check mark ✓)

1. Performance Step: Obtain correct procedure

Standard: Hand candidate ES-1.3, Step 1

Comment:

2. Performance Step: Review Foldout Page, Caution and Note prior to Step 1

Standard: Foldout Page, Caution and Note reviewed

Comment:

3. Performance Step: Determine if transfer to Cold Leg Recirc is required

Standard: Verify both RWST Low-Low Level alarms LIT and VC level trending up

CUE: If requested, VC level trend is upwards

Comment: Step 1

Performance Information

(Denote critical steps with a check mark ✓)

4. Performance Step: RESET SI

Standard: Observe SI ACTUATED light extinguished on panel
SBF2

Comment: Candidate should expect SI reset complete. SI would be reset by BOP
 during performance of RO-1.
 Step 2

5. Performance Step: RESET Containment Spray

Standard: Verify VC Spray reset

- Verify Spray Reset on QSPDS
- Press both Cont Spray Reset pushbuttons (SBF1)

Comment: Step 3

6. Performance Step: Align SI Recirc Switches #1 and #3

Standard: See Steps Below

Comment:

✓ 7. Performance Step: Place Recirc Switches 1 and 3 to ON

Standard: Rotate switches to ON position

Comment: Step 4a

Performance Information

(Denote critical steps with a check mark ✓)

8. Performance Step: Dispatch NPO to energize valves

- MCC-36A
 - AC-MOV-743, RHR Miniflow Isolation
 - SI-MOV-894A, SI Accum Disch Isolation
- MCC-36B
 - AC-MOV-1870, RHR Miniflow Isolation
 - SI-MOV-882, RHR pump suction RWST
 - SI-MOV-894B, SI Accum Disch Isolation
 - SI-MOV-894D, SI Accum Disch Isolation

Standard: Dispatch NPO to energize valves on MCC 36A and 36B

CUE: Acknowledge as NPO

Comment: Step 4b

9. Performance Step: Establish communications with PAB 73 ft. and prepare for operation of SWN-35-1 and 35-2

Standard: Dispatch NPO to PAB, 73 ft.

CUE: Acknowledge as NPO

Comment: Step 4c

10. Performance Step: Check Safety Injection Recirc Switch No. 1 Function Complete Light Lit

Standard: Verify Recirc Switch #1 function complete light LIT

Comment: Step 5

Performance Information

(Denote critical steps with a check mark ✓)

11. Performance Step:	Verify Safety Injection Recirc Sw No. 3 Functions Complete
-----------------------	--

Standard:	NOTE: Function complete light will NOT be LIT <ul style="list-style-type: none">• Observe both RHR Pumps OFF• Observe 882 CLOSED• Observe 744 Open and Deenergized
-----------	--

Comment: Step 6

12. Performance Step:	Check RCS Pressure less than Intact SG Pressure
-----------------------	---

Standard:	Observe RCS Pressure less than SG Pressure.
-----------	---

Comment: Step 7a

13. Performance Step:	Place both Motor Driven Auxiliary Feed Pumps in Trip Pullout.
-----------------------	---

Standard:	Rotate switches to Pullout position
-----------	-------------------------------------

Comment: Step 7b

Performance Information

(Denote critical steps with a check mark ✓)

14. Performance Step: Initiate performance of Attachment 1, Parallel Control Room Actions

Standard: Direct performance of Attachment 1

CUE: Additional Team operator will perform parallel actions of Attachment 1

Comment: **BOOTH/ADDITIONAL OPERATOR:** Verify 459, 460, 200 A, B, C closed, stop running Charging pump(s), close TCV-130, place all Pressurizer heaters in OFF. Notify operator that Attachment 1 complete. Step 8

15. Performance Step: Align Safety Injection Recirc Switch No 2

Standard: See steps below

Comment:

16. Performance Step: Check Valves SWN-FCV-1111 and 1112 Closed

Standard: Dispatch NPO to verify SWN-FCV-1111 and 1112 CLOSED

CUE: FCV-1111 and 1112 are CLOSED

Comment: Step 9a

Performance Information

(Denote critical steps with a check mark ✓)

✓ 17. Performance Step: Place Safety Injection Recirc Switch 2 to ON

Standard: Rotate Switch to ON

Comment: Step 9b

18. Performance Step: Check Safety Injection Recirc Switch No. 2 Function
Complete light Lit

Standard: Observe Function Complete Light Lit (Panel SBF-1)

Comment: Step 9c

19. Performance Step: Establish communications with PAB 73 ft.

Standard: Request NPO to standby CCW Hx's

CUE: Acknowledge as NPO

Comment: Step 10a

20. Performance Step: Check RHR Hx CCW Shutoff Valves OPEN

Standard: Verify 822 A and 822B OPEN (Panel SBF-1)

Comment: Step 10b

Performance Information

(Denote critical steps with a check mark ✓)

Alternate Path Steps

21. Performance Step: Manually START 32 Recirc pump

Standard: Rotate Switch to Start Pump does not start

Comment: Step 10c

22. Performance Step: Manually START 31 Recirc pump

Standard: Rotate Switch to Start Pump does not start
Goes to Attachment 3 for RHR pumps

Comment: Step 10c RNO

23. Performance Step: Review Notes and Caution before Attachment 3 Step 1

Standard: Reviews Notes and Caution

Comment: Attachment 3 Step 1

24. Performance Step: Check if RHR pumps are available

Standard: Observe both RHR Pumps are available (Panel SBF-1)

Comment: Attachment 3 Step 1

Performance Information

(Denote critical steps with a check mark ✓)

✓ 25. Performance Step: Place Safety Injection Recirc Switch 3 to OFF position.

