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

Facility: IPEC Unit 2 Task No: 2000650102

Task Title: **Replace a Watchstander due to Illness**

K/A Reference: 2.1.5 RO – 2.9 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 contacted you on Sunday, 2/23 (a scheduled day off), to report to the control room to work a 12 hour overtime shift from 0600-1800.
- You were on vacation from 1/26 to 2/8.
- Your work history for the previous 2 weeks is as follows (all hours worked performing licensed operating duties):

Sunday 2/9	**Monday 2/10**	**Tuesday 2/11**	**Wednesday 2/12**	**Thursday 2/13**	**Friday 2/14**	**Saturday 2/15**
Worked 1200-1800	Worked 0600-1800	Worked 0600-1800	Worked 0600-1400	Worked 0600-1400	Worked 0600-1400	Worked 0600-1400
Sunday 2/16	**Monday 2/17**	**Tuesday 2/18**	**Wednesday 2/19**	**Thursday 2/20**	**Friday 2/21**	**Saturday 2/22**
Worked 0600-1500	Worked 0600-2100	OFF	OFF	Worked 0600-1800	Worked 0800-1200	Worked 0600-2100

Task Standard: Reviews the work hour history and determines that overtime request will result in exceeding work hour limits and also previously worked schedule violates additional work hour rules.

Required Materials:

General References:

Initiating Cue:

Using the work history provided:

1. Determine if your prior work schedule met work hour requirements.
2. Determine if you can work the entire requested shift schedule, if not, list any and ALL restrictions that apply.
3. Document your conclusion on the cue sheet below.

Time Critical Task: No

Validation Time: 30

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain correct procedures

Standard: Obtain EN-OM-123
IP-SMM-OP-103

CUE: Give candidates procedure.

Comment:

√ 2. Performance Step: Determines that the required 10 hour break between work periods will not be met, and that the additional hours will result in exceeding 26 hours in any 48 hours period.

Standard: 10 hours break not met – (From 2100 to 0600 = 9 hours)

27hrs in 48hr period – (Sat 10/6 [15 hrs] + Sun 10/7 [12 hrs] = 27 hrs

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 3. Performance Step:	**Determines that the previously worked schedule, there was NOT a 34 hour break in any 9 day period.** **9 day period [2/9 -2/17] did not have a 34 hour break**
Standard:	**Determines that previously worked schedule violation occurred due to not having a 34 hour break in a 9 day period.** **Actual Break – Mon 2/17 (2100) to Thus 2/20 (0600) = 33 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:

- The Shift Manager has contacted you on Sunday, 2/23 (a scheduled day off), to report to the control room to work a 12 hour overtime shift from 0600-1800.
- You were on vacation from 1/26 to 2/8.
- Your work history for the previous 2 weeks is as follows (all hours worked performing licensed operating duties):

Sunday 2/9	**Monday 2/10**	**Tuesday 2/11**	**Wednesday 2/12**	**Thursday 2/13**	**Friday 2/14**	**Saturday 2/15**
Worked 1200-1800	Worked 0600-1800	Worked 0600-1800	Worked 0600-1400	Worked 0600-1400	Worked 0600-1400	Worked 0600-1400
Sunday 2/16	**Monday 2/17**	**Tuesday 2/18**	**Wednesday 2/19**	**Thursday 2/20**	**Friday 2/21**	**Saturday 2/22**
Worked 0600-1500	Worked 0600-2100	OFF	OFF	Worked 0600-1800	Worked 0800-1200	Worked 0600-2100

Initiating Cue:

Using the work history provided:

1. Determine if your prior work schedule met work hour requirements.
2. Determine if you can work the entire requested shift schedule, if not, list any and ALL restrictions that apply.
3. Document your conclusion on the cue sheet below.

Facility: IPEC UNIT 2 Task No: 0001250502

Task Title: **Determine Reactor Vessel Venting Time Per FR-I.3, Attachment 1**

K/A Reference: 2.1.25 RO – 3.9 SRO – 4.2 Job Performance Measure No: RO Admin CO-2

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:

1. An event occurred 24 hours ago that resulted in a YELLOW path condition on the Inventory Critical Safety Function Status Tree, FR-I.3.

2. The TSC has requested that the Reactor Vessel be vented in accordance with FR-I.3, Response to Voids in Reactor Vessel.

3. Given the following information:

Containment Pressure	2.6 psig
Containment Temperature	172°F
Containment Hydrogen	2.3%
RCS Pressure	550 psig

Task Standard: Vessel Venting time is properly calculated.

Required Materials: Calculator

General References: 2-FR-I.3

Initiating Cue: You are the spare RO and the CRS has directed you to calculate Reactor Vessel Venting Time in accordance with FR-I.3 Attachment 1 and Figure FRI3-3.

Time Critical Task: No

Validation Time: 20 min

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain correct procedure

Standard: Obtains FR-I.3

Comment:

√ 2. Performance Step: Determine Containment Volume at STP (A)

Standard: A = 2.61 E6 X 17.3/14.7 X 492/632

A = 2.39 E6

Comment:

√ 3. Performance Step: Determine Maximum Hydrogen volume that can be vented (B)

Standard: $B = \frac{(3.0 - 2.3 \times 2.39\ E6)}{100}$

B = 1.67 E4

Comment:

√ 4. Performance Step: Determine Hydrogen flow rate as a function of RCS pressure (C)

Standard: Using FRI3-3; C = 1500 SCFM

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 5. Performance Step: Calculate maximum venting time

Standard: **Time = $\frac{1.67\ E4}{1500}$**

Time = 11 minutes

Comment:

Terminating Cue: JPM Complete

Number:	Title:	Revision Number:
2-FR-I.3	RESPONSE TO VOIDS IN REACTOR VESSEL	REV. 2

FIGURE FRI3-3

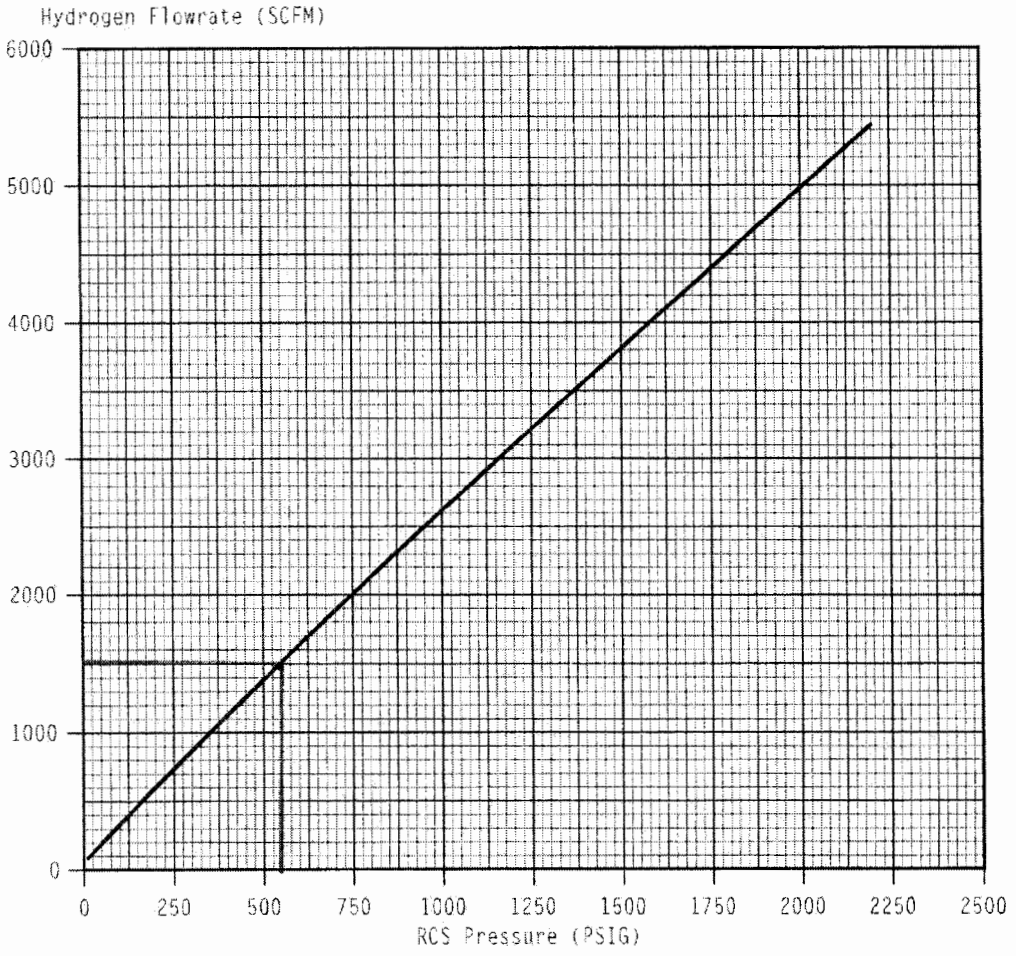


FIGURE FRI3-3, HYDROGEN FLOWRATE VERSUS RCS PRESSURE
-END-

Number:	Title:	Revision Number:
2-FR-I.3	RESPONSE TO VOIDS IN REACTOR VESSEL	REV. 2

ATTACHMENT 1 (Attachment page 1 of 1)
INSTRUCTIONS FOR DETERMINING VENTING TIME

1. Determine containment air volume at STP = A

$$A = 2.61\ E6\ \text{cu ft} \times \frac{P}{14.7\ \text{psia}} \times \frac{492^\circ R}{T}$$

17.3 / 632 → 2.39E6

where: P (psia) = Containment pressure (psig) + 14.7
and: T (°R) = Containment temperature (°F) + 460

2. Determine maximum hydrogen volume that can be vented = B

$$B = \frac{(3.0\% - \text{Containment Hydrogen Concentration}) \times A}{100\%}$$

2.3 / 2.39E6 → 1.67E4

3. Determine hydrogen flow rate as a function of RCS pressure = C

1500

a) Check RCS pressure.

b) Using FIGURE FR13-3, read hydrogen flow rate.

4. Calculate maximum venting time:

$$\text{Maximum venting time} = \frac{B}{C}$$

11 min

Maximum venting time = 11 minutes

-END-

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:

1. An event occurred 24 hours ago that resulted in a YELLOW path condition on the Inventory Critical Safety Function Status Tree, FR-I.3.

2. The TSC has requested that the Reactor Vessel be vented in accordance with FR-I.3, Response to Voids in Reactor Vessel.

4. Given the following information:

Containment Pressure	2.6 psig
Containment Temperature	172°F
Containment Hydrogen	2.3%
RCS Pressure	550 psig

Initiating Cue:

You are the spare RO and the CRS has directed you to calculate Reactor Vessel Venting Time in accordance with FR-I.3 Attachment 1 and Figure FRI3-3.

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

Facility: IPEC UNIT 2 Task No: 0350040421

Task Title: **Perform a SG tube Leakrate Determination using 2-AOP-SG-1**

K/A Reference: 2.3.14 RO – 3.4 Job Performance Measure No: RO 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 plant is operating at 25% power
- Radiation Monitor 45 is in alert.
- The operating crew is responding in accordance with 2-AOP-SG-1 Steam Generator Tube Leak.
- Condenser air in leakage is 2.7 SCFM
- RCS Total Gaseous Activity 1.53 X 10^{-2} µci/cc
- Given the attached Leakrate Log

Task Standard: SG Tube Leakage calculated using 2-AOP-SG-1 Attachment 1

Required Materials: Leakrate Log, Calculator, 2-AOP-SG-1

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

Initiating Cue: You are the BOP and the CRS has directed you to estimate the SG Tube Leakage, and determine sample frequency.

Time Critical Task: NA

Validation Time: 15 Minutes

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step:	Review data
Standard:	Candidate may use Attachment 1 or separate paper
Comment:	

√2. Performance Step:	**Calculate SG Tube Leakage for 1215**
Standard:	**Determines SG Tube Leakage is 48.1 gpd**
Comment:	

√ 3. Performance Step:	**Calculate SG Tube Leakage for 1230**
Standard:	**Determines SG Tube Leakage is 54.7 gpd**
Comment:	

√ 4. Performance Step:	**Calculate Delta Leakrate**
Standard:	**Determines leakrate has increased 6.6 gpd over last hour.**
Comment:	

Performance Information

(Denote critical steps with a check mark √)

√ 5. Performance Step:	**Determine sample frequency**
Standard:	**Determines sample frequency is every 15 minutes**
Comment:	

Terminating Cue: JPM Complete

Steam Generator Tube Leak

Attachment 1
R-45 Estimated Leak Rate

Page 1 of 1

NOTE

For low levels of radioactivity as read on R-45, the estimated leak rate will be higher than actual.

1. Obtain the following

   A. RCS total gaseous activity (from Chemistry Data Book or WINCDMS) 1.53E-2 µCi/cc

   B. Condenser air inleakage 2.7 SCFM

   C. R-45 reading 2.88E-5 µCi/cc

2. Calculate primary to secondary leak rate using the following formula per the following frequency requirements:

   - leak rate unstable or **NOT** positively identified as stable - every 15 minutes
   - leak rate **stable** per Attachment 2 - Use Attachment 2 frequencies

$$\frac{[(B\ 2.7) \times (C\ 2.88E\text{-}5) \times 10770}{(A\ 1.53E\text{-}2)} = [\ 54.7\ ]$$

Primary to secondary leak rate (gpd)

Steam Generator Tube Leak 2-AOP-SG-1 Rev. 15
Page 39 of 69

Attachment 1
R-45 Estimated Leak Rate

Page 1 of 1

NOTE

For low levels of radioactivity as read on R-45, the estimated leak rate will be higher than actual.

1. Obtain the following

   A. RCS total gaseous activity (from Chemistry Data Book or WINCDMS) 1.53E-2 µCi/cc

   B. Condenser air inleakage 2.7 SCFM

   C. R-45 reading 2.53E-5 µCi/cc

2. Calculate primary to secondary leak rate using the following formula per the following frequency requirements:

   - leak rate unstable or **NOT** positively identified as stable - every 15 minutes
   - leak rate **stable** per Attachment 2 - Use Attachment 2 frequencies

$$\frac{[(B\ 2.7) \times (C\ 2.53E-5) \times 10770}{(A\ 1.53E-2)} = [48.1]$$

Primary to secondary leak rate (gpd)

Page 1 of 1

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

DATE/ TIME	RX POWER	R-45 (When I/S)	R-49 (When I/S)	ATT 1 CALC (When performed)	N-16 (gpd) (When > 30% power)				Chemistry Grab Sample (gpd) (When Chemistry provides)			
		(μCi/cc)		(gpd)	21	22	23	24	21	22	23	24
1115	25%	2.39 E-05		45.4 gpd	NA	NA	NA	NA				
1130	25%	2.40 E-05		45.6 gpd	NA	NA	NA	NA				
1145	25%	2.46E-05		46.7 gpd	NA	NA	NA	NA				
1200	25%	2.50E-05		47.5 gpd	NA	NA	NA	NA				
1215	25%	2.53E-05		48.1 gpd	NA	NA	NA	NA				
1230	25%	2.88E-05		54.7 gpd	NA	NA	NA	NA				
					NA	NA	NA	NA				
					NA	NA	NA	NA				
					NA	NA	NA	NA				

The difference between the two values is 6.6 gpd over the last hour. This is greater than a 5 gpd change in last hour and the frequency should be 15 minutes.

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 plant is operating at 25% power
- Radiation Monitor 45 is in alert.
- The operating crew is responding in accordance with 2-AOP-SG-1 Steam Generator Tube Leak.
- Condenser air in leakage is 2.7 SCFM
- RCS Gaseous Activity 1.53 X 10^{-2} µci/cc
- Given the attached Leakrate Log

Initiating Cue: You are the BOP and the CRS has directed you to estimate the SG Tube Leakage, and determine sample frequency.

Attachment 1
R-45 Estimated Leak Rate

Page 1 of 1

NOTE
For low levels of radioactivity as read on R-45, the estimated leak rate will be higher than actual.

1. Obtain the following

   A. RCS total gaseous activity (from Chemistry Data Book or WINCDMS) _____ μCi/cc

   B. Condenser air inleakage _____ SCFM

   C. R-45 reading _____ μCi/cc

2. Calculate primary to secondary leak rate using the following formula per the following requirements:

   - leak rate unstable or **NOT** positively identified as stable -every 15 minutes
   - leak rate stable per Attachment 2 – Use Attachment 2 frequencies

$$\frac{[(B\_\_\_\_\_) \times (C\_\_\_\_\_) \times 10770}{(A\_\_\_\_\_)} = [\text{Primary to secondary leak rate (gpd)}]$$

Page 1 of 2

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

DATE/ TIME	RX POWER	R-45 (When I/S)	R-49 (When I/S)	ATT 1 CALC (When performed)	N-16 (gpd) (When > 30% power)				Chemistry Grab Sample (gpd) (When Chemistry provides)			
		(µCi/cc)		(gpd)	21	22	23	24	21	22	23	24
1115	25%	2.39 E-05		45.4 gpd	NA	NA	NA	NA				
1130	25%	2.40 E-05		45.6 gpd	NA	NA	NA	NA				
1145	25%	2.46E-05		46.7 gpd	NA	NA	NA	NA				
1200	25%	2.50E-05		47.5 gpd	NA	NA	NA	NA				
1215	25%	2.53E-05			NA	NA	NA	NA				
1230	25%	2.88E-05			NA	NA	NA	NA				
					NA	NA	NA	NA				
					NA	NA	NA	NA				
					NA	NA	NA	NA				

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

Facility: IPEC UNIT 2 Task No: 0430010321

Task Title: **Demonstrate Proficiency in use of Generator Capability Curve**

K/A Reference: 2.2.41 RO – 3.4 SRO – 3.8 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:

- Reactor is at 100% power, equilibrium Xenon, EOL
- An NPO incorrectly operated valves resulting in a loss of some Hydrogen from the Main Generator
- The Hydrogen vent path has been isolated

Task Standard: MVAR adjustment accurately evaluated.

Required Materials: Ruler

General References: Graph EL-1

Initiating Cue: You are the BOP and the CRS has directed you to determine if the Main Generator is operating within the limits of Graph EL-1 for current conditions.

Time Critical Task: No

Validation Time: 15

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain correct procedure

Standard: Obtains Graph-EL-1

Comment:

√ 2. Performance Step: Obtain current generator gas pressure

Standard: Determines Gas Pressure is approximately 45 psig

Comment:

√ 3. Performance Step: Obtain current generator gross megawatts

Standard: Determines approximately 950

Comment:

√ 4. Performance Step: Obtain current MVAR load

Standard: Determine MVAR load is approximately 460 Leading

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 5. Performance Step: Evaluate conditions using Graph EL-1

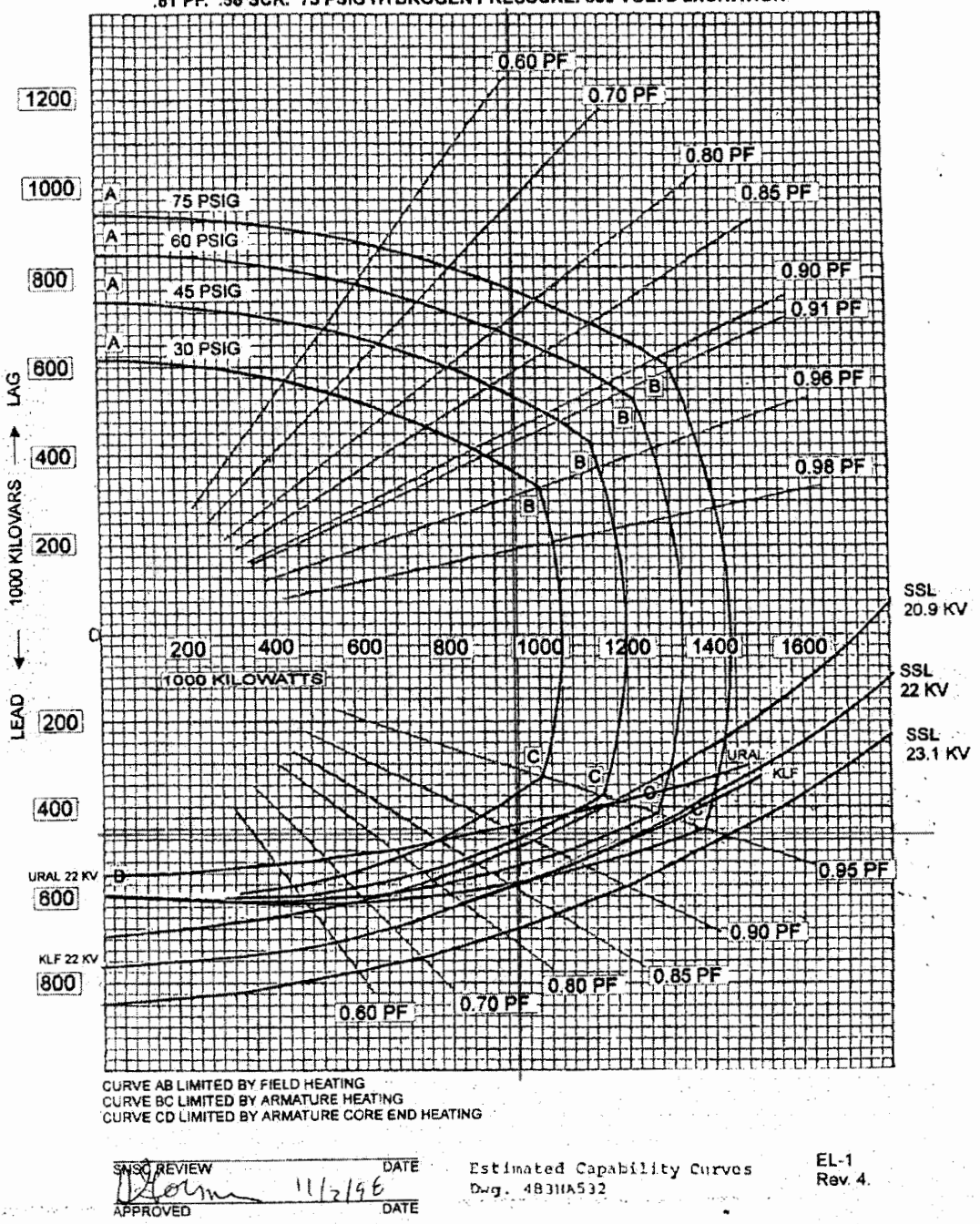
Standard: Determines MVAR Loading is outside allowable on Graph EL-1

Comment:

Terminating Cue: JPM Complete

460 Lead 45 psig 950 MW

KEY



SNSC REVIEW DATE 11/2/96

APPROVED DATE

Estimated Capability Curves
Dwg. 4831IA532

EL-1
Rev. 4.

