Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Indian Point Task No: IPEC-21-200-Normal-054

Task Title: Perform a Reactivity Balance – Load Reduction

K/A Reference: 1940012125 RO – 3.9 SRO – 4.2 Job Performance Measure No: RO Admin CO-1

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.

Initial Conditions:

The Shift Manager has directed a shutdown to 20% power to repair 21 Main Feed Regulating Valve.

- Plant is at 45 % Power MOL
- SM has directed a power reduction to 20% power
- Rate of Power Reduction 200 MWe/hr
- Core Burnup 435.6 EFPD
- Difference in Xenon Worth is +142 from Reactor Engineering
- Current Rod Height CBD 158 Step
- Target Rod Height CDB 143 Steps
- Beacon computer is out of service
- Current Boron Concentration is 1025 ppm

Initiating Cue: The CRS has directed you to perform the reactivity calculation in accordance with 2-POP-3.1 Attachment 2.

Task Standard: Reactivity Calculation reviewed

Required Materials: Calculator

General References: 2-POP-2.1 Operation at Greater Than 45% Power
2-POP-3.1 Plant Shutdown from 45% Power
2-GRAPH-RCS-4
2-GRAPH-RV-1
2-GRAPH-RV-2
2-GRAPH-RV-3
2-GRAPH-RV-11
Boron/Dilution Tables

Time Critical Task: No

Validation Time: 30 Minutes

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Enter Attachment 2 Step 1 Data

Standard: See attached Answer Key for data

Comment: Attachment 2 Step 1 All data is given

√ 2. Performance Step: Determine change in Power Defect

Standard: Interpolate data for 45% power and 20% power
Correct Data 711.65 at 45% and 328.6 at 20%
732.8 – 337.9 = 394.9

Comment: Attachment 2 Step 2 GRAPH-RV-2

3. Performance Step: Enter data correctly for Xenon Worth

Standard: Given in Initial Conditions.
Enter 142 pcm

Comment: Attachment 2 Step 3.2

√ 4. Performance Step: Calculate Rod Worth and enter data Step 4

Standard: Rod Wroth Interpolation CBD at 158 = 185.5
Rod worth CBD at 143 = 242 from Graph

Comment: Attachment 2 Step 4 GRAPH-RV-1

Performance Information

(Denote critical steps with a check mark √)

√ 5. Performance Step:	**Calculate total Reactivity step 5**
Standard:	**Correct calculation 394.9 + 142 +(-56.5) = 480.4**
Comment:	**Attachment 2 step 5**

√ 6. Performance Step:	**Interpolate "pcm/ppm" using GRAPH-RV-3** **Locate "gal/ppm" from Boration Table**
Standard:	**Interpolate pcm/ppm at 6.89 - 6.90** **Determine gal/ppm 3.2 from Boron Dilution Table** **6.89/3.2 = 2.1pcm/gal**
Comment:	**Attachment 2 step 6.1**

√ 7 Performance Step:	**Calculate total boric acid**
Standard:	**480.4 / 2.1 = 228.76 gallons (229±1)**
Comment:	**Attachment 2 Step 6.2**

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:

The Shift Manager has directed a shutdown to 20% power to repair 21 Main Feed Regulating Valve.

- Plant is at 45 % Power MOL
- SM has directed a power reduction to 20% power
- Rate of Power Reduction 200 MWe/hr
- Core Burnup 435.6 EFPD
- Difference in Xenon Worth is +142 from Reactor Engineering
- Current Rod Height CBD 158 Step
- Target Rod Height CDB 143 Steps
- Beacon computer is out of service
- Current Boron Concentration is 1025 ppm

Initiating Cue:

The CRS has directed you to perform the reactivity calculation in accordance with 2-POP-3.1 Attachment 2.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Indian Point Unit 2 Task No: IPEC-21-008-Abnormal-004

Task Title: Use Flow Diagram to Determine Leak Isolation Boundaries

K/A Reference: 1940012241 RO – 3.9 Job Performance Measure No: RO Admin EC-1

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.

Initial Conditions:

- The NPO reported a diaphragm leak on 733C, Primary Water Emergency Supply Stop valve

Initiating Cue: You are the RO and you have been directed to identify all valves that must be closed/verified closed to isolate the leak.

General References: Flow Diagram 227781 Auxiliary Coolant System
Flow Diagram 251783
Flow Diagram 9321-F-2724 Auxiliary Coolant System

Time Critical Task: No

Validation Time: 15 Minutes

Task Standard: All valves identified

Performance Information

(Denote critical steps with a check mark √)

√ 1. Performance Step: **Close the following valve**
734A Supply Header Stop
787A Safety Injection Pumps Supply Header Stop

Standard: **Locate valves on print 227781**

Comment:

√ 2. Performance Step: **Close the following valve**
PW-114 Aux Coolant Supply Stop

Standard: **Located on Print 9321-F-2724**

Comment: **Candidate may identify opening PW-115 to drain. NOT CRITICAL**

√ 3. Performance Step: **Close the following valve**
736B Thermal Barrier Hx Inlet Stop
777B Seal Hx Inlet Stop
736A Thermal Barrier Hx Inlet Stop
777D Seal Hx Inlet Stop

Standard: **Located on Print 251783**

Comment:

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:

- The NPO reported a diaphragm leak on 733C, Primary Water Emergency Supply Stop valve

Initiating Cue:

You are the RO and you have been directed to identify all valves that must be closed/verified closed to isolate the leak.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Indian Point Task No: IPEC-21-200-Normal-014

Task Title: Prepare a Manual Gaseous Waste Release Permit

K/A Reference: 1940012311 RO – 3.8 Job Performance Measure No: RO Admin RC-1

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance X Actual Performance _____

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.

Initial Conditions:

- The program for computer generated waste release permits is corrupt.
- The unit is in Refueling Outage Condenser Air Ejectors are not in service.
- 23 Gas Decay Tank was isolated February 2, 2019 at 08:00 per 2-SOP-5.2.1, Gaseous Waste Disposal System Operation
- Permit Number 20190009
- 23 Large Gas Decay Tank has been pressurized to 90 psig
- Tank Activity is 2 e^{-1} µCi/cc
- R-44 is currently reading 4.3 e^{-6} µCi/cc
- Current R-44 Alarm Setpoint 3 e^{-4} µCi/cc
- Current R-44 Warn Setpoint 2.25 e^{-4} µCi/cc
- Plant Vent Flow 28,000 SCFM
- The Shift Manager requests all calculations be performed for Shift Manager Authorization levels

Initiating Cue: You are the RO and CRS has directed you to perform a Manual Calculation for the release of 23 GDT.

Required Materials: Calculator

General References: 2-SOP-5.4.2 Gas Decay Tank Release

Time Critical Task: No

Validation Time: 20 minutes

Task Standard: Attachment 1 completed

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Enter given data on Attachment 1
   - 23 GDT
   - Isolation Date 2/2/2019
   - Isolation Time 0830
   - Permit Number 20190009
   - Sample Number 20190032
   - Tank Activity 2 e^{-1} µCi/cc
   - GDT Pressure is 90 psig
   - R-44 is currently reading 4.3 e-6 µCi/cc
   - Current R-44 Alarm Setpoint 3 e-4 µCi/cc
   - Current R-44 Warn Setpoint 2.25 e-4 µCi/cc
   - Plant Vent Flow 28,000 SCFM

Standard: Enters data on Attachment 1

Comment:

√ 2. Performance Step: Determine Tank Curie Content (A)

Standard: Calculate 21.16 Ci - (21.1 – 21.2)

Comment: Procedure Step 4.2.3

√ 3. Performance Step: Determine Plant Vent Pre-Release Rate

Standard: Calculate 5.68 e^{-5} Ci/sec

Comment:

Performance Information

(Denote critical steps with a check mark √)

4. Performance Step: Determine Condenser Air Ejector Release Rate is 0

Standard: Enter 0

Comment: Procedure Step 4.2.3.3

√ 5. Performance Step: Determine Available GDT Release Rate

Standard: Calculate 7.13 e^{-3} Ci/sec

Comment: Procedure Step 4.2.3.4

√ 6. Performance Step: Determine the time needed for the release

Standard: Calculate 49.5 minutes ± 0.1

Comment: Procedure step 4.2.3.5

√ 7 Performance Step: Calculate R-44 Alarm Setpoints

Standard: Calculate Alarm Setpoint 5.44e^{-4} µCi/cc
Calculate Warn Setpoint 4.08e^{-4} µCi/cc

Comment: Procedure Step 4.2.6.2
Note the Warn Setpoint is NOT critical

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:

- The program for computer generated waste release permits is corrupt.
- The unit is in Refueling Outage Condenser Air Ejectors are not in service.
- 23 Gas Decay Tank was been isolated February 2, 2019 at 08:00 per 2-SOP-5.2.1, Gaseous Waste Disposal System Operation
- Permit Number 20190009
- 23 Large Gas Decay Tank has been pressurized to 90 psig
- Tank Activity is $2e^{-1}$ µCI/cc
- R-44 is currently reading $4.3e^{-6}$ µCi/cc
- Current R-44 Alarm Setpoint $3e^{-4}$ µCi/cc
- Current R-44 Warn Setpoint $2.25e^{-4}$ µCi/cc
- Plant Vent Flow 28,000 SCFM
- The Shift Manager requests all calculations be performed for Shift Manager Authorization levels

Initiating Cue:

You are the RO and CRS has directed you to perform a Manual Calculation for the release of 23 GDT.

ATTACHMENT 1
GDT MANUAL GAS RELEASE PERMIT
(Page 1 of 1)

GDT = 23 ISOLATED DATE 2 2 2019 TIME 0800 PERMIT No 20190009

GDT Sample 1 =	20190032	Date 2 0 2019	Time 0830	Activity (C)	2e-1 µCi/cc
GDT Sample 2[1] =		Date	Time	Activity	µCi/cc
Plant Vent Sample[2] =		Date	Time	Activity	µCi/cc
GDT Volume (V)	LGDT Volume = 525 ft³ each		SGDT Volume = 40 ft³ each		
GDT Pressure (P)	90 psig			R-44 Current Warn	2.25e-4 µCi/cc
Plant Vent Flow (F)	28,000 SCFM			R-44 Current High Alarm	3e-4 µCi/cc
				R-44 Current Reading (B)	4.3e-6 µCi/cc
CAE In-leakage (F_c)	NA SCFM			CAE Concentration[3] (E_i)	0 µCi/cc

1 Per Step 4.2.1.5.1 IF R-44 is NOT operable THEN representative samples of each GDT to be released SHALL be available
2 Per Step 4.2.2.7b) IF R-44 is NOT operable THEN a representative pre-release Plant Vent sample SHALL be available
3 R-44 OR noble gas activity grab sample
4 CAE equivalent release rate only need be considered if it exceeds the value in P&L 2.10

GDT Curie Content: [Step 4.2.3.1]

A = [2.83 E-2 * 2e-1 (C) * 525 (V) * (14.7 + 90 (P))] / 14.7 = 21.16 Ci (A) ✓

Plant Vent Pre-Release Rate: [Step 4.2.3.2]

RR_{pv} = 4.72 E-4 (4.3e-6 (B) * 2.8e4 (F)) = 5.68e-5 Ci/sec (RR_{pv}) ✓

CAE Release Rate[4]: [Step 4.2.3.3]

RR_{cae} = 4.72 E-4 * 0 (E_i) * 0 (F_c) = 0 Ci/sec (RR_{cae})

Available GDT Release Rate: [Step 4.2.3.4]

GDT = [7.2e-3 (ARR) - (5.68e-5 (RR_{pv}) + 0 (RR_{cae}))] = 7.13e-3 Ci/sec GDT ✓

Release Times: [Step 4.2.3.5]

T_{min} = 49.5 min ✓ Chosen % of Auth Limit = 50 T_{calc} = 99 min T = min

R-44 Alarm Set points: [Steps 4.2.6.2 and 4.2.6.5]

S = [2119 * (7.2e-3 (ARR) - 0 (RR_{cae}))] ÷ 2.8e+4 (F) = 5.44e-4 µCi/cc (S) ✓

Warn = 0.75 * 5.44e-4 (S) = 4.08e-4 µCi/cc Warn

Prepared By: _____ Verified By: _____

Discharge Authorization: _____ Date: _____

Start → Date _____ Time _____

Terminate → Date ____/____/____ Time: _____ Final GDT Pressure _____

ANSWER KEY

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Indian Point Unit 2 Task No: IPEC-21-150-Emergency-001

Task Title: **Perform Initial Unusual Event Notification**

K/A Reference: 1940012439 RO-3.9 Job Performance Measure No: RO Admin EP-1

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance _____ Actual Performance X

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 small plane crash in the Buchanan Switchyard has caused all Buchanan Ring Bus Breakers to Trip
- Rescue efforts have prevented restoration of power to the Ring Bus
- The Shift Manager Declared an Unusual Event based on EAL-SU1.1 minutes ago.

Task Standard: Notification of event in progress complete to State, Counties and NRC.

Required Materials: Simulator RECS phone
Completed NYS Radiological Data Form Part 1

General References: IP-EP-115 Form EP-3N, NUE Notification Checklist

Initiating Cue: You are the Spare RO, and the Shift Manager has directed you to perform the duties of the Control Room Offsite Communicator.

Time Critical Task: YES

Validation Time: 15 minutes

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain the Control Room Communicator Binder

Standard: Obtains Binder from Bookcase

Comment:

2. Performance Step: Inform the Shift Manager that you have assumed the duties of the Control Room Communicator

Standard: Same as above

Comment: CUE: Acknowledge communication.

√ 3. Performance Step: Obtain the completed and signed NYS Radiological Emergency Data Form Part 1 (IP-EP-115 Form EP-1) from the Shift Manager

Standard: Request Form from the Shift Manager.

Comment: CUE: Give the candidate the completed form.

Performance Information

(Denote critical steps with a check mark √)

4. Performance Step: Review the form to ensure all required information is entered including the Shift Manager (Emergency Director) Signature

Standard: Determines all necessary data is correctly entered.

Comment:

5. Performance Step: Verify SM has sent electronic Fax and email of the NYS Radiological Data Form Part 1 to State/Counties/EOF.

Standard: Contact SM to determine if Fax and email have been sent.

Comment: CUE: Fax and email have been sent.

√ 6. Performance Step: Pick up RECS Handset

Standard: Picks up RECS Handset

Comment: NOTE: This step starts with the NUE Notification Checklist.

Performance Information

(Denote critical steps with a check mark √)

√ 7. Performance Step:	**When you hear the message "Welcome to Wave Please enter session ID" depress the "7" button**
Standard:	**Depresses the "7" button**
Comment:	

√ 8. Performance Step:	**You will hear two tones wait 5 seconds and state "This is to report an event at Indian Point Energy Center. Standby for roll call".**
Standard:	**After 5 seconds states "This is to report an event at Indian Point Energy Center. Standby for roll call".**
Comment:	

√ 9. Performance Step:	**Enter Time you are starting the initial roll call**
Standard:	**Enters time on NUE Notification Checklist**
Comment:	

Performance Information

(Denote critical steps with a check mark √)

√ 10. Performance Step: **Initiate roll call by asking "(location title) are you on the line for each of the stations, stopping after each name is read to allow station to identify itself. Check off each location as they answer the roll call**

Standard: **Reads each station name, when station acknowledges, checks it on NUE Notification Checklist**

Comment: **If using the booth operator to acknowledge message, no CUE is needed. If acknowledging yourself then CUE candidate"**
New York State
Westchester County
Putnam County
Rockland County
Orange County
Peekskill City
West Point

√ 11. Performance Step: **State, "This is the Unit 2 Central Control Room. An Unusual Event has been declared at the Indian Point**
Energy Center based on EAL# SU1.1. A Part 1 Notification # 1 has been sent to you vial Email and FAX".

Standard: **Reads statement**

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 12. Performance Step: **Confirm the receipt of email or FAX by asking "(location Title) do you acknowledge receipt of an Email of FAX from IPEC"?**

Standard: **Reads roll call list and asks for acknowledgment. Checks off each station when acknowledgment is received.**

Comment: **If using the booth operator to acknowledge message, no CUE is needed. If acknowledging yourself then CUE candidate"**
New York State has received the email.
Westchester County has received the email.
Putnam County has received the email.
Rockland County has received the email.
Orange County has received the email.
Peekskill City has received the email.
West Point has received the email.

---

13. Performance Step: If any of the above did not receive either an email of FAX, THEN FAX part 1 to location and verbally read the entire Part 1 form. IF all locations received (or you completed reading) proceed

Standard: All locations received email

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 14. Performance Step: End notifications by saying "Indian Point out at _____. Enters time

Standard: Makes statement and enters current time

Comment: The time entered at checklist step 9 must be within 15 minutes of the time of declaration used for the Part 1 form.