Standard: Rotate Switch to OFF

Comment: Attachment 3 Step 2

26. Performance Step: Check 744 RHR Loop Isol Valve De-energized Open

Standard: Observe 744 De-energized Open (Panel SBF-1 2 is true)

Comment: Attachment 3 Step 3

27. Performance Step: Check 882, RHR Pump Suction Stop Valve Closed

Standard: Observe 882 Closed

Comment: Attachment 3 Step 4

28. Performance Step: Check if RHR injection flow previously verified

Standard: RHR flow was previously verified given in Initial Conditions

CUE: RHR injection flow was verified in E-0 Step 8.

Comment: Attachment 3 Step 5

Performance Information

(Denote critical steps with a check mark ✓)

✓ 29. Performance Step: **Open Cont Sump Stop Valves to RHR Suction in following order**

Standard: **Open 885B first
Open 885A second**

Comment: Attachment 3 Step 6

30. Performance Step: **Close SI-HCV-638 or SI-HCV-640**

Standard: **Rotate switch to close until green light lit.**

Comment: Attachment 3 Step 7

✓ 31. Performance Step: **Start One RHR Pump**

Standard: **Rotate Switch to Start position (Panel SGF)
Observe red light illuminated**

Comment: Attachment 3 Step 8

32. Performance Step: **Rotate Recirc Switch 4 to OFF Position**

Standard: **Recirc Switch 4 verified in Off**

Comment: Recirc Switch 4 was never rotated to ON in this scenario.
Attachment 3 Step 9

Performance Information

(Denote critical steps with a check mark ✓)

33. Performance Step: Close 1802A AND 1802B

Standard: Verify Valves closed

Comment: Valves 1802A and 1802B were never opened in this scenario
Attachment 3 Step 10.

End Alternate Path Steps

34. Performance Step: Check minimum Recirculation Flow to Core Established.

Standard: Observe Low head Recirc Flow greater than 360 gpm on
946A – D (Panel SBF-1)

Comment: Step 11

Terminating Cue: JPM Complete

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Simulator Setup

Reset Simulator to any 100% Power IC

Insert Malfunctions

- MAL-RCS001 – 100%
- MAL-CNS003A TRIP Recirc Pump 31 Trip
- MAL-CNS003B TRIP Recirc Pump 32 Trip

Run Simulator

Perform all actions of E-0, RO-1 and E-1

Wait until RWST Low Low level alarms annunciate

Freeze Simulator

Take Snapshot if using more than once.

Initial Conditions:

- A Large Break LOCA occurred approximately 25 minutes ago.
- The RWST LOW LOW Level alarm has just illuminated.
- SI has been RESET per RO-1 and procedure E-1, Steps 1 through 19 actions have been completed.

Initiating Cue:

You are the BOP and the CRS has directed you to transfer to Cold Leg Recirculation per ES-1.3, steps 1 through 11.

Facility: Indian Point Unit 3Task No: 31-073-NORMAL-016Task Title: **Adjust R-18 Setpoint**K/A 073000A4.02
Reference: RO – 3.7 SRO – 3.7Job Performance Measure No: Sim 3

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated
Performance

X

Actual Performance

Classroom

Simulator

X

Plant

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

- Preparations are underway to release 1 Monitor Tank
- The current alarm setpoint for R-18 is 4.0×10^{-4} $\mu\text{Ci/ml}$
- The calculated alarm setpoint for the release is 1.25×10^{-3} $\mu\text{Ci/ml}$
- The Bantam 11 Control Cabinet is OOS for maintenance.
- The CRS has reviewed 3- SOP-RM-010 and the setpoint change is acceptable.
- The Radiation Monitor Supervisory Key is at location 58 in the Key Rack

Required Materials: Radiation Monitor Supervisory Key

General References: 3-SOP-RM-008 Radiation Monitoring Control Cabinet (Bantam 11/RM-23A Cabinet)

Initiating Cue: You are the BOP and the CRS has directed you to reset the Alarm setpoint for R-18 to 1.25×10^{-3} $\mu\text{Ci/ml}$ using the RM-23A in accordance with 3-SOP-RM-008 Step 4.3.5.3.

Time Critical Task: No

Task Standard: Locate and Manipulate equipment to reset R-18 Alarm setpoint using the RM-23A controller in accordance with 3-SOP-RM-008.