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

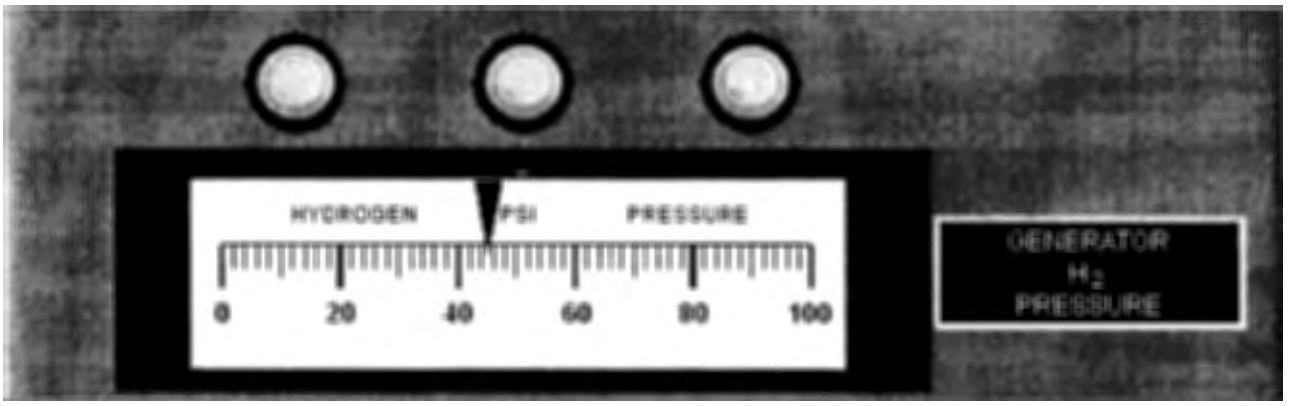
Examiner's signature and date: _____ _____

Initial Conditions:

- Reactor is at 100% power, equilibrium Xenon, EOL
- An NPO incorrectly operated valves resulting in a loss of some Hydrogen from the Main Generator
- The Hydrogen vent path has been isolated

Initiating Cue:

You are the BOP and the CRS has directed you to determine if the Main Generator is operating within the limits of Graph EL-1 for current conditions


HYDROGEN
PSI
PRESSURE
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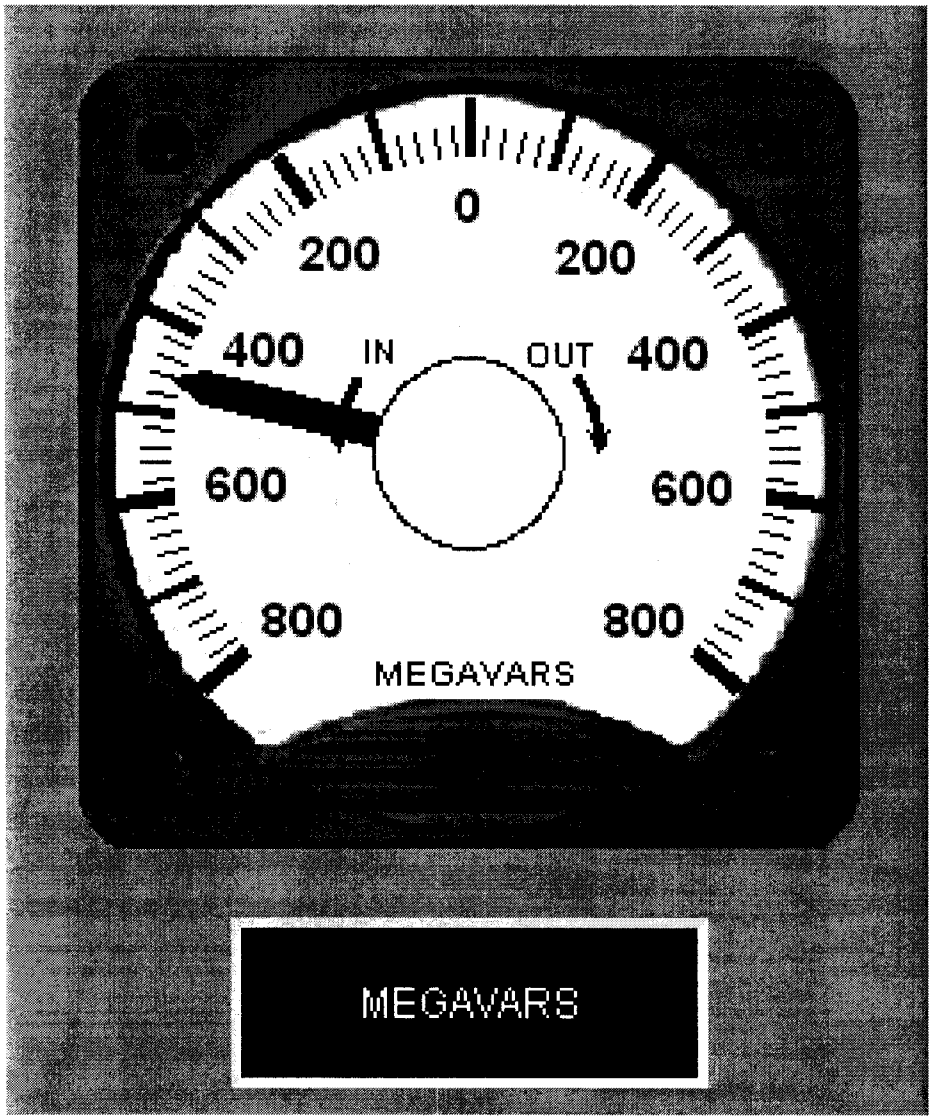
20
40
60
80
100
GENERATOR
H_2
PRESSURE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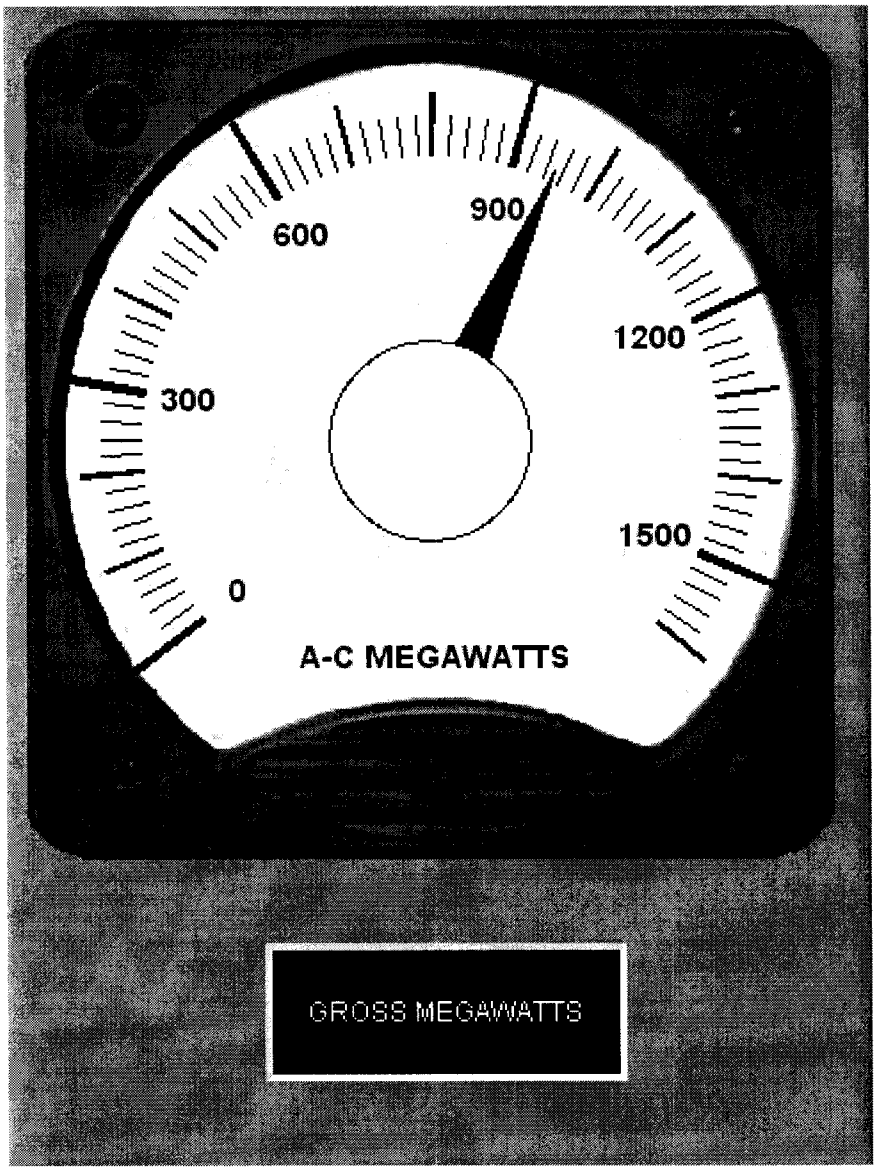
200
200
400
IN
OUT
400
600
600
800
800
MEGAVARS
MEGAVARS


600
900
1200
300
1500
0
A-C MEGAWATTS
GROSS MEGAWATTS

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

Facility: IPEC UNIT 2 Task No: 2000650102

Task Title: **Replace a Watchstander due to Illness**

K/A Reference: 2.1.5 SRO – 3.9 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:

- Unit 2 is at 100% power.
- An oncoming RO for the 1800-0600 shift has called in sick
- Date is 2/25
- Time is 1700

Reference the attached RO work hour sheet.

Task Standard:

Reviews the work hour history for various RO candidates and determines if any one of the candidates can stand an entire shift. Explains whether or not RO can stand the entire shift

Required Materials: Operations Schedule (Included)

General References: EN-OM-123
IP-SMM-OP-103

Initiating Cue:

There are 5 RO's available to fill the position. You are told to perform verification of overtime hours to determine which RO, if any, can stand the entire shift. Document your conclusion(s) below (why or why NOT)

Time Critical Task: No

Validation Time: 30 Min

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain correct procedures

Standard: Obtain EN-OM-123
IP-SMM-OP-103

CUE: Give candidates procedures and schedule.

Comment:

2. Performance Step: Review Ops Schedule and procedural requirements

Standard: Reviews Schedule and determines scheduling requirements

Comment:

√ 3. Performance Step: Determines that the RO candidate #1 CANNOT fill the RO position because RO#1 violates >72 hrs in any 7 days – from 2/19-2/25 (12+13+12+12+12+12=73 hrs)

Standard: Determines that the RO candidate #1 CANNOT fill the RO position because RO#1 violates >72 hrs in any 7 days – from 2/19-2/25 (12+13+12+12+12+12=73 hrs)

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 4. Performance Step:	**Determines that the RO candidate #2 CANNOT fill the RO position because RO#2 violates <34 hours break in any 9 days (no 34 hr break from 2/17 – 2/25)**
Standard:	**Determines that the RO candidate #2 CANNOT fill the RO position because RO#2 violates <34 hours break in any 9 days (no 34 hr break from 2/17 – 2/25).**
Comment:	

√ 5. Performance Step:	**Determines that the RO candidate #3 CAN fill the RO position. NO violation of the work hour limits....**
Standard:	**Determines that the RO candidate #3 CAN fill the RO position. NO violation of the work hour limits.**
Comment:	

Performance Information

(Denote critical steps with a check mark √)

√ 6. Performance Step:	**Determines that the RO candidate #4 CANNOT fill the RO position because RO#4 violates >26 hrs in any 48 hours – from 2/24-2/25 [15hrs (2/24-25)+12hrs (2/17-18) = 27 hrs]**
Standard:	**Determines that the RO candidate #4 CANNOT fill the RO position because RO#4 violates >26 hrs in any 48 hours – from 2/24-2/25 [15hrs (2/24-25)+12hrs (2/17-18) = 27 hrs]**
Comment:	

√ 6. Performance Step:	**Determines that the RO candidate #5 CANNOT fill the RO position because RO#5 violates <10 hours break (between work period) on 2/25 (0900 to 1800(2/25) = 9hrs break)**
Standard:	**Determines that the RO candidate #5 CANNOT fill the RO position because RO #5 violates <10 hours break (between work period) on 2/25 (0900 to 1800(2/25) = 9hrs break)**
Comment:	

Terminating Cue: JPM Complete

SRO Admin JPM A1.1 – ANSWER KEY

RO										
	2/16	2/17	2/18	2/19	2/20	2/21	2/22	2/23	2/24	2/25
1			1800(2/18)-0200(2/19)	1800(2/19)-0600(2/20)		1800(2/21)-0700(2/22)	1800(2/22)-0600(2/23)	1800(2/23)-0600(2/24)	1800(2/24)-0600(2/25)	1800(2/25)-0600(10/11)
	0	**0**	**8**	**12**	**0**	**13**	**12**	**12**	**12**	**12**
2		0600(2/17)-1800(2/17)	0600(2/18)-1800(2/18)	0600(2/19)-1800(2/19)	0600(2/20)-1800(2/20)	0600(2/21)-1200(2/21)	0600(2/22)-1000(2/22)	0600(2/23)-1200(2/23)	0600(2/24)-1000(2/24)	1800(2/25)-0600(10/11)
	0	**12**	**12**	**12**	**12**	**6**	**4**	**6**	**4**	**12**
3	0600(2/16)-1800(2/16)		1800(2/18)-0600(2/19)		1800(2/20)-0800(2/21)	1800(2/21)-0600(2/22)	1800(2/22)-0800(2/23)	1800(2/23)-0600(2/24)		1800(2/25)-0600(10/11)
	12	**0**	**12**	**0**	**14**	**12**	**14**	**12**	**0**	**12**
4	0800(2/16)-1600(2/16)	0800(2/17)-1600(2/17)	0800(2/18)-1600(2/18)	0800(2/19)-1600(2/19)			1800(2/22)-0000(2/23)	1800(2/23)-0600(2/24)	1700(2/24)-0800(2/25)	1800(2/25)-0600(10/11)
	12	**12**	**12**	**12**	**0**	**0**	**6**	**12**	**15**	**12**
5			0700(2/18)-1500(2/18)	0700(2/19)-1500(2/19)	0700(2/20)-1500(2/20)	0700(2/21)-1500(2/21)		0600(2/23)-1100(2/23)	2300(2/24)-0900(2/25)	1800(2/25)-0600(10/11)
	0	**0**	**8**	**8**	**8**	**8**	**0**	**5**	**10**	**12**

SRO Admin JPM A1.1 – ANSWER KEY

- >16 hrs in any 24 hours –
- >26 hrs in any 48 hours – RO Candidate # 4 violation (15(2/24-25)+12(2/17-18) = 27 hrs)
- >72 hrs in any 7 days – RO Candidate #1 violation (12+13+12+12+12+12=73 hrs)
- <10 hours break (between work period) – RO Candidate # 5 violation (0900 to 1800(2/25) = 9hrs break)
- <34 hours break in any 9 days – RO Candidate # 2 violation (no 34 hr break from 2/17 – 2/25)

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 2 is at 100% power.
- An oncoming RO for the 1800-0600 shift has called in sick
- Date is 2/25
- Time is 1700

Reference the attached RO work hour sheet.

Initiating Cue:

There are 5 RO's available to fill the position. You are told to perform verification of overtime hours to determine which RO, if any, can stand the entire shift. Document your conclusion(s) below (why or why NOT)?

ANSWER:
RO#1:

RO#2:

RO#3:

RO#4:

RO#5:

RO							
	2/16	2/17	2/18	2/19	2/20	2/21	2/22
1			1800(2/18) - 0200(2/19)	1800(2/19) - 0600(2/20)		1800(2/21) - 0700(2/22)	1800(2/ - 0600(2/
2		0600(2/17) - 1800(2/17)	0600(2/18) - 1800(2/18)	0600(2/19) - 1800(2/19)	0600(2/20) - 1800(2/20)	0600(2/21) - 1200(2/21)	0600(2/ - 1000(2/
3	0600(2/16) - 1800(2/16)		1800(2/18) - 0600(2/19)		1800(2/20) - 0800(2/21)	1800(2/21) - 0600(2/22)	1800(2/ - 0800(2/
4	0800(2/16) - 1600(2/16)	0800(2/17) - 1600(2/17)	0800(2/18) - 1600(2/18)	0800(2/19) - 1600(2/19)			1800(2/ - 0000(2/
5			0700(2/18) - 1500(2/18)	0700(2/19) - 1500(2/19)	0700(2/20) - 1500(2/20)	0700(2/21) - 1500(2/21)	

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

Facility: IPEC UNIT 2 Task No: 0001250502

Task Title: **Review Reactor Vessel Venting Time Calculation Per FR-I.3, Attachment 1**

K/A Reference: 2.1.25 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 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:

1. An event occurred 24 hours ago that resulted in a YELLOW path condition on the Inventory Critical Safety Function Status Tree, FR-I.3.

2. The TSC has requested that the Reactor Vessel be vented in accordance with FR-I.3, Response to Voids in Reactor Vessel.

3. Given the following information:

Containment Pressure	2.6 psig
Containment Temperature	172°F
Containment Hydrogen	3.2%
RCS Pressure	550 psig

Task Standard: Vessel Venting time is properly calculated.

Required Materials: Calculator

General References: 2-FR-I.3

Initiating Cue:

You are the CRS and a spare RO has calculated Reactor Vessel Venting Time in accordance with FR-I.3 Attachment 1 and Figure FRI3-3. The SM has directed you to review the calculation and determine what, if any, actions are required.

Time Critical Task: No

Validation Time: 20 min

Performance Information

(Denote critical steps with a check mark √)

√ 1. Performance Step: **Obtain correct procedure**

Standard: **Obtains FR-I.3**

Comment: **It is possible for the candidate to determine that the Reactor Vessel cannot be vented with containment hydrogen at 3.2% before reviewing the calculation.**

NOTE: See Step 3

---

2. Performance Step: Determine Containment Volume at STP (A)

Standard: A = 2.61 E6 X 17.3/14.7 X 492/632

A = 2.39 E6

Determines calculation is correct.

Comment:

√ 3. Performance Step: **Determine Maximum Hydrogen volume that can be vented (B)**

Standard: **$B = \frac{(3.0 - 3.2 \times 1.32\ E6)}{100}$**

B = -4.22 E4

Comment: **There are two elements wrong with this step.**

1. **The number used for the calculation was transposed**
2. **In the body of the procedure, the Reactor Vessel cannot be vented if containment hydrogen is greater than 3%.**

Procedure Step 17 directs consultation with the TSC if containment hydrogen is > 3.0%

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:

1. An event occurred 24 hours ago that resulted in a YELLOW path condition on the Inventory Critical Safety Function Status Tree, FR-I.3.

2. The TSC has requested that the Reactor Vessel be vented in accordance with FR-I.3, Response to Voids in Reactor Vessel.

4. Given the following information:

Containment Pressure	2.6 psig
Containment Temperature	172°F
Containment Hydrogen	3.2%
RCS Pressure	550 psig

Initiating Cue:

You are the CRS and a spare RO has calculated Reactor Vessel Venting Time in accordance with FR-I.3 Attachment 1 and Figure FRI3-3. The SM has directed you to review the calculation and determine what, if any, actions are required.

Number:	Title:	Revision Number:
2-FR-I.3	RESPONSE TO VOIDS IN REACTOR VESSEL	REV. 2

ATTACHMENT 1 (Attachment page 1 of 1)

INSTRUCTIONS FOR DETERMINING VENTING TIME

1. Determine containment air volume at STP = A

$$A = 2.61\ E6\ cu\ ft \times \frac{17.3}{14.7\ psia} \times \frac{492°R}{T\ 632}$$

2.39EL

where: P (psia) = Containment pressure (psig) + 14.7
and: T (°R) = Containment temperature (°F) + 460

2. Determine maximum hydrogen volume that can be vented = B

$$B = \frac{(3.0\% - \text{Containment Hydrogen Concentration})}{100\%} \times A$$

2.3 2.39EL

1.67E4

3. Determine hydrogen flow rate as a function of RCS pressure = C

1500

a) Check RCS pressure.

b) Using FIGURE FR13-3, read hydrogen flow rate.

4. Calculate maximum venting time:

$$\text{Maximum venting time} = \frac{B}{C}$$

11min

Maximum venting time = 11 minutes

-END-

FIGURE FRI3-3

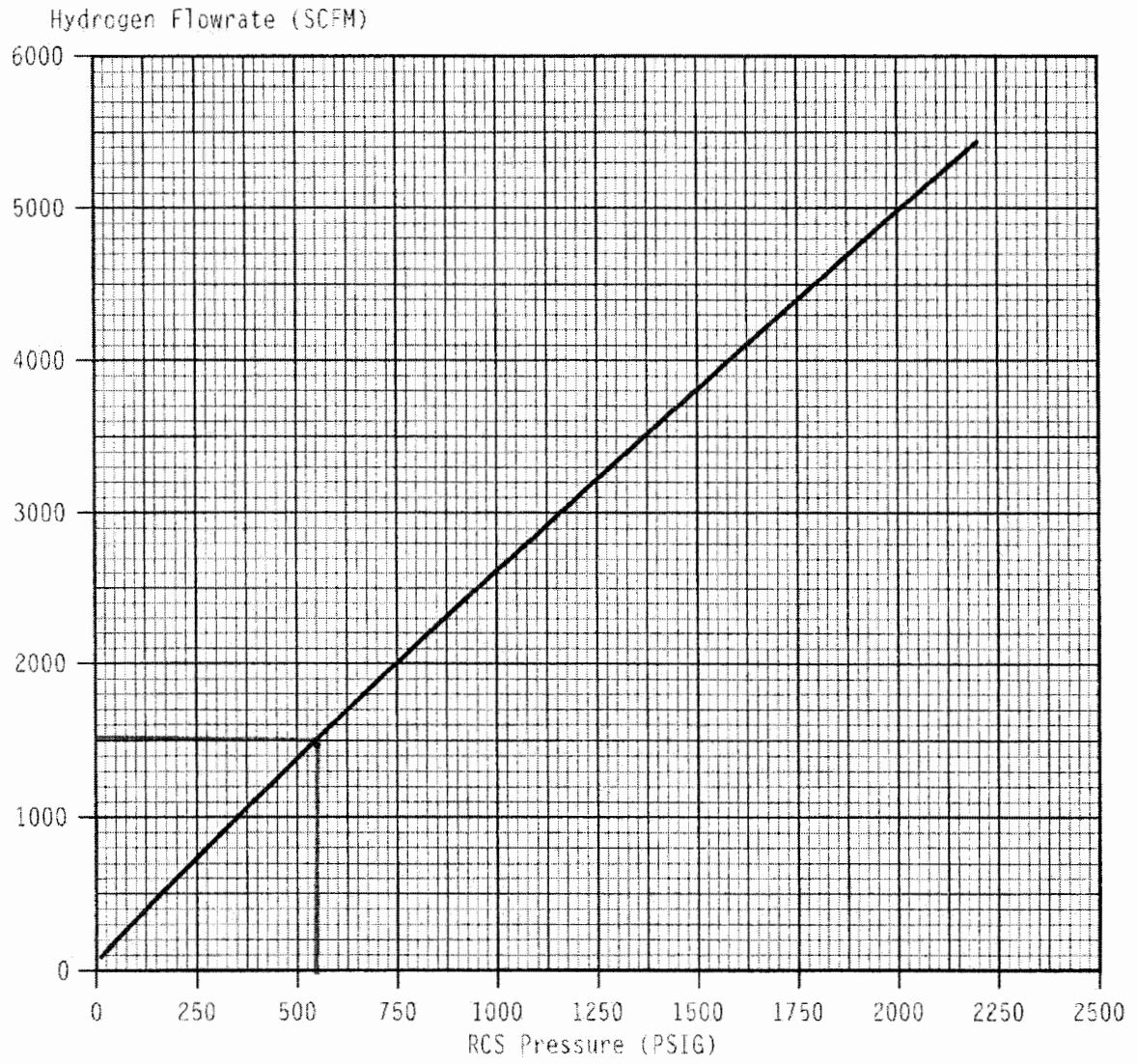


FIGURE FRI3-3, HYDROGEN FLOWRATE VERSUS RCS PRESSURE

-END-

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

Facility: IPEC UNIT 2 Task No: 0350060402

Task Title: **Review a SG tube Leakrate Determination using 2-AOP-SG-1**

K/A Reference: 2.3.14 SRO – 3.8 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 plant is operating at 25% power
- Radiation Monitor 45 is in alert.
- The operating crew is responding in accordance with 2-AOP-SG-1 Steam Generator Tube Leak.
- Condenser air in leakage is 2.7 SCFM
- RCS Total Gaseous Activity 1.53 X 10^{-2} µci/cc
- Given the attached Leakrate Log
- R-49 Automatic Actions have occurred.

Task Standard: SG Tube Leakage calculation reviewed using 2-AOP-SG-1 Attachment 1 and 2

Required Materials: Leakrate Log

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

Initiating Cue:

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

- sample frequency
- recommend actions (if any)

Time Critical Task: NA

Validation Time: 15 Minutes

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step:	Check Calculations
Standard:	Candidate may use Attachment 1 or separate paper Candidate should determine that the calculations for 1115 through 1215 are correct.
Comment:	

√2. Performance Step:	**Check Calculation for 1230**
Standard:	**Determines calculation is incorrect. The correct value is 60.81 gpd**
Comment:	

√ 3. Performance Step:	**Check Calculation for 1245**
Standard:	**Determines calculation is incorrect. The correct value is 76.02 gpd** **In addition to the calculation being incorrect, The CRS should recognize that the leakrate is > 75 gpd and the plant should be placed in MODE 3 within the next 2 hours (procedure step 4.63).**
Comment:	

Performance Information

(Denote critical steps with a check mark √)

√ 4. Performance Step:	**Calculate SG Tube Leakage change over last hour**
Standard:	**Determines SG Tube Leakage has increased by:** • **13.3 gpd from 1130 to 1230** • **27.9 from 1145 to 1245.**
Comment:	

√ 5. Performance Step:	**Calculate SG Tube Leakage change over last hour**
Standard:	**Determines SG Tube Leakage has increased by 13.3 gpd from 1130 to 1230.**
Comment:	

6. Performance Step:	Review Sample frequency recommendation by RO
Standard:	Identify Sample frequency recommendation by RO is correct
Comment:	

Terminating Cue: JPM Complete

Attachment 2
SG Leak Rate Data Sheet

Page 1 of 1

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

DATE/ TIME	RX POWER	R-45 (When I/S)	R-49 (When I/S)	ATT 1 CALC (When performed)	N-16 (gpd) (When > 30% power)				Chemistry Grab Sample (gpd) (When Chemistry provides)			
		(μCi/cc)		(gpd)	21	22	23	24	21	22	23	24
1115	25%	2.46E-05		46.75	NA	NA	NA	NA				
1130	25%	2.50E-05		47.51	NA	NA	NA	NA				
1145	25%	2.53E-05		48.08	NA	NA	NA	NA				
1200	25%	2.68E-05		50.93	NA	NA	NA	NA				
1215	25%	2.90E-05		55.11	NA	NA	NA	NA				
1230	25%	3.20E-05	60.81	***58.81***	NA	NA	NA	NA				
1245	25%	4.00E-05	76.02	***65.02***	NA	NA	NA	NA				
					NA	NA	NA	NA				
					NA	NA	NA	NA				

The calculated value for 1230 is incorrect. The correct value should be 60.81 gpd.
The calculated value for 1245 is incorrect. The correct value should be 76.02 gpd.
The leakrate has exceeded 75 gpd and the plant should be placed in MODE 3 within an additional 2 hours.