---

15. Performance Step: Signs Reported by and Enters RECS on Part 1 Form

Standard: Signs form and enters RECS

Comment:

---

16. Performance Step: Other Notifications

Standard: IF not already completed, notify
- Security
- On Duty Communications Representative
- NRC Resident Inspector

Comment: CUE: All of the above notifications have been made.

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 small plane crash in the Buchanan Switchyard has caused all Buchanan Ring Bus Breakers to Trip
- Rescue efforts have prevented restoration of power to the Ring Bus
- The Shift Manager Declared an Unusual Event based on EAL# SU1.1 minutes ago.

Initiating Cue: You are the Spare RO, and the Shift Manager has directed you to perform the duties of the Control Room Offsite Communicator.

New York State

Indian Point Energy Center

RADIOLOGICAL EMERGENCY DATA FORM - PART 1 Notification #. 1

1. This is an: **Exercise** notification at the Indian Point Energy Center

2. The Emergency Classification is: **A. Unusual Event**

This Emergency Classification declared on: **10/24/18** (Date) at: **10:40** (Time 24 hr clock)

3. Release of Radioactive Materials due to the Classified Event:

To Atmosphere:	To Water:
A. No Release	A. No Release

4. The following Protective Actions are recommended to be implemented as soon as practicable:

A. NO NEED for PROTECTIVE ACTIONS outside the site boundary.

5. EAL#: **SU1.1**

All off-site AC electrical power has been lost for more than 15 minutes. Power is still available from on-site sources. Current plant conditions DO NOT threaten public safety.

Affected Location:

C. IPEC SITE

6. Reactor Status:

Unit 2: Shutdown at (Date) **10/24/18** (Time) **10:30** (24 hr clock)

Unit 3: Shutdown at (Date) **10/24/18** (Time) **10:30** (24 hr clock)

7. Wind Speed: **2.8** Meters/Sec at elevation 10 meters

8. Wind Direction: (From) **200** Degrees at elevation 10 meters

9. Stability Class: A B **C** D E F G

10. Reported By - Communicator: _____ Telephone # **555-1212**

(Communicator's Name)

11. Emergency Director Approval: **Emergency Director** Date/Time: **10/24/2018 11:02**

(Director's Name)

Page 1 of 1 Electronic Form

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Indian Point Task No: IPEC-22-175 Refueling-005

Task Title: Identify the Location for Spent Fuel Assemblies

K/A Reference: 1940012142 RO – 2.5 SRO – 3.4 Job Performance Measure No: SRO Admin CO-1

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.

Initial Conditions:

Three fuel assemblies in the spent fuel pit need to be moved to facilitate an inspection of the spent fuel racks in those areas.

Fuel Assembly Data

Fuel Assembly 1
- Initial Enrichment 4.5 W/o
- Burnup 52,000 MWD/MTU
- In Spent Fuel Pit since April 2011
- Number of IFBA Rods 0

Fuel Assembly 2
- Initial Enrichment 4.95 W/o
- Burnup 0 MWD/MTU (New Fuel Assembly)
- In Spent Fuel Pit since January 2010
- Number of IFBA Rods 24

Fuel Assembly 3
- Unit 3 Assembly
- Initial Enrichment 4.25 W/o
- Burnup 24000 MWD/MTU
- In Spent Fuel Pit since March 2001
- Number of IFBA Rods 0

Required Materials: None

General References: Technical Specifications

Initiating Cue: You are the CRS and the SM has directed you to determine the Spent Fuel Pit Region(s) each fuel assembly can be moved to.

Time Critical Task: No

Validation Time: 30 Minutes

Task Standard: All acceptable Storage Regions identified for each fuel assembly.

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain Tech Spec Section 2.7.13 and Basis

Standard: Tech Specs and basis available for candidates

Comment:

√ 2. Performance Step: Evaluate Fuel Assembly 1

Standard: Determine Fuel Assembly 1 can be moved to any available SFP location.

Comment: Use Figure 3.7.13-1

√ 3. Performance Step: Evaluate Fuel Assembly 2

Standard: Determine Fuel Assembly 2 can be moved to:

- **Any Region 1-2 location**
- **Checkerboard loading location in Region 1-1**
- **Peripheral Cells in Region 2-2**

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 4. Performance Step:	**Evaluate Fuel Assembly 3**
Standard:	**Determine Fuel Assembly 3 can be moved to:** • **Any Region 1-2 location** • **Any Region 1-1 location**
Comment:	

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:

Three fuel assemblies in the spent fuel pit need to be moved to facilitate an inspection of the spent fuel racks in those areas.

Fuel Assembly Data

Fuel Assembly 1
- Initial Enrichment 4.5 W/o
- Burnup 52,000 MWD/MTU
- In Spent Fuel Pit since April 2011
- Number of IFBA Rods 0

Fuel Assembly 2
- Initial Enrichment 4.95 W/o
- Burnup 0 MWD/MTU (New Fuel Assembly)
- In Spent Fuel Pit since January 2010
- Number of IFBA Rods 24

Fuel Assembly 3
- Unit 3 Assembly
- Initial Enrichment 4.25 W/o
- Burnup 24000 MWD/MTU
- In Spent Fuel Pit since March 2001
- Number of IFBA Rods 0

Initiating Cue:

You are the CRS and the SM has directed you to determine the Spent Fuel Pit Region(s) each fuel assembly can be moved to.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Indian Point Task No: IPEC-22-200-Normal-010

Task Title: Review a Reactivity Balance – Load Reduction

K/A Reference: 1940012125 RO – 3.9 SRO – 4.2 Job Performance Measure No: SRO Admin CO-2

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.

Initial Conditions:

The Shift Manager has directed a shutdown to 20% power to repair 21 Main Feed Regulating Valve.

- Plant is at 45 % Power MOL
- SM has directed a power reduction to 20% power
- Rate of Power Reduction 200 MWe/hr
- Core Burnup 435.6 EFPD
- Difference in Xenon Worth is +142 from Reactor Engineering
- Current Rod Height CBD 158 Step
- Target Rod Height CDB 143 Steps
- Beacon computer is out of service
- 21 Boric Acid Storage Tank is in Service at 76% and 20,000 ppm.
- 22 Boric Acid Storage Tank is at 67% and 18,500 ppm and NPO is batching to it.
- Current Boron Concentration is 1025 ppm
- The spare RO has calculated a reactivity balance for this power reduction

Initiating Cue: The Shift Manager has directed you to review the reactivity calculation.

Task Standard: Reactivity Calculation reviewed

Required Materials: Calculator

General References: 2-POP-2.1 Operation at Greater Than 45% Power
2-POP-3.1 Plant Shutdown from 45% Power
2-GRAPH-RCS-4
2-GRAPH-RV-1
2-GRAPH-RV-2
2-GRAPH-RV-3
2-GRAPH-RV-11
Boron/Dilution Tables

Time Critical Task: No

Validation Time: 30 Minutes

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Review Attachment 2 Step 1 Data

Standard: Determines all data properly entered

Comment: Attachment 2 Step 1

2. Performance Step: Review Attachment 2 Step 2

Standard: Determine data calculation correct for Step 2

Comment: Attachment 2 Step 2

3. Performance Step: Determine data entered correctly for Xenon Worth

Standard: Given in Initial Conditions.

Comment: Attachment 2 Step 3.2

4. Performance Step: Review Step 4 data and calculation

Standard: Determine data and calculation are correct

Comment: Attachment 2 Step 4

Performance Information

(Denote critical steps with a check mark √)

√ 5. Performance Step:	**Review calculation step 5**
Standard:	**Determine Calculation is NOT correct** **Identify incorrect sign for Step 3 data resulting in incorrect total reactivity.** **Correct calculation 394.9 + 142 +(-56.5) = 480.4**
Comment:	**Attachment 2 step 5**

√ 6. Performance Step:	**Review Calculation Step 6**
Standard:	Determine step 6.1 calculation is correct. **Determine calculation for step 6.2 is NOT correct (step 5 data is incorrect.)** **Correct calculation 480.4/ 2.1 =228.8 gallons**
Comment:	**Attachment 2 step 6.1 is correct thus not critical**

√ 7 Performance Step:	**Identify TRM 3.1.B.1 will be entered due to volume of Boric Acid Storage Tanks**
Standard:	**22 Boric Acid Storage Tank Boron Concentration is NOT available. The boron concentration is too low. It should be ≥ 20,000 ppm. Also the tank is not available during batching evolutions. If 229 gallons are removed from 21 BAST the volume will drop below the required 6000 gallon minimum.**
Comment:	

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:

The Shift Manager has directed a shutdown to 20% power to repair 21 Main Feed Regulating Valve.

- Plant is at 45 % Power MOL
- SM has directed a power reduction to 20% power
- Rate of Power Reduction 200 MWe/hr
- Core Burnup 435.6 EFPD
- Difference in Xenon Worth is +142 from Reactor Engineering
- Current Rod Height CBD 158 Step
- Target Rod Height CDB 143 Steps
- Beacon computer is out of service
- 21 Boric Acid Storage Tank is in Service at 76% and 20,000 ppm.
- 22 Boric Acid Storage Tank is at 67% and 18,500 ppm and NPO is batching to it.
- Current Boron Concentration is 1025 ppm
- The spare RO has calculated a reactivity balance for this power reduction

Initiating Cue:

The Shift Manager has directed you to review the reactivity calculation.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Indian Point Task No: IPEC-22-200-Normal-078

Task Title: Review a Check Off List

K/A Reference: 1940012214 RO – 3.9 SRO – 4.3 Job Performance Measure No: SRO Admin EC-1

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.

Initial Conditions:

- A plant heat up is in progress following a refueling outage
- Current Temperature is 335°F and pressure is 940 psig
- Preparations are underway to enter Mode 3

Initiating Cue: The shift manager has directed you to review 2-COL-10.2.1, Containment Spray System prior to entering MODE 3.

Required Materials: None

General References: 2-COL-10.2.1, Containment Spray System
OAP-019 Component Verification and System Control
Tech Specs

Time Critical Task: No

Validation Time: 25 Minutes

Task Standard: Identify errors and required actions

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step:	Review COL-10.2.1
Standard:	Reviews COL 10.2.1
Comment:	

√ 2. Performance Step:	**Identify PT-3301 is a Post Accident Monitor**
Standard:	**Review TS 3.3.3** **Determine 30 day AOT**
Comment:	

√ 3. Performance Step:	**Identify 2 trains of Containment Spray are INOPERABLE and required in MODE 4**
Standard:	**Review TS 3.6.6.a and 3.6.6.f and determine that Containment Spray should be OPERABLE in MODE 4** **Enter LCO 3.0.3 and be in MODE 5 in 37 hours**
Comment:	

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 plant heat up is in progress following a refueling outage
- Current Temperature is 335°F and pressure is 940 psig
- Preparations are underway to enter Mode 3

Initiating Cue:

The Shift Manager has directed you to review 2-COL-10.2.1, Containment Spray System prior to entering MODE 3.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Indian Point Task No: IPEC-22-200-Normal-018

Task Title: Review a Manual Gaseous Waste Release Permit

K/A Reference: 1940012311 SRO – 4.3 Job Performance Measure No: SRO Admin RC-1

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.

Initial Conditions:

- The program for computer generated waste release permits is corrupt.
- The unit is in Refueling Outage
- Condenser Air Ejectors are not in service.
- 23 Gas Decay Tank was isolated February 2, 2019 at 08:00 per 2-SOP-5.2.1, Gaseous Waste Disposal System Operation
- Permit Number 20190009
- 23 Large Gas Decay Tank has been pressurized to 85 psig
- Tank Activity 0.7 µCi/cc
- R-44 is currently reading 4.3 e^{-6} µCi/cc
- Current R-44 Alarm Setpoint 3 e^{-4} µCi/cc
- Current R-44 Warn Setpoint 2.25 e^{-4} µCi/cc
- Plant Vent Flow 30,000 SCFM
- The Shift Manager requests all calculations be performed for Shift Manager Authorization levels

Initiating Cue: You are the Spare SRO and SM has directed you to review and authorize a Manual Calculation for the release of 23 GDT.

Required Materials: Calculator

General References: 2-SOP-5.4.2 Gas Decay Tank Release

Time Critical Task: No

Validation Time: 20 minutes

Task Standard: Attachment 1 completed

Performance Information

(Denote critical steps with a check mark √)

√ 1. **Performance Step:** **Enter given data on Attachment 1**

- 23 GDT
- Isolation Date 2/2/2019
- Isolation Time 0830
- Permit Number 20190009
- Sample Number 20190032
- **Tank Activity 7 e^{-1} µCi/cc**
- GDT Pressure is 85 psig
- R-44 is currently reading 4.3 e-6 µCi/cc
- Current R-44 Alarm Setpoint 3 e-4 µCi/cc
- Current R-44 Warn Setpoint 2.25 e-4 µCi/cc
- Plant Vent Flow 30,000 SCFM

Standard: Tank Activity entered incorrectly
Data entered on Attachment 1

Comment: Incorrect Tank Activity is critical

√ 2. **Performance Step:** **Determine Tank Curie Content (A)**

Standard: **Calculate 70.5 Ci**

Comment: **Procedure Step 4.2.3.1**

---

3. Performance Step: Determine Plant Vent Pre-Release Rate

Standard: Calculate 6.09 e^{-5} Ci/sec Correct

Comment: Procedure Step 4.2.3.2

Performance Information

(Denote critical steps with a check mark √)

4. Performance Step: Determine Condenser Air Ejector Release Rate is 0

Standard: Enter 0

Comment: Procedure Step 4.2.3.3

√ 5. Performance Step: Determine Available GDT Release Rate

Standard: Determine incorrect value (1.44 e^{-2}) for Allowable Release Rate was used.
Calculate 7.14 e^{-3} Ci/sec as correct value

Comment: Procedure Step 4.2.3.4

√ 6. Performance Step: Determine the time needed for the release

Standard: Determine minimum time should be 165 minutes NOT 8.2.

Comment: Procedure step 4.2.3.5
Releasing the tank in less than 165 minutes will exceed the allowable release rate.

Performance Information

(Denote critical steps with a check mark √)

√ 7 Performance Step:	**Calculate R-44 Alarm Setpoint**
Standard:	**Calculate Alarm Setpoint 5.09 e^{-4} µCi/cc Not correct due to incorrect Allowable Release Rate**

Comment: **Procedure Step 4.2.6.2**
Note the Warn Setpoint is NOT critical

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:

- The program for computer generated waste release permits is corrupt.
- The unit is in Refueling Outage
- Condenser Air Ejectors are not in service.
- 23 Gas Decay Tank was isolated February 2, 2019 at 08:00 per 2-SOP-5.2.1, Gaseous Waste Disposal System Operation
- Permit Number 20190009
- 23 Large Gas Decay Tank has been pressurized to 85 psig
- Tank Activity 0.7 µCi/cc
- R-44 is currently reading 4.3 e^{-6} µCi/cc
- Current R-44 Alarm Setpoint 3 e^{-4} µCi/cc
- Current R-44 Warn Setpoint 2.25 e^{-4} µCi/cc
- Plant Vent Flow 30,000 SCFM
- The Shift Manager requests all calculations be performed for Shift Manager Authorization levels

Initiating Cue:

You are the Spare SRO and SM has directed you to review and authorize a Manual Calculation for the release of 23 GDT.