Validation Time: 15 Minutes

Performance Information

(Denote critical steps with a check mark ✓)

1. Performance Step: Obtain correct procedure

Standard: Hand candidate SOP-RM-008

Comment:

2. Performance Step: Determine NOT changing R-1 or R-33 Setpoint

Standard: Given in initial conditions

Comment: Step 4.3.5.3.a

3. Performance Step: Depress Channel

Standard: Depresses R18 LIQ button on RM-23A

Comment: Step 4.3.5.3.b

✓ 4. Performance Step: Insert key and turn Norm Supervisor switch to Supervisor

Standard: Insert Key and rotate switch to Supervisor

Comment: Step 4.3.5.3.c

Performance Information

(Denote critical steps with a check mark ✓)

5. Performance Step: Verify SUPV Mode LED is ON
Standard: Observes SUPV Mode LED ON

Comment: Step 4.3.5.3.d

✓ 6. Performance Step: If changing High Alarm set point ENTER 009
Standard: Enter 0 0 9 using keypad

Comment: Step 4.3.5.3e

7. Performance Step: Determine NOT changing Alert set point at this time
Standard: No Action Required

Comment: Step 4.3.5.3.f

✓ 8. Performance Step: Depress ITEM and verify current setpoint is displayed
Standard: Depresses ITEM button and observes digital display

Comment: Step 4.3.5.3.g

Performance Information

(Denote critical steps with a check mark ✓)

✓ 9. Performance Step: Enter new set point using the following format
[1] [2] [5] [-] [0] [3]

Standard: Enters data in stated format

Comment: Step 4.3.5.4

✓ 10. Performance Step: Verify desired value is displayed then depress ENTER
key

Standard: Observes digital display correct then presses ENTER
key

Comment: Step 4.3.5.5

11. Performance Step: If value displayed is not correct, depress CLEAR button and
repeat procedure step 4.3.5.4

Standard: If value displayed is not correct press CLEAR button and
re-perform JPM starting at JPM step 3

Comment: Step 4.3.5.5

✓ 12. Performance Step: Turn Normal Supervisory Key Switch to NORMAL and
remove key

Standard: Rotate key to NORM and remove

Comment: Step 4.3.5.6

Performance Information

(Denote critical steps with a check mark ✓)

13. Performance Step:	Depress desired channel button to return display to normal
-----------------------	--

Standard:	Depress R18 LIQ button
-----------	------------------------

Comment: Step 4.3.5.7

14. Performance Step:	IF RM-23A alarm set point was changed Verify Supv Mode LED is OFF
-----------------------	---

Standard:	Observes LED is OFF
-----------	---------------------

Comment: Step 4.3.5.8

Terminating Cue: JPM Complete

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Simulator Setup

This JPM can be run from any IC.

Initial Conditions:

- Preparations are underway to release 1 Monitor Tank
- The current alarm setpoint for R-18 is $4.0 \times 10^{-4} \mu\text{Ci/ml}$
- The calculated alarm setpoint for the release is $1.25 \times 10^{-3} \mu\text{Ci/ml}$
- The Bantam 11 Control Cabinet is OOS for maintenance.
- The CRS has reviewed 3- SOP-RM-010 and the setpoint change is acceptable.
- The Radiation Monitor Supervisory Key is at location 58 in the Key Rack

Initiating Cue:

You are the BOP and the CRS has directed you to reset the Alarm setpoint for R-18 to $1.25 \times 10^{-3} \mu\text{Ci/ml}$ using the RM-23A in accordance with 3-SOP-RM-008 Step 4.3.5.3.

Facility: Indian Point Unit 3Task No: 31-000-EMERGENCY-013Task Title: **Establish Feed and Bleed per FR-H.1**

00WE05A101

K/A Reference: RO – 4.1 SRO – 4.0Job Performance Measure No: Sim 4

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance

X

Actual Performance

Classroom

Simulator

X

Plant

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

- A loss of feedwater has occurred.
- Steps 1-4 of E-0 are complete.
- A transition to ES-0.1 was made at Step 4.
- A transition to FR-H.1 was made due to a RED path on the Heat Sink CSF.
- The fold out page requirements for bleed and feed are met

Required Materials: None

General References: 3-FR-H.1, Response to Loss of Heat Sink

Initiating Cue: You are the ATC and the CRS has directed you to perform Bleed and Feed of the RCS per FR-H.1, steps 10 – 16.

Time Critical Task: No

Task Standard: Locate and manipulate equipment to established RCS Bleed and Feed with one inoperable PORV per FR-H.1 prior to SG dryout.

Validation Time: 20 minutes

Performance Information

(Denote critical steps with a check mark ✓)

1. Performance Step: Obtain correct procedure

Standard: Hand candidate FR-H.1

Comment:

2. Performance Step: Review Cautions before step 10

Standard: Caution reviewed

Comment:

✓ 3. Performance Step: Manually actuate SI

Standard: Depress both SI Pushbuttons

Comment: Step 10
Panel SBF-2

✓ 4. Performance Step: Check All RCPs Stopped

Standard: Trip all RCPs

Comment: Step 11
Panel SAF

Performance Information

(Denote critical steps with a check mark ✓)

5. Performance Step: Check RCP Seal Cooling
 Check Seal Injection Established
 Thermal Barrier Cooling Established

Standard: Observe Charging Pumps NOT running
 Observe CCW pumps running and RCP Alarms Clear on
 SGF

Comment: Step 12
 Panel SBF-1 or SGF

6. Performance Step: Check Charging Pump Status
 Check Component Cooling Water for Charging Pumps
 AVAILABLE
 Check Charging Pumps ANY RUNNING

Standard: Observe CCW Pumps running
 Observe No Charging Pumps Running

Comment: Step 13a and 13b
 Panel SBF-1

✓ 7. Performance Step: Align charging pump suction to RWST
 Open LCV112B, RWST Makeup to Charging Pump
 Suction
 Close LCV-112C, VCT Outlet