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 plant is operating at 25% power
- Radiation Monitor 45 is in alert.
- The operating crew is responding in accordance with 2-AOP-SG-1 Steam Generator Tube Leak.
- Condenser air in leakage is 2.7 SCFM
- RCS Total Gaseous Activity 1.53 X 10^{-2} µci/cc
- Given the attached Leakrate Log
- R-49 Automatic Actions have occurred.

Initiating Cue:

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

- sample frequency
- recommend actions (if any)

Page 1 of 1

NOTE

For low levels of radioactivity as read on R-45, the estimated leak rate will be higher than actual.

1. Obtain the following

   A. RCS total gaseous activity (from Chemistry Data Book or WINCDMS) _____ μCi/cc

   B. Condenser air inleakage _____ SCFM

   C. R-45 reading _____ μCi/cc

2. Calculate primary to secondary leak rate using the following formula per the following requirements:

   - leak rate unstable or **NOT** positively identified as stable -every 15 minutes
   - leak rate stable per Attachment 2 – Use Attachment 2 frequencies

$$\frac{[(B\_\_\_\_\_) \times (C\_\_\_\_\_)}{(A\_\_\_\_\_)} \times 10770 = [\_\_\_\_\_]$$

Primary to secondary leak rate (gpd)

Attachment 2
SG Leak Rate Data Sheet

Page 1 of 1

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

DATE/ TIME	RX POWER	R-45 (When I/S)	R-49 (When I/S)	ATT 1 CALC (When performed)	N-16 (gpd) (When > 30% power)				Chemistry Grab Sample (gpd) (When Chemistry provides)			
		(μCi/cc)		(gpd)	21	22	23	24	21	22	23	24
1115	25%	2.46E-05		46.75	NA	NA	NA	NA				
1130	25%	2.50E-05		47.51	NA	NA	NA	NA				
1145	25%	2.53E-05		48.08	NA	NA	NA	NA				
1200	25%	2.68E-05		50.93	NA	NA	NA	NA				
1215	25%	2.90E-05		55.11	NA	NA	NA	NA				
1230	25%	3.20E-05		58.81	NA	NA	NA	NA				
1245	25%	4.00E-05		65.02	NA	NA	NA	NA				
					NA	NA	NA	NA				
					NA	NA	NA	NA				

Based on calculated leakrate sample frequency should remain every 15 minutes.

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

Facility: IPEC UNIT 2 Task No: 0430010321

Task Title: **Demonstrate Proficiency in use of Generator Capability Curve**

K/A Reference: 2.2.41 RO – 3.4 SRO – 3.8 Job Performance Measure No: SRO Admin EC-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:

- Reactor is at 100% power, equilibrium Xenon, EOL
- Main Generator Hydrogen makeup is not available
- Machine Gas High Low Pressure alarm is up on the TG Monitor Panel
- The given conditions have been stable for the last hour.

Task Standard: MVAR adjustment accurately evaluated and acceptable recommendation identified.

Required Materials: Ruler

General References: Graph EL-1
2-ARP-042, G.E. Unit Aux Board GE Generator
2-SOP-26.2 Hydrogen and Carbon Dioxide to Main Generator

Initiating Cue: You are the CRS, evaluate the given conditions and provide recommendation and explanation.

Time Critical Task: No

Validation Time: 15

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain correct procedure

Standard: Obtains Graph-EL-1

Comment:

√ 2. Performance Step: Obtain current generator gas pressure

Standard: Determines Gas Pressure is approximately 45 psig

Comment:

√ 3. Performance Step: Obtain current generator gross megawatts

Standard: Determines approximately 950

Comment:

√ 4. Performance Step: Obtain current MVAR load

Standard: Determine MVAR load is approximately 460 Leading

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 5. Performance Step: **Evaluate conditions using Graph EL-1**

Standard: **Determines MVAR Loading is outside allowable on Graph EL-1**

Comment:

√ 6. Performance Step: **Make acceptable recommendation**

Standard: **Based on given information, raising Machine Gas Pressure is NOT acceptable**

Reducing value of Leading VARS, until point on EL-1 is above URAL 22KV line, is acceptable.

OR

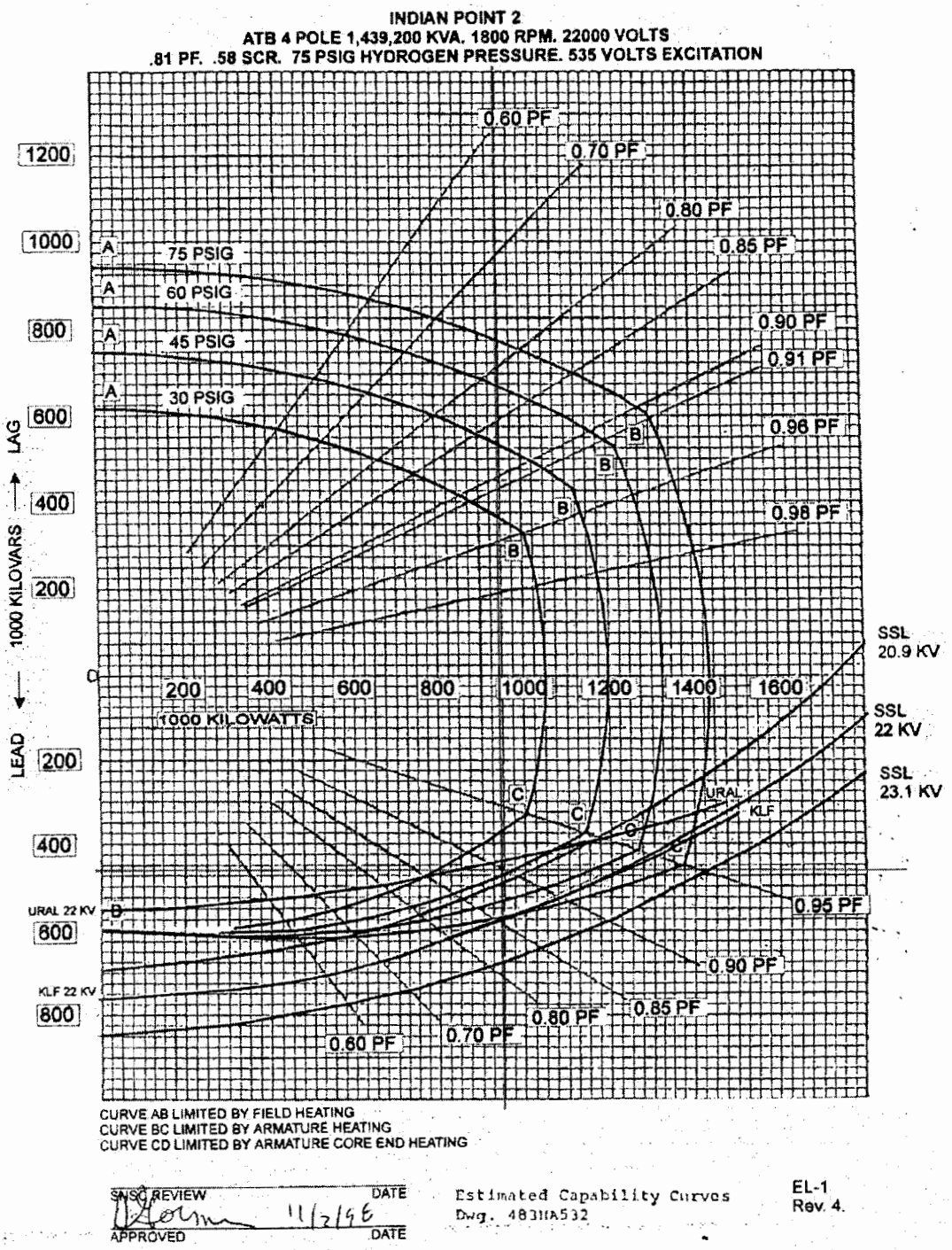
Reduce Turbine Load, until point on EL-1 is above URAL 22KV line, is acceptable

Comment:

Terminating Cue: JPM Complete

460 Lead 45 psig 950 MW

KEY



SNSC REVIEW DATE 11/2/96

APPROVED DATE

Estimated Capability Curves
Dwg. 483HA532

EL-1
Rev. 4.

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

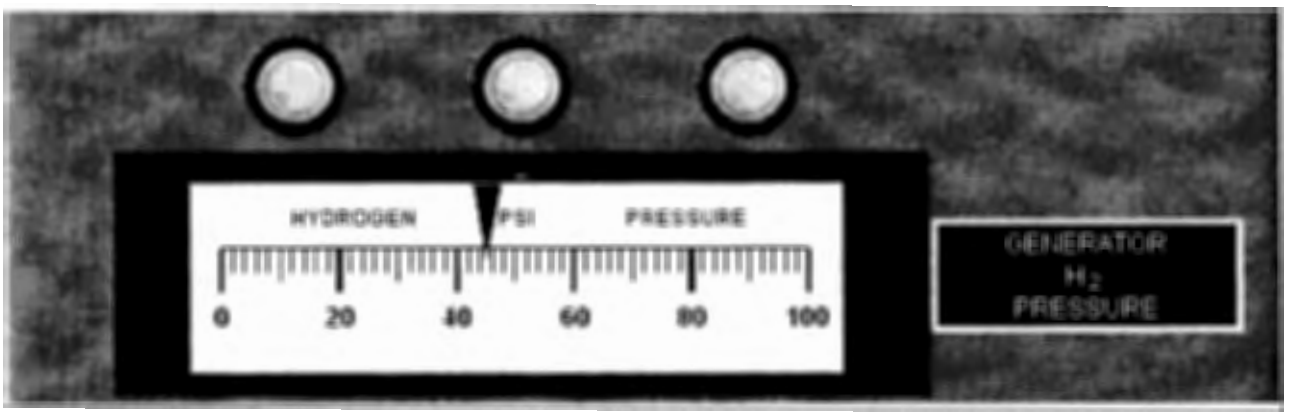
Examiner's signature and date: _____ _____

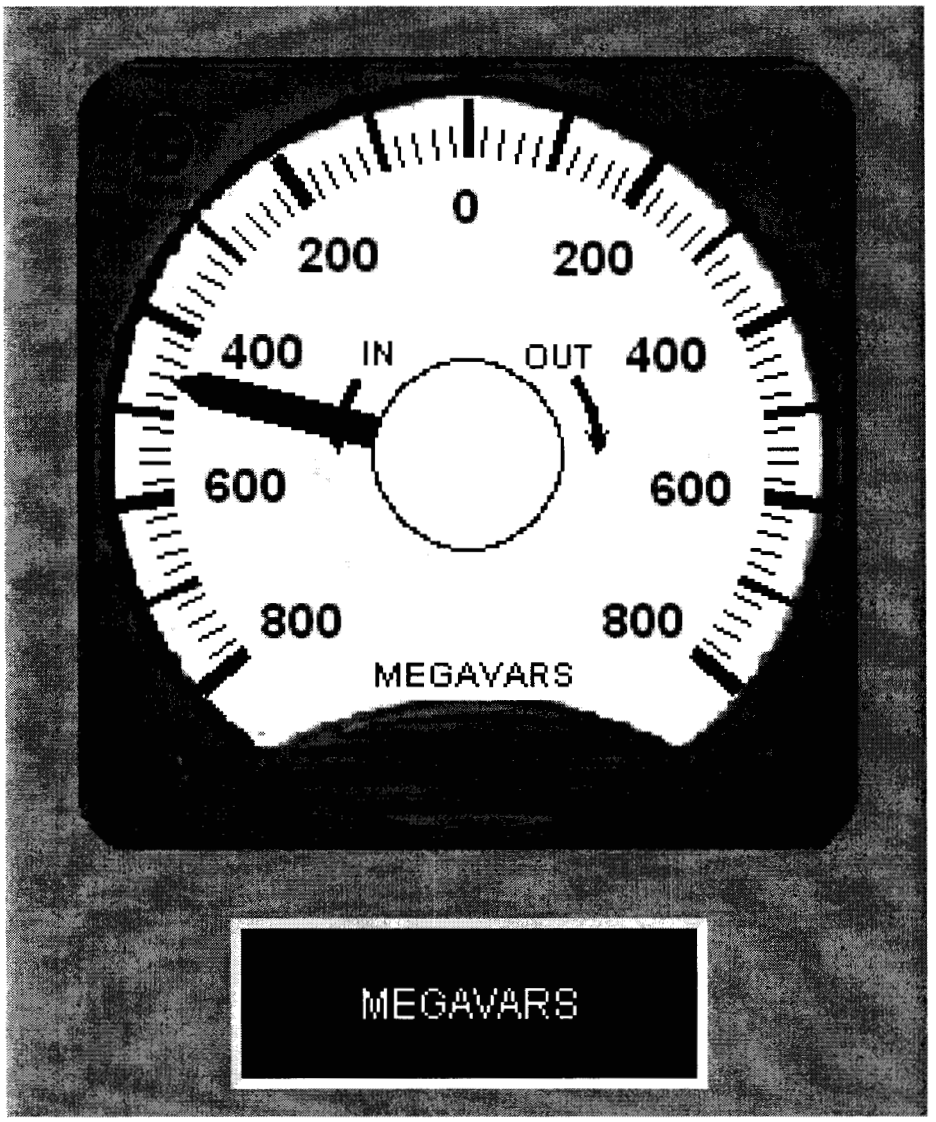
Initial Conditions:

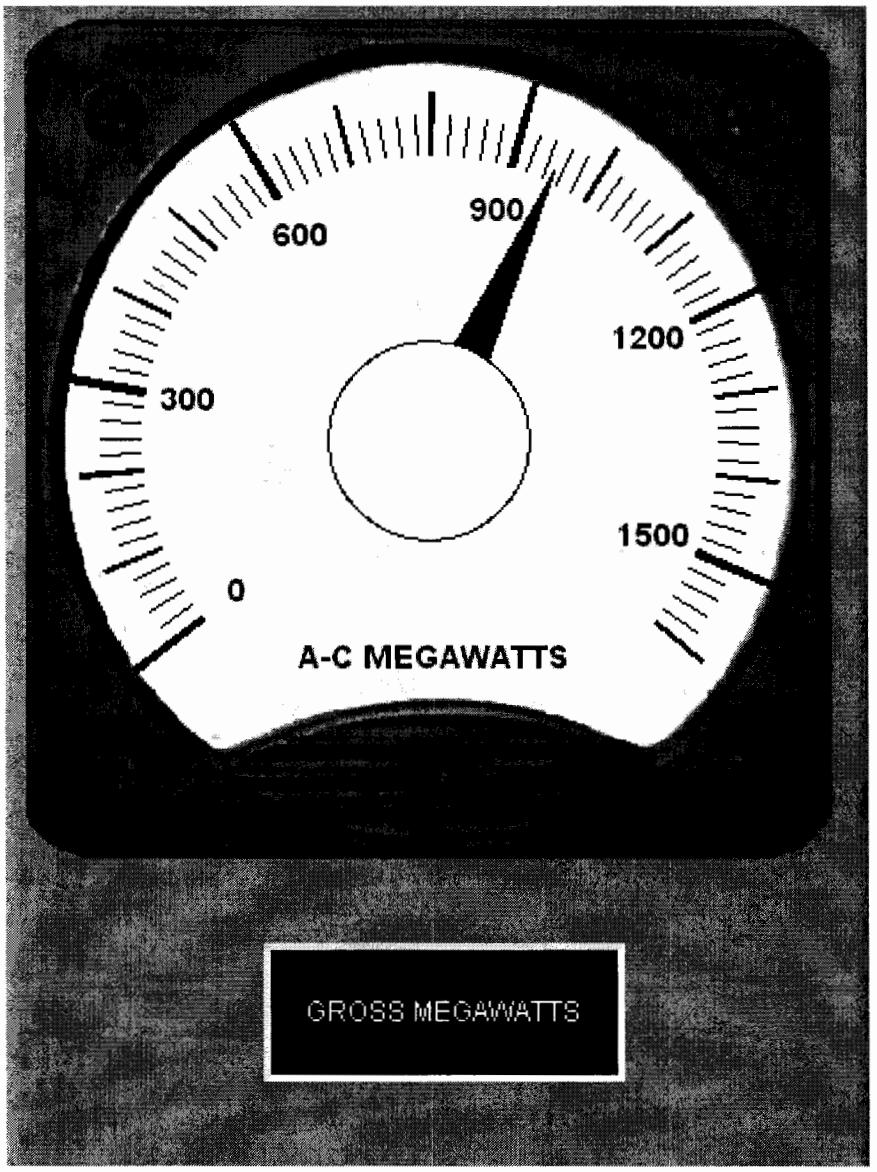
- Reactor is at 100% power, equilibrium Xenon, EOL
- Main Generator Hydrogen makeup is not available
- Machine Gas High Low Pressure alarm is up on the TG Monitor Panel
- The given conditions have been stable for the last hour.

Initiating Cue:

You are the CRS, evaluate the given conditions and provide recommendation and explanation.


HYDROGEN
PSI
PRESSURE
0
20
40
60
80
100
GENERATOR
H_2
PRESSURE


0
200
200
400
IN
OUT
400
600
600
800
800
MEGAVARS
MEGAVARS


600
900
1200
300
1500
0
A-C MEGAWATTS
GROSS MEGAWATTS

Facility: IPEC UNIT 2 Task No: 1500010522

Task Title: **Classify Emergency Events Requiring Emergency Plan Implementation**

K/A Reference: 2.4.38 SRO – 4.4 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.

Initial Conditions:

Indian Point Energy Center Unit 2 was operating at 100% and has been there for 100 days. 24 Containment Fan Cooler Unit is inoperable for circuit breaker maintenance.

Unit 3 is at 100% power; no issues.

Safety Injection automatically initiated due to a large break LOCA inside containment.

The following plant conditions exist:

- The team is responding per E-O, Reactor Trip or Safety Injection.
- Containment Isolation Phase A and B have been confirmed.
- 21 and 22 Containment Spray Pumps failed to start and attempts to start the pumps were unsuccessful.
- 24 Containment Fan Cooler Unit remains unavailable
- RCS Subcooling is 0.0°F
- Containment Pressure is 38 psig and stable
- R-25 is reading 19 R/hr and R-26 is reading 21 R/hr
- RVLIS, Full Range is reading 44%

Meteorological Conditions:

- Wind Speed: 3.5 meters/second
- Wind Direction: 120 degrees @ 10 meters
- Stability Class: C

I will perform duties of Offsite Communicator.

Task Standard: Proper E-Plan Classification and Part 1 form properly filled out .

Required Materials: EAL Wall Chart.

General References: IP-EP-115
IP-EP-120
IP-EP-210
IP-EP-410

Initiating Cue:

You are the CRS and the SM is unable to get to the control room. Classify the event and complete the Radiological Emergency Data Form.

Time Critical Task: Yes (Declare event in 15 minutes and Initiate notification within 15 minutes of declaration)

Validation Time: 30 min

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain correct procedure IP-EP-120 or EAL chart

Standard: Give candidate Wall Chart

Comment:

√ 2. Performance Step: Evaluate Initiating Cues to determine a GE classification applies.

Standard: Determine EAL FG1.1 applies
Fuel Clad – C.3 Loss
RCS – D.2 Loss
CNMT – D.7 Potential Loss

Comment: This action is time critical Mark Time when Declaration is made.

√ 3. Performance Step: Complete "New York State Radiological Emergency Data Form, Part 1"

Standard: Complete IP-EP-115

Comment: Critical elements on Part 1 form are marked with an asterisk

√ 4. Performance Step: Direct Communicator to initiate notification.

Standard: Hand completed Part 1 form to evaluator and direct them to initiate notification.

CUE: Acknowledge direction to initiate notification.

Comment: This action is time critical.

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 (at the Indian Point Energy Center)

2. The Emergency Classification is:
A. Unusual Event B. Alert C Site Area Emergency
(D. General Emergency) * E. Emergency Terminated
This Emergency Classification declared on: Today * (Date) at Time of Declaration * (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 *
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) *

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

All remaining Areas MONITOR the EMERGENCY ALERT SYSTEM

NOTE: OFFSITE AUTHORITIES SHOULD CONSIDER SHELTER-IN-PLACE + TAKE KI IF EVACUATION IS NOT FEASIBLE

5. EAL#: FG-11 * Loss of 2 Fission Product Barriers And Potential loss of third

Affected Location:
(A. UNIT 2) *
B. UNIT 3
C. IPEC SITE

6. Reactor Status:
Unit 2: Operational or (Shutdown) at (Date)_____ (Time) _____ (24 hr clock)
Unit 3: (Operational) or Shutdown at (Date)_____ (Time) _____ (24 hr clock)

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

8. Wind Direction: (From) 120 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)

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:

Indian Point Energy Center Unit 2 was operating at 100% and has been there for 100 days. 24 Containment Fan Cooler Unit is inoperable for circuit breaker maintenance.

Unit 3 is at 100% power; no issues.

The events below occurred today approximately 5 minutes ago.

Safety Injection automatically initiated due to a large break LOCA inside containment.

The following plant conditions exist:

- The team is responding per E-O, Reactor Trip or Safety Injection.
- Containment Isolation Phase A and B have been confirmed.
- 21 and 22 Containment Spray Pumps failed to start and attempts to start the pumps were unsuccessful.
- 24 Containment Fan Cooler Unit remains unavailable
- RCS Subcooling is 0.0°F
- Containment Pressure is 38 psig and stable
- R-25 is reading 19 R/hr and R-26 is reading 21 R/hr
- RVLIS, Full Range is reading 44%

Meteorological Conditions:

- Wind Speed: 3.5 meters/second
- Wind Direction: 120 degrees @ 10 meters
- Stability Class: C

I will perform duties of Offsite Communicator.

Initiating Cue:

You are the CRS and the SM is unable to get to the control room. Classify the event and complete the Radiological Emergency Data Form.

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

Facility: IPEC UNIT 2 Task No: 0040420421

Task Title: **Emergency Borate the RCS**

K/A Reference: 004000A4.18 RO – 4.3 SRO – 4.1 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:

- A Reactor Trip has occurred.
- The Crew is performing ES-0.1, Reactor Trip Response
- At step 6 the crew determined 4 Control Rods did not fully insert on the trip
- RCS Tavg is 547°F.
- RCS Boron is 1221 PPM, at 327 EFPD.

Task Standard: The correct amount of boron addition determined and boration has been commenced using MOV-333 Boration Path.