GAS DECAY TANK GASEOUS RELEASES

ATTACHMENT 1
GDT MANUAL GAS RELEASE PERMIT
(Page 1 of 1)

GDT = 23 ISOLATED: DATE 2 2 2019 TIME 0800 PERMIT No 2019 0009

GDT Sample 1 =	2431	Date: 2 2 2019	Time: 0900	Activity, Ci	$7.0e^{-2}$ ✱	Ci/cc
GDT Sample 2[1] =	NA	Date: NA	Time: NA	Activity	NA	Ci/cc
Plant Vent Sample[2] =	NA	Date: NA	Time: NA	Activity	NA	Ci/cc
GDT Volume (V)	LGDT Volume = 525 ft³ each		SGDT Volume = 40 ft³ each			
GDT Pressure (P)	85 psig			R-44 Current Warn	$2.25e^{-4}$	Ci/cc
Plant Vent Flow (F)	$3.0e^{4}$ SCFM			R-44 Current High Alarm	$3.0e^{-4}$	Ci/cc
				R-44 Current Reading (B)	$4.3e^{-6}$	Ci/cc
CAE In-leakage (F_c)	0 SCFM			CAE Concentration[3] (E_i)	0	Ci/cc

1. Per P&L 2.1.1, IF R-44 is NOT operable THEN release alternate sample of each GDT to be released SHALL be available
2. Per Step 4.2.2.7b, IF R-44 is NOT operable THEN a representative plant vent sample SHALL be available
3. R-45 OR noble gas activity grab sample
4. CAE equivalent release rate only need be considered if it exceeds the value in P&L 2.1.1

GDT Curie Content: [Step 4.2.3.1]

A = [2.83 E-2 · $7.0e^{-2}$ (C) ✱ · 525 (V) · (14.7 + 85 (P))] / 14.7 = 7.05 (A) Ci

Plant Vent Pre-Release Rate: [Step 4.2.3.2]

RR_{pv} = 4.72 E-4 ($4.3e^{-6}$ (B) · $3.0e^{4}$ (F)) = $6.09e^{-5}$ (RR_{pv}) Ci/sec

CAE Release Rate[4]: [Step 4.2.3.3]

RR_{cae} = 4.72 E-4 · 0 (E_i) · 0 (F_c) = 0 (RR_{cae}) Ci/sec

Available GDT Release Rate: [Step 4.2.3.4]

GDT = [$1.44e^{-2}$ (ARR) ✱ - ($6.09e^{-5}$ (RR) + 0 (RR_{cae}))] = $1.43e^{-2}$ GDT Ci/sec

Release Times: [Step 4.2.3.5]

T_{min} = 8.2 ✱ min Chosen % of Auth Limit = .75 T_{GDT} = 10.9 min T = min

R-44 Alarm Set points: [Steps 4.2.6.2 and 4.2.6.5]

S = [2119 · ($1.44e^{-2}$ (ARR) ✱ - 0 (RR_{cae}))] ÷ $3.0e^{4}$ (F) = $1.02e^{-3}$ (S) ✱ Ci/cc

Warn = 0.75 · $1.02e^{-3}$ (S) = $7.63e^{-4}$ Warn Ci/cc

Prepared By: _____ Verified By: _____

Discharge Authorization: _____ Date: _____

Start → Date _____ Time _____

Terminate → Date _____ Time _____ Final GDT Pressure _____

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Indian Point Unit 2 Task No: IPEC-22-150-Emergency-001

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

K/A Reference: 1940002.4.41 SRO – 4.6 Job Performance Measure No: SRO Admin EP-1

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
IP-EP-410, Protective Action Recommendations
IPEC Emergency Action Level Charts / EAL Book
Appropriate E-Plan Forms (EP-1, Part 1 and Checklist)

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 3 remains stable at 100% power.

METEOROLOGICAL CONDITIONS:

Wind Speed: 3.5 meters/second
Wind Direction: 182 degrees @ 10 meters
Stability Class: B

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 highlited.

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 # 1

1. This is an: (EXERCISE) ACTUAL EMERGENCY-- EVENT/DRILL TERMINATION notification at the Indian Point Energy Center

2. The Emergency Classification is: A. Unusual Event B. Alert C. Site Area Emergency (D. General Emergency) *
This Emergency Classification declared on: TODAY (Date) at CURRENT TIME (Time 24 hr clock)

3. Release of Radioactive Materials due to the Classified Event:

To Atmosphere:	To Water:
(A.) NO Release	(A.) NO Release
B. Release BELOW Federal Limits	B. Release BELOW Federal Limits
C. Release ABOVE Federal Limits	C. Release ABOVE Federal Limits
D. Unmonitored Release Requiring Evaluation	D. Unmonitored Release Requiring Evaluation

4. The following Protective Actions are recommended to be implemented as soon as practicable:
A. NO NEED for PROTECTIVE ACTIONS outside the site boundary
* (B.) EVACUATE 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)
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
C. SHELTER-IN-PLACE 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
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

5. EAL#: SG 1.1 * Loss of all offsite and onsite AC power to 480V safeguards buses and restoration of at least one safeguards bus within 4 hours is not likely
This is a Rapidly Progressing Severe Accident
Affected Location: (A. UNIT 2) * B. UNIT 3 C. IPEC SITE

6. Reactor Status:
Unit 2: Operational or (Shutdown) at (Date) TODAY (Time) Current Time - 30 min (24 hr clock)
Unit 3: Operational or (Shutdown) * at (Date) TODAY (Time) Current Time - 30min (24 hr clock)

7. Wind Speed: 3.5 Meters/Sec at elevation 10 meters

8. Wind Direction: (From) 182° F Degrees at elevation 10 meters

9. Stability Class: A (B) C D E F G

10. Reported by – Communicator: _____ Telephone # _____
(Communicator's Name)

11. Emergency Director Approval: _____ Date/Time: _____
(Director's Name)

Page 1 of 1 Form EP-1, Rev 9

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 3 remains stable at 100% power.

METEOROLOGICAL CONDITIONS:

Wind Speed: 3.5 meters/second
Wind Direction: 182 degrees @ 10 meters
Stability Class: B

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.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Indian Point Unit 2 Task No: IPEC-21-001-Abnormal-011

Task Title: **Retrieve Dropped Rod**

K/A Reference: 001000A408 RO – 3.7 SRO – 3.4 Job Performance Measure No: Sim A

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance _____ Actual Performance X

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:

- The reactor is stable at its present power level. It has been determined that Rod **H-8** has dropped fully into the core.
- All repairs have been completed. The rod has been cleared for retrieval.
- The CRS has directed you to retrieve the dropped rod in accordance with 2-AOP-ROD-1 step 4.67 through 4.93
- Reactor engineering and OM have determined the rod will be realigned with it group.
- Reactor engineer has determined that no restrictions exist for rod withdrawal

Required Materials: 2-AOP-ROD-1

General References: 2-AOP-ROD-1

Initiating Cue: You are the ATC and the CRS has directed you to retrieve rod H8 using 2-AOP-ROD-1 starting at step 4.67.

Time Critical Task: No

Validation Time: 20 minutes

Task Standard: Reactor tripped. Immediate Operator Actions complete.

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Determine and correct cause for dropped rod

Standard: Given in Initial Conditions

CUE: If necessary cue candidate that "The cause of the dropped rod has been corrected".

Comment: Procedure Step 4.67

2 Performance Step: Obtain determination from Reactor Engineer and O)M whether rod should be realigned with its group.

Standard: Given in Initial Conditions

CUE: If necessary cue candidate that "The Reactor Engineer and OM have determined the rod will be aligned with its group.

Comment: Procedure Step 4.68

3. Performance Step: Will rod be realigned with its group

Standard: Given in Initial Conditions Rod will be realigned with its group.

Comment: Procedure Step 4.68

4. Performance Step: Observe Cautions and Note before Step 4.70

Standard: Review Cautions and Note

Comment: Cautions and Note prior to step 4.70

Performance Information

(Denote critical steps with a check mark √)

5. Performance Step: Obtain the following from Reactor Engineer

__ Any limitation on power level to allow rod withdrawal

__ Rate of rod withdrawal

Standard: Given in Initial Conditions

CUE: If necessary cue candidate There are NO limitations on power level or rate of rod withdrawal.

Comment: Procedure Step 4.70

√ 6. Performance Step: OPEN lift coil disconnect switches for all rods in affected bank except affected rod.

Standard: Place lift coil disconnect switches in UP position for F2, B10, K14, P6, B6, F14, P10, K2

Comment: Procedure Step 4.71

√ 7. Performance Step: PLACE rod control bank selector switch in bank containing affected rod

Standard: Rotate Selector Switch to CBD

Comment: Procedure Step 4.72

Performance Information

(Denote critical steps with a check mark √)

8. Performance Step:	Record group step counter reading for group containing affected rod
Standard:	Candidate observes and records position of Control Bank D group 2 step counter indication

Comment: Procedure Step 4.73

9. Performance Step:	Manually set group step counter to zero for group containing affected rod.
Standard:	Depress the RS button and observe digital counter is at 000

Comment: Procedure Step 4.74
NOTE: This is different on the simulator than it is in the plant. The plant has thumb wheels that must be rotated to reset to 000.

10. Performance Step:	Is affected rod in a control bank
Standard:	Determines H8 is in Control Bank D

Comment: Procedure Step 4.75

Performance Information

(Denote critical steps with a check mark √)

11. Performance Step: PLACE P/A converter display selector switch in position for appropriate bank

Standard: Rotate P/A converter display switch to Bank D position

Comment: Procedure Step 4.76

12. Performance Step: Record P/A converter reading

Standard: Records indication on P/A converter

Comment:

13. Performance Step: Is alarm FCF 1-3 (NIS POWER RANGE OVERPOWER ROD STOP 106%) CLEAR

Standard: Determines alarm is clear

Comment: Procedure Step 4.78

14. Performance Step: Observe NOTE before step 4.79

Standard: Reviews NOTE

Comment:

Performance Information

(Denote critical steps with a check mark √)

Alternate Path Steps Begin Here

√ 15. Performance Step:	**Withdraw affected rod at rate specified by Reactor Engineer in step 4.70 while maintaining Tavg on program (as applicable) until group step counter matches that recorded in step 4.73**
Standard:	**Commences rod withdrawal.** **Stops rod withdrawal when any alarm occurs**

Comment: **Procedure Step 4.79**

During withdrawal of rod H8, rod P6 will drop into the core. This will require re-entry into the procedure and tripping the reactor.

16. Performance Step:	Determines P6 indicated on the bottom
Standard:	Observes rod bottom light lit Observes Power Range Channel N41 indication lower than remaining 3 Candidate may re-enter the procedure at step 4.1
Comment:	

17. Performance Step:	Was this procedure entered due to continuous rod motion
Standard:	Determines procedure was NOT entered due to continuous Rod Motion and Goes To Step 4.24

Comment: Procedure Step 4.1

Performance Information

(Denote critical steps with a check mark √)

18. Performance Step: Go To applicable step based on indicated condition

Standard: Dropped or Misaligned Rod Step 4.55

Comment: Procedure Step 4.24

√ 19. Performance Step: Determine if a rod has been dropped or misaligned using the following methods as necessary:

__ Observation of power range channels for indicated deviation.

Standard: Determines rod P-6 has dropped

Comment: Procedure Step 4.55

20. Performance Step: Has a rod been dropped

Standard: Determines YES P6 is dropped

Comment: Procedure Step 4.56

21. Performance Step: Do two or more rods indicate dropped

Standard: Determines YES two rods are dropped.

Comment: Procedure Step 4.57

Performance Information

(Denote critical steps with a check mark √)

√ 22. Performance Step: **Trip the reactor and GO TO E-0**

Standard: **Depress Reactor Trip pushbutton on Flight Panel**

Comment: **Procedure Step 4.58**

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: _____ _____

Reset Simulator to any 85% Power IC

Insert MAL-CRF002BA H8 Dropped Rod – STATIONARY (REMOVE)
MAL-CRF002AV P6 Dropped Rod – STATIONARY when Rod H8 is at 10 steps.

Initial Conditions:

- The reactor is stable at its present power level. It has been determined that Rod **H-8** has dropped fully into the core.
- All repairs have been completed. The rod has been cleared for retrieval.
- The CRS has directed you to retrieve the dropped rod in accordance with 2-AOP-ROD-1 step 4.67 through 4.93
- Reactor engineering and OM have determined the rod will be realigned with it group.
- Reactor engineer has determined that no restrictions exist for rod withdrawal

Initiating Cue:

You are the ATC and the CRS has directed you to retrieve rod H8 using 2-AOP-ROD-1 starting at step 4.67.

Facility: Indian Point 2 Task No: IPEC-21-004-Normal-004

Task Title: Place Excess Letdown In Service

K/A Reference: 004000A406 RO – 3.6 SRO – 3.1 Job Performance Measure No: Sim B (RO Only)

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance _____ Actual Performance X

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:

- Reactor at 100% Power.
- A packing leak exists on 202; Letdown Isolation Valve in the PAB.
- Maintenance has requested that normal letdown be isolated to allow them to adjust the packing gland.
- Infrequently Performed Task and Evolution Briefing has been completed.
- Consider all IPTE requirements met.

Initiating Cue: The CRS has directed that you transfer normal letdown to excess letdown IAW 2-SOP-3.1, section 4.16.2. All Precautions and Limitations have been reviewed as well as Initial Conditions verified.

Required Materials: None

General References: 2-SOP-3.1, Charging Seal Water and Letdown Control

Task Standard: Establish Excess Letdown flow to the RCDT within operating limits.

Time Critical Task: No

Validation Time: 25 Minutes

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain correct procedure

Standard: 2-SOP-3.1, Charging Seal Water and Letdown Control

Comment:

√ 2. Performance Step: **Establish CCW flow through the excess letdown heat exchanger**

- **OPEN 796, EX Letdown Hx Outlet CCW Isol Valve on Panel SG**
- **OPEN 793/796 EX Letdown Hx Outlet CCW Isol Valve On Panel SN**
- **OPEN 791/798 EX Letdown Hx Inlet CCW Isol Valve on Panel SN**

Standard: **Rotate Switch for 796 to OPEN Panel SGF**
Rotate Switch for 793/796 to OPEN Panel SNF
Rotate switch fo r791/798 to OPEN on Panel SNF

Comment: Procedure Step 4.16.2.1

√ 3. Performance Step: **POSITION 215, Excess Letdown Diversion Valve, to DIVERT to direct flow to RCDT.**

Standard: **Rotate switch to DIVERT position on SFF**

Comment: Procedrue Step 4.16.2.2

Performance Information

(Denote critical steps with a check mark √)

4. Performance Step: Verify HCV-123, Excess Letdown Flow Controller , is Closed

Standard: Observe potentiometer at 0 and output meter indicates CLOSED on Panel SFF

Comment: Procedure step 4.16.2.3

√ 5. Performance Step: OPEN 213, Excess Letdow Stop

Standard: Rotate switch to OPEN on SFF

Comment: Procedure Step 4.16.2.4

√ 6. Performance Step: To allow for warm-up of Excess Letdown Heat Exchanger, SLOWLY OPEN HCV-123, Excess Letdown Flow Controller Stop

Standard: Slowly rotate potentiometer counter clockwise. Observe output meter increasing toward OPEN

Comment: Procedure Step 4.14.2.5

7 Performance Step: Observe CAUTION before Step 4.16.2.6

Standard: Review Caution

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 8. Performance Step: **Use HCV-123 to establish desired Excess Letdown flow**

Standard: **Adjust HCV-123 to fully open with excess letdown temperature <160°F**

Comment: **Procedure Step 4.16.2.6.**

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: _____ _____

Initial Conditions:

- Reactor at 100% Power.
- A packing leak exists on 202; Letdown Isolation Valve in the PAB.
- Maintenance has requested that normal letdown be isolated to allow them to adjust the packing gland.
- Infrequently Performed Task and Evolution Briefing has been completed.
- Consider all IPTE requirements met.

Initiating Cue:

The CRS has directed that you transfer normal letdown to excess letdown IAW 2-SOP-3.1, section 4.16.2. All Precautions and Limitations have been reviewed as well as Initial Conditions verified.

Facility: Indian Point 2 Task No: IPEC-21-000-Emergency-034

Task Title: **Depressurize the RCS to Refill the Pressurizer**

K/A Reference: 006000A409 RO – 4.1 SRO – 4.2 Job Performance Measure No: Sim C

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance _____ Actual Performance X

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 small break LOCA occurred approximately 45 minutes ago.
- RCPs were tripped as required in E-0.
- All required actions of E-0 and E-1 have been completed
- A Cooldown has been initiated.
- The crew is currently at step 9 of ES-1.2, Post LOCA Cooldown and Depressurization.
- Containment conditions are NOT adverse.

Initiating Cue: You are the ATC and the CRS has directed you to depressurize the RCS to Refill the Pressurizer.

Required Materials: None

General References: 2-ES-1.2 Post LOCA Cooldown and Depressurization

Task Standard: Pressurizer Level is > 28% and Depressurization is stopped.

Time Critical Task: NA

Validation Time: Minutes

Performance Information

(Denote critical steps with a check mark √)

---

1. Performance Step: Obtain correct procedure

Standard: Hand candidate 2-ES-1.2

Comment: Procedure Step 9

---

2. Performance Step: Observe NOTE before Step 9

Standard: Notes Reviewed

Comment:

---

3. Performance Step: Depressurize RCS to Refill PRZR

Standard: Determine Normal Spray is NOT available (No RCPs Running)

Comment: Procedure Step 9.a

---

4. Performance Step: Depressurize RCS to Refill PRZR – Use one PRZR PORV

Standard: Determine Block Valve 536 cannot be opened
Determine PORV 455C will not open

Comment: Procedure Step 9.a (RNO)

Performance Information

(Denote critical steps with a check mark √)

ALTERNATE PATH STEPS BEGIN HERE

√ 5. Performance Step: **Depressurize RCS to Refill PRZR – Use Auxiliary Spray**
Maintain RCP Seal Injection 6 gpm to 12 gpm
Reduce Charging Pump Speed to minimum flow (Panel FBF)
Close Charging Line Flow Control Valve HCV-142 (Panel SFF)

Standard: **Lower charging Pump Speed potentiometer**
Lower HCV 142 Potentiometer
Make adjustments slowly.

Comment: **Procedure Step 9.a. RNO substeps 1 – 3.**

Temporarily exceeding 12gpm or less than 6 gpm is acceptable during adjustments.