Standard: Rotate switch for LCV-112B to Open
 Rotate switch for LCV-112C to Close

Comment: Step 13b.1 RNO
 Panel SFF

Performance Information

(Denote critical steps with a check mark ✓)

8. Performance Step: Prepare all available charging pumps to start
Place controllers in manual and adjust to starting position

Standard: Move Auto/Manual switch to Manual on all pumps.
Rotate potentiometer to starting position

Comment: Step 13b.3 RNO
Panel FBF

9. Performance Step: Establish maximum charging flow
Check charging suction aligned to RWST YES
Check HCV-142 fully open – YES
Open CH-AOV-204B Normal Charging Isolation YES

Standard: Observe indications for charging pump suction valve Panel SFF
Observe indication for HCV-142 fully open Panel SFF
Observe indication for CH-AOV-204B open Panel SFF

Comment: Step 13C.1-3

✓ 10. Performance Step: Start all available charging pumps and increase speed to maximum.

Standard: Rotate switches for all charging pumps to START
Rotate potentiometer for all charging pumps to maximum

Comment: Step 13C.4
Panel FBF

Performance Information

(Denote critical steps with a check mark ✓)

11. Performance Step:	Verify RCS Feed Path Check charging pumps ALL three running Check HHSI pumps all three running
Standard:	Observer pump operating indication for charging and SI pumps
Comment:	Step 14a & 14b Panel FBF and SBF-2

12. Performance Step:	Verify SI Valve Alignment Proper Emergency Alignment Verify Safeguard Valve Off Normal Position alarm on SBF-1 Clear - YES Ensure BIT discharge valves 1835A and 1835B OPEN - YES Ensure BIT inlet valves 1852A and 1852B OPEN – YES Ensure 856J, 856H, 856C, 856E OPEN - YES
Standard:	Observer alarm clear SBF-1 Observer valve position OPEN SBF-2

Comment: Step 14C

Performance Information

(Denote critical steps with a check mark ✓)

Alternate Path Steps

✓ **13. Performance Step:** **Establish RCS Bleed Path**
Check both PRZR PORV block valves Power Available – YES
Check PRZR PORV block valves All Open – YES
Open all PRZR PORVs

Standard: Observe block valve indication energized and open Panel FCF.
Rotate PORV switches to OPEN
Observe PCV-455C did not open

NOTE: Only step to open PORV is critical

Comment: Step 15
 Panel FCF

✓ **14. Performance Step:** **Verify Adequate RCS Bleed Path**
Check PRZR PORVs All Open – NO
 Install Reactor Vessel Head Vent Fuses Panel SBR-1
 Open all Reactor Vessel Head Vent Valves Panel SBF-1

Standard: Observe PORV indication
 Install fuses in fuse holders inside Supervisory Panel
 Rotate switches for head vent valves to OPEN

Comment: Step 16 RNO

Terminating Cue: JPM Complete

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Simulator Setup

- Hang a tag on 32 ABFP (PCV-139) Control Switch in Trip
- Insert the following malfunctions:
 - MAL-CFW001A 31 ABFP Trip
 - MAL-CFW001C 32 ABFP Trip
 - MAL-ATS004A 31 MBFP Trip
 - MAL-ATS004B 32 MBFP Trip
 - SWI-RCS021C PORV 455C Switch Close Position ON
 - SWI-RCS021D PORV 455C Switch Open Position OFF
 - MAL TUR002A Turbine Trip Failure Electrical
 - MAL TUR002B Turbine Trip Failure Mechanical

To create the JPM set up perform the following:

- Trip both MBFPs from 100% Power
- Perform E-0 steps 1-4 (no SI)
- Transition to ES-0.1
- Remove BOTH TURBINE trip failures when SG levels approximately 20% WR.
- When Wide Range SG levels are at Feed and Bleed criteria (average of the three lowest SG WR levels <20%) Freeze Simulator.

Initial Conditions:

- A loss of feedwater has occurred.
- Steps 1-4 of E-0 are complete.
- A transition to ES-0.1 was made at Step 4.
- A transition to FR-H.1 was made due to a RED path on the Heat Sink CSF.
- The fold out page requirements for bleed and feed are met

Initiating Cue:

You are the ATC and the CRS has directed you to perform Bleed and Feed of the RCS per FR-H.1, steps 10 – 16.

Facility: Indian Point 3

Task No: _____

Task Title: Transfer Buses 1-4 to the Unit Aux TransformerK/A Reference: 062000A401
RO – 3.3 SRO – 3.1Job Performance Measure
No: Simulator 5

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing: _____

Simulated Performance _____ Actual Performance XClassroom _____ Simulator X Plant _____**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

- A plant startup is in progress in accordance with 3-POP-1.3.
- Generator Load is approximately 35 MWe.
- All Precautions, Limitations, and Prerequisites of 3-SOP-EL-005, Operation of On-Site Power Sources have been reviewed, met and signed off.

Required Materials: 3-SOP-EL-005, Operation of On-Site Power Sources**General References:** 3-SOP-EL-005, Operation of On-Site Power Sources**Initiating Cue:** You are the BOP and the CRS has directed you to transfer Buses 1 - 4 to the Unit Aux Transformer in accordance with 3-SOP-EL-005, Section 4.3.**Time Critical Task:** No**Validation Time:** 15 minutes**Alternate Path:** No**Task Standard:** Locate and manipulate controls to transfer Buses 1 – 4 from the Station Aux Transformer to the Unit Aux Transformer in accordance with 3-SOP-EL-005.