Required Materials: 2-SOP-3.2

General References: 2-SOP-3.2

Initiating Cue: You are the ATC and the CRS has directed you to initiate Emergency Boration in accordance with 2-SOP-3.2

Time Critical Task: No

Validation Time: 15 Min

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step:	Obtain Correct Procedure
Standard:	Obtains 2-SOP-3.2 and Reviews Precautions and Limitations
Comment:	

2. Performance Step:	Observe NOTES before Step 4.6.5
Standard:	Reviews NOTES
Comment:	

Performance Information

(Denote critical steps with a check mark √)

√ 3. Performance Step:	**Determine RCS Boron Concentration must be increased 667 ppm**
Standard:	**1309 Minimum Shutdown Boron Concentration** **1221 Current Boron Concentration** **88 ppm to achieve Min Shutdown Boron Conc.** **193 ppm increase for each rod > 1 (3 rods)** **193 ppm per rod X three rods = 579** **579 + 88 = 667 ppm increase boron concentration required.** **Using Attachment 1 approximately 1985 gallons of Boric Acid is required** **Using 2.99 gal/ppm, approximately 1995 gallons of Boric Acid is required**
Comment:	**At some point during the performance of this JPM the candidate must determine that between 1985 and 2005gallons of boric acid are required.** **The candidate may wait until boric acid addition has commenced to calculate the amount of boric acid necessary.**

---

4. Performance Step:	Observe NOTES before Step 4.6.12
Standard:	Reviews NOTES
Comment:	

Performance Information

(Denote critical steps with a check mark √)

5. Performance Step:	Initiate boration using the desired method
Standard:	Normal Boration is identified as the Preferred method, and it is expected that the candidate will start with this method. Go To Attachment 3

Comment: Step 6.5.12

6. Performance Step:	Observe Caution before Step 1.0 of Attachment 3
Standard:	Review CAUTION

Comment:

7. Performance Step:	Place Makeup Mode Selector Switch to BORATE
Standard:	Rotate switch to BORATE

Comment: Step 1.1 of Attachment 3 Panel FCF

8. Performance Step:	Set Boric Acid Integrator to 600 gallons
Standard:	Set thumbwheels to 600.0

Comment: Step 1.2 of Attachment 3 Panel FBF

Performance Information

(Denote critical steps with a check mark √)

---

9. Performance Step: Place Makeup Control Switch to START

Standard: Rotate switch to START position
Observe boration does NOT begin.
Return to Step 4.6.12

Comment: Step 1.3 of Attachment 3 Panel FCF
Candidate may make several attempts to start Boration.

10. Performance Step: Select Alternate Method for Emergency Boration

Standard: Candidate can select either MOV-333 Boration Path or RWST Boration Path.

If candidate selects MOV-333 go to JPM Step 14

Comment: *Only MOV-333 path will function*

11. Performance Step: Place LCV-112A, VCT Inlet to Divert

Standard: Rotate Switch to DIVERT

Comment: Step 1.1 of Attachment 4 Initiating Boration Using 112B Boration Panel SFF

12. Performance Step: Open LCV-112B Emergency RWST Makeup Stop

Standard: Rotate Switch to OPEN
Observe valve does NOT OPEN

Comment: Step 1.2 of Attachment 4 Initiating Boration Using 112B Boration Panel SFF

Performance Information

(Denote critical steps with a check mark √)

13. Performance Step:	Return to Step 4.6.12 Select Alternate Method for Emergency Boration
Standard:	Go to Attachment 5, MOV-333 Boration Path
Comment:	
14. Performance Step:	Observe CAUTION before step 1.1
Standard:	Review CAUTION
Comment:	
√ 15. Performance Step:	NOTE in service BAST level
Standard:	Observe BAST level at approximately 63%
Comment:	Step 1.1 of Attachment 5, Panel SFF
√ 16. Performance Step:	OPEN MOV-333
Standard:	Rotate Switch to OPEN Observe Valve OPEN
Comment:	Step 1.2 of Attachment 5, Panel SFF
√ 17. Performance Step:	Place BOTH Boric Acid Transfer Pumps in FAST
Standard:	Rotate switches to FAST Observe Pumps OFF (green lights lit)
Comment:	Step 1.3 of Attachment 5 Pumps will stop (green light on) when switch is rotated to the FAST position

Performance Information

(Denote critical steps with a check mark √)

√ 18. Performance Step:	Restart BOTH Boric Acid Transfer Pumps
Standard:	Rotate Switches to START Observe Red Light on for Fast Speed
Comment:	Step 1.4 of Attachment 5 Pumps will start in Fast Speed (Red Fast Light ON) Panel FCF
√ 19. Performance Step:	Place operating Charging Pump(s) control in MANUAL AND RAISE to maximum speed
Standard:	Place Auto-Manual transfer switch to MANUAL and rotate potentiometer to maximum output (speed)
Comment:	Step 1.5 of Attachment 5, Panel FBF
20. Performance Step:	ADJUST HCV-142 to maintain RCP Seal Injection between 6 and 12 gpm
Standard:	Rotate HVC-142 in Open direction to maintain 6 – 12 gpm seal injection flow
Comment:	Step 1.6 of Attachment 5, Panel SFF

Performance Information

(Denote critical steps with a check mark √)

√ 21. Performance Step:	Observe NOTES before Step 1.7
Standard:	Reviews NOTES
Comment:	Candidate should determine BAST must be lowered by 32 – 33% (depending on method used to determine amount of Boric Acid to add) to achieve proper boron concentration.
22. Performance Step:	Verify level lowering in the in service BAST
Standard:	Observes Level Lowering
Comment:	CUE: Inform candidate that the in service BAST has lowered 33%
√ 23. Performance Step:	Close MOV-333
Standard:	Rotate switch to CLOSE
Comment:	Step 2.1 of Attachment 5, Panel SFF

24. Performance Step:	Return both Boric Acid Transfer Pumps to SLOW
Standard:	Rotate switches to slow speed Candidate should observe Red Slow indicating light ON

Comment: Step 2.2 of Attachment 5,

For Time consideration the JPM can be Terminated at this point. There are no additional critical steps

---

Performance Information

(Denote critical steps with a check mark √)

---

25. Performance Step: Dispatch NPO to OPEN the immediately CLOSE 330, Boric Acid Blender Primary Water Bypass Stop to flush line 208

Standard: Contact Nuc Side NPO and direct to OPEN then CLOSE 330.

Comment: CUE: Acknowledge request as NPO and report valve has been OPENED and CLOSED.

---

26. Performance Step: Place running Charging Pump speed controller in AUTO

Standard:

- Place Charging Pump Speed Controller in MAN-BAL
- ADJUST the Bias Knob until the deviation meter indicates zero
- Place Charging Pump speed controller to AUTO
- Slowly turn the Bias Knob back to zero

Comment:

---

27. Performance Step: ADJUST HCV-142 to maintain RCP Seals between 6 and 12 gpm

Standard: Rotate potentiometer in close direction as necessary

Comment:

Performance Information

(Denote critical steps with a check mark √)

28. Performance Step:	Direct Chemistry to obtain RCS Boron Sample.
Standard:	Contact Chemistry and direct them to obtain RCS Boron Sample

Comment: CUE Acknowledge request as Chemist

29. Performance Step:	When Chemistry reports Boron Concentration, the set FIC-110, Boric Acid Control for the new Boron Concentration per Graph-CVCS-1B
Standard:	Sets FIC-110 to proper setting

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: _____

Reset the Simulator to any 100% power IC

Insert the following Malfunctions for Stuck Rods

MAL-CFR001A	Rod D-4	UNTRIP
MAL-CFR001AJ	Rod H-12	UNTRIP
MAL-CFR001D	Rod M-4	UNTRIP
MAL-CRF001AX	Rod F14	UNTRIP
SWI-CVC033A	LCV-112B	CLOSE POS
SWI-CVC048	MAKEUP MODE SELECTOR SWITCH	AUTO MAKEUP

Trip the reactor and allow the plant to stabilize.

Freeze the Simulator

Take a snapshot if JPM is to be used more than once.

Initial Conditions:

- A Reactor Trip has occurred.
- The Crew is performing ES-0.1, Reactor Trip Response
- At step 6 the crew determined 4 Control Rods did not fully insert on the trip
- RCS Tavg is 547°F.
- RCS Boron is 1221 PPM, at 327 EFPD.

Initiating Cue:

You are the ATC and the CRS has directed you to initiate Emergency Boration in accordance with 2-SOP-3.2

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

Facility: IPEC UNIT 2 Task No: 0000390521

Task Title: **Perform the Required Action to Align the SI System for Recirculation during Transfer to Cold Leg Recirculation**

K/A Reference: 000011A1.11 SRO – 4.2 RO – 4.2 Job Performance Measure No: Sim B

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.
- Safety Injection has been RESET in accordance with E-1, Loss of Reactor or Secondary coolant.
- The RWST level has decreased to 9.24 feet and the CRS has directed you to transfer to cold leg recirculation in accordance with ES-1.3
- All steps up through and including step 18 of E-1 have been completed.
- FSB Ventilation was previously shutdown
- The service water system is aligned for three header operation.
- The first 3 steps of ES-1.3 have been completed.

Task Standard: Cold leg recirculation flow is established and the core is adequately cooled (i.e., adequate Recirc flow).

Required Materials: None

General References: 2-ES-1.3, Transfer to Cold Leg Recirculation

Initiating Cue:

You are the BOP and the CRS has directed you to align the plant for cold leg Recirc in accordance with ES-1.3, Transfer to Cold Leg Recirculation, commencing at step 4 up to and including the determination that adequate low head recirculation flow has been established.

Time Critical Task: No

Validation Time: 20 Minutes

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain Correct Procedure

Standard: Obtain current revision of 2-ES-1.3

Comment:

2. Performance Step: Observe CAUTION before step 4

Standard: Reviews Caution

Comment: Step 4

Note for examiner. This CAUTION is important because it tells the candidate to trip safeguards pumps to prevent damage due to loss of suction. The candidates should be periodically monitoring RWST level to determine if SI and Containment Spray pumps should be stopped.

3. Performance Step: Reduce 480V Bus Loads

Standard: Observe Charging Pumps OFF
Observe PRZR Heaters OFF

Comment: Step 4

4. Performance Step: One at time, Depress Containment Spray Reset Pushbuttons

Standard: Depress Pushbuttons

Comment: Step 5

It is not necessary to reset Containment Spray at this time. It was reset at step 6 of E-1. Candidate may attempt to reset and/or verify relays are reset.

Performance Information

(Denote critical steps with a check mark √)

√ 5. Performance Step:	**Place Safety Injection Recirc Switches 1 and 3 to ON**
Standard:	**Rotate Recirc Switches 1 and 3 to ON position** **Check 22 SI Pump Stopped Panel SBF-2** **Check 21 Containment Spray Pump Stopped Panel SBF-1** **Check RHR Pumps Both Stopped Panel SBF-1**

Comment: Step 6

6. Performance Step:	Align Service Water as follows: Check Service Water Aligned for 3 header ops. Verify SWN-4 & 5 Closed
Standard:	Three header ops was given in Initial Conditions. Contact Conventional NPO to verify SWN-4 & 5 Closed

CUE: SWN-4 and 5 are closed.

Comment: Step 7

7. Performance Step:	Observe NOTE before Step 8
Standard:	Reviews NOTE before Step 8

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 8. Performance Step: **Place Safety Injection Recirc Switch 2 to ON**

Standard: **Rotate Switch to ON position**
Check one service water pump supplying Non-Essential Header Yes
Check 3 CCW Pumps Running Yes
Stop 23 CCW Pump Panel SGF
Check Function Complete Light LIT YES Panel SBF-1

Comment: Step 8
Only Recirc Switch reposition is critical

√ 9. Performance Step: **Verify One RHR Heat Exchange Isolated**

Check 822A & B Open
Check 746 & 747 Open
Close 746

Standard: Observes 822A & B Open Panel SBF-1
Check 746 & 747 Open Panel SBF-1
Rotate Switch for 746 to Close Panel

Comment: **Only action to Close 746 is critical.**

---

10. Performance Step: Align Safety Injection Recirc Switch 4 as follows
Manually Start 21 Recirculation Pump

Standard: Rotate Switch to Start Position
Observe Pump Not Running

Comment: Step 10 Panel SBF-1

Performance Information

(Denote critical steps with a check mark √)

11. Performance Step:	If 21 pump can NOT be started, then manually start 22 recirculation pump
Standard:	Rotate Switch to Start Position Observe Pump Not Running
Comment: Step 10 RNO Panel SBF-1	
√ 12. Performance Step:	If neither recirculation pump can be started, perform Attachment 2
Standard:	Go to Attachment 2
Comment:	
13. Performance Step:	Check if FSB Ventilation Previously Shutdown
Standard:	Contact NPO to shutdown ventilation Given in Initial Conditions
Comment: Att 2 Step 1	
14. Performance Step:	Observe Cautions and Notes before Step 2
Standard:	Reviews Cautions and Notes
Comment:	

Performance Information

(Denote critical steps with a check mark √)

15. Performance Step:	Establish Cold Leg recirculation using RHR Pumps Check 885A and 885B both energized
Standard:	Observes 885A and B energized
Comment: Att. 2 Step 2a Panel SBF-1	
√ 16. Performance Step:	Dispatch NPO to energize MOV 882 at MCC 26B
Standard:	Simulate Radio contact NPO to energize valve
CUE: Acknowledge and report 882 is energized	
Comment: Booth Operator	Energize MOV-882 LOA-EPS492 CLOSED Drawing Index EPS21 – Click on Breaker and Close in dialog box
17. Performance Step:	Verify the following Safety Injection Recirc Switches are OFF Recirc Switch 3 Recirc Switch 4 Recirc Switch 5
Standard:	Rotate Recirc Switch 3 to OFF Observe Recirc Switches 4 and 5 in OFF (Not Critical)
Comment: Att. 2 Step 2c Panel SBF-1	

Performance Information

(Denote critical steps with a check mark √)

18. Performance Step:	Verify RHR Pumps Both Stopped
Standard:	Observe operating lights for RHR Both OFF
Comment: Att. 2 Step 2d Panel SBF-1	
19. Performance Step:	Stop Both Recirc Pumps
Standard:	Observe both Recirc Pumps stopped
Comment: Att. 2 Step 2e Panel SBF-1	
20. Performance Step:	Close 1802A and 1802B
Standard:	Observe both valves closed
Comment: Att. 2 Step 2f Panel SBF-1 Neither valve was opened	
21. Performance Step:	Close RHR pump suction valve from RWST MOV-882
Standard:	Rotate switch to Close position
Comment: Att. 2 Step 2g Panel SBF-1	

Performance Information

(Denote critical steps with a check mark √)

√ 22. Performance Step: Establish recirculation flow path for RHR pumps
Verify RHR Discharge Valve (MOV-744) Open
Verify RHR Suction Valves from Containment Sump are Open
1805 (Normally Open)
MOV-885A
MOV-885B

Standard: Observe Valve Position Indicators all indicate Open
Rotate Switches for MOV 885A and 885B to Open

May dispatch an NPO to verify 1805 Opened. If so:

CUE: Acknowledge direction and report 1805 is open

Comment: Att. 2 Step 2h Panel SBF-1

√ 23. Performance Step: Start 22 RHR Pump

Standard: Rotate switch to Start position

Comment: Att. 2 Step 2i Panel SGF-1

24. Performance Step: Return to Step in effect

Standard: Returns to Step 11

Comment:

Performance Information

(Denote critical steps with a check mark √)

25. Performance Step:	Determine if Adequate Low Head Recirculation Flow has been established Check ALL Flow meters (946A-D) Greater than 500 gpm
Standard:	Observes all 956 indicators greater than 500 gpm

Comment: Step 11 Panel SBF-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: _____ _____

Reset Simulator to any 100% IC
Insert Malfunction MAL-RCS-005A
Perform the actions of E-0 including Attachment 1.
Perform the first 18 steps of E-1.
Perform the first 5 steps of ES-1.3
Allow RWST level to decrease to 9.24 feet.
Ensure both RWST Low Low Level Alarms are up.

Ensure Three Header Operations Placard is in place at the service water header selector switch.

Perform the Required Actions to Align the SI System for Recirculation during Transfer to Cold Leg Recirculation (Manual Start of 21 Recirc Pump)

Initial Conditions:

- A large break LOCA has occurred.
- Safety Injection has been RESET in accordance with E-1, Loss of Reactor or Secondary coolant.
- The RWST level has decreased to 9.24 feet and the CRS has directed you to transfer to cold leg recirculation in accordance with ES-1.3
- All steps up through and including step 18 of E-1 have been completed.
- FSB Ventilation was previously shutdown
- The service water system is aligned for three header operation.
- The first 3 steps of ES-1.3 have been completed.

Initiating Cue:

You are the BOP and the CRS has directed you to align the plant for cold leg Recirc in accordance with ES-1.3, Transfer to Cold Leg Recirculation, commencing at step 6 up to and including the determination that adequate low head recirculation flow has been established.

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

Facility: IPEC UNIT 2 Task No: 0100180421

Task Title: **Respond to a Pressurizer Low Pressure Alarm**

K/A Reference: 000027A101 RO – 4.0 SRO-3.9 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:

- The plant is operating at 100% power
- No Equipment is Out of Service

Task Standard: Pressurizer pressure stable, reactor tripped with 23, 24 and 21or 22 RCPs tripped.

Required Materials: None

General References: 2-ARP-SAF

Initiating Cue:

You are the ATC. Respond to changing plant conditions or events.

Time Critical Task: No

Validation Time: 15 minutes

Performance Information

(Denote critical steps with a check mark √)

NOTE:

Candidate may diagnose failed open Spray Valve at any time during this JPM. The exact order of actions before the Reactor Trip is not important, and they may be performed in any order.

The reactor must be tripped before the Reactor Coolant Pumps are tripped.

1. Performance Step:	Acknowledge Pressurizer Low Pressure 2185 psig Alarm and refer to ARP
Standard:	Observe alarm and retrieve ARP from holder

Comment: Candidate may recognize pressure lowering before alarm annunciates.

2. Performance Step:	Compare redundant Pressurizer Pressure indicators
Standard:	Observe pressure decreasing on all 4 channels

Comment: ARP Step 3.1

3. Performance Step:	Verify Heaters and Sprays are operating properly.
Standard:	Observe Heaters energized and one spray valve opened

Comment: ARP Step 3.2 Candidate may diagnose stuck open spray valve at this time

4. Performance Step:	Evaluate and perform the following: • If pressure reduction is due to a rapid temperature reduction OR rapid load increase then go to appropriate procedure.
Standard:	Determine pressure reduction NOT due to temperature or load change

Comment: ARP Step 3.3

Performance Information

(Denote critical steps with a check mark √)

5. Performance Step:	IF the Pressurizer heaters or sprays are NOT operating properly, THEN PLACE Pressurizer Pressure Master Controller in MANUAL and ATTEMPT to establish RCS pressure at 2235 psig.
Standard:	Transfer controller to Manual (T-bar up) and output adjusted to Heaters (Left of null)

Comment: ARP Step 3.4

6. Performance Step:	If Foxboro control for a spray valve has failed the valve open, then: • Fail the affected valve closed by lifting out the control module and pulling the fuse
Standard:	Observes Spray Valve NOT Closed and removes controller from Flight Panel. When controller is removed, then fuse is removed from back.

Cue: The controller is removed from the panel, and the fuse is removed from the controller.

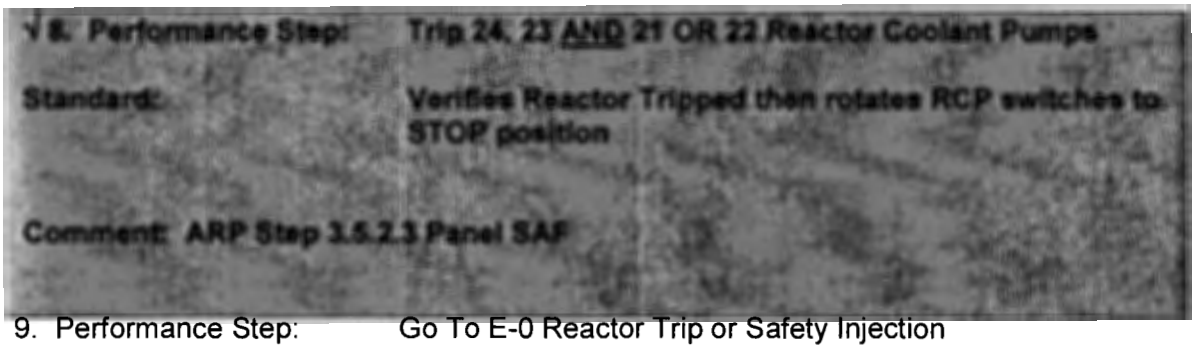
Comment: ARP Step 3.5.1
Removal of the fuse is NOT critical because it will not cause the spray valve to close. The risk of dropping the fuse holder inside the flight panel is significant.

√ 7. Performance Step:	If Spray Valve(s) does NOT closed, Then • TRIP the Reactor • If operating, trip the turbine
Standard:	Identifies spray valve will not close; depresses the Rx TRIP button on Panel FCF. Observes Turbine Tripped

Comment: ARP Step 3.5.2.1 and 3.5.2.2

Performance Information

(Denote critical steps with a check mark √)



9. Performance Step: Go To E-0 Reactor Trip or Safety Injection

Standard: Observes conditions to verify reactor tripped

Comment: ARP Step 3.5.2.4

Terminating Cue: JPM Complete

NOTE: If a Safety Injection occurs during the performance of this JPM, it is likely a failure. The candidate's progress through the required actions will determine actual pass or fail grade.

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 100% IC

Insert Malfunction: MAL-CVH-RCS002B 75% 120 Second Ramp.

Insert Schedule: **Failed auto rx trips.sch** to fail automatic reactor trip with manual trip available.

Initial Conditions:

- The plant is operating at 100% power
- No Equipment is Out of Service

Initiating Cue:

You are the ATC. Respond to changing plant conditions or events.

Facility: IPEC UNIT 2 Task No: 0590060321

Task Title: **Transfer Main Feed from LFBV to MFRV During Power Ascension**

K/A Reference: 059000A403 RO – 2.9 SRO – 2.9 Job Performance Measure No: Sim D

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 plant is at approximately 30% power
- Steam and Feed Flow signals are approximately 900,000 lbm/hr
- SG level is currently being maintained by the Low Flow Bypass Valves
- 22, 23, and 24 FRVs are in Automatic.
- An NPO is standing by 21 FRV.
- All necessary Precautions and Limitations are met.

Task Standard: 21 Steam Generator Level is being control by 21 Main Feedwater Regulating Valve in Automatic.

Required Materials: None

General References: 2-SOP-21.1, Main Feedwater System

Initiating Cue: You are the ATC and the CRS has directed you to

- Transfer 21 SG feedwater control from the Low Flow Bypass Valve to the Main Feed Regulating Valve (MFRV) in MANUAL in accordance with 2-SOP-21.1, Main Feedwater System Step 4.2.1.1c(1) – 4.2.1.1c(7).
- When 21 MFRV operation is verified satisfactory transfer 21 MFRV to Automatic.

Time Critical Task: No

Validation Time: 15

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step:	Obtain correct procedure
Standard:	Obtains 2-SOP-21.1

Comment: Hand the candidate the procedure.

2. Performance Step:	Observe NOTES before step 4.2.1.1
Standard:	Reviews NOTES
Comment:	

3. Performance Step:	Verify selected 21 FW Regulator controller on the Flight Panel is in MAN AND Closed.
Standard:	Observes Controller in MAN and Potentiometer rotated to 0 position

Comment: Step 4.2.1.1a Panel FBF

4. Performance Step:	If desired to transfer level control in AUTO then go to step 4.2.1.1d.
Standard:	It is not desired to transfer level control in AUTO
Comment:	

Performance Information

(Denote critical steps with a check mark √)

√ 5. Performance Step:	**SLOWLY begin closing 21 Feedwater Bypass Valve until SG level begins to trend down.**
Standard:	**Rotate 21 Feedwater Bypass Valve potentiometer in the close direction (clockwise)**
Comment:	**Step 4.2.1.1c(1) Panel FBF**

√ 6. Performance Step:	**OPEN 21 Man Feedwater Regulating Valve to restore level to program**
Standard:	**Rotate 21 Main Feedwater Regulating Valve potentiometer in the open direction (counter clockwise)**
Comment:	**Step 4.2.1.1c(2) Panel FBF**

√ 7. Performance Step:	**REPEAT steps 4.2.1.1c(1) AND 4.2.1.1c(2) until Feedwater Bypass Valve is Closed**
Standard:	**Rotate 21 Feedwater Bypass Valve potentiometer in close direction** **Rotate 21 Main Feedwater Regulating Valve potentiometer in open direction**
Comment:	**Step 4.2.1.1c(3) Panel FBF**

Performance Information

(Denote critical steps with a check mark √)

8. Performance Step: Verify 21 3 element controller FC-417 in Rack B5 is in AUTO

Standard: Locate Controller in Rack B5 and observe it is in AUTO

CUE: A Spare operator will monitor SG levels

Comment: Step 4.2.1.1c(4) Rack B5

9. Performance Step: Verify 21 SG level is on trend near programmed level

Standard: Observe 21 SG level trend; make adjustments as necessary.