√ 6. Performance Step: **Close Charging Stop Valves**

Standard: **Rotate Switches 204A and 204B to Close (Panel SFF)**

Comment: **Procedure Step 9.a. RNO substep 4**

Performance Information

(Denote critical steps with a check mark √)

√ 7 Performance Step:	**Close the pressurizer spray valves**
Standard:	**Lift "T" bar switch and push to left.** **Observe Individual spray valve potentiometers at zero**
Comment:	**Procedure Step 9.a RNO substep 5** **This step is critical because failure to place the spray valves in manual could result in opening of one or both spray valves. If one or both valves open, aux spray will return to RCS not PRZR.**
√ 8. Performance Step:	**Open Aux Spray Valve**
Standard:	**Rotate switch to OPEN (Panel SFF)**
Comment:	**Procedure Step 9.a RNO substep 6**
√ 9. Performance Step:	**Initiate spray slowly using HCV-142**
Standard:	**Slowly rotate potentiometer to OPEN (Panel SFF)**
Comment:	**Procedure Step 9.a RNO substep 7**

Performance Information

(Denote critical steps with a check mark √)

√ 10. Performance Step:	**Adjust charging pump speed to increase spray flow**
Standard:	**Slowly rotate potentiometer to increase charging pump speed.**
Comment:	**Procedure Step 9.a RNO substep 8**
11. Performance Step:	Check Pressurizer Level greater than 28% [47% for adverse]
Standard:	Observe Pressurizer Level indication.
CUE: Pressurizer Level is 30% and rising.	
Comment:	Procedure Step 9.b
√ 12. Performance Step:	**Stop RCS Depressurization**
Standard:	**Close 212** **Adjust charging pump speed to maintain seal injection between 6 and 12 gpm**
Comment:	**Procedure Step 9.c**

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 100% IC

Insert:

MAL-RCS002A – 0.2 No Ramp. Small Break LOCA

Allow Simulator to run.

Perform actions of E-0, E-0 Attachment 1, E-1 and first 8 steps of ES-1.2

LOA-EPS390 Breaker Open – Supply Breaker for MOV-536

SWI-RCS004A CLOSE POS – Switch for 455C fails to open PORV.

Initial Conditions:

- A small break LOCA occurred approximately 45 minutes ago.
- RCPs were tripped as required in E-0.
- All required actions of E-0 and E-1 have been completed
- A Cooldown has been initiated.
- The crew is currently at step 9 of ES-1.2, Post LOCA Cooldown and Depressurization.
- Containment conditions are NOT adverse.

Initiating Cue: You are the ATC and the CRS has directed you to depressurize the RCS to Refill the Pressurizer.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Indian Point Unit 2 Task No: IPEC-21-000-Emergency-103

Task Title: **Perform the required Actions to Start 1 RCP During Response to Inadequate Core Cooling**

K/A Reference: WE06EA1.01 RO3.8 SRO-3.8 Job Performance Measure No: Sim-D

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance		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:

- An event occurred a short time ago that resulted in a transition to FR-C.1, Response to Inadequate Core Cooling.
- The Steam Generator depressurization was ineffective.
- Containment is not adverse

Task Standard: Three RCPs running.

Required Materials: None

General References: 2-FR-C.1, Response to Inadequate Core Cooling

Initiating Cue: You are the BOP and the CRS has directed you to determine if RCPs should be started and to start RCPs if conditions warrant in accordance with 2-FR-C.1 step 18.

Time Critical Task: No

Validation Time: 15 Minutes

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain correct procedure

Standard: Obtains 2-FR-C.1

Comment: *CUE: Hand candidate 2-FR-C.1*

2. Performance Step: Check if RCPs Should be Started

Standard: Sub Steps Below Steps 3 - 4

Comment:

3. Performance Step: Check Core Exit Thermocouples GREATER THAN 1200°F

Standard: Observes CETs > 1200°F

CUE: If necessary cue "CETs are >1200°"

Comment:

Performance Information

(Denote critical steps with a check mark √)

4. Performance Step:	Check if an idle RCS cooling loop is available
Standard:	Observe Narrow Range SG Level GREATER THAN 10% RCP in associated loop available and not running
Comment:	

√ 5. Performance Step:	**Place RCP BEARING LIFT PERMISSIVE BYPASS key switch in bypass located on the rear of SA Panel**
Standard:	**Enter the Supervisory Panel and locate the key switches (near the floor) and place selected RCP switch in bypass**
Comment:	

√ 6. Performance Step:	**Start one RCP**
Standard:	**Rotate RCP Switch to Start Position**

Comment: ***CUE: If requested direct candidate to start 24 RCP***

Performance Information

(Denote critical steps with a check mark √)

7. Performance Step: Check Core Exit Thermocouples GREATER THAN 1200°F

Standard: Observes CETs > 1200°F

CUE: If necessary cue "CETs are >1200°"

Comment:

8. Performance Step: Check if an idle RCS cooling loop is available

Standard: Observe Narrow Range SG Level GREATER THAN 10%
RCP in associated loop available and not running

Comment:

√ 9. Performance Step: Place RCP BEARING LIFT PERMISSIVE BYPASS key switch in bypass located on the rear of SA Panel

Standard: Enter the Supervisory Panel and locate the key switches (near the floor) and place selected RCP switch in bypass

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ **10. Performance Step: Start one RCP**

Standard: Rotate RCP Switch to Start Position

Comment: CUE: If requested direct candidate to start 23 RCP

11. Performance Step: Check Core Exit Thermocouples GREATER THAN 1200°F

Standard: Observes CETs > 1200°F

CUE: If necessary cue "CETs are >1200°"

Comment:

12. Performance Step: Check if an idle RCS cooling loop is available

Standard: Observe Narrow Range SG Level GREATER THAN 10%
RCP in associated loop available and not running

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 13. Performance Step:	**Place RCP BEARING LIFT PERMISSIVE BYPASS key switch in bypass located on the rear of SA Panel**
Standard:	**Enter the Supervisory Panel and locate the key switches (near the floor) and place selected RCP switch in bypass**
Comment:	

√ 14. Performance Step: Start one RCP

Standard: Rotate RCP Switch to Start Position

Comment: ***CUE: If requested direct candidate to start 22 RCP***

15. Performance Step:	Check Core Exit Thermocouples GREATER THAN 1200°F
Standard:	Observes CETs LESS THAN 1200°F and lowering
Comment:	*If CETs NOT < 1200°F and lowering, CUE: CETs are 1100° and lowering slowly*

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:

- An event occurred a short time ago that resulted in a transition to FR-C.1, Response to Inadequate Core Cooling.
- The Steam Generator depressurization was ineffective.
- Containment is not adverse

Initiating Cue:

You are the BOP and the CRS has directed you to determine if RCPs should be started and to start RCPs if conditions warrant in accordance with 2-FR-C.1 step 18.

Facility: Indian Point 2 Task No: IPEC-21-000-Emergency-002

Task Title: Manually Initiate Containment Spray

K/A Reference: 026000A401 RO-3.3 SRO – 4.3 Job Performance Measure No: Sim E

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance _____ Actual Performance X

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 Large Break LOCA has occurred.
- The crew is performing the actions of E-0
- RCPs are tripped
- The BOP has completed all actions through step 12 of Attachment 1 (step 12 is complete)

Initiating Cue: You are the BOP and you are to continue actions of Attachment 1 at step 13 Check if Containment Spray Should Be Actuated

Required Materials: None

General References: E-0, Reactor Trip or Safety Injection Attachment 1

Task Standard: Containment Spray is in service, phase B is actuated

Time Critical Task: No

Validation Time: 10 Minutes

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain correct procedure

Standard: Hand candidate E-0 Attachment 1

Comment:

2. Performance Step: Review NOTE prior to Step 13

Standard: Note Reviewed

Comment:

3. Performance Step: Check Containment pressure – EVER GREATER THAN 24 PSIG

Standard: Determine Containment pressure was greater than 24 psig

CUE: "Containment pressure peaked at 28 psig."

Comment: Attachment step 13a

4. Performance Step: Verify Spray Pumps Running

Standard: Observe Spray Pumps Not Running

Comment: Attachment step 13b

Performance Information

(Denote critical steps with a check mark √)

Begin Alternate Path Actions Now

5. Performance Step: Manually initiate Spray and verify both pumps running

Standard: Observe Spray Pumps still not running

Comment: Attachment Step 13b(RNO)
Panel SBF-1

√ 6. Performance Step: If Spray Pumps NOT RUNNING THEN manually start pumps

Standard: Rotate 21 and 22 Spray Pump switches to start
Observe pumps both running

Comment: Attachment Step 13b (RNO)
Panel SBF-1

7 Performance Step: Verify spray pump discharge valves - OPEN

Standard: Observe Spray Pump discharge valves closed
21 Spray Pump MOV 866A/B
22 Spray Pump MOV 866C/D

Comment: Attachment Step 13c

Performance Information

(Denote critical steps with a check mark √)

√ 8. Performance Step: **Manually OPEN spray pump discharge valves**

Standard: **Rotate Switches (2) to open MOV 866A-D**

Comment: **Each switch operates 2 valves**
Attachment Step 13c (RNO)

---

9 Performance Step: Verify containment isolation Phase B valves - CLOSED

Standard: Observe containment isolation Phase B valves -OPEN
MOV 784 MOV 786
MOV 769 MOV 797
MOV 625 MOV 789
MOV 222

Comment: Attachment Step 13d
Panel SNF

√ 10. Performance Step: **Manually CLOSE containment isolation Phase B valves**

Standard: **Rotate Switches (4) to open MOV 866A-D**

Comment: **Three switches operates 2 valves each and one switch operates one valve**
Attachment Step 13d (RNO)

No further actions are required for this JPM. RCPs were tripped (Initial Conditions) and IVSW valves are verified by the NPO.

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

RLY-PPL463; S-1 relay; Stuck Contacts
RLY-PPL465; S-2 relay; Stuck Contacts

Large Break LOCA
MAL-RCS005A INSERT

Initial Conditions:

- A Large Break LOCA has occurred.
- The crew is performing the actions of E-0
- RCPs are tripped
- The BOP has completed all actions through step 12 of Attachment 1 (step 12 is complete)

Initiating Cue:

You are the BOP and you are to continue actions of Attachment 1 at step 13 Check if Containment Spray Should Be Actuated

Facility: Indian Point 2 Task No: IPEC-21-080-Normal-002

Task Title: Transferring Buses 5 and 6 to 13.8 kV from 138 kV.

K/A Reference: 062000A401 RO – 3.3 SRO 3.1 Job Performance Measure No: Sim F

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance _____ Actual Performance X

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:

- Unit is at 100% power
- 2-SOP-27.1.3, Operation of 13.8 kV System is complete. Power is available from 13W92 to GT-25 and GT-26
- 52GT/BT is OPENED
- Con Ed DO has confirmed 138 and 13.8 kV power supplies are aligned to the same electrical source.
- All precautions and limitations have been reviewed and satisfied

Initiating Cue: You are the BOP and you have been directed to transfer bus 5 & 6 to 13.8kV feeders 13W92 or 13W93 from 138kV.

Required Materials: None

General References: 2-SOP-27.1.4, 6900 Volt System

Task Standard: Buses 5 & 6 powered from 13.8 kV

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 procedure

Comment:

2. Performance Step: Verify 6900V is available up to GT-25 and GT-26

Standard: Given in Initial Conditions.

Comment:

3. Performance Step: Observe Cautions before Step 4.5.2

Standard: Reviews Cautions

Comment:

Performance Information

(Denote critical steps with a check mark √)

---

4. Performance Step: If buses 1, 2, 3, 4, are energized from Unit Auxiliary Transformer, THEN PLACE the following breakers in Pullout and CAUTION tag

Standard: Buses 1 – 4 are energized from Unit Auxiliary Transformer Place the following breakers in TPO

- 6900V Bus 1-5 Tie Breaker UT1-ST5
- 6900V Bus 2-5 Tie Breaker UT2-ST5
- 6900V Bus 3-6 Tie Breaker UT3-ST6
- 6900V Bus 4-6 Tie Breaker UT4-ST6
- Hang CAUTION TAGS on all four breakers

Cue: Another operator will hang the caution tage

Comment: Procedure Step 4.5.2
Panel SHF

---

5. Performance Step: Coordinate with Con Ed DO to ensure 138kV and 13.8kV power supplies are aligned to the same electrical source (this ensures all sources are synchronized)

Standard: Given in Initial Conditions.

CUE: Con Ed DO reports 138kV and 13.8kV are aligned to the same power source.

Comment: Procedure Step 4.5.3

Performance Information

(Denote critical steps with a check mark √)

√ **6. Performance Step:** **If directed by SM/CRS to feed Bus 5**
- **CLOSE 52GT-25**
- **OPEN ST-5**

Standard: **Rotate Switches for 52GT-25 to CLOSE**
Rotate Switches for ST-5 to OPEN

Comment: **Procedure Step 4.5.4.1 and 4.5.4.2**
Panel SHF

√ **7. Performance Step:** **If directed by SM/CRS to feed Bus 6**
- **CLOSE 52GT-26**
- **OPEN ST-6**

Standard: **Rotate Switches for 52GT-26 to CLOSE**
Rotate Switches for ST-6 to OPEN

Comment: **Procedure Step 4.5.5.1 and 4.5.5.2**
Panel SHF

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
- 2-SOP-27.1.3, Operation of 13.8 kV System is complete. Power is available from 13W92 to GT-25 and GT-26
- 52GT/BT is OPENED
- Con Ed DO has confirmed 138 and 13.8 kV power supplies are aligned to the same electrical source.
- All precautions and limitations have been reviewed and satisfied

Initiating Cue:

You are the BOP and you have been directed to transfer bus 5 & 6 to 13.8kV feeders 13W92 or 13W93 from 138kV.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility: Indian Point 2 Task No: IPEC-21-010-Abnormal-008

Task Title: Controlling Pressurizer Pressure Channel (455) Failed High

K/A Reference: 000027A215
RO – 3.7 SR) – 4.0 Job Performance Measure No: Sim G

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing: Performance

Simulated Performance _____ Actual Performance √

Classroom _____ 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:

- Reactor at 4% power,
- 23 T Cold failed high instrument has been removed from service in accordance with 2-AOP-INST-1 Instrument/Controller Failures

Task Standard: Plant stabilized with appropriate procedure completed

Required Materials: 2-AOP-INST-1 Instrument/Controller Failures

General References: 2-AOP-INST-1 Instrument/Controller Failures

Initiating Cue: Respond as required to all plant conditions and alarms. Perform immediate actions for memory, if required. Obtain appropriate procedure and perform all required subsequent actions.

Time Critical Task: N/A

Validation Time: 15 Minutes

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Identify control system affected by the failure.

Standard: Identify Pressurizer Pressure Control System

Comment: **INSTRUCTOR NOTE: ACTIVATE TRIGGER #1 TO INPUT MALFUNCTION**

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

Standard: Pressurizer Pressure Controller placed in manual, close spray valves and establish heaters as necessary to stabilize Pressurizer pressure

Comment:

3. Performance Step: Check that all Control Systems listed have been checked as being affected

Standard: All Control Systems checked

Comment:

4. Performance Step: Go To applicable step for indicated failure

Standard: Go To Pressurizer pressure Step

Comment:

Performance Information

(Denote critical steps with a check mark √)

5. Performance Step: Manually operate Pressurizer heaters and sprays as necessary to maintain desired RCS pressure

Standard: Control spray valves and Pressurizer heaters as necessary to stabilize Pressurizer pressure

Comment:

√6. Performance Step: Perform Attachment for Pressurizer Pressure Channel

Standard: Pressurizer Pressure Channel Switch: Defeat 1& 4 (Rack B-6)
ΔT Switch T/411A: Defeat Loop 1 (Rack B-8)

Comment:

7. Performance Step: Place Pressurizer Pressure Recorder Transfer Switch (Panel FBF) to Controlling Channel

Standard: Swap Recorder Switch to Channel 3

Comment:

8. Performance Step: Return Pressurizer heater and spray controls to Auto

Standard: Pressurizer Pressure Control returned to Auto

Comment: ***Termination for RO***

Performance Information

(Denote critical steps with a check mark √)

9. Performance Step: Refer to Technical Specifications for required actions

Standard: Tech spec 3.4.1, Table 3.3.1-1 and Table 3.3.2-1 referenced

Comment: SRO will determine that bistables cannot be tripped

Terminating Cue: ***When SRO determines bistables cannot be tripped***

VERIFICATION OF COMPLETION

Job Performance Measure No. CHARLIE 2011

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 SET-UP

Reset to 100% IC
Ensure Channel 1 in Control
Ensure 23 T Cold failed high (XMT-RCS044A to 600)
Remove channel from service IAW 2-AOP-INST-1

Insert malfunction XMT-RCS028A to 2500.00000 on event 1
PRZR Pressure Channel 1 (455) Fails High on Trigger 1

SNAP IC and Password protect

Initial Conditions:

- Reactor at 4% power,
- 23 T Cold failed high instrument has been removed from service in accordance with 2-AOP-INST-1 Instrument/Controller Failures

Initiating Cue:

Respond as required to all plant conditions and alarms. Perform immediate actions for memory, if required. Obtain appropriate procedure and perform all required subsequent actions.