Performance Information

(Denote critical steps with a check mark ✓)

1. Performance Step: Reviews NOTE prior to step 4.3.1.

Standard: Student reviews NOTE and utilizes proper place keeping.

Comment: NOTE prior to step 4.3.1.

2. Performance Step: VERIFY LESS THAN 100 VOLT DIFFERENCE BETWEEN Station and Unit Auxiliary Transformers by performing either of the following:

- ADJUST MTG voltage
- PLACE Station or Unit Auxiliary Transformers Tap Changers in manual and ADJUST voltage

Standard: Student observes meters; adjusts MTG voltage or Station Aux or Unit Aux Transformers Tap Changers if necessary.

Comment: Procedure Step 4.3.1.

✓ 3. Performance Step: IF desired to transfer 6.9KV Bus 1 to Unit Auxiliary Transformer, THEN PERFORM the following:

1. PERFORM Voltage check per step 4.3.1.
2. **PLACE 6900V BUS No. 1 Synchroscope in Bus 1 UNIT.**
3. **IF Synchroscope is at 12 o'clock, THEN (CCR):**
 - a. **CLOSE 6900V Bus No. 1 Normal Feed breaker.**
 - b. **OPEN 6900V Bus No. 1-5 Tie breaker**
4. PLACE 6900V Bus No. 1 Synchroscope in Off.
5. IF transfer can NOT be completed, THEN CONTACT I&C to investigate.

Standard: Student determines that transfer is desired. Observes voltage meters, places switch handle in Bus 1 UNIT position. When synchroscope is at 12 o'clock, rotates No. 1 Normal Feed Breaker switch to Closed position and releases to auto. Student then rotates No. 1-5 Tie Breaker switch to the Open position and releases to auto.

Comment: Procedure Step 4.3.2. Only bolded steps above are critical (2 & 3).

Performance Information

(Denote critical steps with a check mark ✓)

-
- ✓ **4. Performance Step:** IF desired to transfer 6.9KV Bus 2 to Unit Auxiliary Transformer, THEN PERFORM the following:
1. IF both of the following breakers are closed, THEN VERIFY 480V Bus No. 2A-3A Tie breaker is open:
 - a. 480V Bus No. 2A Normal Feed
 - b. 480V Bus No. 3A Normal Feed
 2. PERFORM Voltage check per step 4.3.1.
 3. **PLACE 6900V BUS No. 2 Synchroscope in Bus 2 UNIT.**
 4. IF Synchroscope is at 12 o'clock, THEN (CCR):
 - a. **CLOSE 6900V Bus No. 2 Normal Feed breaker.**
 - b. **OPEN 6900V Bus No. 2-5 Tie breaker.**
 5. PLACE 6900V Bus No. 2 Synchroscope in Off.
 6. IF transfer can NOT be completed, THEN CONTACT I&C to investigate.

Standard:

Student determines that transfer is desired. Observes voltage meters, places switch handle in Bus 2 Unit position. When synchroscope is at 12 o'clock, rotates No. 2 Normal Feed Breaker switch to Closed position and releases to auto. Student then rotates No. 2-5 Tie Breaker switch to the Open position and releases to auto.

Comment: Procedure Step 4.3.3. Only bolded steps above are critical (3 & 4).

At Examiners discretion, the JPM may be terminated at this time.

Performance Information

(Denote critical steps with a check mark ✓)

-
- ✓ **5. Performance Step:** IF desired to transfer 6.9KV Bus 3 to Unit Auxiliary Transformer, THEN PERFORM the following:
1. IF both of the following breakers are closed, THEN VERIFY 480V Bus No. 2A-3A Tie breaker is open:
 - a. 480V Bus No. 2A Normal Feed
 - b. 480V Bus No. 3A Normal Feed
 2. PERFORM Voltage check per step 4.3.1.
 3. **PLACE 6900V BUS No. 3 Synchroscope in Bus 3 Unit.**
 4. IF Synchroscope is at 12 o'clock, THEN (CCR):
 - a. **CLOSE 6900V Bus No. 3 Normal Feed breaker.**
 - b. **OPEN 6900V Bus No. 3-6 Tie breaker.**
 5. PLACE 6900V Bus No. 3 Synchroscope in Off.
 6. IF transfer can NOT be completed, THEN CONTACT I&C to investigate.

Standard: Student determines that transfer is desired. Observes voltage meters, places switch handle in Bus 3 Unit position. When synchroscope is at 12 o'clock, rotates No. 3 Normal Feed Breaker switch to Closed position and releases to auto. Student then rotates No. 3-6 Tie Breaker switch to the Open position and releases to auto.

Comment: Procedure Step 4.3.4. Only bolded steps above are critical (3 & 4).

Performance Information

(Denote critical steps with a check mark ✓)

-
- ✓ **6. Performance Step:** IF desired to transfer 6.9KV Bus 4 to Station Auxiliary Transformer, THEN PERFORM the following:
1. PERFORM Voltage check per step 4.3.1.
 2. **PLACE 6900V BUS No. 4 Synchroscope in Bus 4 Unit.**
 3. IF Synchroscope is at 12 o'clock, THEN (CCR):
 - a. **CLOSE 6900V Bus No. 4 Normal breaker.**
 - b. **OPEN 6900V Bus No. 4-6 Tie Feed breaker.**
 4. PLACE 6900V Bus No. 4 Synchroscope in Off.
 5. IF transfer can NOT be completed, THEN CONTACT I&C to investigate.