Comment: This is dependent on the candidate ability to smoothly control feedwater flow in Manual
Step 4.2.1.1c(5) Panel FBF

10. Performance Step: Verify 21 SG Steam Flow and Feed Flow indication are matched

Standard: Observe 21 SG Steam Flow and Feed Flow approximately equal at 900,000 lbm/hr

Comment: This is dependent on the candidate ability to smoothly control feedwater flow in Manual
Step 4.2.1.1c(6) Panel FBF

Performance Information

(Denote critical steps with a check mark √)

√ 11. Performance Step:	**Place 21 FW Regulator controller to AUTO**
Standard:	**Move switch to AUTO position** **Observe FRV response stable (NOT erratic)**

Comment: Step 4.2.1.1c(7) Panel FBF

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 IC 231

Place MFRVs in Manual
Open LFBVs and Close MFRVs.
Stabilize SG Level.

Override 22 Booster Fan Switch to Stop Position to prevent starting.
SWI HVA011A – STOP Position

Take a snapshot if JPM is given more than once.

Initial Conditions:

- The plant is at approximately 30% power
- Steam and Feed Flow signals are approximately 900,000 lbm/hr
- SG level is currently being maintained by the Low Flow Bypass Valves
- An NPO is standing by 21 FRV.
- All necessary Precautions and Limitations are met.

Initiating Cue:

You are the ATC and the CRS has directed you to

- Transfer 21 SG feedwater control from the Low Flow Bypass Valve to the Main Feed Regulating Valve (MFRV) in MANUAL in accordance with 2-SOP-21.1, Main Feedwater System Step 4.2.1.1c(1) – 4.2.1.1c(7).
- When 21 MFRV operation is verified satisfactory transfer 21 MFRV to Automatic.

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

Facility: IPEC UNIT 2 Task No: 0000300521

Task Title: **Perform the Required Actions to Reset FCU Services and CCR Ventilation**

K/A Reference: 022000A4.01 SRO – 3.6 RO – 3.6 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:

- SI was initiated due to a steam break in the Turbine Building.
- MSIVs were closed
- All required actions of E-0 have been completed.
- SI, Phase A & B have been reset.
- The CRS is addressing the remainder of the items in step 22.

Task Standard: Fan Cooler Unit Services and CCR Ventilation have been RESET.

Required Materials: Screwdriver

General References: 2-ES-1.1 SI Termination

Initiating Cue: You are the BOP and the CRS has directed you to reset FCU Services and CCR Ventilation in accordance with ES-1.1 step 22.

Time Critical Task: No

Validation Time: 15 Min

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain Correct Procedure

Standard: Obtain current revision of 2-ES-1.1

Comment:

√ 2. Performance Step: Place the following control switches in the position indicated:

- **TCV-1104 OPEN**
- **TCV-1105 OPEN**

Standard: Rotate switches to Open position

Comment:Step 22 (6th bullet) Panel SBF-1

3. Performance Step: Verify the following control switches in the position indicated:

- FCU NORM OUT valves OPEN

Standard: Observe Switches in OPEN

Comment: Step 22 (6th bullet) Panel SBF-2

Performance Information

(Denote critical steps with a check mark √)

√ 4. Performance Step: **Place the following control switches in the position indicated:**
- **Place Mode Selector Switch to 2**

Standard: **Rotate switch to position 2**

Comment: Step 22 (6th bullet) Panel PY2

√ 5. Performance Step: **Place the following switches to CUTOUT**
- **Unit -1 K-8 fan switch (OT2-3)**
- **OT2-1**
- **OT2-2**

Standard: **Rotate switches to CUTOUT**

Comment: Step 22 (6th Bullet) Panel PY2 Back corner of Simulator Control Room

---

Performance Information

(Denote critical steps with a check mark √)

√ 6. Performance Step: **Depress both Reset buttons in racks E-7 and F-8 for each of the following:**

- **FCU service Water**
- **FCU ventilation**
- **CCR Ventilation**

Standard: **Reset Pushbuttons Depressed**

Comment: Step 22 (6th bullet) Racks E-7 and F-8 in back of Simulator Control Room

Terminating Cue: JPM Complete

VERIFICATION OF COMPLETION

Job Performance Measure No. Simulator E

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 100% Power IC.
Manually Actuate SI
Perform applicable actions of E-0 including Attachment 1 and ES-1.1 up to 22.

Take a snapshot if JPM is to be given multiple times.

Initial Conditions:

- SI was initiated due to a steam break in the Turbine Building.
- MSIVs were closed
- All required actions of E-0 have been completed.
- SI, Phase A & B have been reset.
- The CRS is addressing the remainder of the items in step 22.

Initiating Cue:

You are the BOP and the CRS has directed you to reset FCU Services and CCR Ventilation in accordance with ES-1.1 step 22.

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

Facility: IPEC UNIT 2 Task No: 0800300121

Task Title: **Transfer Buses 1and 2 to the Unit Auxiliary Transformer**

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:

- A Plant startup is in progress in accordance with 2-POP-1.3 Plant Startup from Zero to 45% Power.
- The turbine has been synchronized with Breakers 7 and 9 closed.

Task Standard: Buses 1 – 4 are transferred to the Unit Auxiliary Transformer.

Required Materials: None

General References: 2-SOP-27.1.4

Initiating Cue: **You are the BOP and the CRS has directed you to transfer 6.9 kV buses 1 and 2 to the Unit Auxiliary Transformer in accordance with 2-SOP-27.1.4**

Time Critical Task: No

Validation Time: 10

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step:	Obtain Correct Procedure and Reviews Precautions and Limitations
Standard:	Obtains 2-SOP-27.1.4 P&Ls reviewed

Comment:

2. Performance Step:	VERIFY Unit Auxiliary Transformer and Station Auxiliary Transformer are within 50 volts.
Standard:	Observes UAT and SAT are within 50 Volts

Comment: Step 4.2.1.1

NOTE to examiner: If Station Auxiliary and Unit Auxiliary Transformer voltages are not within 50 Volts, perform JPM steps 3-5 below.

3. Performance Step:	Place the appropriate Tap Changer in MANUAL
Standard:	Push in handle to place UAT Tap Changer in Manual

Comment: Step 4.1.7.1

NOTE: During validation, the Unit Aux Tap Changer meter was not functioning and the Station Aux volt meter was not indicating properly.

If necessary CUE candidate to use SAT volt meter on the Supervisory Panel SHF.

Performance Information

(Denote critical steps with a check mark √)

4. Performance Step:	Manually adjust Unit Aux Tap Changer to match voltages
Standard:	Rotate switch to raise of lower voltage as necessary
Comment: Step 4.1.7.2	

5. Performance Step:	Place UAT Tap Changer in AUTO
Standard:	Pull Tap Changer Switch to OUT
Comment: Step 4.1.7.3	

√ 6. Performance Step:	**Place 6900V Bus 1 Synchroscope switch to Bus 1 - Unit**
Standard:	**Place Handle into switch location and rotate to Bus 1 Unit position**
Comment: Step 4.2.1.2	

7. Performance Step:	Verify Synchroscope at approximately 12 o'clock
Standard:	Observes Synchroscope at 12 o'clock
Comment: Step 4.2.1.3	

Performance Information

(Denote critical steps with a check mark √)

√ 8. Performance Step:	**Close Normal Feed Breaker UT-1**
Standard:	**Rotate Normal Feed Breaker Switch to Close**
Comment: Step 4.2.1.4	

√ 9. Performance Step:	**Open Bus 1-5 Tie Breaker UT1-ST5**
Standard:	**Rotate Tie Breaker Switch to Open**
Comment: Step 4.2.1.5	

√ 10. Performance Step:	**Place Synchroscope to OFF**
Standard:	**Rotate Switch to OFF**
Comment: Step 4.2.1.6	

11. Performance Step:	VERIFY Unit Auxiliary Transformer and Station Auxiliary Transformer are within 50 volts.
Standard:	Observes UAT and SAT are within 50 Volts
Comment:Step Step 4.2.2.1	

Performance Information

(Denote critical steps with a check mark √)

√ 12. Performance Step:	**Place 6900V Bus 2 Synchroscope switch to Bus 2 - Unit**
Standard:	**Place Handle into switch location and rotate to Bus 2 Unit position**
Comment: Step 4.2.2.2	

13. Performance Step:	Verify Synchroscope at approximately 12 o'clock
Standard:	Observes Synchroscope at 12 o'clock
Comment: Step 4.2.2.3	

√ 14. Performance Step:	**Close Normal Feed Breaker UT-2**
Standard:	**Rotate Normal Feed Breaker Switch to Close**
Comment: Step 4.2.2.4	

√ 15. Performance Step:	**Open Bus 2-5 Tie Breaker UT2-ST5**
Standard:	**Rotate Tie Breaker Switch to Open**
Comment: Step 4.2.2.5	

Performance Information

(Denote critical steps with a check mark √)

√ 16. Performance Step:	**Place Synchroscope to OFF**
Standard:	**Rotate Switch to OFF**

Comment: Step 4.2.2.6

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:

- **A Plant startup is in progress in accordance with 2-POP-1.3 Plant Startup from Zero to 45% Power.**
- **The turbine has been synchronized with Breakers 7 and 9 closed.**

Initiating Cue:

You are the BOP and the CRS has directed you to transfer 6.9 kV buses 1 and 2 to the Unit Auxiliary Transformer in accordance with 2-SOP-27.1.4

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

Facility: IPEC UNIT 2 Task No: 0450040421

Task Title: **Respond to Turbine First Stage Pressure Transmitter Failure**

K/A Reference: 016000A2.01 RO – 3.0 SRO – 3.1 Job Performance Measure No: Sim G

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 indicated power.
- Steady State, equilibrium Xenon.
- No equipment out of service.

Task Standard: .

Required Materials: None

General References: 2-AOP-INST-1, Instrument or Controller Failures
2-AOP-ROD-1, Rod Control and Indication System Malfunctions

Initiating Cue: You are the ATC.

Time Critical Task: No

Validation Time: 10

Performance Information

(Denote critical steps with a check mark √)

√ 1. Performance Step:	**Operator takes Immediate Actions from memory (steps 3.1-3.3)**
	Note: Immediate actions of 2-AOP-INST-1
Standard:	**1. Checks all parameters listed** **2. Determines that PT-412A has failed low**
Comment:	

√ 2. Performance Step:	**Take manual actions as necessary to control parameters and stabilize the plant**
Standard:	**Place Rod Control in Manual**
Comment:	**Procedure step 3.2**

3. Performance Step:	Have all controls systems listed in step 3.1 been checked as being affected?
Standard:	Observe all systems were checked during performance of immediate operator actions.
Comment:	Procedure step 3.3

Performance Information

(Denote critical steps with a check mark √)

4. Performance Step:	Has an instrument failure occurred?
Standard:	Determine an instrument failure has occurred PT-412A failed low.

Comment: Procedure step 4.1

5. Performance Step:	Go To applicable step for the indicated failure
Standard:	Identify step 4.168 is the affected step

Comment: Procedure step 4.2

6. Performance Step:	Has Channel A failed low?
Standard:	Determine 412A has failed low using PICS

Comment: Procedure step 4.168

7 Performance Step:	Are control rods in Manual?
Standard:	Rod control should be in manual at this time

Comment: Procedure step 4.169

Performance Information

(Denote critical steps with a check mark √)

8. Performance Step: Maintain Tavg and Tref per graph RPC-4 (RCS T-ref vs Reactor Power) and restore delta flux to target per CRS direction using any of the following

- Rod Control
- Boration
- Adjust Turbine Load

CUE: The CRS directs restoring Tave using Control Rods.

Standard: Withdraw Control Rods to restore Tavg

Comment: Procedure step 4.170

9. Performance Step: Observe Rods continue to withdraw in Manual after In-Hold-Out switch released

Standard: Observe step counters and IRPI continuing outward motion

Comment: The following steps are from procedure 2-AOP-ROD-1. The candidate may just trip the reactor and go to E-0.

10. Performance Step: Was this procedure entered due to continuous unwarranted rod motion?

Standard: Determines YES

Comment: Procedure step 4.1 (AOP-ROD-1)

Performance Information

(Denote critical steps with a check mark √)

11. Performance Step:	Is rod control in manual
Standard:	Determines rod control is in manual
Comment:	Procedure step 4.2
12. Performance Step:	Does continuous unwarranted rod motion exist?
Standard:	Determines YES
Comment:	Procedure step 4.3
√ 13. Performance Step:	Trip the reactor and go to E-0
Standard:	Push reactor trip pushbutton
Comment:	Procedure step 4.4

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: _____ _____

Any 100 % Power IC

ENSURE GROUP 92 IS DISPLAYED ON ENG CRT PICS MONITOR SHOW GROUP 92

PT-412A, First Stage Turbine Pressure fails Low

XMT-MSS053A FIXED OUTPUT:
PT-412A FIRST STAGE TURBINE PRESSURE C
SEVERITY -14.7

Continuous Rod Motion

Insert Malfunction: MAL-CRF004A to 72 step/min
This malfunction will start when rod motion is initiated.

Initial Conditions:

- Reactor at indicated power.
- Steady State, equilibrium Xenon.
- No equipment out of service.

Initiating Cue:

You are the ATC.

Facility: Indian Point 2 Task No: 0030010101

Task Title: **Start a Reactor Coolant Pump**

K/A Reference: 003000A406 RO – 2.9 SRO – 2.9 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:

- Reactor is shutdown with RCS temperature and pressure as indicated
- 21 Reactor Coolant Pump is fully operational
- The RCS is aligned per COL 1.1
- All applicable Precautions and Limitations are satisfied
- DMIMS is in service
- An NPO is standing by 21 RCP
- The RCP has been secured for 12 hours

Task Standard: 21 RCP is running and its Lift Oil Pump is secured.

Required Materials: None

General References: 2-SOP-1.3, Reactor Coolant Pump Startup and Shutdown.

Initiating Cue: You are the BOP and the CRS has directed you to start 21 RCP in accordance with 2-SOP-1.3 steps 4.1.1 through 4.1.17

Time Critical Task: No

Validation Time: 20

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain correct procedure

Standard: Obtains SOP-1.3

Comment: Evaluator may give candidate the procedure at this time

2. Performance Step: Review Precautions and Limitations

Standard: Check plant lineup and conditions

Comment: Candidate was given all P&Ls were met in Initial Conditions. Candidate may take some time to look at P&Ls but should not take time to evaluate all.

3. Performance Step: If the Containment is accessible then

- Inspect Bearing Lift Oil System for leaks if RCP secured for 30 days or longer
- Inspect JO Bell Oil Level Alarm tubing for damage and leaks

Standard: Bearing Lift Oil System Inspection is not necessary
Contact NPO to inspect Oil Level Alarm

CUE: NPO reports "All conditions normal for 21 RCP"

Comment: Step 4.1.1

Performance Information

(Denote critical steps with a check mark √)

4. Performance Step: Check if RCP should be rotated by hand

Standard: Determine rotation is not necessary (three remaining RCPs are running.

Comment: Step 4.1.2

5. Performance Step: Observe NOTES before step 4.1.3

Standard: Reviews NOTES

Comment:

√ 6. Performance Step: Verify Bearing Lift Pump is Running

Standard: Rotate 21 Bearing Lift Pump switch to Start

Observe red light (breaker closed) and white light (21 Lift Pressure) are both lit

Comment: Step 4.1.3 Panel SAF

Performance Information

(Denote critical steps with a check mark √)

7. Performance Step: Select Containment Microphone to the RCP (21) to be started

Standard: Rotate Microphone switch to 21 RCP

Comment: Step 4.1.4 CRS desk

8. Performance Step: Verify DMIMS Signal Recorder is in service

Standard: DMIMS signal recorder is in service given in Initial Conditions.

CUE: DMIMS Signal Recorder is in service.

Comment: Step 4.1.5

9. Performance Step: If power is being supplied from the Station Auxiliary Transformer
   - Place the Tap Changer in MANUAL
   - RAISE the bus voltage to 7.2 KV

Standard: Push Tap Changer Handle IN for Manual
Rotate switch to RAISE to establish 7.2 KV.

CUE: SAT meter on rear of flight panel is not indicating properly. Use the volt meter on Supervisory Panel SHF.

Comment: This is not critical because on the Simulator the RCP will Start regardless of the voltage.
Step 4.1.6 Panel FCR (rear of flight panel)

Performance Information

(Denote critical steps with a check mark √)

10. Performance Step:	If power is being supplied from GT25/26
Standard:	Determine power is NOT being supplied from GT-25/26 No Action is Required
Comment: Step 4.1.7	

11. Performance Step:	Prior to starting the first of either 23 or 24 RCP, Verify that both spray valves are CLOSED to prevent a pressure transient on the RCS.
Standard:	Observer both 23 and 24 RCP are operating No Action Required
Comment: Step 4.1.8	

12. Performance Step:	Verify Bearing Lift Pump has been running for at least two minutes
Standard:	Determine pump has been operating for 2 minutes
Comment:	It is expected that two minutes has elapsed since the pump was started. If not the candidate should wait until 2 minutes has elapsed. This is NOT critical because the pump would start in less than two minutes. This is an administrative requirement. Step 4.1.9

Performance Information

(Denote critical steps with a check mark √)

13. Performance Step:	Observe NOTE before step 4.1.10
Standard:	Reviews the NOTE

Comment:

14. Performance Step:	NOTIFY Security, the start of an RCP is imminent and the accompanying voltage dip may cause auto start of the Security Diesel
Standard:	Using phone or radio simulate contact Security and inform of imminent start of 21 RCP

CUE: Acknowledge as Security the start of 21 RCP

Comment: Step 4.1.10

15. Performance Step:	Observe CAUTIONS and NOTES before step 4.1.11
Standard:	Reviews Cautions and Notes

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 16. Performance Step: Start the RCP

Standard: **Rotate Switch for 21 RCP to Start position**

Observe Motor Amps off scale high

Observe Flow indication increasing

Verify Reactor Coolant 21 Loop Low Flow Channel Trip 90% alarm clears before motor current returns on scale.

Comment: Step 4.1.11 Panel SAF

17. Performance Step: Verify the normal running current

Standard: Observe AC Amps approximately 400

Comment: Step 4.1.12

18. Performance Step: Place the Containment Microphone to OFF

Standard: Rotate switch to OFF

CUE: ***IF CRS asked if it is desired to turn off the microphone***
"Yes the CRS desires the microphone turned off"

Comment: Step 4.1.13

Performance Information

(Denote critical steps with a check mark √)

19. Performance Step: Closely MONITOR Digital Metal Impact Monitor System DMIMS

Standard: Observes DMIMS display

Comment: Step 4.1.14 DMIMS rack (behind the Flight Panel)

20. Performance Step: MONITOR the following RCP parameters until stable
- RCS Pressure
- Loop flow
- AC Amps
- Steam Generator Levels
- RCP Seal 1 Leakoff flow
- Seal injection flow
- Seal inlet temperature
- Seal outlet temperature
- RCP Vibration
- RCP Bearing temperatures
- RCP Stator temperature

Standard: Observe RCP parameters

Comment: Step 4.1.15

Performance Information

(Denote critical steps with a check mark √)

21. Performance Step:	If power is being supplied from the station Auxiliary Transformer then • RAISE the bus voltage to 7.05 to 7.15 KV • PLACE the tap changer in AUTO
Standard:	Rotate switch as necessary to set bus voltage to 7.05 – 7.15 KV. Pull switch OUT to place tap changer in AUTO

Comment: Step 4.1.16 Panel FCR (rear of flight panel)

22. Performance Step:	When the RCP has run for at least 1 minute then STOP the Bearing Lift Oil Pump
Standard:	Observe 1 minute has elapsed Rotate switch to STOP position

Comment: Step 4.1.17 Panel SAF

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 IC-5
Trip 21 RCP
Allow simulator to run to stabilize plant conditions
If JPM is to be run more than once, take a Snapshot.

Ensure Seal Return Flow is 1.1 gpm or greater. If necessary override indication to 1.1 gpm.

XMT-CVC009A set to 1.1
XMT-CVC008A set to 1.1

Initial Conditions:

- Reactor is shutdown with RCS temperature and pressure as indicated
- 21 Reactor Coolant Pump is fully operational
- The RCS is aligned per COL 1.1
- All applicable Precautions and Limitations are satisfied
- DMIMS is in service
- An NPO is standing by 21 RCP
- The RCP has been secured for 12 hours

Initiating Cue:

You are the BOP and the CRS has directed you to start 21 RCP in accordance with 2-SOP-1.3 steps 4.1.1 through 4.1.17

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

Facility: IPEC UNIT 2 Task No: 0840140421

Task Title: **Align Nitrogen Bottle to 21 Atmospheric Steam Dump**

K/A Reference: 039000A407 RO – 2.8 SRO – 2.9 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:

- **Work in the transformer yard resulted in a loss of instrument air and unit trip.**
- **All MSIVs were closed.**
- **RCS temperature is slowly rising.**

Task Standard: Nitrogen Bottle is aligned to supply 21 SG Atmospheric valve operator.

Required Materials: None

General References: 2-SOP-ESP-001, Local Equipment Operation and Contingency Actions

Initiating Cue: You are the Conventional NPO and the CRS has directed you to align backup nitrogen to 21 Atmospheric Steam Dump Valve in accordance with 2-SOP-ESP-001 Section 4.12.

Time Critical Task: No

Validation Time: 10 Minutes

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain Correct Procedure

Standard: Obtains 2-SOP-ESP-001 and review Precautions and Limitation

CUE: Hand the candidate the procedure

Comment:

2. Performance Step: Observe NOTEs before step 4.12.1

Standard: Reviews Notes

Comment:

√3. Performance Step: To align 21 Atmospheric go to Step 4.12.2

Standard: Continues procedure with step 4.12.2

Comment:

4. Performance Step: If PCV-1134 (21 ATMO) needs to be operated from the CCR, then align backup N_2 as follows

Standard: The next 7 JPM steps will align N_2 to 21 ATMO

Comment: Step 4.12.2

Performance Information

(Denote critical steps with a check mark √)

5. Performance Step: Verify MS 3A, (PCV-1134 Inlet Stop Main Steam Line 21 is OPEN

Standard: Locates MS-3A and observes valve position

CUE: *When valve is located and simulated checked open, "**MS-3A is Opened".***

Comment: Step 4.12.2.1

√ 6. Performance Step: Connect both Nitrogen bottle quick disconnect to the fittings upstream of SGN-522/SGN-524

Standard: Locates quick disconnect hoses and indicates where they are to be connected.

CUE: *When disconnect hoses are located and simulated connected "**Quick Disconnect Hoses are connected".***

Comment: Step 4.12.2.2

√ 7 Performance Step: Open both Nitrogen bottle isolation valves

Standard: Locate Nitrogen bottle isolation valve

Cue: *When valves are located, **Both Nitrogen bottle valves are open***

Comment: NOTE Only ONE nitrogen bottle valve open is critical.

Performance Information

(Denote critical steps with a check mark √)

√ 8. Performance Step: **Open one of the following valves**

- **N-853**
- **N-855**

Standard: **Locate Valve and Open**

CUE: *When either valve is located and simulated opened* ***" The valve is open".***

Comment: **Step 4.12.2.4**

---

9. Performance Step: Verify both f the following regulators are set for 85 psig
   - N-850
   - N-854

Standard: Locate regulators and demonstrate how to adjust pressure

CUE: *When regulators located and candidate demonstrates how to adjust pressure,* ***"The Regulators are set at 85 psig"***

Comment: Step 4.12.2.5

√ 10. Performance Step: **Close IA-806 21 SG ATMO Relief Inst Air Stop**

Standard: **Locate valve and simulate closing**

CUE: *When valve is located and simulated closed* ***"The Valve is Closed"***

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 11. Performance Step: **Open SGN-522 CCR Remote Backup Nitrogen Inlet Stop to 21 ATMO**

Standard: **Locate valve and simulate opening**

CUE: *When the valve is located and simulated opened* ***"The valve is opened".***

Comment: **Step 4.12.2.7**

---

12. Performance Step: Notify the CCR N_2 Bottle Supply is aligned to PCV-1134.

Standard: Simulate calling CCR using radio

CUE: Acknowledge as CCR

Comment: Step 4.12.2.8

Terminating Cue: JPM Complete

VERIFICATION OF COMPLETION

Job Performance Measure No.