Facility: Indian Point 2 Task No: IPEC-21-029-Normal-001

Task Title: **Terminate Containment Pressure Relief**

K/A Reference: 029000A301 Job Performance Measure No: Sim H

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance _____ Actual Performance X

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:

- VC Pressure Relief is in progress.
- The desired VC Pressure has been reached
- Nuclear NPO is NOT available

Initiating Cue: You are the ATC and the CRS has directed you to terminate the VC Pressure Relief

Required Materials: None

General References: 2-SOP-5.4.1, VC Pressure Reliefs

Task Standard: Pressure Relief Fan Stopped and PCV-1190, 1191, and 1192 Closed

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 2-SOP-5.4.1

Comment:

√ **2. Performance Step:** **TERMINATE the VC pressure relief by performing the following:**

- Verify Containment Building Purge Supply / Exhaust Valves are Closed
- **Place the Purge Duct Trip Switch to TRIP on CCR Panel SLF**

Standard: Observe PCV-1170, 1171, 1172, and 1173 are closed.
Rotate Purge Duct Trip Switch to TRIP position

Comment: ***Purge Duct Trip Switch will successfully stop the VC Pressure Relief Fan, but it WILL NOT close the PCV-1190.***

Procedure Step 4.4.1.2.b

---

3. Performance Step: Observe NOTE before step 4.4.2

Standard: Reviews NOTE

Comment:

Performance Information

(Denote critical steps with a check mark √)

4. Performance Step: Verify PCV-1190, Pressure Relief Valve Inside VC is Closed

Standard: Observe PCV-1190 NOT closed Panel SL

Comment: Procedure Step 4.4.2

Alternate Path Steps Begin Here

√ 5. Performance Step: **If PCV-1190 does not close, then at CCR Panel SN, Attempt to Close PCV-1190 using the CNMT BLDG PRESS RELIEF VALVES Switch.**

Standard: **Hold Switch to Close until Red indicating light extinguishes. Observe PCV-1190 Closed (Green Light Lit)**

Comment: Procedure Step 4.4.2.1

End Alternate Path Actions

√ 6. Performance Step: **Close PCV-1191 and PCV-1192 using control switch located on CCR Panel SLF.**

Standard: **Rotate Switch to CLOSE position**
Observe Valves closed on

Comment: Procedure Step 4.4.2.3

There are No more critical steps for this JPM.

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 Power IC

Run Schedule VC Pressure Relief to place VC Pressure Relief in service.

Initial Conditions:

- VC Pressure Relief is in progress.
- The desired VC Pressure has been reached
- Nuclear NPO is NOT available

Initiating Cue:

You are the ATC and the CRS has directed you to terminate the VC Pressure Relief

Facility: Indian Point 2 Task No: IPEC-21-084-Abnormal-027

Task Title: Start 22 (turbine driven) Auxiliary Boiler Feed Pump (ABFP)

K/A Reference: 0610002130 RO – 4.4 SRO – 4.0 Job Performance Measure No: In Plant I

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:

- The Control Room has been evacuated
- 21 and 23 AFW Pumps are not available

Initiating Cue: You are the conventional Side RO and the CRS had directed you to start 22 Aux Boiler Feed Pump in accordance with Attachment 2 Steps 2.76-2.90

Required Materials: None

General References: 2-AOP-SSD-1, Control Room Inaccessibility Safe Shutdown

Task Standard: 22 ABFP is running

Time Critical Task: No

Validation Time: 20 Minutes

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step:	Obtain correct procedure
Standard:	Hand Candidate 2-AOP-SSD-1
Comment:	

2. Performance Step:	Unlock the handwheel and then loosen Lock Nut on manual hand wheel stem and operate the manual handwheel (jack) in clockwise direction to engage and maintain the following in current position. • FCV-405A (ABFP 22 Discharge to 21 SG) • FCV-405B (ABFP 22 Discharge to 22 SG) • FCV-405C (ABFP 22 Discharge to 23 SG) • FCV-405D (ABFP 22 Discharge to 24 SG)
Standard:	Remove lock and chain from handwheel for each valve. Rotate lock nut counterclockwise to allow operation of handwheel stem Rotate Handwheel clockwise to engage valve stem
CUE:	***Lock and Chain removed*** ***Lock nut rotates counterclockwise*** ***Valve Handwheels (4) rotate clockwise until engaged with stem***
Comment:	Attachment 2 Step 2.76

Performance Information

(Denote critical steps with a check mark √)

√ 3. Performance Step: **Close Instrument Air Stop Valve supply to FCV405s**

- **IA-858**
- **IA-859**
- **IA-860**
- **IA-862**

Standard: **Rotate valve handwheels clockwise until they stop**

CUE: Handwheels rotate clockwise then Stop

Comment: Attachment Step 2.77

√ 4. Performance Step: **Open valve filter/regulator petcocks for the following:**

- **FCV-405A**
- **FCV-405B**
- **FCV-405C**
- **FCV-405D**

Standard: **Petcocks rotate in Open Direction**

CUE: Petcock Thumbwheels rotate counterclockwise then Stop

Comment: Attachment Step 2.78

Performance Information

(Denote critical steps with a check mark √)

√ 5. Performance Step: **Close the following with the manual handwheel (jack)**
- **FCV-405A (ABFP 22 Discharge to 21 SG)**
- **FCV-405B (ABFP 22 Discharge to 22 SG)**
- **FCV-405C (ABFP 22 Discharge to 23 SG)**
- **FCV-405D (ABFP 22 Discharge to 24 SG)**

Standard: **Rotate handwheels clockwise until they stop**

CUE: Handwheels rotate clockwise then Stop

Comment: Attachment Step 2.79

---

6. Performance Step: Determine if 22 ABFP is running

Standard: 22 ABFP is NOT running Go To Step 2.82

CUE: 22 Aux Boiler Feed Pump is NOT running

Comment: Attachment Step 2.80

√ 7 Performance Step: **Operate HCV-1118 (Aux BFP 22 Turbine Speed Governor) hand control jack clockwise to the completely DOWN/IN position**

Standard: **Rotate handweel for HCV-1118 clockwise until it stops**

CUE: Handwheel rotate clockwise then Stops

Comment: **Attachment Step 2.82**

Performance Information

(Denote critical steps with a check mark √)

√ **8. Performance Step:** **Close IA-1391 (Inst Air/Nitrogen Headers Root Valve to HC-1118/HCV-1118 (racks near FT12201)**

Standard: **Rotate handwheel clockwise until it stops**

CUE: Handwheel rotate clockwise then Stops

Comment: **Attachment Step 2.83**

√ **9. Performance Step:** **Disconnect instrument air line to HCV-1118**

Standard: **Using attached wrench disconnect the airline**

CUE: Airline is disconnected

Comment: **Attachment Step 2.84**

---

10. Performance Step: Is 22 ABFP trip flapper valve latched?

Standard: Observe the trip flapper valve IS latched

CUE: Trip Flapper is Up and Latched.

Comment: Attachment Step 2.85

Performance Information

(Denote critical steps with a check mark √)

√ **11. Performance Step:** **Place control switch for PCV-1139 (Steam Stop Valve Aux Feedwater Pump 22) in Trip (ABFP local control panel)**

Standard: **Rotate switch to left toTRIP position**

CUE: Switch rotates to LEFT/TRIP position

Comment: **Attachment Step 2.86**

√ **12. Performance Step:** **Place control switch for PCV-1139 in AUTO for at least 10 seconds**

Standard: **Rotate switch to vertical to AUTO position and wait 10 seconds.**

CUE: Switch rotates to UP/AUTO position

Comment: **Attachment Step 2.87**

√ **13. Performance Step:** **Place control switch for PCV-1139 in ON**

Standard: **Rotate switch to right to ON position**

CUE: Switch rotates to RIGHT/ON position

Comment: **Attachment Step 2.88**

Performance Information

(Denote critical steps with a check mark √)

---

14. Performance Step: Is 22 ABFP steam inlet pressure 525 – 575 psig on PI-6331?

Standard: Observe PI 6331

CUE: PI-6331 indicates 550 psig

Comment: Attachment Step 2.89

√ 15. Performance Step: Rotate hand control jack on HCV-1118 (Aux BFP 22 Turbine Speed Governor) counterclockwise to adjust speed until discharge pressure is 200 – 250 psig above SG pressure (ABFP Local Control Panel)

Standard: Rotate Handwheel Counterclockwise observing discharge pressure and SG pressure.

Comment: Attachment Step 2.90

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:

- The Control Room has been evacuated
- 21 and 23 AFW Pumps are not available

Initiating Cue:

You are the Conventional Side RO and the CRS had directed you to start 22 Aux Boiler Feed Pump in accordance with Attachment 2 Steps 2.76 through 2.90

Facility: Indian Point 2 Task No: IPEC-24-084-Abnormal-006

Task Title: Establish Backup Cooling to the Charging Pumps

K/A Reference: 0080002130 RO – 4.4 SRO – 4.0 Job Performance Measure No: In Plant J

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:

- The CCR has been evacuated due to a fire and 2-AOP-SSD-1, Control Room Inaccessibility Safe Shutdown Control, has been implemented
- CCW cooling to the Charging pumps is not available

Initiating Cue: You are the Nuc Side RO and the CRS has directed you to align Backup Cooling Water Supply to the Charging Pumps per Attachment 10

Required Materials: None

General References: 2-AOP-SSD-1, Control Room Inaccessibility Safe Shutdown Control

Task Standard: City Water Cooling is aligned to Charging Pumps

Time Critical Task: No

Validation Time: Minutes 20 Minutes

Performance Information

(Denote critical steps with a check mark √)

---

1. Performance Step: Obtain correct procedure

Standard: Hand Candidate 2-AOP-SSD-1 Attachment 10

Comment:

---

2. Performance Step: Review NOTES before step 10.1

Standard: Notes Reviewed

Comment:

√ 3. Performance Step: Connect hose to Charging Pumps City Water Backup Header Stop, route hose to drainage

Standard: Locate hose and 1873D connection and simulate routing hose to suitable drainage

CUE: Hose is connected

Comment: Attachment Step 10.1

Performance Information

(Denote critical steps with a check mark √)

√ 4. **Performance Step:** **Close 1874 Charging Pumps City Water Backup Telltale Stop**

Standard: **1874 to Clockwise direction**

CUE: Handwheel rotates clockwise and stops

Comment: Attachment Step 10.2

√ 5. **Performance Step:** **Close 756B Charging Pumps Oil and Fluid Drive Heat Exchanger Outlet Stop**

Standard: **756B to Clockwise direction**

CUE: Handwheel rotates clockwise and stops

Comment: Attachment Step 10.3

√ 6. **Performance Step:** **Close 756A Charging Pumps Oil and Fluid Drive Coolers Inlet Stop**

Standard: **756A to Clockwise direction**

CUE: Handwheel rotates clockwise and stops

Comment: Attachment Step 10.4

Performance Information

(Denote critical steps with a check mark √)

√ 7 **Performance Step:** **Open 1873C Charging Pumps City Water Backup Outlet Header Stop**

Standard: **1873C to counter-clockwise direction**

CUE: Handwheel rotates counterclockwise and stops

Comment: **Attachment Step 10.5**

√ 8. **Performance Step:** **Open 1873D Charging Pumps City Water Backup Outlet Header Stop**

Standard: **1873D to counter-clockwise direction**

CUE: Handwheel rotates counterclockwise and stops

Comment: **Attachment Step 10.6**

√ 9. **Performance Step:** **Open 1873A Charging Pumps City Water Backup Inlet Header Stop**

Standard: **1873A to counter-clockwise direction**

CUE: Handwheel rotates counterclockwise and stops

Comment: **Attachment Step 10.7**

Performance Information

(Denote critical steps with a check mark √)

√ **10. Performance Step:** **Open 1873B Charging Pumps City Water Backup Inlet Header Stop**

Standard: **1873B to counter-clockwise direction**

CUE: Handwheel rotates counterclockwise and stops

Comment: **Attachment Step 10.8**

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: _____ _____

Initial Conditions:

- The CCR has been evacuated due to a fire and 2-AOP-SSD-1, Control Room Inaccessibility Safe Shutdown Control, has been implemented
- CCW cooling to the Charging pumps is not available

Initiating Cue:

You are the Nuc Side RO and the CRS has directed you to align Backup Cooling Water Supply to the Charging Pumps per Attachment 10

Facility: Indian Point 2 Task No: IPEC-24-071-Normal-002/005

Task Title: Manually Swap In-Service Large Gas Decay Tank

K/A Reference: 071000A405 RO – 2.6 SRO – 2.6 Job Performance Measure No: In Plant K

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:

- 21 Large Gas Decay Tank (LGDT) is Out of Service.
- 22 LGDT is in-service at 90 psig
- 22 LGDT is in RE-USE
- 24 LGDT is in Standby at 27 psig
- 23 LGDT is at 76 psig
- No LGDT is Inert.
- RCS Total Activity is 0.09 µCi/cc
- O2 and H2 concentration of all Tanks and Vent Header is verified less than 1%

Initiating Cue: You are the Nuc Side NPO and the CRS has directed you to manually swap from 22 to 24 Large Gas Decay Tank in-service and in RE-USE in accordance with 2-SOP-5.2.1, Section 4.2.3. Select 23 LGDT as standby.

Required Materials: None

General References: 2-SOP-5.2.1, Gaseous Waste Disposal System Operation

Task Standard: 24 LGDT in-service and in RE-USE.

Time Critical Task: No

Validation Time: 10 Minutes

Performance Information

(Denote critical steps with a check mark √)

---

1. Performance Step: Obtain correct procedure

Standard: Hand Candidate Procedure

Comment:

---

2. Performance Step: Select a new standby LGDT, as a backup by positioning Gas Decay Tank Selector Switch to desired LGDT

Standard: Rotate switch to 23 position

CUE: Switch rotates to 23 LGDT position

Comment: Procedure Step 4.2.3.1

√ 3. Performance Step: PUSH the 2X LGDT Manual Override pushbutton of selected (24 LGDT) to be placed in service

Standard: Push 24 LGDT Manual Override pushbutton

CUE: Push Button depresses

Comment: Procedure Step 4.2.3.2

Performance Information

(Denote critical steps with a check mark √)

---

4. Performance Step: Verify the red lights of both, the desired Standby LGDT AND the In-Service LGDT are LIT at the LGDT Tank Selector Switch

Standard: Observe both 23 and 24 LGDT red lights lit.

CUE: Red lights for 23 and 24 LGDT are lit.

Comment: Procedure Step 4.2.3.3

---

5. Performance Step: Verify the red light on the In-Service LGDT is lit at the 24 LGDT Inlet Header

Standard: Observe 24 LGDT red light lit at the inlet header.

CUE: 24 LGDT Inlet Header red light is LIT.

Comment: Procedure Step 4.2.3.4

---

6. Performance Step: Observe CAUTION before 4.2.3.5

Standard: Reviews Caution

Comment: The P&L is satisfied in Initial Conditions.

Performance Information

(Denote critical steps with a check mark √)

√ 7 Performance Step: **If previous in service LGDT was also in RE-USE, Then CLOSE the associated Re-Use valve**

1630 22 LGDT Reuse Outlet

Standard: **Rotate Switch for 1630 to Close position**

CUE: Switch for 1630 rotates to CLOSE

Comment: **Procedure Step 4.2.3.5**

√ 8. Performance Step: **If current in service LGDT is to be placed in RE-USE and P&L 2.11 is met, THEN OPEN the associated Re-Use valve:**
1632 24 LGDT Reuse Outlet

Standard: **P&L 2.11 is met (given in Initial Conditions)**
Rotate Switch for 1632 to OPEN

CUE: Switch for 1632 rotates to OPEN

Comment: **Procedure Step 4.2.3.6**

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: _____ _____

Initial Conditions:

- 21 Large Gas Decay Tank (LGDT) is Out of Service.
- 22 LGDT is in-service at 90 psig
- 22 LGDT is in RE-USE
- 24 LGDT is in Standby at 27 psig
- 23 LGDT is at 76 psig
- No LGDT is Inert.
- RCS Total Activity is 0.09 µCi/cc
- O2 and H2 concentration of all Tanks and Vent Header is verified less than 1%

Initiating Cue:

You are the Nuc Side NPO and the CRS has directed you to manually swap from 22 to 24 Large Gas Decay Tank in-service and in RE-USE in accordance with 2-SOP-5.2.1, Section 4.2.3. Select 23 LGDT as standby.