Standard: Student determines that transfer is desired. Observes voltage meters, places switch handle in Bus 4 Unit position. When synchroscope is at 12 o'clock, rotates No. 4 Normal Feed Breaker switch to Closed position and releases to auto. Student then rotates No. 4-6 Tie Breaker switch to the Open position and releases to auto.

Comment: Procedure Step 4.3.5. Only bolded steps above are critical (2 & 3).

-
7. Performance Step: WHEN transfer is complete, THEN VERIFY the Unit and Station Auxiliary Transformer Tap Changers are in Auto.

Standard: Student ensures both tap changers are in Auto.

Comment: Procedure Step 4.3.6.

Terminating Cue: JPM Complete

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Simulator Setup

Generator Load < 40 MWe

Initial Conditions:

- A plant startup is in progress in accordance with 3-POP-1.3.
- Generator Load is approximately 35 MWe.
- All Precautions, Limitations, and Prerequisites of 3-SOP-EL-005, Operation of On-Site Power Sources have been reviewed, met and signed off.

Initiating Cue:

You are the BOP and the CRS has directed you to transfer Buses 1 - 4 to the Unit Aux Transformer in accordance with 3-SOP-EL-005, Section 4.3.

File:

Task Number:

Facility: Indian Point 3Task No: 0000020501Task Title: Perform RO-1, BOP Operator Actions During Use of EOPS – Phase A FailuresK/A Reference: 103A3.01 (3.9/4.2)Job Performance Measure No: Sim-6

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing: _____

Simulated Performance _____ Actual Performance XClassroom _____ Simulator X Plant _____**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: An inadvertent SI occurred a few minutes ago. The team is performing E-0, Reactor Trip or Safety Injection.

Task Standard: Locate and manipulate equipment to verify/establish proper Safety Injection alignment in accordance with RO-1.

Required Materials: RO-1, BOP Operator Actions During Use of EOPS

General References: N/A

Initiating Cue: The Control Room Supervisor has directed you to perform RO-1, BOP Operator Actions During Use of EOPS

Time Critical Task: No

Validation Time: 25 minutes

Performance Information

(Denote critical steps with a check mark)

1. Performance Step: Monitor Control Room Annunciators

Standard: Acknowledge alarms, report unusual alarms to CRS, monitor status of VC temperature and 480V bus voltage alarms

Comment: Step 1

2. Performance Step: Verify SI Pumps running

Standard: Checks three SI pumps and two RHR pumps running

Comment: Step 2

√ 3. Performance Step: Verify FCU status

Standard: Starts 31 FCU
Places FCU dampers in incident mode position
Places 1104 and 1105 control switches to open

Comment: Step 3

4. Performance Step: Verify SI Valve alignment

Standard: Verify Safeguard Valve Off Normal Position alarm clear
Verify open valves 1835A&B, 1852A&B, and 856J, H, C, E

CUE: RWST Purification Loop not in service.

Comment: Step 4

Performance Information

(Denote critical steps with a check mark)

5. Performance Step: Verify ABFP status

Standard: Check both motor driven feed pumps running and turbine driven feedpump running

Comment: Step 5

√ 6. Performance Step: Verify ABFP valve alignment

Standard: Check flow from both MDAFW pumps
 Check SG Blowdown isolation valves closed
 Closes PCV-1215A

Comment: Step 6

7. Performance Step: Verify CCW Pump status

Standard: Checks three CCW pumps running
 Checks 822A and B open

Comment: Step 7

8. Performance Step: Verify Essential SW Pumps running

Standard: Checks three SW pumps running on essential header

Comment: Step 8

Performance Information

(Denote critical steps with a check mark)

√ 9. Performance Step: Verify Containment Isolation Phase A and B

- Standard: Check Phase A actuation status (not actuated but should be)
- Manually actuate Phase A (nothing happens)
 - Check Phase B actuation status (not actuated and not required)
 - Check if containment spray has actuated (has not)
 - Check Phase A valves closed
 - **Manually closes phase A valves**
 - **550**
 - **200B**
 - **201**
 - **202**
 - **956EF**
 - **1228**
 - **1610**
 - **1234, 1236, 1235, 1237**
 - Check Phase B valve closed (no – they are open, Phase B not required)

CUE: When asked, Blowdown Flash tank is not in service.