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to complete:

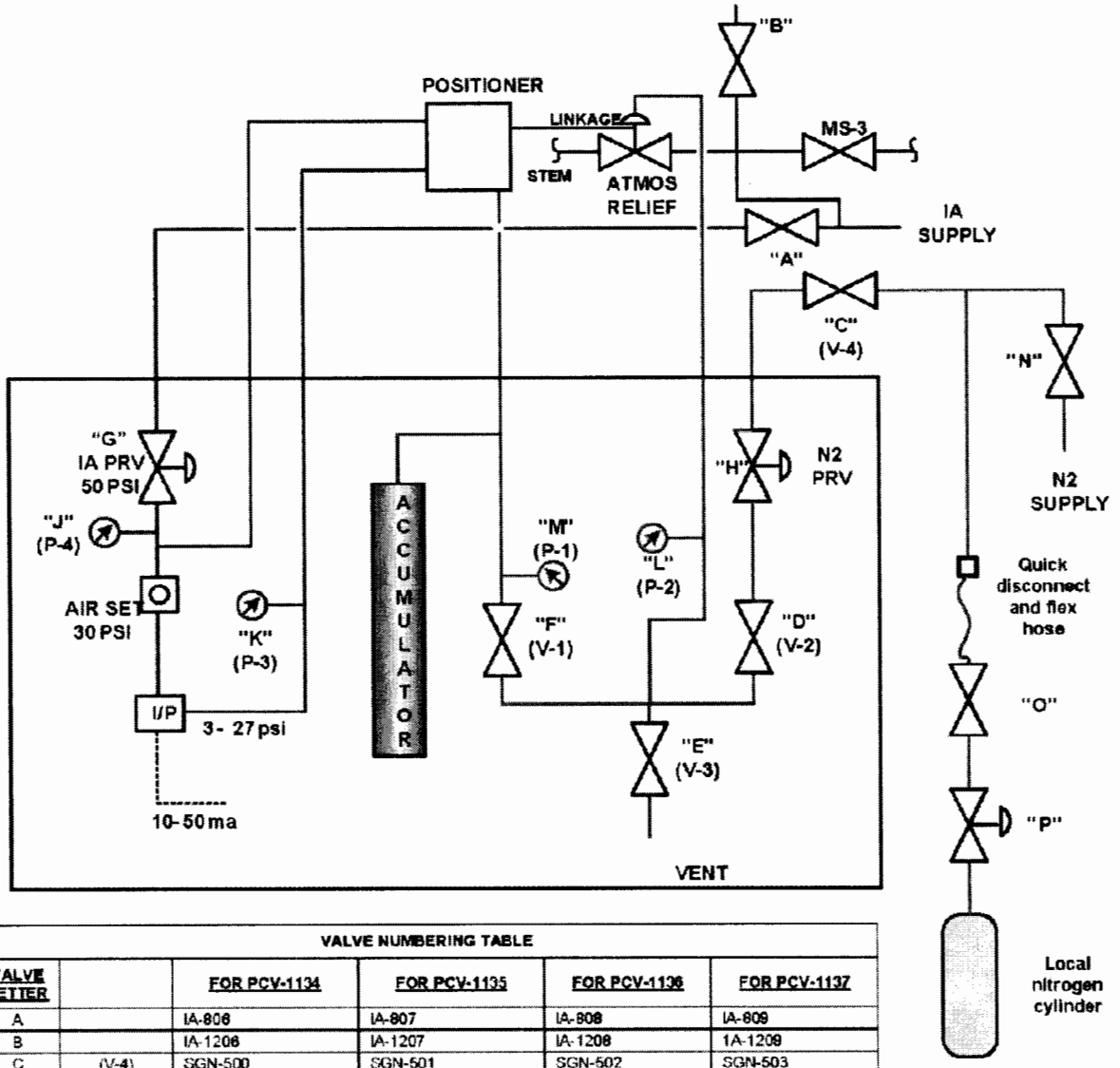
Question Documentation:

Question:

Response:

Result: SAT or UNSAT

Examiner's signature and date: _____ _____



VALVE NUMBERING TABLE					
VALVE LETTER		FOR PCV-1134	FOR PCV-1135	FOR PCV-1136	FOR PCV-1137
A		IA-806	IA-807	IA-808	IA-809
B		IA-1206	IA-1207	IA-1208	1A-1209
C	(V-4)	SGN-500	SGN-501	SGN-502	SGN-503
D	(V-2)	SGN-508	SGN-509	SGN-510	SGN-511
E	(V-3)	IA-1008	IA-1009	IA-1010	IA-1011
F	(V-1)	IA-1202	IA-1203	IA-1204	IA-1205
G		PRV-5607	PRV-5609	PRV-5611	PRV-5613
H		PRV-5608	PRV-5610	PRV-5612	PRV-5614
J	(P-4)	PI-6106	PI-6110	PI-6114	PI-6118
K	(P-3)	PI-6107	PI-6111	PI-6115	PI-6119
L	(P-2)	PI-6108	PI-6112	PI-6116	PI-6120
M	(P-1)	PI-6109	PI-6113	PI-6117	PI-6121
N		SGN-520	SGN-520	SGN-521	SGN-521
O		N-853	N-853	N-851	N-851
P		N-850	N-850	N-852	N-852

Initial Conditions:

- Work in the transformer yard resulted in a loss of instrument air and unit trip.
- All MSIVs were closed.
- RCS temperature is slowly rising.

Initiating Cue:

You are the Spare RO and the CRS has directed you to align backup nitrogen to 21 Atmospheric Steam Dump Valve in accordance with 2-SOP-ESP-001 Section 4.12.

Facility: IPEC UNIT 2 Task No: 0720060122

Task Title: **Secure Discharge Lineup for 23 Large Gas Decay Tank and Lineup 24 Large Gas Decay Tank for Release.**

K/A Reference: 071000A405 RO – 2.6 SRO – 2.6 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 system is aligned in accordance with COL 5.2.1.**
- **Preparations are being made for a refueling outage**
- **Release of 23 Large Gas Decay Tank (LGDT) has just been completed**
- **N_2 purge of 23 LGDT will NOT be performed**
- **The SM has directed 24 Large Gas Decay Tank is to be released.**
- **24 Large Gas Decay Tank had been isolated, sampled, and the sample has been analyzed.**
- **A PAB Exhaust Fan is Running**
- **Iodine and Particulate Composite Collection Device IS in place**
- **Release Permit has been completed and approved to release 24 LGDT in accordance with SOP-5.2.1.**
- **Radiation Monitor R-44 is in service**
- **Radiation Monitor R-44 High Alarm setpoint was NOT adjusted**
- **R_{TA} for the release permit is 3.525 E-06 µCi/cc**
- **Release Permit Number 140015**
- **T_{MIN} 45 min**
- **Planned Release Time 20 min**

Task Standard: 23 Large Gas Decay Tank Lineup secured and 24 Large Gas Decay Tank is lined up for release.

Required Materials: None

General References: 2-SOP-5.2.1, Gaseous Waste Disposal SystemOperation
2-SOP-5.2.3, Gas Analyzer

Initiating Cue:

You have been directed to SIMULATE securing the lineup for 23 Large Gas Decay Tank in accordance with SOP-5.2.1 step 4.4.13 and lineup 24 Large Gas Decay Tank for release in accordance with SOP-5.2.1 Attachment 4 section 1

Time Critical Task: No

Validation Time: 20 minutes

Performance Information

(Denote critical steps with a check mark √)

√ **1. Performance Step:** **When release has been completed,:**

- **If N_2 purge will not be performed then close RCV-014 and go to step 4.4.14**

Standard: **N_2 purge will not be performed (given in initial conditions)**
Rotate regulator to left to decrease air pressure on indicator on Waste Disposal Panel

CUE: Air pressure is ZERO
Green Light is LIT
Red Light is OFF

Comment: **Procedure step 4.4.13.1**

---

2. Performance Step: Enter finishing time in Unit Narrative Log

Standard:

CUE: "The FSS has made the Unit Narrative Log entry".

Comment: Procedure step 4.4.14

Performance Information

(Denote critical steps with a check mark √)

√ 3. Performance Step: **Verify Gas Analyzer is returned to AUTO (sampling the in service GDT)**

- Verify all Sample-Bypass Switches are BYPASSED per step 4.1.7 with the noted exception (Not Critical)
- **Place the LGDT Sample-Bypass Switch in SAMPLE**
- Place the MODE Switch in AUTO (Not Critical)

Standard: Observes all switches in BYPASS (Not Critical)
Rotate the LGDT Sample-Bypass Switch to SAMPLE
Rotate the MODE Switch to AUTO

CUE: hand candidate procedure 2-SOP-5.2.3
When switches are located:
"All Sample-Bypass Switches are in BYPASS"
"The LGDT Sample-BYPASS switch is in Sample"
"The MODE Switch is in AUTO"

Comment: **Procedure 2-SOP-5.2.3**

---

4. Performance Step: Complete Section 2 of Discharge Sample Checkoff to restore normal system lineup

Standard: Perform next 3 JPM Steps

Comment: Procedure Step 4.4.15

Performance Information

(Denote critical steps with a check mark √)

√ 5. Performance Step: **1619 23 LGDT Outlet Stop – Closed**

Standard: **Locate Valve and Simulate Closing**

CUE: When valve is located, "The valve is closed"

Comment: **2-SOP-5.2.1 Attachment 3 Section 2**

√ 6. Performance Step: **1644C PCV-1038A Inlet Stop – OPEN**

Standard: **Locate Valve and Simulate Opening**

CUE: When valve is located, "The valve is opened"

Comment: **2-SOP-5.2.1 Attachment 3 Section 2**

---

7 Performance Step: 1643C 23 LGDT Stop (Inlet and PT) – OPEN

Standard: Locate Valve and Observe OPENED

CUE When Valve is located, "The valve is opened".

Comment: This step is not critical; the valve is expected to be opened.

---

8. Performance Step: Return completed applicable attachment to CCR

Standard:

CUE: "The FSS will return the attachment to the CCR"

Comment:

Performance Information

(Denote critical steps with a check mark √)

9. Performance Step: Verify RCV-014 Plant Stack Discharge Valve is CLOSED

Standard: Locate Valve and observe closed indications.

CUE: When the valve is located, "The valve is closed"

Comment: This step is not critical; the valve was closed at the beginning of this evolution.

10. Performance Step: Determine appropriate Discharge/Sample Checkoff Attachment to be used for discharge and Align selected GDT (Attachment 4 – 24 LGDT) for release by completing Section 1

Standard: Simulate performing the next 3 JPM steps

Comment:

√ 11. Performance Step: 1644D PCV-1039 Outlet Stop – CLOSED

Standard: Locate 1644D and simulate closing

CUE: When the valve is located, "The valve is closed"

Comment: 2-SOP-5.2.1 Attachment 4 Section 1

Performance Information

(Denote critical steps with a check mark √)

√ 12. Performance Step: 1620 24 LGDT Outlet Stop – OPENED

Standard: Locate 1620 and simulate closing

CUE: When the valve is located, "The valve is opened"

Comment: 2-SOP-5.2.1 Attachment 4 Section 1

---

13. Performance Step: 1643D 24 LGDT Stop (Inlet and PT) – OPENED

Standard: Locate 1644D and simulate Verifying Open

CUE: When the valve is located, "The valve is OPENED"

Comment: 2-SOP-5.2.1 Attachment 4 Section 1

---

14. Performance Step: Verify remaining valves on Attachment 4 - CLOSED

Standard: Locate each valve and simulate checking CLOSED

CUE: When valves are located, "The valve is closed".

Comment: *Valves 1632 and PCV-1039B can be verified closed on the Waste Disposal Panel or the valves can be visually verified closed locally.*

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: _____ _____

GASEOUS WASTE DISPOSAL SYSTEM OPERATION	No:2-SOP-5.2.1 Rev: 33
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ATTACHMENT 3
23 LGDT Discharge / Sample Checkoff
(Page 1 of 1)

Release Permit Number 140015 R_{TA} = 3.17 E -6 µCi/cc

T_{MIN} = 47 min. {SEE Attachment 8} Planned Release Time (T) = 20 mim

NOTE

- WHEN multiple LGDTs are to be sampled and released, THEN additional associated discharge stops are NOT closed as called for below.
- Chemistry Manager permission is required, when a 23 LGDT is >1E-2 uCi/cc

1.0	23 Large Gas Decay Tank Start of Discharge		Position	Init.	Date
•	1644C	PCV-1038A Inlet Stop	CLOSED	[illegible]	Today
•	1631	23 LGDT Reuse Outlet	CLOSED	[illegible]	Today
•	PCV-1038B	Gas Analyzer Sample Inlet	CLOSED	[illegible]	Today
•	1617	21 LGDT Outlet Stop	CLOSED	[illegible]	Today
•	1618	22 LGDT Outlet Stop	CLOSED	[illegible]	Today
•	1620	24 LGDT Outlet Stop	CLOSED	[illegible]	Today
•	1652F	21 SGDT Outlet Stop	CLOSED	[illegible]	Today
•	1652E	22 SGDT Outlet Stop	CLOSED	[illegible]	Today
•	1652D	23 SGDT Outlet Stop	CLOSED	[illegible]	Today
•	1652C	24 SGDT Outlet Stop	CLOSED	[illegible]	Today
•	1652B	25 SGDT Outlet Stop	CLOSED	[illegible]	Today
•	1652A	26 SGDT Outlet Stop	CLOSED	[illegible]	Today
•	1619	23 LGDT Outlet Stop	OPEN	[illegible]	Today
•	1643C	23 LGDT Stop (Inlet and PT)	OPEN	[illegible]	Today

2.0	Termination of Discharge				
•	1619	23 LGDT Outlet Stop	CLOSED	___	_____
•	1644C	PCV-1038A Inlet Stop	OPEN	___	_____
•	1643C	23 LGDT Stop (Inlet and PT)	OPEN	___	_____

Completed by:_____ Date:_____ Time:_____

GASEOUS WASTE DISPOSAL SYSTEM OPERATION	No:2-SOP-5.2.1 Rev: 33
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ATTACHMENT 4
24 LGDT Discharge / Sample Checkoff
(Page 1 of 1)

Release Permit Number 140016 R_{TA} = 3.525E-6 µCi/cc

T_{MIN} = 45 min. {SEE Attachment 8} Planned Release Time (T) = 20 mim

NOTE

- WHEN multiple LGDTs are to be sampled and released, THEN additional associated discharge stops are NOT closed as called for below.
- Chemistry Manager permission is required, when a 24 LGDT is >1E-2 uCi/cc

1.0	24 Large Gas Decay Tank Start of Discharge		Position	Init.	Date
•	1644D	PCV-1039A Inlet Stop	CLOSED	___	_____
•	1632	24 LGDT Reuse Outlet	CLOSED	___	_____
•	PCV-1039B	Gas Analyzer Sample Inlet	CLOSED	___	_____
•	1617	21 LGDT Outlet Stop	CLOSED	___	_____
•	1618	22 LGDT Outlet Stop	CLOSED	___	_____
•	1619	23 LGDT Outlet Stop	CLOSED	___	_____
•	1652F	21 SGDT Outlet Stop	CLOSED	___	_____
•	1652E	22 SGDT Outlet Stop	CLOSED	___	_____
•	1652D	23 SGDT Outlet Stop	CLOSED	___	_____
•	1652C	24 SGDT Outlet Stop	CLOSED	___	_____
•	1652B	25 SGDT Outlet Stop	CLOSED	___	_____
•	1652A	26 SGDT Outlet Stop	CLOSED	___	_____
•	1620	24 LGDT Outlet Stop	OPEN	___	_____
•	1643D	24 LGDT Stop (Inlet and PT)	OPEN	___	_____

2.0	Termination of Discharge				
•	1620	24 LGDT Outlet Stop	CLOSED	___	_____
•	1644D	PCV-1039A Inlet Stop	OPEN	___	_____
•	1643D	24 LGDT Stop (Inlet and PT)	OPEN	___	_____

Completed by:_____ Date:_____ Time:_____

Initial Conditions:

- The system is aligned in accordance with COL 5.2.1.
- Preparations are being made for a refueling outage
- Release of 23 Large Gas Decay Tank (LGDT) has just been completed
- N_2 purge of 23 LGDT will NOT be performed
- The SM has directed 24 Large Gas Decay Tank is to be released.
- 24 Large Gas Decay Tank had been isolated, sampled, and the sample has been analyzed.
- A PAB Exhaust Fan is Running
- Iodine and Particulate Composite Collection Device IS in place
- Release Permit has been completed and approved to release 24 LGDT in accordance with SOP-5.2.1.
- Radiation Monitor R-44 is in service
- Radiation Monitor R-44 High Alarm setpoint was **NOT** adjusted
- R_{TA} for the release permit is 3.525 E-06 µCi/cc
- Release Permit Number 140015
- T_{MIN} 45 min
- Planned Release Time 20 min

Initiating Cue:

You have been directed to **SIMULATE** securing the lineup for 23 Large Gas Decay Tank in accordance with SOP-5.2.1 step 4.4.13 and lineup 24 Large Gas Decay Tank for release in accordance with SOP-5.2.1 Attachment 4 section 1

Facility: IIPEC Unit 2 Task No: 0001070521

Task Title: **Perform the Required Actions to Replace 21 Feedwater Regulating Bypass Valve Air Lines for Local Operation during Loss of Secondary Heat Sink**

K/A Reference: 00WE05A101 RO – 4.1 SRO – 4.0 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:

- **A loss of Secondary Heat Sink has occurred.**

Task Standard: Air control line for Main Feed Bypass Regulating Valve, FCV-417L, replaced properly in accordance with FR-H.1, Attachment 2.

Required Materials: None

General References: 2-FR-H.1, Loss of Secondary Heat Sink

Initiating Cue:

The CCR has directed you to replace the control air line on FCV-417L Main Feed Bypass Regulating Valve for 21 Feed Line, in accordance with Attachment 2 of FR-H.1.

Time Critical Task: No

Validation Time: 25

Performance Information

(Denote critical steps with a check mark √)

1. Performance Step: Obtain correct procedure

Standard: Obtains current revision of 2-FR-H.1

Comment: Hand candidate 2-FR-H.1

√ 2. Performance Step: Locate Flexible Air Line and wrench

Standard: Flexible Air hose and wrench located in Aux Boiler Feed Pump Building

Comment: Tubing is located in pipe attached to hand rail by Feedwater Regulating Bypass Valves.

√ 3. Performance Step: Disconnect Positioner Output Air Line

Standard: Air line disconnected at point A on Attachment 2

CUE: Airline is disconnected

Comment:

Performance Information

(Denote critical steps with a check mark √)

√ 4. Performance Step: **Disconnect Steam Generator Feedwater Trip Solenoid Air Line Tubing**

Standard: **Air Line disconnected at point B on Attachment 2 (Bottom of diaphragm)**

CUE: Airline is disconnected

Comment:

√ 5. Performance Step: **Connect male end of flex tubing to Positioner Output Airline Tubing**

Standard: **Airline connected at Point A on Attachment 2**

CUE: Airline is connected

Comment:

√ 6. Performance Step: **Connect female end of flex tubing**

Standard: **Airline connected at point B on Attachment 2 (bottom of diaphragm)**

CUE: Airline is connected

Comment:

Performance Information

(Denote critical steps with a check mark √)

7 Performance Step:	Notify Control Room to place 21 SG bypass feedwater flow control valve controller to OPEN
Standard:	Contact Control Room using radio.

CUE: Acknowledge Place 21 SG bypass flow control valve to OPEN.

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 loss of Secondary Heat Sink has occurred.

Initiating Cue:

The CCR has directed you to replace the control air line on FCV-417L Main Feed Bypass Regulating Valve for 21 Feed Line, in accordance with Attachment 2 of FR-H.1.

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

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions:
Reset simulator to 90% power IC Load Simulator Schedule-Scenario1
The Plant is at 90% power.
22 SI Pump is OOS
Ensure 23 Charging Pump, 23 SWP and 26 SWP are in service

Turnover:
Return plant to 100% power over the next hour.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R (ATC) N (CRS) N (BOP)	Power Escalation
2	MOT-SWS008A	C(BOP) TS(CRS)	23 SW Pump trips.
3	XMT-SGN034A	I (ATC) I (CRS)	PT-404 Steam Header Pressure fails high causing MBFPs to be placed in manual.
4	MAL-EPS007D	C (ALL) TS(CRS)	480V Bus 6A fault.
5	MAL-RCS006A	M(ALL)	Small Break LOCA
6	BKR-PPL003/4	M(ALL)	ATWS
7	MOC-AFW001	C(CRS) C(BOP)	21 AFW Pump failure
8	RLY-PPL487/488	C(CRS)	Automatic Safety Injection failure
9	RLY-PPL085/090	C(CRS) C(BOP)	Phase A Isolation failure

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

SESSION OUTLINE:

The evaluation begins with the plant at 90% power steady state operation. The team has been directed to return the plant to 100%. 22 SI pump is out of service for bearing inspection. 22 SI Pump was removed from service 8 hours ago, expected return in 6 hours.

The crew will take the watch and start increasing power. After power ascension has begun, 23 Service Water Pump will trip. BOP will diagnose and another pump will be started per the alarm response procedure. The CRS will evaluate Tech Specs.

When power ascension resumes, PT-404 (Steam Header Pressure) fails high. ATC diagnoses failure and places Main Boiler Feed Pump speed control to manual. CRS directs crew to perform AOP-INST-1, Instrument/Controller Failures.

Next, a fault occurs on Bus 6A. Team enters AOP-480V-1, Loss of 480 V Bus to stabilize the plant. The crew will start a charging pump, evaluate Tech Specs, and commence a shutdown per POP-2.1.

After formulating a shutdown plan, a SBLOCA occurs. Auto reactor trip is demanded but the Reactor trip breakers do not open. The team will attempt to manually trip the reactor and then go to FR-S.1. The turbine will be manually tripped. Motor driven AFW pumps can not be started. AFW must be manually aligned using the turbine driven AFW pump. The crew will begin manually inserting control rods and then will align emergency Boration using the alternate path in the RNO because MOV 333 is de-energized. Following main generator trip, blackout with unit trip logic strips 480V busses resulting in rod insertion. The team will transition back to E-0. SI will be manually actuated.

21 SI pump will be in service. 23 SI pump cannot be powered. 22 SI pump is OOS. Charging will be established after manual action to align suction to the RWST. The team will diagnose RCS not intact and transition to E-1, Loss of Reactor or Secondary Coolant.

The scenario is terminated after transition to E-1 has been made.

Procedure Flow path: POP-2.1, ARP-SJF, AOP-INST-1, AOP-480V-1, POP-2.1, FR-S.1, E-0, and E-1

CRITICAL TASKS:

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

- o De-energize the Rod Drive MG Sets (can be satisfied by tripping turbine)
- o Manually insert the rods
- o Establish Emergency Boration

E-0 -- F Establish at least 400 gpm AFW flow to the S/Gs before completion of FR-S.1 step 3.

E-0 -- D Manually actuate at least one train of SIS actuated safeguards before completion of E-0 step 4

EXPLANATION OF CREDITED MALFUNCTIONS:

Event 1 - Power escalation. ATC will withdraw control rods and/or dilute. The BOP will raise turbine power.

Event 2 - A running service water pump will trip. The BOP will be credited with the malfunction since another pump will be started on his panel.

Event 3 - PT-404 (Steam Header Pressure) will fail which affects MFW Pump speed. The ATC is credited with the malfunction since feed pump control is on his panel.

Event 4 - Due to initial conditions specified in the scenario, the loss of this bus will require pumps to be started on both control board operators' panels. (ATC charging pump, BOP SW pump)

Event 7 - 21 AFW Pump will not start and 23 AFW Pump does not have power due to loss of Bus 6A. Therefore, 22 AFW will require manual action to place in service. This will be performed by the BOP.

Event 8 - A manual safety injection will be required. This was not credited to either control board operator since it could be performed by either the ATC or BOP.

Event 9 - Phase A isolation will be manually actuated. This occurs on the BOP's panel.