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

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: Reset simulator to 100% % power, 22 AFP OOS, 21 and 23 protected; 22 Circulator OOS

Turnover: # 22 ABFP has been out-of-service for bearing oil line repair for 4 hours. It is expected back within the next 6 hours (ITS 3.7.5 – 72 hr AOT). 21 and 23 ABFP are protected equipment. 22 Circulator is out of service for motor replacement (Day 2), not expected to return this shift

Critical Tasks:

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

- De-energize the Rod Drive MG sets
- Manually insert the rods
- Establish Emergency Boration

Manually actuate Main Steam isolation before transition out of E-0

Manually start SI system pumps before transition out of ES-1.1

Event No.	Malf. No.	Event Type*	Event Description
1	XMT-RCS048A	I (ATC) I (BOP) I (CRS) TS(CRS)	RCS Loop 24 Cold Leg temperature failure (TE-441B) fails low
2	MAL-NIS004A	R (ATC) N (CRS) N (BOP) TS (CRS)	NI-43 fails High which results in a Tech Spec Shutdown
3	RLY-GEN007	M (ATC) M (CRS) M (BOP)	Main Generator output breakers trip
4	BKR-PPL003 BKR-PPL004	C (ATC)	Reactor Trip Failure
5	MAL-SGN005	M (ATC) M (CRS) M (BOP)	Steam Break in Turbine Hall, Auto closure MSIVs blocked
6	SWI-SGS002	C (CRS) C (BOP)	Phase A reset failure
7	AOV-RCS003A	C (BOP) C (CRS)	PRZR PORV Fails open

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

Scenario 1 Summary

The scenario begins with the plant at 100% power with 22 Auxiliary Feedwater pump out of service expected to return in 6 hours. 22 Circulator is out of service for motor replacement (day 2), not expected to return this shift. The team assumes the shift.

Event 1 *(Instrument Failure, All)*
24 Cold Leg temperature instrument fails low resulting in the ATC placing control rods in manual and running charging pump in manual. BOP will defeat the failed channel input from the Average Tave and ΔT. The ATC will place rod control in auto and running charging pump back in auto. CRS will refer to Tech Spec Table 3.3.1-1 and 3.3.2-1. When SM notified, bistables for the failed channel will ordered to be tripped by the BOP IAW Attachment 9.

Event 2 (*Reactivity, ATC; Normal, BOP and CRS)*
NI-43 will fail high, the ATC will determine rods are stepping in and place them in manual. Entry into 2-AOP-NI-1 will occur and ensure control rods in manual, the CRS will refer to Tech Spec 3.3.1, 3.3.2 and 3.2.4. The team will enter 2-SOP-13-1 Nuclear Instrumentation system operation and BOP will commence to remove the channel from service. The team will determine that the channel cannot be removed from service. The team will recognize the inability to remove the channel from service and then commence a Tech Spec (3.0.3) shutdown using 2-POP-2.1. The ATC lower reactor power by borating and drive rods in manual. The BOP will lower turbine power using the manual governor.

Event 3 *(Major, All)*
When the team has demonstrated enough of the shutdown evolution, the output breakers on the generator will trip open and an automatic reactor trip will not occur;

Event 4 (Component, ATC)
The RO's will not be able to manually trip the reactor and the team will enter 2-FRS-1 and the ATC will manually insert rods and emergency borate. The reactor trip breakers will be opened locally by the NPO.

Event 5 *(Major, All)*
When the turbine overpeeds, a steam line in the turbine building will rupture. Automatic main steam line isolation will not actuate. The team will manually close the MSIV's to stop the steam leak after the reactor is shutdown.

Event 6 *(Component, BOP and CRS)*
The team will progress through 2-E-0, and the team will determine at step 16 that Safety Injection should be terminated and transition to 2-ES-1.1. When resetting Phase A it will not reset requiring the key switches to reset.

Event 7 *(Component, ATC and CRS)*
When SI is terminated PORV PCV-456 will fail open and its associated block valve will blow a fuse when closing. The team will restart the Safety Injection system pumps from foldout page criteria and transition back to 2-E-1. *(End of Scenario)*
.

Procedure flow path: 2-AOP-INST-1, 2-AOP-NI-1, 2-E-0, 2-FRS-1, 2-E-0, 2-ES-1.1, 2-E-1

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
IC Reset		Reset Simulator to 100% power IC
Setup	**Run Schedule file:** Scenario 1 22 AFP PCV-1139 to trip and hang caution tags Protect 21 and 23 AFP	Verify schedule file has been loaded.
Event 1	**Actuate Trigger 1** **At lead evaluator direction**	24 loop T Cold fails low
Role Play	**When SM, I&C or Work Control are notified**	Work package being developed
Event 2	**Actuate Trigger 2** **At lead evaluator direction**	NI-43 fails low
Role Play	**When SM, I&C or Work Control are notified**	Remove entire channel from service
Event 3	**Actuate Trigger 3** **At lead evaluator direction**	Generator output breakers open
Event 4	**In setup**	Reactor will not trip
Role Play	**When NPO dispatched to trip reactor locally**	Delete malfunctions BKR-PPL003 and BKR-PPL004
Event 5	**In setup**	Main Steam Line rupture
Role Play	**When dispatched**	Perform LOA's as requested
Event 6	**In setup**	Phase A will not reset
Event 7	**Actuate Trigger 7** **At lead evaluator direction**	PORV 456 fails open

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

Event Description: 24 Loop Cold Leg temperature instrument fails low

Time	Position	Applicant's Actions or Behavior
	BOP	Acknowledges OPΔT channel trip or rod stop, OTΔT channel trip or rod stop, Delta T Deviation, and Tave deviation on SAF-1
	ATC	Place rod control and running charging pump in manual, maintain pressurizer level per Graph RCS-2
	CRS	Announces entry into 2-AOP-INST-1, Instrument or Controller Failures
	BOP	Defeat Loop 4 (Tave) in rack D-10 and Defeat loop 4 (ΔT) in rack B-8
	ATC	Place Rod control and running charging pump in auto
	CRS	Refer to TS tables 3.3.1-1 and 3.3.2-1
	CRS	Will determine that: The spec is not met. 3.3.1-1 function 5, Overtemperature ΔT, requires 4 operable channels. With one failed condition E applies which requires placing the channel in trip within 72 hours.
	CRS	Will determine that: The spec is not met. 3.3.1-1 function 6, Overpower ΔT, requires 4 operable channels. With one failed condition E applies which requires placing the channel in trip within 72 hours.
	CRS	Will determine that: The spec is not met. 3.3.2-1 function 4d, High Steam Line Flow coincident with low Tave, requires 1 per loop. With one failed condition D applies which requires placing the channel in trip within 72 hours.
Note: If needed, prompt CRS as the SM that bistables need to be tripped or do not need to be tripped as per the Lead Evaluator.		
	BOP	Trip bistables on attachment 9 (Loop 4) Overtemp Trip, Overpwr Trip, and Lo TAVG in yellow rack B-10
Lead Evaluator		When the team has tripped bistables move to Event 2.

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

Event Description: NI-43 fails high, requiring TS 3.0.3 shutdown

Time	Position	Applicant's Actions or Behavior
	ATC	Acknowledges alarms NIS Power Range Overpower rod stop 106%, NIS power range channel deviation 3%, and NIS power range 108%
	ATC	Places Control Rod to manual
	CRS	Announces entry into 2-AOP-INST-1, Instrument or Controller Failures
	CRS	Announces entry into 2-AOP-NI-1, Nuclear Instrument Malfunction
	ATC	Places rod control to manual (If not done)
	CRS	Refers to TS 3.2.1, 3.2.2, 3.2.4, 3.2.4.2 and 3.3.1
	CRS	Reviews 3.2.4.2 for failed instrument. Will determine that: QPTR verified within limits using Movable Incore Detectors (24 hours)
	BOP	Removes NI-43 from service IAW 2-SOP-13.1 Nuclear Instrumentation operation
	BOP	CANNOT place Delta T defeat switch in Defeat loop 3
	CRS	Reviews 3.3.1 for failed instrument Will determine that Condition D applies with one power range inoperable requiring the channel to be tripped in 72 hours Will determine that 2 Overtemperature ΔT channels are inoperable requiring a TS shutdown (3.0.3)
	CRS	Obtain 2-POP-2.1 and SM permission for power reduction
	CRS	Direct ATC/BOP to perform a Reactivity Calculation for the power reduction
	ATC/BOP	Prepare Reactivity Calculation using the Daily Reactivity Sheet 2-WCR-1
	CRS	Assigns roles for power reduction, Reviews Reactivity Plan

Op-Test No.: 1 Scenario No.: 1 Event No.: 2 Event Description: NI-43 fails high, requiring TS 3.0.3 shutdown		
	ATC	If rods are inserted: • Places/verifies rods are in Manual • Inserts rods specified number of steps • Observes: o Proper rod motion o Tavg o Power
	BOP	Peer checks rod insertion
	ATC	If boration is performed: • Energize All Pressurizer Heaters • Places RCS Makeup control to Stop • Place RCS Makeup Mode selector to borate • Adjusts integrator to desired boration amount • Places RCS Makeup control to Start • Observes: o Proper makeup response o Tavg o Power
	BOP	Peer check boration
	ATC/BOP	Initiate Turbine Load Reduction at desired rate • Governor (Preferred) • Load Limit 1 • Load Limit 2
	ATC	Maintain the manual setpoint for the MFRV Controllers Nulled.
	ATC	Adjust Control Rod to maintain AFD
Lead Evaluator		When the following has been demonstrated/observed: • Sufficient load reduction. • Sufficient normal plant operations by the BOP. Then instruct Booth to insert Event 3.

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

Event Description:

Time	Position	Applicant's Actions or Behavior
	ALL	Generator Output breakers open
	CRS	Announce entry to 2-E-0
	ATC	Attempts to trip the reactor
	BOP	Attempts to trip the reactor
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: • De-energize the Rod Drive MG sets/open breakers • Manually insert the rods • Establish Emergency Boration.		
	BOP	Dispatch NPO to trip reactor locally
	CRS	Will announce entry into 2-FR-S.1, Response to Nuclear Power Generation/ATWS.
	ATC	Will check that the reactor did not trip and will insert control rods.
	BOP	Will trip the turbine. (Turbine tripped already)
	BOP	Open MOV-333.
	ATC	Place both boric acid transfer pumps in fast.
	BOP	Place running charging in manual.
	BOP	Open 112B and close 112C.
	ATC	Place make up controls in stop.
	BOP	Run charging pump at least 75 gpm.
	ATC	Check PZR pressure < 2335 psig (it will be)
	CRS	Checks that turbine and reactor are tripped (the reactor will be tripped by now).
	CRS	Exits 2-FR-S.1 and goes to 2-E-0 step 1.
Lead Evaluator		Event 4 automatically occurs when turbine speed exceeds 2275 rpm, Main steam line break

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

Event Description: Steam Line rupture

Time	Position	Applicant's Actions or Behavior
	TEAM	Will note sound of steam leak.
		Critical Task **Manually actuate Main Steam isolation before transition out of E-0**
	ATC	Will announce closing MSIVs (Auto closure blocked)
	ATC	Verifies reactor trip: • Trip breakers open • Flux decreasing • Rod bottom lights lit • RPIs less than 12.5 inches
	ATC	Verifies Turbine Trip: • All stop valves closed
	BOP	Verifies power to 480V busses: • All busses energized
	ATC	Checks SI status • SI Annunciator Lit: • Both trains of SI actuated
	BOP	Begins Attachment 1, Automatic Action Verification: (Done in parallel. Actual actions for event listed) • Checks adverse containment conditions – not adverse • Starts 1 charging pump • Align charging suction to the RWST by opening 112B and closing 112C • Places VCT makeup to stop • Dispatches NPO to reset lighting and MCCs 24A,27A,29A • Stops all condensate pumps • Places airlock switches in incident mode • Notifies CRS that attachment is complete
	ATC	Verify AFW pumps running • Both Motor driven pumps running • AFW flow >400gpm
	ATC	Verify SI flow and CCW pumps are running.

Op-Test No.: 1 Scenario No.: 1 Event No.: 5 Event Description: Steam Line rupture		
	ATC	Dispatch NPO to close SW valves: • FCV-1111 • FCV-1112 • SWN-6 • SWN-7 • SWN-4 • SWN-5 When valves are reported closed, a Non-Essential SW pump will be started.
	ATC	Verify RCS average temperature.
	ATC	Checks PORVs and spray valves closed.
	ATC	Checks for RCP trip criteria – pumps will be left running.
	ATC	Checks if SG Faulted-None
	ATC	Checks if SG tubes intact-Yes
	ATC	Checks if RCS Intact-Yes
	ATC	Checks for SI termination • Subcooling • Heat Sink • RCS Pressure • Pzr Level
	CRS	Transition to 2-ES-1.1 SI termination
Lead Evaluator		Actions will continue with Event 6.

Op-Test No.: 1 Scenario No.: 1 Event No.: 6/7

Event Description: SI termination/PORV opening

Time	Position	Applicant's Actions or Behavior
	CRS	Announce entry into 2-ES-1.1
	ATC/BOP	Reset SI
	BOP	Reset Phase A When buttons depressed Phase A does not reset Place Key switches to bypass and reset Phase A
	BOP	Establish IA to containment
	ATC	Stop SI pumps and place in auto
	BOP	Stop RHR pumps and place in auto
	BOP	Acknowledge PORV open alarm
	ATC	Determines PORV-PCV-456 is open and attempts to close it, when it does not close, the block valve will be closed. Block valve will lose power prior to closing
Critical Task: Start SI pump(s) prior to exiting 2-ES-1.1		
	ATC	Determines that they meet the Foldout page criteria for SI reinitiation criteria
	CRS	Verifies SI reinitiation criteria
	BOP	Starts SI system pumps as required
	CRS	Announce transition to 2-E-1
Lead Evaluator		Scenario Terminated

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

Examiners: _____ Operators: _____

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Initial Conditions: 100% power. 21 Charging Pump and 21 CCW Pump are out of service.

Turnover: 21 Charging Pump (Day 3) and 21 CCW Pump (Day 3) out of service, none are expected to return this shift.

Critical Tasks:

Manually actuate at least one train of SIS-actuated safeguards before any of the following: Transition to any E-1 series, E-2 series, or E-3 series procedure or transition to any FRP.

Isolate the faulted SG before transition out of E-2

Cool down the RCS to CSD conditions at the highest achievable rate w/o exceeding 100F/hr

Event No.	Malf. No.	Event Type*	Event Description
1	XMT-RCS020A	I (ATC) I (BOP) I (CRS) TS (CRS)	LT-460 (Pressurizer Level) fails low.
2	-	N (CRS) N (BOP) R (ATC)	Downpower
3	MAL-CRF002AV	C (CRS) C (ATC) TS(CRS)	Rod F-14 does not move when rods demanded.
4	MAL-SGN004A	M (ATC) M (BOP) M (CRS)	Steam line rupture upstream 23 MSIV
5	RLY-PPL487/488	C (ATC) C (CRS)	Failure of SI to actuate automatically.
6	MOC-AFW001	C (ATC) C (CRS)	Failure of 21 AFW pump to autostart
7	MOC-	C (BOP)	Failure of 21 SW pump to autostart.
8	MAL-RCS014C	M (ATC) M (BOP) M (CRS)	23 SGTR

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

Scenario 2 Summary

The scenario begins with the plant at 100% power with 21 Charging Pump (Day 3) and 21 CCW Pump (Day 3) out of service. None are expected to return this shift. The team assumes the shift.

Event 1 (Instrument, All: Tech Spec, CRS)
After the team has assumed the watch, LT-460 (controlling PZR level transmitter) will fail low. This will cause charging pump speed to increase and letdown to isolate. The team will respond by placing the running charging pump in manual. AOP-INST-1 (Instrument and Controller Failures) will be entered. The failed channel will be defeated, removed from service and letdown restored.

Event 2 (Reactivity, ATC; Normal, BOP and CRS)
The SM will direct to remove the unit from service within 2 hours using 2-AOP-RSD-1 (Rapid Shutdown) due to 23 SG non-return check valve having a steam leak. The ATC will borate and drive rods in manual (or at least monitor automatic insertion) and the BOP will lower turbine power using the manual governor. CRS will make notifications of downpower.

Event 3 (Component, ATC; Tech Spec, CRS)
The ATC will diagnose Control Rod F-14 misaligned (Stuck at 223 steps) in the core during rod motion. Control Rod or Power Distribution trouble will annunciate the BOP validates the ATC diagnosis. This will require the load reduction to be stopped and the condition evaluated per 2-AOP-ROD-1 (Rod Control Malfunctions). Rod control will be placed in manual, power reduction will recommence by borating only.

Event 4 (Major, All)
Once enough of the load reduction has been completed, a Steam Line Rupture upstream of 23 MSIV (ABFP Building) will occur requiring a reactor trip. The team will trip the reactor and enter 2-E-0. The team will transition to E-2 due to 23 SG pressure decreasing in an uncontrolled manner, and 23 SG will be isolated

Event 5 (Component, ATC)
The ATC will determine that both trains of Safety injection did not actuate and manually actuate SI.

Event 6 (Component, ATC)
21 Auxiliary Feed Water pump will not autostart, ATC will start 21 AFW pump.