Comment: Step 9

10. Performance Step: Verify Containment Ventilation Isolation

- Standard: Check CLOSED FCV-1170, 1171, 1172, and 1173
Check CLOSED PCV-1190, 1191 and 1192
Check WCCPP low pressure zone alarms not lit
Verify OPEN IVSW valves 1410, 1413, 6200 and 6201

Comment: Step 10

Performance Information

(Denote critical steps with a check mark)

11. Performance Step: Verify EDG status

CUE: Acknowledge as NPO when dispatched

Standard: Check EDGs all running

- Check OPEN 1176 and 1176A
- Dispatch NPO to open CS for 1176 and 1176A

Comment: Step 11

12. Performance Step: Verify CCR Ventilation

Standard: Set CCR ventilation mode switch to position 3

- Check Dampers A-Dim, B-Bright, and either F1 or F2 bright
- Check D1 and D2 bright
- Verify AC compressors and fans all running

Comment: Step 12

√ 13. Performance Step: Verify Emergency DC Oil Pump status

CUE: Acknowledge as NPO when dispatched

Standard: **Starts Main Turbine emergency bearing oil pump**
Dispatch NPO to verify main generator air side seal oil backup pump running
Check MBFP DC Emergency oil pump running

Comment: Step 13

Performance Information

(Denote critical steps with a check mark)

√ 14. Performance Step: Reset SI

Standard: **Press both SI reset pushbuttons**

Check SI reset – SI actuated light out, AUTO SI BLOCK Train A and B lights both lit

Comment: Step 14

15. Performance Step: Reset MCCs

CUE: Acknowledge as NPO when dispatched

Standard: Dispatch NPO to secure VC sump pumps and RCDT pumps on WDP
Dispatch NPO to align and reset MCCs per SOP-EL-15

Comment: Step 15

16. Performance Step: Check if additional SI actions should be performed

CUE: CRS is performing ES-1.1, SI Termination

Standard: Informs CRS of status, goes no further in RO-1

- 31 FCU failed to auto start, manually started
- PCV-1215A failed to auto close, manually closed
- Phase A did no auto actuate, multiple valves manually closed

CUE: Acknowledge report to CRS

Comment:

Terminating Cue: Completion of RO-1 step 16. Candidate directed by procedure to perform no further actions in RO-1.

VERIFICATION OF COMPLETION

Job Performance Measure No. Audit Sim-E, Perform RO-1, BOP Operator Actions
During Use of EOPS – Phase A Failures

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Simulator Setup

Reset Simulator to any at power IC
Insert the following malfunctions

Ensure 31 FCU is stopped	MAL-HVA001A1
Fail PCV-1215A OPEN	MAL-SGB001B 15A

550	STL-PRT003
200B	STL-CVC007
201	STL-CVC009
202	STL-CVC010
956EF	STL-NSS005, STL-NSS006
1228	STL-AIR001
1610	STL-WPS007

Manually actuate Safety Injection.

Initial Conditions

Initial Conditions: An inadvertent SI occurred a few minutes ago. The team is performing E-0, Reactor Trip or Safety Injection.

Initiating Cue: The Control Room Supervisor has directed you to perform RO-1, BOP Operator Actions During Use of EOPS

RETURN THIS TO THE EVALUATOR WHEN THE TASK IS COMPLETE

Facility: Indian Point Unit 3Task No: 31-105-ABNORMAL-001Task Title: **Respond to a T_{hot} Microprocessor Failure High**016000A201K/A Reference: RO – 3.0 SRO – 3.1Job Performance Measure No: Sim 7

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance X
Classroom _____ Simulator _____Actual Performance _____
X Plant _____**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

- The reactor is at indicated power
- Steady State, equilibrium Xenon conditions exist
- No equipment is out of service

Required Materials: None

General References: 3-AOP-INST-1 Instrument and Controller Failures

Initiating Cue: You are the ATC. Take appropriate actions to stabilize the plant.

Time Critical Task: No

Task Standard: Locate and manipulate equipment to stabilize plant transient and remove failed instrument channel from service in accordance with 3-AOP-INST-1.

Validation Time: 20

Performance Information

(Denote critical steps with a check mark ✓)

-
- | | |
|----------------------|--|
| 1. Performance Step: | Respond to alarms on SAF and SOF <ul style="list-style-type: none">• HIGH T-AVG• T-AVG DEVIATION• OVERPOWER ΔT CHANNEL TRIP OR ROD STOP• OVERTEMP ΔT CHANNEL TRIP OR ROD STOP• LOOP 31 HOT LEG RTD TROUBLE |
|----------------------|--|

Standard:	Observe Alarms Diagnose Instrument failure is cause of transient
-----------	---

Comment:	
----------	--

-
- | | |
|------------------------|--|
| ✓ 2. Performance Step: | Take manual actions as necessary to control parameters and stabilize the plant. |
|------------------------|--|

Standard:	Places Rod Control in Manual Places running charging pump in Manual
-----------	--

Comment:	Actions to stabilize plant directed by EN-OP-115, Conduct of Operations
----------	--

-
- | | |
|----------------------|-------------------------------------|
| 3. Performance Step: | Has an instrument failure occurred? |
|----------------------|-------------------------------------|

Standard:	Determines a Temperature instrument failure has occurred.
-----------	---

Comment:	Step 4.1. It is NOT necessary to identify the exact instrument failure (Thot Microprocessor). The actions are the same for any narrow range temperature instrument failure.
----------	---

Performance Information

(Denote critical steps with a check mark ✓)

4. Performance Step: Are Control Rods in Manual

Standard: Determines Control Rods are in Manual

Comment: Step 4.140
This step should have been completed in to stabilize the plant per EN-OP-115.

5. Performance Step: Are Charging Pumps in Manual?

Standard: Determines Charging Pumps are in Manual

Comment: Step 4.141
This step should have been completed in to stabilize the plant per EN-OP-115.