<SCHEDULE> **2014_scenario_1_setup_rev0.sch**

At Time	On Event	Action	Description
00:00:00	None	Insert remote LOA-EPS070 to OUT	52-SI2A SI 22 480V BKR RACK OUT/RACK IN
00:00:00	None	Insert remote LOA-EPS071 to OUT	52-SI2B SI 22 480V ALT BKR RACK OUT/IN
00:00:00	None	Insert malfunction RLY-PPL487 to STUCK_CONTACTS	RELAY FAILURES: SIA-1 (A) SAFETY INJECTION AUTO MASTER RLY
00:00:00	None	Insert malfunction RLY-PPL488 to STUCK_CONTACTS	RELAY FAILURES: SIA-2 (B) SAFETY INJECTION AUTO MASTER RLY
00:00:00	None	Insert malfunction RLY-PPL085 to STUCK_CONTACTS	RELAY FAILURES: C-A1 CONT.ISOLATION PHASE A TRAIN A
00:00:00	None	Insert malfunction RLY-PPL090 to STUCK_CONTACTS	RELAY FAILURES: C-A2 CONT.ISOLATION PHASE A TRAIN B
00:00:00	None	Insert malfunction BKR-PPL004 to FAIL_ASIS	52/RTB REACTOR TRIP BKR
00:00:00	None	Insert malfunction BKR-PPL003 to FAIL_ASIS	52/RTA REACTOR TRIP BKR
00:00:00	None	Insert malfunction MOC-AFW001 to ASIS	AF1 AUX FEEDWATER PUMP MOTOR NO.21
00:00:00	None	Insert malfunction MOC-SWS008 to TRIP on event 2	SW3 SERVICE WATER PUMP MOTOR 23
00:00:00	None	Insert malfunction XMT-SGN034A to 1200.00000 in 120 on event 3	FIXED OUTPUT: PT-404 STM HDR PRESS COND STEAM DUMP
00:00:00	None	Insert malfunction MAL-EPS007D on event 4	480V BUS 6A FAULT
00:00:00	None	Insert malfunction MAL-RCS006A to 1.00000 in 300 on event 5	SMALL BREAK LOCA LOOP A HOT LEG (NR)

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
IC Reset		Reset Simulator to 90% power ILO IC.
SES Setup Schedule File	**Run setup schedule file** and verify malfunctions and over-rides have been entered.	Removes 22 SI pump OOS. Loads 23 SW pump failure on trigger 2. Loads SIA Train A and B failures. Loads Phase A and B failures. Loads RTB A and B failures. Loads 21 AFW Pump failure. Loads PT-404 failure on trigger 3. Loads Loss of bus 6A on trigger 4. Loads SBLOCA on trigger 5.
Floor Setup	1. Start 23 Charging pump and secure all others. 2. Place control switch for 22 SI pump to pullout and apply a danger tag. Put protected equipment placards on 21 and 23 SI pumps. 3. Update the protected equipment computer. 4. Perform setup checklist.	Provide turnover to the crew. Watch team walks the panels and assumes the watch.
Event 1	None - Power Ascension	Perform field action LOAs as requested per NPO task list.
Event 2	Actuate Trigger 2 **At lead evaluator direction**	MOC-SWS008 Event: 2 Delay: 0 Final Value: TRIP Ramp: 0
Role Play	If NPO Dispatched Check 23 SWP and breaker	Report motor is extremely hot. Breaker indicates overcurrent trip.
Event 3	Actuate Trigger 3 **At lead evaluator direction**	XMT-SGN034A Event: 3 Delay: 0 Final Value: 1200 Ramp: 120
Role Play	Acknowledge requests for I&C to troubleshoot.	I&C will develop a troubleshooting plan.

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
Event 4	Actuate Trigger 4 **At lead evaluator direction**	^ MAL-EPS007D 480V BUS 6A FAULT IMF MAL-EPS007D Event: 4 Delay: 0 Final Value: TRUE Ramp: 0
Role Play	If NPO Dispatched If NPO dispatched align 21 BATP to blender	Acrid odor at rear of bus 6A bus work. Supply breaker tripped on short term over-current. No smoke or fire. Close 370 and open 369
Event 5	Actuate Trigger 5 **At lead evaluator direction**	^ MAL-RCS006A SMALL BREAK LOCA LOOP A HOT LEG (NR) IMF MAL-RCS006A Event: 5 Delay: 0 Final Value: 1.0 Ramp: 300
Role Play	When NPO dispatched to locally trip the reactor, then Delete *BKR-PPL004 and BKR-PPL003.*	
Role Play	At CCR request	Perform field action LOAs as requested per NPO task list.

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

Event Description: Power Escalation

Time	Position	Applicant's Actions or Behavior
		Note: **The reactivity plan for the power ascension should be developed by the team in the briefing room prior to taking the watch. The plan could call for dilution and/or rod withdrawal**
	CRS	Assigns roles for power ascension
	ATC	Reviews reactivity plan
	ATC	If rods are withdrawn: • Places/verifies rods are in Manual • Withdraws rods • Observes: o Proper rod motion o Tavg o Power
	BOP	Peer checks rod withdrawal
	ATC	If dilution is performed: • Places RCS Makeup control to Stop • Place RCS Makeup Mode selector to Dilute • Adjusts integrator to desired dilution amount • Places RCS Makeup control to Start • Observes: o Proper makeup response o Tavg o Power
	BOP	Peer check dilution
	BOP	Raises MTG load using governor

Op-Test No.: 1 Scenario No.: 1 Event No.: 1		Page 1 of 2
Event Description: Power Escalation		
	ATC	Peer checks MTG load increase
Lead Evaluator		When the following has been demonstrated/observed: • Sufficient load ascension. • Sufficient normal plant operations by the BOP. Then instruct Booth to insert Event 2.

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

Event Description: 23 Service Water Pump Trips

Time	Position	Applicant's Actions or Behavior
	BOP	Diagnose that 23 SWP has tripped.
	BOP of CRS	Recommend / direct starting either 21 or 22 SWP per the alarm response procedure.
	BOP	Starts 21 or 22 SWP
Note: Although not required, it is possible that the CRS may enter AOP-RW-001		
	BOP	Refers to ARPs for alarms
	CRS	Evaluate Tech Specs. LCO 3.7.8 will not be satisfied. Condition A will apply placing plant in 72 hour action statement.
Lead Evaluator		When the following has been demonstrated/observed: • Service Water pressure has been stabilized • T.S. have been evaluated Then instruct Booth to insert Event 3

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

Event Description: PT-404 Steam Header Pressure fails high causing MBFPs to be placed in manual.

Time	Position	Applicant's Actions or Behavior
	ATC	Diagnosis failure of PT-404 high due to changes MFW Pump speed and meter indication
	ATC	Place MFW Pump Master Speed Controller to manual to maintain SG levels
	CRS	Directs team to perform immediate operator actions of AOP-INST-1
	ATC	Checks instruments listed in AOP-INST-1
	CRS	Implements 2-AOP-INST-1 • Verifies no other instrument failures • Ensures actions have been taken to stabilize the plant • Ensures steam dumps are in temperature mode
	Team	Contact I&C to investigate PT-404 failure
Lead Evaluator		When the following has been demonstrated/observed: • MFW Pumps have been placed in manual • SG levels are stable • I&C contacted Then instruct Booth to insert Event 4

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

Event Description: 480V Bus 6A fault.

Time	Position	Applicant's Actions or Behavior
	Team	Diagnose that 480V Bus 6A
	CRS	Will enter AOP-480V-1
	ATC	Start 21 or 22 Charging Pump
	BOP	Start 24 or 25 SWP
	ATC	Ensure Primary Water Pump is in service
	Team	Dispatch operator to monitor EDGs
	BOP	Initiate Attachment 3: • 6A will be confirmed to be faulted • 23 EDG will be shutdown
	CRS	Direct initiating SOP 5.2.1 to maintain vent header pressure
	ATC	Verifies that Boric Acid Transfer Pump is in service
	CRS	Evaluate Tech Specs. The most limiting T.S. action statement is per 3.8.4. Additionally, 3.8.9, 3.8.1, and 3.5.2 should be evaluated. Because 22 Safety Injection pump was OOS and 23 has now lost power, the plant will have to proceed to Mode 5.
Note: If needed, the booth will call as the Operations Manager to direct the CRS to proceed to shutdown and cooldown.		
	CRS	Will begin plans for shutdown and cooldown to MODE 5.
Lead Evaluator		When the following has been demonstrated/observed: • Plant is stabilized • Tech Specs evaluated • Shutdown being planned Then instruct Booth to insert Event 5

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

Event Description: Small Break LOCA

Time	Position	Applicant's Actions or Behavior
	ATC	Diagnose loss of RCS inventory based on PZR level trend
Note: CRS may direct entry in AOP-LEAK-1		
	CRS	Direct reactor trip and safety injection
	ATC	Presses reactor trip push button on flight panel
	ATC	Notes that reactor did not trip
	BOP	Presses reactor trip push button on supervisory panel
	ATC	Notes that reactor did not trip
	BOP	Trips turbine
	CRS	Directs team to perform immediate operator actions of FR-S.1
The team will now proceed to Event 6 for the ATWS		

Op-Test No.: 1 Scenario No.: 1 Event No.: 6/7/8/9 Page 1 of 3

Event Description: ATWS/Loss of 21 AFW Pump/Failure of Auto SI/Failure of Auto Phase A

Time	Position	Applicant's Actions or Behavior
Critical Task: Insert negative reactivity into the core by at least one of the following methods before step 4 of FR-S.1 is complete: o De-energize the Rod Drive MG Sets (can be satisfied by tripping turbine) o Manually insert the rods o Establish Emergency Boration		
	ATC	Manually drive control rods
	CRS/BOP	Dispatch operator to locally trip reactor breakers
Note: The reactor trip breakers will be opened locally after emergency boration is established.		
	BOP	Verify turbine trip
Critical Task: Establish at least 400 gpm AFW flow to the S/Gs before completion of FR-S.1 step 3.		
	BOP	Increase speed on 22 AFW Pump and adjust FCV-405A-D to establish 800 gpm AFW flow (400 gpm will satisfy critical task)
	BOP	Initiate Emergency Boration: • Determine MOV-333 not powered and RWST will be used • Open LCV-112B suction from RWST • Close LCV-112C suction from VCT • Place makeup control switch to stop Establish maximum charging flow
	BOP	Verify RCS pressure < 2335 psig
	BOP	Verify ventilation isolation
Note: The CRS may direct the BOP to perform steps 1-9 of E-0 based on a caution in FR-S.1		

If not, the following step will be performed when the CRS exits FR-S.1

Critical Task:

Manually actuate at least one train of SIS actuated safeguards before completion of E-0 step 4

	BOP	Perform E-0 steps 1-9 per caution in FR-S.1:
		• Verify reactor trip (will be tripped at this point)
		• Verify turbine trip (will be tripped)
		• Verify power to 480V busses (all but 6A will be powered)
		• Check SI status:
		  ○ Will note SI required but Auto SI did not actuate
		  ○ Will manually SI
		• Perform Attachment 1 of E-0
		  ○ Establish charging
		  ○ Check electrical status
		  ○ Secure condensate pumps
		  ○ Verify FW isolation
		  ○ Verify SW lineup
		  ○ Verify SI pump and valve alignment
		  ○ Verify FCU alignment
		  ○ Verify AFW flow - may reduce flow at this point
		  ○ Verify Containment isolation - will manually actuate Phase A
		  ○ Checks containment spray status
		  ○ Checks CCR AC

	ATC	Verify reactor is subcritical: • Power range < 5% • Negative SUR
	CRS	Returns to E-0
	TEAM	Performs or re-performs E-0 steps 1-4: • Verify reactor trip (will be tripped at this point) • Verify turbine trip (will be tripped) • Verify power to 480V busses (all but 6A will be powered) • Check Status
	BOP	Performs Attachment 1 of E-0 if not already in progress
	ATC	Verifies AFW flow - flow may be reduced at this time if not already done.

Op-Test No.: 1 Scenario No.: 1 Event No.: 6/7/8/9		Page 1 of 3
Event Description: ATWS/Loss of 21 AFW Pump/Failure of Auto SI/Failure of Auto Phase A		
	ATC/BOP	Verify SI flow
	ATC/BOP	Check RCP cooling
	ATC/BOP	Align valves to support start of a NESW pump
	ATC	Check RCS temperature
	ATC	Check PORV status
	ATC	Check if RCPs should be stopped. RCPs will be tripped if not already done.
	ATC	Check if SGs are faulted
	ATC	Check if SG tubes are intact
	ATC	Check if RCS is intact
	CRS	Transition to E-1
Lead Evaluator		Terminate scenario

EMERGENCY PLAN DECLARATION

Site Area Emergency

EAL SS2.1

Failure of an automatic trip signal to reduce power range < 5% AND Manual trip actions taken at the reactor controls console (manual reactor trip switches) are not successful

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

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions:
Reset simulator to 100% power IC Load Simulator Schedule-Scenario2
The Plant is at 100% power.
Ensure 25 SWP and 22 Charging Pump in service.

Turnover:
Perform power reduction to 90% for turbine valve testing.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R (ATC) N (CRS) N (BOP)	Power Reduction
2	MOT-CFW001B	C (ALL) TS(CRS)	21 Condensate Pump trip. TS for AFD.
3	BST-CCW009A	C(BOP) C(CRS)	RCP Thermal Barrier CCW Return Valve (FCV-625) spurious closure.
4	MAL-EPS007B	C (ALL) TS(CRS)	480V Bus 3A fault.
5	CNH-PCS007D	C(ATC) C(CRS)	22 FRV fails in auto.
6	CVH-CFW005A	M(ALL)	22 FRV fails in manual.
7	MOC-AFW002 CVH-ATS017B	M(ALL)	Failure of 22 and 23 AFW to start which along with other conditions leads to loss of heat sink.
8	AOV-MSS036A/ CVH-MSS030B	C(ALL)	Failure of Turbine Stop/Control Valve pair.
9	AOV-RCS002A	C(ALL)	Failure of PORV requiring opening of reactor head vent valves

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

SESSION OUTLINE:

The evaluation begins with the plant at 100% power steady state operation with no significant equipment out of service. The team has been directed to lower power to 90% for turbine valve testing.

After taking the watch, the team will begin reducing load. Once reduction is started 21 Condensate Pump will trip. This will cause the team to rapidly reduce power and challenge TS 3.2.3 for Axial Flux Difference.

When the team has stabilized the plant (or is reducing power to <50%), MOV-625 will spuriously close. This valve is the CCW return valve from the RCP thermal barriers. The team will re-open the valve using ARP guidance. Subsequently, a fault will occur on 480V Bus 3A. The team will take actions in accordance with AOP-480V-1, "Loss of Normal Power to any Safeguards 480V Bus." Due to the fault on Bus 3A, 22 EDG cannot re-energize the bus. TS require plant shutdown.

After the team stabilizes the plant and evaluates tech specs, 22 FRV will fail closed in automatic. Manual control will work initially, but the valve will eventually fail closed regardless of position. This will lead to an automatic reactor trip due to low SG level or the team will trip the reactor manually before the trip setpoint is reached.

When the reactor is tripped, the turbine upper left stop and control valve pair fail to close. MSIV's must be manually closed to trip the turbine, but the valves will initially fail open requiring local action. The MSIVs will be closed when SG inventory is reduced to a value closer to bleed and feed criteria.

23 AFW Pump will not auto start and will not be able to be manually started from the Control Room due to 480V circuit breaker failure. 22 AFW Pump will not be available due to the governor valve not opening. 21 AFW pump cannot be run since 3A is not powered.

The team will transition to FR-H.1, "Loss of Secondary Heat Sink" due to a loss of AFW flow. SG WR levels will lower until bleed and feed is required.

One PRZR PORV will not open when required. The crew will open the Reactor Head Vent valves. After the head vent valves are opened, 23 AFW pump from its normal supply after racking the breaker out and back in. The team will restore AFW flow to 23 and 24 SGs. The scenario can be terminated after the head vent valves have been closed, or at the discretion of the lead evaluator.

Procedure flow path: POP-2.1, AOP-FW-1, ARP-SGF, AOP-480V-1, AOP-FW-1, E-0, FR-H.1

CRITICAL TASKS:

E-0 -- P	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
FR-H.1 -- F	Establish RCS bleed and feed when the average of the three lowest S/G levels reach 20% WR.

EXPLANATION OF CREDITED MALFUNCTIONS:

Event 1: Power reduction. The ATC gets credit for a reactivity manipulation for boration. The BOP and CRS get credit for a normal evolution.

Event 2: 21 Condensate Pump trip will require further boration and power reduction, so all operators are credit with this malfunction. Maintaining axial flux distribution in required band is a challenge for this event, so the CR will have to evaluate tech specs for axial flux difference.

Event 3: FCV-625 will close. The valve is on the BOP panel and will be reopened per the ARP or AOP.

Event 4: Loss of 480V Bus 3A will require restoration of equipment on both the ATC and BOP panels. This will put the plant in a tech spec action statement.

Event 5: The FRV is on the ATC panel and will initially be placed in manual to control 22 SG level.

Event 6: The FRV failing in manual will lead the team to trip the reactor or cause an automatic trip.

Event 7: The failure of 22 and 23 AFW Pumps in conjunction with loss of 480V Bus 3A (21 AFW Pump power) will lead to a loss of heat sink.

Event 8: The failure of the stop and control valve pair will require closing MSIVs and drive the team to bleed and feed criteria.

Event 9: The failure of the PORV will require the use reactor head vent valves for bleed and feed.

2014_scenario_2_setup_rev2

At Time	On Event	Action	Description
00:00:00	None	Insert malfunction MOT-CFW001B to 100.00000 on event 2	BRG 1 FAILURE: CP21 CONDENSATE PUMP 21 MTR
00:00:00	None	Insert malfunction BST-CCW009A to TRIP_(JBST=T) on event 3 delete in 5	FAILURE: FIC-625-H FCV-625 HIGH FLOW CLOSEURE
00:00:00	None	Insert malfunction MAL-EPS007B on event 4	480V BUS 3A FAULT
00:00:00	None	Insert malfunction CNH-PCS007D to 0 in 180 on event 5	MCB CTRLR FIXED AUTO ONLY: FIC-427 SG 22 FD REG VLV CONT A/M
00:00:00	None	Insert malfunction CVH-CFW005A to CLOSE on event 6	FAILMODE: FCV-427 SG 22 FW REGULATOR
00:00:00	None	Insert malfunction MOC-AFW002 to ASIS	AF3 AUX FEEDWATER PUMP MOTOR NO.23
00:00:00	None	Insert malfunction CVH-ATS017B to 0	VARIABLE POSN: HCV-1118 AUX BFP 22 TURBINE GOVERNOR
00:00:00	None	Insert malfunction AOV-MSS036A to FAIL_AS_IS	GENERAL FAILURE: MS-863 HP TURB STOP FROM SG21
00:00:00	None	Create Event 30 jbkrta == 0 -desc jbkrta	rx trip brkr a
00:00:00	None	Insert malfunction AOV-RCS002A to FAIL_AS_IS	GENERAL FAILURE: PCV-455C PZR POWER OPERATED RELIEF VALVE
00:00:00	None	Insert malfunction CVH-MSS030B to 45.00000 on event 30	VARIABLE POSN: PCV-5991 HP TURB THROTTLE FROM SG21
00:00:00	None	Insert malfunction AOV-SGN001B to 100.00000 on event 30 delete in 180	VARIABLE POSN: MS-1-21 MAIN STEAM STOP VALVE MS-1-21
00:00:00	None	Insert malfunction AOV-SGN002B to 100.00000 on event 30 delete in 200	VARIABLE POSN: MS-1-22 MAIN STEAM STOP VALVE MS-1-22
00:00:00	None	Insert malfunction AOV-SGN003B to 100.00000 on event 30 delete in 215	VARIABLE POSN: MS-1-23 MAIN STEAM STOP VALVE MS-1-23
00:00:00	None	Insert malfunction AOV-SGN004B to 100.00000 on event 30 delete in 195	VARIABLE POSN: MS-1-24 MAIN STEAM STOP VALVE MS-1-24

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
IC Reset	**228 or saved 100% IC**	Reset Simulator to 100% power IC
SES Setup Schedule File	**Run schedule** and verify malfunctions and over-rides have been entered	Loads 22 & 23 AFW pumps failures Fails Upper Left Stop Valve Loads PORV 455C failure Loads MSIV failures Loads 625 failure on event 3 Loads bus 3A fault on event 4 Loads 22 FRV auto failure on event 5 Loads 22 FRV manual failure on event 5
Floor Setup	**Ensure that 22 Charging Pump is in service.** **Ensure that 25 SWP is in service.** Perform setup checklist Distribute Turn over sheets	Update *Update the Protected Equipment Computer display. Risk is green.* Watch team walks the panels and assumes the watch.
Event 1	Power Reduction	Provide information as requested by team.
Event 2	Actuate Event 2 21 Condensate Pump Trip	
Role Play	When called about 21 Condensate Pump **At lead evaluator direction**	Motor is very hot
Event 3	Actuate Event 3 **At lead evaluator direction**	Spurious closure of MOV-625
Role Play	If NPO sent to investigate MOV-625 closure	NPO reports no obvious damage, but a team is removing scaffold in the Pipe Pen. Area immediately adjacent to the flow switch and may have bumped the instrument.

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
Event 4	Actuate Event 4 **At lead evaluator direction**	Bus 3A Fault
Role Play	If NPO sent to investigate Bus 3A Trip Acknowledge requests for I&C to troubleshoot	NPO reports no obvious damage, but bus supply breaker tripped on over current and strong odor of ozone. I&C will develop a troubleshooting plan
Event 5	Actuate Event 5 **At lead evaluator direction**	22 FRV fails in auto
Role Play	If asked to investigate 22 FRV	Valve appears normal. Cannot tell reason for failure.
Event 6	Actuate Event 6 **At lead evaluator direction**	22 FRV fails in manual
NOTE:	When Rx is tripped	Upper left stop and control valve do not close. MSIVs will not close
NOTE:	**When SG WR Level reaches about 30%, modify the following malfunctions to 0%:** **AOV-SGN001B** **AOV-SGN002B** **AOV-SGN003B** **AOV-SGN004B**	
Role Play	As NPO sent to close MSIVS, let the control room know that either you closed them or they had closed before you got there depending on timing.	

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
Role Play	AFW Status:	21 de-energized 22 governor valve will not open 23 pump appears normal. Breaker appears normal.
Role Play	When NPO dispatched to energize head vent valves at MCC 26A/B	Close breaker for HCV-3100 o MCC 26A Sheet 2 (EPS 18) LOA-EPS431 Close breaker for HCV-3101 o MCC 26B Sheet 2 (EPS 22) LOA-EPS523
	After head vent valves have been opened:	Fix 23 ABFP 480V brkr: Call CCR and request 23 ABFP control switch be placed in pullout to support breaker check. From the Director - Delete MOC-AFW002. NPO reports that the 480V breaker for 23 ABFP has been swapped with the spare breaker. Request CCR to attempt to start 23 ABFP.
Role Play	At CCR request	Perform various LOA's per NPO local task list

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

Event Description: Power Reduction

Time	Position	Applicant's Actions or Behavior
		Note: **The reactivity plan for the power reduction should be developed by the team in the briefing room prior to taking the watch. The plan could call for boration and/or rod insertion**
	CRS	Assigns roles for power reduction
	ATC	Reviews reactivity plan
	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

Op-Test No.: 1 Scenario No.: 2 Event No.: 1		Page 1of 2
Event Description: Power Reduction		
	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 Position per TS and Graph-RPC-16
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 2

Op-Test No.: 1 Scenario No.: 2 Event No.: 2		Page 1 of 1
Event Description: 21 Condensate Pump Trip		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	Announces 21 Condensate Pump tripped after observing 6.9 KV Motor Trip Alarm and indications of pump trip
	CRS	Instructs team to perform immediate operator actions of AOP-FW-1
	ATC	Checks MFW Pumps are both in service and announces that immediate actions are complete
	ATC/BOP	Continue load reduction to get steam flow ≤ feed flow: • Continue/increase boration • Operate governor to reduce turbine load
	CRS	Evaluate axial flux difference to determine if TS 3.2.3 is met. Depending on team response could be in: • 15 minute action to restore AFD with additional 15 minutes to get < 90% power. • 30 minute action to get to < 50% power.
	ATC/BOP	May neeed to remove windup from FRVs by placing in manual and returning to automatic.
	ATC/BOP	May place MFW master speed controller to manual
	ATC/BOP	May place FRVs in manual
Lead Evaluator		When the plant has been stabilized and AFD TS has been addressed: Then instruct Booth to insert Event 3

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

Event Description: RCP Thermal Barrier CCW Return Valve (FCV-625) spurious closure.

Time	Position	Applicant's Actions or Behavior
	BOP	Notes CCW Thermal Barrier Return Low Flow alarm
	BOP	Observes FCV-625 has gone closed
	BOP	Refers to ARP-2-ARP-SGF
Note: ***CRS should determine based on ARP guidance and indications that the closure was spurious and re-opening the valve is appropriate. If the valve remains closed, the scenario can continue.***		
	BOP	Re-open FCV-625
	BOP	Direct Nuke NPO to monitor flow at FI-625
Lead Evaluator		When valve is re-opened, or it is clear it will remain closed, instruct Booth to initiate Event 5.