Event 7 (Component, BOP)
21 Service water pump will not autostart, BOP will have to manually start 21 SW pump

Event 8 (Major, All)
The team will diagnose that 23 SG is now ruptured and transition to E-3. With the steam line break and ruptured SG on 23, step 5 of 2-E-3 will direct them to 2-ECA-3.1. When team initiates cooldown to cold shutdown (Step 13 2-ECA-3.1) the scenario will end.

Procedure flow path: AOP-INST-1, AOP-RSD-1, AOP-ROD-1, AOP-UC-1, E-0, E-2, E-3, ECA-3.1

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:** 2019 Scenario 2 Schedule Hang caution tags on 21 Charging Pump and 21 CCW Pump	Verify schedule file has been loaded.
Event 1	**Actuate Trigger 1** **At lead evaluator direction**	LT-460 fails low.
Role Play	**When SM, I&C or Work Control are notified**	Inform team that work package is being developed. Remove channel from servcie
Event 2	Downpower	SM directs downpower due to steam leak on 23 SG MS-2, IAW 2-AOP-RSD-1 (2 hours)
Event 3	**In setup**	Rod F-14 does not move in when rods step in. (Stuck)
Role Play	**If I&C/NPO sent to investigate with direction**	No Problems noted
Event 4	**Actuate Trigger 4** **At lead evaluator direction**	Steam line rupture 23 steam line. Auto MSL isolation will not occur
Role Play	**If NPO sent to investigate**	Large amount of steam and noise in steam bridge area. Will not be able to access this area throughout the scenario.
Event 5/6/7/8	**In setup**	Respond to field requests per EOPs.
Role Play	**If RP is sent to check indications**	There are elevated radiation levels near the door to the auxiliary building where the steam is.

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

Event Description: LT-460 fails low

Time	Position	Applicant's Actions or Behavior
	BOP	Acknowledges alarms for low PZR level on Panel SA-1.
	ATC	Place running charging pump in manual. Will work with BOP to minimize charging and seal injection. Will notify that the plant is stable.
	BOP	Working with ATC will close HCV-142 to minimize charging
	CRS	Announces entry into 2-AOP-INST-1, Instrument or Controller Failures
	CRS	Determines that Pzr level instrument failure has occurred and goes to procedure section.
	BOP	Defeats Channel II in Rack B-6
	ATC	Places PZR Level recorder switch to controlling channel
	CRS	Directs use of 2-SOP-3.1 to restore letdown flow.
	ATC	Ensures 200A, B, and C are closed
	BOP	Verify 200A, B, C, 201, and 202 are in remote
	BOP	Establishes required charging flow by opening HCV-142
	ATC	Opens LCV-459 when open places in auto
	ATC	Places PCV-135 in manual and sets to 50%
	ATC	Opens 200C (or other 200 valve as directed)
	ATC	Adjusts PCV-135 to maintain pressure, may return to automatic.
	ATC	Resets PZR heaters
	ATC	Returns charging pump control to automatic
	CRS	Reviews TS table 3.3.1-1 for failed instrument. Will determine that: The spec is not met. 3.3.1-1 function 8, PZR High Level, requires 3 operable channels. With one failed condition K applies which requires placing the channel in trip within 72 hours.
Note: If needed, prompt CRS as the SM that bistables need to be tripped or do not need to be tripped as per the Lead Evaluator.		
	BOP	Will trip bistable in Rack White A-12: • LC-460A (Loop 2) Hi Level Trip
Lead Evaluator		When the team is directed to downpower, actions are tracked on Event 2.

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

Event Description: Downpower

Time	Position	Applicant's Actions or Behavior
	CRS	Enters 2-AOP-RSD-1 Rapid Shutdown.
	ATC	Places all available PZR heater groups in on.
	ATC	Initiates 100 gallon boration per attachment 2: • Sets integrator to 100 gallons • Sets FCV-110A to desired rate • Place RCS MU Mode Switch in Borate • Turn MU Control Switch to Start and back to Auto • Observe flow
	CRS	Initiates notifications (Booth will offer to perform non-watch team notifications).
	BOP	Will initiate load reduction using turbine governor.
Lead Evaluator		When rods step in auto (or manual), F-14 will not move. These actions are tracked on Event 3.

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

Event Description: Rod F-14 fails to move

Time	Position	Applicant's Actions or Behavior
	BOP	Acknowledge and announce "Control Rod or Power Distribution Trouble" alarm is up.
	ATC	Announce that rod F-14 is out of alignment.
	CRS	Announce entry into 2-AOP-ROD-1 Rod Control and Indication Systems Malfunctions.
Note: Step 4.24 the team may determine Rod did not indicate motion or misaligned, depending on the ATC/BOP observations. Both paths will perform the same actions.		
	ATC	Place rods in manual if not already done.
	CRS	Review Tech Specs 3.1.4 Will determine that: Condition A is met for 3.1.4. This means the plant is in a 1 hour verify SDM or borate to restore SDM. and be in mode 3 within 6 hours
	CRS	Determine that further load reduction will be done using boration or rods if discussed with Operations Manager and/or Reactor Engineering.
Lead Evaluator		When the following has been demonstrated/observed: • Tech Specs addressed. • Sufficient load reduction. Then instruct Booth to insert Event 4.

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

Event Description: Steam line rupture with failure of Automatic Main Steam Line Isolation

Time	Position	Applicant's Actions or Behavior
	TEAM	Will note sound of steam leak.
	ATC	Will note changes in parameters due to steam leak (Tavg, Steam Flow)
	CRS	Will either direct entry into 2-AOP-UC-1, Uncontrolled Cooldown, or simply direct a reactor trip and closure of MSIVs.
	ATC	Trip Reactor
	ATC/BOP	Close MSIV's (Auto closure blocked)
Lead Evaluator		Actions will continue with Event 5.

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

Event Description: Failure of SI to actuate automatically / Failure of 21 AFW Pump to auto-start and 21 SW pump to autostart

Time	Position	Applicant's Actions or Behavior
	CRS	Announce to team to perform the immediate operator actions of E-0 Reactor Trip or Safety Injection
	ATC	Verifies reactor trip: • Trip breakers open • Flux decreasing • Rod bottom lights lit • RPIs less than 12.5 inches
	ATC	Verifies Turbine Trip: • All stop valves closed
	BOP	Verifies power to 480V busses: • All busses energized
Critical Task: Manually actuate at least one train of SIS-actuated safeguards before any of the following: • Transition to any E-1 series, E-2 series, or E-3 series procedure or transition to any FRP. • Completion of step 5.a of ES-0.1.		
	ATC	Checks SI status: Will note that SI did not actuate, but should have based on lowering RCS pressure. Will initiate manual SI for both trains. Will note: • SI annunciator lit • 3 SI pumps running • Both trains actuated by verifying valve position

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

Event Description: Failure of SI to actuate automatically / Failure of 21 AFW Pump to auto-start and 21 SW pump to autostart

	BOP	Begins Attachment 1, Automatic Action Verification: (Done in parallel. Actual actions for event listed) • Checks adverse containment conditions – not adverse • Starts 1 charging pump • Align charging suction to the RWST by opening 112B and closing 112C • Places VCT makeup to stop • Dispatches NPO to reset lighting and MCCs 24A,27A,29A • Stops all condensate pumps • Starts 21 SW Pump • Places airlock switches in incident mode • Notifies CRS that attachment is complete
	ATC	Either per step 6: • Establish flow to 21 and 22 SG by: o Starting 21 AFW Pump or o Starting 22 AFW Pump and feeding 21 and 22 SG
	ATC	Verify SI flow and CCW pumps are running.
	ATC	Dispatch NPO to close SW valves: • FCV-1111 • FCV-1112 • SWN-6 • SWN-7 • SWN-4 • SWN-5 When valves are reported closed, a Non-Essential SW pump will be started.
	ATC	Verify RCS average temperature.
	ATC	Checks PORVs and spray valves closed.
	ATC	Checks for RCP trip criteria – pumps will be left running.
	ATC	Checks if any SG is faulted. Will determine that 23 SG is faulted.
Lead Evaluator		Further actions will be tracked on Event 8.

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

Event Description: 23 Steam Generator Faulted/Ruptured

Time	Position	Applicant's Actions or Behavior
		Critical Task: Isolate the faulted SG before transition out of E-2 The actions to isolate the faulted SG will be directed in E-2, but they may be taken as a prudent operator action when recognized in E-0. The critical task is satisfied by securing AFW flow to 23 SG and closing the 23 MSIV. The team should attempt to locally isolate steam traps and supply to 22 AFW Pump from 23 SG. These actions will not be possible since the area is not accessible during the scenario.
	CRS	Transitions to E-2.
	ATC	Checks that all SGs are not faulted.
	ATC	Identifies faulted SG as 23.
	ATC	Isolates Faulted SG: • Verifies main feed isolated. • Isolates AFW flow (satisfied critical task) • Verifies ADV is closed. • Verifies blowdown is isolated. • Will not be able to access area to: o Close MS-42. o Isolate upstream traps. o Verify MSIV bypass closed. Unable to access area for isolation the following is done: • Verify following valves closed: o Turbine stop valves. o Condenser steam dump valves. o Moisture separator reheater valves. • Dispatch NPO to close: o 21 MBFP stop valve MS-7 o 22 MBFP stop valve MS-7-1 o Air ejector stop valve MS-8 o Gland steam regulator stop
	ATC	Checks CST level > 2 ft.

Op-Test No.: 1 Scenario No.: 2 Event No.: 8 Event Description: 23 Steam Generator Faulted/Ruptured		
	ATC	Checks secondary radiation: • Steam line radiation monitors (R-30 will be elevated). • R-45 (normal isolate prior to SGTR) • R-49 (normal isolate prior to SGTR)
Note: The indications of abnormal secondary radiation may be subtle. If not diagnosed correctly here, the team will go to E-1 where more diagnostic information will be obtained to indicate transition to E-3 is appropriate.		
	CRS	Transitions to E-3
	ATC	Check for RCP trip criteria
	ATC	Identify ruptured SG based on radiation levels.
	ATC	Isolates flow from ruptured SG (Setpoint will be adjusted, ADV is already closed.)
	CRS	Will determine that 23 SG is not intact and direct 22 AFW to be tripped. Local isolation is not possible.
	BOP	Verify's 23 SGBD isolations closed
	BOP	Dispatch NPO to isolate Upstream traps and MSIV bypass (Unable to isolate)
	ATC	Close rupture SG MSIV
	CRS	Determine that feedflow must remain isolated to the ruptured SG because it is also faulted.
	ATC	Check 23 SG pressure > 440 psig.
	CRS	Transition to ECA-3.1, SGTR with LOCA and Subcooled Recovery Desired.
	CRS	Will perform the following actions per ECA-3.1: Reset SI Reset CIV Phase A and B Restore Instrument Air to Containment Check status of 480V busses PZR heaters to off Check Containment Spray stopped AFW isolated to 23 SG Secure RHR pumps Evaluation of plant status
	ATC	Establish maximum charging flow: • Ensure 3 charging pumps are running at maximum speed.
	ATC	Check for Faulted SG
	ATC	Check Intact SG levels

Op-Test No.: 1 Scenario No.: 2 Event No.: 8 Event Description: 23 Steam Generator Faulted/Ruptured		
Critical Task: Cool down the RCS to CSD conditions at the highest achievable rate w/o exceeding 100F/hr.		
	CRS	Evaluate RCS cooldown. Will determine that RCS is already cooling down at maximum allowable rate.
Lead Evaluator		When team demonstrates that cooldown is properly understood, then terminate the scenario.

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

Examiners: _____ Operators: _____

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Initial Conditions: 100% power, 22 Circulator is OOS for motor replacement (Day 2)

Turnover: 22 Circulator is OOS for motor replacement (Day 2)

Critical Tasks:

Manually trip the main turbine before a severe (orange-path) challenge develops to either the sub-criticality or the integrity CSF or before transition to ECA-2.1, whichever happens first

Establish RCS bleed and feed prior to SG levels reaching 14% WR.

Event No.	Malf. No.	Event Type*	Event Description
1	XMT-CFW005A	I(ATC) I(CRS) I(BOP) TS(CRS)	21B SG Feed Flow Controlling Channel (FT-418B) fails low
2	XMT-FHW015A	R(ATC) N(BOP) N(CRS) TS(CRS)	21 and 22 Heater Drain Pumps trip, Power reduction
3	FLX-CFW038	M(ATC) M(BOP) M(CRS)	Feed line break in the ABFP Building (Effects ALL SG)
4	MAL-TCA004 MAL-TCA005	C (ATC)	Turbine fails to trip
5	MOC-AFW001 MOC-AFW002	C(ATC)	21 and 23 Motor driven AFW pumps fail to operate, 22 AFP is started
6	CVH-ATS019B	M(ATC) M(BOP) M(CRS)	22 AFW pump trips on overspeed after flow is established
7	MOC-SIS002 MOC-SIS003	C(BOP) C(CRS)	21 and 22 SIP fail to auto start

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

Scenario 3 Summary

The scenario begins with the plant at 100% power. 22 Circulator is Out of service for motor replacement (2 Day)

Event 1 (Instrument, All; TS, CRS)
The team will assume the watch and 21 SG controlling feed flow channel (B) will fail low. The ATC will transfer Steam flow and Feed Flow channels to A to restore feedwater flow. The team will progress through 2-AOP-INST-1 and remove the channel from service.

Event 2 (Reactivity, ATC; Normal BOP and CRS; TS, CRS)
Once the channel is removed from service both heater drain tank pumps will trip due to a level failure on the heater drain tank. The team will take actions in accordance with 2-AOP-FW-1 and reduce power to restore feedwater flow greater than steam flow. Once the plant is stable the team will determine a power reduction to approx. 400MW is required to close the 10" heater drain tank dumps. The team will commence a power reduction per 2-POP-2.1.

Event 3 (Major, All)
Once the enough of the power reduction is complete, a feed line break in the ABFP Building will occur affecting all SG's. The ATC will recognize the reduction in feedwater flow and trip the reactor and close the MBFP discharge valves in accordance with 2-AOP-FW-1.

Event 4 (Component, ATC)
When the reactor is manually tripped the main turbine will not be able to be tripped, the MSIV's will be required to be closed.

Event 5 (Component, ATC and CRS)
Both motor driven auxiliary feedwater pumps will not function requiring the turbine driven (22) auxiliary feedwater pump to be aligned to feed all steam generators.

Event 6 (Major, All)
When the 22 AFP turbine speed is raised the pump will trip. The team will transition to 2-FR-H.1 due to less than 400 gpm to the SG's. When the 3 lowest SG's average wide range level decreases to less than 20% the team will initiate feed and bleed.

Event 7 (Component, BOP)
21 and 22 Safety injection pumps will not start when SI is actuated and will be manually started. After the bleed path has been established 22 AFP will be restored and the team will feed the required SG(s). Once feed flow has been established the scenario is terminated.

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Procedure flow path: 2-AOP-INST-1, 2-AOP-FW-1, 2-POP-2.1, 2-AOP-FW-1, 2-E-0, 2-FR-H.1

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
IC Reset		Reset Simulator to 100% power IC
Setup **Schedule File**	**Scenario 3** Caution tag 22 Circulator OOS	 Verify schedule file has been loaded. Allow turbine load to stabilize
Event 1	**Actuate Trigger 1** **At lead evaluator direction**	21B SG feed flow fails low
Role Play	**When SM, I&C or Work Control are notified**	Work package being developed
Event 2	**Actuate Trigger 2** **At lead evaluator direction**	21 and 22 HDTPs trip
Event 3	**Actuate Trigger 3** **At lead evaluator direction**	Feed line break in Aux Feed Building
Role Play	**Aux feed building access**	Unavailable until MBFP discharge valves closed
Event 4	**In setup**	Turbine and Generator fail to trip
Role Play	If NPO dispatched to trip turbine locally	Trip turbine (LOA-TCA015 to trip)
Event 5	**In setup**	21 and 23 AFW pumps fail to operate
Event 6	**In setup**	22 AFW pump trips on overspeed
Role Play	**If NPO dispatched to 22 AFW pump**	Pump tripped, steam on other side of door in FRV room
Event 7	**In setup**	21 and 22 Safety Injection pumps fail to start

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

Event Description: Event

Time	Position	Applicant's Actions or Behavior
	BOP	Acknowledges High Steam Mismatch trip (SBF-2)
	ATC	Recognizes 21B feed flow channel failed low and places Feedflow transfer switch to "A" channel (May place Steam flow channel in "A" also), Determines plant is stable
	CRS	Announces entry into 2-AOP-INST-1 Instrument and Controller Failures
	ATC	Will restore 21 SG level to program
	CRS	Refers to TS Table 3.3.1 Item 14 SG water level low coincident with SF/FF mismatch Place channel in trip 72 hours
Note: If needed, prompt CRS as the SM that bistables need to be tripped or do not need to be tripped as per the Lead Evaluator.		
	BOP	Trip bistable FC-418F (Loop 1BSF>FWF) White rack A-11 (Attachment 4)
Lead Evaluator		When channel is removed from service event 2 can be actuated.