6. Performance Step: Maintain PRZR level in normal band per graph RCS-2

Standard: Refers to Graph RCS-2 to determine Pressurizer Level for current Tavg

Comment: Step 4.142

7. Performance Step: Observe NOTES before Step 4.143

Standard: Reviews NOTES

Comment:

Performance Information

(Denote critical steps with a check mark ✓)

✓ 8. Performance Step: Place ΔT DEFEAT (Rack B-8) in position specified in Table 1

Standard: Place Switch 3T/411A in DFT CH1

Comment: Step 4.143

✓ 9. Performance Step: Place TAVG DEFEAT (Rack D-8) in position specified in Table 2

Standard: Place Switch T/412A in LOOP A UNIT 1

Comment: Step 4.143

10. Performance Step: Is LO POWER AUTO ROD WITHDRWL STOP (FBF) extinguished

Standard: Determines LO POWER AUTO ROD WITHDRWL STOP is extinguished.

Comment: Step 4.144

11. Performance Step: Is Tav_g within 1.5° of T_{ref}

Standard: This will depend on how rapidly the malfunction was identified an Rod Control placed in Manual
If adjustment is necessary a spare RO will restore Tav_g

Comment: Step 4.145
Panel FCF

Performance Information

(Denote critical steps with a check mark ✓)

12. Performance Step: When 2 minutes have elapsed since performance of Step 4.143, the PLACE Control Rod Mode Selector Switch in AUTO

Standard: Rotate Control Rod Mode Selector Switch to AUTO

Comment: Step 4.146
Panel FCF

13. Performance Step: Place Steam Dump Control switch to RESET and return to TEMP CONT

Standard: Rotates switch to Reset position then returns to TEMP CONT

Comment: Step 4.147
Panel FBF

14. Performance Step: Place Steam Dump Controller in AUTO

Standard: Determines Steam Dump Controller is in AUTO

Comment: Step 4.148
Panel FCF

15. Performance Step: Is auto control of charging pump speed desired

Standard:

CUE: YES auto control of charging pump is desired.

Comment: Step 4.149

Performance Information

(Denote critical steps with a check mark ✓)

16. Performance Step: Set controller bias dial to zero

Standard: Rotates bias dial to zero if necessary

Comment: Step 4.150
Panel FBF

17. Performance Step: Place charging pump speed controller in MAN-BAL

Standard: Move switch to MAN-BAL position (just right of mid position)

Comment: Step 4.151
Panel FBF

18. Performance Step: Adjust auto bias dial (big dial) to null deviation meter

Standard: Rotate dial as necessary to null the deviation meter.

Comment: Step 4.152
Panel FBF

19. Performance Step: Place charging pump speed controller in AUTO

Standard: Move switch to AUTO position (All the way to the left)

Comment: Step 4.153
Panel FBF

Performance Information

(Denote critical steps with a check mark ✓)

20. Performance Step: Refer to Technical Specification for required actions

Standard:

CUE: The STA will refer to Tech Specs

Comment: Step 4.154

21. Performance Step: Observe CAUTIONS before Step 4.155

Standard: Reviews Cautions

Comment:

22. Performance Step: Are all redundant bistable status lights for failed instrument listed in Attachment 9 (RCS Temperature Tables) Table 1 (Page 139) extinguished?

Standard: Observes redundant bistable status light extinguished

- J-11 LO TAVG LOOP 32 TC422D
- K-11 LO TAVG LOOP 33 TC432D
- L-11 LO TAVG LOOP 34 TC442D
- B-11 OT Δ T LOOP 2 TC421A
- C-11 OT Δ T LOOP 3 TC431A
- D-11 OT Δ T LOOP 4 TC441A
- B-12 OP Δ T LOOP 2 TC421C
- C-12 OP Δ T LOOP 3 TC431C
- D-12 OP Δ T LOOP 4 TC441C

Comment: Step 4.155
Panel SOF

Performance Information

(Denote critical steps with a check mark ✓)

23. Performance Step: Observe NOTE before Step 4.156

Standard: Reviews NOTE

Comment:

✓ 24. Performance Step: Trip bistables for failed instrument listed in Attachment 9 (RCS Temperature Tables) Table 2 (Page 143).

Standard: Lifts bistable trip switches to TRIP (up) position.

- Loop 1, Over Power Trip
- Loop 1, Over Temp Trip
- Loop 1, Low Tavc

Comment: Step 4.156
Red Rack A-4

25. Performance Step: Are all bistable status lights for failed instrument listed in Attachment 9 (RCS Temperature Tables) Table 3 (Page 145) illuminated?Standard: Observes Bistable Status Light ON

- I-11 LO TAVG LOOP 31 TC412D
- A-11 OT ΔT LOOP 1 TC411A
- A-12 OP ΔT LOOP 1 TC411C

Comment: Step 4.157
Panel SOF

Terminating Cue: JPM Complete

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____

Simulator Setup

Reset Simulator to any 100% power IC

Ensure Rod Control is in Automatic

Insert Malfunction

MAL-RCS006A LOOP 31 RTD MICROPROCESSOR FAILURE 645°

Take Snapshot if JPM is going to be used more than once.

Initial Conditions:

- The reactor is at indicated power
- Steady State, equilibrium Xenon conditions exist
- No equipment is out of service

Initiating Cue:

You are the ATC. Take appropriate actions to stabilize the plant.