Op-Test No.: 1 Scenario No.: 2 Event No.: 4		Page 1 of 1
Event Description:		
Time	**Position**	**Examinee's Actions or Behavior**
	BOP/ATC	Diagnose bus 3A de-energized: • Numerous alarms • 22 EDG Running • Loss of running charging pump • Indications for Bus 3A Normal Feed Breaker
	CRS	Announces entry into AOP-480V-1.
	ATC	Start 21 or 23 Charging pump and adjust speed to match 22 prior to trip. If flashing in letdown line occurs, then first close LCV-459, start a charging pump and re-establish letdown per 2-SOP-3.1
	BOP	Check CCW pumps running and 625 open Check SW Pressure - 1,2,3 Header pressure is low May start 21 or 23 SWP Dispatch NPO to monitor EDGs
	CRS	Initiate review of the following TS to determine required actions based on plant conditions: 3.8.9 Distribution Systems – Operating Condition A Determine that bus 3A is inoperable putting plant in 8 hour action statement. Based on the faulted bus the team may assume shutdown should be commenced at this time.
Lead Evaluator		When plant is stable and tech specs have been addressed: Then instruct Booth to insert Event 5

Op-Test No.: 1 Scenario No.: 2 Event No.: 5		Page 1 of 1
Event Description: 22 FRV fails in auto		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	Diagnose 22 FRV failure based on lower level on all channels. Steam Generator Level Deviation Alarm may annunciate.
	ATC	Places 22 FRV in manual and stabilizes 22 SG level.
	CRS	Announces to team to perform immediate operator actions of either AOP-INST-1 or AOP-FW-1
	TEAM	Goes through AOP. No actions are taken other than controlling 22 SG level in manual
Lead Evaluator		When the SG is stable: Then instruct Booth to insert Event 6

Op-Test No.: 1 Scenario No.: 2 Event No.: 6		Page 1of 2
Event Description: 22 FRV fails in manual		
Time	**Position**	**Examinee's Actions or Behavior**
Note: If team did not stabilize 22 SG level for previous event, and automatic or manual reactor trip may have already occurred.		
	ATC	Notices that 22 SG level is trending down and 22 FRV is not responding.
	ATC	Trips reactor
	CRS	When Unit trips, direct team to perform immediate actions of E-0 • Verifies immediate actions using the procedure.
When the CRS directs "Perform the Immediate Operator Actions of E-0, the ATC and BOP will first perform the IOAs silently only announcing unexpected conditions. The crew will then re-perform the IOAs verbalizing each item.		
	ATC	Verifies Reactor Trip: • Reactor trip and bypass breakers open • Rod bottom lights lit • IRPIs < 12.5 inches • Nuclear flux decreasing
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.		

Op-Test No.: 1 Scenario No.: 2 Event No.: 6		Page 1of 2
Event Description: 22 FRV fails in manual		
	ATC	Verifies Turbine Trip: • Observes stop and control valve are not all closed • Trip Turbine • Takes MSIV switches to closed • Notes MSIVs did not close • Dispatches NPO to locally close MSIVs (MSIVs will be closed when sufficient mass has been removed from SGs to meet bleed and feed criteria without lengthy delay.
	BOP	Check status of 480V buses: • Observe ALL busses energized from Offsite Power except Bus 3A

Note:

Depending on timing, an SI signal may be present at step 4 of E-0. The scenario will progress with or without an SI signal at this point.

If there is no SI signal, an evaluator will have to step in as STA when transition to ES-0.1 occurs or if CRS is looking for concurrence to go to FR-H.1 for the loss of heat sink. This will not be necessary if there is an SI signal.

	ATC	Check SI status Determine SI is Actuated • Any SI Annunciator - Lit • SI Pumps Any Running Determines SI NOT actuated and NOT required
	BOP/ATC	Check AFW Status • Observes no AFW flow • Attempted to use 22 AFW pump to establish flow
	CRS	Transition to ES-0.1

Op-Test No.: 1 Scenario No.: 2 Event No.: 7/8/9 Page 1 of 3

Event Description: Failure of 22 and 23 AFW to start which along with other conditions leads to loss of heat sink / Failure of Turbine Stop/Control Valve pair / Failure of PORV requiring opening of reactor head vent valves

Time	Position	Applicant's Actions or Behavior
		Note: Bleed and Feed criteria of the average of the three lowest SGs being < 20% will eventually be met. How much of the early steps of FR-H.1 are performed will depend on when this happens. These steps assume that criteria are met when step 2 is read.
	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 21 and 23 charging pumps
	BOP	Opens HCV-142
	ATC	Verifies HHSI pumps are running
	ATC/BOP	Verifies SI valve lineup
	ATC	Opens PORV block valves
	ATC	Attempt to open PORVs, observes 455C will not open
	BOP	Dispatches NPO to energize HCV-3100/3101
	ATC/BOP	Opens HCV-3100/3101
	ATC/BOP	Reset SI: • Check CCW pumps • Place key switches in SI reset position • Reset SI

Op-Test No.: 1 Scenario No.: 2 Event No.: 7/8/9		Page 1 of 3
Event Description: Failure of 22 and 23 AFW to start which along with other conditions leads to loss of heat sink / Failure of Turbine Stop/Control Valve pair / Failure of PORV requiring opening of reactor head vent valves		
	ATC/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 FSS will call about restoring 23 AFW pump. The team will be asked to place the switch in pull to lock. After another few minutes, the team will be told that 23 AFW should be available.		
	CRS	Evaluate SG conditions per foldout prior to re-establishing AFW flow to 23 and 24 SGs
	ATC/BOP	Start 23 AFW pump
	ATC/BOP	Establish 400 gpm total to 23 and 24 SGs
Lead Evaluator		Terminate the scenario.

EMERGENCY PLAN DECLARATION

Site Area Emergency

EAL FS1.1 Loss or potential loss of any two barriers.

Loss of heat sink will lead to a call based on the Fission Product Barrier Matrix:

Potential Loss of Fuel Cladding (A.CSFST)
Potential Loss of RCS (A.CSFST)

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

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions:
Reset simulator to 4% power IC Load Simulator Schedule-Scenario3
The Plant is at 4% power. 23 Charging Pump is OOS. 22 MBFP is OOS. PORV 456 is OOS
Ensure 21 Charging Pump in service, Ensure 23 CCW Pump is in service

Turnover:
Perform power ascension to 10% for turbine sync.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R (ATC) N (CRS) N (BOP)	Power Ascension
2	MOT-CVC003B	C (ATC) C(CRS) TS(CRS)	21 Charging Pump trip
3	MOC-CCW003A	C (BOP) C (CRS) TS(CRS)	23 CCW pump trip with failure of other CCW pumps to autostart
4	XMT-CRF012A	TS(CRS)	Control Rod D8 IRPI fails low.
5	XMT-CFW036A	C (ALL)	PT-408A fails high causing 21 MFW Pump to go to minimum speed.
6	MAL-ATS005A	M(ALL)	21 MFW Pump trips.
7	MAL-RCS014D	M(ALL)	24 SGTR.
8	AOV-CAS009A	C(ALL)	Failure of air to containment making PORVs required for depressurization.
9	AOV-RCS002A	C(ALL)	PORV will not close causing team to transition to ECA-3.1
10	MOC-CNM008/9	C(BOP)	21 and 22 Containment Recirc Fans fail to autostart.

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

SESSION OUTLINE:

The evaluation begins with the plant at 4% power during startup. The following equipment is out of service:

- PORV 456 due to blowing fuses.
- 23 Charging Pump for seal replacement.
- 22 MBFP since forced outage work is not complete.

When the team takes the watch, they will raise power in anticipation of putting the MTG in service.

Following some power ascension, 21 Charging Pump will trip. 22 Charging Pump will be placed in service. TRO-3.1.B.1 will not be met putting the plant in a 24 hour AOT.

23 CCW Pump will trip and the low pressure auto start has been disabled for 21 and 22 CCW Pumps. The BOP will start a CCW Pump per ARP-SGF.

Control Rod D8 IRPI fails low. The team will take actions in accordance with AOP-ROD-1, "Rod Control and Indication Systems Malfunction."

PT-408A will fail high causing 21 MBFP to slow down to minimum. If the team does not recognize the failure and place 21 MBFP in manual, the reactor will trip on low SG level. If the team places the pump in manual, an overspeed trip of the MFW pump will eventually be inserted. With power above 4%, the team will manually trip the reactor. If power is < 4% and the team does not trip the reactor, the SGTR can be initiated which will drive a trip and SI.

When the reactor trips, a SGTR will occur in 24 SG. The team will take actions per E-0, "Reactor Trip or Safety Injection". The team will then transition to E-3, "Steam Generator Tube Rupture."

When SI is reset, PCV-1228 (Instrument Air to Containment) will fail in the closed position. The team will need to use a Pressurizer PORV to depressurize. When the team goes to close the PORV, the valve will fail open. This will cause the team to ultimately go to ECA-3.1 for recovery.

Procedure flow path: POP-1.3, AOP-CVCS-1, ARP-SGF, AOP-ROD-1, AOP-AIR-1, E-0, E-3, ECA-3.1

CRITICAL TASKS:

E-3 -- A Isolate feedwater flow to and steam flow from the ruptured SG before transition to ECA-3.1 occurs.

E-3 -- B Establish and maintain RCS temperature so that transition from E-3 does not occur due to either of the following:

- RCS temperature TOO HIGH to maintain required sub-cooling in E-3 step16 table, OR
- RCS temperature TOO LOW results in a severe challenge to the Sub-criticality or Integrity CSF.

EXPLANATION OF CREDITED MALFUNCTIONS:

Event 1 - Power ascension. This is a reactivity manipulation for ATC. BOP will be controlling SG levels manually and CRS will be supervising evolution.

Event 2 - Charging pump trip. The ATC will start another charging pump. Since two charging pumps are now inoperable, the CRS will have to determine that the plant is in a 24 hour action statement.

Event 3 - The running CCW pump will trip and the other two will have all auto starts blocked. The BOP will have to start a CCW pump.

Event 4 - IRPI for rod D-8 will fail. The CRS will evaluate TS 3.1.7 for the inoperable IRPI.

Event 5 - PT-408A (MFW pressure) fails high which causes the MFW pump to go to minimum speed. The ATC will have to place MFW control in manual. The BOP will have to make adjustments to Low Flow FRVs.

Event 6 - The only MFW pump trips which will require a reactor trip if power when above 4%.

Event 7 - SGTR in 24 SG causes SI to be initiated. Diagnosis is a challenge at low power since there will be less radiation monitor response.

Event 8 - Failure of instrument air to containment needs to be diagnosed by the BOP and will change the depressurization method used by the ATC.

Event 9 - The PORV failing to close will lead team to contingency procedure.

Event 10 - 21 and 22 Containment Recirc Fans will not start. The BOP will have to notice this while performing E-0 Attachment 1 and start the fans.

At Time	On Event	Action	Description
00:00:00	None	Create event 30 jbkrta==0 - desc jbkrta	rx trip a
00:00:00	None	Create event 29 xaoi125a==1 - desc xaoi125a	pb/rs-1 pushbutton
00:00:00	None	Insert malfunction MOC-AFW002 to AUT_CLS	AF3 AUX FEEDWATER PUMP MOTOR NO.23
00:00:00	None	Insert remote LOA-EPS012 to OUT	52-C3 C 23 480V BKR RACK OUT/RACK IN
00:00:00	None	Insert malfunction MOT-CVC003B to 100.00000 on event 2	BRG 1 FAILURE: C1 CHARGING PMP 21 MOTOR
00:00:00	None	Insert malfunction BST-CCW017B to 0	SETPOINT DRIFT: PC-600-L ACS/COMP CLNG PUMP DISCH PRESS
00:00:00	None	Insert malfunction MOC-CCW003 to TRIP on event 3	CC3 COMPONENT COOLING PUMP MOTOR 23
00:00:00	None	Insert malfunction XMT-CRF012A to 1.4013e-045 on event 4	FIXED OUTPUT: LVDT-D8 LVDT FOR CRDM D8
00:00:00	None	Insert malfunction XMT-CFW036A to 1400.00000 in 30 on event 5	FIXED OUTPUT: PT-408A 26 HTRS COMMON OUTLET PRESSURE
00:00:00	None	Insert malfunction MAL-ATS005A on event 6	MBFP 21 OVERSPEED
00:00:00	None	Insert malfunction MAL-RCS014D to 10.00000 on event 30	STEAM GENERATOR 24 TUBE LEAK (NR)
00:00:00	None	Insert malfunction AOV-CAS009A to CLOSE on event 29	GENERAL FAILURE: PCV-1228 AIR FILTER DISCHARGE - CONT BLDG
00:00:00	None	Insert malfunction AOV-RCS002A to OPEN on event 9	GENERAL FAILURE: PCV-455C PZR POWER OPERATED RELIEF VALVE
00:00:00	None	Insert malfunction MOV-RCS001 to N/A on event 9	535 PZR PORV ISOLATION VALVE
00:00:00	None	Insert malfunction MOC-CNM008 to AUT_CLS	CRF1 21 CONTAINMENT RECIRCULATION FAN
00:00:00	None	Insert malfunction MOC-CNM009 to AUT_CLS	CRF2 22 CONTAINMENT RECIRCULATION FAN

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
IC Reset		Reset Simulator to 4% power IC
SES Setup Schedule File	**Run setup schedule file** and verify malfunctions and over-rides have been entered	
Floor Setup	**Ensure 21 Charging Pump in service** **Ensure 23 CCW Pump in service** Place 23 Charging pump in TPO and apply Danger Tags Place PCV-456 in closed and 536 in TPO and apply Danger Tags Distribute Turn over sheets	**HANG PROTECTED EQUIPMENT tags for:** 21 and 22 Charging Pumps Update the Protected Equipment Display PC
Event 1	Power Ascension	Respond to notifications
Event 2	**Actuate Trigger 2** **At lead evaluator direction**	Initiates trip of 21 Charging Pump
Role Play	When called about Charging Pumps and breakers	21 Charging Pump is hot and breaker appears to have tripped on overcurrent. 22 Charging Pump is running sat after being placed in service.
Event 3	**Actuate Trigger 3** **At lead evaluator direction**	Initiates trip of 23 CCW Pump
Role Play	When called about CCW Pumps.	You cannot tell why 23 tripped. Which ever pump is started appears to being running sat.
Event 4	**Actuate Trigger 4** **At lead evaluator direction**	Initiates IRP failure for D8:

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
Role Play	If I&C asked to investigate	Report that technicians will be sent to investigate. The problem will not be solved during the scenario.
Event 5	**Actuate Trigger 5** **At lead evaluator direction**	Initiates failure of PT-408A high.
Role Play	If I&C asked to investigate	Report that technicians will be sent to investigate. The problem will not be solved during the scenario.
Event 6	**Actuate Trigger 6** **At lead evaluator direction**	Initiates trip of 21 MFW Pump
Role Play	If asked to investigate	Report that personnel will be sent to investigate. The problem will not be solved during the scenario.
Role Play	If NPO sent to investigate PCV-1228	Report the following: There is a large air leak near PCV-1228. The NPO may be able to wrap the leak and reduce the air leakage. This repair will not be completed before the scenario is terminated
Event 9	**When PORV is opened to depressurize RCS:** **Activate Trigger 9**	Initiates failure of PORV and Block Valve.
Role Play	As requested by Control Room	Perform various LOA's per NPO Local Task List.

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Event Description: Power Ascension

Time	Position	Applicant's Actions or Behavior
		Note: ***The reactivity plan for the power ascension should be developed by team in briefing room prior to taking the watch. The plan could call for dilution and/or rod withdrawal.***
	CRS	Assigns roles for power ascension
	ATC	Reviews reactivity plan

	ATC	If rods are withdrawn:
		• Places/verifies rods are in Manual
		• Withdraws rods
		• Observes:
		  ○ Proper rod motion
		  ○ Tavg
		  ○ Power

	BOP	Peer checks rod withdrawal

	ATC	If dilution is performed:
		• Places RCS Makeup control to Stop
		• Place RCS Makeup Mode selector to Dilute
		• Adjusts integrator to desired dilution amount
		• Places RCS Makeup control to Start
		• Observes:
		  ○ Proper makeup response
		  ○ Tavg
		  ○ Power

	BOP	Peer check dilution Adjust Low Flow Feed Reg Valves to maintain SG levels.

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Event Description: Power Ascension	
Lead Evaluator	When the following has been demonstrated/observed: • Sufficient load ascension. • Sufficient normal plant operations by the BOP. Then instruct Booth to insert Event 2.

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Event Description: 21 Charging Pump Trip		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	Notes 480V Motor Trip Alarm
	ATC	Diagnoses that 21 Charging Pump has tripped
	CRS	Announces entry in AOP-CVCS-1
	ATC/BOP	Verify there is no gas binding or issue preventing start of 22 Charging Pump
	ATC	Starts 22 Charging Pump
	CRS	Evaluates TRM TRO 3.1.B.1 and determines plant is in 24 hour action statement
Lead Evaluator		When the following has been demonstrated/observed: Then instruct Booth to insert Event 3

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Event Description: Trip of 23 CCW pump.

Time	Position	Applicant's Actions or Behavior
	BOP	Diagnose that 23 CCW pump has tripped:
	BOP	Realize that a standby pump should have started and did not. Start 21 or 22 CCW as directed by ARP-SGF which may be referenced after starting the pump.
	CRS	May Enter 2-AOP-CCW-1
	CRS/BOP	If prior actions have not been taken based on Auto-Start Failure Pump starts described above will be directed at Step 1 of the procedure.
	CRS	CRS will evaluate TS 3.7.7 and determine that the plant is in a 72 hour actions statement due to having two CCW Pumps out of service.
Lead Evaluator		When CCW is restored initiate Event 4

Op-Test No.: 1 Scenario No.: 3 Event No.: 4		Page 1 of 1
Event Description: Control Rod D8 IRPI fails low		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	Acknowledge Rod Bottom Rod Stop alarm
	ATC	Diagnose that an IRPI has failed (may announce actual dropped rod): • D8 IRPI reading 0 and rod bottom light lit • No power change • No NIS Dropped Rod alarm • No QPTR tilt indications
	CRS	Announce entry into AOP-ROD-1
	CRS/ATC	Determine failed IRPI
	CRS	Refers to TS 3.1.7 and determines that immediate compensatory actions are needed.
Lead Evaluator		When the following has been demonstrated/observed: TS evaluated Then instruct Booth to insert Event 5

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Event Description: PT-408A fails high causing MBFP to go to minimum speed		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	Diagnoses failure based on: • Changing speed on 21 MFW Pump • Changing SG Levels • Possible SG Level Deviation Alarm • Meter indication for PT-408A
	ATC	Places MFW master speed controller or 21 MFW speed controller in manual to control speed.
	BOP	Adjusts Low Flow FRVs to maintain SG Levels
	CRS	Directs team to perform immediate operator actions of AOP-INST-1
	ATC	Checks all instruments listed in AOP-INST-1
	CRS	Implements AOP-INST-1 • Verifies no other instrument failures • Ensures actions have been taken to stabilize the plant
Lead Evaluator		When the following has been demonstrated/observed: SG levels stable Then instruct Booth to insert Event 6

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Event Description: 24 SGTR, loss of instrument air to containment, PORV fails open	

Time	Position	Applicant's Actions or Behavior
Note: ***The diagnoses of 24 SGTR will happen during the performance of E-0***		
	ATC	Diagnose that SGTR exits in 24 SG: • Decreasing PZR level • VCT lowering level • 24 SG level increasing without feed
	CRS	Directs ATC to trip Reactor if not already done Directs ATC or BOP to Initiate SI
	ATC	Trips reactor if not already done
	ATC or BOP	Initiates Safety Injection
	CRS	Directs Operators to perform immediate operator actions of E0.
	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: • 2A, 3A, 5A and 6A are energized
	ATC	Checks SI Status: • SI Annunciators are lit • SI Pumps are running • Both Trains of SI are actuated

Note: ***The first 4 steps of E-0 are performed twice. Once by the ATC and BOP using placards, and a second time with the CRS reading the procedure.***		
	CRS	Directs BOP to perform Attachment 1 of E-0
	BOP	Performs Attachment 1 in parallel with the CRS/ATC progressing through E-0: • Start a charging pump and align suction to RWST by opening LCV-112B and closing LCV-112C. • Starts 21 and 22 Containment Recirc Fans • Dispatch NPO to reset lighting and MCCS 24A, 27A, and 29A. • Stop condensate pumps. • Use 22 AFWP to align AFW flow to 23 and 24 SGs if not already done.
	CRS/ATC	Manually start 23 AFW Pump to supply 23 SG (24 will be fed if team does not realize that it is ruptured)
	CRS/ATC	Verify SI System Flow: Checks RCS Pressure Checks SI Flow indicated if RCS Pressure is below 1720 psig Secures and places one RHR Pump in Pullout.
	CRS/ATC	Check RCP Seal Cooling: • Checks CCW • Direct Service Water Valves SWN-4, SWN-5 be closed locally • When valves are closed start NESW pump
	CRS/ATC	Check RCS Temperature: AFW Flow may be throttled back to just above 400 gpm at this point to maintain RCS Temperature.
	CRS/ATC	Will check that Spray, Aux Spray, and PORVs are all closed.
	CRS/ATC	Check if RCPs should be stopped: They will be left in service
	CRS/ATC	Check for Faulted SG
	CRS/ATC	Check for Ruptured SG: • 24 SG Level will be increasing in an uncontrolled manner Team will identify 24 SG is ruptured.
	CRS	Transition to E-3 Steam Generator Tube Rupture

	CRS/ATC	Check if RCPs should be stopped: Pumps will not be secured
	CRS	Identifies 24 SG as ruptured
Critical Task 1 Isolate Feedwater flow to and steam flow from the ruptured SG before transition to ECA-3.1 occurs.		
Isolating AFW Flow to 24 SG and adjusting the ADV may have occurred in E-0 when level reached 10% as a Prudent Operator Action.		
	ATC/BOP	Secure feeding 24 SG
	CRS/ATC	Adjust 24 SG ADV to 1030 psig if not already done
	CRS/ATC	Verify blowdown isolated from 24 SG
	CRS/ATC	Direct closure of steam traps upstream of 24 SG
	CRS/ATC	Direct check that MS-55D (MSIV bypass) is closed.
	CRS/ATC	Close 24 MSIV
	CRS/ATC	Check 24 SG level > 10%
	CRS/ATC	Check 24 SG pressure > 440 psig
	CRS/ATC	Determine CET target temperature based on 24 SG Pressure (about 500^0F)
Critical Task 2 Establish/Maintain RCS temperature to ensure transition out of E-3 does not occur due to either of the following: • RCS temperature too high to maintain required subcooling (This could be caused by team allowing CET temperature to come back up above target value). • RCS temperature too low resulting in severe challenge to the subcriticality or integrity CSF. (Procedure specifies maintain temperature below target value without giving a specified band, however operators are trained to keep temperature close to target. Overcooling which leads to integrity challenge constitutes failure).		
	CRS/ATC	Commence Cooldown to target CET temperature: • **Place HP Steam Dumps in Pressure Mode and Manual** • **Initiate Cooldown** • Do not exceed 0.5E6 lbs/hr on each of 21, 22, 24 SG *Team will continue in procedure while CETs are lowering* When CET temperatures are less than target: • **Stop cooldown by closing HP Steam Dumps** **Maintain CET temperature below target temperture**
	CRS/ATC	Check SG Levels and maintain AFW flow

	CRS/ATC	Check PORVs and Block Valves. A block valve will be opened.
	CRS/ATC	Reset SI: • Place CCW Pumps in Trip Pullout • Close MFRV and Bypass FRVs • Place SI Defeat Key Switches in Defeat • Press SI Reset Pushbuttons
	CRS/BOP	Reset Phase A: • Place switches in open for IVSW valves 141, 1413, SOV-3518, SOV-3519 • Place Containment Rad Monitor WCPS Valve Switch to open • Place VC Hatch switches in incident • Place all remaining Phase A Valve switches to close • Depress Phase A reset pushbuttons
	CRS/BOP	Attempt to establish instrument air to containment. 1228 will not open
	CRS/BOP	Secure remaining in service RHR Pump
	CRS/ATC	After cooldown stopped, check 24 SG Pressure stable or increasing. It will be stable
	CRS/ATC	Check subcooling > 43F
	CRS	Determine that PORV will be needed to depressurize RCS
	CRS/ATC	Use PORV PCV-455C to depressurize
	CRS/ATC	When depressurizing termination criteria are met: • Attempt to close PCV-455C • Attempt to close block valve
	CRS	Transition to ECA-3.1
Lead Evaluator	Terminate scenario.	

EMERGENCY PLAN DECLARATION

Alert

FA1.1 Any loss or potential loss of fuel clad or RCS

From the fission product barrier matrix, RCS will be lost (D. Inventory Rupture SG results in ECCS actuation)