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

Event Description: Heater drain tank level indication fails low

Time	Position	Applicant's Actions or Behavior
	BOP	Acknowledges following alarms • 6.9Kv motor trip common (SHF) • Heater Drain Pumps Low Flow 500gpm (SCF) • Heater Drain High Low Level (SCF)
	CRS	Announce perform immediate action of 2-AOP-FW-1
	ATC	Both MBFP's operating
	CRS	Announce entry into 2-AOP-FW-1
	BOP	Determines both Heater drain pumps are tripped
	BOP	All condensate pumps are running
	ATC	Initiate load reduction to maintain Feed flow $\geq$ Steam Flow MBFP suction pressure >280psig
	ATC	Place MBFP speed control in manual if cutback has actuated to maintain MBFP suction pressure >280 psig
	ATC/BOP	Initiates Boric acid addition per 2-WCR-1
	ATC/BOP	Determines the axial flux is out of target band (May be out of envelope)
	CRS	Review TS 3.2.3 Restore AFD to within the target band (30 Min) If axial flux deviated outside of the acceptable operation region (Envelope) require power reduction to < 50% in 30 Minutes
	ATC/BOP	Remove wind up from FRV if required
	CRS	Determine power reduction to 400mw is necessary due to 10" heater drain dumps open (Both pumps tripped)
	CRS	Enters 2-POP-2.1 for power reduction
	CRS	Initiate notifications for down power
	ATC	Perform reactivity calculation
	ATC	Energize all pressurizer heaters
	ATC	Commence Boration
	BOP	Reduce turbine load with governor
Lead Evaluator		When the following has been demonstrated/observed: • Sufficient load reduction. • Sufficient normal plant operations by the BOP. Then instruct Booth to insert Event 3

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

Event Description: Common Feed line rupture (Effects all SG's)

Time	Position	Applicant's Actions or Behavior
	ATC	Recognizes reduction in feedflow to all SG's (May trip reactor)
	CRS	Announces entry to 2-AOP-FW-1
	ATC	Close BFD-2-21 and BFD-2-22 MBFP Discharge valves
	CRS	Announce perform immediate action 2-E-0 reactor trip or safety injection
Critical Task Manually trip the main turbine before a severe (orange-path) challenge develops to either the sub-criticality or the integrity CSF or before transition to ECA-2.1, whichever happens first		
	ATC	Attempts to trip the turbine manually, will not trip requiring MSIV's to be closed
Lead Evaluator		Event 4 tracks remaining actions

Op-Test No.: 1 Scenario No.: 3 Event No.: 4/5

Event Description: 21 and 23 ABFP do not operate

Time	Position	Applicant's Actions or Behavior
	ATC	Determines 21 and 23 AFP not running, starts 21 and 23 AFP they do not operate requiring 22 AFP start
	ATC	Raises speed 22 AFP 200 to 250 psi above SG pressure
	ATC	Aligns AFW flow to SG's
	ATC	Recognizes 22 AFP trips
	CRS	Transition to 2-FR-H.1
Lead Evaluator		Actions will continue with Event 6.

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

Event Description: Loss of heat sink

Time	Position	Applicant's Actions or Behavior
	CRS	Enters FR-H.1
	Team	Verifies secondary heat sink is required: RCS press > SG press RCS temp > 350F
Critical Task: Establish RCS bleed and feed when the average of the three lowest S/G levels reach 20% WR.		
	BOP/ATC	Recognizes Bleed and Feed criteria are met
	ATC/BOP	Stops all RCPs
	ATC/BOP	Actuates SI if not already done
	ATC	Starts one charging pumps
	BOP	Aligns charging pump suction to RWST, opening LCV-112B and closing LCV-112C
	ATC	Starts non running charging pumps
	ATC	Raises speed on all running charging pumps to maximum
	BOP	Opens HCV-142
	BOP	Starts 21 and 22 SI pumps
	ATC/BOP	Verifies SI valve lineup
	ATC	Opens PORV block valves
	ATC/BOP	Reset SI: • Check CCW pumps • Place key switches in SI reset position • Reset SI

Op-Test No.: 1 Scenario No.: 3 Event No.: 6 Event Description: Loss of heat sink		
	BOP	Reset Phase A: • Place IVSW switches to open for 1410, 1413, 3518, 3519 • Place containment rad monitor weld channel valves to open • Verify airlocks in incident • Close all remaining Phase A valve switches • Reset Phase A
Note: At this point, the ATC/BOP will call about restoring an AFW pump. The team will be asked to place the switch for PCV-1139 to off for 22 AFP or 21 AFP the control switch in pullout. After another few minutes, the team will be told that 21/22 AFW should be available.		
	CRS	Evaluate SG conditions per foldout prior to re-establishing AFW flow to all SGs
	ATC/BOP	Start 22 AFW pump
	ATC/BOP	Establish 400 gpm total to all SGs
Lead Evaluator		Terminate the scenario.

Facility: Indian Point 2 Scenario No.: 5 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: Initialize to 100% power IC

Turnover 21 EDG OOS LCO 3.8.1.b governor issues, will return next shift, 21 Containment spray pump being tested PT-Q035a LCO 3.6.6 a.

Critical Tasks:
Establish at least 400 gpm AFW flow to the SGs before SG WR level decreases below 14%.

Manually start ESW pump(s) such that the EDG does not fail due to engine overheating.

Event No.	Malf. No.	Event Type*	Event Description
1	XMT-MSS053A	I (ATC) I (BOP) I (CRS) TS (CRS)	Turbine First Stage Pressure (PT-412A) fails low
2	MOT-CNM012A	C (BOP) TS(CRS)	25 FCU Trip
3	CNH-PCS019B	C (ATC) TS (CRS)	LC-459D (Pressurizer Level Controller) fails low
4	MAL-RCS014A	R (ATC) N (CRS) N (BOP) TS (CRS)	21 Steam Generator Tube Leak (120 GPD), Tech Spec shutdown
5	XMT-CFW037A	M (ATC) M (BOP) M (CRS)	PT-408B (MBFP Suction pressure) fails low
6	MAL-EPS006E	M (ATC) M (BOP) M (CRS)	6.9kv bus 5 faults when the Unit trips, 22 EDG trips on overcrank, 23 EDGs output breaker does not automatically close
7	MOC-SWS008	C (BOP)	23 Service Water pump does not autostart

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

Scenario 5 Summary

The team will assume the watch with 21 EDG OOS, LCO 3.8.1.b., 21 Containment spray pump for testing (PT-Q035a) LCO 3.6.6 a.

Event 1 (Instrument, All; TS, CRS)
PT-412a (First Stage Turbine Pressure) will fail low, rods will auto insert and be subsequently stopped by the ATC. The team will perform the actions of 2-AOP-INST-1 and restore rods to their position prior to the malfunction, and remove the channel from service.

Event 2 (Component, BOP and CRS; TS, CRS)
Once the channel is removed from service 25 FCU will trip on overcurrent, the team will take ARP/SOP actions to secure 25 FCU. The CRS will determine that with the EDG, CS pump and FCU out of service they do not meet LCO 3.6.6 and that they require a 3.0.3 shutdown. The team will commence a 2-POP-2.1 shutdown to place the Unit mode 3 in 7 hours.

Event 3 (Component, ATC and CRS; TS, CRS)
LC-459D will fail low, Charging pump auto speed control will reduce to 0. The ATC will diagnose a speed control problem and place the running charging pump in manual.

Event 4 (Reactivity, ATC; Normal, BOP and CRS; TS, CRS)
A 120 GPD tube leak will occur in 21 Steam Generator. The team will enter 2-AOP-SG-1 and determine that a shutdown is required using 2-AOP-RSD-1.

Event 5 (Major, All)
When the required reactivity manipulation is completed PT-408B (MBFP Suction pressure) will fail low, reducing the speed on both MBFP's and the team take actions in accordance with 2-AOP-INST-1 and manually trip the reactor.

Event 6 (Major, All)
When the reactor trips 6.9kv bus 5 faults, deenergizing 6.9Kv Buses 5, 1 and 2, with 21 EDG OOS 480v bus 5a is deenergized, none of which can have power restored. 22 EDG fails to start due to overcrank, this deenergizes busses 2a and 3a. 23 EDG output breaker does not close in auto leaving bus 6a deenergized. The team will perform the immediate actions of 2-E-0 and at step 3 enter ECA-0.0.

Event 7
480v bus 6a may be restored by ARP action or step 6 of ECA-0.0 and 23 Service water pump does not start when the bus is energized and is started. and return to 2-E-0 and transition to ES-0.1 when the scenario will be terminated.

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Procedure flow path: 2-AOP-INST-1, 2-SOP-10.3, 2-POP-2.1, 2-AOP-INST-1(2-AOP-FW-1), 2-E-0, 2-ECA-0.0, 2-E-0, 2-ES-0.1

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
IC Reset		Reset Simulator to 100% power IC
Schedule File	**Run schedule file: Scenario 5** Caution Tag 21 EDG OOS	Verify schedule file has been loaded.
Event 1	**Actuate Trigger 1** **At lead evaluator direction**	First Stage Turbine pressure (PT-412a) fails low
Role Play	**When SM, I&C or Work Control are notified**	Work package being developed
Event 2	**Actuate Trigger 2** **At lead evaluator direction**	25 FCU trips on overcurrent
Role Play	**When SM, Maintenance or Work Control are notified**	Work package being developed
Event 3	**Actuate Trigger 3** **At lead evaluator direction**	LC-459D fails low (Pzr level controller)
Role Play	**When SM, I&C or Work Control are notified**	Work package being developed
Event 4	**Actuate Trigger 4** **At lead evaluator direction**	120 GPD tube leak 21 SG
Role Play	**When dispatched**	Perform LOA's as requested
Event 5	**Actuate Trigger 5** **At lead evaluator direction**	MBFP Suction pressure fails low
Event 6	**In setup**	6.9Kv bus 5 faults, 22 EDG trips on overcrank and 23 EDG output breaker does not auto close
Event 7	**In setup**	23 Service water pump does not autostart upon bus restoration

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

Event Description: PT-412A fails low (First Stage Turbine pressure)

Time	Position	Applicant's Actions or Behavior
	ATC	Diagnose PT-412A failure and place control rods in manual
	BOP	Acknowledge Hi Steam flow SI alarm
	CRS	Announce entry in 2-AOP-INST-1
	ATC	Verify control rods in manual
	CRS	Restore Tave and Delta flux
	ATC/BOP	Withdraw control rods to 223 CBD
	CRS/ATC	Has PT-404 failed - NO
	CRS/ATC	Place steam controller in pressure mode • Adjust output to 0% • Setpoint to 84% • Reset loss of load interlock if not reset • Place steam dump controller in pressure mode
	CRS	Refer to tech spec table 3.3.1-1 (P-7) 3.3.2-1 (High Steam Flow SI)
	SM (CUE)	Remove channel from service and trip bistables
	BOP	Trip Bistables from Attachment 11 FC-419A Loop 1A High SF SI Red rack A-3 FC-429A Loop 2A High SF SI Red rack A-3 FC-439A Loop 3A High SF SI Red rack A-2 FC-449A Loop 4A High SF SI Red rack A-2
Lead Evaluator		When the team has tripped bistables, insert event 2

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

Event Description: 25 FCU trips; Tech spec shutdown

Time	Position	Applicant's Actions or Behavior
	BOP	Acknowledges 480V motor trip common alarm
	BOP	Determines 25 FCU has tripped
	CRS	Evaluates Tech Specs 3.6.6 With 21 Containment Spray pump out and 21 EDG they are required to cascade and declare 21 and 22 FCU out of service (21 EDG) Two trains of FCU's and one train of CS. Determines they do not meet Tech Specs and are in 3.0.3 Shutdown (Combination of three or more trains inoperable)
	BOP	2-SOP-10.3 FCU operation, closes outlet damper on 25 FCU
	CRS	Initiate's a shutdown using 2-POP-2.1
	ATC	Develops reactivity plan
Note This is not a credited reactivity (Normal) event		
Lead Evaluator		When Tech specs have been evaluated insert event 3

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

Event Description: LC-459D Fails low (Pressurizer level controller)

Time	Position	Applicant's Actions or Behavior
	ATC	Diagnose charging pump speed goes to 0 • Charging flow decreases (Low charging flow alarm) • Will place running charging pump in manual and restore flow
	BOP	Acknowledge Low thermal barrier Delta P
	CRS	Announces entry into 2-AOP-INST-1
Note No malfunction can be seen by team, team may decide to place another charging pump in service		
	CRS/ATC	Determines it is a controller failure
Lead Evaluator		When the following has been demonstrated/observed: • Tech Specs addressed. • Prior to the team placing another charging pump in service Then instruct Booth to insert Event 4.

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

Event Description: 120 GPD tube leak 21 Steam Generator

Time	Position	Applicant's Actions or Behavior
	BOP	Acknowledges N-16 alarm • Dispatches NPO to alarm
	CRS	Announces entry to 2-AOP-SG-1
	CRS/ATC	Determines Pzr level CAN be maintained
	NPO (CUE)	Leak is in 21 SG at 120 GPD
	BOP	Notify Chemistry to sample 21 SG (0-CY-2450)
	CHEM (CUE)	(Time Compression) 21 SG leak is at 120GPD (It takes about 45 minutes to sample and analyze)
	BOP	Make notifications per EN-LI-108
	BOP	Perform Attachment 2
	CRS	Initiate 2-AOP-RSD-1 to achieve Shutdown <50% in 1 hour and mode 3 within an additional 2 hours (3 Hours total)
Note BOP may be left to complete actions in 2-AOP-SG-1		
	BOP	Actions in 2-AOP-SG-1 Notify HP of Shutdown Controlled drain header alignment – Not required Adjust Atmospheric controller to 1030 psig (74%) Close PCV-1214 and 1214a (Blowdown Isolations) Dispatch NPO to locally isolate 21 SG with Attachment 3
	CRS/ATC	Place all Pzr heaters to on
	CRS/ATC	Initiate 100 gallon boration per attachment 2
	CRS/ATC	Manually control rods to maintain Tave $\pm$ 4 degrees of RPC-4
	BOP	Initiate notifications of rapid shutdown
	CRS/ATC	Initiate load reduction
	BOP	Direct NPO's to monitor secondary plant parameters per Attachment 5
Note BOP will be performing the Turbine load reduction/ ATC will be controlling rods in manual		
Lead Evaluator		When sufficient load reduction has been performed, continue with Event 5.

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

Event Description: PT-408B fails low (MBFP Suction Pressure)

Time	Position	Applicant's Actions or Behavior
	ATC	Diagnoses PT-408B fail low
	CRS	Announce perform immediate actions 2-AOP-FW-1
	ATC	Determines no MBFP running and trips reactor
	CRS	Announce perform immediate actions 2-E-0 reactor trip or safety injection
	ATC	Verifies Reactor Trip: • Checks trip breakers open • Checks flux decreasing • Checks rod bottom lights lit • Checks IRPIs <12.5 inches
	ATC	Verifies Turbine Trip by observing all Turbine Stop Valves closed.
	BOP	Verifies Power to 480V Busses: Determines no 480v busses are energized
	CRS	Announce perform immediate actions 2-ECA-0.0
	ATC	Verifies Reactor Trip: • Checks trip breakers open • Checks flux decreasing • Checks rod bottom lights lit (will have lost power) • Checks IRPIs <12.5 inches (will have lost power)
	ATC	Verifies Turbine Trip by observing all Turbine Stop Valves closed.
	ATC/BOP	Check if RCS isolated Letdown isolation valves closed (200A, B, C and LCV-459) Przr PORVs closed Excess Letdown Isolation closed (213)

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

Event Description: PT-408B fails low (MBFP Suction Pressure)

[redacted]		
	ATC/BOP	Verify AFW flow >400 gpm Check CST available 22 AFW pump running Manually Align 22 AFP FCV 's Adjust steam supply (HC-1118)
	CRS/BOP	Determine status of 2a and 3a • Both de-energized, 22 EDG not running
	CRS/BOP	Energize 480v bus with EDG • Determine 23 EDG is running • Manually close 23 EDG output breaker to bus 6a
	CRS/BOP	Determine 480v bus 6a is energized
[redacted]		
	CRS/BOP	Determine 23 SWP did not autostart and start 23 SWP
	CRS/BOP	Check CCR and AFW pump room ventilation in service • Dispatch NPO to open AFW pump room roll up door
	CRS	Return to 2-E-0 Reactor trip or Safety Injection
	ATC	Check SI Status • No annunciators lit no SI system pumps running • Verifies SI not required • Cntmt Pressure <2 psig • Pzr Pressure <1840 psig • Pzr Level <14% • Steamline Delta P >155 psid • High Steam line flow
	BOP	Verify 22 AFW pumps running >760 gpm
	CRS	Transition to 2-ES-0.1
Lead Evaluator		Terminate Scenario